Plug-In

Frequency Mixer

SRA-8+

Level 7 (LO Power +7 dBm) 0.0005 to 10 MHz

Generic photo used for illustration purposes only

CASE STYLE: A01

+RoHS Compliant

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

Maximum Ratings

Operating Temperature	-55°C to 100°C
Storage Temperature	-55°C to 100°C
RF Power	50mW
IF Current	40mA

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

Features

- excellent conversion loss, 5.69 dB typ.
- high L-R isolation, 50 dB typ. L-I isolation, 50 dB typ.
- rugged welded construction
- hermetic

Applications

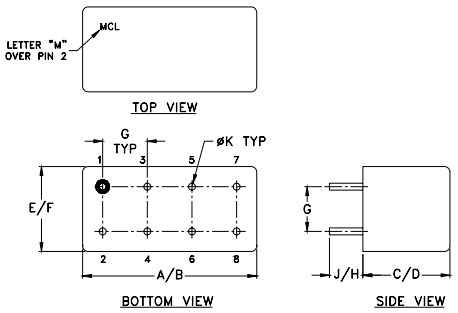
- IF signal processing
- AM broadcasting radio

Pin Connections

LO	8
RF	1
IF	3,4^
GROUND	2,5,6,7

^ pins must be connected together externally

Outline Drawing



Outline Dimensions (inch / mm)

A	B	C	D	E	F
.770	.800	.385	.400	.370	.400
19.56	20.32	9.78	10.16	9.40	10.16
G	**H**	**J**	**K**		**wt**
.200	.20	.14	.031		grams
5.08	5.08	3.56	0.79		5.2

Electrical Specifications

FREQUENCY (MHz)		CONVERSION LOSS (dB)				LO-RF ISOLATION (dB)						LO-IF ISOLATION (dB)					
		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.
.0005-10	DC-10	5.69	.11	7.5	8.5	60	50	50	40	45	35	60	50	50	40	45	35

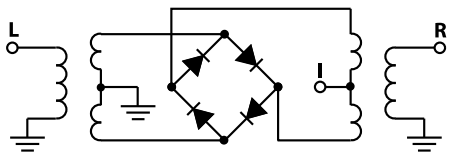
1 dB COMP.: +1 dBm typ.

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 +7dBm	LO +7dBm	LO +7dBm	LO +7dBm	LO +7dBm
0.001	3.00	5.26	71.79	72.81	1.41	3.30
0.002	3.00	4.96	75.56	77.65	1.37	2.70
0.005	3.01	4.92	73.77	80.99	1.38	2.54
0.01	3.01	4.88	71.40	77.86	1.37	2.46
0.02	3.02	4.84	71.49	76.56	1.37	2.41
0.05	3.05	4.84	72.03	78.05	1.38	2.32
0.10	3.10	4.79	71.80	78.10	1.38	2.29
0.20	3.20	4.88	71.48	77.93	1.38	2.21
0.50	3.50	4.86	71.98	77.73	1.37	2.10
0.70	3.70	4.83	71.60	76.54	1.37	1.98
1.00	4.00	4.88	71.65	75.42	1.37	1.95
1.43	4.43	4.91	71.81	71.58	1.37	1.94
2.00	5.00	4.91	72.01	69.03	1.36	1.96
2.86	5.86	4.97	71.64	64.97	1.37	2.01
4.29	7.29	5.16	71.16	59.46	1.36	2.03
5.00	8.00	5.17	71.48	58.01	1.36	2.02
6.43	9.43	5.18	70.78	54.45	1.36	1.98
7.14	4.14	5.21	70.73	53.39	1.36	1.94
8.57	5.57	5.23	70.34	50.80	1.36	1.92
10.00	7.00	5.22	70.10	48.53	1.35	1.90

