

Voltage Controlled Oscillator **ZX95-3605R-S+**

50Ω 3300 to 3605 MHz

The Big Deal:

- Wide Band
- Low Phase Noise
- Linear Tuning Sensitivity
- Robust design and construction
- Rigid unibody construction



CASE STYLE: GB956

Product Overview:

The ZX95-3605R-S+ is a Voltage Controlled Oscillator, designed to operate from 3300 to 3605 MHz for WiMAX applications. The ZX95-3605R-S+ is built using Mini-Circuits proven unibody construction (size of 1.20" x .75" x .46") which integrates the RF connectors with the case body to shield against unwanted signals and noise.

Key Features

Feature	Advantages
Linear Tuning Sensitivity Ratio: 1.37:1 typ.	Optimal for loop filter design.
Good Harmonic Suppression, -20 dBc typ.	Provides clear signals suitable for systems requiring high spectral purity.
Low Phase Noise: -97 dBc/Hz typ at 10 kHz offset	Low phase noise improves system EVM (Error Vector Magnitude).
High Power Output, +8.5 dBm typ.	Reduces amplification requirements and improves immunity to external noise sources.
Good Pulling, 3.5 MHz typ.	Improves immunity against changes in output load.
Good Pushing, 2.5 MHz/V typ.	Provides increased immunity against noisy DC lines and improves output frequency stability vs. variations in supply voltage.



Coaxial

Voltage Controlled Oscillator

ZX95-3605R-S+

Linear Tuning 3300 to 3605 MHz

Features

- low phase noise, -97 dBc/Hz typ. @ 10kHz offset
- linear tuning characteristics
- low pulling, 3.5 MHz typ.
- low pushing, 2.5 MHz/V typ.
- protected by US patent 6,790,049

Applications

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



CASE STYLE: GB956

Connectors	Model
SMA	ZX95-3605R-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				TUNING				NON HARMONIC SPURIOUS (dBc)		HARMONICS (dBc)		PULLING pk-pk @12 dB (MHz)	PUSHING (MHz/V)	DC OPERATING POWER	
								VOLTAGE RANGE (V)	SENSI- TIVITY (MHz/V)	PORT CAP (pF)	3 dB MODULATION BANDWIDTH (MHz)								
	Min.	Max.	Typ.	1	10	100	1000	Min.	Max.	Typ.	Typ.	Typ.	Typ.	Typ.	Max.	Typ.	Typ.	Vcc (volts)	Current (mA)
ZX95-3605R-S+	3300	3605	+8.5	-71	-97	-118	-138	0.5	8	57-78	13	130	-90	-20	-15	3.5	2.5	5	46

Maximum Ratings

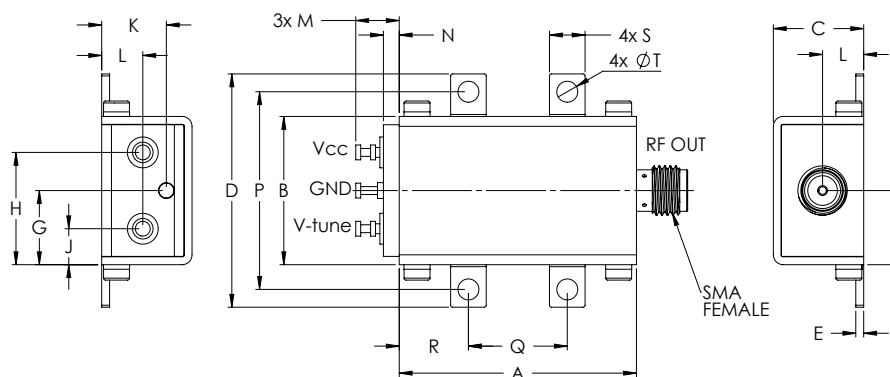
Operating Temperature	-55°C to 85°C
Storage Temperature	-55°C to 100°C
Absolute Max. Supply Voltage (Vcc)	7V
Absolute Max. Tuning Voltage (Vtune)	10V
All specifications	50 ohm system

