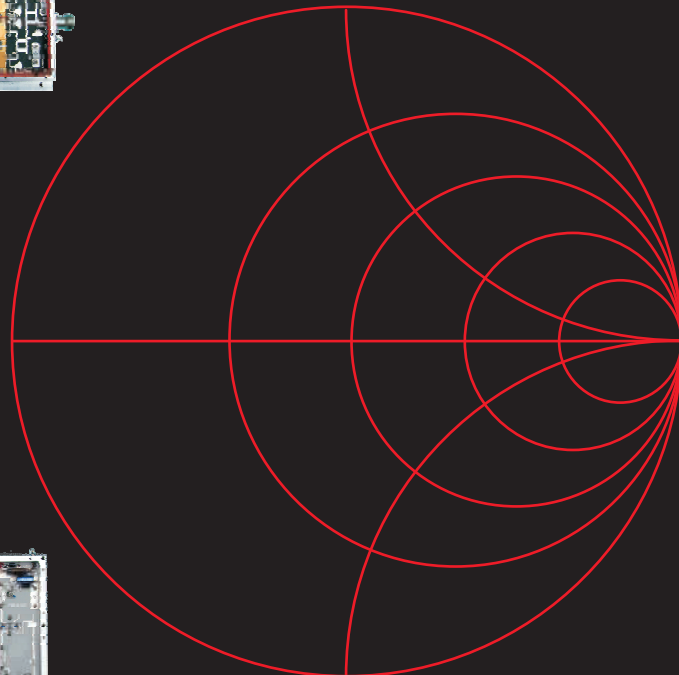
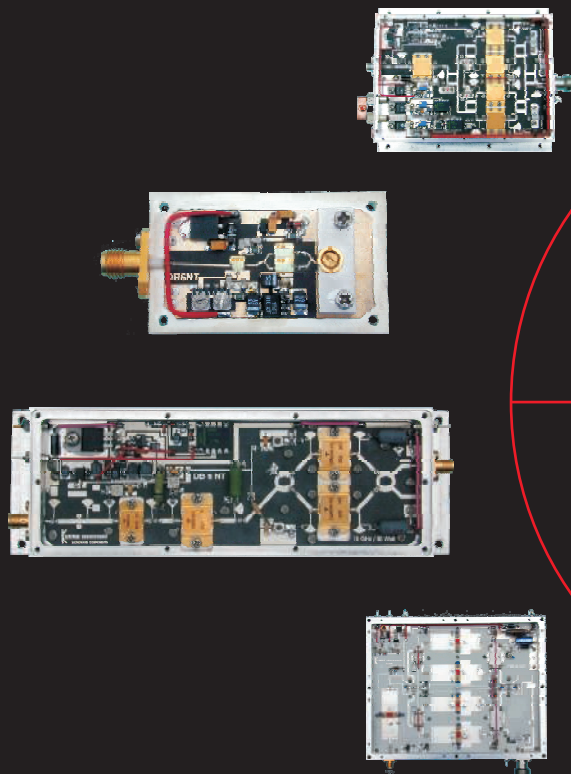
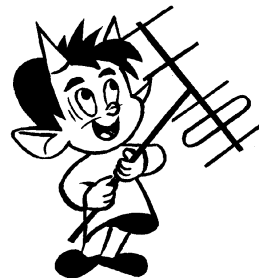


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Preamplifier - Product Selection Guide

Frequency Range 144 MHz to 2.4 GHz

Type	Frequency Range (MHz)	Noise Figure (dB) ¹⁾		Gain typ. (dB)	Power Supply		Connectors		Case Type waterproof	Remarks
		typical	maximum		DC Voltage (V)	Current (mA)	Input	Output		
MKU LNA 144 A	144.2 (+/- 2)	0.35	0.4	> 25	12 ... 14	60	N, male	N, female	milled alu, no	High IP3
MKU LNA 432 A	432.2 (+/- 2)	0.4	0.45	> 15	12 ... 14	60	N, male	N, female	milled alu, no	High IP3
KU LNA 1090 A	1070 ... 1110	0.5	0.6	> 30	8 ... 15	130	N, female	BNC, female	German silver, no	Including band pass filter
KU LNA 1090 A TM	1070 ... 1110	0.5	0.6	> 30	8 ... 15	130	N, female	N, female	German silver, yes	Including band pass filter
MKU LNA 131 A HEMT	1296 (+/- 50)		0.5	18	9 ... 15	15	SMA, male	SMA, female	milled alu, no	3)
MKU LNA 131 B HEMT	1296 (+/- 50)		0.5	18	9 ... 15	15	SMA, female	SMA, female	milled alu, no	3)
MKU LNA 132 A	1275 (+/- 10)	0.7		> 35	9 ... 18	30	N, male	N, female	German Silver, no	Including helical filter
MKU LNA 132 A2	1275 (+/- 10)	0.7		> 35	9 ... 18	30	N, female	F, female	German Silver, no	Including helical filter, 2350 MHz notch
MKU LNA 132 A2 TM	1275 (+/- 10)	0.7		> 35	9 ... 18	30	N, female	F, female	German Silver, yes	Including helical filter, 2350 MHz notch
MKU LNA 132 B	1296 (+/- 10)	0.7		> 15	9 ... 18	15	N, male	N, female	German Silver, no	Including helical filter
MKU LNA 131 AH HEMT	1296 (+/- 50)	0.4	0.45	20	9 ... 15	15	N, male	N, female	milled alu, no	Super low noise HEMT
MKU LNA 132 AH HEMT	1296 (+/- 50)	0.4	0.45	33	9 ... 15	65	N, male	N, female	milled alu, no	Super low noise HEMT, high IP3
MKU LNA 132 AH HEMT-SMA	1296 (+/- 50)	0.4	0.45	33	9 ... 15	65	SMA, male	SMA, female	milled alu, no	Super low noise HEMT, high IP3
KU LNA 141 AH HEMT	1350 ... 1450		0.4	> 17	9 ... 15	15	N, male	N, female	milled alu, no	Super low noise HEMT
KU LNA 142 AH HEMT	1350 ... 1450		0.4	33	9 ... 15	65	N, male	N, female	milled alu, no	Super low noise HEMT
KU LNA 152 A	1550 (+/- 10)	0.7		> 35	9 ... 18	30	N, male	N, female	German Silver, no	Including helical filter, for Inmarsat
KU LNA 1575/4 SMA	1575 (+/- 10)	0.7		45	12	300	SMA, female	4 x SMA, f.	German Silver, no	Including helical filter, for GPS
KU LNA 1575-50	1575 (+/- 10)		0.5	55	9 ... 18	100	N, male	N, male	milled alu, no	Including helical filter, for GPS
KU LNA 172 A	1695 (+/- 10)	0.7		> 35	9 ... 18	30	N, male	N, female	German Silver, no	Including helical filter
MKU LNA 231 A HEMT	2320 (+/- 50)		0.6	> 16	9 ... 18	15	SMA, male	SMA, female	milled alu, no	
MKU LNA 231 B HEMT	2320 (+/- 50)		0.6	> 16	9 ... 18	15	SMA, female	SMA, female	milled alu, no	
MKU LNA 232 A2	2350 (+/- 30)	0.7		> 35	9 ... 18	30	N, male	N, female	German Silver, no	Including ceramic filter, 1250 MHz notch
MKU LNA 232 A2 TM	2350 (+/- 30)	0.7		> 35	9 ... 18	30	N, female	N, female	German Silver, yes	Including ceramic filter, 1250 MHz notch
MKU LNA 232 B	2320 (+/- 10)	0.7		> 15	9 ... 18	15	N, male	N, female	German Silver, no	Including helical filter
MKU LNA 231 AH HEMT	2304 ... 2320	0.4	0.5	16	9 ... 15	15	N, male	N, female	milled alu, no	Super low noise HEMT, 4)
MKU LNA 232 AH HEMT	2304 ... 2320	0.5	0.6	30	9 ... 15	65	N, male	N, female	milled alu, no	Super low noise HEMT, high IP3, 4)
KU LNA 222 AH HEMT	2200 ... 2400	0.5		30	9 ... 15	65	SMA, female	SMA, female	milled alu, no	Super low noise HEMT, high IP3

Footnotes

- Noise figure values at +18 °C.
Only for narrowband preamplifiers: noise figure is specified at center frequency.
- Also see waveguide table.
- N connectors available
- SMA connectors available

Important notes

- Preamplifiers do **not contain coaxial relays!**
- In case of outdoor installation, **protection against water and moisture** is required!
- Other connectors or cases are available on request.

Waveguide table

R 100	WG 16	WR 90
R 120	WG 17	WR 75
R 220	WG 20	WR 42
R 500	WG 24	WR 19

Vorwärtlicher Produktkatalogguide

Frequency Range 3.4 GHz to 47 GHz and 1 MHz to 7000 MHz / broadband										
Type	Frequency Range (MHz)	Noise Figure (dB) ¹⁾		Gain typ. (dB)	Power Supply		Connectors		Case Type waterproof	Remarks
		typical	maximum		DC Voltage (V)	Current (mA)	Input	Output		
MKU LNA 341 A HEMT	3400 (+/- 50)		0.7	12	9 ... 15	15	SMA, male	SMA, female	milled alu, no	
MKU LNA 341 B HEMT	3400 (+/- 50)		0.7	12	9 ... 15	15	SMA, female	SMA, female	milled alu, no	
MKU LNA 342 A HEMT	3400 (+/- 50)		0.7	28	9 ... 15	80	SMA, male	SMA, female	milled alu, no	
MKU LNA 342 B HEMT	3400 (+/- 50)		0.7	28	9 ... 15	80	SMA, female	SMA, female	milled alu, no	
KU LNA 3436 A	3400 ... 3600	0.8	0.9	29 (+/- 2)	9 ... 15	80	SMA, male	SMA, female	milled alu, no	
KU LNA 3436 B	3400 ... 3600	0.8	0.9	29 (+/- 2)	9 ... 15	80	SMA, female	SMA, female	milled alu, no	
MKU LNA 571 A HEMT	5760 (+/- 50)		0.7	> 12	9 ... 15	15	SMA, male	SMA, female	milled alu, no	
MKU LNA 571 B HEMT	5760 (+/- 50)		0.7	> 12	9 ... 15	15	SMA, female	SMA, female	milled alu, no	
MKU LNA 572 A HEMT	5760 (+/- 50)		0.7	> 25	9 ... 15	30	SMA, male	SMA, female	milled alu, no	
MKU LNA 572 AF HEMT	5760 (+/- 50)		0.7	> 25	9 ... 15	30	SMA, male	SMA, female	milled alu, no	Including band pass filter
MKU LNA 572 B HEMT	5760 (+/- 50)		0.7	> 25	9 ... 15	30	SMA, female	SMA, female	milled alu, no	
MKU LNA 572 BF HEMT	5760 (+/- 50)		0.7	> 25	9 ... 15	30	SMA, female	SMA, female	milled alu, no	Including band pass filter
KU LNA 8000 A	8000 ... 8450	0.6	0.7	> 22	12 ... 15	30	R 100 (2)	SMA, female	milled alu, no	Input waveguide R100 / WG16 / WR90
MKU LNA 101 AS HEMT	10368 (+/- 50)	0.7	0.8	> 12	9 ... 15	15	SMA, male	SMA, female	milled alu, no	
MKU LNA 101 BS HEMT	10368 (+/- 50)	0.7	0.8	> 12	9 ... 15	15	SMA, female	SMA, female	milled alu, no	
MKU LNA 102 A HEMT	10368 (+/- 50)	0.8		> 22	9 ... 15	30	SMA, male	SMA, female	milled alu, no	
MKU LNA 102 B HEMT	10368 (+/- 50)	0.8		> 22	9 ... 15	30	SMA, female	SMA, female	milled alu, no	
MKU LNA 102 S-EME	10368 (+/- 50)	0.7		> 23	9 ... 15	30	R 100 (2)	SMA, female	milled alu, no	Input waveguide R100 / WG16 / WR90
MKU LNA 102 S-EME R120	10368 (+/- 50)	0.7		> 23	9 ... 15	30	R 120 (2)	SMA, female	milled alu, no	Input waveguide R120 / WG17 / WR75
MKU LNA 243 CS2	24000 ... 24250		2.0	> 24	9 ... 15	60	SMA, male	SMA, female	milled alu, no	Output power typ. 10 mW
MKU LNA 243 WS2	24000 ... 24250		1.5	> 26	9 ... 15	60	R 220 (2)	R 220 (2)	milled alu, no	Output power typ. 10 mW
MKU LNA 243 RX2	24000 ... 24250		1.5	> 26	9 ... 15	60	R 220 (2)	SMA, female	milled alu, no	Output power typ. 10 mW
MKU LNA 245 W	24000 ... 24250		2.5	> 30	10 ... 15	210	R 220 (2)	R 220 (2)	milled alu, no	Saturation output power 80 mW
MKU LNA 245 HP	24000 ... 24250		2.5	> 30	10 ... 15	210	SMA, male	SMA, female	milled alu, no	Saturation output power 80 mW
MKU LNA 472 B	47000 ... 47250		5.0	> 27	10 ... 14	110	R 500 (2)	R 500 (2)	milled alu, no	Saturation output power 30 mW
KU LNA BB1088 A	120 ... 180	1.0	1.3	20 (+/- 2)	12 ... 14	230	SMA, female	SMA, female	milled alu, no	High IP3
KU LNA BB2240 A	225 ... 400	1.0	1.2	20 (+/- 2.5)	12 ... 15	380	SMA, female	SMA, female	milled alu, no	High IP3, output P1dB typ. 28 dBm
KU LNA BB3050 A	350 ... 500	1.0	1.3	20 (+/- 3)	12 ... 15	380	SMA, female	SMA, female	milled alu, no	High IP3
KU LNA BB0515 A-SMA	5 ... 1500	1.2	2.0	19	12 ... 14	85	SMA, female	SMA, female	milled alu, no	High IP3, bias-T optional
KU LNA BB0515 B-N	5 ... 1500	1.2	2.0	19	12 ... 14	85	N, female	N, female	milled alu, no	High IP3, bias-T optional
KU LNA BB1020 A	1000 ... 2000	0.8	1.0	> 29	12 ... 15	200	SMA, female	SMA, female	milled alu, no	High IP3
KU LNA BB1522 A	1500 ... 2200	0.8	1.0	> 27	12 ... 15	250	SMA, female	SMA, female	milled alu, no	High IP3
KU LNA BB2227 A	2200 ... 2700	0.9	1.2	> 25	12 ... 15	250	SMA, female	SMA, female	milled alu, no	High IP3, built-in bias-T
KU LNA BB2000 LSF-SMA	1000 ... 2800	0.6	1.0	35 (+/- 3)	12 ... 15	30	SMA, female	SMA, female	milled alu, no	Built-in bias-T
KU LNA BB2000 LSF-N	1000 ... 2800	0.6	1.0	35 (+/- 3)	12 ... 15	30	N, male	N, female	milled alu, no	Built-in bias-T
KU LNA BB0180 A-SMA	1 ... 7000	4.0		23 (+/- 3)	12	90	SMA, female	SMA, female	milled alu, no	High IP3, bias-T optional
KU LNA BB0180 B-N	1 ... 7000	4.0		23 (+/- 3)	12	90	N, female	N, female	milled alu, no	High IP3, bias-T optional

Selective Super Low Noise PHEMT Preamplifiers for 144 MHz and 432 MHz

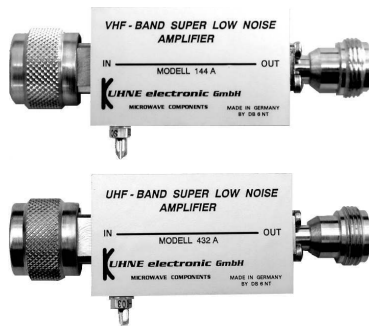
MKU LNA 144 A - MKU LNA 432 A

These selective super low noise preamplifiers use the latest PHEMT transistor technology from Agilent. Due to their high technical performance - low noise figure, high gain and very high IP3 - they are the ideal preamplifiers for contest operation as well as EME, Meteorscatter, Aurora and tropo DX.

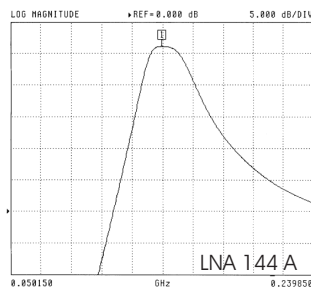
- Low noise figure and high gain
- Two-pole helical band pass filter for good selectivity
- High IP3 - ideal for contest operation
- Unconditionally stable - no parasitic oscillations in case of poor antenna match
- Milled aluminium case
- Important note: The preamplifiers do not contain built-in coaxial relays!

Specifications

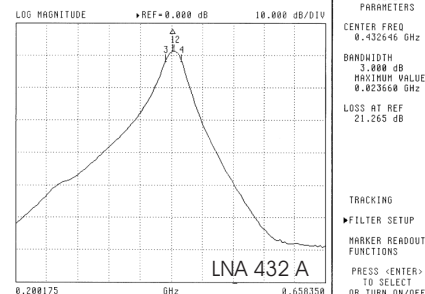
Type	MKU LNA 144 A	MKU LNA 432 A
Center frequency	144.2 MHz +/-	432.2 MHz +/-
Noise figure @ 18 °C	0.35 dB +/- 0.05	0.4 dB +/- 0.05
Gain	> 25 dB	typ. 20 dB
Input return loss	> 3 dB	typ. 5 dB
Output return loss	typ. 15 dB	> 15 dB
Output IP3	typ. + 24 dBm	typ. +27 dBm
Supply voltage	+12...14 V DC	+12...14 V DC
Current consumption	typ. 60 mA	typ. 60 mA
Input connector	N-male / 50 ohms	N-male / 50 ohms
Output connector	N-female / 50 ohms	N-female / 50 ohms
Case	milled aluminium	milled aluminium
Dimensions in mm	30 x 50 x 24	30 x 50 x 24
Weight	typ. 100 g	typ. 100 g



S21 FORWARD TRANSMISSION



S21 FORWARD TRANSMISSION



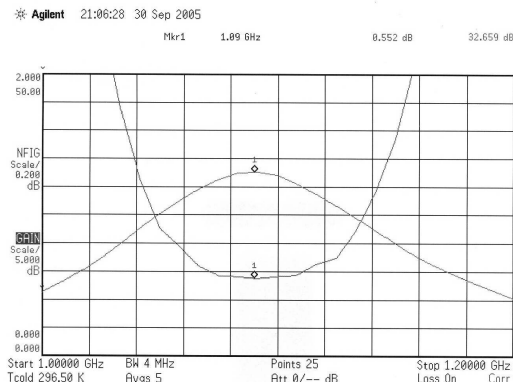
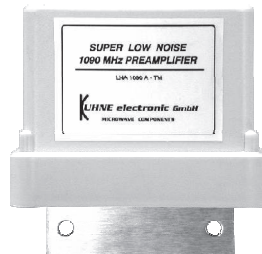
Amplifiers for other frequencies available on request.

L-Band Super Low Noise Amplifier

KU LNA 1090 A - KU LNA 1090 A TM

This high linear preamplifier was developed for applications in the IFF frequency range (Identification Friend or Foe) at 1090 MHz. The preamplifier has a two-pole band pass filter between the two amplifier stages for high suppression of out-of-band signals. This preamplifier features excellent large signal performance and a low noise figure.

- High IP3 for excellent large signal performance
- Low noise figure
- ESD protection at preamplifier input
- Remote power supply (with bias-T) is possible
- Built-in band pass filter
- Important note: The preamplifier does not contain built-in coaxial relays!



Specifications

Type	KU LNA 1090 A		KU LNA 1090 A TM	
Frequency range	1070...1110 MHz		1070...1110 MHz	
Noise figure @ 18 °C	typ. 0.5 dB; max. 0.6 dB		typ. 0.5 dB; max. 0.6 dB	
Gain	min. 30 dB		min. 30 dB	
RF input power	1 mW		1 mW	
Supply voltage	+8...15 V DC		+8...15 V DC	
Current consumption	130 mA		130 mA	
Input connector	N-female / 50 ohms		N-female / 50 ohms	
Output connector	BNC-female / 50 ohms		N-female / 50 ohms	
Case	German silver case		German silver, installed into a water resistant case	
Dimensions in mm	74 x 37 x 30		110 x 60 x 85	
Weight	typ. 90 g		typ. 330 g	

NEW

Amplifiers for other frequencies available on request.

Super Low Noise HEMT Preamplifiers with Helical Filters

MKU LNA 132 A / B • amateur band 23 cm (1.3 GHz)

MKU LNA 232 B • amateur band 13 cm (2.3 GHz)

KU LNA 152 A • INMARSAT 1.55 GHz

KU LNA 172 A • METEOSAT 1.7 GHz

- Helical filter for good selectivity
- Low noise figure
- Unconditionally stable - no parasitic oscillators in case of poor antenna match
- Solder pin for direct power supply (feed-through capacitor)
- Built-in bias-T for remote power supply via coaxial cable

MKU LNA 232 A2 • MKU LNA 232 A2 TM

- Notch filter for 1250 MHz at input - for duplex operation on 1.3 GHz (TX) and 2.3 GHz (RX)
- Multilayer ceramic filter for good selectivity
- Low noise figure
- Unconditionally stable - no parasitic oscillations in case of poor antenna match
- Built-in bias-T for remote power supply via coaxial cable
- MKU LNA 232 A2: additional solder pin for direct power supply (feed-through capacitor)

MKU LNA 132 A2 • MKU LNA 132 A2 TM

- Notch filter for 2350 MHz at input - for duplex operation on 1.3 GHz (RX) and 2.3 GHz (TX)
- Helical filter for good selectivity
- Low noise figure
- Unconditionally stable - no parasitic oscillations in case of poor antenna match
- Built-in bias-T for remote power supply via coaxial cable
- F-female output connector - for direct connection to a TV satellite receiver

Specifications

Type	MKU LNA 132 A	MKU LNA 132 A2	MKU LNA 132 B	KU LNA 152 A	KU LNA 172 A	MKU LNA 232 A2	MKU LNA 232 B
Center frequency	1275 MHz +/-	1275 MHz +/-	1296 MHz +/-	1550 MHz +/-	1695 MHz +/-	2350 MHz +/-	2320 MHz +/-
Noise figure @ 18 °C	typ. 0.7 dB	typ. 0.7 dB	typ. 0.7 dB	typ. 0.7 dB	typ. 0.7 dB	typ. 0.7 dB	typ. 0.7 dB
Gain	> 35 dB	> 35 dB	> 15 dB	> 35 dB	> 35 dB	> 35 dB	> 15 dB
Supply voltage	+9...18 V DC	+9...18 V DC	+9...18 V DC	+9...18 V DC	+9...18 V DC	+9...18 V DC	+9...18 V DC
Current consumption	30 mA	30 mA	15 mA	30 mA	30 mA	30 mA	15 mA
Input connector	N-male	N-male	N-male	N-male	N-male	N-male	N-male
Output connector	N-female	F-female	N-female	N-female	N-female	N-female	N-female
Case	German silver	German silver	German silver	German silver	German silver	German silver	German silver
Dimensions in mm	74 x 38 x 30	74 x 38 x 30	74 x 38 x 30	74 x 38 x 30	74 x 38 x 30	74 x 38 x 30	74 x 38 x 30
Weight	typ. 130 g	typ. 100 g	typ. 130 g	typ. 130 g	typ. 130 g	typ. 130 g	typ. 130 g
		MKU LNA 132 A2 TM Installed into a water resistant case 109 x 60 x 85 typ. 390 g				MKU LNA 232 A2 TM Installed into a water resistant case 109 x 60 x 85 typ. 400 g	

Amplifiers for other frequencies available on request.

Super Low Noise HEMT Preamplifiers

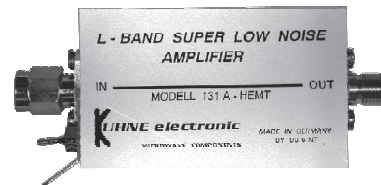
MKU LNA 131 A HEMT - MKU LNA 131 B HEMT

MKU LNA 231 A HEMT - MKU LNA 231 B HEMT

MKU LNA 341 A HEMT - MKU LNA 341 B HEMT

MKU LNA 342 A HEMT

- Low noise figure
- Unconditionally stable - no parasitic oscillations in case of poor antenna match
- Professional milled aluminium case
- Small mechanical dimensions
- Important note: The preamplifiers do not contain built-in coaxial relays.



Specifications

	131 A HEMT	131 B HEMT	231 A HEMT	231 B HEMT	341 A HEMT	341 B HEMT	342 A HEMT
Type MKU LNA	1296 MHz +/-	1296 MHz +/-	2320 MHz +/-	2320 MHz +/-	3400 MHz +/-	3400 MHz +/-	3400 MHz +/-
Center frequency	max. 0.5 dB	max. 0.5 dB	max. 0.6 dB	max. 0.6 dB	max. 0.7 dB	max. 0.7 dB	typ. 0.7 dB
Noise figure @ 18 °C	> 18 dB	> 18 dB	> 16 dB	> 16 dB	> 12 dB	> 12 dB	typ. 28 dB
Gain	+9...15 V DC	+9...15 V DC	+9...18 V DC	+9...18 V DC	+9...15 V DC	+9...15 V DC	+9...15 V DC
Supply voltage	typ. 15 mA	typ. 15 mA	typ. 15 mA	typ. 15 mA	typ. 15 mA	typ. 15 mA	typ. 80 mA
Current consumption	SMA-male	SMA-female	SMA-male	SMA-female	SMA-male	SMA-female	SMA-male
Input connector	SMA-female	SMA-female	SMA-female	SMA-female	SMA-female	SMA-female	SMA-female
Output connector	milled	milled	milled	milled	milled	milled	milled
Case	aluminium	aluminium	aluminium	aluminium	aluminium	aluminium	aluminium
Dimensions in mm	50 x 30 x 17	50 x 30 x 17	50 x 30 x 17	50 x 30 x 17	50 x 30 x 17	50 x 30 x 17	73 x 30 x 20
Weight	typ. 50 g	typ. 50 g	typ. 50 g	typ. 50 g	typ. 50 g	typ. 50 g	typ. 100 g

Option "N"

Input connector N-male, output connector N-female, on request.

Amplifiers for other frequencies available on request.

Super Low Noise HEMT Preamplifiers

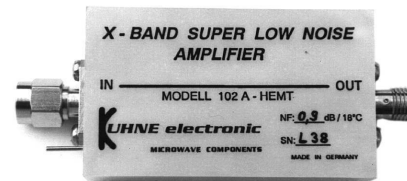
MKU LNA 342 B HEMT

MKU LNA 571 A HEMT - MKU LNA 571 B HEMT

MKU LNA 101 AS HEMT - MKU LNA 101 BS HEMT

MKU LNA 102 A HEMT - MKU LNA 102 B HEMT

- Low noise figure
- Unconditionally stable - no parasitic oscillations in case of poor antenna match
- Professional milled aluminium case
- Small mechanical dimensions
- Important note: The preamplifiers do not contain built-in coaxial relays.



Specifications

Type MKU LNA	342 B HEMT	571 A HEMT	571 B HEMT	101 AS HEMT	101 BS HEMT	102 A HEMT	102 B HEMT
Center frequency	3400 MHz +/-	5760 MHz +/-	5760 MHz +/-	10368 MHz +/-	10368 MHz +/-	10368 MHz +/-	10368 MHz +/-
Noise figure @ 18 °C	max. 0.7 dB	max. 0.7 dB	max. 0.7 dB	max. 0.8 dB	max. 0.8 dB	typ. 0.8 dB	typ. 0.8 dB
Gain	typ. 28 dB	> 12 dB	> 12 dB	> 12 dB	> 12 dB	> 22 dB	> 22 dB
Supply voltage	+9...15 V DC	+9...15 V DC	+9...15 V DC	+9...15 V DC	+9...15 V DC	+9...15 V DC	+9...15 V DC
Current consumption	typ. 80 mA	typ. 15 mA	typ. 15 mA	typ. 15 mA	typ. 15 mA	typ. 30 mA	typ. 30 mA
Input connector	SMA-female	SMA-male	SMA-female	SMA-male	SMA-female	SMA-male	SMA-female
Output connector	SMA-female	SMA-female	SMA-female	SMA-female	SMA-female	SMA-female	SMA-female
Case	milled aluminium	milled aluminium	milled aluminium	milled aluminium	milled aluminium	milled aluminium	milled aluminium
Dimensions in mm	73 x 30 x 20	50 x 30 x 17	50 x 30 x 17	50 x 30 x 17	50 x 30 x 17	50 x 30 x 17	50 x 30 x 17
Weight	typ. 100 g	typ. 50 g	typ. 50 g	typ. 50 g	typ. 50 g	typ. 50 g	typ. 50 g

Option "N"

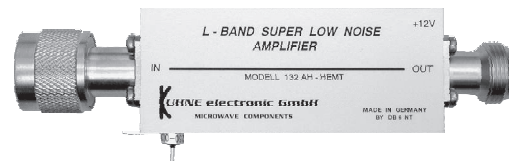
Input connector N-male, output connector N-female, on request.

Super Low Noise HEMT Preamplifiers for the 23 & 13 cm band

MKU LNA 131 AH HEMT - MKU LNA 132 AH HEMT - MKU LNA 132 AH HEMT-SMA KU LNA 222 AH HEMT

For many years, our super low noise microwave preamplifiers have been used successfully. Ham Radio Contest results proof that! Due to a extremely low noise figure the preamplifiers are ideal for tropo DX, EME (earth moon earth operation) and for receiving satellites.

- Extremely low noise figure
- Good input return loss (low VSWR)
- Unconditionally stable - no parasitic oscillations in case of poor antenna match
- Professional milled aluminium case
- Small mechanical dimensions
- Male connector at the input for direct connection to antenna or coaxial relay
- MKU LNA 132 AH HEMT: high IP3 for good large signal performance
- Important note: The preamplifiers do not contain built-in coaxial relays!