Electrical Schematic



Notes

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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.
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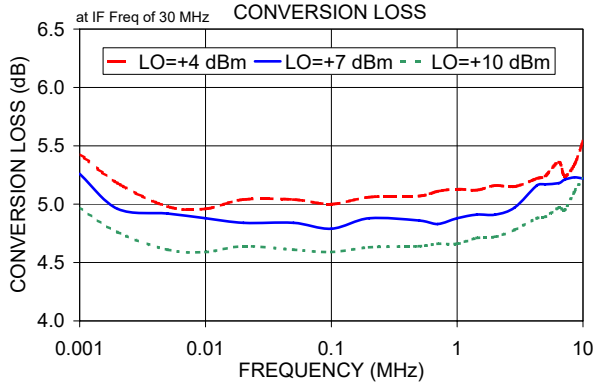
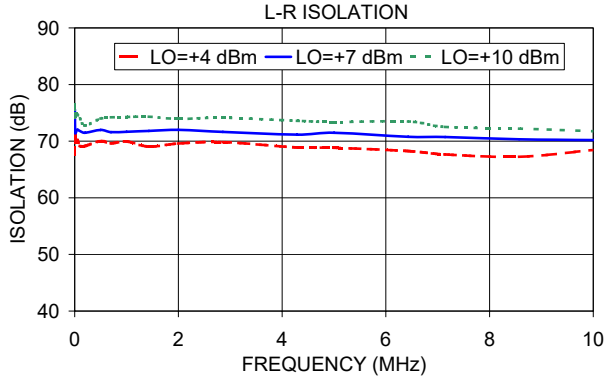
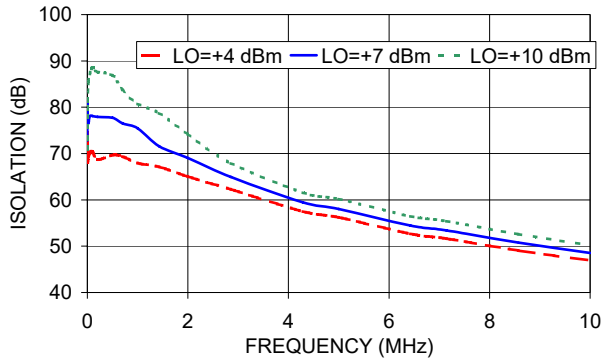
SRA-8+
CONVERSION LOSS
at IF Freq of 30 MHz