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

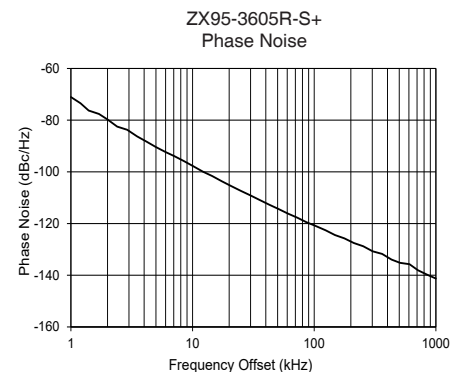
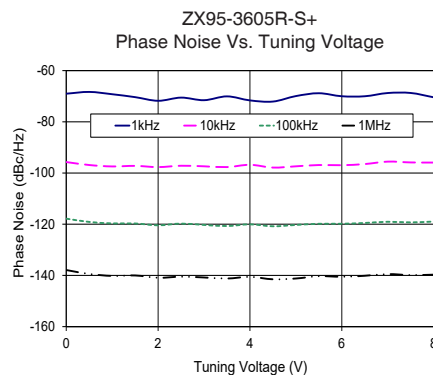
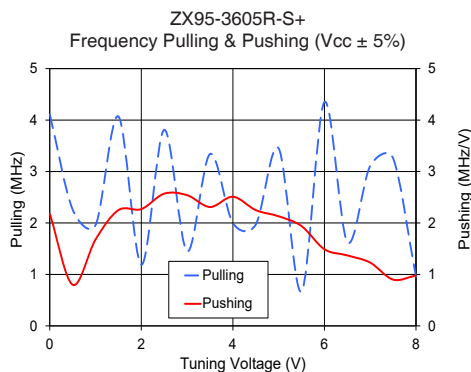
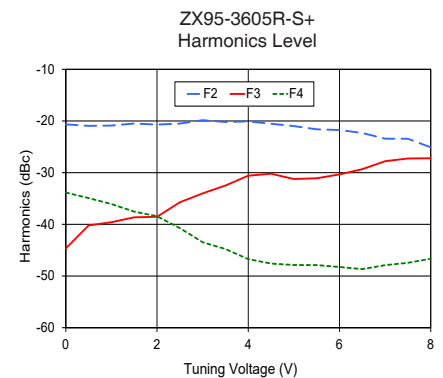
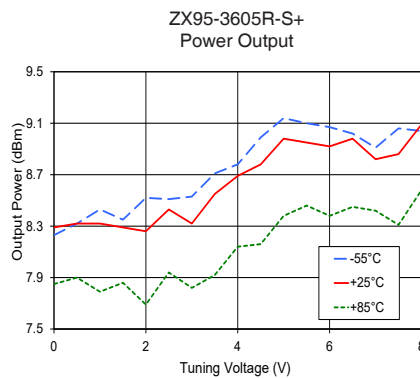
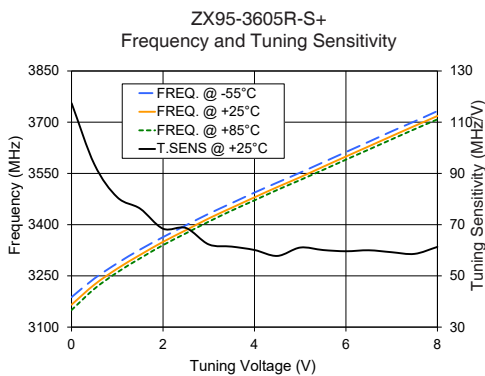


