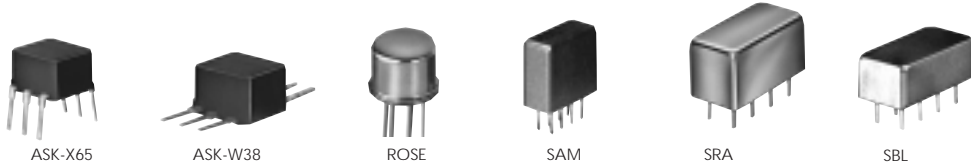


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to allow for the correct viewing of
continuous facing pages.**

FREQUENCY MIXERS

Plug-In & Flatpack

LEVEL 7 500 Hz to 4.3 GHz



+7 dBm LO, up to +1 dBm RF

MODEL NO.	FREQUENCY MHz		CONVERSION LOSS dB				LO-RF ISOLATION, dB					LO-IF ISOLATION, dB					CASE STYLE	CONNECTOR	PRICE \$		
	LO/RF f_L - f_U	IF	Mid-Band \bar{x}	m	σ	Total Range Max.	L Typ.	L Min.	M Typ.	M Min.	U Typ.	U Min.	L Typ.	L Min.	M Typ.	M Min.				U Typ.	U Min.
<input type="checkbox"/> ASK-1'	1-600	DC-600	5.58	.06	7.0	8.5	50	30	35	25	30	20	45	35	30	20	25	15	W38	w	6.95
<input checked="" type="checkbox"/> ASK-2'	1-1000	DC-1000	6.79	.10	8.0	9.8	60	40	35	18	26	16	50	30	25	17	15	10	W38	w	8.25
ROSE-1	1-600	DC-600	5.08	.03	6.5	7.5	40	30	35	25	30	20	55	40	40	20	25	18	PP94	ab	12.95
ROSE-2	1-1000	DC-1000	5.60	.23	7.0	8.0	61	45	37	22	25	18	55	40	26	17	16	12	PP94	ab	18.95
SAM-1	1-600	DC-600	5.67	.05	7.0	8.5	55	45	45	30	35	20	50	40	40	25	30	20	A03	e	18.95
SAM-2	1-1000	DC-1000	5.68	.08	7.5	9.5	55	45	40	25	35	20	50	40	40	25	30	25	A03	f	22.45
SAM-3	0.1-500	DC-500	5.04	.07	7.0	8.5	60	50	50	35	35	30	50	40	45	30	30	20	A03	e	21.95
SRA-1	.5-500	DC-500	5.11	.09	7.0	8.5	50	45	45	30	35	25	45	35	40	25	30	20	A01	e	14.45
SRA-1W	1-750	DC-750	5.80	.04	7.5	8.5	50	45	45	30	35	25	45	30	40	25	30	20	A01	f	17.95
SRA-1-1	.1-500	DC-500	4.81	.11	7.5	8.5	50	45	45	30	35	25	45	30	40	25	30	20	A01	e	15.95
SRA-2	1-1000	.5-500	5.66	.07	7.5	8.5	45	30	35	20	30	20	45	30	30	20	30	20	A01	j	17.95
SRA-2CM	5-1000	DC-1000	5.27	.04	7.0	8.5	60	50	35	30	30	25	50	45	30	25	25	20	A01	f	15.95
SRA-3	.025-200	DC-200	4.61	.06	7.5	8.5	60	50	45	35	35	25	45	35	40	30	30	20	A01	e	17.95
SRA-5	5-1500	10-600	6.69	.07	8.0	8.5	50	45	35	30	30	20	45	40	30	25	25	15	A06	m	26.95
SRA-6	.003-100	DC-100	4.58	.05	7.5	8.5	60	50	45	30	35	25	60	45	40	25	30	20	A01	d	26.95
SRA-8	.0005-10	DC-10	5.69	.11	7.5	8.5	60	50	50	40	45	35	60	50	50	40	45	35	A01	d	31.95
SRA-11	5-2000	10-600	6.72	.07	8.5	9.0	50	45	35	25	30	20	45	40	30	20	25	15	A06	m	22.95
SRA-12	800-1250	50-90	6.21	.13	7.5	7.5	32	25	35	25	35	25	30	20	30	20	30	20	A06	m	31.95
SRA-149***	5-500	DC-500	5.61	.07	6.5	8.0	60	50	55	45	53	40	50	40	35	25	30	24	A06	p	10.95
SRA-2000	100-2000	DC-600	8.60	.15	9.5	9.5	37 (Typ.) 20 (Min.)			30 (Typ.) 20 (Min.)			30 (Typ.) 20 (Min.)			A06			m	23.95	
SRA-2400	750-2400	DC-400	5.95	.26	9.0	9.0	30	20	30	20	30	20	30	8	30	8	30	8	A06	s	24.95
SRA-3500**	500-3500	DC-1000	7.28	.31	9.5	9.5	30	17	30	17	30	17	20	8	20	8	20	8	A06	s	30.95
<input type="checkbox"/> SBL-1	1-500	DC-500	5.60	.09	7.0	8.0	60	45	45	35	40	25	45	35	40	25	30	20	A06	d	5.75
<input type="checkbox"/> SBL-1X	10-1000	5-500	5.88	.10	7.5	8.0	50	40	40	30	30	20	50	45	40	35	35	25	A06	j	7.45
<input type="checkbox"/> SBL-1Z	10-1000	DC-500	6.27	.09	7.5	9.0	50	40	35	25	25	20	40	25	25	18	19	15	A06	s	8.45
<input type="checkbox"/> SBL-1-1	0.1-400	DC-400	4.84	.04	7.0	8.0	50	45	45	30	35	25	45	30	40	25	30	20	A06	d	8.45
<input type="checkbox"/> SBL-3	.025-200	DC-200	4.81	.05	7.5	8.5	55	50	45	30	35	25	45	35	40	30	30	20	A06	e	8.45
<input type="checkbox"/> SBL-11	5-2000	10-600	7.08	.11	8.5	9.0	50	45	35	25	30	20	45	40	30	20	25	15	A06	m	21.95
SIMA-5	2-1500	DC-1000	7.01	.08	8.0	9.0	65	44	44	23	31	22	54	38	30	18	25	11	A06	m	26.95