Specifications

Type	MKU LNA 131 AH HEMT	MKU LNA 132 AH HEMT	MKU LNA 132 AH HEMT-SMA	KU LNA 222 AH HEMT
Center frequency	1296 MHz +/-	1296 MHz +/-	1296 MHz +/-	2200...2400 MHz
Noise figure @ 18 °C	0.4 dB NF 0.05	0.4 dB +/- 0.05	0.4 dB +/- 0.05	typ. 0.5 dB
Gain	min. 17 dB ; typ. 20 dB	min. 29 dB ; typ. 33 dB	min. 29 dB ; typ. 33 dB	typ. 30 dB
Output IP3	-	typ. 27 dBm	typ. 27 dBm	typ. 22 dB
Supply voltage	+9...15 V DC	+9...15 V DC	+9...15 V DC	+ 9 ... 15 V DC
Current consumption	typ. 15 mA	typ. 65 mA	typ. 65 mA	typ. 65 mA
Input connector	N-male / 50 ohms	N-male / 50 ohms	SMA-male / 50 ohms	SMA-female / 50 Ohm
Output connector	N-female / 50 ohms	N-female / 50 ohms	SMA-female / 50 ohms	SMA-female / 50 Ohm
Case	milled aluminium	milled aluminium	milled aluminium	gefrästes Aluminium
Dimensions in mm	50 x 30 x 22	70 x 30 x 22	70 x 30 x 22	73 x 30 x 22
Weight	typ. 45 g	typ. 140 g	typ. 80 g	typ. 100 g

Options

Other connectors on request!

Amplifiers for other frequencies available on request.

Super Low Noise HEMT Preamplifiers for the 23 & 13 cm band

MKU LNA 231 AH HEMT - MKU LNA 232 AH HEMT

KU LNA 3436 A - KU LNA 3436 B

For many years, our super low noise microwave preamplifiers have been used successfully. Ham Radio Contest results proof that! Due to a extremely low noise figure the preamplifiers are ideal for tropo DX, EME (earth moon earth operation) and for receiving satellites.

- Extremely low noise figure
- Good input return loss (low VSWR)
- Unconditionally stable - no parasitic oscillations in case of poor antenna match
- Professional milled aluminium case
- Small mechanical dimensions
- Male connector at the input for direct connection to antenna or coaxial relay
- High IP3 for good large signal performance
- Important note: The preamplifiers do not contain built-in coaxial relays!



Specifications

	MKU LNA 231 AH-HEMT	MKU LNA 232 AH-HEMT	KU LNA 3436 A	KU LNA 3436 B
Type	2304...2320 MHz	2304...2320 MHz	3400...3600 MHz	3400...3600 MHz
Frequency range	typ. 0.4 dB	typ. 0.5 dB	typ. 0.8 dB	typ. 0.8 dB
Noise figure @ 18 °C	typ. 16 dB	typ. 30 dB	typ. 29 dB	typ. 29 dB
Gain	-	typ. 27 dBm	typ. 27 dBm	typ. 27 dBm
Output IP3	+ 9 ... 15 V DC	+ 9 ... 15 V DC	+ 9 ... 15 V DC	+ 9 ... 15 V DC
Supply voltage	typ. 15 mA	typ. 65 mA	typ. 80 mA	typ. 80 mA
Current consumption	N-male / 50 ohms	N-male / 50 ohms	SMA-male / 50 ohms	SMA-female / 50 ohms
Input connector	N-female / 50 ohms	N-female / 50 ohms	SMA-female / 50 ohms	SMA-female / 50 ohms
Output connector	milled aluminium	milled aluminium	milled aluminium	milled aluminium
Case	50 x 30 x 18	73 x 30 x 22	73 x 30 x 22	73 x 30 x 22
Dimensions in mm	typ. 100 g	typ. 140 g	typ. 140 g	typ. 140 g
Weight				

Options

Other connectors on request!

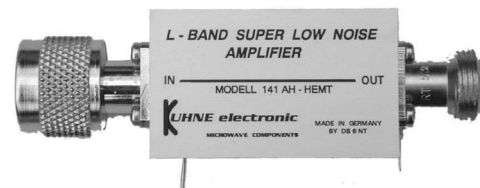
Amplifiers for other frequencies available on request.

Super low noise HEMT preamplifiers for radio astronomy

KU LNA 141 AH HEMT - KU LNA 142 AH HEMT

Our radio astronomy preamplifiers for the 1400 MHz band provide extremely low noise figures. They are excellent for receiving weak signals from space. The preamplifiers can be added to the receiving system without additional adaptors because of the male input connector and female output connector.

- Extremely low noise figure
- Good input return loss (low VSWR)
- Unconditionally stable - no parasitic oscillations in case of poor antenna match
- Milled aluminium case
- Small mechanical dimensions
- Important note: The preamplifiers do not contain built-in coaxial relays!



Specifications

Type	KU LNA 141 AH HEMT	KU LNA 142 AH HEMT
Frequency range	1350...1450 MHz	1350...1450 MHz
Noise figure @ 18° C	max. 0.4 dB +/- 0.05	max. 0.4 dB +/- 0.05
Gain	> 17 dB	typ. 33 dB
Supply voltage	+9...15 V DC	+9...15 V DC
Current consumption	typ. 15 mA	typ. 65 mA
Input connector	N-male / 50 ohms	N-male / 50 ohms
Output connector	N-female / 50 ohms	N-female / 50 ohms
Case	milled aluminium	milled aluminium
Dimensions in mm	50 x 30 x 22	73 x 30 x 22
Weight	typ. 100 g	typ. 140 g

Options Other connectors on request!

Amplifiers for other frequencies available on request.

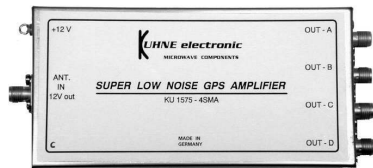
Super Low Noise HEMT Preamplifiers and Power Splitter for GPS

KU LNA 1575-4 SMA

- Power supply (12 V) of an active antenna via the preamplifier's input connector is possible
- 4 separate output stages and output connectors
- Internal helical filter
- Low noise figure
- Unconditionally stable - no parasitic oscillations in case of poor antenna match

KU LNA 1575-50

- Very low noise figure
- High gain
- Internal helical filter
- Unconditionally stable - no parasitic oscillations in case of poor antenna match



Specifications

Type	KU LNA 1575/4 SMA
Center frequency	1575 MHz +/- 10 MHz
Noise figure @ 18 °C	typ. 0.7 dB
Gain	typ. 47 dB +/- 3 dB
Output power	
Output IP3	
Supply voltage	+12 V DC
Current consumption	typ. 300 mA
Input connector	SMA-female / 50 ohms
Output connector	4 x SMA-female / 50 ohms
Case	German silver
Dimensions in mm	111 x 55 x 30
Weight	typ. 150 g

Type	KU LNA 1575-50
Center frequency	1575 MHz +/- 10 MHz
Noise figure @ 18 °C	max. 0.5 dB
Gain	typ. 55 dB
Output power	> 10 dBm
Output IP3	> 20 dBm
Supply voltage	+9...18 V DC
Current consumption	typ. 100 mA
Input connector	N-female / 50 ohms
Output connector	N-female / 50 ohms
Case	milled aluminium
Dimensions in mm	102 x 45 x 29
Weight	typ. 220 g

Specifications

Type	KU DIV 1575
Center frequency	1575 MHz +/- 50 MHz
Insertion loss	typ. 3 dB
Isolation	typ. 25 dB
Impedance	50 Ohm
DC path	+0...24 V DC / max. 0.5 A
Input connector	N-female / 50 ohms
Output connector A	N-female / 50 ohms
Output connector B	N-female / 50 ohms
Case	Tinplate
Dimensions in mm	37 x 37 x 30
Weight	typ. 95 g

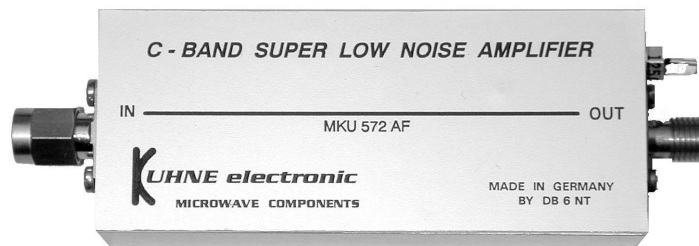
Amplifiers for other frequencies available on request.

Super Low Noise HEMT Preamplifiers

MKU LNA 572 A HEMT - MKU LNA 572 B HEMT - MKU LNA 572 AF HEMT MKU LNA 572 BF HEMT

The preamplifiers MKU LNA 572 AF HEMT and MKU LNA 572 BF HEMT contain an internal band pass filter for the 5.7 GHz range.

- Low noise figure
- Unconditionally stable - no parasitic oscillations in case of poor antenna match
- Milled aluminium case
- Small mechanical dimensions
- Important note: The amplifiers do not contain built-in coaxial relays!



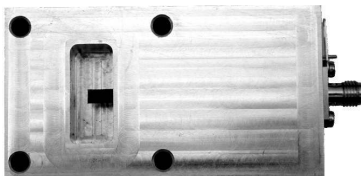
Specifications

Type	MKU LNA 572 A HEMT	MKU LNA 572 B HEMT	MKU LNA 572 AF HEMT	MKU LNA 572 BF HEMT
Center frequency	5760 MHz +/- 50	5760 MHz +/- 50	5760 MHz +/- 50	5760 MHz +/- 50
Noise figure @ 18° C	max. 0.7 dB	max. 0.7 dB	max. 0.7 dB	max. 0.7 dB
Gain	min. 25 dB	min. 25 dB	min. 25 dB	min. 25 dB
Supply voltage	+9...15 V DC	+9...15 V DC	+9...15 V DC	+9...15 V DC
Current consumption	typ. 30 mA	typ. 30 mA	typ. 30 mA	typ. 30 mA
Input connector	SMA-male / 50 ohms	SMA-female / 50 ohms	SMA-male / 50 ohms	SMA-female / 50 ohms
Output connector	SMA-female / 50 ohms	SMA-female / 50 ohms	SMA-female / 50 ohms	SMA-female / 50 ohms
Case	milled aluminium	milled aluminium	milled aluminium	milled aluminium
Dimensions in mm	74 x 30 x 20	74 x 30 x 20	74 x 30 x 20	74 x 30 x 20
Weight	typ. 75 g	typ. 75 g	typ. 75 g	typ. 75 g
Incl. bandpass	no	no	yes	yes

Amplifiers for other frequencies available on request.

Super low noise HEMT preamplifiers for the X-Band

MKU LNA 102 S-EME - MKU LNA 102 S-EME R120 - KU LNA 8000 A



Specifications

	MKU LNA 102 S-EME	MKU LNA 102 S-EME R120
Type	10368 MHz +/- 50	10368 MHz +/- 50
Center frequency	typ. 0.7 dB	typ. 0.7 dB
Noise figure @ 18 °C	min. 23 dB	min. 23 dB
Gain	+9...15 V DC	+9...15 V DC
Supply voltage	typ. 30 mA	typ. 30 mA
Current consumption	Waveguide	Waveguide
Input connector	R100 / WG16 / WR90	R120 / WG17 / WR75
Output connector	SMA-female / 50 ohms	SMA-female / 50 ohms
Case	milled aluminium	milled aluminium
Dimensions in mm	20 x 40 x 83	20 x 40 x 83
Weight	typ. 110 g	typ. 110 g

MKU LNA 102 S-EME. Winner of the Noise figure contest at EME-conference in Prague 2002

- Small size
- Low noise figure and high gain
- Milled aluminium case, professional construction
- Male connector at the input of the amplifier for direct connection to a coaxial relay - typ. "A"
- Unconditionally stable. No parasitic oscillation in case for poor antenna match
- Use of latestest GaAs - HEMT - FET's
- Direct transition from waveguide to pcb
- Important note: The preamplifiers do not contain built-in coaxial relays!

Deep space communication preamplifier

Specifications

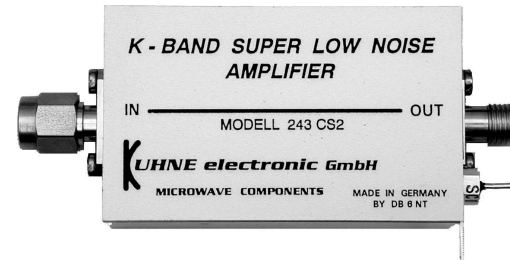
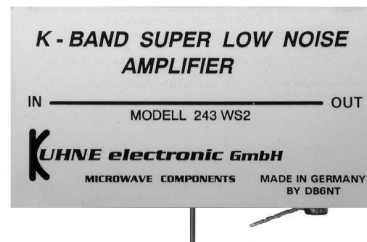
	KU LNA 8000 A
Type	8000...8450 MHz
Frequency range	max. 0.7 dB
Noise figure @ 18 °C	min. 22 dB
Gain	+9...15 V DC
Supply voltage	typ. 30 mA
Current consumption	Waveguide
Input connector	R100 / WG16 / WR90
Output connector	SMA-female / 50 ohms
Case	milled aluminium
Dimensions mm	20 x 40 x 83 mm
Weight	typ. 110 g

Super Low Noise HEMT Amplifiers for 24 GHz

MKU LNA 243 WS2 - MKU LNA 243 CS2

The HEMT amplifiers for 24 GHz feature low noise figures and high output power. They can be used as preamplifiers and as driver or power amplifiers. The amplifiers are available with SMA or waveguide connectors.

- Low noise figure
- Unconditionally stable - no parasitic oscillations in case of poor antenna match
- Milled aluminium case
- Small mechanical dimensions
- Important note: The amplifiers do not contain built-in coaxial relays!



Specifications

Type	MKU LNA 243 WS2	MKU LNA 243 CS2
Frequency range	24...24.25 GHz	24...24.25 GHz
Noise figure @ 18 °C	max. 1.5 dB	max. 2.0 dB
Gain	min. 26 dB	min. 24 dB
Saturation output power	typ. 10 mW	typ. 10 mW
Supply voltage	+9...15 V DC	+9...15 V DC
Current consumption	typ. 60 mA	typ. 60 mA
Input connector	Waveguide R220 / WR42 / WG20	SMA-male / 50 ohms
Output connector	Waveguide R220 / WR42 / WG20	SMA-female / 50 ohms
Case	milled aluminium case	milled aluminium case
Dimensions in mm	55 x 30 x 27	50 x 30 x 17
Weight	typ. 85 g	typ. 40 g

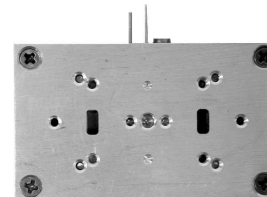
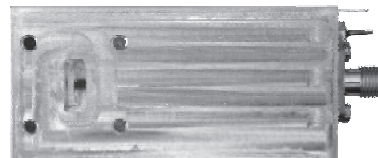
Amplifiers for other frequencies available on request.

Super Low Noise HEMT Amplifiers for 24 and 47 GHz

MKU LNA 243 RX2 - MKU LNA 472 B

Our amplifiers for 24 GHz and 47 GHz use the latest semiconductor technologies. They achieve low noise figures and a high output power. Therefore, they can be used as preamplifiers or as power amplifiers as well. The waveguide input is directly coupled to the internal PCB for minimum losses. Due to their small mechanical dimensions, the modules can be used for building very compact receive or transmit systems.

- Low noise figure
- Unconditionally stable - no parasitic oscillations in case of poor antenna match
- Milled aluminium case
- Small mechanical dimensions
- Important note: The amplifiers do not contain built-in coaxial relays!



Specifications

Type	MKU LNA 243 RX2	MKU LNA 472 B
Center frequency	24048 MHz (24.0...24.25 GHz)	47088 MHz (47.0...47.25 GHz)
Noise figure @ 18 °C	max. 1.5 dB	max. 5.0 dB
Gain	min. 26 dB	min. 27 dB
Saturation output power	typ. 10 mW	typ. 30 mW
Supply voltage	+9...15 V DC	+10...14 V DC
Current consumption	typ. 60 mA	typ. 110 mA
Input connector	Waveguide R220 / WR42 / WG20	Waveguide R500 / WR19 / WG24
Output connector	SMA-female / 50 ohms	Waveguide R500 / WR 19 / WG24
Case	milled aluminium case	milled aluminium case
Dimensions in mm	63 x 30 x 20	50 x 30 x 20
Weight	typ. 75 g	typ. 100 g

Super Low Noise Broadband Amplifiers

These broadband amplifiers feature a very low noise figure over a wide frequency range. Frequencies below 900 MHz are suppressed by a built-in high pass filter. The amplifiers provide a solder pin for direct DC supply (feed through capacitor) and a bias-T for remote power supply via coaxial cable.

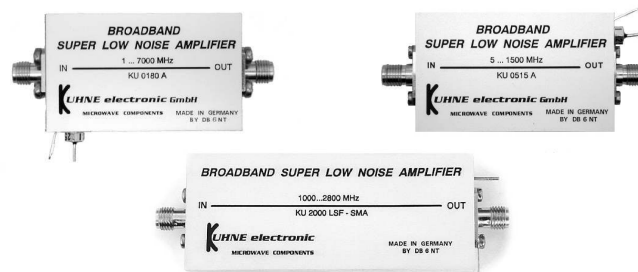
Specifications

Type	KU LNA BB2000 LSF-SMA	KU LNA BB2000 LSF-N
Frequency range	1.0...2.8 GHz	1.0...2.8 GHz
Noise figure @ 18 °C	max. 1 dB	max. 1 dB
Noise figure @ 2,4 GHz	typ. 0.6 dB	typ. 0.6 dB
Gain	typ. 35 dB +/- 3 dB	typ. 35 dB +/- 3 dB
Supply voltage	+12...15 V / 30 mA	+12...15 V / 30 mA
Input connector	SMA-female / 50 ohms	N-male / 50 ohms
Output connector	SMA-female / 50 ohms	N-female / 50 ohms
Case	milled aluminium	milled aluminium
Dimensions in mm	73 x 30 x 18	73 x 30 x 18
Weight	typ. 85 g	typ. 85 g
	Built-in bias tee	Built-in bias tee

These amplifiers achieve a huge bandwidth from 1 MHz to 7000 MHz and a low noise figure.

Specifications

Type	KU LNA BB0180 A-SMA	KU LNA BB0180 B-N
Frequency range	1...7000 MHz	1...7000 MHz
Noise figure @ 18 °C	typ. 4.0 dB	typ. 4.0 dB
Gain	typ. 7 dBm	typ. 7 dBm
Output P1dB	23 dB +/- 3 dB	23 dB +/- 3 dB
Input return loss (S11)	>10 dBm	>10 dBm
Output IP3	typ. 25 dBm	typ. 25 dBm
Supply voltage	+12 V DC	+12 V DC
Current consumption	typ. 90 mA	typ. 90 mA
Input connector	SMA-female / 50 ohms	N-female / 50 ohms
Output connector	SMA-female / 50 ohms	N-female / 50 ohms
Case	milled aluminium	milled aluminium
Dimensions in mm	30 x 50 x 20	30 x 50 x 20
Weight	typ. 85 g	typ. 85 g
Option	Bias tee possible	Bias tee possible



The broadband amplifiers for the frequency range 5 MHz to 1500 MHz provide high output power and a low noise figure. This offers a wide range of applications. For example, they can be used as broadband measurement equipment in laboratories or as preamplifiers with best large signal performance.

Specifications

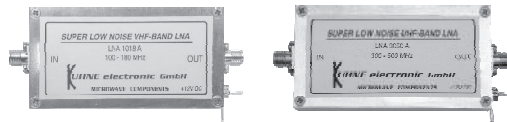
Type	KU LNA BB0515 A-SMA	KU LNA BB0515 B-N
Frequency range	5...1500 MHz	5...1500 MHz
Noise figure @ 18 °C	max. 2.0 dB	max. 2.0 dB
Gain @ 1500 MHz	min. 17 dB	min. 17 dB
Output P1dB	typ. 21 dBm	typ. 21 dBm
Input return loss (S11)	typ. 6 dBm	typ. 6 dBm
Output IP3 @ 20 MHz	typ. 33 dBm	typ. 33 dBm
Output IP3 @ >100 MHz	> 35 dBm	> 35 dBm
Supply voltage	+12...14 V DC	+12...14 V DC
Current consumption	typ. 85 mA	typ. 85 mA
Input connector	SMA-female	N-female
Input impedance	50 ohms	50 ohms
Output connector	SMA-female	N-female
Output impedance	50 ohms	50 ohms
Case	milled aluminium	milled aluminium
Dimensions in mm	50 x 30 x 20	50 x 30 x 20
Weight	typ. 45 g	typ. 45 g
Option	Bias tee possible	Bias tee possible

Super Low Noise Broadband Amplifiers for VHF and UHF

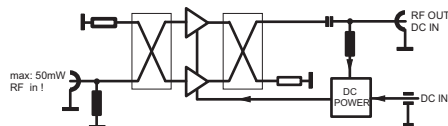
KU LNA BB1018 A - KU LNA BB3050 A

The broadband preamplifiers for the VHF and UHF range feature best large signal performance and a low noise figure. This is achieved by two parallel amplifier paths which are coupled by 3dB hybrid couplers. The amplifiers can also be used for low power applications - for example as measurement equipment in laboratories.

- High IP3
- Low noise figure
- Static protection at preamplifier input
- Bias-T for remote power supply
- Solder pin for direct power supply
- Milled aluminium case



KU LNA BB1018 A / KU LNA BB3050 A

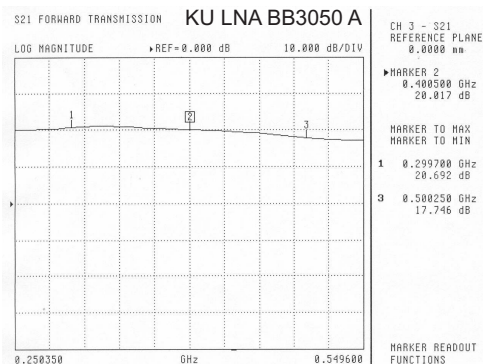
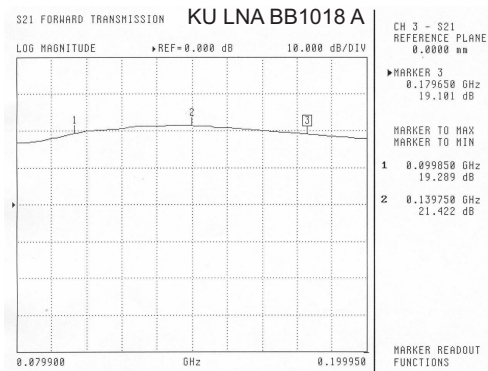


Specifications

Type	KU LNA BB1018 A
Frequency range	(100) 120...180 MHz
Noise figure @ 18 °C	typ. 1.0 dB; max. 1.3 dB
Gain	>20 dB (max. +/- 2dB)
Power P1dB	max. 10 dB
Saturation output power	better 15 dB
Input return loss (S11)	typ. +44 dBm @ 140 MHz
Output return loss (S22)	typ. +22 dBm @ 140 MHz
Output IP3	+ 12...14 V DC
Input IP3	typ. 230 mA
Supply voltage	SMA-female / 50 ohms
Current consumption	SMA-female / 50 ohms
Input connector	milled aluminium
Output connector	78 x 41 x 21
Case	typ. 100 g
Dimensions in mm	
Weight	

Type	KU LNA BB3050 A
Frequency range	(300) 350...500 MHz
Noise figure @ 18 °C	typ. 1.0 dB; max. 1.3 dB
Gain	20 dB (max. +/- 2.5dB)
Power P1dB	28 dBm @ 400 MHz
Saturation output power	>30 dBm @ 400 MHz
Input return loss (S11)	max. 15 dB
Output return loss (S22)	better 15 dB
Output IP3	typ. +40 dBm @ 400 MHz
Input IP3	typ. +22 dBm @ 400 MHz
Supply voltage	+ 12...15 V DC
Current consumption	typ. 380 mA
Input connector	SMA-female / 50 ohms
Output connector	SMA-female / 50 ohms
Case	milled aluminium
Dimensions in mm	78 x 41 x 21
Weight	typ. 100 g

Amplifiers for other frequencies available on request.



Super Low Noise Broadband Amplifier for 1.0 to 2.7 GHz

KU LNA BB1020 A - KU LNA BB1522 A - KU LNA BB2227 A

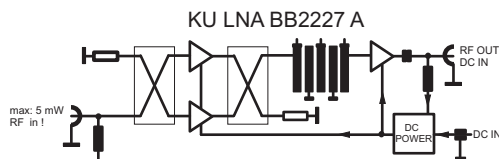
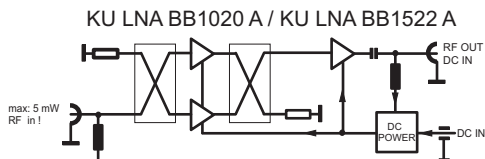
The broadband preamplifiers for the frequency range 1.0 to 2.7 GHz were originally designed for radio link systems. They provide a low noise figure, excellent large signal performance and high linearity. This is why they can be used for a wide range of analog and digital applications.

The internal band pass filter of the KU LNA BB2227 A results in good selectivity of the preamplifier. Out-of-band signals are effectively suppressed. Typical applications are Multichannel Multipoint Distribution Systems (MMDS) or digital video transmissions using DVB-T and DVB-S.

- High IP3
- Low noise figure
- Static protection at preamplifier output

- Bias-T for remote power supply
- Solder pin for direct power supply
- Milled aluminium case

- Important note: The preamplifiers do not contain built-in coaxial relays!



Specifications

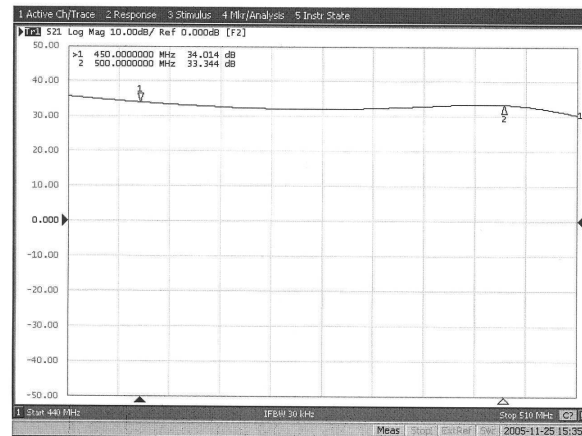
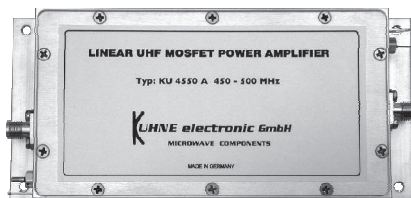
Type	KU LNA BB1020 A	KU LNA BB1522 A	KU LNA BB2227 A
Frequency range	1000...2000 MHz	1500...2200 MHz	2200...2700 MHz
Noise figure @ 18° C	typ. 0.8 dB; max. 1.0 dB	typ. 0.8 dB; max. 1.0 dB	typ. 0.9; max. 1.2 dB
Gain	>29 dB	min. 27 dB	min. 25 dB
Saturation output power	-	typ. 20 dBm @ 1.8 GHz	-
Output IP3	typ. 37 dBm @ 1.5 GHz	typ. +36 dBm @ 1.8 GHz	typ. +33 dBm
Power P1dB	-	typ. 19 dBm @ 1.8 GHz	typ. 23 dBm @ 1.5 GHz
Input return loss (S11)	better 10 dB	better 13 dB	better 13 dB
Output retrun loss (S22)	typ. 10 dB	typ. 10 dB	typ. 10 dB
Supply voltage	+ 12...15 V DC	+ 12...15 V DC	+ 12...15 V DC
Current consumption	typ. 200 mA	typ. 250 mA	typ. 250 mA
Input connector	SMA-female / 50 ohms	SMA-female / 50 ohms	SMA-female / 50 ohms
Output connector	SMA-female / 50 ohms	SMA-female / 50 ohms	SMA-female / 50 ohms
Case	milled aluminium	milled aluminium	milled aluminium
Dimensions in mm	78 x 41 x 21	78 x 41 x 21	78 x 41 x 21
Weight	typ. 100 g	typ. 100 g	typ. 110 g

Amplifiers for other frequencies available on request.

Linear MOSFET Power Amplifier for the UHF-Band

The new power amplifier KU PA 4550 A provides high linearity and good thermal stability. It is run as Class-A amplifier. The power amplifier can be used for analog and digital applications, for example C-OFDM systems, DATV or digital data transmission.

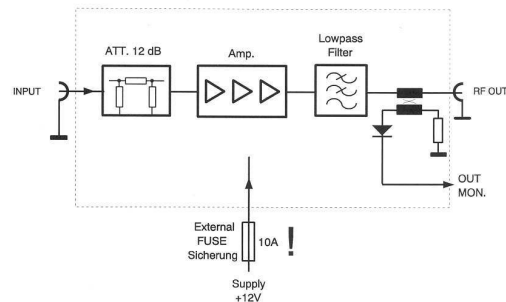
- Surge protection and reverse polarity protection
- Integrated output low pass filter (for harmonic rejection)
- Detector output (DC voltage) for monitoring forward output power
- Supply voltage +12V DC



Specifications

Type	KU PA 4550 A
Frequency range	450...500 MHz
Input power	typ. 30 mW (3 mW optional)
Output power	30 W @ 1 dB compression
Saturation output power	typ. 35 W
Gain	typ. 30 dB
Maximum load SWR	1.8 : 1
Harmonic rejection	typ. 60 dB
IM 3 @ 5 W PEP	typ. 37 dBc
Gain flatness	max. +/- 1 dB
Supply voltage	+ 12 V DC
Current consumption	max. 8,5 A
Quiescent current	typ. 4 A
Input connector	SMA-female / 50 ohms
Output connector	SMA-female / 50 ohms
Case	milled aluminium
Dimensions in mm	130 x 60 x 20
Weight	280 g
Maximum case temperature	55 °C

NEW



Linear Power Amplifiers for 23 cm with MOSFET Module

KU PA 0850 N - 1 Watt • MKU PA 1301 A - 1 Watt

These two GaAs FET amplifiers are suitable for low power applications or as driver amplifiers. Because of their small mechanical dimensions, they are easy to integrate in compact systems.

