

Up Converter Frequency Mixer

Level 17 (LO Power +17 dBm) 10 to 7100 MHz

ZX05-U712H-S+



Generic photo used for illustration purposes only

CASE STYLE: FL905

Connectors	Model
SMA	ZX05-U712H-S+

+RoHS Compliant

The +Suffix identifies RoHS Compliance. See our web site for RoHS Compliance methodologies and qualifications

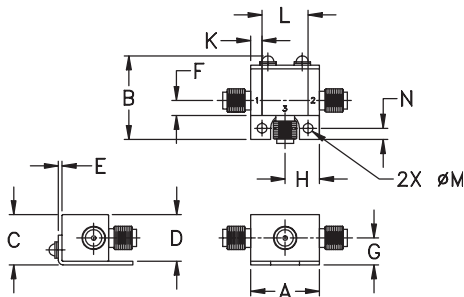
Maximum Ratings

Operating Temperature	-40°C to 85°C
Storage Temperature	-55°C to 100°C
IF Power	100mW
Permanent damage may occur if any of these limits are exceeded.	

Coaxial Connections

LO	1
IF (IN)	2
RF (OUT)	3

Outline Drawing



Outline Dimensions (inch mm)

A	B	C	D	E	F	G
.74	.90	.54	.50	.04	.16	.29
18.80	22.86	13.72	12.70	1.02	4.06	7.37
H	J	K	L	M	N	wt
.37	--	.122	.496	.106	.122	grams
9.40	--	3.10	12.60	2.69	3.10	20.0

Features

- up converter mixer
- low conversion loss, 7.5 dB typ.
- high IP3, 27 dBm typ.
- rugged construction
- small size
- protected by US patents, 6,790,049 and 7,027,795

Applications

- cellular infrastructure
- WIMAX
- line-of-sight links
- wide band receivers
- bluetooth

Electrical Specifications

FREQUENCY (MHz)			CONVERSION LOSS* (dB)			LO-IF (IN) ISOLATION (dB)		LO-RF (OUT) ISOLATION (dB)		IP3 at center band (dBm)
IF (IN)	LO	RF (OUT)	Typ.	σ^{**}	Max.	Typ.	Min.	Typ.	Min.	
2600-7100	10-1780	2600-7100	7.5	0.3	9.2	30	17	24	15	27

1 dB COMPR. +14 dBm typ.

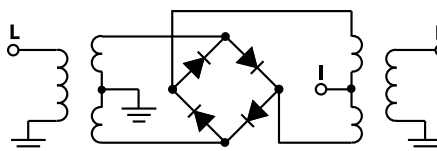
* Conversion Loss at 30 MHz LO

** σ is a standard deviation

Typical Performance Data

Frequency (MHz)			Conversion Loss (dB)	VSWR RF Port (:1)	Frequency (MHz)	Isolation L-I (dB)	Isolation L-R (dB)	VSWR LO Port (:1)
IF (IN)	LO	RF (OUT)						
			LO +17dBm	LO +17dBm		LO +17dBm	LO +17dBm	LO +17dBm
2600.10	30.00	2630.10	7.83	1.32	10.10	69.72	54.09	1.33
2800.10	30.00	2830.10	7.15	1.47	100.10	51.66	38.75	1.32
3000.10	30.00	3030.10	6.97	1.61	200.10	45.94	34.10	1.38
3400.10	30.00	3430.10	7.08	2.07	300.10	41.85	31.17	1.48
3600.10	30.00	3630.10	7.22	2.23	400.10	39.69	28.59	1.60
3800.10	30.00	3830.10	7.51	2.42	500.10	37.41	26.06	1.62
4000.10	30.00	4030.10	7.43	2.55	600.10	35.37	24.40	1.62
4400.10	30.00	4430.10	7.48	2.77	700.10	34.28	22.62	1.63
4600.10	30.00	4630.10	7.18	2.72	800.10	32.48	21.55	1.67
4800.10	30.00	4830.10	7.28	2.65	900.10	31.01	21.20	1.80
5000.10	30.00	5030.10	7.20	2.62	1000.10	30.18	21.05	1.97
5200.10	30.00	5230.10	7.40	2.57	1100.10	28.34	20.83	2.20
5400.10	30.00	5430.10	7.53	2.46	1200.10	27.15	20.30	2.41
5600.10	30.00	5630.10	7.76	2.40	1300.10	26.11	19.80	2.56
5800.10	30.00	5830.10	7.81	2.16	1400.10	24.55	19.67	2.67
6000.10	30.00	6030.10	7.83	1.96	1500.10	23.55	19.71	2.76
6200.10	30.00	6230.10	7.55	1.73	1600.10	22.84	19.33	2.93
6400.10	30.00	6430.10	7.33	1.58	1700.10	21.54	18.71	3.00
6600.10	30.00	6630.10	7.09	1.59	1720.10	21.24	18.63	3.06
7100.10	30.00	7130.10	7.37	1.80	1780.10	20.77	18.34	3.08