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V TUNE	TUNE SENS (MHz/V)	FREQUENCY (MHz)			POWER OUTPUT (dBm)			Icc (mA)	HARMONICS (dBc)			FREQ. PUSH (MHz/V)	FREQ. PULL (MHz)	PHASE NOISE (dBc/Hz) at offsets				FREQ OFFSET (kHz)	PHASE NOISE at 3450 MHz (dBc/Hz)
		-55°C	+25°C	+85°C	-55°C	+25°C	+85°C		F2	F3	F4			1kHz	10kHz	100kHz	1MHz		
0.00	117.45	3187.6	3165.7	3149.8	8.23	8.29	7.85	38.45	-20.7	-44.7	-33.9	2.18	4.11	-69.02	-95.7	-117.8	-137.9	1.0	-71.06
1.00	80.68	3286.9	3271.2	3260.3	8.43	8.32	7.79	38.68	-20.9	-39.6	-36.1	1.68	1.96	-69.23	-97.4	-119.7	-140.2	2.0	-79.74
1.50	76.24	3327.1	3311.6	3301.3	8.35	8.29	7.86	38.74	-20.5	-38.6	-37.5	2.25	4.07	-70.37	-97.2	-119.7	-140.0	3.5	-86.26
2.00	68.41	3363.4	3349.7	3340.0	8.52	8.26	7.69	38.87	-20.7	-38.5	-38.4	2.27	1.19	-71.79	-97.7	-120.4	-140.9	6.0	-92.33
2.50	68.69	3398.1	3383.9	3374.5	8.51	8.43	7.94	38.95	-20.5	-35.7	-40.7	2.57	3.81	-70.55	-97.2	-119.8	-140.5	8.5	-95.84
3.00	62.27	3431.9	3418.2	3408.7	8.53	8.32	7.82	39.03	-19.9	-34.0	-43.5	2.54	1.45	-71.56	-97.4	-120.3	-140.8	10.0	-97.66
3.50	61.42	3462.9	3449.4	3441.0	8.71	8.55	7.92	39.21	-20.2	-32.5	-44.8	2.31	3.34	-70.07	-97.7	-120.7	-141.2	20.8	-105.51
4.00	60.10	3493.9	3480.1	3471.2	8.78	8.69	8.14	39.29	-20.1	-30.6	-46.7	2.51	2.00	-71.64	-96.8	-120.1	-140.6	35.5	-110.86
4.50	57.78	3523.3	3510.1	3501.7	8.99	8.78	8.16	39.43	-20.5	-30.2	-47.6	2.25	1.97	-72.09	-97.9	-120.8	-141.5	60.7	-116.11
5.00	61.05	3552.4	3539.0	3530.7	9.14	8.98	8.38	39.54	-21.0	-31.2	-47.9	2.13	3.45	-69.95	-97.4	-120.3	-141.2	86.7	-119.51
5.50	60.08	3582.6	3569.5	3560.3	9.10	8.95	8.46	39.58	-21.6	-31.1	-47.9	1.94	0.67	-68.84	-96.9	-119.8	-140.3	100.0	-120.68
6.00	59.61	3612.7	3599.6	3590.4	9.07	8.92	8.38	39.63	-21.8	-30.3	-48.3	1.49	4.35	-70.02	-97.0	-119.8	-140.5	148.1	-124.44
6.50	59.99	3642.8	3629.4	3620.0	9.02	8.98	8.45	39.65	-22.3	-29.3	-48.7	1.37	1.63	-70.02	-96.5	-119.5	-140.1	177.0	-125.74
7.00	59.23	3673.3	3659.4	3649.8	8.91	8.82	8.42	39.68	-23.4	-27.8	-47.9	1.23	3.11	-68.76	-95.6	-119.0	-139.5	211.6	-127.53
7.50	58.58	3702.4	3689.0	3679.5	9.06	8.86	8.31	39.70	-23.4	-27.3	-47.5	0.90	3.26	-68.74	-95.9	-119.3	-139.9	302.4	-130.74
8.00	61.30	3732.7	3718.3	3708.3	9.04	9.09	8.58	39.60	-25.1	-27.2	-46.7	0.98	0.96	-70.43	-95.9	-119.0	-139.7	361.5	-131.75
8.50	58.48	3763.3	3748.9	3738.2	8.85	8.80	8.52	39.55	-25.5	-26.4	-46.2	0.88	3.73	-69.72	-94.9	-118.2	-138.9	507.5	-135.19
9.00	57.65	3792.6	3778.2	3767.9	8.97	8.76	8.28	39.53	-27.0	-26.0	-44.0	0.29	1.21	-70.84	-95.3	-118.2	-139.1	606.7	-135.71
9.50	59.22	3822.7	3807.0	3796.3	8.93	8.92	8.44	39.37	-27.7	-26.3	-42.5	0.22	2.14	-68.56	-94.7	-117.8	-138.8	851.6	-139.81
10.00	59.22	3852.0	3836.6	3825.0	8.73	8.72	8.38	39.25	-28.9	-25.6	-42.5	0.88	3.31	-67.44	-93.7	-117.1	-138.1	1000.0	-141.26

