Coaxial

Frequency Mixer

ZX05-10H-S+

Level 17 (LO Power +17 dBm) 10 to 1000 MHz

Generic photo used for illustration purposes only

CASE STYLE: FL905

Connectors	Model
SMA	ZX05-10H-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
RF Power	200mW
IF Current	40mA

Permanent damage may occur if any of these limits are exceeded.

Coaxial Connections

LO	1
RF	2
IF	3

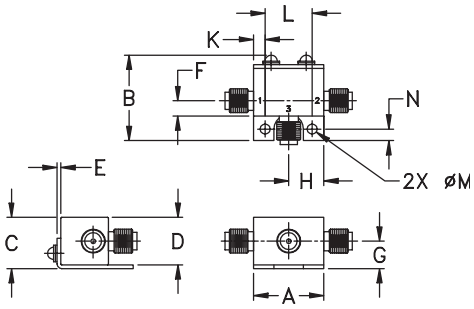
Features

- rugged construction
- small size
- low conversion loss
- high L-R isolation
- protected by US Patents 6,133,525; 6,790,049 & 6,947,717

Applications

- cellular
- PCS
- instrumentation
- satellite communication

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

Electrical Specifications (T_{AMB}=25°C)

FREQUENCY (MHz)		CONVERSION LOSS (dB)				LO-RF ISOLATION (dB)						LO-IF ISOLATION (dB)						IP3 at center band (dBm)
		Mid-Band m			Total Range	L		M		U		L		M		U		
LO/RF f_L-f_U	IF	$\overline{X}$	σ	Max.	Max.	Typ.	Min.	Typ.	Min.	Typ.	Min.	Typ.	Min.	Typ.	Min.	Typ.	Min.	Typ.
10-1000	DC-800	7.0	0.1	8.5	9.5	68	52	55	38	47	25	46	30	32	20	26	13	22

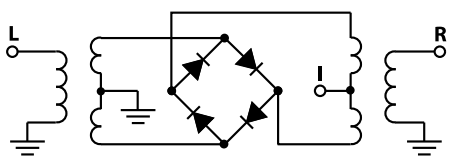
1 dB COMP.: +14 dBm typ.
Conversion Loss increases when IF is above 150 MHz.

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

Typical Performance Data

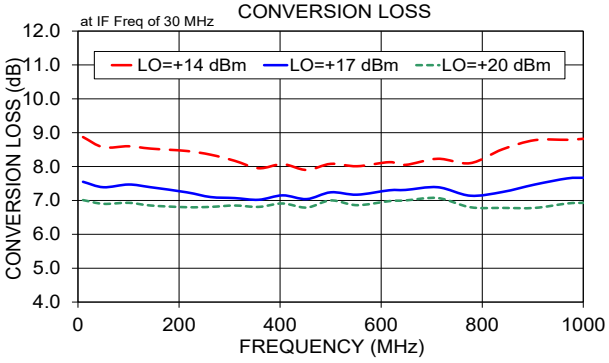
Frequency (MHz)		Conversion Loss (dB)	Isolation L-R (dB)	Isolation L-I (dB)	VSWR RF Port (:1)	VSWR LO Port (:1)
RF	LO	LO +17dBm	LO +17dBm	LO +17dBm	LO +17dBm	LO +17dBm
10.10	40.10	7.55	81.69	62.06	1.43	1.13
50.10	80.10	7.39	69.91	47.32	1.39	1.09
100.10	70.10	7.47	64.18	40.85	1.40	1.13
143.85	113.85	7.39	61.39	37.09	1.39	1.18
215.10	185.10	7.24	56.02	32.50	1.38	1.20
262.60	232.60	7.10	54.66	30.65	1.38	1.19
310.10	280.10	7.07	53.72	29.51	1.40	1.20
357.60	327.60	7.02	53.34	28.60	1.39	1.17
405.10	375.10	7.15	51.82	28.24	1.40	1.20
452.60	422.60	7.04	50.25	27.84	1.39	1.18
500.10	470.10	7.24	48.94	27.66	1.41	1.24
552.10	522.10	7.17	46.94	27.44	1.39	1.23
616.10	586.10	7.30	45.19	27.21	1.38	1.30
648.10	618.10	7.31	44.07	27.04	1.38	1.32
712.10	682.10	7.39	42.17	25.98	1.35	1.34
776.10	746.10	7.14	39.71	24.50	1.32	1.45
840.10	810.10	7.25	36.65	23.70	1.28	1.53
904.10	874.10	7.47	34.81	23.29	1.26	1.56
968.10	938.10	7.65	33.06	22.47	1.23	1.69
1000.10	970.10	7.67	32.44	21.87	1.23	1.70