MKU PA 133 HY2 - 30 Watts • MKU PA 1360 HY - 60 Watts

MKU PA 13120 HY - 120 Watts

This series of power amplifiers for the 23cm band uses LDMOS FET modules. Due to their linearity and thermal stability the amplifiers are excellent for all analog and digital modes in amateur radio. Typical examples are SSB, CW, ATV and DATV (digital amateur television).



Specifications	GaAs	GaAs	MOSFET Modul	MOSFET Modul	MOSFET Modul
Type	KU PA 0850 N	MKU PA 1301 A	MKU PA 133 HY2	MKU PA 1360 HY	MKU PA 13120 HY
Frequency range	800...900 MHz	1240...1300 MHz	1240...1300 MHz	1240...1300 MHz	1240...1300 MHz
Input power	30...50 mW	< 50 mW	typ. 0.1 W	typ. 0.2 W	typ. 0.4 W
In maximum	50 mW	50 mW	0.2 W	0.4 W	0.8 W
Output power @ 50 Ohm		1 W	>30 W CW	>60 W CW	>120 W CW
Gain	typ. 15 dB				
Saturation output power	typ. 1 Watt	> 1 W	>35 W	typ. 70 W	typ. 150 W
Efficiency			typ. 30 %	typ. 30 %	typ. 30 %
Harmonic suppression	28 dB@ 1 W	> 6 dB	- 50 dB	- 50 dB	- 50 dB
Input S11			> 4,5 dB	> 12 dB	> 16 dB
SWR of load	1,8 : 1	1.8 : 1	1.8 : 1	1.8 : 1	1.8 : 1
Maximum case temperature	55 °C	55 °C	55 °C	55 °C	55 °C
Monitor output	No	No	Yes	Yes	Yes
Supply voltage	+ 12 ... 14 V	+12...14 V	+12...13.8 V	+12...13.8 V	+12...13.8 V
IDQ	typ. 0.35 A	typ. 0.3 A	typ. 4 A	max. 8 A	typ. 14 A
Switching voltage	-	+12...14 V	+12...13.8 V	+12...13.8 V	+12...13.8 V
Current consumption	typ. 0.35 A	max. 0.45 A	max. 11 A	max. 20 A	max. 40 A (max.50)
Input connector	N-female	SMA-female	SMA-female	SMA-female	SMA-female
Output connector	N-female	SMA-female	SMA-female	SMA-female	N-female
Dimensions mm	50 x 30 x 22	30 x 50 x 22	60 x 130 x 20	80 x 124 x 22	152 x 190 x 26
Case	milled aluminium	milled aluminium	milled aluminium	milled aluminium	milled aluminium
Convenient power supply	-	-	S 150 W 12	S 300 W 12	S 500 W 12
Convenient heatsink	-	-	SK 150-62	SK 200-80	2x SK 200-80
Weight	typ. 90 g	typ. 65 g	typ. 270 g	typ. 400 g	typ. 1300 g

Amplifiers for other frequencies available on request.

Linear High Power Amplifiers for the 23cm Band

MKU PA 1330 A - 30 Watts

MKU PA 1350 A - 50 Watts

MKU PA 13100 A - 100 Watts

MKU PA 13100 B - 100 Watts

Our high power amplifiers for the 23cm band are based on LDMOS technology. They provide high linearity, high efficiency and offer a wide range of analog and digital applications



Specifications

Type	MKU PA 1330 A	MKU PA 1350 A	MKU PA 13100 A	MKU PA 13100 B
Frequency range	1240...1300 MHz	1240...1300 MHz	1240...1300 MHz	1240...1300 MHz
Input power	1 W	2.5 W	0.3 W	5 W
In maximum	1.5 W	max. 5 W	max. 0.5 W	max. 10 W
Output power	>30 W	>50 W	>100 W	>100 W
Saturation output power	typ. 40 W	typ. 60 W	typ. 120 W	typ. 120 W
Efficiency	typ. 55 %	typ. 45 %	typ. 40 %	typ. 40 %
IM3	-30 dBc @ 30 W PEP	-28 dBc @ 50 W PEP	-27 dBc @ 100 W PEP	-27 dBc @ 100 W PEP
IM3	-48 dBc @ 10 W PEP	-48 dBc @ 20 W PEP	-38 dBc @ 30 W PEP	-28 dBc @ 30 W PEP
Harmonic rejection	-37 dBc @ 30 W	-39 dBc @ 50 W	-39 dBc @ 100 W	-39 dBc @ 100 W
Input S11	typ. 10 dB	typ. 7 dB	typ. 10 dB	typ. 10 dB
SWR of load	1.8 : 1	1.8 : 1	1.8 : 1	1.8 : 1
Maximum case temperature	55° C	55° C	55° C	55° C
Monitor output	Yes	Yes	Yes	Yes
Supply voltage	+26 V	+26 V	+26 V	+26 V
IDQ	typ. 0.5 A	typ. 0.5 A	typ. 2 A	typ. 2 A
Switching voltage	+12...14 V	+12...14 V	+12...14 V	+12...14 V
Current consumption	max. 3,5 A	max. 5 A	max. 14 A	max. 14 A
Input connector	SMA-female / 50 ohms	SMA-female / 50 ohms	SMA-female / 50 ohms	SMA-female / 50 ohms
Output connector	SMA-female / 50 ohms	SMA-female / 50 ohms	N-female / 50 ohms	N-female / 50 ohms
Dimensions mm	60 x 130 x 20	60 x 130 x 20	80 x 192 x 22	80 x 135 x 22
Case	milled aluminium	milled aluminium	milled aluminium	milled aluminium
Weight	typ. 240 g	typ. 240 g	typ. 570 g	typ. 370 g
Convenient power supply	S 150 W 24	S 150 W 24	SP 320 W 24	SP 320 W 24
Convenient heatsink	SK 120-75	SK 150-62	SK 200-80	SK 200-80

Amplifiers for other frequencies available on request.

Linear High Power Amplifiers for the 23cm Band

MKU PA 13200 A - MKU PA 13200 B - MKU PA 13500 A

Big power, high efficiency and best linearity are achieved by our high power amplifiers for the 23cm band. In comparison to tube power amplifiers, the new LDMOS transistors need a supply of only +26 V or +28 V. High voltage transformers, waiting for the tube warm-up and retuning of the tube are the past!

Safe operation is guaranteed by the internal overheat protection. The built-in sequencer can be used to control other devices like preamplifiers or antenna relays.

An output power of 1kW be achieved by combining two MKU PA 13500 A amplifiers. This is ideal for EME (earth-moon-earth operation).

- Overheat protection
- Reverse polarity protection
- Important note: The preamplifiers do not contain built-in coaxial relays.
- Built-in sequence controller
- Output for "on air" LED

Specifications

Type	MKU PA 13200 A	MKU PA 13200 B	MKU PA 13500 A
Frequency range	1240...1300 MHz	1240...1300 MHz	1296 MHz (1240...1300 MHz)
Input power	0.5 W	>10 W	20 W
In maximum	max. 1,0 W	<20 W	30 W
Output power	200 W	200 W	500 W
Saturation output power	typ. 220 W	typ. 220 W	> 550 W
Efficiency	typ. 40 %	typ. 40 %	typ. 40 %
Harmonic rejection	typ. 10 dB	typ. 10 dB	min. 10 dB
SWR of load	1.8 : 1	1.8 : 1	1.8 : 1
Maximum case temperature	55° C	55° C	55° C
Monitor output	Yes	Yes	Yes
Supply voltage	+26 V	+26 V	+ 28 V
Quiescent current	typ. 4 A	typ. 4 A	typ. 6 A
Switching PTT	ground @ TX	ground @ TX	ground @ TX
Current consumption	max. 26 A	max. 24 A	max. 50 A
Input connector	SMA-female / 50 ohms	SMA-female / 50 ohms	SMA -female / 50 ohms
Output connector	N-female / 50 ohms	N-female / 50 ohms	N-female / 50 ohms
Dimensions mm	152 x 192 x 26	152 x 190 x 26	190 x 152 x 38,5
Case	milled aluminium	milled aluminium	milled aluminium
Weight	typ. 1300 g	typ. 1300 g	typ. 1550 g
Convenient power supply	SP 500 W 24	SP 500 W 24	
Convenient heatsink	SK 200-160	SK 200-160	SK 200-160
Convenient fans	2x Fan 80x80	2x Fan 80x80	4x Fan 80x80

500 W
at 1.3 GHz !!!



Power Amplifier

Amplifiers for other frequencies available on request.

Linear Power Amplifiers for 1.4 GHz

KU PA 1401A - KU PA 1401 B

These two GaAs FET amplifiers are suitable for low power applications or as driver amplifiers. Because of their small mechanical dimensions, they are easy to integrate into compact systems.

KU PA 1430 A - KU PA 1430 B

The power amplifiers for 1.4 GHz are based on LDMOS technology. They are characterized by high linearity, high efficiency and good thermal stability. This offers a wide range of analog and digital applications.

Specifications		GaAs-FET	Specifications		LD-MOSFET
Type		KU PA 1401 A	Type		KU PA 1430 A
Frequency range		1300...1400 MHz	Frequency range		1300...1400 MHz
Input power		50...80 mW	Input power		1 Watt
Gain		typ. 13 dB	Maximum input power		1,5 Watt
Output power		typ. 1 W	Output power		30...40 W
Saturation output power		> 1 Watt	Saturation output power		typ. 40 W
IM 3 @ 0,5 Watt PEP		-32 dBc	Efficiency		typ. 55 %
Maximum case temperature		55°C	IM 3		-27 dBc @ 30 Watt PEP
Supply voltage		+ 12 ... 14 V	IM 3		-41 dBc @ 10 Watt PEP
Quiescent current		typ. 0.35 A	Harmonic rejection		- 37 dB @ 30 Watt
Current consumption		max. 0.5 A	Input S11		typ. 10 dB
Input connector		SMA-female	SWR of load		1.8 : 1
Output connector		SMA-female	Maximum case temperature		55°C
Dimensions mm		30 x 50 x 22	Monitor output		Ja
Case		milled aluminium	Supply voltage		+ 26 V
Weight		approx. 65 g	Quiescent current		typ. 0.5 A
			Switching voltage		12 - 14 V
			Current consumption		max. 3.5 A
			Input connector		SMA-female / 50 ohms
			Output connector		SMA-female / 50 ohms
			Dimensions mm		60 x 130 x 20
			Case		milled aluminium
			Convenient power supply		S 120 W 24
			Convenient heatsink		SK 120-75
			Weight		typ. 245 g
					typ. 245 g

NEW



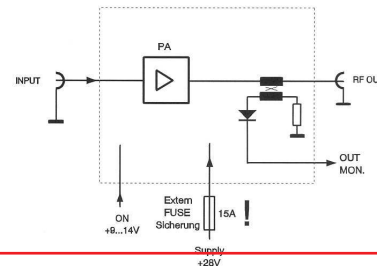
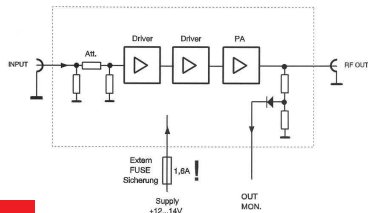
Linear Power Amplifiers for 1.5 GHz

NEW

KU PA 1505 A - KU PA 15150 A

These new power amplifiers for the 1.5 GHz band provide high linearity, high efficiency and best thermal stability. They can be used for analog and digital systems. Typical applications are Digital Audio Broadcasting (DAB) and Digital Multimedia Broadcasting (DMB).

- High Linearity
- High Efficiency
- Surge protection and reverse polarity protection
- Detector output (DC voltage) for monitoring forward output power
- Small mechanical dimensions



Specifications

Type
Frequency range
Input power
Output power
Saturation output power
Gain
IM 3 @ 1 W PEP
Maximum case temperature
Gain flatness
Supply voltage
Current consumption
Input connector
Output connector
Dimensions mm
Case

KU PA 1505 A
 1450...1600 MHz
 typ. 10 mW (3 mW optional)
 min. 4 Watts
 typ. 5 Watts
 typ. 27 dB
 > 50 dBc
 55°C
 +/- 1 dB max.
 + 12...14 V DC
 max. 1.5 A
 SMA-female
 SMA-female
 130 x 60 x 20
 milled aluminium

Specifications

Type
Frequency range
Input power
Small signal gain
Output power P1dB
Saturation power
Efficiency
IM 3
Gain flatness
Harmonic rejection
Input SWR
Maximum load SWR
Maximum case temperature
Monitor output (power)
Supply voltage
Quiescent current
ON/OFF switching voltage
Current consumption
Input connector
Output connector
Dimensions mm
Case

KU PA 15150 A
 1450...1500 MHz
 4 Watts CW
 typ. 16 dB
 120 Watt CW
 typ. 140 Watt
 typ. 45 %
 -40 dBc @ 20 Watt PEP
 +/- 1 dB max.
 -41 dBc @ 30 Watt / -32 dBc @ 140 Watt
 typ. 10 dB
 1.8 : 1
 55°C
 Ja
 + 28 V
 typ. 1.5 A
 9...14 V DC
 max. 12 A @ 140 W CW
 SMA-Buchse
 N-Buchse
 60 x 130 x 20
 milled aluminium
 Recommended heatsink : SK 200 - 80
 Recommended fan: 2x FAN 80x80mm 24V

Amplifiers for other frequencies available on request.

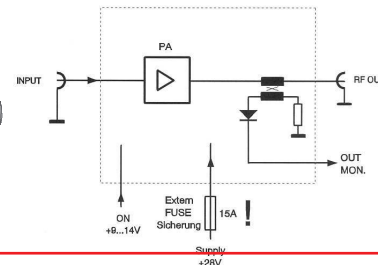
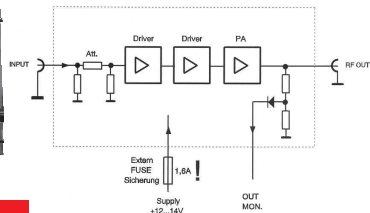
Linear Power Amplifiers for 1.6 GHz

NEW

KU PA 1605 A - KU PA 16150 A

These new power amplifiers for the 1.6 GHz band provide high linearity, high efficiency and best thermal stability. They are suitable for different analog and digital applications - for example satellite communications.

- High Linearity
- High Efficiency
- Surge protection and reverse polarity protection
- Detector output (DC voltage) for monitoring forward output power
- Small mechanical dimensions



Specifications

Specifications

Type
Frequency range
Input power
Output power
Saturation output power
Gain
IM 3 @ 1 W PEP
Maximum case temperature
Gain flatness
Supply voltage
Current consumption
Input connector
Output connector
Dimensions mm
Case

KU PA1605 A
 1600...1680 MHz
 typ. 10 mW (3 mW optional)
 min. 4 Watts
 typ. 5 Watts
 typ. 27 dB
 > 50 dBc
 55°C
 +/- 1 dB max.
 + 12...14 V DC
 max. 1.5 A
 SMA-female / 50 ohms
 SMA-female / 50 ohms
 130 x 60 x 20
 milled aluminium

Type
Frequency range
Input power
Small signal gain
Output power P1dB
Saturation power
Efficiency
IM 3
Gain flatness
Harmonic rejection
Input SWR
Maximum load SWR
Maximum case temperature
Monitor output (power)
Supply voltage
Quiescent current
ON/OFF switching voltage
Current consumption
Input connector
Output connector
Dimensions mm
Case

KU PA 16150 A
 1620...1670 MHz
 4 Watts CW
 typ. 18 dB
 140 Watt CW
 typ. 150 Watt
 typ. 45 %
 -40 dBc @ 20 Watt PEP
 +/- 1 dB max.
 -41 dBc @ 30 Watt / -32 dBc @ 140 Watt
 typ. 10 dB
 1.8 : 1
 55°C
 Ja
 + 28 V
 typ. 3 A
 9...14 V DC
 max. 12 A @ 140 W CW
 SMA-Buchse / 50 ohms
 N-Buchse / 50 ohms
 60 x 130 x 20
 milled aluminium
 Recommended heatsink : SK 200 - 80
 Recommended fan: 2x FAN 80x80mm 24V

Power Amplifiers 2.5 GHz - Product Selection Guide

Frequency Range 2.1 to 2.7 GHz

Type	Frequency Range (MHz)	RF Power CW ¹⁾		RF Power digital ²⁾		Gain typ. ³⁾ (dB)	Power Supply		Output Protection ⁴⁾	Remarks
		Input typ.	Output P _{1dB} (W)	Output (W)			DC Voltage (V)	Current (A)		
KU PA 222 TX	2100 ... 2300	50 mW	> 4	0.5 ... 1	20	12 ... 14	max. 1.5	No		
KU PA 242 TX	2300 ... 2500	50 mW	> 4	0.5 ... 1	20	12 ... 14	max. 1.5	No		
KU PA 262 TX	2500 ... 2700	50 mW	> 4	0.5 ... 1	20	12 ... 14	max. 1.5	No		
KU PA 223 BBA	2100 ... 2300	3 mW	> 4	0.5 ... 1	31	12 ... 14	max. 1.5	No		
KU PA 243 BBA	2300 ... 2500	3 mW	> 4	0.5 ... 1	31	12 ... 14	max. 1.5	No		
KU PA 263 BBA	2500 ... 2700	3 mW	> 4	0.5 ... 1	31	12 ... 14	max. 1.5	No		
KU PA 2127 ALK	2100 ... 2700	1 mW	> 4	0.5 ... 1	39	11 ... 14	typ. 1.5	No		
KU PA 2327 AL	2300 ... 2700	1 mW	> 4	0.5 ... 1	39	11 ... 14	typ. 1.5	Yes		ALC included
KU PA 2123 A	2100 ... 2300	0.1 mW	> 20	2 ... 5	55	11 ... 14	typ. 8.0	Yes		ALC included
KU PA 2325 A	2300 ... 2500	0.1 mW	> 20	2 ... 5	55	11 ... 14	typ. 8.0	Yes		ALC included
KU PA 2527 A	2500 ... 2700	0.1 mW	> 20	2 ... 5	55	11 ... 14	typ. 8.0	Yes		ALC included
KU PA 2123 B	2100 ... 2300	15 mW	> 20	2 ... 5	31	11 ... 14	typ. 7.5	Yes		
KU PA 2325 B	2300 ... 2500	15 mW	> 20	2 ... 5	31	11 ... 14	typ. 7.5	Yes		
KU PA 2527 B	2500 ... 2700	15 mW	> 20	2 ... 5	31	11 ... 14	typ. 7.5	Yes		
KU PA 2123 C	2100 ... 2300	2 W	> 20	2 ... 5	10	11 ... 14	typ. 6.0	Yes		
KU PA 2325 C	2300 ... 2500	2 W	> 20	2 ... 5	10	11 ... 14	typ. 6.0	Yes		
KU PA 2527 C	2500 ... 2700	2 W	> 20	2 ... 5	10	11 ... 14	typ. 6.0	Yes		
KU PA 2123 D	2100 ... 2300	5 W	> 50	5 ... 13	10	13	typ. 10	Yes		
KU PA 2325 D	2300 ... 2500	5 W	> 50	5 ... 13	10	13	typ. 10	Yes		
KU PA 2527 D	2500 ... 2700	5 W	> 50	5 ... 13	10	13	typ. 10	Yes		
KU PA 2123 E	2100 ... 2300	15 W	typ. 100	10 ... 25	10	13	typ. 22	Yes		
KU PA 2325 E	2300 ... 2500	15 W	typ. 100	10 ... 25	10	13	typ. 22	Yes		
KU PA 2527 E	2500 ... 2700	15 W	typ. 100	10 ... 25	10	13	typ. 22	Yes		
KU PA 2325 F	2300 ... 2500	15 W	typ. 150	15 ... 38	10	13	typ. 30	Yes		
KU PA 2527 F	2500 ... 2700	15 W	typ. 150	15 ... 38	10	13	typ. 30	Yes		
MKU PA 231 TX	2300 ... 2400	0.7 W	typ. 5	-	10	12 ... 14	typ. 0.8	No		Amateur Radio
MKU PA 232 TX	2300 ... 2400	80 mW	typ. 5	-	20	12 ... 14	typ. 1.3	No		Amateur Radio
MKU PA 233 TX	2300 ... 2400	10 mW	typ. 5	-	32	12 ... 14	typ. 1.5	No		Amateur Radio
MKU PA 231 XL	2300 ... 2400	1 W	typ. 10	-	> 10	12 ... 14	typ. 2.5	No		Amateur Radio
MKU PA 233 XL	2300 ... 2400	50 mW	typ. 10	-	> 23	12 ... 14	typ. 3.3	No		Amateur Radio
MKU PA 234 XL	2300 ... 2400	2 mW	typ. 10	-	40	12 ... 14	typ. 3.3	No		Amateur Radio
MKU PA 231 HXL	2300 ... 2400	1 W	18 ... 20	-	> 12	12 ... 14	typ. 5	No		Amateur Radio
MKU PA 232 HXL	2300 ... 2400	80 mW	18 ... 20	-	> 25	12 ... 14	typ. 5	No		Amateur Radio
MKU PA 232 AL	2300 ... 2400	5 mW	0.8 ... 1.0	-	> 20	12 ... 14	typ. 0.35	No		Amateur Radio
KU PA 2325 BLK	2300 ... 2450	15 mW	> 20	2 ... 5	31	11 ... 14	typ. 7.5	No		Amateur Radio
KU PA 2325 DLK	2300 ... 2450	5 W	typ. 50	5 ... 13	10	11 ... 14	typ. 10	No		Amateur Radio

Footnotes

1) Available power for CW / FM

2) Recommended output power for digital modulation/ digital applications - for example QPSK, C-OFDM, MMDS, DVB-S, DVB-T, DATV (usually 10 ... 25 % of available power)

Valid power measurements only with RMS power meter

3) Small signal gain

4) Output isolator for amplifier protection

Specifications subject to change without notice!

Linear High Power Amplifiers for S-Band

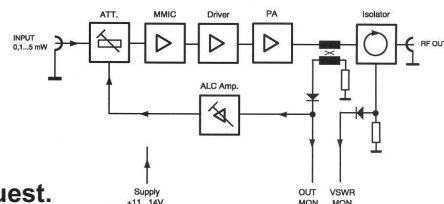
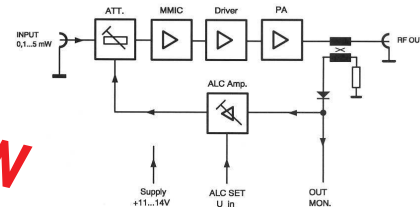
High linear GaAs FET power amplifiers (class A)

for digital broadcast and communication systems

These GaAs FET amplifiers are suitable for low power applications or as driver amplifiers. The amplifiers contain an automatic level control (ALC). The desired output power can be adjusted continuously, from nearly zero to the maximum output power. Typical applications of this amplifier series are digital broadcast and communication systems like Multichannel Multipoint Distribution Systems (MMDS), Digital Video Broadcast (DVB) or Digital Multimedia Broadcast (DMB).

- High linearity and bandwidth
- Built-in automatic level control (ALC)
- Monitor output for forward power detection
- Surge protection and reverse polarity protection
- Suitable for COFDM systems

The amplifier KU PA 2327 AL contains an additional isolator at the output and a monitor output for reverse power detection.



NEW

Specifications

Type	KU PA 2127ALK	KU PA 2327 AL
Frequency range	2100 ... 2700 MHz	2300 ... 2700 MHz
Input power	typ. 1 mW	typ. 1 mW
Output power P1dB	4 Watts	4 Watts
Saturation output power	typ. 5 W	typ. 5 W
Gain	typ. 39 dB	typ. 39 dB
IM3 @ 1 W PEP	typ. -51 dBc	typ. -50 dBc
Case temperature	max. 55°C	max. 55°C
Gain flatness	+ / - 1 dB	+ / - 1 dB
Supply voltage	11 ... 14 V DC	11 ... 14 V DC
Current consumption	typ. 1.5 A	typ. 1.5 A
Input connector	SMA - female / 50 ohms	SMA - female / 50 ohms
Output connector	SMA - female / 50 ohms	SMA - female / 50 ohms
Dimensions mm	156 x 59 x 20	156 x 59 x 20
Case	milled aluminium case	milled aluminium case

Amplifiers for other frequencies available on request.

Linear High Power Amplifiers for S-Band

High linear GaAs FET power amplifiers (class A)

for digital broadcast and communication systems

This series of power amplifiers provides high linearity and a large bandwidth. An isolator at the output protects the semiconductor devices from reverse power. Very good harmonic rejection is achieved. Two detector outputs allow permanent monitoring of forward and reverse power. Typical applications of this amplifier series are digital broadcast and communication systems like Multichannel Multipoint Distribution Systems (MMDS), Digital Video Broadcast (DVB) or Digital Multimedia Broadcast (DMB).

- High linearity and harmonic rejection
- Monitor outputs for forward and reverse power detection
- Surge protection and reverse polarity protection

- Isolator for protection against high VSWR
- Logic ON / OFF control
- Suitable for COFDM systems

The amplifier types KU PA 2123 A, KU PA 2325 A and KU PA 2527 A contain an automatic level control (ALC). The desired output power can be adjusted continuously, from nearly zero to the maximum output power.



Specifications

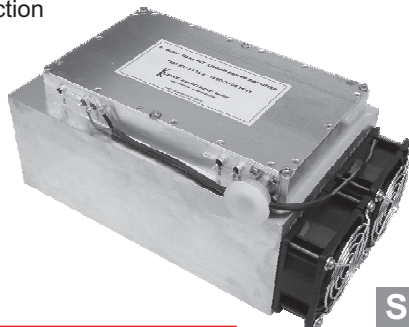
Frequency range 2100...2300 MHz 2300...2500 MHz 2500...2700 MHz Input power Output power P1dB Saturation output power IM3 @ 10 W PEP IM3 @ 20 W PEP Supply voltage Current consumption Dimensions mm Case Case temperature Coaxial connector In Coaxial connector Out Gain flatness Weight	Type KU PA 2123 A KU PA 2325 A KU PA 2527 A typ. 0.1 mW 20 W 25...30 W > 47 dBc 11...14 V DC typ. 8.0 A 213 x 63 x 22 milled aluminium max. 55°C SMA-female / 50 ohms SMA-female / 50 ohms +/- 1 dB typ. 500 g Built-in ALC Level Control	Type KU PA 2123 B KU PA 2325 B KU PA 2527 B typ. 15 mW 20 W 25...30 W > 47 dBc 11...14 V DC typ. 7.5 A 178 x 60 x 20 milled aluminium max. 55°C SMA-female / 50 ohms SMA-female / 50 ohms max. +/- 1 dB typ. +/- 0.5 dB typ. 350 g	Type KU PA 2123 C KU PA 2325 C KU PA 2527 C typ. 2 W 20 W 25...30 W > 47 dBc 11...14 V DC typ. 6.0 A 130 x 60 x 20 milled aluminium max. 55°C SMA-female / 50 ohms SMA-female / 50 ohms max. +/- 1 dB typ. +/- 0.5 dB typ. 250 g	Type KU PA 2123 D KU PA 2325 D KU PA 2527 D typ. 5 W 50 W Min. 60 W - > 47 dB 13 V DC typ. 10.0 A 130 x 60 x 20 milled aluminium max. 55°C SMA-female / 50 ohms SMA-female / 50 ohms max. +/- 1 dB typ. +/- 0.5 dB typ. 260 g Overheat-protection
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Linear High Power Amplifiers for S-Band

High linear GaAs FET power amplifiers (class A)

for digital broadcast and communication systems

- High linearity and harmonic rejection
- Monitor outputs for forward and reverse power detection
- Isolator for protection against high VSWR
- Surge protection and reverse polarity protection
- Suitable for COFDM systems



Specifications

Frequency range
2100...2300 MHz
2300...2500 MHz
2500...2700 MHz
RF input power
RF output power CW
Saturation output power
IP3
Supply voltage
Current consumption
Dimensions in mm
Case
Maximum case temperature
Input connector
Output connector
Gain flatness
Weight

Type
KU PA 2123 E
KU PA 2325 E
KU PA 2527 E
typ. 15 Watt
typ. 100 Watt
> 100 Watt
54 dBm
13 V DC
typ. 22.0 A
172 x 100 x 22
milled copper silver-plate
max. 55°C
SMA-female / 50 ohms
N-female / 50 ohms
max. +/- 0.8 dB
typ. 2000 g
Overheat-protection

Type
KU PA 2325 F
KU PA 2527 F
typ. 15 Watt
typ. 150 Watt
> 150 Watt
59 dBm
13 V DC
typ. 30.0 A
172 x 100 x 22
milled copper silver-plate
max. 55°C
SMA-female / 50 ohms
N-female / 50 ohms
max. +/- 0.8 dB
typ. 2200 g
Overheat-protection

Specifications

Frequency range
2000...2100 MHz
2100...2200 MHz
2200...2300 MHz
2250...2350 MHz
Input power
Output power
Spurious and harmonic rejection
Switch on voltage
Quiescent current
Operating voltage
Current consumption
Dimensions mm
Case
Case temperature
Coaxial connector In
Coaxial connector Out
Weight

Type
KU PA 2021 LD 200
KU PA 2122 LD 200
KU PA 2223 LD 200
KU PA 2323 LD 200
typ. 15 Watt
200 Watt
typ. 40 dB
+ 12 V
typ. 4 A
28 V DC
max. 22 A
130x140x26
milled aluminium
max. 55°C
SMA-female
N-female
ca. 850 g

Amplifiers for other frequencies available on request.