L = low range [f_L to $10 f_L$]

M = mid range [$10 f_L$ to $f_U/2$]
m = mid band [$2f_L$ to $f_U/2$]

U = upper range [$f_U/2$ to f_U]

NOTES:

- \bar{x} Average of conversion loss at center of mid-band frequency ($f_L + f_U/4$)
- σ Standard deviation
- Non-hermetic
- Phase detection, positive polarity
- ASK plug-in mounting case X65
- ** Below 10°C, f_L is 0.2 MHz.
- * Conversion loss 9.5 dB maximum from 0.01 to 0.015 MHz
- *** Conversion loss 10dB maximum at IF=1000 MHz
- *** Blue bead pin 4
- 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 ratings:
 - 1a. RF power, 50 mW
 - 1b. Peak IF current, 40 mA

NSN GUIDE

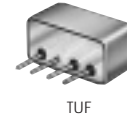
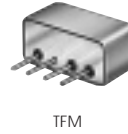
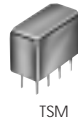
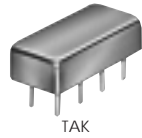
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ASK-1	5895-01-320-0366
SAM-1	5895-01-117-2926
SAM-2	5895-01-165-6621
SAM-3	5895-01-062-9973
SBL-1	5895-01-126-4913
SBL-1X	5895-01-179-8084
SRA-1	5895-00-008-8272 03
SRA-1-1	5962-01-113-5431
SRA-1W	5895-01-163-0433 09
SRA-3	5895-01-021-5914
SRA-6	5895-01-124-0117
SRA-8	5985-01-081-0977
SRA-11	5895-01-273-0883
SBL-3	5895-01-326-6030
TAK-5	5895-01-271-0842
TAK-6	5895-01-231-2372
TFM-2	5895-01-135-1852
TFM-3	5895-01-112-0031
TFM-4	5895-01-317-9388
TFM-11	5895-01-409-1158
TFM-12	5895-01-179-5686
TSM-3	5895-01-373-2444