Electrical Schematic

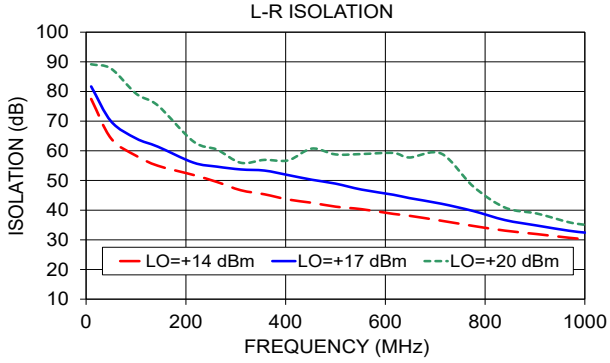


Notes
A. Performance and quality attributes and conditions not expressly stated in this specification document are intended to be excluded and do not form a part of this specification document.
B. Electrical specifications and performance data contained in this specification document are based on Mini-Circuit's applicable established test performance criteria and measurement instructions.
C. 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

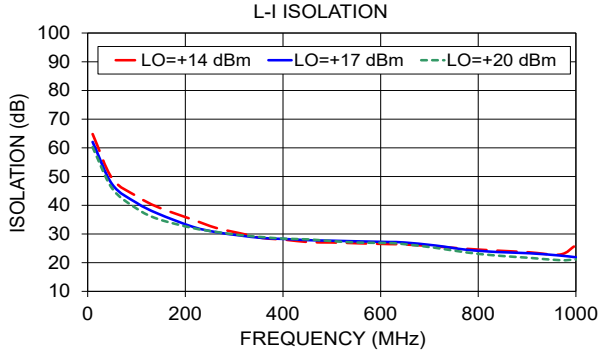
ZX05-10H-S+
CONVERSION LOSS
at IF Freq of 30 MHz