Electrical Schematic



Notes

- Performance and quality attributes and conditions not expressly stated in this specification document are intended to be excluded and do not form a part of this specification document.
- Electrical specifications and performance data contained in this specification document are based on Mini-Circuits' applicable established test performance criteria and measurement instructions.
- The parts covered by this specification document are subject to Mini-Circuits standard limited warranty and terms and conditions (collectively, "Standard Terms"); Purchasers of this part are entitled to the rights and benefits contained therein. For a full statement of the Standard Terms and the exclusive rights and remedies thereunder, please visit Mini-Circuits' website at www.minicircuits.com/VCLStore/terms.jsp

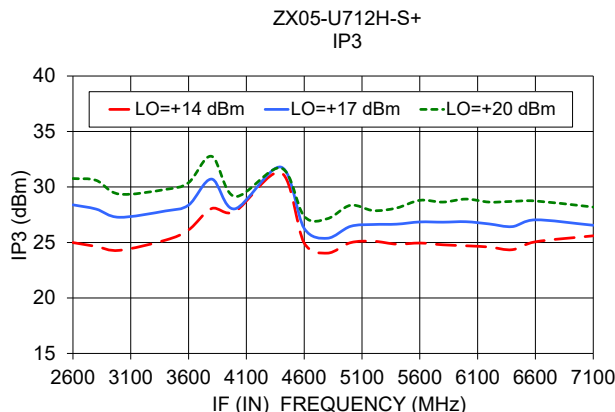
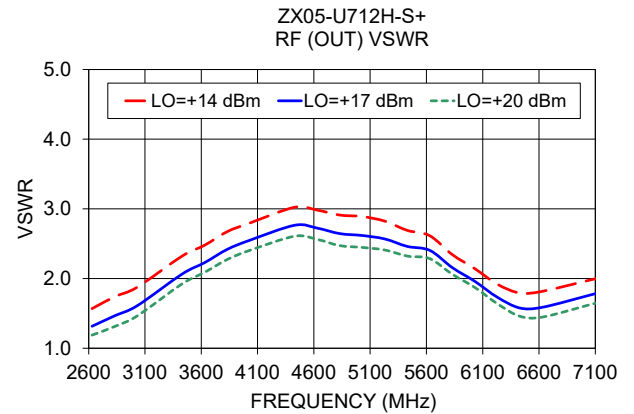
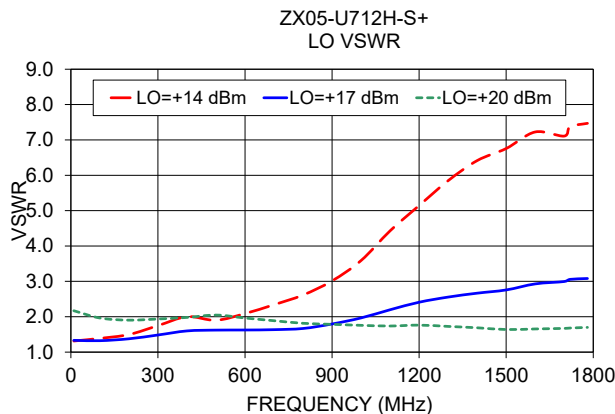
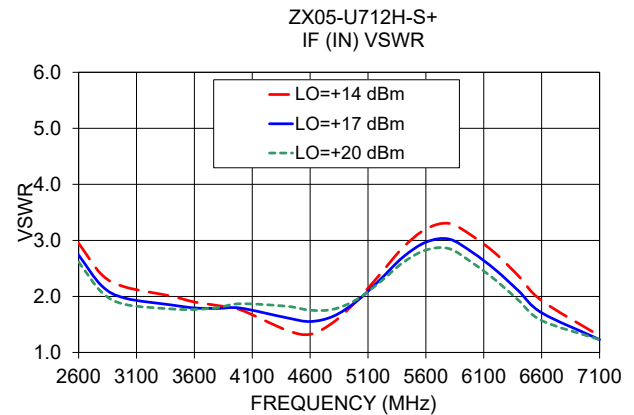
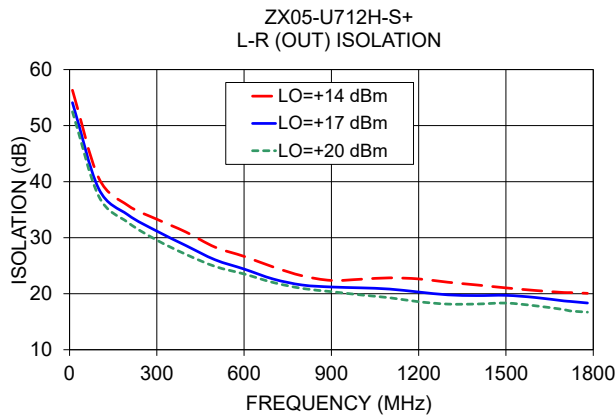
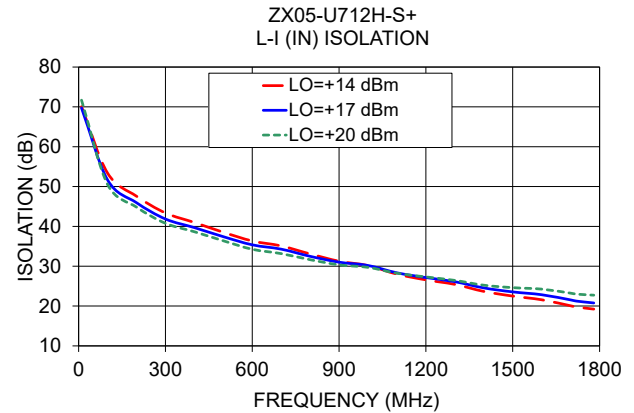
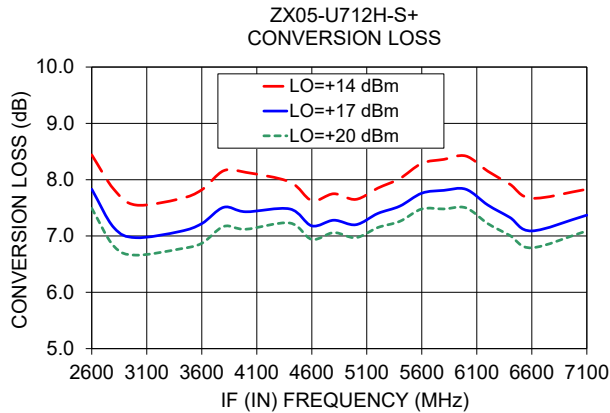