*at 25°C unless mentioned otherwise



Additional Notes

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Voltage Controlled Oscillator

ZX95-3605R+

Typical Performance Data

V TUNE	TUNE SENS (MHz/V)	FREQUENCY (MHz)			POWER OUTPUT (dBm)			HARMONICS (dBc)			FREQ. PUSH (MHz/V)	FREQ OFFSET (kHz)	PHASE NOISE (dBc/Hz)
		-55°C	+25°C	+85°C	-55°C	+25°C	+85°C	F2	F3	F4			
0.0	117.5	3187.6	3165.7	3149.8	8.2	8.3	7.9	-20.7	-44.7	-33.9	2.2	1	-71
0.5	93.5	3242.3	3224.5	3212.0	8.3	8.3	7.9	-20.9	-40.2	-34.9	0.8	10	-97
1.0	80.7	3286.9	3271.2	3260.3	8.4	8.3	7.8	-20.9	-39.6	-36.1	1.7	100	-118
1.5	76.2	3327.1	3311.6	3301.3	8.4	8.3	7.9	-20.5	-38.6	-37.5	2.3	1000	-138
2.0	68.4	3363.4	3349.7	3340.0	8.5	8.3	7.7	-20.7	-38.5	-38.4	2.3		
2.5	68.7	3398.1	3383.9	3374.5	8.5	8.4	7.9	-20.5	-35.7	-40.7	2.6		
3.0	62.3	3431.9	3418.2	3408.7	8.5	8.3	7.8	-19.9	-34.0	-43.5	2.5		
3.5	61.4	3462.9	3449.4	3441.0	8.7	8.6	7.9	-20.2	-32.5	-44.8	2.3		
4.0	60.1	3493.9	3480.1	3471.2	8.8	8.7	8.1	-20.1	-30.6	-46.7	2.5		
4.5	57.8	3523.3	3510.1	3501.7	9.0	8.8	8.2	-20.5	-30.2	-47.6	2.3		
5.0	61.0	3552.4	3539.0	3530.7	9.1	9.0	8.4	-21.0	-31.2	-47.9	2.1		
5.5	60.1	3582.6	3569.5	3560.3	9.1	9.0	8.5	-21.6	-31.1	-47.9	1.9		
6.0	59.6	3612.7	3599.6	3590.4	9.1	8.9	8.4	-21.8	-30.3	-48.3	1.5		
6.5	60.0	3642.8	3629.4	3620.0	9.0	9.0	8.5	-22.3	-29.3	-48.7	1.4		
7.0	59.2	3673.3	3659.4	3649.8	8.9	8.8	8.4	-23.4	-27.8	-47.9	1.2		
7.5	58.6	3702.4	3689.0	3679.5	9.1	8.9	8.3	-23.4	-27.3	-47.5	0.9		
8.0	61.3	3732.7	3718.3	3708.3	9.0	9.1	8.6	-25.1	-27.2	-46.7	1.0		
8.5	58.5	3763.3	3748.9	3738.2	8.9	8.8	8.5	-25.5	-26.4	-46.2	0.9		
9.0	57.6	3792.6	3778.2	3767.9	9.0	8.8	8.3	-27.0	-26.0	-44.0	0.3		
9.5	59.2	3822.7	3807.0	3796.3	8.9	8.9	8.4	-27.7	-26.3	-42.5	0.2		
10.0	59.2	3852.0	3836.6	3825.0	8.7	8.7	8.4	-28.9	-25.6	-42.5	0.9		

