NON-CATALOG

Coaxial

Voltage Controlled Oscillator ZX95-1023-S+

5V Tuning for PLL ICs 945 to 1023 MHz

Features

- linear tuning characteristics
- low phase noise
- low pushing
- protected by US patent 6,790,049

Applications

- r & d
- lab
- instrumentation
- wireless communications
- industrial communications

CASE STYLE: GB956

Connectors	Model
SMA	ZX95-1023-S+

+RoHS Compliant

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

Electrical Specifications

MODEL NO.	FREQ. (MHz)		POWER OUTPUT (dBm)	PHASE NOISE dBc/Hz SSB at offset frequencies,kHz Typ.				TUNING VOLTAGE RANGE (V)		SENSI-TIVITY (MHz/V)	PORT CAP (pF)	3 dB MODULATION BANDWIDTH (MHz)	NON HARMONIC SPURIOUS (dBc)	HARMONICS (dBc)		PULLING pk-pk @12 dBr (MHz)	PUSHING (MHz/V)	DC OPERATING POWER Vcc (volts)	DC OPERATING POWER Current (mA)
	Min.	Max.	Typ.	1	10	100	1000	Min.	Max.	Typ.	Typ.	Typ.	Typ.	Typ.	Max.	Typ.	Typ.		Max.
ZX95-1023-S+	945	1023	+6.6	-81	-109	-130	-150	0.5	5	32	43	40	-90	-26	-19	1.4	0.4	5	35

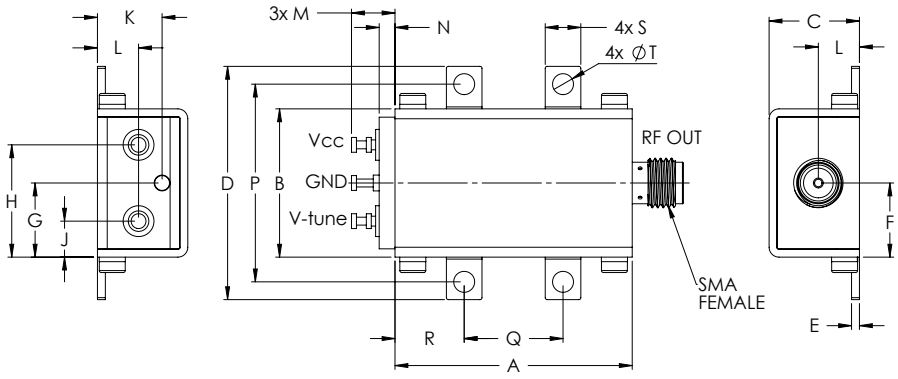
Maximum Ratings

Operating Temperature	-55°C to 85°C
Storage Temperature	-55°C to 100°C
Absolute Max. Supply Voltage (Vcc)	6V
Absolute Max. Tuning Voltage (Vtune)	7V
All specifications	50 ohm system

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

NOTE: When soldering the DC connections, caution must be used to avoid overheating the DC terminals. See Application Note AN-40-10 .

Outline Drawing



Outline Dimensions (inch / mm)

A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	wt.
1.20	**.75**	**.46**	**1.18**	**.04**	**.38**	**.38**	**.57**	**.18**	**.33**	**.21**	**.22**	**.08**	**1.00**	**.50**	**.35**	**.18**	**.106**	grams
30.48	19.05	11.68	29.97	1.02	9.65	9.65	14.48	4.57	8.38	5.33	5.59	2.03	25.40	12.70	8.89	4.57	2.69	35.0