www.minicircuits.com P.O. Box 350166, Brooklyn, NY 11235-0003 (718) 934-4500 sales@minicircuits.com

REV. B
M171494
ZX05-U712H-S+
ED-12902/18
DJ/CP/AM
200811
Page 1 of 2

Performance Charts

ZX05-U712H-S+



Notes

- Performance and quality attributes and conditions not expressly stated in this specification document are intended to be excluded and do not form a part of this specification document.
- Electrical specifications and performance data contained in this specification document are based on Mini-Circuit's applicable established test performance criteria and measurement instructions.
- The parts covered by this specification document are subject to Mini-Circuits standard limited warranty and terms and conditions (collectively, "Standard Terms"); Purchasers of this part are entitled to the rights and benefits contained therein. For a full statement of the Standard Terms and the exclusive rights and remedies thereunder, please visit Mini-Circuits' website at www.minicircuits.com/MCLStore/terms.jsp



Frequency Mixer (Upconverter)

ZX05-U712H-S+

Typical Performance Data

IF INPUT (MHz)	LO INPUT (MHz)	RF OUTPUT (MHz)	CONVERSION LOSS (dB)			IP-3 INPUT (dBm)			LO INPUT (MHz)	LO-IF ISOLATION (dB)			LO-RF ISOLATION (dB)		
			@LO (dBm)			@LO (dBm)				@LO (dBm)			@LO (dBm)		
			+14	+17	+20	+14	+17	+20		+14	+17	+20	+14	+17	+20
2600	30	2630	8.44	7.83	7.49	24.99	28.39	30.76	10	70.07	69.72	71.69	56.31	54.09	52.46
2700	30	2730	8.09	7.47	7.14	24.80	27.84	30.14	20	68.04	65.30	63.95	52.38	50.43	48.97
2800	30	2830	7.83	7.15	6.82	24.64	28.01	30.60	30	63.46	60.88	59.30	49.58	47.50	46.02
2900	30	2930	7.67	7.08	6.76	24.66	27.89	30.59	40	61.67	58.68	56.99	47.68	45.27	43.69
3000	30	3030	7.55	6.97	6.66	24.29	27.27	29.36	50	59.33	56.93	55.40	45.91	43.59	42.06
3100	30	3130	7.62	7.03	6.73	24.25	27.57	29.80	60	57.68	55.58	54.32	44.41	42.44	41.04
3200	30	3230	7.61	7.02	6.71	24.52	27.42	29.22	70	55.62	53.85	52.78	43.28	41.35	39.99
3300	30	3330	7.56	7.00	6.70	24.61	27.24	29.05	80	54.86	53.16	52.07	42.31	40.23	38.83
3400	30	3430	7.66	7.08	6.77	25.21	27.84	29.78	90	54.35	52.72	51.67	41.59	39.47	38.06
3500	30	3530	7.74	7.16	6.81	25.53	28.00	30.26	100	53.38	51.66	50.52	40.68	38.75	37.42
3600	30	3630	7.82	7.22	6.87	26.13	28.37	30.39	120	51.89	49.72	48.39	39.50	37.59	36.26
3700	30	3730	7.95	7.34	6.99	26.50	29.62	31.29	140	50.22	48.48	46.59	38.38	36.28	34.96
3800	30	3830	8.16	7.51	7.17	28.06	30.71	32.76	160	48.88	47.24	46.11	37.36	35.54	34.28
3900	30	3930	8.10	7.49	7.14	28.44	29.30	30.34	180	47.97	46.44	45.40	36.65	34.65	33.32
3950	30	3980	8.06	7.50	7.21	27.85	28.25	29.52	200	47.57	45.94	44.83	35.77	34.10	32.74
4000	30	4030	8.13	7.43	7.12	27.78	28.03	29.14	220	46.18	44.31	43.13	35.44	33.37	31.80
4050	30	4080	7.81	7.29	7.06	26.78	27.44	28.71	240	45.59	43.84	42.67	34.57	32.78	31.28
4100	30	4130	8.39	7.79	7.46	30.04	28.70	30.10	260	44.26	42.74	41.73	34.37	32.17	30.54
4150	30	4180	7.84	7.35	7.09	26.75	27.70	29.28	300	43.37	41.85	40.77	33.29	31.17	29.56
4200	30	4230	8.21	7.66	7.36	29.04	28.29	30.20	340	41.89	40.46	39.37	32.24	30.06	28.51
4300	30	4330	8.05	7.57	7.30	32.00	30.43	31.96	360	41.54	40.28	39.27	32.09	29.46	27.81