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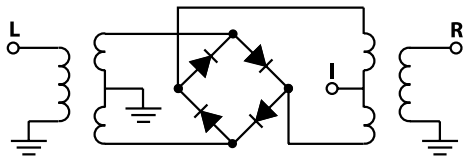
+7 dBm LO, up to +1 dBm RF

MODEL NO.	FREQUENCY MHz		CONVERSION LOSS dB				LO-RF ISOLATION, dB						LO-IF ISOLATION, dB						CASE STYLE	CONFORM TO	PRICE \$	
	LO/RF f_c-f_u	IF	Mid-Band m	\bar{x}	σ	Max.	Total Range Max.	L Typ.	L Min.	M Typ.	M Min.	U Typ.	U Min.	L Typ.	L Min.	M Typ.	M Min.	U Typ.				U Min.
TAK-5*	.01-250	DC-250	4.65	.02	7.0	8.5		60	50	50	35	40	35	55	45	45	30	35	25	A04	e	22.95
TAK-6	.5-600	DC-600	5.58	.04	7.5	8.5		60	50	50	30	40	25	55	45	45	30	30	20	A04	e	22.95
TSM-3	.1-500	DC-500	4.75	.04	7.5	8.5		60	50	50	35	35	25	55	45	45	30	35	25	A11	e	23.95
TFM-2	1-1000	DC-1000	5.74	.07	7.5	8.5		50	45	40	25	30	25	45	40	35	25	25	18	B02	z	14.95
† TFM-3••	0.04-400	DC-400	4.70	.06	7.0	8.0		60	50	50	35	35	25	55	40	45	30	35	25	B02	z	23.45
† TFM-4	5-1250	DC-1250	6.47	.05	7.5	8.5		50	45	40	30	30	25	45	40	35	25	25	20	B02	z	25.45
TFM-5	5-1500	DC-1000	6.33	.06	8.5	9.5		60	45	35	25	30	25	60	40	35	15	25	14	B02	aa	27.95
TFM-11	1-2000	5-600	7.16	.07	8.5	9.0		50	45	35	25	25	20	45	40	27	20	25	20	B13	z	48.95
TFM-12	800-1250	50-90	5.71	.14	—	7.5		35	25	35	25	35	25	30	20	30	20	30	20	B13	z	48.95
TFM-2400	750-2400	DC-400	6.65	.20	—	9.0		30	20	30	20	30	20	30	10	30	10	30	10	B13	aa	30.95
TFM-4300	300-4300	DC-800	5.87	.13	—	10.5		30	20	—	—	30	17	15	7	—	—	10	7	B13	aa	40.95
□ TUF-1	2-600	DC-600	5.85	.04	7.0	8.0		60	50	42	30	37	25	60	45	47	30	36	22	B02	z	5.25
□ TUF-2	50-1000	DC-1000	5.85	.07	7.5	9.0		58	40	47	30	42	25	50	35	44	20	29	18	B02	z	6.20
□ TUF-3	0.15-400	DC-400	4.7	.02	7.0	8.0		60	50	46	30	35	25	60	40	47	25	35	20	B02	z	7.05
□ TUF-5	20-1500	DC-1000	5.7	.04	9.0	9.0		54	40	42	30	39	25	40	25	32	18	23	8	B02	z	10.45
□ TUF-11A	1400-1900	40-500	6.8	.30	8.6	8.6		33 (typ.)	20 (min.)	—	—	—	—	29 (typ.)	15 (min.)	—	—	—	—	B02	z	18.95
□ TUF-860	800-1050	DC-250	5.6	.24	7.75	7.75		35 (typ.)	25 (min.)	—	—	—	—	27 (typ.)	20 (min.)	—	—	—	—	B02	z	10.45

L = low range [f_L to $10f_L$]

M = mid range [$10f_L$ to $f_U/2$]
 m = mid band [$2f_L$ to $f_U/2$]