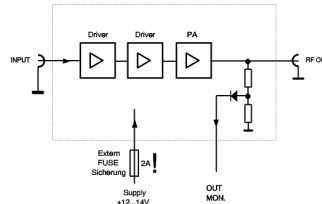
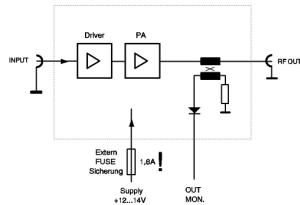
Linear High Power Amplifiers for S-Band

High linear GaAs FET power amplifiers (class A)

for digital broadcast and communication systems

These GaAs FET amplifiers are suitable for low power applications or as driver amplifiers. Because of their small mechanical dimensions, they are easy to integrate into compact systems. Typical applications of this amplifier series are digital broadcast and communication systems like Multichannel Multipoint Distribution Systems (MMDS), Digital Video Broadcast (DVB) or Digital Multimedia Broadcast (DMB).

- Simple DC voltage supply +12 ... 14 V DC
- High linearity and bandwidth
- Monitor output for forward power detection
- Surge protection and reverse polarity protection
- Suitable for COFDM systems



Specifications

Type	KU PA 222 TX	KU PA 242 TX	KU PA 262 TX	KU PA 223 BBA	KU PA 243 BBA	KU PA 263 BBA
Frequency range	2100...2300 MHz	2300...2500 MHz	2500...2700 MHz	2100...2300 MHz	2300...2500 MHz	2500...2700 MHz
Input power	typ. 50 mW	typ. 50 mW	typ. 50 mW	typ. 3 mW	typ. 3 mW	typ. 3 mW
Output power	min 4 Watts	min 4 Watts	min 4 Watts	min 4 Watts	min 4 Watts	min 4 Watts
Saturation output power	> 5 Watts	> 5 Watts	> 5 Watts	> 5 Watts	> 5 Watts	> 5 Watts
Gain	typ. 20 dB	typ. 20 dB	typ. 20 dB	typ. 31 dB	typ. 31 dB	typ. 31 dB
IM 3 @ 1 W PEP	> 55 dBc	> 55 dBc	> 55 dBc	> 55 dBc	> 55 dBc	> 55 dBc
Operating voltage	12 ... 14 V DC	12 ... 14 V DC	12 ... 14 V DC	12 ... 14 V DC	12 ... 14 V DC	12 ... 14 V DC
Current consumption	max. 1.5 A	max. 1.5 A	max. 1.5 A	max. 1.5 A	max. 1.5 A	max. 1.5 A
Dimensions mm	80 x 60 x 20	80 x 60 x 20	80 x 60 x 20	130 x 60 x 20	130 x 60 x 20	130 x 60 x 20
Case	milled aluminium	milled aluminium	milled aluminium	milled aluminium	milled aluminium	milled aluminium
Case temperature	max. 55°C	max. 55°C	max. 55°C	max. 55°C	max. 55°C	max. 55°C
Coaxial connectors	SMA - female	SMA - female	SMA - female	SMA - female	SMA - female	SMA - female
Gain flatness	+ / - 1 dB	+ / - 1 dB	+ / - 1.5 dB	+ / - 1 dB	+ / - 1 dB	+ / - 1.5 dB
Weight	typ. 140 g	typ. 140 g	typ. 140 g	typ. 240 g	typ. 240 g	typ. 236 g

Amplifiers for other frequencies available on request.

Power Amplifiers for the 13 cm Amateur Radio Band

MKU PA 231 TX - MKU PA 232 TX - MKU PA 233 TX

MKU PA 231 XL - MKU PA 233 XL - MKU PA 234 XL

MKU PA 232 AL

This series of power amplifiers for the 13cm band uses GaAs FETs. Due to their linearity the amplifiers are usable for all analog and digital modes in amateur radio. Typical examples are SSB, CW, ATV and DATV (digital amateur television).

- Detector output (DC voltage) for monitoring forward output power
- Surge protection and reverse polarity protection
- Milled aluminium case
- Suitable for all analog and digital modes (SSB, CW, ATV, DATV)



Specifications

Type	MKU PA 231 TX	MKU PA 232 TX	MKU PA 233 TX	MKU PA 231 XL	MKU PA 233 XL	MKU PA 234 XL	MKU PA 232 AL
Frequency range	2300...2400 MHz	2300...2400 MHz	2300...2400 MHz	2300...2400 MHz	2300...2400 MHz	2300...2400 MHz	2300...2400 MHz
RF input power	typ. 700 mW	typ. 80 mW	typ. 10 mW	typ. 1 W	typ. 50 mW	typ. 2 mW	typ. 5 mW
RF output power CW	typ. 5 W	typ. 5 W	typ. 5 W	typ. 10 W	typ. 10 W	typ. 10 W	typ. 0.8...1 W
Supply voltage	12...14 V DC	12...14 V DC	12...14 V DC	12...14 V DC	12...14 V DC	12...14 V DC	12...14 V DC
Current consumption	typ. 0.8 A	typ. 1.3 A	typ. 1.5 A	typ. 2.5 A	typ. 3.2 A	typ. 3.3 A	typ. 0.35 A
Input connector	SMA-female	SMA-female	SMA-female	SMA-female	SMA-female	SMA-female	SMA-female
Output connector	SMA-female	SMA-female	SMA-female	SMA-female	SMA-female	SMA-female	SMA-female
Case	milled aluminium	milled aluminium	milled aluminium	milled aluminium	milled aluminium	milled aluminium	German Silver
Dimensions in mm	80 x 60 x 20	80 x 60 x 20	130 x 60 x 20	80 x 60 x 20	130 x 60 x 20	130 x 60 x 20	75 x 30 x 38
Weight	typ. 140 g	typ. 140 g	typ. 250 g	typ. 140 g	typ. 260 g	typ. 260 g	typ. 140 g

Amplifiers for other frequencies available on request.

Power Amplifiers for the 13 cm Amateur Radio Band

MKU PA 231 HXL - MKU PA 232 HXL - KU PA 2325 BLK - KU PA 2325 DLK

- Detector output (DC voltage) for monitoring forward output power
- Surge protection and reverse polarity protection
- Milled aluminium case
- Suitable for all analog and digital modes (SSB, CW, ATV, DATV)



Specifications

Type
Frequency range
RF input power
RF output power CW
Supply voltage
Current consumption
Input connector
Output connector
Case
Dimensions in mm

MKU PA 231 HXL
2300...2400 MHz
1 W
18...20 W
12...14 V DC
typ. 5 A
SMA-female
SMA-female
milled aluminium
80 x 60 x 20

MKU PA 232 HXL
2300...2400 MHz
80 mW
18...20 W
12...14 V DC
typ. 5 A
SMA-female
SMA-female
SMA-female
milled aluminium
80 x 60 x 20

For DATV applications

KU PA 2325 BLK
2300...2450 MHz
typ. 15 mW
typ. 20 W
11...14 V DC
typ. 7,5 A
SMA-female
SMA-female
milled aluminium
178 x 60 x 20

KU PA 2325 DLK
2300...2450 MHz
typ. 5 W
typ. 50 W
11...14 V DC
typ. 10 A
SMA-female
SMA-female
milled aluminium
130 x 60 x 20

Amplifiers for other frequencies available on request.

High Power Amplifiers for the 9 cm Amateur Radio Band

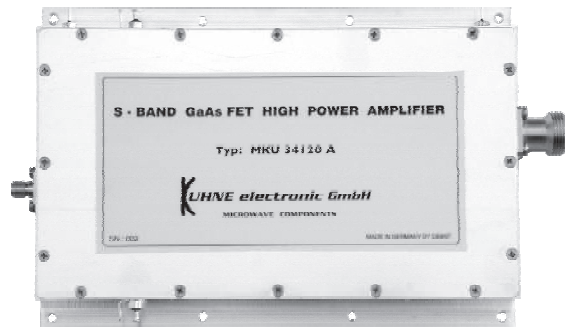
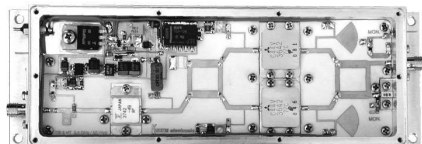
MKU PA 341 A - MKU PA 342 XL - MKU PA 342 AXL

MKU PA 342 XLB - MKU PA 343 HXL-2 - MKU PA 34120 A

- Suitable for all analog and digital modes (SSB, CW, ATV, DATV)
- Detector output (DC voltage) for monitoring forward output power
- Surge protection and reverse polarity protection
- Milled aluminium or copper case



**120 W
at 3.4 GHz !!!**



Specifications

Type	MKU PA 342 AXL	MKU PA 342 XL	MKU PA 341 A	MKU PA 342 XLB	MKU PA 343 HXL-2	MKU PA 34120 A
Centerfrequency	3400 MHz	3400 MHz	3400 MHz	3400 MHz	3400 MHz	3400 MHz
Option USA	3456 MHz	3456 MHz	3456 MHz	3456 MHz	3456 MHz	3456 MHz
RF output power	>4 W	>12 W	typ. 4 W	>20 W	typ. 40 W	> 120 W
RF input power	typ. 40 mW	typ. 100 mW	200 mW	typ. 200 mW	typ. 30 mW	typ. 0.5...1 W
Supply voltage	12...14 V DC	12...14 V DC	12...14 V DC	12...14 V DC	12...14 V DC	13...14 V DC
Current consumption	typ. 1.5 A	typ. 3 A	typ. 1.2 A	typ. 7 A	typ. 15 A	typ. 34 A
Dimensions in mm	130 x 60 x 23	130 x 60 x 23	40 x 75 x 22	130 x 60 x 23	180 x 60 x 23	100 x 180 x 25
Case	milled aluminium	milled aluminium	milled aluminium	milled aluminium	milled aluminium	milled copper
Input connector	SMA-female	SMA-female	SMA-female	SMA-female	SMA-female	SMA-female
Output connector	SMA-female	SMA-female	SMA-female	SMA-female	SMA-female	N-female
Harmonic rejection					45 dB	

Amplifiers for other frequencies available on request.

High Power Amplifiers for the 6cm Amateur Radio Band

Low and medium power

MKU PA 601 - MKU PA 602 - MKU PA 602 H

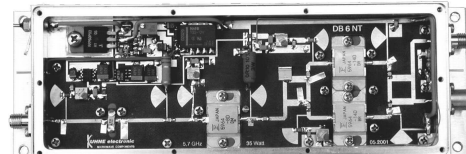
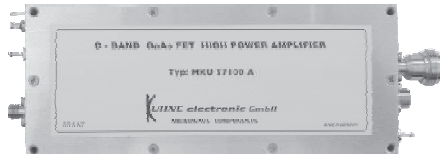
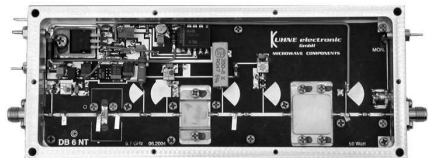
MKU PA 602 XH - MKU PA 604 HXL

High power

MKU PA 5750 A - MKU PA 57100

- Detector output (DC voltage) for monitoring forward output power
- Surge protection and reverse polarity protection
- Milled aluminium case
- Suitable for all analog and digital modes (SSB, CW, ATV, DATV)

100 W
at 5.7 GHz !!!



Specifications

Type	MKU PA 601	MKU PA 602	MKU PA 602 H	MKU PA 602 XH	MKU PA 604 HXL	MKU PA 5750 A	MKU PA 57100 A
Center frequency	5760 MHz	5760 MHz	5760 MHz	5760 MHz	5760 MHz	5760 MHz	5760 MHz
RF input power	typ. 600 mW	max. 100 mW	typ. 200 mW	typ. 300 mW	typ. 300 mW	max. 200 mW	typ. 200 mW
RF output power CW	>4 W	>4 W	>8 W	>15 W	>15 W	typ. 50 W	typ. 100 W
Supply voltage	typ. 1.2 A	typ. 1.6 A	typ. 2.5 A	typ. 5 A	typ. 5 A	+ 12 V DC	+ 12 V DC
Current consumption	12...14 V DC	12...14 V DC	12...14 V DC	12...14 V DC	12...14 V DC	typ. 13 A	typ. 28 A
Dimensions in mm	55 x 80 x 22	55 x 80 x 22	55 x 80 x 22	55 x 80 x 22	55 x 80 x 22	158 x 64 x 22	158 x 64 x 22
Case	milled AL	milled AL	milled aluminium	milled aluminium	milled aluminium	milled aluminium	milled aluminium
Input connector	SMA-female	SMA-female	SMA-female	SMA-female	SMA-female	SMA-female	SMA-female
Output connector	SMA-female	SMA-female	SMA-female	SMA-female	SMA-female	SMA-female	N-female
Weight	typ. 160 g	typ. 180 g	typ. 180 g	typ. 180 g	typ. 180 g		
Maximum case temperature						-20 ... + 55°C	-20 ... + 55°C
On / Off control						+ 12 V @ TX	+ 12 V @ TX
Overheat protection						Yes	Yes

Amplifiers for other frequencies available on request.

Linear High Power Amplifiers for S-Band

High linear GaAs FET power amplifiers (class A)

for digital broadcast and communication systems

This series of power amplifiers provides high linearity and a large bandwidth. An isolator at the output protects the semiconductor devices from reverse power. Very good harmonic rejection is achieved. Two detector outputs allow permanent monitoring of forward and reverse power. Typical applications of this amplifier series are digital broadcast and communication systems like Multichannel Multipoint Distribution Systems (MMDS), Digital Video Broadcast (DVB) or Digital Multimedia Broadcast (DMB). The amplifiers contain an automatic level control (ALC). The desired output power can be adjusted continuously, from nearly zero to the maximum output power.

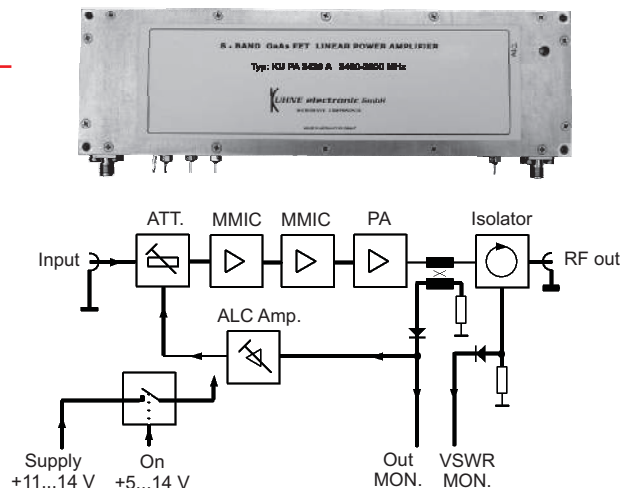
- High linearity and harmonic rejection
- Monitor outputs for forward and reverse power detection
- Surge protection and reverse polarity protection

- Isolator for protection against high VSWR
- Logic ON / OFF control
- Suitable for COFDM systems

NEW

Specifications

Type	KU PA 3436 AL	KU PA 3436 A
Frequency range	3400...3600 MHz	3400...3600 MHz
RF input power	max. 1 mW	typ. 0.1 mW
RF output power CW	typ. 4 W	typ. 10 W
Saturation power power	typ. 5 W	>12 W
RF Output power COFDM	0,5...1 W	1...2 W
Gain	min. 39 dB	min. 50 dB
Gain flatness (ALC off)	typ. +/- 2.5 dB	typ. +/- 2,5 dB
Gain flatness (ALC on)	typ. +/- 0.25 dB	typ. +/- 0.25 dB
Harmonic rejection	>50 dB	>50 dB
Supply voltage	+11...14 V DC	+11...14 V DC
Current consumption	typ. 1.5 A	typ. 5 A
Input connector	SMA-female / 50 ohms	SMA-female / 50 ohms
Output connector	SMA-female / 50 ohms	SMA-female / 50 ohms
Case	milled aluminium	milled aluminium
Dimensions in mm	222 x 63 x 22	222 x 63 x 22
Weight	typ. 500 g	typ. 500 g
Maximum case temperature	55 °C	55 °C



Linear High Power Amplifiers for S-Band and C-Band

High linear GaAs FET power amplifiers (class A)

for digital broadcast and communication systems

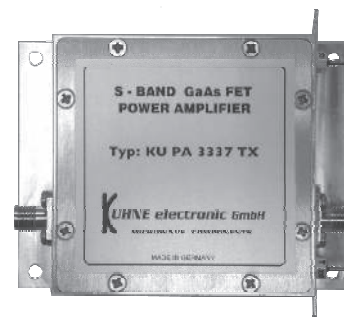
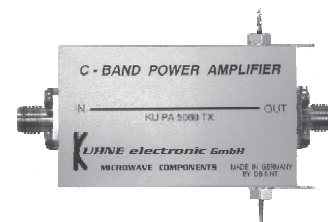
This series of power amplifiers provides high linearity and a large bandwidth. Typical applications of this amplifier series are digital broadcast and communication systems like Multichannel Multipoint Distribution Systems (MMDS), Digital Video Broadcast (DVB) or Digital Multimedia Broadcast (DMB).

- Small mechanical dimensions
- High gain and output power
- Milled aluminium case
- Detector output (DC voltage) for monitoring forward output power
- Surge protection and reverse polarity protection

Specifications

Type	KU PA 3337 TX	KU PA 5060 TX
Frequency range	3.3 ... 3.7 GHz	5.0 GHz ... 6.0 GHz
RF input power	typ. 5 mW (max. 30 mW)	8 mW (max. 30 mW)
RF output power CW	typ. 1.6 W	800 mW
Saturation output power	typ. 2 W	typ. 1,1 W
RF Output power COFDM	200 ... 500 mW	100 ... 250 mW
Gain	typ. 26 dB	typ. 21 dB
Gain flatness	typ. +/- 1 dB	typ. +/- 2 dB
Output-IP3	typ. 40 dBm	typ. 37 dBm
Harmonic rejection	typ. -25 dBc	typ. -30 dBc
Supply voltage	+11 ... 14 V DC	+9 ... 14 V DC
Current consumption	typ. 1 A	typ. 530 mA
Input connector	SMA-female / 50 ohms	SMA-female / 50 ohms
Output connector	SMA-female / 50 ohms	SMA-female / 50 ohms
Case	milled aluminium	milled aluminium
Dimensions in mm	80 x 60 x 20	50 x 30 x 22
Weight	150 g	70 g
Maximum case temperature	55 °C	55 °C

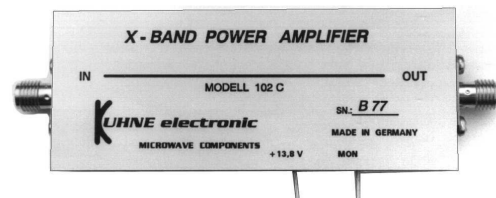
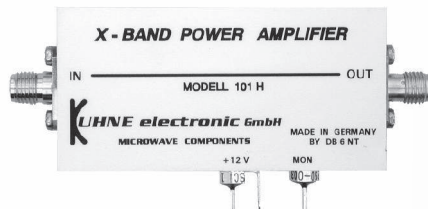
NEW



Power Amplifiers for the 10 GHz Amateur Radio Band

MKU PA 101 N - MKU PA 101 H - MKU PA 102 C - MKU PA 102 AL

- Detector output (DC voltage) for monitoring forward output power
- Surge protection and reverse polarity protection
- Small mechanical dimensions
- Suitable for all analog and digital modes (SSB, CW, ATV, DATV)



Specifications

	MKU PA 101 N	MKU PA 101 H	MKU PA 102 C	MKU PA 102 AL
Type	10368 MHz	10368 MHz	10368 MHz	10368 MHz
Center frequency	typ. 200 mW	typ. 230 mW	typ. 50 mW	<10 mW
RF input power	>1 W	>2 W	>1 W	>200 mW
RF output power CW	typ. 1.3 W	>2.4 W	typ. 1.3 W	>250 mW
Saturation output power	12...14 V DC	12...14 V DC	12...14 V DC	12...14 V DC
Supply voltage	typ. 450 mA	typ. 800 mA	typ. 500 mA	typ. 250 mA
Current consumption	SMA-female / 50 Ohm	SMA-female / 50 Ohm	SMA-female / 50 Ohm	SMA-female / 50 Ohm
Input connector	SMA-female / 50 Ohm	SMA-female / 50 Ohm	SMA-female / 50 Ohm	SMA-female / 50 Ohm
Output connector	milled aluminium	milled aluminium	milled aluminium	German silver
Case	60 x 30 x 20	60 x 30 x 20	75 x 30 x 18	75 x 30 x 38
Dimensions in mm	typ. 50 g	typ. 50 g	typ. 60 g	typ. 70 g
Weight				

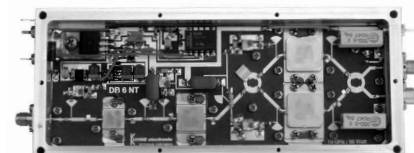
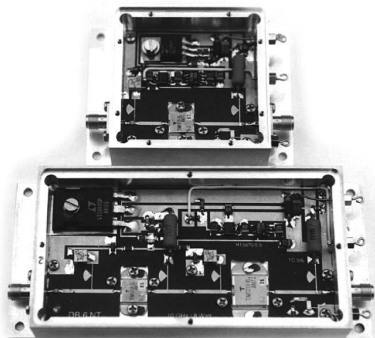
Amplifiers for other frequencies available on request.

Power Amplifiers for the 10 GHz Amateur Radio Band

MKU PA 101 X - MKU PA 102 X - MKU PA 102 XL - MKU PA 103 XLC MKU PA 1025 A - MKU PA 1050 A

- Suitable for all analog and digital modes (SSB, CW, ATV, DATV)
- Detector output (DC voltage) for monitoring forward output power
- Surge protection and reverse polarity protection
- Small mechanical dimensions

50 W
at 10 GHz !!!



Specifications

Type	MKU PA 101 X	MKU PA 102 X	MKU PA 102 XL	MKU PA 103 XLC	MKU PA 1025 A	MKU PA 1050 A
Center frequency	10368 MHz	10368 MHz	10368 MHz	10368 MHz	10368 MHz	10368 MHz
RF input power	typ. 800 mW	typ. 150 mW	typ. 200 mW	typ. 200 mW	max. 200 mW	typ. 200 mW
RF output power CW	>4 W	>4 W	>8 W	16...20 W	typ. 25 W	typ. 50 W
Saturation output power	typ. 5 W	typ. 5 W	typ. 10 W	> 16 W	> 25 W	> 50 W
Supply voltage	12 ... 14 V DC	12 ... 14 V DC	12 ... 14 V DC	12 ... 14 V DC	12 ... 14 V DC	12 ... 14 V DC
Current consumption	typ. 1.2 A	typ. 1.5 A	typ. 4 A	typ. 8 A	typ. 8 A	typ. 20 A
Input connector	SMA-female	SMA-female	SMA-female	SMA-female	SMA-female	SMA-female
Output connector	SMA-female	SMA-female	SMA-female	SMA-female	SMA-female	SMA-female
Case	milled aluminium	milled aluminium	milled aluminium	milled aluminium	milled aluminium	milled aluminium
Dimensions in mm	80 x 60 x 20	70 x 45 x 20	130 x 60 x 20	170 x 60 x 20	158 x 64 x 22	158 x 64 x 22
Weight					typ. 370 g	typ. 370 g
Maximal case temperature	-20...+50 °C	-20...+50 °C	-20...+50 °C	-20...+50 °C	-20...+50 °C	-20...+50 °C
Overheat-protection					Yes	Yes

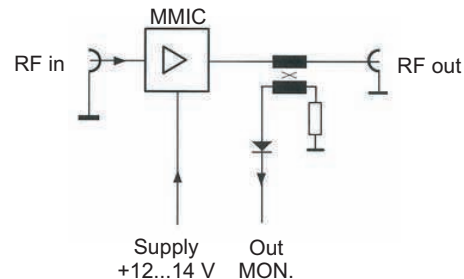
Amplifiers for other frequencies available on request.

Linear Power Amplifier for the X-Band

KU PA 093 MM - KU PA 103 MM - KU PA 113 MM

This series of broadband power amplifiers features highest linearity. The class A power amplifiers are designed for digital applications like DVB-T, DVB-S, MMDS (Multichannel Multipoint Distribution Systems) and in general for all systems, which are based on OFDM, QPSK or QAM. They are manufactured with high precision and they meet highest reliability standards.

- Built-in directional coupler with detector for monitoring the output power (MON)
- Small mechanical dimensions
- High gain and high output power
- Milled aluminium case
- Built-in protection circuit for the POWER GaAs FETs
- Good harmonic rejection
- Class A operation for highest linearity



Specifications

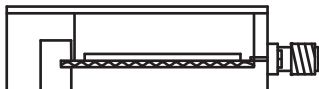
Type	KU PA 093 MM	KU PA 103 MM	KU PA 113 MM
Frequency range	8.5 ... 10.0 GHz	9.5 ... 11.0 GHz	11.0 ... 12.5 GHz
RF input power	typ. 5 mW	typ. 5 mW	typ. 5 mW
Input return loss (S11)	typ. 10 dB	typ. 10 dB	typ. 10 dB
RF output power CW	> 1.5 W	> 1.5 W	> 1.5 W
Saturation output power	typ. 2 W	typ. 2 W	typ. 2 W
Gain	typ. 25 dB	typ. 25 dB	typ. 25 dB
Gain flatness	+/- 1 dB	+/- 1 dB	+/- 1 dB
Harmonic rejection	typ. 50 dB	typ. 60 dB	typ. 60 dB
Supply voltage	+12 ... +14 V DC	+12 ... +14 V DC	+12 ... +14 V DC
Current consumption	typ. 1.6 A	typ. 1.6 A	typ. 1.6 A
Input connector	SMA-female / 50 ohms	SMA-female / 50 ohms	SMA-female / 50 ohms
Input connector	SMA-female / 50 ohms	SMA-female / 50 ohms	SMA-female / 50 ohms
Dimensions in mm	80 x 60 x 20	80 x 60 x 20	80 x 60 x 20
Case	Milled aluminium	Milled aluminium	Milled aluminium case

Amplifiers for other frequencies available on request.

Power Amplifiers for the 24 GHz Amateur Radio Band / Waveguide

MKU PA 244 WH - MKU PA 244 TX - MKU PA 241 PAW - MKU PA 2410 AW

- Detector output (DC voltage) for monitoring forward output power
- Surge protection and reverse polarity protection
- Milled aluminium case
- Small mechanical dimensions
- Suitable for all analog and digital modes (SSB, CW, ATV, DATV)



10 W
at 24 GHz !!!

Specifications

	MKU PA 244 TX	MKU PA 241 PAW	MKU PA 244 WH	MKU PA 2410 AW
Type	24...24.25 GHz	24...24.25 GHz	24...24.25 GHz	24...24.25 GHz
Frequency range	typ. 8 mW	typ. 50 mW	typ. 8 mW	typ. 20 mW; max. 50 mW
RF input power	>90 mW	>300 mW	typ. 80 mW	typ. 10 W
RF output power CW	typ. 100 mW	typ. 340 mW	typ. 100 mW	>10 W
Saturation output P	12...15 V DC	12...15 V DC	12...15 V DC	12...15 V DC
Supply voltage	typ. 300 mA	typ. 320 mA	typ. 300 mA	typ. 14 A
Current consumption	SMA-Buchse	SMA-Buchse	waveguide R220 / WG20 / WR42	waveguide R220 / WG20 / WR42
Input connector	waveguide R220 / WG20 / WR42	waveguide R220 / WG20 / WR42	waveguide R220 / WG20 / WR42	waveguide R220 / WG20 / WR42
Output connector	milled aluminium	milled aluminium	milled aluminium	milled aluminium
Case	30 x 82 x 20	47 x 30 x 20	65 x 30 x 27	119 x 63 x 22
Dimensions in mm	typ. 85 g	typ. 60 g	typ. 80 g	typ. 305 g
Weight				

Amplifiers for other frequencies available on request.