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

NON-CATALOG

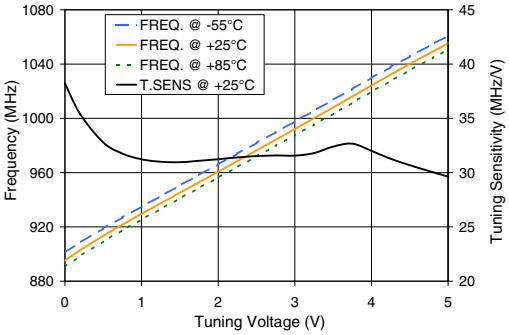
Performance Data & Curves*

ZX95-1023-S+

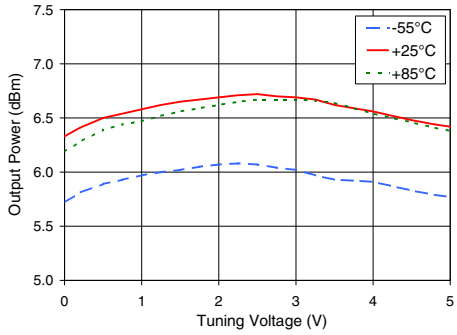
V TUNE	TUNE SENS (MHz/V)	FREQUENCY (MHz)			POWER OUTPUT (dBm)			Icc (mA)	HARMONICS (dBc)			FREQ. PUSH (MHz/V)	FREQ. PULL (MHz)	PHASE NOISE (dBc/Hz) at offsets				FREQ OFFSET (KHz)	PHASE NOISE at 984 MHz (dBc/Hz)
		-55°C	+25°C	+85°C	-55°C	+25°C	+85°C		F2	F3	F4			1kHz	10kHz	100kHz	1MHz		
0.00	38.22	901.2	895.3	890.7	5.72	6.33	6.19	26.13	-39.1	-26.5	-47.6	1.19	0.91	-79.5	-108.0	-129.5	-149.5	1.0	-81.42
0.50	32.78	918.9	913.5	909.4	5.89	6.50	6.39	26.52	-37.1	-26.6	-48.9	0.69	1.17	-82.2	-109.8	-131.3	-151.4	2.0	-91.02
0.75	31.75	927.0	921.7	917.6	5.93	6.54	6.44	26.69	-36.9	-26.3	-49.5	0.58	1.26	-83.6	-109.9	-131.7	-151.3	3.5	-98.31
1.00	31.23	934.9	929.6	925.5	5.97	6.58	6.47	26.85	-36.9	-26.3	-49.4	0.49	1.34	-82.1	-110.4	-131.9	-152.0	6.0	-104.26
1.25	31.00	942.8	937.4	933.3	6.00	6.62	6.52	27.01	-37.4	-26.3	-50.0	0.43	1.50	-83.3	-110.5	-132.1	-152.1	8.5	-108.01
1.50	30.96	950.5	945.2	941.0	6.02	6.65	6.56	27.15	-38.0	-26.3	-50.6	0.37	1.62	-82.4	-110.7	-132.0	-152.4	10.0	-109.51
1.75	31.09	958.3	952.9	948.7	6.05	6.67	6.59	27.28	-38.7	-26.0	-50.3	0.34	1.71	-83.2	-110.8	-132.2	-152.2	20.8	-116.72
2.00	31.23	966.1	960.7	956.4	6.07	6.69	6.62	27.40	-40.1	-25.9	-50.7	0.31	1.73	-82.7	-110.3	-132.0	-152.3	35.5	-121.82
2.25	31.40	974.0	968.5	964.2	6.08	6.71	6.65	27.50	-41.2	-26.0	-50.7	0.31	1.67	-82.5	-110.2	-132.0	-151.7	60.7	-126.94
2.50	31.52	981.9	976.4	972.0	6.07	6.72	6.67	27.58	-41.9	-26.2	-50.5	0.32	1.53	-82.7	-109.9	-131.7	-151.9	86.7	-130.26
2.75	31.58	989.8	984.3	979.8	6.04	6.70	6.67	27.65	-41.6	-26.4	-50.7	0.34	1.27	-82.1	-109.9	-131.5	-151.6	100.0	-131.47
3.00	31.56	997.8	992.1	987.6	6.02	6.69	6.67	27.71	-39.9	-26.4	-51.3	0.39	0.91	-82.6	-109.2	-131.1	-151.2	148.1	-134.89
3.25	31.80	1005.7	1000.0	995.5	5.97	6.67	6.66	27.74	-38.2	-26.9	-51.1	0.46	0.69	-82.6	-108.8	-130.7	-151.1	177.0	-136.21
3.50	32.40	1013.6	1008.0	1003.4	5.93	6.62	6.64	27.76	-36.3	-27.3	-49.8	0.58	0.75	-81.2	-108.0	-129.9	-149.8	211.6	-137.87
3.75	32.67	1021.7	1016.1	1011.5	5.92	6.59	6.59	27.79	-35.2	-26.3	-49.4	0.69	1.26	-80.8	-107.2	-129.1	-149.1	302.4	-140.91
4.00	32.00	1029.9	1024.3	1019.6	5.91	6.56	6.54	27.87	-34.9	-24.8	-49.0	0.71	1.63	-79.9	-107.2	-129.2	-149.4	361.5	-142.31
4.25	31.27	1037.8	1032.3	1027.6	5.87	6.52	6.50	27.95	-34.7	-24.2	-48.2	0.69	1.85	-81.4	-107.4	-129.2	-149.5	507.5	-145.41
4.50	30.69	1045.6	1040.1	1035.5	5.83	6.48	6.46	28.04	-34.8	-24.0	-48.3	0.70	1.98	-80.1	-106.9	-129.1	-149.2	606.7	-146.95
4.80	30.04	1054.8	1049.3	1044.7	5.79	6.44	6.41	28.13	-34.4	-23.8	-48.5	0.69	2.10	-79.9	-106.6	-129.0	-149.1	851.6	-149.05
5.00	29.64	1060.8	1055.3	1050.7	5.77	6.42	6.38	28.19	-34.0	-23.5	-47.8	0.69	2.18	-80.0	-106.4	-128.9	-149.1	1000.0	-150.16