U = upper range [$f_U/2$ to f_U]



pin connections see case style outline drawings

PORT	d	e	f	j	m	p	s	w	z	aa	ab
LO	8	8	8	8	8	8	1	1	4	1	1
RF	1	1	1	3,4^	1	2	8	4	1	4	3
IF	3,4^	3,4^	3,4^	1	3	5,6^	3	5	2	2	2
GND EXT.	2,5,6,7	2,5,6,7	2,5,6,7	2,5,6,7	2,5,6,7	1,3,4,7	2,5,6,7	2,3,6	3	3	4
CASE GND	—	2	2,5,6,7	2,5,6,7	2,5,6,7	3,4,7	2,5,6,7	—	3	3	4
NOT USED	—	—	—	—	4	—	4	—	—	—	—

^ pins must be connected together externally



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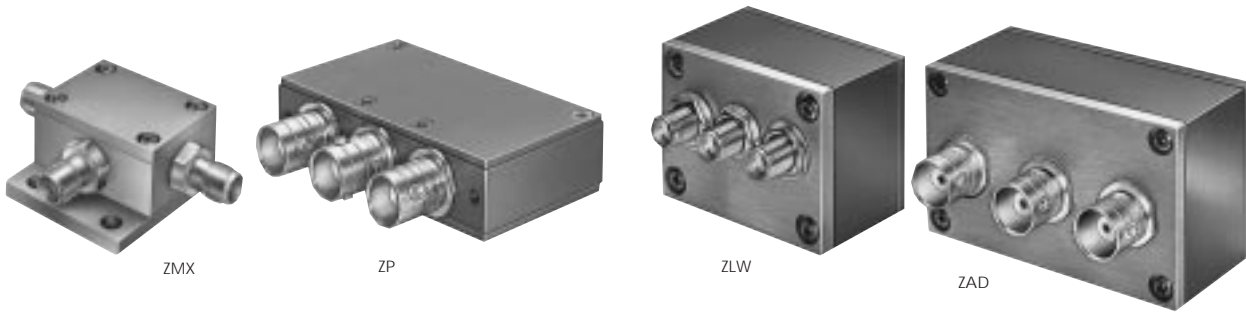
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FREQUENCY MIXERS