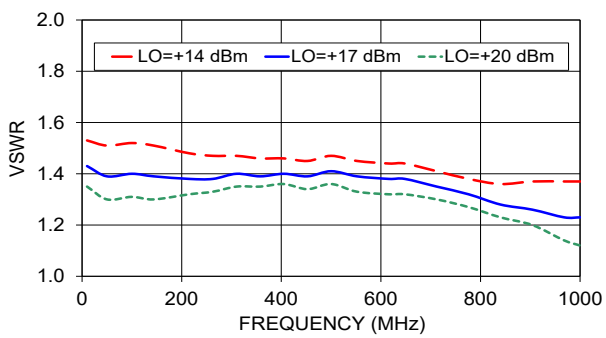
ZX05-10H-S+
L-R ISOLATION



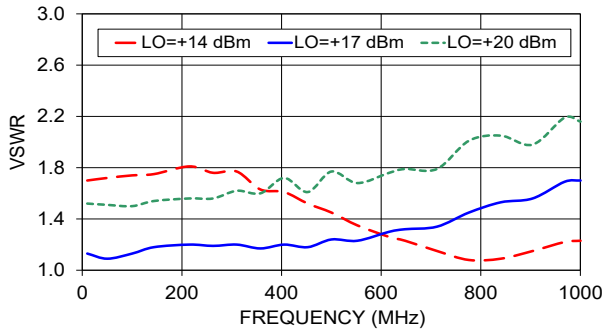
ZX05-10H-S+
L-I ISOLATION



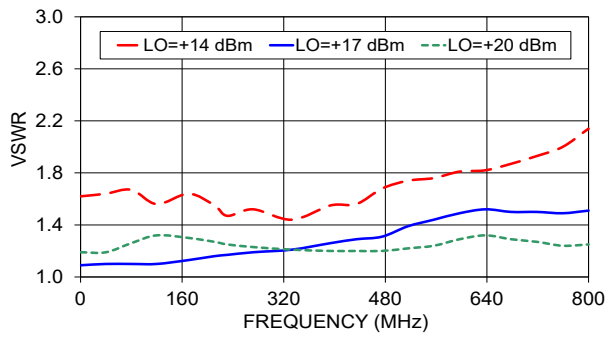
ZX05-10H-S+
RF VSWR



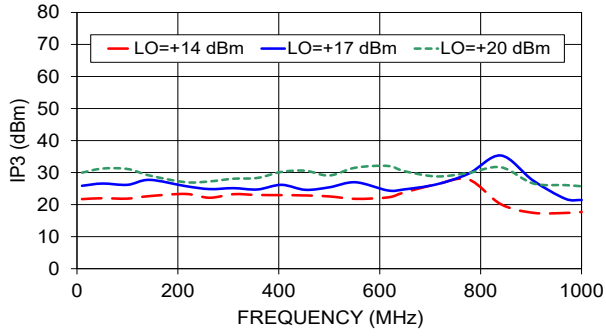
ZX05-10H-S+
LO VSWR



ZX05-10H-S+
IF VSWR



ZX05-10H-S+
IP3



Frequency Mixer ZX05-10H+

Typical Performance Data

RF (MHz)	LO (MHz)	CONVERSION LOSS (dB) @LO (dBm)		
		+14	+17	+20
10.1	40.1	8.87	7.55	7.01
15.1	45.1	8.66	7.42	6.91
20.1	45.1	8.62	7.42	6.85
35.1	50.1	8.63	7.39	6.90
50.1	65.1	8.57	7.39	6.90
75.1	70.1	8.56	7.45	6.95
100.1	80.1	8.60	7.47	6.93
120.1	90.1	8.56	7.40	6.89
143.9	113.9	8.53	7.39	6.85
167.6	137.6	8.56	7.47	6.86
191.4	161.4	8.50	7.37	6.81
215.1	185.1	8.46	7.24	6.80
238.9	208.9	8.48	7.18	6.79
262.6	232.6	8.35	7.10	6.81
286.4	256.4	8.22	7.08	6.80
310.1	280.1	8.17	7.07	6.85
333.9	303.9	8.10	7.06	6.83
357.6	327.6	7.95	7.02	6.81
381.4	351.4	8.02	7.06	6.82
405.1	375.1	8.07	7.15	6.91
428.9	398.9	7.97	7.08	6.82
452.6	422.6	7.90	7.04	6.79
476.4	446.4	7.98	7.17	6.89
500.1	470.1	8.08	7.24	7.00
520.1	490.1	8.05	7.17	6.93
552.1	522.1	8.01	7.17	6.86
584.1	554.1	8.05	7.23	6.90
616.1	586.1	8.13	7.30	6.98
648.1	618.1	8.05	7.31	7.00
680.1	650.1	7.99	7.26	6.97
712.1	682.1	8.23	7.39	7.07
744.1	714.1	8.11	7.28	6.96
776.1	746.1	8.10	7.14	6.80
808.1	778.1	8.41	7.27	6.86
840.1	810.1	8.51	7.25	6.78
872.1	842.1	8.60	7.32	6.76
904.1	874.1	8.78	7.47	6.78
936.1	906.1	8.93	7.70	6.90
968.1	938.1	8.79	7.65	6.91
1000.1	970.1	8.82	7.67	6.93