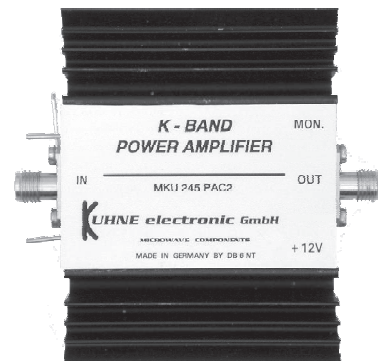
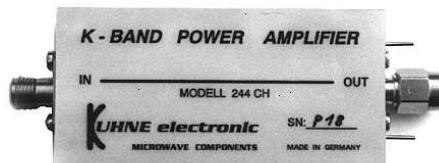
Power Amplifiers for the 24 GHz Amateur Radio Band / SMA

MKU PA 241 PAC - MKU PA 242 PAC - MKU PA 245 PAC2

MKU PA 244 CH - MKU PA 243 C - MKU PA 2403 A - MKU PA 2410 A

- Suitable for all analog and digital modes (SSB, CW, ATV, DATV)
- Detector output (DC voltage) for monitoring forward output power
- Milled aluminium case
- Small mechanical dimensions

10 W
at 24 GHz !!!



Specifications

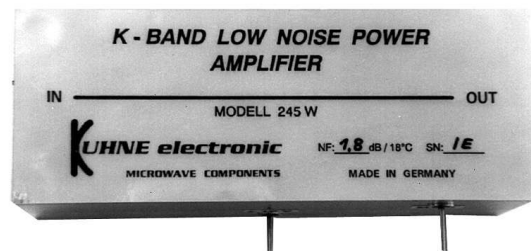
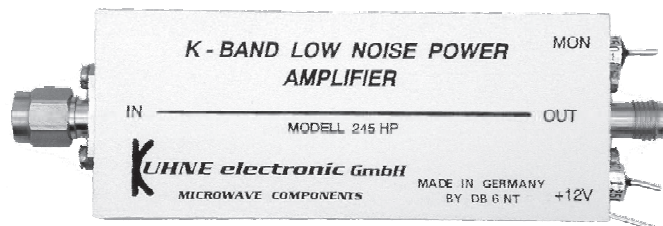
Type	MKU PA 241 PAC	MKU PA 242 PAC	MKU PA 245 PAC2	MKU PA 244 CH	MKU PA 243 C	MKU PA 2403 A	MKU PA 2410 A
Frequency range	24...24.25 GHz	24...24.25 GHz	24...24.25 GHz	24...24.25 GHz	24...24.25 GHz	24...24.25 GHz	24...24.25 GHz
RF input power	typ. 50 mW	typ. 150 mW	typ. 8 mW	typ. 8 mW	typ. 0.1 mW	typ. 20 mW max. 50 mW	typ. 20 mW max. 50 mW
RF output power CW	typ. 300 mW	typ. 500 mW	typ. 1.2 W	typ. 80 mW	> 20 mW	typ. 3 W	typ. 10 W
Saturation output power	typ. 340 mW	typ. 580 mW	typ. 1.3 W	> 90 mW	> 30 mW	> 3 W	> 10 W
Supply voltage	10...15 V DC	10...15 V DC	10...15 V DC	10...15 V DC	10...15 V DC	9...12 V DC	9...12 V DC
Current consumption	typ. 320 mA	typ. 650 mA	typ. 850 mA	typ. 300 mA	typ. 70 mA	typ. 3 A	typ. 14 A
Input connector	SMA-male	SMA-male	SMA-female	SMA-male	SMA-female	SMA-female	SMA-female
Output connector	SMA-female	SMA-female	SMA-female	SMA-female	SMA-female	SMA-female	SMA-female
Case	milled aluminium	milled aluminium	milled aluminium	milled aluminium	milled aluminium	milled aluminium	milled aluminium
Dimensions in mm	30 x 35 x 18	40 x 40 x 18	50 x 65 x 23	60 x 30 x 18	50 x 30 x 18	50 x 30 x 18	119 x 63 x 22

Amplifiers for other frequencies available on request.

Low Noise HEMT Power Amplifiers for 24 GHz

MKU LNA 245 HP - MKU LNA 245 W

- Detector output (DC voltage) for monitoring forward output power
- Milled aluminium case
- Small mechanical dimensions
- Suitable as preamplifier and as power amplifier



Specifications

	MKU LNA 245 HP	MKU LNA 245 W
Type	24.0 - 24.25 GHz	24.0 - 24.25 GHz
Frequency range	typ. 2.5 dB @ 18°C	typ. 2.5 dB @ 18°C
Noise figure	min. 30 dB	min. 30 dB
Gain	typ. 80 mW	typ. 80 mW
Saturatoin output power	@ 0.2 mW in approx. 70 mW out	max. 1 mW in - typ. 70 mW out
Supply voltage	+10...15 V DC	+10...15 V DC
Current consumption	typ. 210 mA	typ. 210 mA
Dimensions in mm	74 x 30 x 17 mm	77 x 30 x 28 mm
Weight	typ. 60 g	typ. 120 g
Case	milled aluminium	milled aluminium
Input	SMA-male / 50 ohms	waveguide R220 / WR42 / WG20
Output	SMA-female / 50 ohms	waveguide R220 / WR42 / WG20

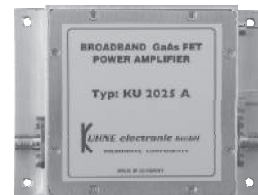
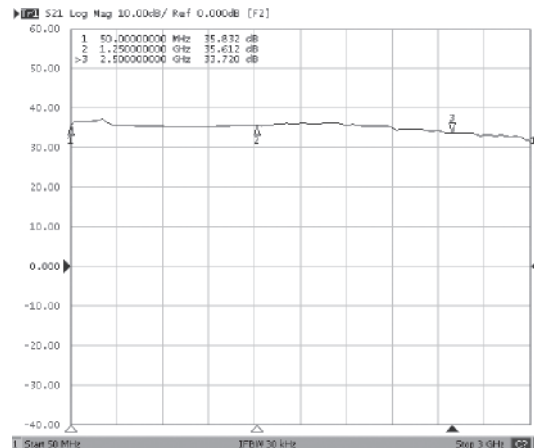
Amplifiers for other frequencies available on request.

Broadband Power Amplifiers

KU PA BB233 BBA - KU PA BB2025 A

Our broadband power amplifiers offer a wide range of applications, such as

- EMC measurement
- Additional power for standard signal generators
- Measurement equipment for laboratories and research institutes
- Power amplifier for different applications



Specifications

Type	KU PA BB233 BBA
Frequency range	500...2500 MHz
Output power	typ. 1 W
Saturation power @ 2.3 GHz	typ. 3 W
Gain	min. 30 dB
Noise figure @ 18 °C	typ. 6 dB
Current consumption	approx. 1 A
Supply voltage	+12...14 V DC
Dimensions in mm	130 x 60 x 20
Coaxial connectors	SMA-female / 50 ohms
Weight	typ. 240 g

Specifications

Type	KU PA BB2025 A
Frequency range	50...2500 MHz
Gain	min. 35 dB
Saturation power (50...500 MHz)	typ. 3 W
Saturation power (500...2500 MHz)	typ. 2 W
1 dB Compression Point (50...500 MHz)	> 2 W
1 dB Compression Point (500...2500 MHz)	typ. 1.5 W
SWR	< 2:1
Noise figure @ 18 °C	< 4 dB
Supply voltage	+ 24...26 V DC / typ. 700 mA
Dimensions in mm	80 x 60 x 20
Coaxial connectors	SMA-female / 50 ohms
Weight	typ. 140 g

Transverter for the 2m Band - TR 144 H +40

The high-performance transverter TR 144 H +40 with its outstanding characteristics is the result of a special circuit design. It is based on Kuhne electronic's long experience in the design of microwave transverters. The transverter was originally designed for VHF amateur radio applications, for example high performance contest stations. It can be modified for professional use in the 140 MHz frequency range. The receiver provides very good large-signal performance. It has an output IP3 of >40 dBm. The option "+40" was developed for the use with HF transceivers like TEN-TEC ORION / FTDX-9000 / IC7800 / IC756 PRO III and other high-end transceivers.

Oscillator

A temperature-compensated low noise butler oscillator generates the 116 MHz LO signal. A thermostat crystal with a 40 °C precision crystal heater is used. Phase noise of the output signal is -156 dBc/Hz @ 10 kHz. This value is far better than that of most HF transceivers. The oscillator output power is about 100 mW.

Receiver

In the receiver frontend there is only one balanced super low noise stage with two Power GaAs-FETs. A noise figure (NF) of 0.9 dB and an output IP3 of >40 dBm are achieved. To prevent interference in case of multi-band operation, there is a notch filter for the 70cm band at the input. The prestage is followed by a high-Q helical filter and a matching network. A high-level double balance GaAs-FET ring mixer with an IP3 of >35 dBm converts the signal to the intermediate frequency (IF) at 28...30 MHz. The total gain of the receiver path is limited to 25 dB to avoid overdriving of the HF transceiver. An internal preamplifier of the HF transceiver has to be switched off. The transverter provides excellent large-signal performance. Gain and sensitivity are ideal for contesting and DXing. For EME operation the use of the preamplifier LNA 144 A is recommended. This drops the total noise figure to 0.35 dB. A second N-connector permits the use of a separate cable for the preamplifier.

Transmitter

In the transmit path of the transverter a second 17 dBm ring mixer with an adjustable attenuator is used. The IF input power is internally adjustable between 1 to 50 mW. For further power adjustments the HF transceiver can be used. At the mixer output there is a matching network and a helical band pass filter. It is followed by an MMIC amplifier stage, another helical band pass filter, driver amplifier and power amplifier. LD-MOSFETs are used in driver amplifier and power amplifier. The available output power is 60 W. To achieve optimum intermodulation performance, the output power is limited to 25 W. Overdriving is prevented by an ALC circuit. The transmit unit of the transverter has a protection circuit. If the antenna SWR is bad, the power amplifier switches off for 3 seconds. This is indicated by a red light in the power meter scale. A final low pass filter guarantees spurious and harmonic rejection of more than 60 dB. The output power is indicated on a calibrated meter.

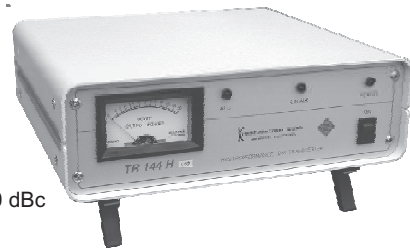
Sequence Controller

The built-in sequence controller allows time-controlled operation of a high-quality power amplifier and a coaxial relay with a preamplifier, which is placed directly at the antenna. The required connectors are on the back panel of the transverter.

Transverter for the 2 m band TR 144 H +40

Some technical characteristics

- Aluminium case with a big heat sink
- Internally wired with silver plated Teflon coaxial cable
- Antenna relay with 70 dB isolation
- Converter with excellent large-signal performance
- Big case for additional filters and other components
- Built-in directional coupler for calibrated power output control
- Power amplifier with built-in VSWR protection
- Phase noise of the oscillator better -156 dBc/Hz @ 10 kHz
- 5-pole low-pass filter for harmonic rejection
- Low noise butler oscillator with adjustable frequency; 40 °C precision crystal heater
- Built-in sequence control
- Including DC-power cable / control cable
- Spurious and harmonic rejection better than 60 dBc
- Handbook



Specifications

Type
VHF Frequency range
IF Frequency range
IF Input power
PTT control
Output

TR 144 H +40
 144...146 MHz
 28...30 MHz
 1...50 mW
 contact closure to ground
 25 Watt @ 50 Ohm
 IM3@ 20 Watts PEP 32 dB
 13.8 V DC (12 - 14 V)
 typ. 6 A (TX)
 typ. 25 dB
 typ. 40 dBm, min. 37 dBm
 > -106 dBc @ 3 kHz BW
 > 102.5 dB SFDR @ 3 kHz BW
 (Spurious free dynamic range)

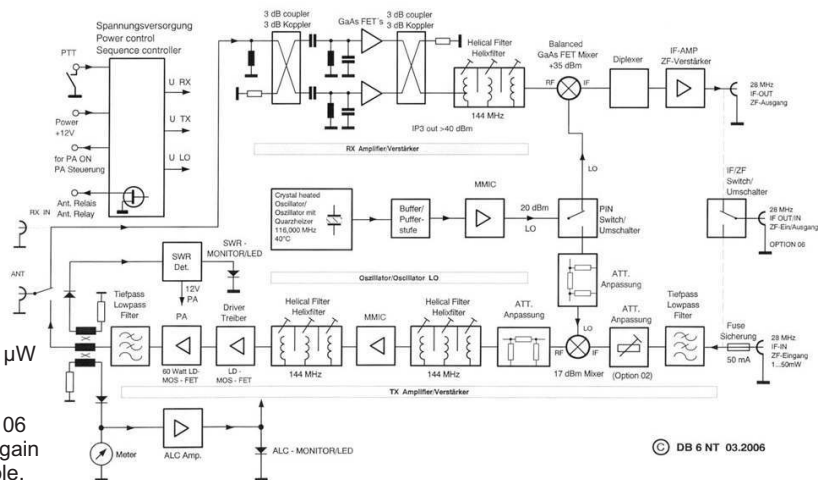
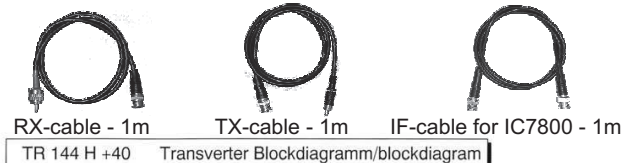
Supply voltage
Current consumption
RX Gain
IP3 out
Blocking
IM-Dynamic

Noise figure @ 18 °C
Dimensions mm
Case

IF connectors
RF connectors
DC supply and control connector
Possible options

typ. 1.2 dB
 270 x 260 x 80
 aluminium
 BNC-female
 N-female
 SUB-D 9-pole
 - 02: TX IF input power -20 dBm / 10...200 µW
 - 04: drive gain control on the front panel
 - 05: IF frequency 14...16 MHz
 - 06: common IF-connector for RX/TX Opt. 06
 (common IF-connector) and Opt. 04 (drive gain control on the front panel) are not compatible.

Accessories to order



Transverter for the 2 m band - TR 144 H

The high-performance transverter TR 144 H with its outstanding characteristics is the result of a special circuit design. It is based on Kuhne electronic's long experience in the design microwave transverters. The TR 144 H was originally designed for VHF amateur radio applications, for example high performance contest stations. It can be modified for professional use in the 140 MHz frequency range.

Oscillator

A temperature-compensated low noise butler oscillator generates the 116 MHz LO signal. A thermostat crystal with a 40 °C precision crystal heater is used. Phase noise of the output signal is -156 dBc/Hz @ 10 kHz. This value is much better than that of the HF transceivers. The oscillator output power is about 100 mW.

Receiver

In the receiver frontend there is only one super low noise stage with a noise figure of 0.3 dB and an output IP3 of 25 dBm. The prestage is followed by a helical band pass filter and a matching network. A high level schottky diode ring mixer converts the signal to the intermediate frequency (IF) at 28...30 MHz. The total gain of the receiver path is limited to 25 dB to avoid overdriving of the HF transceiver. The internal preamplifier of the HF transceiver has to be switched off. The transverter provides excellent large-signal performance. Gain and sensitivity are ideal for contesting and DXing. For EME operation the use of the preamplifier LNA 144 A is recommended. This drops the total noise figure to 0.35 dB. A second N-connector permits the use of a separate cable for the preamplifier.

Transmitter

In the transmit path of the transverter a second 17 dBm ring mixer with an adjustable attenuator is used. The IF input power is internally adjustable between 1 to 50 mW. For further power adjustments the HF transceiver can be used. At the mixer output there is a matching network and a helical band pass filter. It is followed by an MMIC amplifier stage, another helical band pass filter, driver amplifier and power amplifier. LD-MOSFETs are used in driver amplifier and power amplifier. The available output power is 60 W. To achieve optimum intermodulation performance, the output power is limited to 25 W. Overdriving is prevented by an ALC circuit. The transmit unit of the transverter has a protection circuit. If the antenna SWR is bad, the power amplifier switches off for 3 seconds. This is indicated by a red light in the power meter scale. A final low pass filter guarantees spurious and harmonic rejection of more than 60 dB. The output power is indicated on a calibrated meter.

Sequence Controller

The built-in sequence controller allows time-controlled operation of a high-quality power amplifier and a coaxial relay with a preamplifier, which is placed directly at the antenna. The required connectors are on the back panel of the transverter.

Transverter for the 2 m band TR 144 H - TR 222 H for 222 MHz band

Some technical characteristics

- Aluminium case with a big heat sink
- Internally wired with silver plated Teflon coaxial cable
- Antenna relay with 70 dB isolation
- Converter with excellent large-signal performance
- There are two separate IF connectors. They can be switched to one common IF connector (TR 144 H)
- Big case for additional filters and other components - Built-in directional coupler for calibrated power output control
- Power amplifier with built-in VSWR protection (TR 144 H)
- 5-pole low-pass filter for harmonic rejection
- Spurious and harmonic rejection better than 60 dBc
- Phase noise of the oscillator better -156 dBc/Hz @ 10 kHz
- Built-in sequence control
- Including DC-power cable / control cable - Handbook included
- IF input power range 10...200 μ W or 1...50 mW (internal switch) (TR 144 H)



Accessories to order



RX-cable

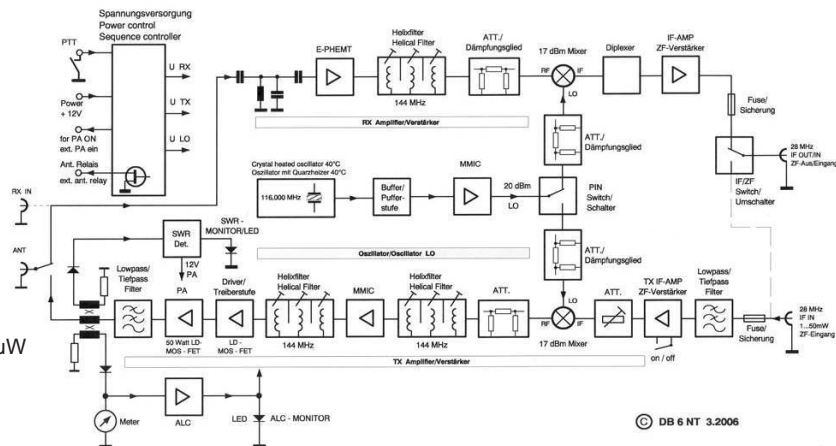


TX-cable

TR 144 H Transverter Blockdiagram/blockdiagram

Specifications

Type	TR 144 H	TR 222 H
Frequency range	144...146 MHz	222...224 MHz
IF Frequency range	28...30 MHz	28...30 MHz
IF Input power	1...50 mW, internal adjustable attenuator	
PTT-control	contact closure to ground	
Output power	25 Watt @ 50 Ohm IM3@ 20 Watts PEP 32 dB	
Operation voltage	13,8 V DC (12 - 14 V)	
Current consumption	typ. 6 A (TX)	
RX gain	typ. 25 dB, output IP3 typ. +23 dBm	
Noise figure @ 18 °C	max. 0.8 dB	
Dimensions mm	270 x 260 x 80	
Case	aluminium	
Coaxial connect. IF	BNC - female	
Coaxial connect. VHF	N - female	
DC-supply and control connectors	SUB-D 9-pole	
Possible Options		
TR 144 H:	02: TX IF input power -20 dBm / 10...200 μ W	
04 + 05	03: RX IF Amplifier +10 dB	
TR 222 H:	04: drive gain control on the front panel	
02 + 03 + 04 + 06	05: IF Frequency 14...16 MHz	
	06: common IF-connector for RX/TX	



Transverter for the 70 cm band - TR 432 H

The high-performance Transverter TR 432 H with its outstanding specifications is the combined result of a circuit design using state-of-the-art components and of Kuhne Electronics long experience in micro-wave Transverter. The TR 432 H is specially designed for demanding UHF Amateur Radio applications like high performance contest stations, but can be modified for professional use in the 400 MHz frequency range.

Oscillator

The local oscillator signal for both transmit and receive mixer is derived from two switch able temperature compen-sated low noise butler oscillators and a frequency multiplier chain. The circuit uses a thermostat crystal with 40 °C precision crystal heater. The second oscillator is intended for non-standard output frequencies, using a customer-provided crystal. In the TR 432 H Option 01 the second oscillator is equipped with a crystal for satellite operation. The phase noise of the output signal lies at far under -148 dBc/Hz@10kHz which is better as the used shortwave transceivers. After frequency multiplication, the LO signal is filtered in a double tuned helical filter, boosted to 100 mW in a MMIC amplifier and applied to the receiver or transmitter mixer via a PIN switch.

Receiver

The receiver path is able to cope with very large interference levels from other transmitters, a situation common to contest sites with other high-power transmitters in the neighbourhood. To achieve optimum intermodulation and large-signal performance, the TR 432 H uses only one PHEMT RF amplifier stage with a noise figure of 0.4 dB and an output intercept point of 30 dBm. A helical band pass filter provides optimum rejection of out-of-band signals and a high-level ring mixer (LO + 17 dBm, 50 mW) with output diplexer converts the input signal to the IF band at 28 MHz. The overall gain in the receiver path was deliberately set to only 20 dB, as even high-performance HF transceivers have still large signal problems at 28 MHz. For EME and DX work or for long antenna feed cables we recommend a preamplifier like the LNA 432 A Low Noise Amplifier mounted directly at the antenna feed point, using separate receive and transmit cables. Here you need only one additional high-quality coaxial relay, as the TR 432 H provides a separate receiver input (N-female).

Transmitter

The transmitter path uses a second 17 dBm ring mixer for up conversion from 28 MHz to 432 MHz, and two cascaded helical band pass filters are used to achieve an exceptionally "clean" transmit signal. The transmit amplifier uses state-of-the-art LDMOS transistors in the driver and PA stage and is designed for 40 W output. To achieve optimum transmitter intermodulation performance, an integrated ALC loop with over-drive indicator limits the peak output power to 20 W. An output low pass filter provides a harmonic suppression of more than 60 dB. A directional coupler with a Schottky-diode makes the calibrated indication of the output power possible at the built-in meter.

Sequence Controller

The built-in sequence controller makes a time controlled operation of a high-quality power amplifier and a coaxial relay possible with preamplifier directly at the antenna. Connections for this are at the equipment back side.

Transverter for the 70 cm band - TR 432 H

Some technical characteristics

- Aluminium case with a big heat sink
- Inside wiring with silver plated Teflon coaxial cable
- There are two separate IF connectors. They can be switched to one common IF connector
- Antenna relay with 70dB cross-talk attenuation
- Converter can process large signals
- Extension with additional filters and other components
- Built-in directional coupler for calibrated power output control
- 5-pole low-pass filter for harmonic rejection
- Spurious and harmonic rejection better 60dBc
- Phase noise of the oscillator better -148dBc/Hz@10kHz
- Built-in sequence control
- Including DC-power cable / control cable
- Handbook
- IF input power range 10...200 μ W or 1...50 mW (internal switch)



Accessories to order



RX-cable

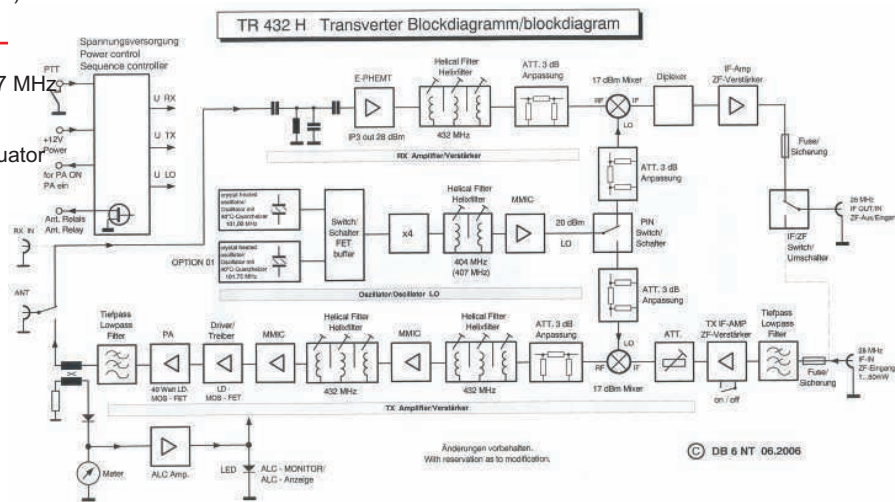


TX-cable

Specifications

Type
UHF Frequency range
IF Frequency range
IF Input power
PTT control
Output
Operating voltage
Current consumption
RX Gain
Noise figure @ 18 °C
Dimensions mm
Case
IF connectors
RF connectors
DC supply and control connector
Weight
Possible options

TR 432 H
 432...434 MHz (Standard), 435...437 MHz (Oscar), no sideband inversion
 28...30 MHz
 1...50 mW, internal adjustable attenuator
 contact closure to ground
 20 Watts @ 50 Ohm
 13.8 V DC (12 - 14 V)
 typ. 6 A
 min. 20 dB
 typ. 1.0 dB NF
 270 x 260 x 80
 aluminium
 BNC-female
 N-female
 SUB-D 9-pole
 typ. 2.7 kg
 01: Band 2: 435...437 MHz
 04: drive gain control on the front panel



Transverter for the 23 cm Band - TR 1296 H

Some technical characteristics

- Aluminium case with a big heat sink
- Inside wiring with silver plated Teflon coaxial cable
- Antenna relay with 60dB cross-talk attenuation
- Converter can process large signals
- Extension with additional filters and other components
- Built-in directional coupler for calibrated power output control
- 5-pole low-pass filter for harmonic rejection
- Spurious and harmonic rejection better 60dBc
- Phase noise of the oscillator better -138dBc/Hz@10kHz
- Built-in sequence control
- Including DC-power cable / control cable
- Handbook

Specifications

Type	TR 1296 H - 144
SHF-frequency range	1296...1298 MHz (Standard) Option 01: 1268...1270 MHz
IF-frequency range	144-146 MHz
IF-input power	0.5 – 3Watt, adjustable
PTT-control	ground to transmit or +12V on the IF cable @ TX
Power output	20 Watt@50 Ohm
Supply voltage	13.8 V DC (12-14 V)
Current consumption	typ. 8 A (TX)
RX gain	> 20 dB
Noise figure @ 18 °C	typ. 1.2 dB
Dimensions mm	270 x 260 x 80
Case	Aluminium
Coaxial connectors IF	BNC-female
Coaxial connectors UHF	N-female
Operation voltage and control connector	SUB-D 9-pole
Possible Options	- 01: Band 2: 1268...1270 MHz

Accessories to order

for TR 1296 H - 144



RX-cable
(coaxial connecting cable 2m transceiver-transverter)

Accessories to order

for TR 1296 H - 28



RX-cable



TX-cable

TR 1296 H - 28
1296...1298 MHz (Standard)
Option 01: 1268...1270 MHz
28...30 MHz
1...50 mW, adjustable
ground to transmit

20 Watt@50 Ohm
13.8 V DC (12-14 V)
typ. 8 A (TX)
> 20 dB
typ. 1.2 dB
270 x 260 x 80
Aluminium
BNC-female
N-female
SUB-D 9-pole

- 01: Band 2: 1268...1270 MHz
 - 02: TX 10...200 µW IF Input power
 - 04: drive gain control on the front panel
 - 06: common IF-connector for RX/TX
- Opt. 06 (common IF-connector) and Opt. 04 (drive gain control on the front panel) are not compatible.**



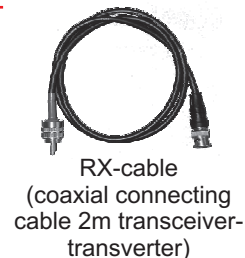
Transverter for the 13 cm Band - TR 2320 H

Some technical characteristics

- Aluminium case with a big heat sink
- Inside wiring with silver plated Teflon coaxial cable
- Antenna relay with 45 dB cross-talk attenuation
- Converter can process large signals
- Extension with additional filters and other components
- Built-in directional coupler for calibrated power output control
- 5-pole low-pass filter for harmonic rejection
- Spurious and harmonic rejection better 50dBc
- Phase noise of the oscillator better -132dBc/Hz@10kHz
- Built-in sequence control
- Including DC-power cable / control cable
- Handbook



Accessories to order

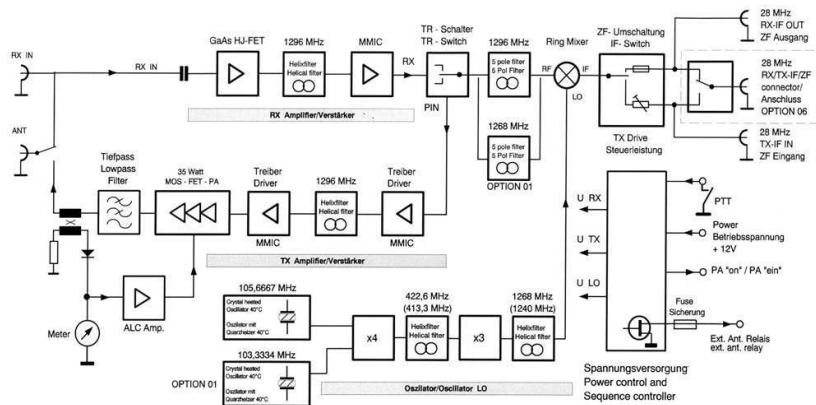


Specifications

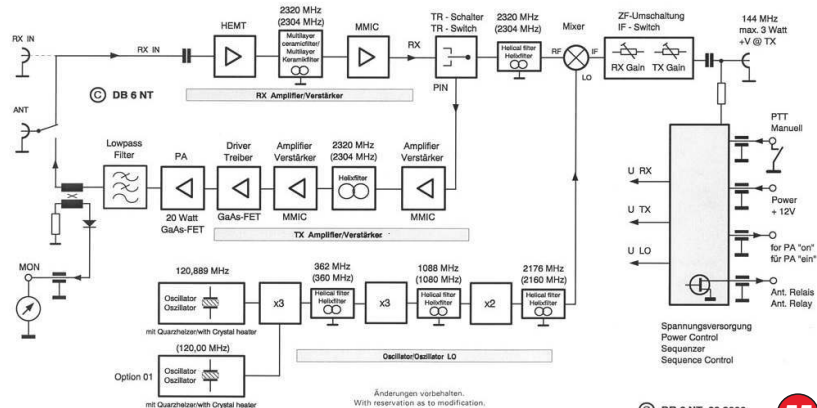
Type	TR 2320 H - 2320	TR 2320 H - 2304	TR 2320 H - 2400
SHF-frequency range	2320...2322 MHz (Standard)	2304...2306 MHz (Standard)	2400...2402 MHz (Standard)
IF-frequency range	144-146 MHz	144-146 MHz	144-146 MHz
IF-Input power	0.5 – 3Watt, adjustable	0.5 – 3Watt, adjustable	0.5 – 3Watt, adjustable
PTT-control	ground to transmit or +12V on the IF-cable at TX	ground to transmit or +12V on the IF-cable at TX	ground to transmit or +12V on the IF-cable at TX
Power output	15 Watt@50 Ohm	15 Watt@50 Ohm	15 Watt@50 Ohm
Operation voltage	13.8 V DC (12-14 V)	13.8 V DC (12-14 V)	13.8 V DC (12-14 V)
Current consumption	typ. 6 A (TX)	typ. 6 A (TX)	typ. 6 A (TX)
RX gain	> 20 dB	> 20 dB	> 20 dB
Noise figure @ 18 °C	typ. 1.5 dB	typ. 1.5 dB	typ. 1.5 dB
Dimensions mm	270 x 260 x 80	270 x 260 x 80	270 x 260 x 80
Case	Aluminium	Aluminium	Aluminium
Coaxial connector IF	BNC-female	BNC-female	BNC-female
Coaxial connectors UHF	N-female	N-female	N-female
Operation voltage and control connector	SUB-D 9-pole	SUB-D 9-pole	SUB-D 9-pole
Possible Options	Opt.01:Band1 2304...2306 MHz	No additional options possible.	No additional options possible.