*at 25°C unless mentioned otherwise

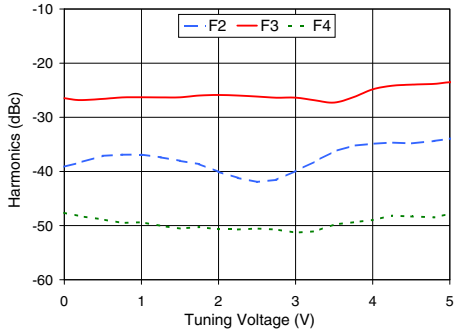
ZX95-1023-S+
Frequency and Tuning Sensitivity



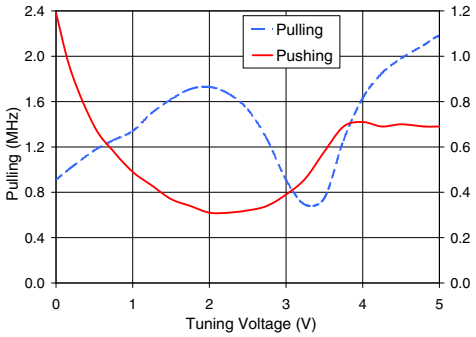
ZX95-1023-S+
Power Output



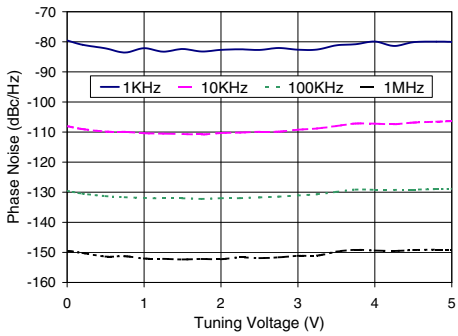
ZX95-1023-S+
Harmonics Level



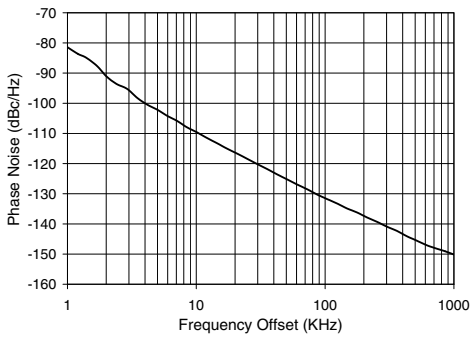
ZX95-1023-S+
Frequency Pulling & Pushing (Vcc ± 5%)



ZX95-1023-S+
Phase Noise Vs. Tuning Voltage



ZX95-1023-S+
Phase Noise



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Voltage Controlled Oscillator ZX95-1023+