LO (MHz)	LO-RF ISOLATION (dB) @LO (dBm)			LO-IF ISOLATION (dB) @LO (dBm)		
	+14	+17	+20	+14	+17	+20
40.1	77.47	81.69	89.16	64.81	62.06	60.23
45.1	74.23	78.85	88.94	60.94	58.72	56.72
45.1	60.79	66.62	86.56	45.55	43.40	41.82
50.1	72.06	76.53	88.41	58.40	56.02	54.19
65.1	67.27	72.77	90.21	52.83	50.66	49.21
70.1	58.34	64.18	79.27	43.19	40.85	38.87
80.1	64.14	69.91	87.68	49.36	47.32	45.88
90.1	56.61	62.90	79.14	41.45	39.09	37.09
113.9	54.97	61.39	75.26	39.34	37.09	35.22
137.6	54.08	59.64	70.43	37.65	35.18	33.78
161.4	53.10	57.55	66.08	36.33	33.65	32.62
185.1	51.86	56.02	63.15	34.99	32.50	32.07
208.9	50.46	55.16	61.80	33.41	31.38	31.35
232.6	49.48	54.66	60.38	32.13	30.65	30.73
256.4	48.01	54.25	57.98	31.25	29.99	30.02
280.1	46.71	53.72	55.97	30.32	29.51	29.64
303.9	45.87	53.66	56.57	29.55	29.32	29.57
327.6	45.34	53.34	56.95	28.61	28.60	28.90
351.4	44.53	52.84	56.56	28.41	28.55	28.65
375.1	43.58	51.82	56.78	27.98	28.24	28.34
398.9	42.91	50.87	60.62	27.69	28.23	28.52
422.6	42.49	50.25	60.75	27.16	27.84	28.11
446.4	41.85	49.83	58.79	27.08	27.70	27.76
470.1	41.18	48.94	58.79	27.03	27.66	27.52
490.1	40.73	48.14	59.78	26.78	27.49	27.41
522.1	40.33	46.94	58.91	27.76	27.44	27.00
554.1	39.56	46.14	57.11	26.77	27.45	26.86
586.1	38.74	45.19	59.28	26.47	27.21	26.85
618.1	38.10	44.07	57.75	26.34	27.04	26.46
650.1	37.30	43.38	57.70	26.05	26.51	25.79
682.1	36.44	42.17	59.06	25.66	25.98	25.18
714.1	35.63	40.88	49.58	25.29	25.40	24.59
746.1	34.68	39.71	48.00	24.83	24.50	23.56
778.1	33.78	38.19	45.83	24.57	24.11	23.16
810.1	33.09	36.65	40.85	24.19	23.70	22.44
842.1	32.45	35.65	40.06	23.83	23.22	21.64
874.1	31.93	34.81	38.85	23.62	23.29	21.70
906.1	31.38	33.75	36.21	23.22	22.96	21.37
938.1	30.70	33.06	35.92	22.86	22.47	20.85
970.1	30.22	32.44	35.05	26.14	21.87	21.14

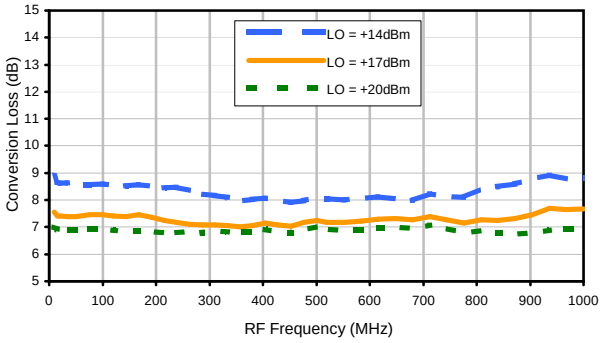
LO (MHz)	RF (MHz)	IP3 Input (dBm) @LO (dBm)
		+17
40.1	10.1	25.90
45.1	15.1	26.00
45.1	20.1	26.20
50.1	35.1	26.10
65.1	50.1	26.60
70.1	75.1	25.80
80.1	100.1	26.20
90.1	120.1	27.00
113.9	143.9	27.70
137.6	167.6	26.40
161.4	191.4	26.00
185.1	215.1	25.80
208.9	238.9	25.10
232.6	262.6	24.90
256.4	286.4	24.90
280.1	310.1	25.10
303.9	333.9	24.80
327.6	357.6	24.70
351.4	381.4	25.20
375.1	405.1	26.20
398.9	428.9	25.60
422.6	452.6	24.60
446.4	476.4	24.80
470.1	500.1	25.40
490.1	520.1	26.10
522.1	552.1	27.00
554.1	584.1	25.50
586.1	616.1	24.40
618.1	648.1	24.70
650.1	680.1	25.20
682.1	712.1	26.30
714.1	744.1	27.40
746.1	776.1	29.60
778.1	808.1	33.60
810.1	840.1	35.30
842.1	872.1	35.60
874.1	904.1	27.50
906.1	936.1	23.50
938.1	968.1	21.80
970.1	1000.1	21.40