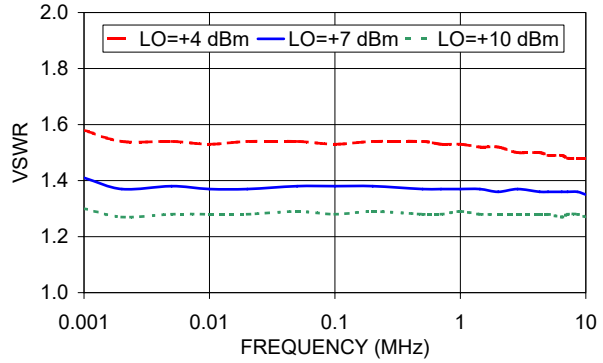
SRA-8+
L-R ISOLATION



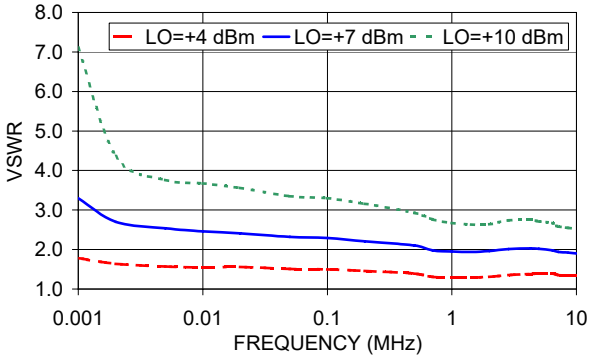
SRA-8+
L-I ISOLATION



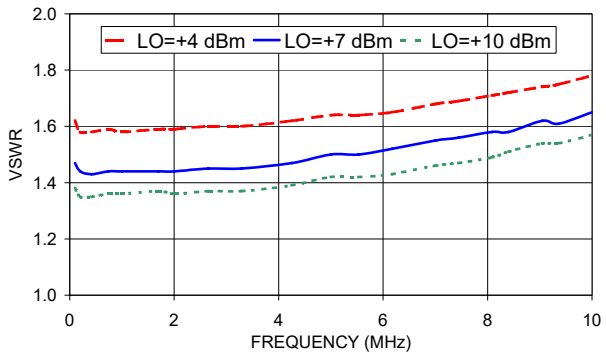
SRA-8+
RF VSWR



SRA-8+
LO VSWR



SRA-8+
IF VSWR



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Frequency Mixer SRA-8+

Typical Performance Data

RF (MHz)	LO (MHz)	CONVERSION LOSS (dB) @LO (dBm)		
		+4	+7	+10
0.001	3.0	5.43	5.26	4.97
0.002	3.0	5.18	4.96	4.76
0.005	3.0	4.98	4.92	4.61
0.010	3.0	4.96	4.88	4.59
0.020	3.0	5.04	4.84	4.64
0.050	3.1	5.04	4.84	4.61
0.100	3.1	5.00	4.79	4.59
0.200	3.2	5.06	4.88	4.63
0.500	3.5	5.07	4.86	4.64
0.700	3.7	5.11	4.83	4.66
1.000	4.0	5.13	4.88	4.66
1.430	4.4	5.12	4.91	4.71
2.000	5.0	5.16	4.91	4.72
2.858	5.9	5.15	4.97	4.78
4.287	7.3	5.22	5.16	4.88
5.001	8.0	5.24	5.17	4.89
6.429	9.4	5.36	5.18	4.97
7.143	4.1	5.24	5.21	4.95
8.572	5.6	5.34	5.23	5.11
10.000	7.0	5.54	5.22	5.22

LO (MHz)	LO-RF ISOLATION (dB) @LO (dBm)			LO-IF ISOLATION (dB) @LO (dBm)		
	+4	+7	+10	+4	+7	+10
0.001	67.63	71.79	76.50	69.01	72.81	70.88
0.002	71.83	75.56	75.83	74.44	77.65	79.57
0.005	69.88	73.77	74.22	70.62	80.99	81.31
0.010	71.05	71.40	74.45	68.14	77.86	83.21
0.020	69.84	71.49	74.87	69.35	76.56	85.54
0.050	70.21	72.03	74.69	70.02	78.05	87.17
0.100	69.18	71.80	74.02	70.42	78.10	88.51
0.200	69.14	71.48	72.78	68.69	77.93	87.64
0.500	70.02	71.98	73.98	69.66	77.73	86.90
0.700	69.63	71.60	74.21	69.38	76.54	83.75
1.000	69.95	71.65	74.26	67.97	75.42	80.75
1.430	69.04	71.81	74.32	67.12	71.58	78.74
2.000	69.59	72.01	73.92	65.05	69.03	74.17
2.858	69.83	71.64	74.13	62.29	64.97	67.88
4.287	68.89	71.16	73.59	57.52	59.46	61.57
5.001	68.83	71.48	73.39	56.20	58.01	60.19
6.429	68.26	70.78	73.48	52.70	54.45	56.48
7.143	67.65	70.73	72.52	51.64	53.39	55.39
8.572	67.23	70.34	72.22	49.07	50.80	52.61
10.000	68.45	70.10	71.76	46.90	48.53	50.21