Notes

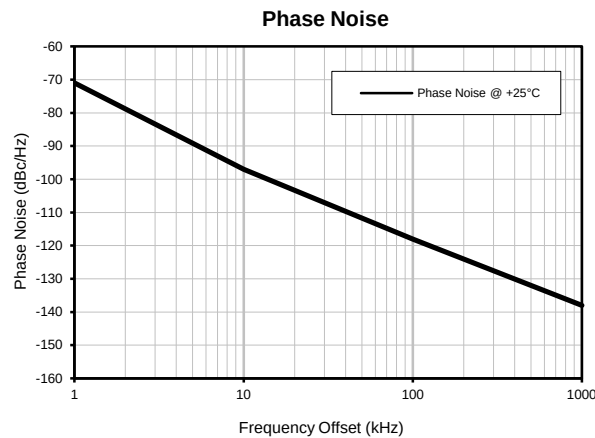
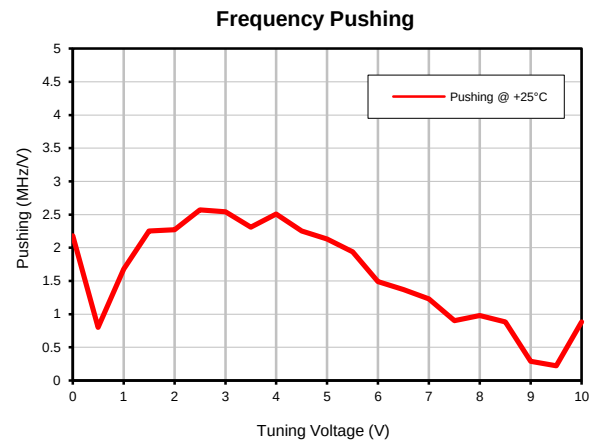
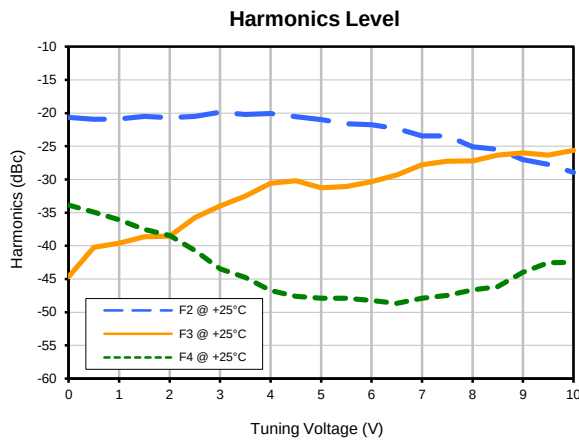
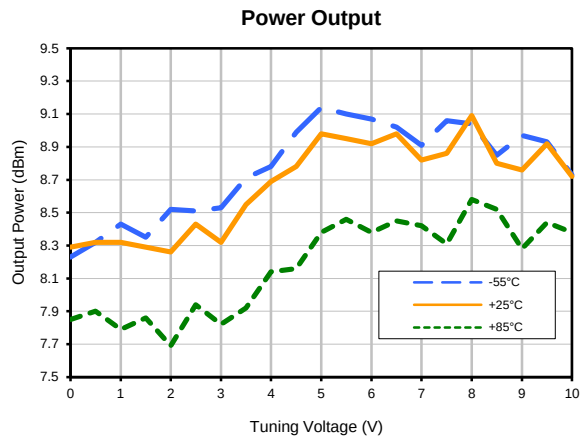
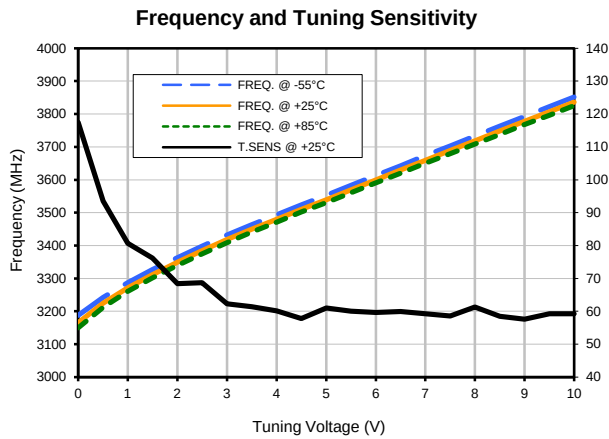
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Voltage Controlled Oscillator