Typical Performance Data

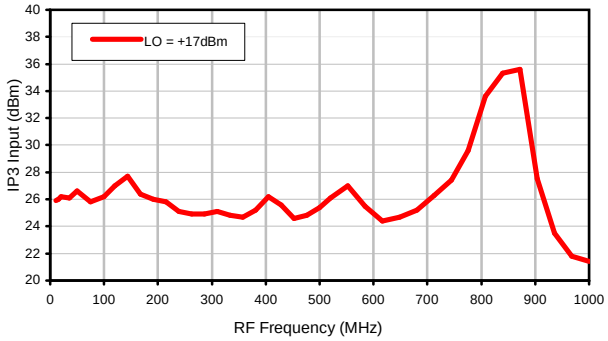
RF/LO (MHz)	RF VSWR (:1) @LO (dBm)			LO VSWR (:1) @LO (dBm)			IF (MHz)	IF VSWR (:1) @LO (dBm)		
	+14	+17	+20	+14	+17	+20		+14	+17	+20
40.1	1.53	1.43	1.35	1.70	1.13	1.52	0.3	1.62	1.09	1.19
45.1	1.52	1.40	1.31	1.72	1.11	1.49	1.0	1.67	1.12	1.16
45.1	1.52	1.41	1.33	1.71	1.10	1.51	5.0	1.68	1.13	1.15
50.1	1.51	1.40	1.31	1.73	1.09	1.51	10.0	1.64	1.13	1.15
65.1	1.53	1.41	1.31	1.74	1.09	1.50	40.0	1.64	1.10	1.19
70.1	1.52	1.40	1.31	1.74	1.13	1.50	80.0	1.67	1.10	1.26
80.1	1.51	1.39	1.30	1.72	1.09	1.51	120.0	1.56	1.10	1.32
90.1	1.51	1.39	1.30	1.74	1.16	1.51	150.0	1.58	1.12	1.33
113.9	1.51	1.39	1.30	1.75	1.18	1.54	170.3	1.64	1.13	1.30
137.6	1.52	1.39	1.31	1.73	1.18	1.54	190.6	1.58	1.15	1.30
161.4	1.50	1.38	1.31	1.76	1.19	1.52	211.0	1.55	1.16	1.27
185.1	1.48	1.38	1.32	1.81	1.20	1.56	231.3	1.47	1.17	1.25
208.9	1.48	1.38	1.33	1.81	1.21	1.59	251.6	1.45	1.18	1.25
232.6	1.47	1.38	1.33	1.76	1.19	1.56	271.9	1.52	1.19	1.23
256.4	1.46	1.39	1.34	1.74	1.19	1.56	292.2	1.48	1.19	1.23
280.1	1.47	1.40	1.35	1.77	1.20	1.62	312.5	1.48	1.20	1.21
303.9	1.47	1.40	1.35	1.70	1.18	1.66	332.8	1.44	1.21	1.21
327.6	1.46	1.39	1.35	1.63	1.17	1.60	353.1	1.46	1.21	1.21
351.4	1.46	1.40	1.35	1.60	1.19	1.64	373.5	1.53	1.24	1.21
375.1	1.46	1.40	1.36	1.61	1.20	1.72	393.8	1.55	1.26	1.20
398.9	1.45	1.39	1.34	1.58	1.20	1.68	414.1	1.55	1.28	1.20
422.6	1.45	1.39	1.34	1.52	1.18	1.61	434.4	1.56	1.29	1.20
446.4	1.47	1.41	1.36	1.47	1.21	1.70	454.7	1.60	1.30	1.21
470.1	1.47	1.41	1.36	1.45	1.24	1.77	475.0	1.68	1.31	1.20
490.1	1.45	1.40	1.35	1.42	1.22	1.72	495.3	1.74	1.35	1.21
522.1	1.45	1.39	1.33	1.35	1.23	1.68	515.6	1.74	1.39	1.22
554.1	1.46	1.39	1.34	1.32	1.31	1.83	536.0	1.77	1.43	1.23
586.1	1.44	1.38	1.32	1.26	1.30	1.76	556.3	1.76	1.44	1.24
618.1	1.44	1.38	1.32	1.23	1.32	1.79	576.6	1.81	1.47	1.26
650.1	1.43	1.38	1.32	1.22	1.37	1.93	596.9	1.81	1.49	1.29
682.1	1.41	1.35	1.30	1.15	1.34	1.79	617.2	1.82	1.51	1.32
714.1	1.40	1.33	1.29	1.12	1.39	1.89	637.5	1.82	1.52	1.32
746.1	1.38	1.32	1.27	1.08	1.45	2.01	657.8	1.86	1.51	1.31
778.1	1.37	1.30	1.26	1.07	1.40	1.85	678.1	1.87	1.50	1.29
810.1	1.36	1.28	1.23	1.09	1.53	2.05	698.5	1.92	1.51	1.28
842.1	1.36	1.27	1.21	1.12	1.57	2.11	718.8	1.93	1.50	1.27
874.1	1.37	1.26	1.20	1.15	1.56	1.98	739.1	1.97	1.50	1.27
906.1	1.37	1.24	1.17	1.20	1.72	2.30	759.4	2.00	1.49	1.24
938.1	1.37	1.23	1.14	1.22	1.69	2.19	779.7	2.08	1.48	1.24
970.1	1.37	1.23	1.12	1.23	1.70	2.16	800.0	2.14	1.51	1.25