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Typical Performance Data

RF/LO (MHz)	RF VSWR (:1) @LO (dBm)			LO VSWR (:1) @LO (dBm)		
	+4	+7	+10	+4	+7	+10
0.001	1.58	1.41	1.30	1.78	3.30	7.11
0.002	1.54	1.37	1.27	1.64	2.70	4.36
0.005	1.54	1.38	1.28	1.57	2.54	3.76
0.010	1.53	1.37	1.28	1.55	2.46	3.67
0.020	1.54	1.37	1.28	1.56	2.41	3.56
0.050	1.54	1.38	1.29	1.51	2.32	3.35
0.100	1.53	1.38	1.28	1.50	2.29	3.30
0.200	1.54	1.38	1.29	1.46	2.21	3.16
0.500	1.54	1.37	1.28	1.39	2.10	2.93
0.700	1.53	1.37	1.28	1.31	1.98	2.76
1.000	1.53	1.37	1.29	1.29	1.95	2.67
1.430	1.52	1.37	1.28	1.29	1.94	2.63
2.000	1.52	1.36	1.28	1.31	1.96	2.64
2.858	1.50	1.37	1.28	1.35	2.01	2.74
4.287	1.50	1.36	1.28	1.38	2.03	2.75
5.001	1.49	1.36	1.28	1.39	2.02	2.71
6.429	1.49	1.36	1.27	1.39	1.98	2.67
7.143	1.48	1.36	1.28	1.35	1.94	2.58
8.572	1.48	1.36	1.28	1.34	1.92	2.55
10.000	1.48	1.35	1.27	1.34	1.90	2.51

IF (MHz)	IF VSWR (:1) @LO (dBm)		
	+4	+7	+10
0.101	1.62	1.47	1.38
0.201	1.58	1.44	1.35
0.420	1.58	1.43	1.35
0.740	1.59	1.44	1.36
1.001	1.58	1.44	1.36
1.698	1.59	1.44	1.37
2.001	1.59	1.44	1.36
2.656	1.60	1.45	1.37
3.294	1.60	1.45	1.37
4.253	1.62	1.47	1.39
5.001	1.64	1.50	1.42
5.530	1.64	1.50	1.42
6.169	1.65	1.52	1.43
7.001	1.68	1.55	1.46
7.446	1.69	1.56	1.47
8.085	1.71	1.58	1.49
8.404	1.72	1.58	1.51
9.043	1.74	1.62	1.54
9.362	1.75	1.61	1.54
10.000	1.78	1.65	1.57

LO/RF (MHz)	max. DC output (mV)	DC Offset (mV)
@LO (dBm) +7		
0.001	-275.2	-0.11
0.005	-271.2	-0.13
0.010	-264.3	-0.13
0.020	-261.9	-0.13
0.050	-262.0	-0.12
0.100	-259.7	-0.12
0.200	-261.0	-0.12
0.500	-262.4	-0.13
0.700	-264.8	-0.13
1.000	-265.8	-0.13
2.000	-266.1	-0.13
3.334	-259.8	-0.13
4.167	-258.1	-0.12
5.000	-255.2	-0.12
5.834	-250.6	-0.12
6.667	-246.6	-0.09
7.000	-247.1	-0.10
7.500	-246.8	-0.13
8.333	-247.7	-0.09
10.000	-247.8	-0.11

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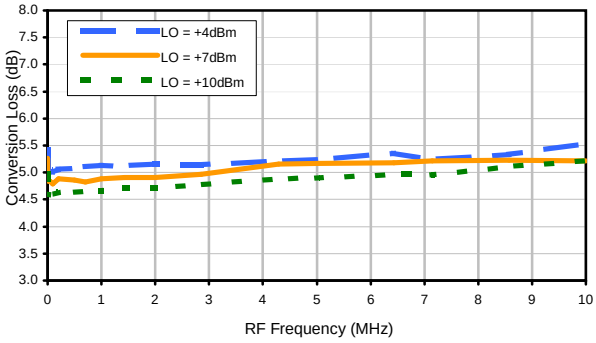
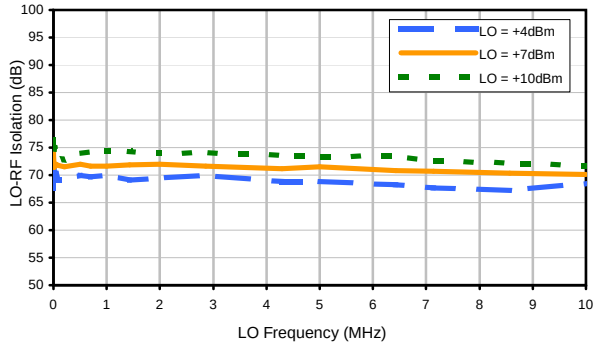
Typical Performance Curves