Typical Performance Data

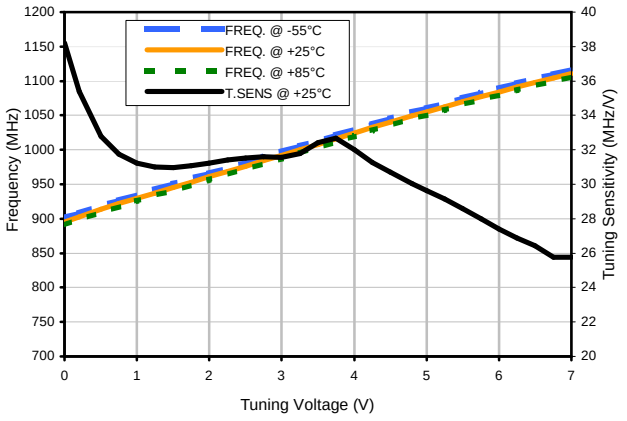
V TUNE	TUNE SENS (MHz/V)	FREQUENCY (MHz)			POWER OUTPUT (dBm)			HARMONICS (dBc)			FREQ. PUSH (MHz/V)
		-55ºC	+25ºC	+85ºC	-55ºC	+25ºC	+85ºC	F2	F3	F4	
0.00	38.22	901.2	895.3	890.7	5.72	6.33	6.19	-39.1	-26.5	-47.6	1.19
0.20	35.39	908.6	902.9	898.6	5.81	6.41	6.28	-38.4	-26.8	-48.2	0.93
0.50	32.78	918.9	913.5	909.4	5.89	6.50	6.39	-37.1	-26.6	-48.9	0.69
0.75	31.75	927.0	921.7	917.6	5.93	6.54	6.44	-36.9	-26.3	-49.5	0.58
1.00	31.23	934.9	929.6	925.5	5.97	6.58	6.47	-36.9	-26.3	-49.4	0.49
1.25	31.00	942.8	937.4	933.3	6.00	6.62	6.52	-37.4	-26.3	-50.0	0.43
1.50	30.96	950.5	945.2	941.0	6.02	6.65	6.56	-38.0	-26.3	-50.6	0.37
1.75	31.09	958.3	952.9	948.7	6.05	6.67	6.59	-38.7	-26.0	-50.3	0.34
2.00	31.23	966.1	960.7	956.4	6.07	6.69	6.62	-40.1	-25.9	-50.7	0.31
2.25	31.40	974.0	968.5	964.2	6.08	6.71	6.65	-41.2	-26.0	-50.7	0.31
2.50	31.52	981.9	976.4	972.0	6.07	6.72	6.67	-41.9	-26.2	-50.5	0.32
2.75	31.58	989.8	984.2	979.8	6.04	6.70	6.67	-41.6	-26.4	-50.7	0.34
3.00	31.56	997.8	992.1	987.6	6.02	6.69	6.67	-39.9	-26.4	-51.3	0.39
3.25	31.80	1005.7	1000.0	995.5	5.97	6.67	6.66	-38.2	-26.9	-51.1	0.46
3.50	32.40	1013.6	1008.0	1003.4	5.93	6.62	6.64	-36.3	-27.3	-49.8	0.58
3.75	32.67	1021.7	1016.1	1011.5	5.92	6.59	6.59	-35.2	-26.3	-49.4	0.69
4.00	32.00	1029.9	1024.3	1019.6	5.91	6.56	6.54	-34.9	-24.8	-49.0	0.71
4.25	31.27	1037.8	1032.3	1027.6	5.87	6.52	6.50	-34.7	-24.2	-48.2	0.69
4.50	30.69	1045.6	1040.1	1035.5	5.83	6.48	6.46	-34.8	-24.0	-48.3	0.70
4.80	30.04	1054.8	1049.3	1044.7	5.79	6.44	6.41	-34.4	-23.8	-48.5	0.69
5.00	29.64	1060.8	1055.3	1050.7	5.77	6.42	6.38	-34.0	-23.5	-47.8	0.69
5.25	29.13	1068.2	1062.7	1058.1	5.72	6.38	6.35	-33.3	-23.5	-47.7	0.69
5.50	28.57	1075.5	1070.0	1065.4	5.68	6.34	6.31	-32.4	-23.3	-47.5	0.67
5.75	27.99	1082.7	1077.1	1072.5	5.66	6.30	6.26	-31.8	-23.3	-47.2	0.64
6.00	27.41	1089.7	1084.1	1079.5	5.64	6.29	6.23	-31.2	-23.7	-46.4	0.62
6.25	26.89	1096.6	1091.0	1086.4	5.61	6.27	6.20	-30.6	-23.5	-46.7	0.58
6.50	26.43	1103.4	1097.7	1093.1	5.59	6.23	6.17	-30.3	-23.2	-46.6	0.54
6.75	25.77	1110.0	1104.3	1099.7	5.57	6.21	6.12	-29.8	-23.2	-46.4	0.50
7.00	25.77	1116.5	1110.7	1106.1	5.56	6.19	6.09	-29.3	-23.6	-45.5	0.46