4400	30	4430	7.96	7.48	7.23	31.29	31.79	31.71	380	40.66	39.51	38.54	31.08	28.95	27.48
4500	30	4530	7.83	7.36	7.11	27.65	28.64	29.64	420	40.03	38.65	37.52	30.43	28.27	26.76
4600	30	4630	7.63	7.18	6.94	24.95	26.27	27.36	460	39.06	37.98	37.02	29.45	27.15	25.72
4700	30	4730	7.58	7.14	6.90	23.81	24.99	26.54	500	38.52	37.41	36.38	28.31	26.06	24.87
4800	30	4830	7.75	7.28	7.06	24.04	25.38	27.14	540	37.24	36.24	35.26	27.62	25.38	24.30
4900	30	4930	7.69	7.26	7.02	24.56	26.08	27.38	580	37.54	36.57	35.53	26.95	24.79	23.91
5000	30	5030	7.65	7.20	6.97	24.98	26.45	28.35	620	36.23	35.34	34.28	26.28	24.03	23.29
5100	30	5130	7.79	7.33	7.08	25.23	26.49	28.40	660	35.46	34.72	33.71	25.46	23.28	22.59
5200	30	5230	7.85	7.40	7.15	25.11	26.62	27.87	700	35.09	34.28	33.16	24.77	22.62	22.00
5300	30	5330	7.88	7.43	7.17	25.08	26.78	27.93	740	33.85	33.18	32.24	23.95	22.03	21.50
5400	30	5430	8.02	7.53	7.26	24.85	26.65	28.11	780	33.49	32.84	31.98	23.38	21.59	21.07
5500	30	5530	8.17	7.67	7.40	25.16	26.85	28.59	820	32.47	31.98	31.20	22.79	21.27	20.73
5600	30	5630	8.29	7.76	7.48	24.95	26.85	28.80	860	31.89	31.55	30.84	22.43	21.32	20.64
5700	30	5730	8.42	7.86	7.57	24.91	26.76	28.42	900	31.25	31.01	30.34	22.37	21.20	20.37
5800	30	5830	8.36	7.81	7.48	24.79	26.83	28.64	940	30.53	30.47	29.96	22.14	21.02	20.11
5900	30	5930	8.44	7.86	7.53	24.84	26.85	28.84	980	29.80	29.84	29.40	22.30	21.04	19.91
6000	30	6030	8.42	7.83	7.50	24.70	26.87	28.91	1020	29.27	29.35	28.98	22.84	21.09	19.73
6100	30	6130	8.33	7.66	7.32	24.62	26.75	29.28	1060	28.95	29.16	28.93	23.07	21.14	19.71
6200	30	6230	8.15	7.55	7.22	24.59	26.67	28.64	1100	28.00	28.34	28.23	22.83	20.83	19.28
6300	30	6330	8.04	7.44	7.11	24.42	26.30	28.41	1140	27.76	28.16	28.10	22.83	20.70	19.04
6350	30	6380	8.02	7.40	7.09	24.20	26.44	28.27	1180	27.22	27.71	27.76	22.90	20.55	18.78
6400	30	6430	7.92	7.33	7.01	24.35	26.43	28.70	1220	26.48	27.00	27.13	22.54	20.17	18.42
6450	30	6480	7.94	7.35	7.00	24.57	26.35	28.60	1260	26.17	26.75	26.94	22.43	20.06	18.29
6500	30	6530	7.88	7.28	6.98	24.77	26.44	28.43	1300	25.44	26.11	26.44	22.05	19.80	18.15
6550	30	6580	7.87	7.29	6.97	24.89	26.78	28.43	1340	24.82	25.56	25.98	21.91	19.80	18.21
6600	30	6630	7.67	7.09	6.79	25.06	27.04	28.74	1380	24.10	25.01	25.66	21.77	19.88	18.37
6650	30	6680	7.70	7.06	6.75	25.28	26.87	28.45	1420	23.64	24.51	25.22	21.35	19.59	18.19
6700	30	6730	7.67	7.13	6.79	25.44	26.92	28.50	1460	22.84	23.87	24.79	21.35	19.80	18.35
6750	30	6780	7.61	7.07	6.78	25.64	26.67	27.96	1500	22.50	23.55	24.62	21.04	19.71	18.33
6800	30	6830	7.64	7.12	6.81	25.38	26.39	28.30	1540	21.81	22.97	24.21	20.91	19.68	18.13
6850	30	6880	7.55	7.04	6.76	24.90	26.12	27.69	1580	21.25	22.55	23.95	20.78	19.66	18.14
6900	30	6930	7.70	7.17	6.87	25.07	26.73	28.02	1620	21.05	22.34	23.81	20.52	19.24	17.71
6950	30	6980	7.65	7.14	6.85	25.32	26.57	28.12	1660	20.36	21.91	23.55	20.44	19.20	17.61
7000	30	7030	7.70	7.21	6.91	25.42	26.98	28.43	1700	20.06	21.54	23.23	20.21	18.71	17.16
7050	30	7080	7.72	7.22	6.93	25.45	26.67	28.24	1740	19.60	21.18	23.02	20.15	18.53	16.80
7100	30	7130	7.83	7.37	7.09	25.60	26.55	28.19	1780	19.23	20.77	22.73	20.07	18.34	16.71