ZX95-3605R+

Typical Performance Data



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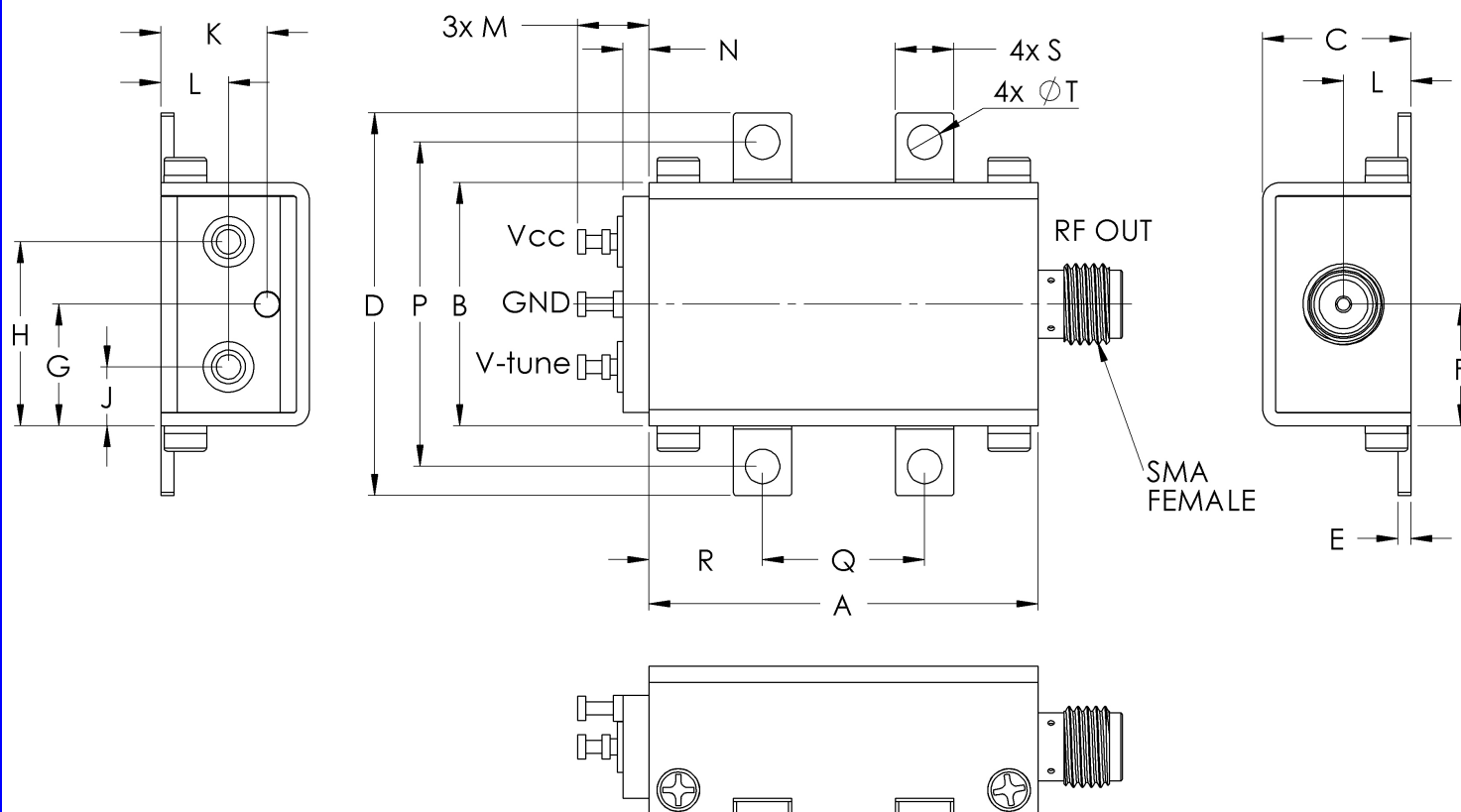
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Case Style

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

Note:

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



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

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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	-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