Typical Performance Curves

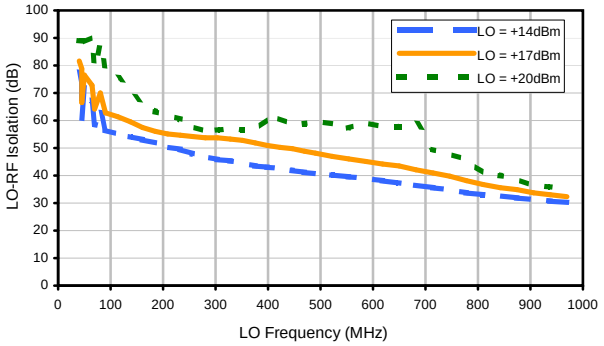
Conversion Loss



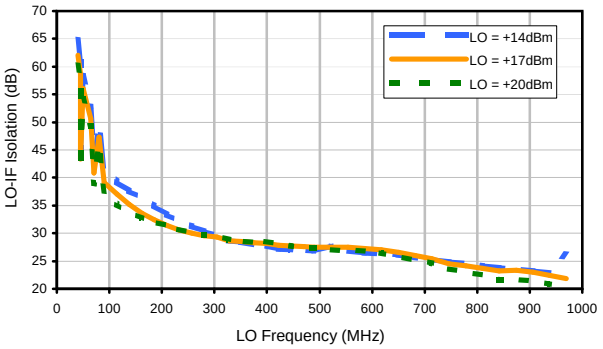
IP3 Input



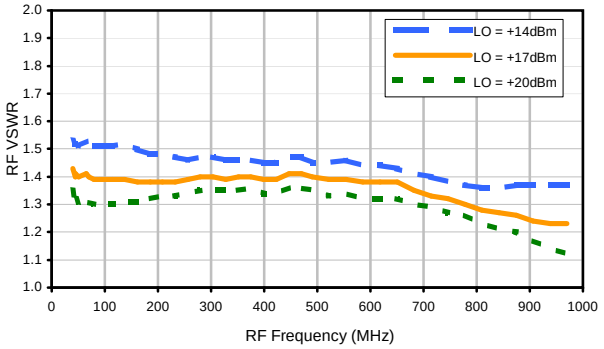
LO-RF Isolation



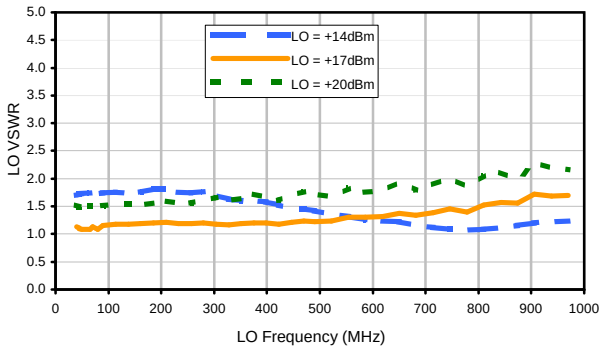
LO-IF Isolation



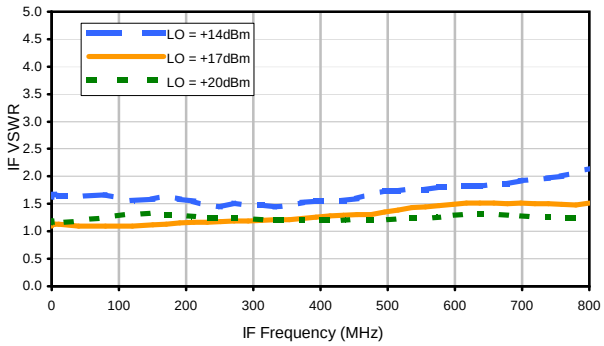
RF VSWR



LO VSWR



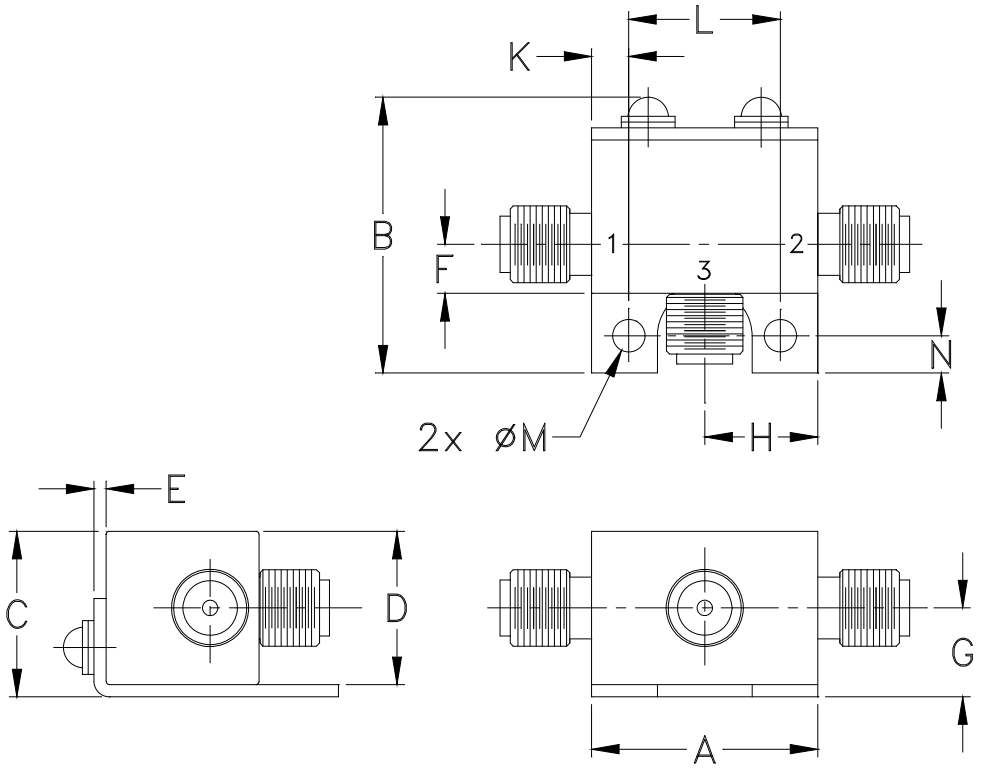
IF VSWR



Case Style FL

FL905

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. ± .03; 3Pl. ± .015.
Tolerance on hole size and interaxes dimensions to be ±.005.

Notes:

1. Case material: Brass.
2. Case finish: Nickel plate.

Mini-Circuits®
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Environmental Specifications **ENV28T5**

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