P.O. Box 350166, Brooklyn, New York 11235-0003 (718) 934-4500 • Fax (718) 332-4661 For detailed performance specs & shopping online see Mini-Circuits web site
The Design Engineers Search Engine Provides ACTUAL Data Instantly From MINI-CIRCUITS At: www.minicircuits.com

IF/RF MICROWAVE COMPONENTS

REV. OR
ZX05-U712H-S+
12/17/2018
Page 1 of 2

Frequency Mixer (Upconverter)

ZX05-U712H-S+

Typical Performance Data

IF INPUT (MHz)	IF VSWR (:1)			LO INPUT (MHz)	LO VSWR (:1)			RF OUTPUT (MHz)	RF VSWR (:1)		
	@LO (dBm)				@LO (dBm)				@LO (dBm)		
	+14	+17	+20		+14	+17	+20		+14	+17	+20
2600	2.95	2.74	2.61	10.1	1.31	1.33	2.17	2630	1.57	1.32	1.19
2700	2.61	2.41	2.29	20.1	1.28	1.24	1.92	2730	1.65	1.39	1.24
2800	2.39	2.19	2.07	30.1	1.31	1.26	1.98	2830	1.74	1.47	1.31
2900	2.25	2.05	1.94	40.1	1.42	1.30	2.13	2930	1.80	1.53	1.38
3000	2.17	1.97	1.86	50.1	1.38	1.30	2.11	3030	1.88	1.61	1.46
3100	2.13	1.93	1.82	60.1	1.32	1.27	1.95	3130	1.99	1.72	1.57
3200	2.07	1.88	1.78	70.1	1.37	1.28	1.91	3230	2.08	1.83	1.69
3300	2.04	1.86	1.77	80.1	1.39	1.28	1.98	3330	2.20	1.95	1.81
3400	2.01	1.85	1.78	90.1	1.39	1.31	2.04	3430	2.32	2.07	1.92
3500	1.95	1.82	1.77	100.1	1.39	1.32	1.96	3530	2.43	2.17	2.03
3600	1.90	1.80	1.77	120.1	1.42	1.30	1.90	3630	2.48	2.23	2.09
3700	1.86	1.78	1.77	140.1	1.45	1.38	2.10	3730	2.55	2.30	2.15
3800	1.84	1.79	1.80	160.1	1.49	1.37	1.95	3830	2.67	2.42	2.27
3900	1.81	1.79	1.84	180.1	1.51	1.42	2.08	3930	2.77	2.51	2.37
3950	1.76	1.77	1.83	200.1	1.50	1.38	1.90	3980	2.74	2.50	2.36
4000	1.76	1.79	1.87	220.1	1.66	1.44	2.03	4030	2.80	2.55	2.40
4050	1.70	1.74	1.83	240.1	1.58	1.46	1.98	4080	2.80	2.56	2.43
4100	1.74	1.82	1.93	260.1	1.69	1.43	1.98	4130	2.87	2.62	2.48
4150	1.62	1.72	1.85	300.1	1.75	1.48	1.94	4180	2.95	2.69	2.55
4200	1.63	1.74	1.89	340.1	1.85	1.55	1.95	4230	2.92	2.67	2.52
4300	1.51	1.69	1.87	360.1	1.89	1.54	2.06	4330	2.96	2.71	2.56
4400	1.40	1.62	1.82	380.1	1.79	1.53	1.94	4430	3.02	2.77	2.61
4500	1.33	1.57	1.78	420.1	1.86	1.57	1.94	4530	3.04	2.78	2.62
4600	1.32	1.55	1.75	460.1	2.00	1.64	2.01	4630	2.98	2.72	2.56
4700	1.40	1.57	1.74	500.1	1.90	1.62	2.05	4730	2.94	2.68	2.51
4800	1.54	1.65	1.77	540.1	1.94	1.64	2.05	4830	2.91	2.65	2.47