Transverter blockdiagram TR 1296 H - TR 2320 H

TR 1296 H - 28 Transverter Blockdiagram/blockdiagram



TR 2320 H - 2320 Transverter Blockdiagram/blockdiagram



Änderungen vorbehalten.
With reservation as to modification.

Transverter for the 23 cm band

MKU 13 G2

This 23 cm transverter was developed employing advanced components. Despite its small size it exhibits excellent performance. It was possible to design the circuit in a 50-Ohm SMD technique using MMIC's, a helical filter and a ring mixer. This module is suitable for building a small portable station or to be part of a powerful home station. The circuit is a further development of MKU 13 G Transverter.

- German silver case, compact construction
- Built-in transmit / receive IF switch
- Built-in 3 Watt IF - attenuator for direct operation with a 2 m transceiver
- Control output for further stages
monitoring output

Specifications

Type	MKU 13 G2
Frequency range	1296...1298 MHz amateur radio band
IF-Frequency range	144...146 MHz
2 m IF input power	max. 3 W can be tuned
RX-Gain	min. 20 dB can be tuned
Noise figure @ 18 °C	max. 0.8 dB NF
TX-Output power	> 1,5 W HF
Operating voltage	+12...14 V DC approx 1 A @ TX
Dimensions mm	30 x 60 x 75 without heatsink
Coaxial connectors	SMA-female / 50 ohms

Transverter with 28...30 MHz IF = MKU 13 G2-28
External filter necessary

**KIT
AVAILABLE!**
KIT 1,3 GHz 13 G2

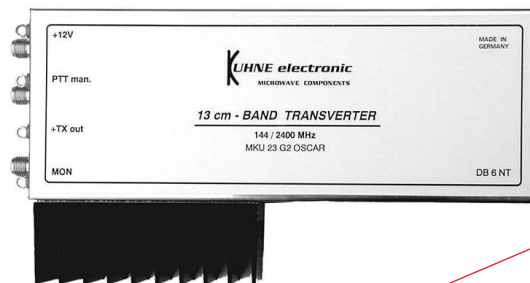


Transverter for the 13 cm band

MKU 23 G2

This 13-cm transverter was developed employing advanced components. Despite its small size it exhibits excellent performance. It was possible to design the circuit in a 50-Ohm SMD technique using MMIC's, a helical filter and a ring mixer. This module is suitable for building a small portable station or to be part of a powerful home station. The circuit is a further development of the MKU 23 G Transverter.

- German silver case, compact construction
- Built-in transmit / receive IF switch
- Built-in 3 Watt IF - attenuator for direct operation with a 2 m transceiver
- DC output for control antenna relays and power amplifiers

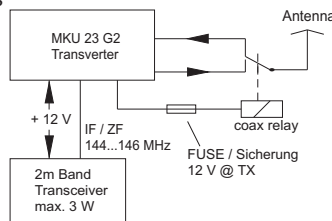


Specifications

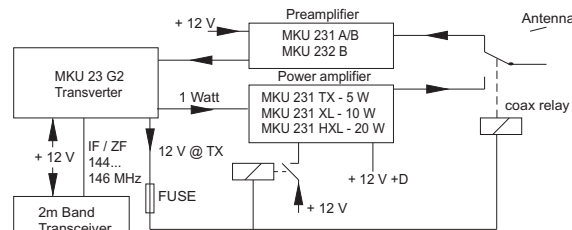
Type
Frequency range
2 m IF input power
RX-Gain
Noise figure @ 18 °C
TX-output power
Supply voltage
Coaxial connectors
Weight

MKU 23 G2
 IF 144...146 MHz - RF 2320...2322 MHz amateur radio band
 IF 144...146 MHz - RF 2304...2306 MHz option USA
 IF 144...146 MHz - RF 2400...2402 MHz option OSCAR
 max. 3 Watt adjustable
 min. 20 dB adjustable
 max. 0.8 dB
 min. 1 Watt RF
 +12...14V DC 0.6 A at TX
 30 x 60 x 150 mm without heatsink
 SMA-female / 50 ohms
 typ. 280 g

The modules with a coax relays can be built-in a waterproof case for mounting on a tower. Because of that the loss of the long coax cable will be avoid.



13 cm Transverter with pre- and power amplifier



The component can be attached along with the coaxial relay in a weather-proof case direct at the antenna. This reduces cable losses.

KIT AVAILABLE!
 KIT 2,3 GHz 23 G2

Transverter for the 9 cm band

Model MKU 34 G2 - MKU 34 G2 432

Two 9 cm Transverters were developed using of modern components, with outstanding technical specifications despite their small mechanical dimensions. The circuits are implemented using MMICs, Helical-filters and ring mixers in SMD. The Transverter-version with 144 MHz IF uses silver tuned high Q cavity resonators for selection. With the version with 432 MHz IF a multipolar stripline filter is used. These modules are suitable for the setting up of a small portable station as well as a basic transverter for a high performance home station. With the power amplifier MKU 341 A the power can be increased to 4 Watts and with MKU 342 XL to 15 Watts RF Power.

- German silver case, compact construction
- Built-in transmit / receive IF switch
- Built-in 3 Watt IF - attenuator for direct operation with a 2 m transceiver
- Control output for further stages
- Monitoring output

**KIT
AVAILABLE!**
KIT 3,4 GHz 34 G2



Specifications

Type	MKU 34 G2
Frequency range RF	3400 - 3402 MHz
Option USA	3456 - 3458 MHz
Frequency range IF	144 - 146 MHz
2 m IF input power	max. 3 Watt adjustable
RX - Gain	min. 20 dB adjustable
Noise figure @ 18 °C	max. 0.9 dB NF
TX - Output power	min. 0.2 Watt RF
Supply voltage	+12...14 V DC <0.4 A @ TX
Dimensions mm	35 x 60 x 150
Coaxial connectors	SMA-female / 50 ohms
Case	German silver case

Specifications

Type	MKU 34 G2 432
Frequency range RF	3400 - 3402 MHz
Option USA	3456 - 3458 MHz
Frequency range IF	432 - 434 MHz
70 cm IF input power	max. 3 Watt adjustable
RX - Gain	min. 20 dB adjustable
Noise figure @ 18 °C	max. 0.9 dB NF
TX - Output power	min. 0.2 Watt RF
Supply voltage	+12...14 V DC <0.4 A @ TX
Dimensions mm	35 x 60 x 150
Coaxial connectors	SMA-female / 50 ohms
Case	German silver case

The 5.7 GHz transverter

The 3rd generation - Model MKU 57 G2

This transverter with its outstanding specifications is the result of circuit design using state of the art components. The module is useful for a high performance EME-station, but due to its small mechanical dimensions, may also be used for portable operation.



KIT
AVAILABLE!
KIT 5,7 GHz 57 G2

Specifications

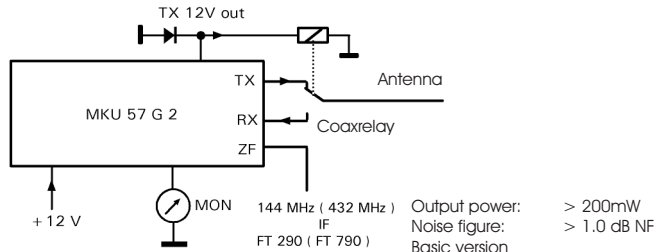
Type	MKU 57 G2
Frequency range RF	5760 - 5762 MHz amateur radio band
Frequency range IF	144 - 146 MHz (432...434 MHz)
IF-Input power	max. 3 Watt adjustable
RX-Gain	>20 dB adjustable
Noise figure @ 18 °C	typ. 1 dB NF
TX-Output power	min. 200 mW RF
Spurious frequency suppression	min. 40 dB typ. 50 dB
Harmonic suppression	typ. 30 dB
OCXO can be coupled in	117 MHz@144 MHz / 111 MHz@432 MHz / 1 mW
PTT input	via IF-cable or contact to ground
12 V - output	for antenna relay and PA, max. 0.6 A
Supply voltage	+12...14 V DC typ. 350 mA/TX
Case	German silver case
Dimensions mm	33 x 60 x 150 without connectors
Coaxial connectors	SMA-female / 50 ohms
Weight	typ. 220 g

Option 01: No built-in oscillator.
SMA connector for the input of an external OCXO.

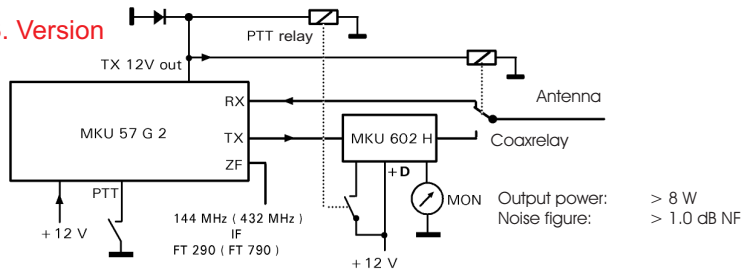
MKU 57 G2 KIT

MKU 57 G2 KIT option 01 for extern. OCXO

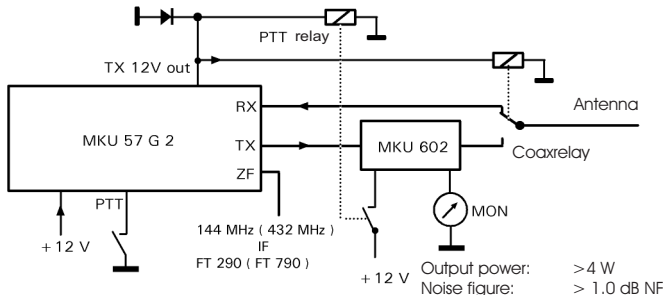
1. Version



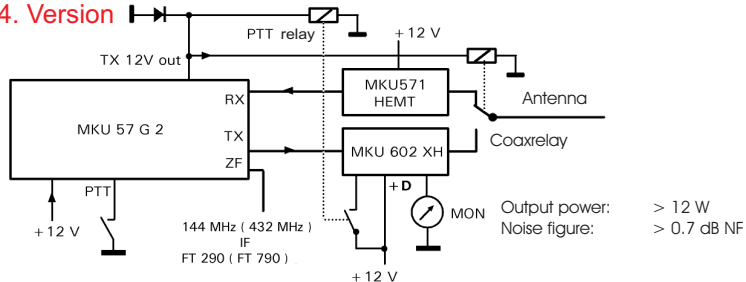
3. Version



2. Version



4. Version

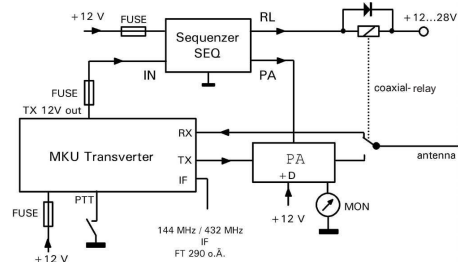
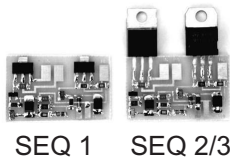


Sequence controllers

Many coaxial relays have too low isolation between the ports while being switched. This may lead to destruction of the input transistor in the converter or preamplifier. They relay should have an isolation of more than 50 dB. The input power to the receive input port must not exceed 1 mW.

The use of a sequence controller is strongly recommended!

SEQ 1 max. 1 A Power
SEQ 2 max. 4 A Power
SEQ 3 max. 18 A Power



The 10 GHz transverter

The 3rd generation - Model MKU 10 G2

This transverter with its outstanding specifications is the result of circuit design using state of the art components. The module is useful for a high performance EME-station, but due to its small mechanical dimensions, may also be used for portable operations.



Option 01: No built-in oscillator. SMA connector for the input of an external OCXO requires 106.5 MHz / 1 mW

Option JA: Export version for Japan 10450...10452 MHz 432...434 MHz IF

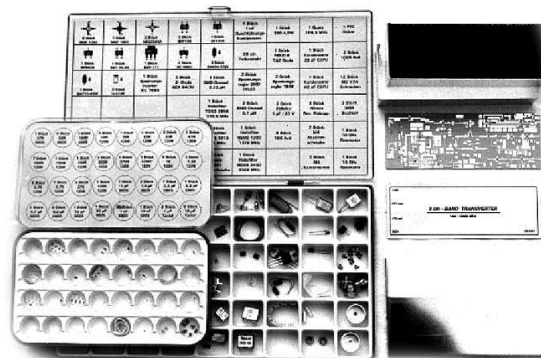
**KIT
AVAILABLE!
KIT 10 GHz 10 G2**

Rainscatter Contest EME Tropo BBT

- Noise figure typ. 1.2 dB
- Output power >200 mW
- 144 MHz IF --- 10368 MHz SHF (432 MHz IF available)
- Built-in IF and DC switch
- Selectivity achieved by helical filters, high Q resonators and microstrip filters
- individual adjustment of RX- and TX-gain
- Provision for coupling an external OCXO
- Switched output voltage for external PA and antenna relays
- Directional coupler with detector for monitoring the output power
- Ceramic printed circuit board
- German silver case for ready made module
- All components integrated within one module.
- Dimensions only 150 x 55 x 30 mm!

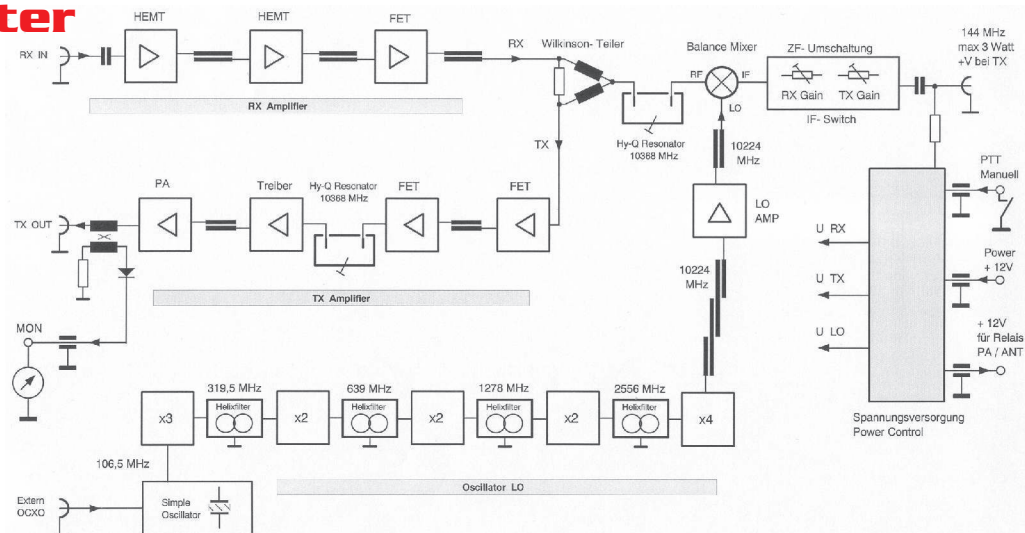
MKU 10 G2 KIT

MKU 10 G2 KIT option 01 for extern. OCXO



10 GHz Transverter

MKU 10 G2
10368 / 144 MHz



Specifications

Type
Frequency range RF
Frequency range IF
2 m Input power
RX-Gain
Noise figure
TX-Output power
Spurious frequency suppression
Harmonic wave suppression
OCXO can be coupled in
PTT input
12 V - output
Monitor output
Supply voltage
Dimensions in mm
Coaxial connectors
Weight

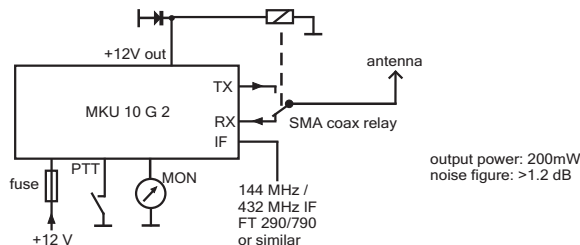
MKU 10 G2
10368...10370 MHz amateur radio band
144...146 MHz (432...434 MHz)
max. 4 W - can be tuned
typ. 20 dB - can be tuned
typ. 1.2 dB NF
min. 200 mW HF
min. 40 dB, typ. 50 dB
typ. 30 dB
106.5 MHz / 1 mW
via IF-cable or contact to ground
for antenna relay and PA, max. 0.6 A
output power monitoring approx. +1.2 V out.
+12...14 V DC typ. 350 mA/TX
30 x 60 x 150
SMA-female / 50 ohms
typ. 220 g



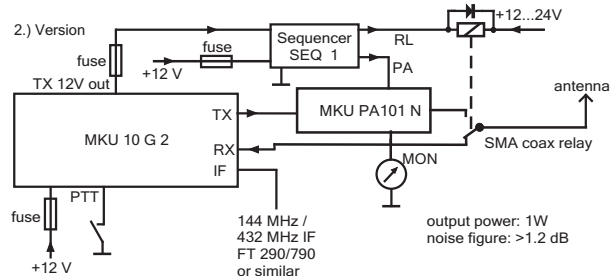
All Transverters available in milled aluminium case:
Option "professional"

10 GHz transverter versions

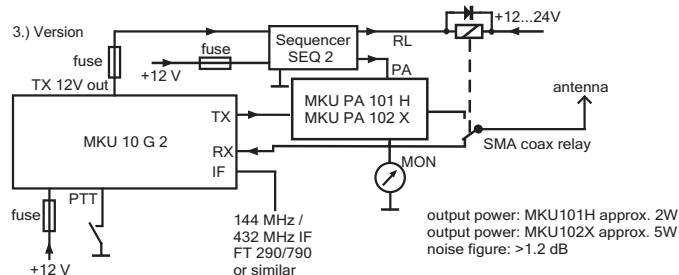
1.) basic version



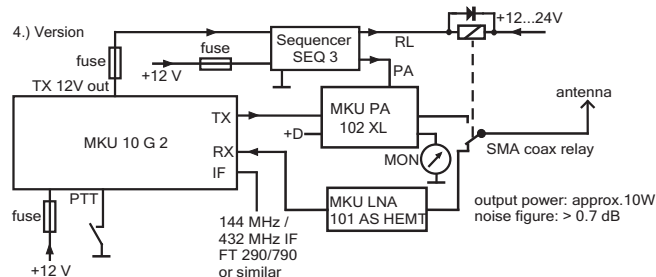
2.) Version



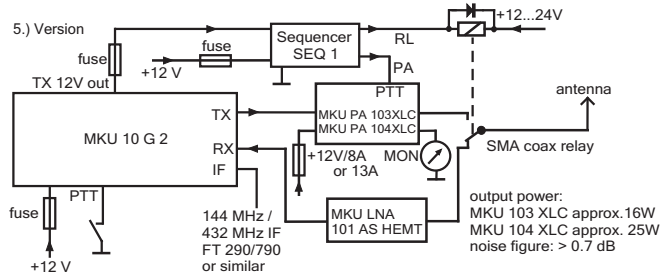
3.) Version



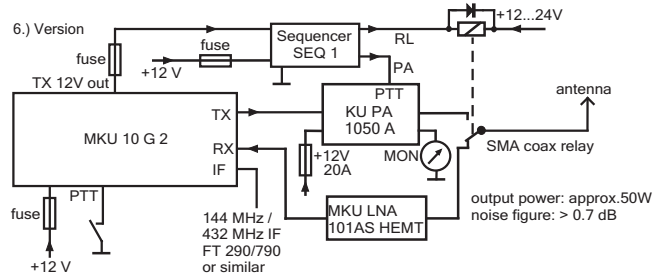
4.) Version



5.) Version



6.) Version



24 GHz transverter

MKU 24 GA Waveguide

MKU 24 GC Coaxial cable

MKU 24 RXO

- Built-in wide band IF-amplifier 50...500 MHz
- Built-in IF transmit / receive switch
- Built-in 2 watt IF - attenuator for direct operation with a 2 m transceiver

**KIT
AVAILABLE!**

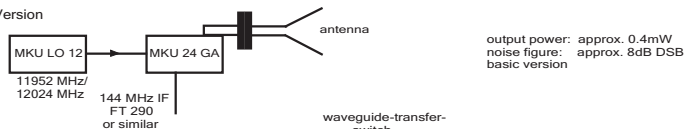


Specifications

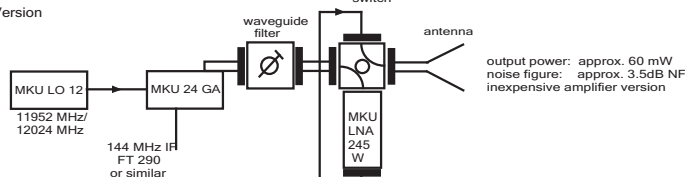
Type	MKU 24 GA	MKU 24 GC	MKU 24 RXO
Frequency range	24.0-24.25 GHz amateur radio band	24.0-24.25 GHz amateur radio band	24.0-24.25 GHz amateur radio band
Oscillator input	11952 MHz / 12024 MHz (144MHz IF)	11952 MHz / 12024 MHz (144MHz IF)	11952 MHz / 12024 MHz (144MHz IF)
LO power	25....50 mW	25....50 mW	25....50 mW
2 m input power	max. 2 Watt	max. 2 Watt	-
RX-Gain	typ. 13 dB (144 MHz IF)	typ. 13 dB (144 MHz IF)	min. 13 dB (144 MHz IF)
Noise figure	typ. 8 dB DSB (144 MHz IF)	typ. 8 dB DSB (144 MHz IF)	typ. 8 dB DSB (144 MHz IF)
TX-output power	typ. 0.2 mW SSB (144 MHz IF)	typ. 0.2 mW SSB (144 MHz IF)	-
Current consumption	typ. 30 mA	typ. 30 mA	typ. 10 mA
Supply voltage	+12...14 V DC	+12...14 V DC	+12...14 V DC
Dimensions	30 x 60 x 20 mm without connectors	30 x 60 x 20 mm without connectors	30 x 60 x 20 mm without connectors
Weight	typ. 90 g	typ. 90 g	typ. 90 g
Case	milled aluminium	milled aluminium	milled aluminium
24 GHz connector	waveguide R 220 / WG20 / WR42	SMA-female	waveguide R220 / WG20 / WR42
IF connector	SMC / 50 ohms	SMC / 50 ohms	SMC / 50 ohms
LO input	SMA-female / 50 ohms	SMA-female / 50 ohms	SMA-female / 50 ohms

24 GHz transverter versions

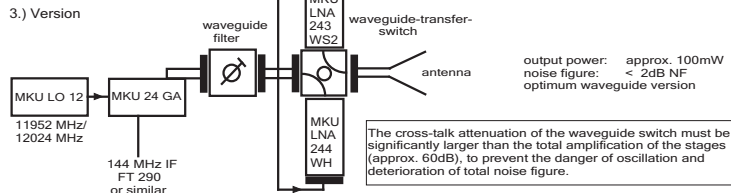
1.) Version



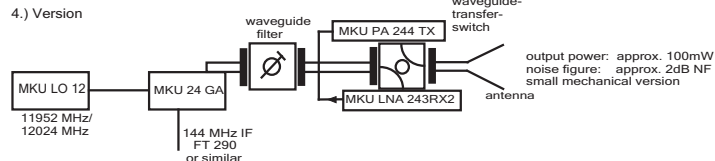
2.) Version



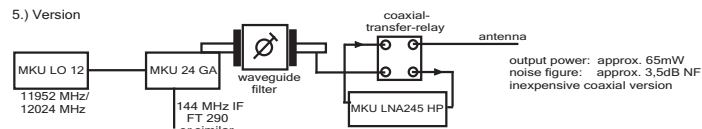
3.) Version



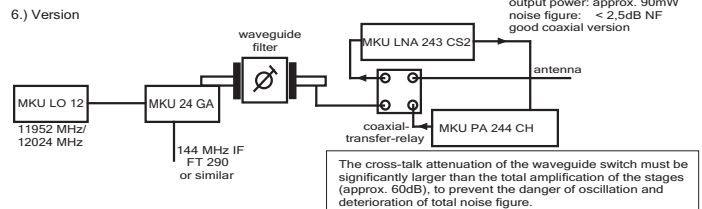
4.) Version



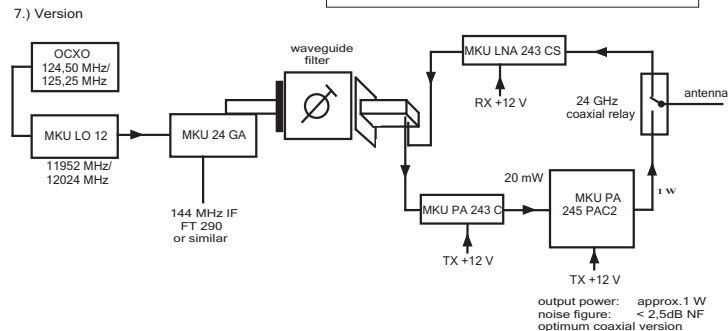
5.) Version



6.) Version



7.) Version



47 GHz transverter

Model MKU 47 G

- Milled aluminium case
- Built-in wide band IF - amplifier 50...435 MHz
- Built-in IF transmit / receive switch
- Built-in 4 Watt IF - attenuator for direct operation to a 2 m transceiver
- Control output for further stages

PROCOM waveguide flange
available



Specifications

Type

Frequency range

Oscillator input

2 m IF input power

RX-Gain

Noise figure

TX-Output power

Current consumption

Supply voltage

Dimensions mm

Weight

Coaxial connectors

Waveguide

MKU 47 G

47088 MHz amateur radio band

11736 MHz 20...40 mW (144 MHz IF)

max. 3 W

typ. 15 dB (144 MHz IF)

typ. 8 dB DSB (144 MHz IF)

typ. 0.15 mW SSB (144 MHz IF)

typ. 100 mA

+12...14 V DC

30 x 90 x 31 without connectors

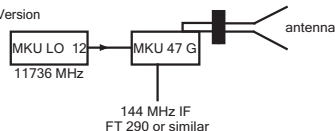
typ. 140 g

SMA-female for LO; SMC for IF; 50 ohms

WR19 / R500 / WG24

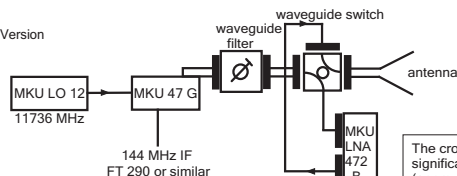
47 GHz transverter versions

1.) Version



output power: typ. 150μW
noise figure: typ. 8dB DSB
basic version

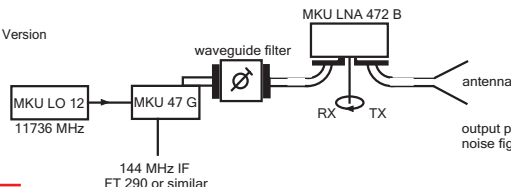
2.) Version



output power: typ. 20mW
noise figure: typ. 5 dB

The cross-talk attenuation of the waveguide switch must be significantly larger than the total amplification of the stages (approx. 60dB), to prevent the danger of oscillation and deterioration of the total noise figure.

3.) Version



output power: typ. 20mW
noise figure: typ. 5 dB



Ku-Band Oscillator K-Band Oscillator

MKU LO 12 - MKU LO 13 - MKU LO 24 - MKU LO 95

- German silver case, compact construction
- Clean output signal by using helical filters and microstrip resonators
- High frequency stability provided by a compensated crystal oscillator
- External OCXO input is possible



Specifications

Type	MKU LO 12	MKU LO 13	MKU LO 24	MKU LO 95
Output frequency	11952 MHz (24 GHz/OSCAR) 12024 MHz (24 GHz) 11736 MHz (47 GHz)	13567 MHz (für 122 GHz Transverter)	24048.9 MHz (für Baken) 24192.9 MHz (für Baken)	9486 MHz (für 76 GHz Transverter)
Input frequency		141,3263 MHz 1 mW / 0 dBm		
Output power	min. 35 mW	min. 20 mW	min. 5 mW	min. 35 mW
Supply voltage	12...14 V DC	12...14 V DC	12...14 V DC	12...14 V DC
Current consumption	typ. 250 mA	typ. 250 mA	typ. 280 mA	typ. 250 mA
Case	German silver	German silver	German silver	German silver
Input connector	SMA-female	SMA-female	SMA-female	SMA-female
Output connector	SMA-female	SMA-female	SMA-female	SMA-female
Dimensions in mm	111 x 55 x 30	111 x 55 x 30	111 x 55 x 30	111 x 55 x 30
Option 01	No built-in oscillator. Instead a SMA-connector for the input of an external OCXO			
Option 02	Aluminium case			

Crystal Oscillator MKU XO 2 OSC

The MKU 2 OSC is a switch-selectable dual crystal oscillator for operating with a 2.3 GHz transverter on 2304 and 2320 MHz. The crystals are stabilized on 40.8°C with a precision crystal heater.