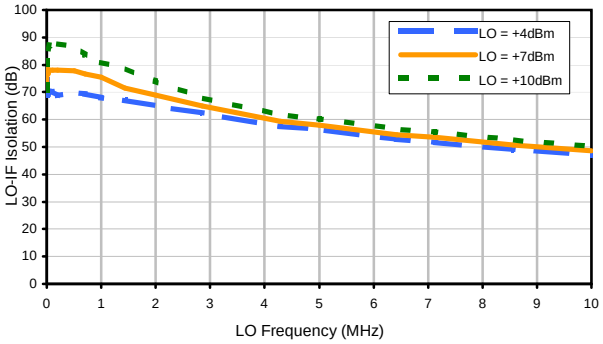
Conversion Loss



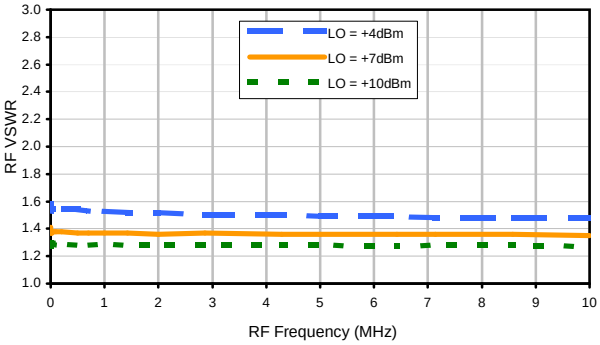
LO-RF Isolation



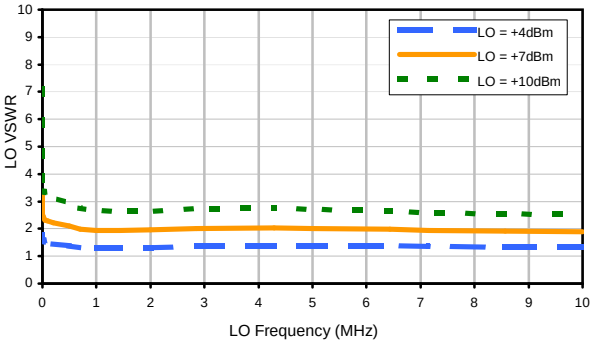
LO-IF Isolation



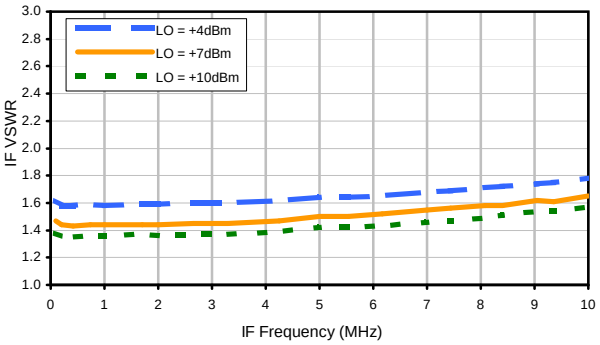
RF VSWR



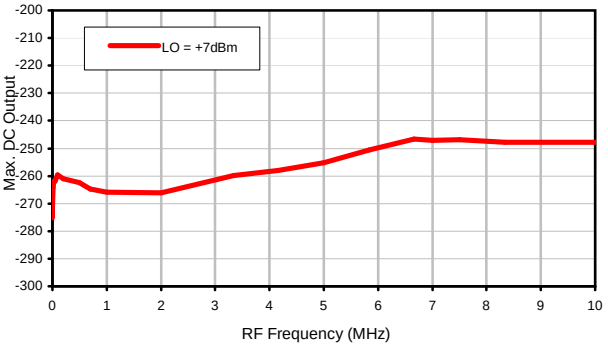
LO VSWR



IF VSWR



Max. DC Output



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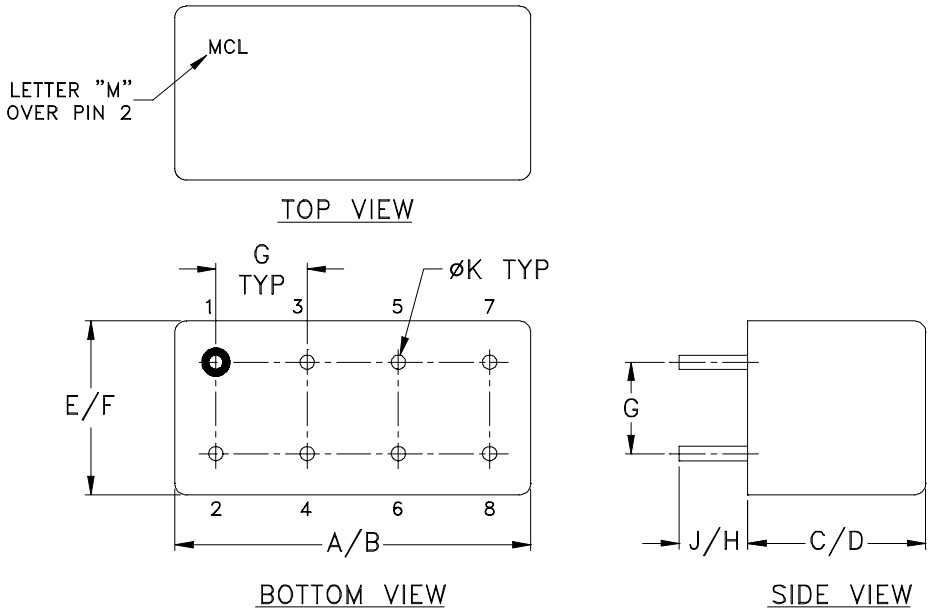
Case Style A

A01
A04
A05
A06

Outline Dimensions



CASE#	A	B	C	D	E	F	G	H	J	K	WT, GRAM
A01	.770 (19.56)	.800 (20.32)	.385 (9.78)	.400 (10.16)	.370 (9.40)	.400 (10.16)	.200 (5.08)	.20 (5.08)	.14 (3.56)	.031 (.79)	5.2
A04			.200 (5.08)	.210 (5.33)							3.7
A05			.240 (6.10)	.250 (6.35)							3.7
A06			.285 (7.24)	.310 (7.87)							5.2

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

Notes:

1. Header material: C.R.S.
   Pin material: #52 alloy.
   Cover material: Cupro-Nickel.
2. Pin finish: Electro Tin-Silver.
3. Insulated spacer available. Request P/N B14-045-01.
4. Tolerance on pin diameter +/-.005 inch.
5. Glass meniscus 0.015 inch max.
6. Blue bead indicates Pin 1. Pin numbers do not appear on unit, for reference only.

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Specification	Test/Inspection Condition	Reference/Spec