FREQ OFFSET (KHz)	PHASE NOISE (dBc/Hz)
1	-81
10	-110
100	-131
1000	-150

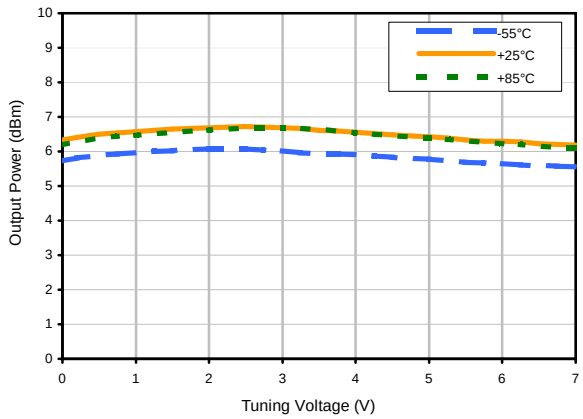
Voltage Controlled Oscillator ZX95-1023+

Typical Performance Data

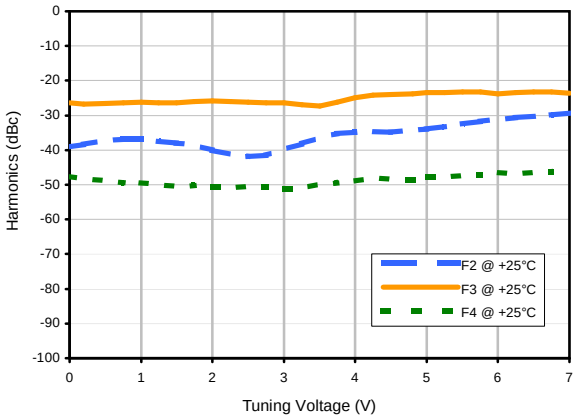
Frequency and Tuning Sensitivity



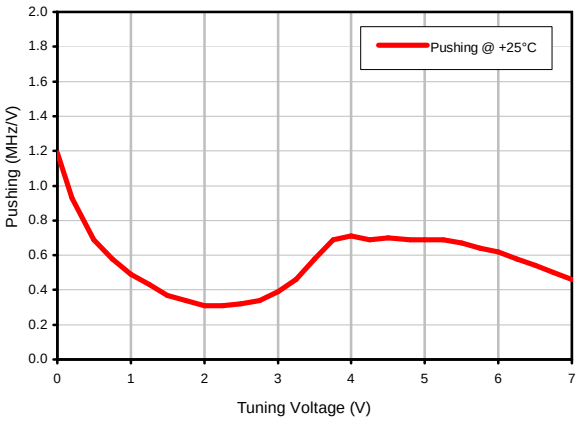
Power Output



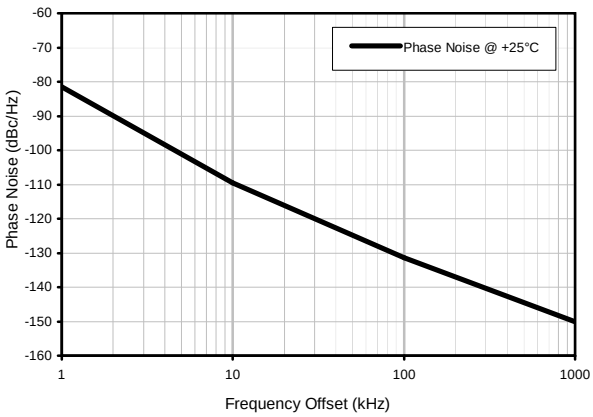
Harmonics Level



Frequency Pushing



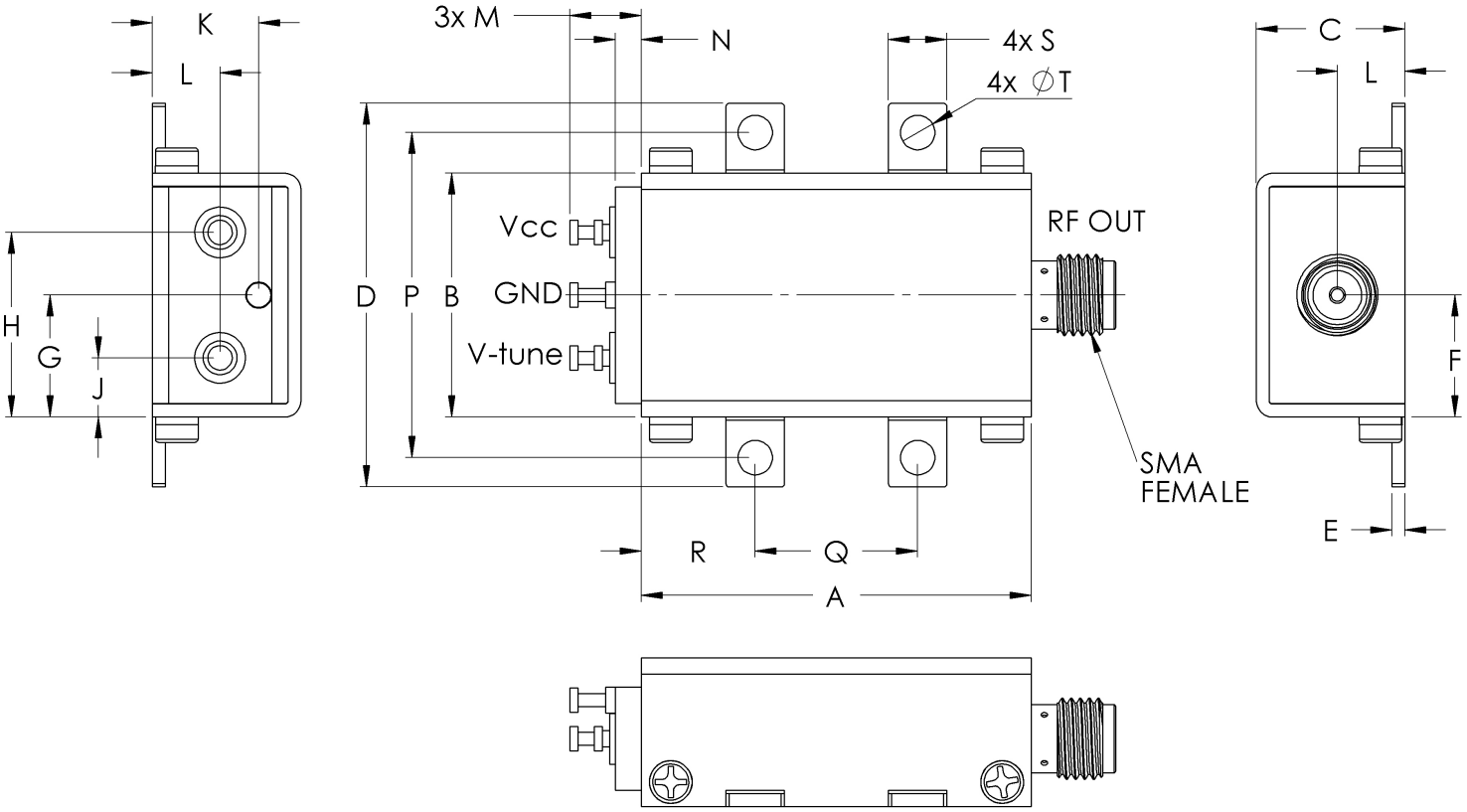
Phase Noise



Case Style GB

Outline Dimensions

GB956



CASE #.	A	B	C	D	E	F	G	H	J	K	L	M	N
GB956	1.20 (30.48)	.75 (19.15)	.46 (11.61)	1.18 (30.07)	.04 (1.02)	.38 (9.53)	.38 (9.53)	.57 (14.43)	.18 (4.62)	.33 (8.31)	.21 (5.28)	.22 (5.59)	.08 (2.03)

CASE #.	P	Q	R	S	T	WT GRAMS
GB956	1.00 (25.4)	.50 (12.7)	.35 (8.89)	.18 (4.57)	.106 (2.69)	35

Dimensions are in inches (mm). Tolerances: 2Pl. ± .03; 3Pl. ± .015
Tolerance on hole size and interaxes dimensions to be ± .005.

Note:

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

Mini-Circuits®
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Mini-Circuits

Environmental Specifications **ENV28T8**

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	-55° to 85°C Ambient Environment	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

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