- German silver case, compact construction
- Dual crystal oscillator
- High frequency stability provided by a compensated crystal oscillator



Specifications

Type	MKU XO 2 OSC
Output frequency	Band 1: 120.000 MHz Band 2: 120.889 MHz
Output power	typ. 1 mW
Phase noise	max. -156 dBc@10 kHz
Frequency stability	typ. 1 ppm 0...40°C
Operating voltage	+ 12 ... 14 V DC
Current consumption	180/100 mA
Dimensions mm	74 x 55 x 30
Case	German Silver
Coaxial connector	SMA - female

Versions for other frequencies on request!

Low pass filter with directional coupler and detector

MKU LPF 13 for 1,3 GHz

MKU LPF 23 for 2,3 GHz

- Stripline 5 pole low pass filter for harmonic suppression
- Integrated directional coupler with detector for monitoring the output power of transmitters
- Available with N- or SMA-connectors.



Specifications

Type

Frequency range

Maximum power

Loss typ.

Dimensions mm

Weight approx

Connectors

MKU LPF 13

1240...1300 MHz

40 W

0.25 dB

75 x 30 x 38 without connectors

70 g

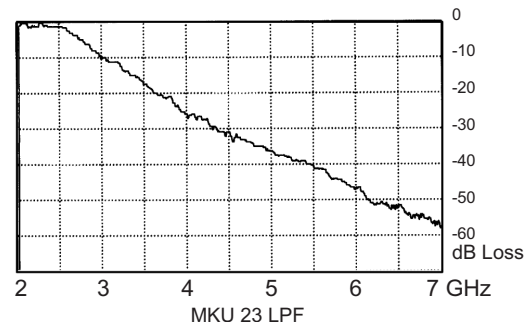
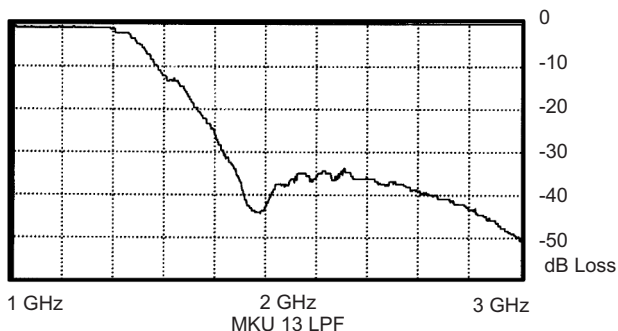
N- or SMA-female, please specify

MKU LPF 23

2300...2450 MHz amateur radio band

40 W

0.4 dB



Beacon-transmitters

Model MKU 13 BAKE	23 cm Band
MKU 23 BAKE	13 cm Band
MKU 34 BAKE	9 cm Band
MKU 56 BAKE	6 cm Band
MKU 10 BAKE	3 cm Band
MKU LO 24	1.2 cm Band

- German Silver case, compact construction
- Clean output signal by using helical filters and microstrip resonators
- High frequency stability provided by a compensated crystal oscillator
- External OCXO input is possible
- Input for F1 keying
- On request beacons in milled aluminium case available



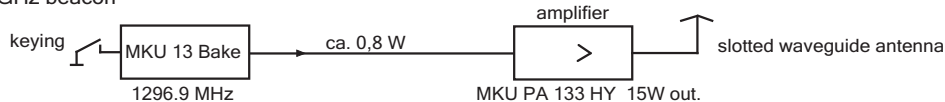
Specifications

Type	MKU	13 BAKE	23 BAKE	34 BAKE	57 BAKE	10 BAKE	LO 24
Center f. +/-		1296.9 MHz	2320.9 MHz	3400.9 MHz	5760.9 MHz	10368.9 MHz	24192.9 MHz 24048.9 MHz
Output typ.		0,8 W	1 W	200 mW	200 mW	200 mW	5 mW
Current typ.		500 mA	500 mA	300 mA	360 mA	280 mA	280 mA
A1 Keying		yes	yes	yes	no	no	no
F1 Keying		yes	yes	yes	yes	yes	yes
Supply voltage		+12...14 V DC					
Dimensions mm		111 x 55 x 30 without connectors. MKU 13 BAKE 30 x 56 x 74					
Weight		approx. 160g					
Coaxial connector		SMA-female / 50 ohms					
Option 01		No built-in oscillator. Instead a SMA-connector for input of an external OCXO					

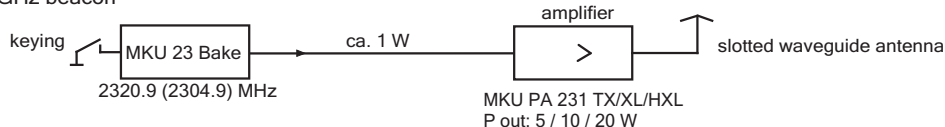
Versions for other frequencies on request!

Beacon transmitter

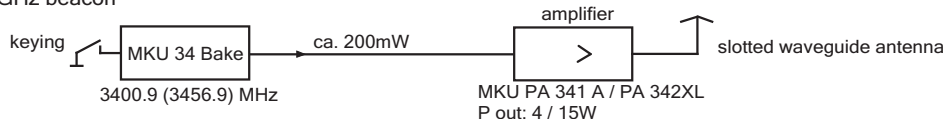
1.3 GHz beacon



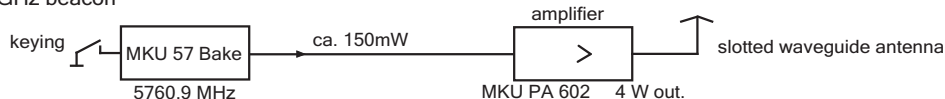
2.3 GHz beacon



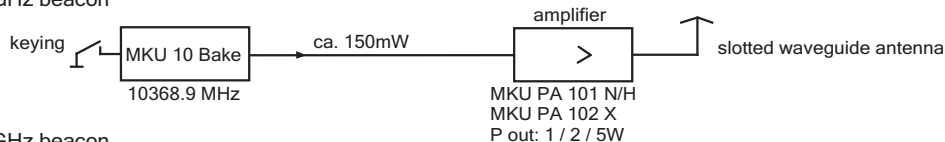
3.4 GHz beacon



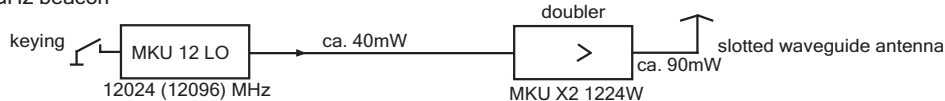
5.7 GHz beacon



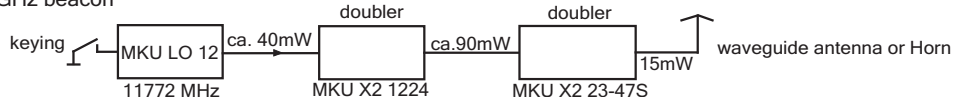
10 GHz beacon



24 GHz beacon



47 GHz beacon



Super low noise converters

- Low noise converters for converting the UHF - SHF amateur radio bands to the 2 m / 70 cm IF range
- Low noise figure and high gain
- Use of the most advanced GaAs HEMT FETs
- Ceramic printed circuit board

MKU LNC 24 OSCAR 2

- Includes 1268 MHz notch for L-Band uplink rejection



MKU LNC 24 TM OSCAR2 in a waterproof case for mounting on a tower.

Specifications

Type MKU LNC	13 CON 28	13 CON 144	14 CON	15 CON	17 CON	17 CON2	2030 A	23 CON	24 OSCAR2	57 CON
Frequency ranges MHz	1296...1298	1296... 1298	1400 +/-	1550 +/-	1695 +/-	1695...1710	2000.5...3000	2320...2322	2400...2402	5760...5762
Oscillator frequency	-	-	-	-	-	-	2000.0 MHz	-	-	-
Noise figure @ 18 °C	typ. 0.6 dB	typ. 0.6 dB	typ. 0.6 dB	typ. 0.7 dB	typ. 0.7 dB	typ. 0.7 dB	typ. 2.5 dB	typ. 0.7 dB	typ. 0.7 dB	max. 1 dB
Gain	min. 20 dB	min. 20 dB	min. 20 dB	min. 20 dB	min. 20 dB	min. 60 dB	min. 30 dB	min. 26 dB	min. 30 dB	min. 20 dB
IF Frequency MHz	28...30	144...146	VHF	VHF	138...153	138...153	0,5...1000	144...146	144...146	432...434
Option 70								432...434	432...434	
Current consumption	cir. 100 mA	cir. 100 mA	cir. 100 mA	cir. 100 mA	cir. 250 mA	cir. 100 mA	cir. 130 mA	cir. 130 mA	cir. 130 mA	cir. 220 mA
Voltage supply via bias tee possible	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Dimensions mm	30 x 56 x 74	30 x 56 x 74	30 x 56 x 74	30 x 56 x 74	30 x 56 x 74	111 x 55 x 30	30 x 56 x 74	30 x 56 x 74	30 x 56 x 74	111 x 55 x 30
Case	German silver	German silver	German silver	German silver	German silver	German silver	German silver	German silver	German silver	German silver
Connector in	SMA-female	SMA-female	SMA-female	N-female	SMA-female	SMA-male	SMA-female	N-female	N-female	SMA-female
Connector out	BNC-female	BNC-female	BNC-female	N-female	BNC-female	N-female	BNC-female	N-female	N-female	BNC-female
Supply voltage	+12...15 V		14 CON2							
RF Input	50 Ohm		Gain 60 dB							
IF Output	50 Ohm									

Bias tee type MKU BT 270 N or SMA

At MKU LNC 14 CON and MKU LNC 15 CON IF specify frequency please

Versions for other frequencies on request.

Super Low Noise X-Band Converter

MKU LNC 10 CON - MKU LNC 10 OSCAR

- Low noise converter for converting the UHF - SHF amateur radio bands to the 2 m / 70 cm IF range
- Low noise figure and high gain
- Use of the most advanced GaAs HEMT FETs
- Ceramic printed circuit board
- Including 1268 MHz notch for L-Band uplink rejection

Specifications

Type	MKU 10 CON	MKU 10 OSCAR
Frequency range	10368...10370 MHz	10451...10453 MHz
Gain NF	typ. 1.2 dB	typ. 1.2 dB
Gain	typ. 20 dB	typ. 20 dB
IF frequency	432...434 MHz	432...434 MHz
Current consumption	typ. 220 mA	typ. 220 mA
Dimensions mm	30 x 56 x 74	30 x 56 x 74
Case	German silver case	German silver case
Input connector	SMA-female	SMA-female
Output connector	N-female	N-female

KU LNC 8084 A

- Super low noise preamplifier for KU LNA 8000 A
- Deep space communication converter
- Low noise figure and high gain
- Use of the most advanced GaAs HEMT FETs
- Ceramic printed circuit board

KU LNC 3436 A - KU LNC 6772 A

These converters are designed for digital applications like DVB-S, DVB-T, WiMAX and MMDS. Due to the use of the latest semiconductor technologies, band pass filters and a low noise VCO, the converters provide a high dynamic range and low phase noise. The converter can be used for all digital modulation types.

Specifications

Type	KU LNC 8084 A	
Center frequency	8420 MHz	
Bandwidth	typ. 300 MHz	
LO frequency	7150 MHz	
IF center frequency	1270 MHz	
Gain	min. 25 dB	typ. 30 dB
Noise figure @ 18 °C	max. 1.4 dB	typ. 1.2 dB
Supply voltage	+ 12 ... 14 V DC	
Voltage supply via bias tee possible	yes	
DC current	typ. 100 mA	
Dimensions mm	30 x 56 x 74	
Case	German silver	
RF connector	SMA-female	
IF connector	N-female	

Specifications

Type	KU LNC 3436 A		KU LNC 6772 A	
Input frequency	3400...3560 MHz (3600 MHz*)		6700...7200 MHz	
IF-frequency	400...560 MHz (600 MHz*)		300...800 MHz	
LO frequency stability	+/- 20 kHz (0...40 °C)		+/- 40 kHz (0...40 °C)	
Gain	typ. 44 dB		min. 40 dB	
Noise figure @ 18 °C	typ. 1.0 dB		typ. 1.5 dB; max. 2.0 dB	
LO frequency @ 18 °C	3000 MHz +/- 10 kHz		6400 MHz +/- 20 kHz	
Supply voltage	+9...18 V DC		+9...18 V DC	
Current consumption	typ. 180 mA		typ. 160 mA	
Input connector	N-female / 50 ohms		SMA-female / 50 ohms	
Output connector	N-female / 50 ohms		SMA-female / 50 ohms	
Dimensions in mm	74 x 56 x 30		74 x 56 x 30	
Case	waaterproof milled aluminium case		waaterproof milled aluminium case	

* -6 dB Gain max.

Super low noise ATV - converters

KU LNC 23 - KU LNC 23-3 - KU LNC 25

KU LNC 2227 A - MKU LNC 34 - MKU LNC 57

MKU LNC 57-2

- Low noise converters for conversion of the 2.3 / 3.4 and 5.7 GHz Amateur radio bands to the SAT receiver range 1.3....1.8 GHz
- Unrestricted suitable for DATV
- Use of the most advanced GaAs - HEMT - FET's
- Build-in bias "T". For power feed up the coaxial cable
- MKU LNC 23

Includes a notch filter for the 23 cm Band for cross band operation. It was possible by using 2 "Multilayered Ceramic Bandfilters" for optimum rejection at 2.3 GHz, as well as Schottky-diode-mixer and SAW resonator to give high frequency stability of +/- 20 kHz and high dynamic range. The phase noise of the SAW-oscillator is better than -115 dBc/Hz @ 10 kHz

- The converter in the 2.5 GHz range is suitable for all high linearity modulation types like DATV DVB-S DVB-T MMDS etc. The converter KU LNC 2227 A was developed for MMDS-applications and converts the signal in the UHF-range 367-867 MHz. This converter is also available in a PRO-Version with waterproof aluminium case.



KU LNC 23 TM
KU LNC 23-3 TM
MKU LNC 25 TM
MKU LNC 34 TM
MKU LNC 57 TM
Built-in a waterproof case for mounting on a tower.



Specifications

Type	KU LNC 23	KU LNC 23-3	KU LNC 25	KU LNC 2227 A	MKU LNC 34	MKU LNC 57	MKU LNC 57-2
Frequency range	2320...2450 MHz	2100...2600 MHz	2350...2550 MHz	2200...2700 MHz	3400...3475 MHz	5650...5850 MHz	5650...5850 MHz
LO-Frequency	916.5 MHz SAW	916.5 MHz SAW	916.5 MHz SAW	1833 MHz SAW	1833 MHz SAW	typ. 7.3 GHz DRO	typ. 7.3 GHz DRO
IF-Frequency	1404...1534 MHz	1184...1684 MHz	1434...1634 MHz	367...867 MHz	1563...1638 MHz	1450...1650 MHz	1450...1650 MHz
Frequency stability	+/- 20 kHz	+/- 20 kHz	+/- 20 kHz	+/- 20 kHz	+/- 40 kHz	typ. 40 kHz/°C	typ. 40 kHz/°C
Gain	typ. 40 dB	typ. 40 dB	typ. 40 dB	typ. 30 dB	typ. 38 dB	typ. 50 dB	min. 40 dB
Noise figure	typ. 0.7 dB	typ. 1.0 dB	typ. 0.7 dB	typ. 1.0 dB	typ. 0.9 dB	max. 1.0 dB	max. 1.0 dB
Current consum.	ca. 70 mA	ca. 130 mA	ca. 70 mA	ca. 270 mA	ca. 100 mA	ca. 150 mA	ca. 100 mA
Operation voltage	+9...18 V	+9...18 V	+9...18 V	+9...18 V	+9...18 V	+9...18 V	+9...18 V
Dimensions mm	30 x 56 x 74	30 x 56 x 74	30 x 56 x 74	ca. 100 g	ca. 100 g	ca. 120 g	ca. 120 g
RF-In-connector	N-female	N-female	N-female	N-female	N-female	SMA-female	N-female
IF-Out-connector	F-female	F-female	F-female	F-female	F-female	F-female	F-female

Supply via Sat-receiver via the IF-cable

Versions for other frequencies on request.

ATV - converter for 24 GHz

MKU LNC 24 A

- Low noise converter for conversion of the 24 GHz amateur radio band to the SAT receiver range 1...1.25 GHz
- Low noise figure and high gain
- Use of the most advanced GaAs - HEMT - FET's
- Waveguide input for the direct installation at the antenna
Built-in bias-T for power feed up the coax cable



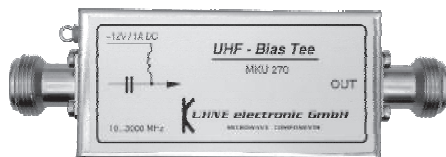
Specifications

Type	MKU LNC 24 A
Frequency range	24...24.25 GHz amateur radio band
LO - Frequency	23 GHz (SHM 11.5 GHz)
Gain	min. 45 dB
Noise figure @ 18 °C	max. 2.5 dB
Current consumption	< 150 mA
Operating voltage	+12...18 V supply via SAT- Receiver over the IF- cable
Dimensions mm	128 x 22 x 35 without connector
Weight	approx. 160 g
Waveguide-input	R 220 / WR 42 / WG 20
IF - output	F-connector / 75 ohms
Case	milled aluminium

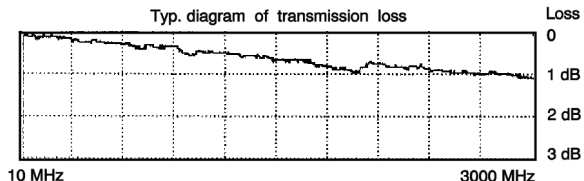
Voltage supply for preamplifier and converters facilitated via the coax cable by remote controlled switch. Built-in 1 Amp miniature fuse as well as protection against overvoltage and wrong polarity.

Bias tee

MKU BT 270



Typ. diagram of transmission loss



Specifications

Type	MKU BT 270
Frequency range	10...3000 MHz
Insert loss	typ. 0.1 dB / 145 MHz
DC	0...15 V. max.: 1 A
Dimensions mm	30 x 38 x 120
Case	German silver
Weight	typ. 100 g
Module with N-connector MKU BT 270 N	
Module with BNC-connector MKU BT 270 BNC	

Versions for other frequencies on request

24 GHz ATV

ATV Oscillator for 12 GHz

MKU ATV 12

- Small size
- Milled aluminium case, professional construction
- Direct base-band video input
- Frequency adjustment with tuning screw
- For application on 24 GHz ATV with frequency doubler MKU X2 1224

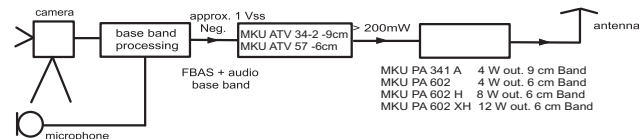


Specifications

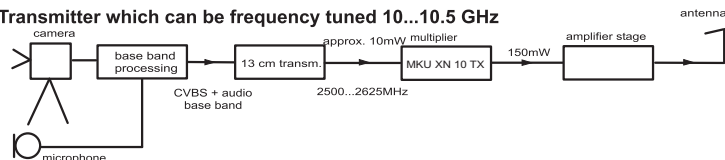
Type	MKU ATV 12
Frequency range	12 - 12.125 GHz
Frequency specification is required - adjustment to the desired amateur radio frequency	
Input	CVBS - baseband <1 Vpp
Output	>20 mW
Output connector	SMA-female / 50 ohms
Input connector	SMC-male / 50 ohms
Baseband	max. 20 MHz
Supply voltage	+12...14 V DC
Current consumption	approx. 80 mA
Dimensions mm	67 x 30 x 17
Weight	typ. 40 g
Case	milled aluminium case
Option 01	without CVBS input

ATV - TRANSMITTER

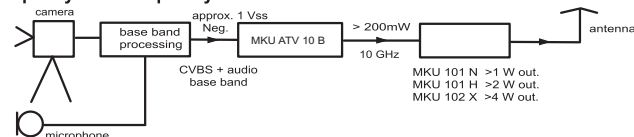
Transmitter which can be frequency tuned 5.650...5850 GHz (3.402...3475)



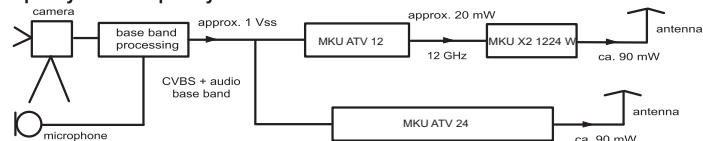
Transmitter which can be frequency tuned 10...10.5 GHz



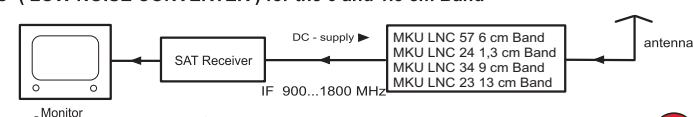
High-quality fixed frequency DRO - Transmitter for the 10 GHz band



High-quality fixed frequency DRO - Transmitter for the 24 GHz band



LNC (LOW NOISE CONVERTER) for the 6 and 1.3 cm Band



Versions for other frequencies on request.

ATV - transmitter for the 9 and 6 cm band

MKU ATV 34-2 - MKU ATV 57

Using these modules together with baseband frequency processing, high performance 3.4 GHz and 5.7 GHz ATV transmitters can be constructed. Using the amplifier MKU PA 341 A the power of the 9 cm transmitter can be increased to more than 4 Watts. For the 6 cm band you can select between different power amplifiers up to 15 Watt. By mounting them directly at the antenna, cable loss can be reduced. You only need the baseband signal and +12 V supply. Tuning is done by a voltage that controls a varicap diode in a coaxial DRO oscillator. An output jack for an external PLL is built-in.



Specifications

Transmitter type	MKU ATV 34-2	MKU ATV 57
Frequency range	3402 - 3475 MHz	5650 - 5850 MHz
Output power typ.	200 mW	200 mW
Current cons. typ.	200 mA	250 mA
Dimensions mm	30 x 37 x 111	30 x 55 x 111
Output for PLL *	1.7 GHz SMC connect.	1.4 GHz SMC connect.
(* only for PLL use)		
Video input	Base band <1Vpp / 75 Ohm. SMC-connector male	
Tuning voltage	+1...12 V	
Supply voltage	+12...14 V DC	
RF - output connector	SMA female / 50 ohms	
Case	German silver case	
SMC-connector for 3.2 mm cable available		

ATV - transmitter modules for 10 GHz

MKU ATV 10 B - MKU ATV 10 H

Using these modules in conjunction with baseband frequency processing, as well as a suitable antenna, high-quality 10 GHz ATV-Transmitter can be constructed. With other power amplifiers there is a increase of the output power of approx. 50 Watts possible.

Using the amplifier MKU PA 341 A the power of the 9 cm transmitter can be increased to more than 4 Watts. For the 6 cm band you can select between different power amplifiers up to 15 Watt. You only need the baseband signal and +12 V supply.

- Small size
- Milled aluminium case
- Direct base-band video input
- Will be adjusted according to frequency specification and optimised for best linearity.
- Can be adjusted by tuning the gold plated precision screw - tuning range +/- 50 MHz



Specifications

Type	MKU ATV 10 B	MKU ATV 10 H
Output power	>200 mW	typ. 1 Watt
Current consumption	typ. 200 mA	typ. 600 mA
Dimensions incl. connectors	20 x 30 x 95 mm	20 x 30 x 117 mm
Weight	approx. 60 g	approx. 100 g
Output connector SMA-female		
Frequency range	10 - 10.5 GHz amateur band - please specificate your frequency!	
Input	Base band max.1 Vpp (invert. neg.)	
Supply connector	SMC-connector	
Supply voltage	+12...14 V DC	
Case	milled aluminium	

SMC-connector for 3.2 mm cable available

Versions for other frequencies on request.

ATV - transmitter for 24 GHz

MKU ATV 24 100 mW

MKU ATV 24-2 300 mW

- Small size
- Milled aluminium case
- Direct base-band input
- Can be adjusted over the entire amateur radio band
- Will be adjusted according to frequency specification and optimised for high linearity
- Built-in directional coupler with detector for monitoring the output power - MON -



Specifications

Output frequency
Frequency range
Output power

24.1 GHz
24 - 24.25 GHz amateur radio band
MKU ATV 24: typ. 100 mW, waveguide R220, WR42
MKU ATV 24-2: typ. 300 mW, waveguide R220, WR42
(SMA-out available on request)
Base band max. 1 V_{pp} (invert. neg.)

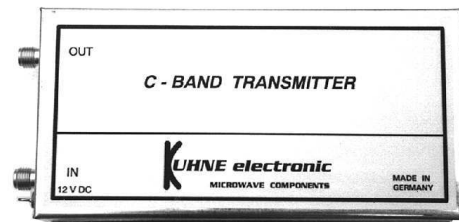
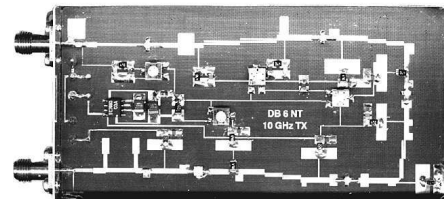
Input
Input connector
Supply voltage
Current consumption
Dimensions mm
Weight

SMC
+12...14 V DC
approx. 300 mA
123 x 30 x 45 incl. heat sink
approx. 220 g

Frequency multiplier

MKU XN 34 TX - MKU XN 57 TX - MKU XN 10 TX

- Wide band frequency multiplier x 3 for generation of 3.4 GHz ATV signal
- Wide band frequency multiplier x 4 for generation of 5.7 or 10 GHz ATV signal
- The use of microstrip band-pass filters ensures the modules can be used over the entire amateur radio band without any fine adjustment
- Modern circuit design with high spurious suppression



Specifications

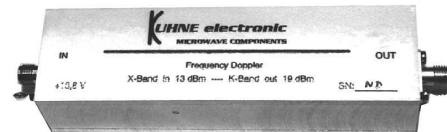
Type	MKU XN 34 TX	MKU XN 57 TX	MKU XN 10 TX
Output frequency	3.4...3.475 GHz	5.65...5.85 GHz	10...10.5 GHz
Input frequency	1.13...1.16 GHz	1.412...1.462 GHz	2.5 - 2.625 GHz
Input power	typ. 20 mW	3...10 mW	3...10 mW
Dimensions mm	30 x 37 x 111	30 x 56 x 111	30 x 56 x 111
Output	>150 mW wide band (200 mW mid-band)		
Supply voltage	+12...15 V DC		
Current consumption	approx. 250 mA		
Weight	approx. 120 g		
Case	German silver case		
Coaxial connectors	SMA-female / 50 ohms		

Frequency multiplier for other frequencies on request

Specifications

24 GHz Frequency doubler

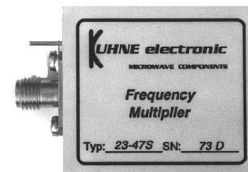
Type	MKU X2 1224	MKU X2 1224 W
Input frequency	12 GHz Band; 20...40 mW	
Output frequency	23.544 / 24.192 GHz / 24.048 / please specify frequency!	
Output	typ. 80...100 mW	
Bandwidth	approx. 300 MHz	
Supply voltage	+11...14 V DC	
Current consumption	typ. 0,4 A	
Dimensions mm	30 x 116 x 24	Opt.W 30 x 116 x 52
Weight	approx. 130 g	Opt.W approx. 250g
Case	milled aluminium	Opt.W incl. heatsink
In- and Output connector	SMA / 50 ohms	
Option W with waveguide output R220/WR42 for ATV or Beacon transmitter		



Specifications

47 GHz Frequency doubler

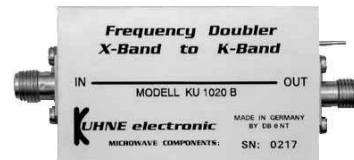
Type	MKU X2 23-47 S
Input frequency	23.544 GHz
Input power	100 mW
Output frequency	47.088 GHz
Output power	typ. >15 mW
Dimensions mm	33 x 30 x 17
Weight	approx. 40 g
Case	milled aluminium
Input connector	SMA-male or female / 50 ohms
Waveguide	47 GHz = WR 19



Specifications

X - K-Band Frequency doubler

Type	KU X2 1020 B
Input frequency	9...11 GHz
Output frequency	18...22 GHz
Input power	-2 dBm; max. +4 dBm
Output power	+4 dBm; typ. +7 dBm
Isolation	>30 dB
Supply voltage	+ 12 V / typ. 50 mA
Dimensions mm	30 x 50 x 17
Case	milled aluminium
Out connector	SMA-female / 50 ohms
In connector	SMA-female / 50 ohms



Transverter-mixer for satellite and DATV communication

MKU UP 13 OTX - MKU UP 24 OTX - MKU UP 57 OTX - MKU UP 10 LTX

These tx-mixers convert the 144 MHz (436 MHz) band to the 1268, 2446 or the 5668 MHz O.S.C.A.R. uplink bands. Employing high "Q" cavity resonators and helical filters as well as state of art circuit design and using ceramic printed circuit board and modern semiconductors, these tx-mixers have outstanding specifications. By connecting a power amplifier the output power can be increased.

