BI-PHASE 1 MHz to 2 GHz

ZFAS

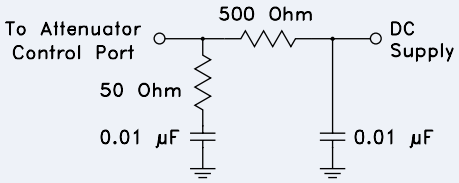
ZMAS

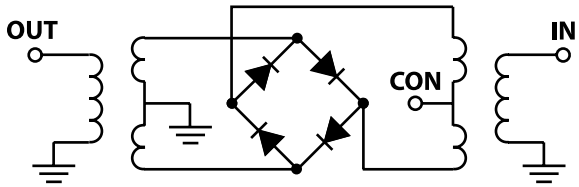
ZAS

MODEL NO.	FREQUENCY MHz IN f_L-f_U	CON	INSERTION LOSS dB (±20 mA) Mid-Band m Typ.	Mid-Band m Max.	Total Range Typ.	Total Range Max.	MAX. INPUT PWR dBm (±20 mA) 1 dB compr.	no damage	IN-OUT ISOLATION, dB (0 mA) L Typ.	L Min.	M Typ.	M Min.	U Typ.	U Min.	BI-PHASE $\bar{X}$ (±20 mA) Typ. Δ AMP (dB) m	Δ AMP (dB) Total Range	Phase(deg) deviation from 180° m	Phase(deg) deviation from 180° Total Range	CASE STYLE Note B	CONNECTION	PRICE $ Qty. (1-9)
ZMAS-1*	5-450	DC-0.05	3.5	4	3.5	4.7	20	30	65	50	55	40	35	25	0.10	0.1	0.5	1.2	M21	cp	66.95
ZMAS-3*	1-200	DC-0.05	1.4	2	1.6	2.5	15	30	65	50	50	40	50	35	0.10	0.1	0.5	1.0	M21	cp	67.95
ZAS-1*	5-450	DC-0.05	3.5	4	3.5	4.7	20	30	65	50	55	40	35	25	0.10	0.1	0.5	1.2	M22	cp	59.95
ZAS-3*	1-200	DC-0.05	1.4	2	1.6	2.5	15	30	65	50	50	40	50	35	0.10	0.1	0.5	1.0	M22	cp	59.95
▲ ZFAS-2000**	100-2000	DC-0.5	4.2	6.5	5.4	7.5	19R	25	30	22	—	—	26	20	0.3	0.4	5.0	8.0	K18	cn	64.95

L = low range [f_L to 10 f_L] M = mid range [10f_L to f_U/2] U = upper range [f_U/2 to f_U]
m = mid band [2f_L to f_U/2]

suggested control port biasing configuration





NSN GUIDE

MCL NO.	NSN
ZAS-3B	5985-01-267-2832
ZMAS-1	5985-01-140-4291

NOTES:
* Recommended for electronic attenuator
** Recommended for bi-phase modulator
▲ Available only with SMA connectors.
✲ +15 dBm from 100-800 MHz
A. General Quality Control Procedures, Environmental Specifications, Hi-Rel and MIL description are given in General Information (Section 0).
B. Connector types and case mounted options, case finishes are given in section 0, see "Case styles & Outline Drawings".
C. Prices and specifications subject to change without notice.
1. Absolute maximum power, voltage and current ratings: 1a. Control current, 30mA
2. Performance specifications apply for input power up to 10 dB below stated 1dB compression.

coaxial connections
see case style outline drawings

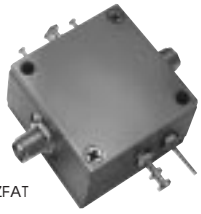
PORT	cn	cp
INPUT	2	3
OUTPUT	1	1
CONTROL	3	2
GND EXT.	—	—
CASE GND	—	—
NOT USED	—	—