4900	1.72	1.77	1.84	580.1	2.07	1.67	2.01	4930	2.87	2.60	2.43
5000	1.92	1.91	1.94	620.1	2.15	1.62	1.97	5030	2.89	2.62	2.45
5100	2.14	2.08	2.07	660.1	2.16	1.60	1.90	5130	2.85	2.59	2.42
5200	2.39	2.29	2.25	700.1	2.34	1.63	1.89	5230	2.82	2.57	2.41
5300	2.65	2.52	2.44	740.1	2.39	1.64	1.87	5330	2.75	2.51	2.36
5400	2.87	2.70	2.60	780.1	2.48	1.62	1.81	5430	2.69	2.46	2.32
5500	3.05	2.85	2.73	820.1	2.60	1.63	1.78	5530	2.64	2.42	2.30
5600	3.20	2.97	2.83	860.1	2.74	1.71	1.79	5630	2.61	2.40	2.29
5700	3.30	3.03	2.88	900.1	3.01	1.80	1.78	5730	2.47	2.27	2.16
5800	3.30	3.02	2.85	940.1	3.14	1.84	1.77	5830	2.34	2.16	2.06
5900	3.18	2.89	2.71	980.1	3.41	1.92	1.76	5930	2.24	2.06	1.97
6000	3.08	2.79	2.60	1020.1	3.76	2.01	1.75	6030	2.14	1.96	1.87
6100	2.92	2.62	2.44	1060.1	4.11	2.10	1.73	6130	2.00	1.82	1.74
6200	2.77	2.48	2.29	1100.1	4.43	2.20	1.74	6230	1.92	1.73	1.64
6300	2.58	2.30	2.12	1140.1	4.82	2.30	1.74	6330	1.84	1.64	1.53
6350	2.48	2.20	2.03	1180.1	5.19	2.39	1.76	6380	1.81	1.60	1.48
6400	2.36	2.10	1.93	1220.1	5.30	2.46	1.77	6430	1.79	1.58	1.46
6450	2.27	2.01	1.85	1260.1	6.01	2.56	1.76	6480	1.79	1.57	1.44
6500	2.15	1.90	1.75	1300.1	5.85	2.56	1.73	6530	1.80	1.57	1.44
6550	2.04	1.81	1.66	1340.1	6.51	2.66	1.72	6580	1.81	1.58	1.44
6600	1.92	1.71	1.57	1380.1	6.76	2.70	1.70	6630	1.82	1.59	1.45
6650	1.81	1.61	1.48	1420.1	6.53	2.69	1.68	6680	1.86	1.63	1.48
6700	1.69	1.50	1.38	1460.1	7.60	2.84	1.67	6730	1.88	1.65	1.50
6750	1.59	1.42	1.31	1500.1	6.76	2.76	1.64	6780	1.91	1.67	1.53
6800	1.48	1.32	1.22	1540.1	7.83	2.97	1.67	6830	1.91	1.68	1.54
6850	1.39	1.23	1.14	1580.1	7.63	2.97	1.66	6880	1.94	1.71	1.56
6900	1.30	1.16	1.07	1620.1	7.44	2.98	1.66	6930	1.96	1.73	1.59
6950	1.26	1.12	1.03	1660.1	8.20	3.16	1.70	6980	1.99	1.77	1.62
7000	1.23	1.11	1.08	1700.1	7.11	3.00	1.67	7030	2.00	1.78	1.64
7050	1.24	1.16	1.15	1740.1	8.01	3.17	1.71	7080	2.02	1.80	1.66
7100	1.30	1.23	1.23	1780.1	7.47	3.08	1.70	7130	2.01	1.80	1.66



P.O. Box 350166, Brooklyn, New York 11235-0003 (718) 934-4500 • Fax (718) 332-4661 For detailed performance specs & shopping online see Mini-Circuits web site
The Design Engineers Search Engine Provides ACTUAL Data Instantly From MINI-CIRCUITS At: www.minicircuits.com