- Built-in control circuit with control voltage output for controlling power amplifiers and antenna relays
- Built-in 3 Watt IF-attenuator for direct operation in connection with a 2 m transceiver
- Special Up-converter for other frequencies



Specifications

Type	MKU UP 13 OTX	MKU UP 24 OTX	MKU UP 57 OTX	MKU UP 10 LTX
Frequency range	1268...1270 MHz	2446...2448 MHz	5668....5670 MHz	10...10,5 GHz*
Input frequency	144...146 MHz	144...146 MHz	144...146 MHz	100...500 MHz*
Output power	1 W	> 1 W	> 200 mW	> 200 mW
2m operation power	max. 3 W adjustable	max. 3 W adjustable	max. 3 W adjustable	1...100 mW adjustable
Supply voltage	12...14 V DC	12...14 V DC	12...14 V DC	12...14 V DC
Current consumption	typ. 500 mA	typ. 600 mA	typ. 350 mA	typ. 600 mA
Case	German silver	German silver	German silver	German silver
Input connector	SMA-female / 50 ohms	SMA-female / 50 ohms	SMA-female / 50 ohms	SMA-female / 50 ohms
Output connector	SMA-female / 50 ohms	SMA-female / 50 ohms	SMA-female / 50 ohms	SMA-female / 50 ohms
Dimensions in mm	30 x 56 x 74	30 x 56 x 150	30 x 56 x 150	30 x 56 x 150
DC-TX out	+12 V on TX	max. 3 A	max. 3 A	max. 0,5 A
Monitor out	> +1 V	> +1 V	> +1 V	> +1 V
Weight	typ. 120 g	typ. 310 g	typ. 120 g	typ. 220 g

* Please select frequency

UP-Conveter

KU UP 2527 A - KU UP 3436 A - KU UP 107 A

These device converts the UHF frequency range around up to microwave frequency range. Typical applications are MMDS transmitter as well as DVB-T or DVB-S systems. The up converters includes more pole band pass filter for high spurious rejection. There is no need for additional external filters! The up converters use a high quality VCO with extremely low phase noise and therefore it is suitable for all modulation types. Together with our power amplifier an output power of more than 100 watts CW can be achieved.

- Single DC Supply +12 V
- Over / Reverse Voltage Protection

NEW



Specifications

Type	KU UP 2527 A
Input frequency (IF)	662...862 MHz
Output frequency (RF)	2500...2700 MHz
LO frequency	1838 MHz
LO accuracy @ 18 °C	max. +/- 10 kHz
LO frequency stability (0...40 °C)	max. +/- 20 kHz
IF input power	max. 2 mW
RF output power P1dB	> 100 mW / 20 dBm
RF saturation power	typ. 130 mW / 21 dBm
Image rejection	typ. 60 dB
Gain	typ. 16 dB
Phaise noise	typ. -120 dBc/Hz @ 100 kHz
Supply voltage	+9 ... 14 V DC
Current consumption	typ. 230 mA
Input connector	SMA-Buchse / 50 ohms
Output connector	SMA-Buchse / 50 ohms
Dimensions in mm	30 x 56 x 74
Case	milled aluminium
Weight	typ. 200 g

KU UP 3436 A
400 ... 600 MHz
3400 ... 3600 MHz
3000 MHz
max. +/- 10 kHz
max. +/- 20 kHz
typ. -10 dBm (max. 3 dBm)
> 13 dBm (20 mW)
> 17 dBm (50 mW)
typ. 50 dB
23 dB (+/- 2 dB)
typ. -112 dBc/Hz @ 100 kHz
+9 ... 14 V DC
typ. 230 mA
SMA-Buchse / 50 ohms
SMA-Buchse / 50 ohms
30 x 56 x 74
milled aluminium
typ. 200 g

Preliminary technical specifications

KU UP 107 A
2000...2500 MHz
10,0...10,7 GHz
7740 oder 8390 MHz
+/- 50 kHz
+/- 50 kHz
max. 1 mW
200...400 mW COFDM Signale
2 W
> 50 dB
> 33 dB
typ. -103 dBc/Hz @ 100 kHz
+12 ... 14 V DC
typ. 1,5 A
SMA-Buchse / 50 ohms
SMA-Buchse / 50 ohms
126 x 64 x 22
milled aluminium
typ. 340 g

Packet link components

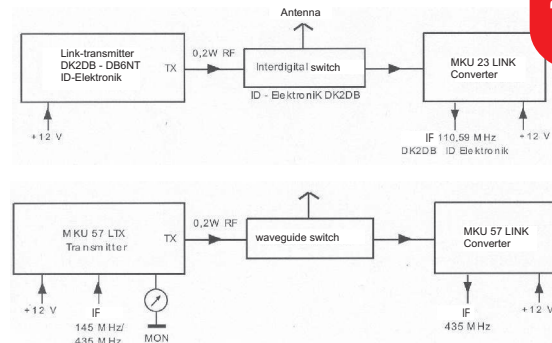
Converter for 2.3 GHz PR-band to 110 MHz IF. Alignment and crystal depend on the required input frequency. These Converters and TX-mixer convert the 5.7 GHz Link-band to a the 435 / 145 MHz IF. These modules use crystal that depend on the required frequencies.

Specifications

Link

Type
Frequency range
IF- frequency
Gain
Noise figure @ 18 °C
Current consumption
Supply voltage
Dimensions mm
RF Input
RF Output

MKU LNC 23 LINK
2380 +/- as ordered
110.59 MHz for DK2DB IF- unit
typ. 20 dB
typ. 2 dB NF
approx. 70 mA
+12...15 V
30 x 56 x 74 without connector
SMA - female / 50 ohms
SMC - female / 50 ohms



Specifications

Converter

Type
Frequency range
IF- frequency
Gain
Noise figure @ 18 °C
Current consumption
Supply voltage
Dimensions mm
RF Input
IF Output
Option 01

MKU LNC 57 LINK
5650 - 5850 MHz
435 MHz
typ. 20 dB
typ. 2 dB NF
approx. 220 mA
+12...15 V
30 x 56 x 111 without connector
SMA-female / 50 ohms
BNC-female / 50 ohms
Gain typ. 40 dB



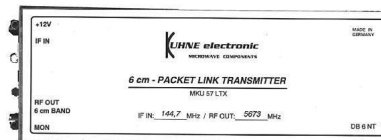
Specifications

Transmitter

Type
Frequency range
IF- frequency
IF- Power in
Output power
Current consumption
Supply voltage
Dimensions mm
RF and IF connector
Monitor for output power control

MKU UP 34 LTX
3400 - 3475 MHz
435 MHz
10...300 mW adj.
typ. 200 mW RF
approx. 300 mA
+12...15 V
30 x 56 x 150 mm .
SMA-female / 50 ohms

MKU UP 57 LTX
5650 - 5850 MHz
144 or 435 MHz
10...300 mW adj.
typ. 200 mW RF
approx. 300 mA
+12...15 V
30 x 56 x 150 mm
SMA-female / 50 ohms

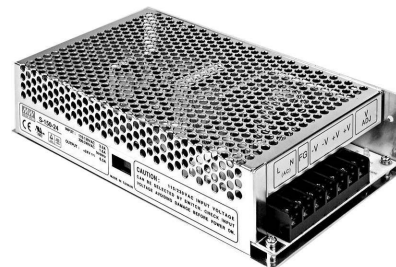


Power supply

Model S 150 W 12 / S 150 W 24

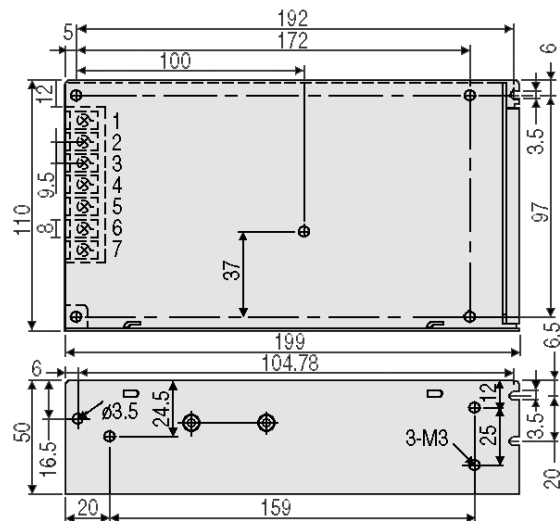
- AC input range selected by switch
- Protections: short circuit / over load / over voltage
- Approvals: UL / TUV / CB / CE
- Free air cooling convection
- Fixed switching frequency at 25 kHz
- 100 % full load burn-in test

NEW



Specifications

Type	S 150 W 12	S 150 W 24
Operating temperature range	-10...+60 °C	-10...+60 °C
Over load protection	105% ... 150%	105%...150%
Over voltage protection	115% ... 135%	115%...135%
Withstand voltage I/ -O/P	3000 V AC	3000 V AC
Isolation-resistor	100 MΩ	100 MΩ
(I/P-O/P, I/P-FG, O/P-FG: 500V DC)	20 ms at full load	20 ms at full load
Set, rise, hold up time	and 230 V AC	and 230 V AC
Weight	800 g	800 g
AC input voltage range	88...132 V AC/ 176...264 V AC (47...63 Hz)	88...132 V AC/ 176...264 V AC (47...63 Hz)
AC input current (at 230V)	1.6 A	1.6 A
AC inrush current (cold start)	35 A	35 A
Output		
Outputvoltage	12 V +/- 1 %	24 V +/- 1%
Adjust-range min.	10.6...13.2 V	21...28 V
Output current range	0...12.5 A	0...6.5 A
Output power	150 Watt	156 Watt
Remaining ripple max.	180 mVp-p	240 mVp-p
Efficiency	82 %	85 %



Power supply

Model SP 200 W 12

- Universal AC input / Full range
- PFC 0.98 @ 115 V AC; 0.93 @ 230 V AC
- Protections: short circuit / over load / over voltage / over temp.
- Built-in fan speed control
- UL / CUL / TUV / CB / CE / S-MARK
- Fixed switching frequency at 134 kHz
- Forced air cooling by built-in DC fan

NEW



Specifications

Type
Operating temperature range
Over load protection
Withstand voltage I/ -O/P
Withstand-resistor
 (I/P-O/P, I/P-FG, O/P-FG: 500 V DC)
Set, rise, hold up time

Weight
AC input voltage range

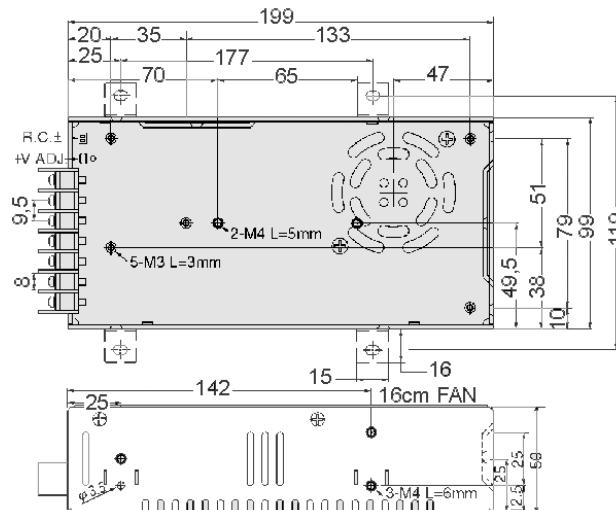
AC input current (at 230 V)
AC inrush current (cold start, at 230 V)

Output
Output voltage
Adjust-range min.
Output current range
Output power
Remaining ripple max.
Efficiency

SP 200 W 12
 -10...+60 °C
 105%...150%
 3000 V AC

100 MΩ
 20 ms at full load
 and 230 V AC
 800 g
 85...264 V AC
 (47...63 Hz)
 1.4 A
 40 A

12 V +10 / -5 %
 10.8...13.2 V
 0...16.7 A
 200 Watt
 100 mVp-p
 79 %



Power supply

Model SP 320 W 12 / SP 320 W 24

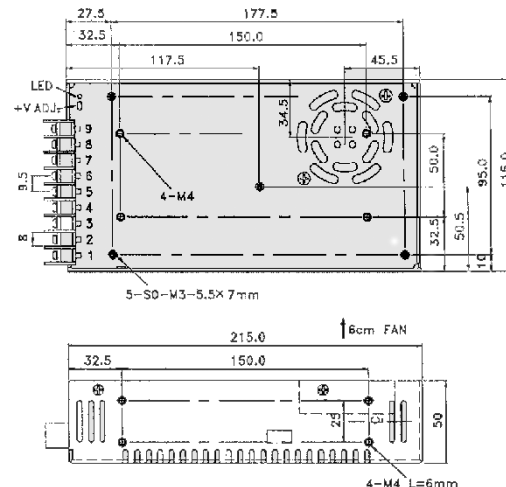
- Universal AC input / Full range
- PFC 0.98 @ 115 V AC; 0.93 @ 230 V AC
- Protections: short circuit / over load/ over voltage/ over temp.
- Cooling fan ON / OFF auto control
- Approvals: UL / CUL / TUV / CB / CE
- Fixed switching frequency at 110 kHz
- Forced air cooling by built-in DC fan



NEW

Specifications

Type	SP 320 W 12	SP 320 W 24
Operating temperature range	-10...+50 °C	-10...+50 °C
Over load protection	105%...135%	105%...135%
Withstand voltage I/ -O/P	3000 V AC	3000 V AC
Withstand-restistor (I/P-O/P, I/P-FG, O/P-FG: 500 V DC)		
Set, rise, hold up time	100 MΩ	100 MΩ
	20 ms at full load and 230 V AC	20 ms at full load and 230 V AC
Weight	1200 g	1200 g
AC input voltage range	85...264V AC/ (47...63 Hz)	85...264V AC/ (47...63 Hz)
AC input current (at 230 V)	2 A	2 A
AC inrush current (cold start, at 230 V)	36 A	36 A
Output		
Output voltage	12 V +/- 1%	24 V +/- 1%
Adjust-range min.	10...13.2 V	20...26.4 V
Output current range	0...25 A	0...12.5 A
Output power	300 Watt	312 Watt
Remaining ripple max.	150 mVp-p	150 mVp-p
Efficiency	83 %	87 %

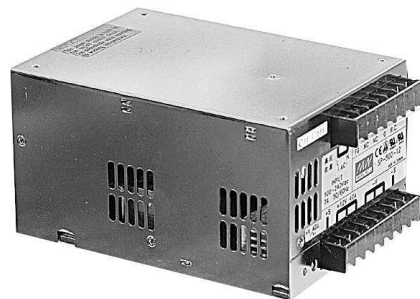


Power supply

Model SP 500 W 12 / SP 500 W 24

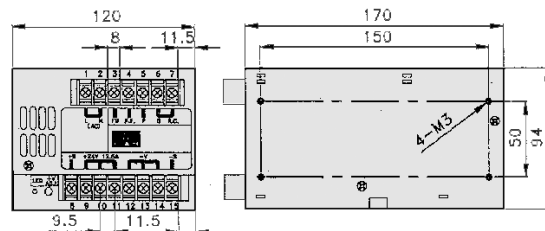
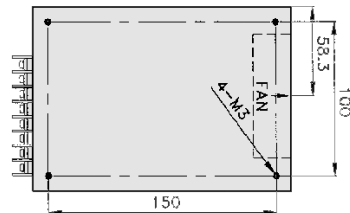
- Universal AC input / Full range
- PFC 0.98 @ 115 V AC; 0.95 @ 230 V AC
- Protections: short circuit / over load / over voltage / over temp.
- Cooling fan ON / OFF auto control
- Approvals: UL / CUL / TUV / CB / CE
- Fixed switching frequency at 110 kHz
- Forced air cooling by built-in DC fan
- 100 % full load burn-in test
- Built-in remote ON-OFF auto control

NEW

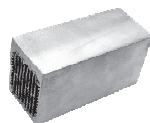
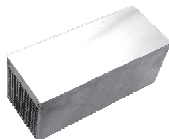


Specifications

Type	SP 500 W 12	SP 500 W 24
Operating temperature range	-10...+50 °C	-10...+50 °C
Over load protection	105%...135%	105%...135%
Withstand voltage I/ -O/P	3000 V AC	3000 V AC
Withstand-resistor	100 MΩ	100 MΩ
(I/P-O/P, I/P-FG, O/P-FG: 500 V DC)		
Set, rise, hold up time	20 ms at full load and 230 V AC	20 ms at full load and 230 V AC
Weight	1800 g	1800 g
AC input voltage range	85...264 V AC/ (47...63 Hz)	85...264 V AC/ (47...63 Hz)
AC input current (at 230 V)	3.5 A	3.5 A
AC inrush current (cold start, at 230 V)	36 A	36 A
Output		
Output voltage	12 V +/- 1%	24 V +/- 1%
Adjust-range min.	10...13.2 V	20...26.4 V
Output current range	0...40 A	0...20 A
Output power	480 Watt	480 Watt
Remaining ripple max.	240 mVp-p	240 mVp-p
Efficiency	84 %	85.5 %



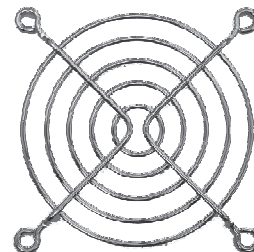
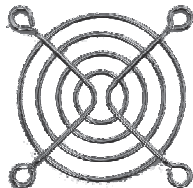
Heatsink



Specifications

Type	SK 120 - 75	SK 200 - 80	SK 150 - 62	SK 300 - 62	SK 200 - 125	SK 200 - 160
Dimensions	150 x 75 x 40 mm	200 x 80 x 85 mm	150 x 62 x 75 mm	300 x 62 x 75 mm	200 x 125 x 75 mm	200 x 160 x 85 mm
Material	Aluminium black-anodized	Aluminium blank flat milled base	Aluminium blank flat milled base	Aluminium blank flat milled base	Aluminium blank flat milled base	Aluminium blank flat milled base
K / W	1.25	0.13	0.21	0.15	0.09	0.065

Fans incl. screen grids



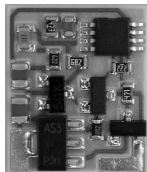
Specifications

Type	Fan 60x60 12 V	Fan 60x60 24 V
Dimensions mm	60 x 60 x 25	60 x 60 x 25
Operating voltage	12 V	24 V
Current consumption	0.19 A	0.12 A
Airflow	40 m³/h	40 m³/h
Noise	34dBA	34dBA
Bearing System	Ball	Ball
Screen grid 60x60	incl.	incl.

Specifications

Type	Fan 80x80 12 V	Fan 80x80 24 V
Dimensions mm	80 x 80 x 25	80 x 80 x 25
Operating voltage	12 V	24 V
Current consumption	0.22 A	0.15 A
Airflow	71 m³/h	71 m³/h
Noise	34dBA	34dBA
Bearing System	Ball	Ball
Screen grid 80x80	incl.	incl.

Precision crystal heater



This precision crystal heater provides temperature compensation for crystals, usually found within crystal oscillators. The circuit, which is built on AL₂O₃ ceramic substrate, has to be mounted on the 40°C thermostat crystal using heat shrink tubing. The circuit heats the crystal to a temperature of 40.8 °C with an accuracy of better than 0.1 °C. This provides high frequency stability over the temperature range of -5 to +40 °C. This crystal heater is a good alternative to completely heated OCXOs, however, the values of an OCXO cannot be achieved.

Specifications

Adjustment tolerance	40.8° C +/- 2.5° C
Regulation accuracy	better 0.1° C
Operating voltage	8...10 V (12 V) as possible use independent separate stabilize voltage
Inrush current	approx. 80 mA
Dimensions mm	10.5 x 14.0 x 3.5

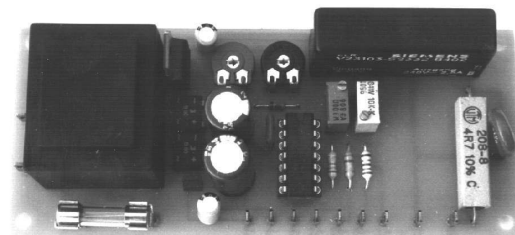
Waterproof case

Waterproof case for self mounting available

Dimension inside
max. 40 x 90 x 57 mm
incl. V2A - Mastclip



Speed control for KR400 Rotor series



Discribed in UKW Berichte magazine or on our homepage.
PCB available

PCBs

01 - PCB broadband amplifier 0,5...2,5 GHz typ. 1 W
02 - PCB 12/24 GHz doubler
03 - PCB 5,7GHz 8 W PA
04 - PCB 10 GHz 4 W PA 2-stage
05 - PCB 10 GHz 4 W PA 1-stage
06 - PCB 10 GHz 4 W PA 2-stage für Mitsubshi FET's
07 - PCB 10 GHz 8 W PA 2-stage
08 - PCB 10 GHz HEMT-pre stage DK
09 - PCB 10 GHz beacon
10 - PCB 12 GHz LO MK4
11 - PCB 24 GHz HEMT ampl. coaxial
12 - PCB 24 GHz HEMT ampl. waveguide
13 - PCB 24 GHz PA ampl. coaxial
14 - PCB 24 GHz PA ampl. waveguide
15 - PCB 24 GHz HEMT amp. coax. only f.NE32584C!
16 - PCB 24 GHz HEMT amp. waveguide only for "
17 - PCB 24 GHz PA Amp. wg in-coax out > beacon
18 - PCB 24 GHz Amp. wg in - coas out
19 - PCB 24 GHz HEPA 4-stage amplifier waveguide
20 - PCB 24 GHz HEPA 4-stage amplifier coax.
21 - PCB 24 GHz MK2 transverter
22 - PCB 24 GHz MK3 Transverter waveguide
23 - PCB 24 GHz MK3 Transverter coaxial
24 - PCB 24 GHz LO
25 - PCB 47 GHz mixer
26 - PCB 47 GHz IF
27 - PCB 76 GHz mixer x 4
28 - PCB 76 GHz IF
29 - PCB 76 GHz mixer x 2
30 - PCB 25.3/76 GHz tripler
31 - PCB 120 GHz multiplier by 3
32 - PCB 120 GHz multiplier by 5
33 - PCB 23/47 GHz doubler
34 - PCB 19/38 GHz doubler
35 - PCB 120 GHz RX mixer
36 - PCB 145 GHz mixer
37 - PCB 241 GHz mixer
38 - PCB Speed control of KR400 Rotor series

Parts

SMC-connector f. coaxable 3,2 mm straight
 Diode BAT 15-03W
 Waterproof case for MKU 23 LNC / 34 LNC / 132A2
 incl. mastclip (not drilled)
 Replacement fuse for TR 144 / 432 H
 Procom waveguide flanges WR 19

UKW Ber. 2.97
DUBUS 1-2.92
DUBUS 3.92
DUBUS 4.91

DUBUS 12.98

DUBUS 3.95

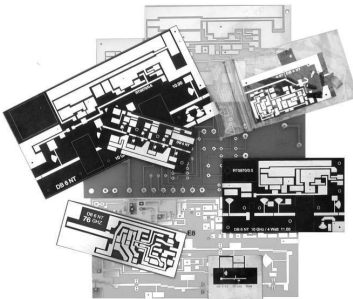
RO4003 through-connection
DUBUS 4.93
DUBUS 4.93
DUBUS 4.93
DUBUS 4.93
DUBUS 3.96
DUBUS 3.96
DUBUS 4/page 347
DUBUS 2.97
Dorsten 2.97
Dorsten 2.97
DUBUS 1.93
DUBUS 2.98
DUBUS 2.98

DUBUS 1.94
DUBUS 1.94
DUBUS 2.92
DUBUS 1.94
DUBUS 1.94
DUBUS 1.94
Dorsten 2005
Dorsten 2005
DUBUS 4.93
DUBUS 1.94
Dorsten 2005
DUBUS 2.94
DUBUS 2.94
UKW Berichte 2/99

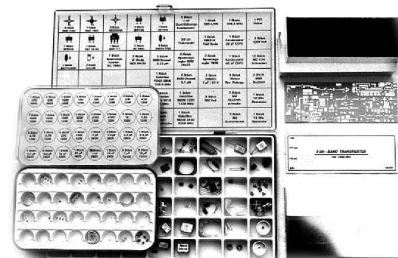
Kits

Kit 1,3GHz 13G2
 Kit 1,3 GHz 13G2-28

Kit 2,3GHz 23G2
 Kit 2,3GHz 23G2 OSCAR
 Kit 3,4GHz 34G2
 Kit 5,7GHz 57G2
 Kit 5,7GHz 57G2, Option for extern. OCXO
 Kit 10 GHz 10G2
 Kit 10 GHz 10G2, Option for extern. OCXO
 Kit 24 GHz HEMT ampl. coaxial vers.
 Kit 24 GHz HEMT ampl. waveg. vers.
 Kit 24 GHz MK2 transverter
 Kit 24 GHz MK3 transverter coaxial
 Kit 24 GHz MK3 transverter waveg



transverter MK2 (all parts you need, description)
 transverter MK2 (all parts you need, description) 28 MHz/IF
 addition filter necessary
 transverter MK2 (all parts you need, description)
 2400 MHz transverter MK2 (all parts, description)
 transverter MK2 (all parts you need, description)
 transverter MK2 (all parts, description)
 transverter MK2 (all parts, description)
 transverter MK2 (all parts, description)
 (3 x NE32584 C + 1 PCB + 1 x Drawing/circuit)
 (3 x NE32584 C + 1 PCB + 1 x Drawing/circuit)
 (1 x PCB + 2 x BAT 15-W3 + 1 pF)
 (1 x PCB + 2 x BAT 15-W3 + 3 x BAR64-03W + 1 x BFP196)
 (1 x PCB + 2 x BAT 15-W3 + 3 x BAR64-03W + 1 x BFP196)



Please take the prices of the modules from the enclosed price list.

- Specifications subject to change without notice -

General Terms and Conditions

of Kuhne electronic GmbH, Berg/Oberfranken

1. Validity

The following Terms and Conditions shall apply for all contracts, deliveries and other services - without any contradiction against the buyers conditions - provided altered conditions have previously been agreed. Only German law is applicable.

2. Offer and Conclusion

With respect to price and delivery contingencies, offers are not always binding unless the seller has specifically given his obligation in writing. Verbal collateral agreements and undertakings exceeding the written sales contract always require the sellers confirmation in writing. In case the financial conditions of the customer deteriorate considerably after conclusion of the contract and if this fact becomes known after the conclusion we are entitled to request either advance payment or provision of security or may withdraw from the contract. Descriptions, drawings and illustrations of the products offered by us and price lists and catalogues are prepared as per the best knowledge. The details given therein are not binding provided certain properties are expressly warranted in writing.

3. Delivery and Delay

Delivery periods are not binding unless the seller has expressly given a confirmation in writing. Part deliveries are admissible. In case of unforeseen delivery impediments such as act of God, strike, interruption of operations in our own company or in our suppliers company or transport problems etc., the seller is entitled to cancel the supply consignment partly or completely. Damage claims of the buyer are excluded.

4. Dispatch and Delivery

Dispatch is made within the sellers discretion and without any guarantee of the cheapest way of dispatch. All consignments including possible returns are at the buyers risk and expenses. On request of the buyer, insurance is effected at the his expense. As for the rest, the risk is passed to the buyer when the goods are handed over to the forwarder or carrier, however, no later than when leaving the stock.

5. Retention of title

In principle we deliver under extended retention of title. Until the buyers' fulfilment of all claims we retain title to the delivered goods. Preceding pledging and assignment for security purposes are prohibited.

6. Prices and Payment

Prices are not binding and are ex place of delivery in EURO € including the respectively valid rate of VAT. Freight, postage and packing are excluded. The price being valid at the day of dispatch will be charged. If not agreed otherwise in writing, payment has to be effected within 21 days upon invoice date without deduction. Supplies to customers who are unknown to the Seller are only made against cash on delivery or advance payment. At the day, the Seller has the money at his disposal without any loss, payments are regarded as effected. In case of delay in payment interest will be charged to the amount charged by the banks for appropriate loans. The withholding of payments due to the customers counterclaims which are not accepted by the seller and the offsetting of those claims are prohibited.

7. Notice of Defects, Warranty

Notice of defects and complaints about quantity are to be asserted immediately by the customer in writing, at least within eight days upon receipt of the goods. The sellers responsibility will be set aside if notices of defects are not in due time. In case of a justified notice of defect the seller has the right either to remedy the defect or to take the product back against a relevant credit note or to replace the product without costs in a reasonable period of time. For private customers the legal guarantee period of 24 months is applicable, for trade and industry are 12 month applicable! Further claims are excluded. The guarantee will lapse if the devices are opened and modified. Semiconductors are excluded from this warranty.

8. Repairs

An estimate of costs prior to the execution of a repair will only be furnished on the customers express request and at his expenses. It is within the sellers discretion whether the repair is carried out in his own workshop or in another one. The costs incurred by dispatch and packing are to the buyers account.

9. Place of Performance and Court of Jurisdiction

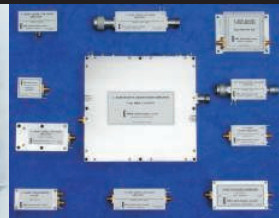
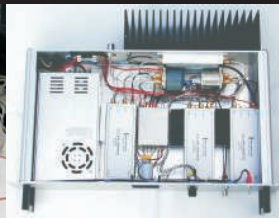
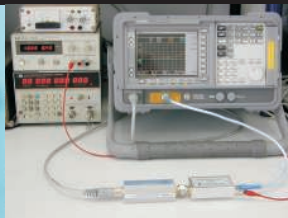
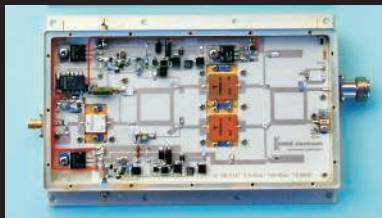
Place of performance and court of jurisdiction is the place of the selling company for all deliveries and payments and for all differences between the contracting parties, including actions for cheques. Only German law is applicable. In the event that one of the clauses of the agreement become inoperative the validity of the remaining clauses will not be affected.

10. Export

Deliveries abroad are only effected against advance payment. Upon receipt of your order we will send you the relevant invoice. As soon as the invoice amount in EURO € is transferred and credited to our account the ordered goods will be immediately dispatched ex Berg stock unless a delivery period has been agreed in writing. Bank charges are always to be taken over by the customer.

11. Special versions

Customised products are excluded from refund and replacement.



We develop and manufacture professional devices for the frequency range 0.1 ... 50 GHz. This includes customer defined amplifiers, mixers, oscillators and systems.