001004

DIGITAL STEP ATTENUATORS 50Ω Precision

TTL CONTROL, PIN DIODE 10 MHz to 1 GHz


TOAT


ZFAT


ZSAT

MODEL NO.	FREQUENCY MHz f_L	f_U	PRIMARY ATTENUATION STEPS dB @TTL CONTROL PORT #1	#2	#3	ATTENUATION dB LOGIC STATE* (1,1,1)** Nom.	(0,0,0) Max.	VSWR (:1) L	M	U	CASE STYLE Note B	CONNECTION	PRICE $ Qty. (1-9)
TOAT-R512	10	1000	0.5±0.18	1±0.25	2±0.25	3.5	4.0	1.6	1.4	1.5	QQ96	cq	59.95
TOAT-124	10	1000	1±0.25	2±0.25	4±0.3	7.0	4.0	1.6	1.4	1.5	QQ96	cq	59.95
TOAT-3610	10	1000	3±0.3	6±0.4	10±0.4	19.0	4.0	1.6	1.4	1.5	QQ96	cq	59.95
TOAT-4816	10	1000	4±0.4	8±0.4	16±0.5	28.0	4.0	1.6	1.4	1.5	QQ96	cq	59.95
TOAT-51020	10	1000	5±0.4	10±0.4	20±0.5	35.0	4.0	1.6	1.4	1.5	QQ96	cq	59.95
ZFAT-R512	10	1000	0.5±0.18	1±0.25	2±0.25	3.5	4.0	1.6	1.4	1.5	SSS173	-	89.95
ZFAT-124	10	1000	1±0.25	2±0.25	4±0.3	7.0	4.0	1.6	1.4	1.5	SSS173	-	89.95
ZFAT-3610	10	1000	3±0.3	6±0.4	10±0.4	19.0	4.0	1.6	1.4	1.5	SSS173	-	89.95
ZFAT-4816	10	1000	4±0.4	8±0.4	16±0.5	28.0	4.0	1.6	1.4	1.5	SSS173	-	89.95
ZFAT-51020	10	1000	5±0.4	10±0.4	20±0.5	35.0	4.0	1.6	1.4	1.5	SSS173	-	89.95
			SIX CONTROL PORTS										
ZSAT-31R5	10	1000	(1) 0.5±0.18 (4) 4±0.3	(2) 1±0.25 (5) 8±0.4	(3) 2±0.25 (6)16±0.5	31.5	7.0	1.7	1.5	1.6	AR214	-	119.00

L = 10 to 100 MHz M = 100 to 500 MHz U = 500 to 1000 MHz

features

- wide frequency band, 10-1000 MHz
- excellent step accuracy, 0.2 dB typ.
- excellent VSWR, 1.3 typ.
- low DC current, 6 mA typ.
- operates over -55° to 100 °C
- small case, 0.6" dia., TO-8

ADDITIONAL SPECIFICATIONS

DC Voltage +5V
DC current 12mA max.
Switching Time (50% TTL to within specified accuracy of the next-selected attenuation step, and to within 0.1 dB of steady-state Thru-Loss) 10 µs typ., 15µs max.
TTL input High Threshold 2V min.
TTL input Low Threshold 0.8V max.
TTL Toggle Rate: 50 kHz typ.
1dB compression: 0 dBm (10-100MHz)
+10dBm (100-1000MHz)
For ZSAT-31R5:
1dB compression: +10 dBm (10-100 MHz)
+15 dBm (100-1000 MHz)

Logic function:

TTL High activates associated in-line attenuation
TTL Low bypasses this attenuation

NSN GUIDE

MCL NO.	NSN
TOAT-124	5985-01-416-9021
TOAT-51020	5985-01-416-9020

NOTES:
* For ZSAT-31R5: Total attenuation (1,1,1,1,1,1)
Thru-Loss (0,0,0,0,0,0)
** Total attenuation above thru-loss.
A. General Quality Control Procedures, Environmental Specifications, Hi-Rel and MIL description are given in section 0, see "Mini-Circuits Guarantees Quality" article.
B. Connector types and case mounted options, case finishes are given in section 0, see "Case Styles & Outline Drawings".
C. Prices and Specifications subject to change without notice.
1. Absolute maximum power, voltage and current rating:
1a. Input power, 15 dBm
1b. DC voltage, 5.5 Volts
1c. TTL, 5.5 Volts
1d. Storage temperature -55°C to +125°C for TOAT models.
2. Step accuracy is specified for basic steps. For combination of steps accuracy is additive.
3. Thru-loss is minimum insertion loss with all attenuation elements bypassed (All TTL controls state are Low).
4. For optimum operation of TOAT models, ensure the device case is properly connected to the ground plane (of PC board).

pin connections

see case style outline drawing

PORT	cq
RF IN	4
RF OUT	11
TTL CONTROL #1	2
TTL CONTROL #2	3
TTL CONTROL #3	1
+5V DC	12
CASE GND	5,6,7,8,9,10

000414