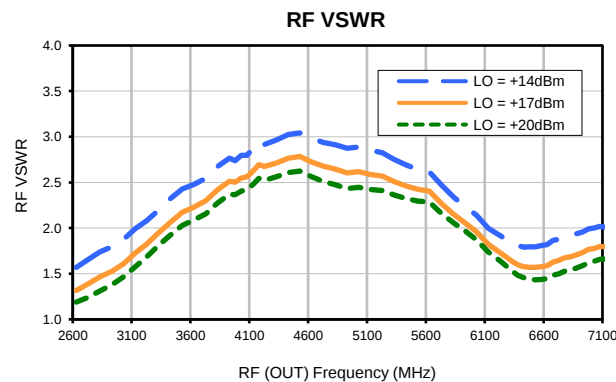
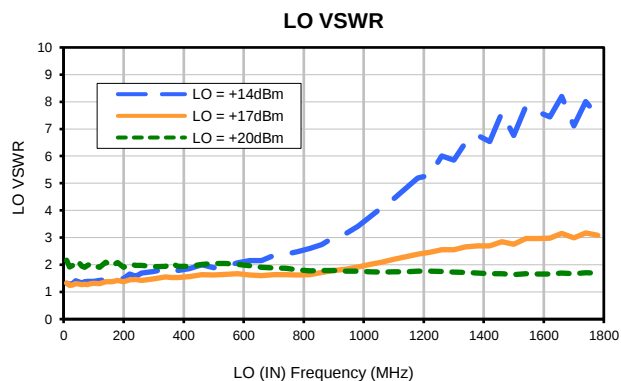
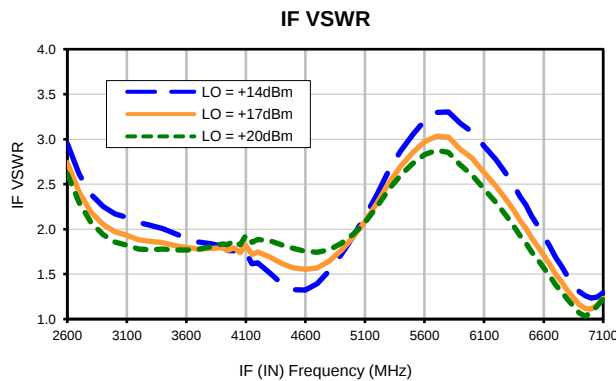
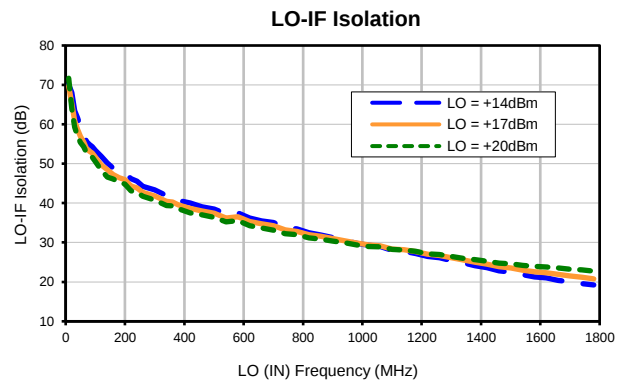
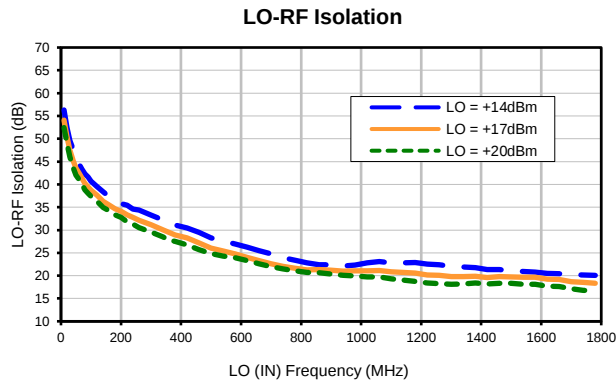
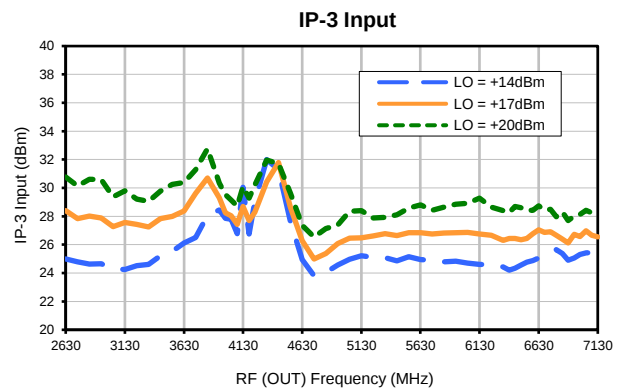
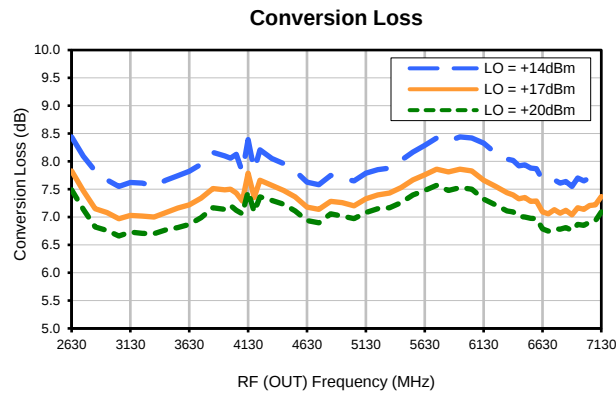
IF/RF MICROWAVE COMPONENTS