Operating Temperature	-55° to 100° C Ambient Environment	Individual Model Data Sheet
Storage Temperature	-55° to 100° C Ambient Environment	Individual Model Data Sheet
Thermal Shock	-55° to 100°C, 100 cycles	MIL-STD-202, Method 107, Condition A-3, except +100°C
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	50g, 11 ms, 1/2-sine, 18 shocks: 3 each direction, each of 3 axes	MIL-STD-202, Method 213, Condition A
Moisture Resistance	10 cycles, 24 hours per cycle	MIL-STD-202, Method 106, Condition A, except 50°C and end point electrical test done within 12 hours
Solderability	10X Magnification	J-STD-002, 95% Coverage
Resistance to Solder Heat	260°C for 10 seconds	MIL-STD-202, Method 210, Condition B
Marking Resistance to Solvents	Isopropyl alcohol + mineral spirits at 25°C; terpene defluxer at 25°C; distilled water + proylene glycol monomethyl ether + monoethanolamine at 63°C to 70°C	MIL-STD-202, Method 215
Terminal Strength	4 1/2 Pound Pull	MIL-STD-202, Method 211, Condition A

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Specification	Test/Inspection Condition	Reference/Spec
Gross Leak	125°C Bubble Test	MIL-STD-202, Method 112, Condition D
Barometric Pressure	100,000 Feet	MIL-STD-202, Method 105, Condition D

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