Coaxial

LEVEL 7 500 Hz to 10 GHz



+7 dBm LO, up to +1 dBm RF

MODEL NO.	FREQUENCY MHz		CONVERSION LOSS dB				LO-RF ISOLATION, dB						LO-IF ISOLATION, dB			CASE STYLE	CONNECTION	PRICE \$			
	LO/RF f_L - f_U	IF	Mid-Band		Total Range	L	M	U	L	M	U	L	M	U	Note B						
			\bar{x}	σ															Max.	Typ.	Min.
ZMX-7GR	3700-7000	DC-1000	5.0	.30	—	8.2	30 (typ.) 20 (min.)			36 (typ.) 20 (min.)			BU413	af	71.95						
ZMX-10G	3700-10000	DC-2000	5.0	.10	—	8.5	37 (typ.) 20 (min.)*			17 (typ.) 8 (min.)			BU413	ad	81.95						
ZP-1	2-600	DC-600	5.85	.10	7.0	8.0	60	50	42	30	37	25	60	45	47	30	36	22	GG60	ag	39.95
ZP-2	50-1000	DC-1000	5.85	.10	7.5	9.0	58	40	47	30	42	25	50	35	44	20	29	18	GG60	ag	39.95
ZP-3	0.15-400	DC-400	4.7	.10	7.0	8.0	60	50	46	30	35	25	60	40	47	25	35	20	GG60	ag	39.95
ZP-5	20-1500	DC-1000	5.7	.10	9.0	9.0	54	40	42	30	39	25	40	25	32	18	23	8	GG60	ag	47.95
ZP-5X	1-1500	1-1000	5.9	.10	7.0	9.0	60	40	40	20	28	17	60	45	45	25	38	20	GG60	hg	47.95
ZP-11A	1400-1900	40-500	6.8	.30	8.6	8.6	33(typ.) 20 (min.)			29 (typ.) 15 (min.)			GG60	ag	47.95						
ZP-860	800-1050	DC-250	5.6	.24	7.75	7.75	35(typ.) 25 (min.)			27 (typ.) 20 (min.)			GG60	ag	47.95						
ZP10514	.2-500	DC-500	5.18	.10	7.0	8.5	55	45	50	35	35	30	50	40	36	30	30	20	GG60	ag	62.95
ZLW-1	.5-500	DC-500	5.81	.08	7.0	8.5	50	45	45	30	35	25	45	35	40	25	30	20	M21	ae	51.95
ZLW-1W	1-750	DC-750	5.74	.05	7.5	8.5	50	45	45	30	35	25	45	30	40	25	30	20	M21	ae	56.95
ZLW-1-1	.1-500	DC-500	4.82	.07	7.5	8.5	50	45	45	30	35	25	45	30	40	25	30	20	M21	ae	53.95
ZLW-2	1-1000	DC-1000	5.68	.08	7.5	9.5	55	45	40	25	35	20	50	40	40	25	30	20	M21	ae	56.95
ZLW-3	.025-200	DC-200	4.61	.06	7.5	8.5	60	50	45	35	35	25	45	35	40	30	30	20	M21	ae	53.95
ZLW-5	5-1500	10-600	5.81	.08	7.5	8.5	55	40	35	25	30	20	50	40	35	25	30	20	M21	ae	61.95
ZLW-6	.003-100	DC-100	4.58	.05	7.5	8.5	60	50	45	30	35	25	60	45	40	25	30	25	M21	ae	64.95
ZLW-11	5-2000	10-600	6.85	.10	8.5	9.0	50	45	35	25	30	20	45	40	30	20	25	15	M21	ae	71.95
ZLW-12	800-1250	50-90	6.21	.13	—	7.5	35	25	35	25	35	25	30	20	30	20	30	20	M21	ae	71.95
ZAD-1	.5-500	DC-500	5.24	.10	7.0	8.5	50	45	45	30	35	25	45	35	40	25	30	20	M22	ae	43.95
ZAD-1-1	.1-500	DC-500	4.83	.04	7.5	8.5	50	45	45	30	35	25	45	30	40	25	30	20	M22	ae	44.95
ZAD-2	1-1000	.5-500	5.66	.07	7.5	8.5	45	30	35	20	30	20	45	30	35	20	30	20	M22	ad	49.95
ZAD-3	.025-200	DC-200	4.61	.06	7.5	8.5	60	50	45	35	35	25	45	35	40	30	30	20	M22	ae	45.95
ZAD-6	.003-100	DC-100	4.65	.08	7.5	8.5	60	50	45	30	35	25	60	45	40	25	30	20	M22	ae	51.95
ZAD-8	.0005-10	DC-10	5.79	.05	7.5	8.5	60	50	50	40	45	35	60	50	50	40	45	35	M22	ae	54.95
ZAD-11	5-2000	10-600	7.12	.12	8.5	9.0	50	45	35	25	30	20	45	40	30	20	25	15	M22	ae	61.95
ZAD-12	800-1250	50-90	6.21	.13	7.5	7.5	35	25	35	25	35	25	30	20	30	20	30	20	M22	ae	61.95

L = low range [f_L to 10 f_L]

M = mid range [$10 f_L$ to $f_U/2$]
m = mid band [$2 f_L$ to $f_U/2$]

U = upper range [$f_U/2$ to f_U]

NOTES:

\bar{x} Average of conversion loss at center of mid-band frequency ($f_L + f_U/4$)

σ Standard deviation

▲ Available only with SMA connectors

† Phase detection, positive polarity

* 15 dB min. 8.5 to 10 GHz

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 ratings:

1a. RF power, 50mW

1b. Peak IF current, 40mA



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000815



ZEM



ZFM



ZAM

+7 dBm LO, up to +1 dBm RF

MODEL NO.	FREQUENCY MHz		CONVERSION LOSS dB				LO-RF ISOLATION, dB						LO-IF ISOLATION, dB						CASE STYLE	C O N F I G U R A T I O N	PRICE \$
	LO/RF f_L - f_U	IF	Mid-Band			Total Range Max.	L Typ.	M Typ.	U Typ.	L Min.	M Min.	U Min.	L Typ.	M Typ.	U Typ.	L Min.	M Min.	U Min.			
			\bar{x}	σ	Max.																
▲ ZEM-2B	10-1000	DC-1000	5.74	.07	7.0	8.5	55	50	30	25	25	20	55	45	30	20	25	20	V37	ad	59.95
▲ ZEM-4300	300-4300	DC-1000	6.65	.06	—	9.5	40	20	—	—	30	17	15	8	—	—	15	8	V37	af	79.95
ZFM-1W	10-750	DC-750	5.42	.14	7.0	8.0	50	45	45	30	35	25	45	40	40	25	27	20	K18	ad	51.95
ZFM-2	1-1000	DC-1000	5.72	.06	7.5	8.5	50	45	40	25	30	25	45	40	35	25	25	20	K18	ad	53.95
ZFM-3	0.04-400	DC-400	4.78	.03	7.0	8.0	60	50	50	35	35	25	55	40	45	30	35	25	K18	ad	61.95
† ZFM-4	5-1250	DC-1250	5.70	.34	7.5	8.5	50	45	40	30	30	25	45	40	35	25	25	20	K18	ad	61.95
ZFM-5X	1-1500	1-1000	5.9	.10	7.0	9.0	60	40	40	20	28	17	60	45	45	25	38	20	K18	ae	59.95
ZFM-11	1-2000	5-600	7.03	.17	8.5	9.0	50	45	35	25	25	20	45	40	27	20	25	20	K18	ad	89.95
ZFM-12	800-1250	50-90	5.67	.12	—	7.5	35	25	35	25	35	25	30	20	30	20	30	20	K18	ad	79.95
▲ ZFM-2000	100-2000	DC-600	7.49	.20	9.5	9.5	—	—	37	20	—	—	—	—	—	—	30	20	K18	ad	71.95
▲ ZFM-4212	2000-4200	DC-1300	5.44	.088	—	8.5	—	—	25	17	—	—	—	—	18	10	—	—	K18	ad	54.95
▲ ZAM-42	1500-4200	DC-500	5.67	.11	—	8.5	25	14	25	14	25	14	18	10	18	10	18	10	F14	af	54.95

L = low range [f_L to $10 f_L$]

M = mid range [$10 f_L$ to $f_U/2$]
 m = mid band [$2f_L$ to $f_U/2$]

U = upper range [$f_U/2$ to f_U]

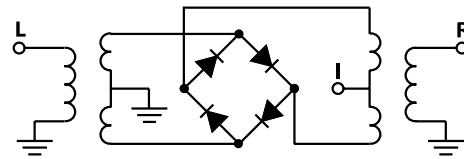
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MCL NO.

- ZAD-1B(BNC)
- ZAD-4B
- ZAD-6B
- ZEM-2
- ZFM-1W
- ZFM-2
- ZFM-3
- ZFM-3 (SMA)
- ZFM-3B
- ZFM-11(SMA)
- ZLW-1W
- ZLW-2
- ZLW-2B
- ZP-10514
- ZP-10514(BNC)

NSN

- 5985-00-280-7750
- 5895-01-127-0376
- 5895-01-344-7843
- 5895-01-235-7834
- 5895-01-412-3037
- 4935-01-230-3782
- 5895-01-257-9523
- 5895-01-214-7362
- 5895-01-381-9289
- 6625-01-415-2182
- 5895-00-607-7010
- 6920-01-037-1974
- 5840-01-186-8398
- 6625-01-108-6156
- 5895-01-384-7453



coaxial connections

see case style outline drawings

PORT	ad	ae	af	ag	hg
LO	1	1	2	L	L
RF	2	3	1	R	X
IF	3	2	3	X	R
GND EXT.	—	—	—	—	—
CASE GND	—	—	—	—	—
NOT USED	—	—	—	—	—



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