REV. OR
ZX05-U712H-S+
12/17/2018
Page 2 of 2

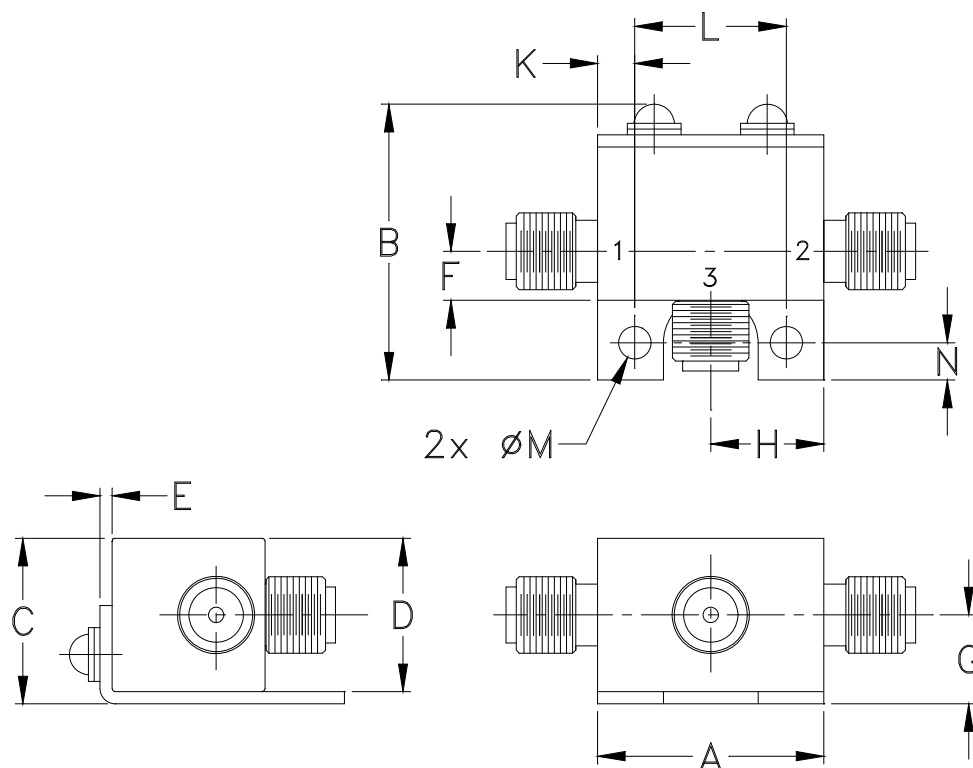
Frequency Mixer (Upconverter)

ZX05-U712H-S+

Typical Performance Curves



Outline Dimensions



CASE #.	A	B	C	D	E	F	G	H	J	K	L	M	N	WT, GRAM
FL905	.74 (18.80)	.90 (22.86)	.54 (13.72)	.50 (12.70)	.04 (1.02)	.16 (4.06)	.29 (7.37)	.37 (9.40)	- -	.122 (3.10)	.496 (12.60)	.106 (2.69)	.122 (3.10)	20.0

Dimensions are in inches (mm). Tolerances: 2Pl. $\pm .03$; 3Pl. $\pm .015$.

Tolerance on hole size and interaxes dimensions to be $\pm .005$.

Notes:

- Case material: Brass.
- Case finish: Nickel plate.



INTERNET <http://www.minicircuits.com>

P.O. Box 350166, Brooklyn, New York 11235-0003 (718) 934-4500 Fax (718) 332-4661

Distribution Centers NORTH AMERICA 800-654-7949 • 417-335-5935 • Fax 417-335-5945 • EUROPE 44-1252-832600 • Fax 44-1252-837010

Mini-Circuits ISO 9001 & ISO 14001 Certified



All Mini-Circuits products are manufactured under exacting quality assurance and control standards, and are capable of meeting published specifications after being subjected to any or all of the following physical and environmental test.

Specification	Test/Inspection Condition	Reference/Spec
Operating Temperature	-40° to 85°C	Individual Model Data Sheet
Storage Temperature	-55° to 100° C Ambient Environment	Individual Model Data Sheet
Barometric Pressure	100,000 Feet	MIL-STD-202, Method 105, Condition D
Humidity	90% RH, 65°C Units may require bake-out after humidity to restore full performance.	MIL-STD-202, Method 103
Thermal Shock	-65° to 125°C, 5 cycles	MIL-STD-202, Method 107, Condition B
Vibration (High Frequency)	20g peak, 10-2000 Hz, 12 times in each of three perpendicular directions (total 36)	MIL-STD-202, Method 204, Condition D
Mechanical Shock	100g, 6ms sawtooth, 3 shocks each direction 3 axes (total 18)	MIL-STD-202, Method 213, Condition I