High Power
Bi-Directional Coupler

BDCA-7-25+

50Ω 7dB Coupling DC Pass 1200 to 2500 MHz

Generic photo used for illustration purposes only

CASE STYLE: DZ944

+RoHS Compliant

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

Available Tape and Reel at no extra cost

Reel Size	Devices/Reel
7"	20, 50, 100, 200
13"	500,1000

Maximum Ratings

Operating Temperature	-55°C to 100°C
Storage Temperature	-55°C to 100°C
DC Current	0.25A

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

Pin Connections

INPUT	1
OUTPUT	6
COUPLED (forward)	10
COUPLED (reverse)	5
GROUND	2,3,4,7,8,9

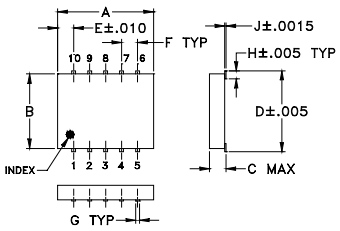
Features

- four-port coupler
- wideband, 1200 to 2500 MHz
- excellent VSWR, 1.05:1 typ. all ports
- good flatness, ±0.3 dB typ.
- excellent power handling capability, 35W (2100 MHz)
- hermetically sealed
- minimal variation with temperature variation
- low profile. 0.052" height
- protected by US Patent 7,049,905
- DC current through input to output 0.25A Max. at 1.0 watt RF input power

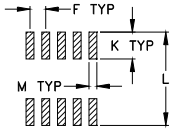
Applications

- PCS, PCN, UMTS
- ISM
- GPS
- defense

Outline Drawing



PCB Land Pattern



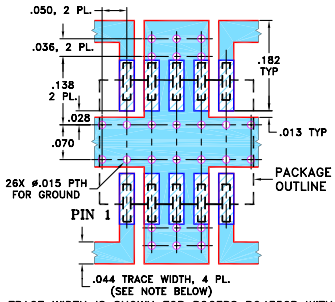
Suggested Layout,
Tolerance to be within ±.002

Outline Dimensions (inch / mm)

A	B	C	D	E	F	G
.30	.250	.052	.266	.050	.050	.012
7.62	6.35	1.32	6.76	1.27	1.27	0.30

H	J	K	L	M	wt
.029	.004	.085	.296	.030	grams
0.74	0.10	2.16	7.52	0.76	0.25

Demo Board MCL P/N: TB-115+
Suggested PCB Layout (PL-004)



NOTE: 1. TRACE WIDTH IS SHOWN FOR ROGERS RO4350B WITH DIELECTRIC THICKNESS .020 ± .0015; COPPER: 1/2 OZ. EACH SIDE. FOR OTHER MATERIALS TRACE WIDTH MAY NEED TO BE MODIFIED.
2. BOTTOM SIDE OF THE PCB IS CONTINUOUS GROUND PLANE.

DENOTES PCB COPPER LAYOUT WITH SMOBC (SOLDER MASK OVER BARE COPPER)

DENOTES COPPER LAND PATTERN FREE OF SOLDER MASK

Bi-Directional Coupler Electrical Specifications

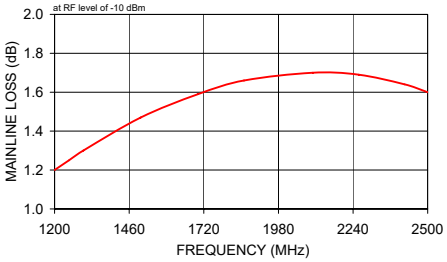
FREQUENCY (MHz)	COUPLING (dB)		MAINLINE LOSS[1] (dB)		DIRECTIVITY (dB)		VSWR (:1)	POWER INPUT[2] (W)
f_L-f_U	Nom.	Max. Flatness	Typ.	Max.	Typ.	Min.	Typ.	Max.
1200-2500								
1200-1700	7.1±0.8	±0.8	1.5	1.9	22	19	1.08	35
1700-2100	6.5±0.5	±0.3	1.6	2.0	22	14	1.05	35
2100-2500	7.0±0.8	±1.0	1.5	2.0	22	12	1.10	27

1. Includes theoretical power loss of 1.0 dB at 7 dB coupling.
2. Derate linearly 1/3 at 100°C

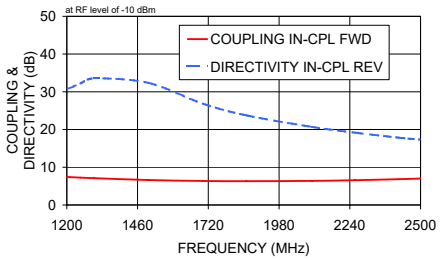
Typical Performance Data

Frequency (MHz)	Mainline Loss (dB)	Coupling (dB)		Directivity (dB)		Return Loss (dB)			
	In-Out	In-Cpl Fwd	Out-Cpl Rev	Out-Cpl Fwd	In-Cpl Rev	In	Out	Cpl Fwd	Cpl Rev
1200.00	1.20	7.44	7.44	28.71	30.67	33.76	38.52	34.05	31.62
1250.00	1.25	7.25	7.26	28.83	32.19	34.26	41.86	36.87	33.16
1300.00	1.30	7.10	7.09	28.92	33.55	34.75	58.50	42.17	34.02
1500.00	1.47	6.62	6.62	26.70	32.36	29.75	32.95	35.05	30.66
1700.00	1.59	6.36	6.37	23.78	26.87	25.23	26.63	27.37	25.76
1860.00	1.66	6.30	6.30	21.94	23.76	23.19	23.89	24.17	23.22
2100.00	1.70	6.39	6.38	19.67	20.71	21.34	21.69	21.28	20.95
2260.00	1.69	6.57	6.56	18.53	19.15	20.76	21.18	20.21	20.12
2420.00	1.64	6.84	6.84	17.58	17.85	20.67	21.04	19.83	19.80
2500.00	1.60	7.01	7.00	17.10	17.32	20.88	21.37	19.63	19.70

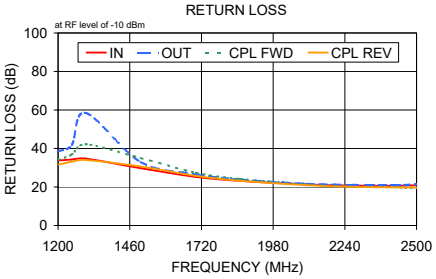
BDCA-7-25+
MAINLINE LOSS



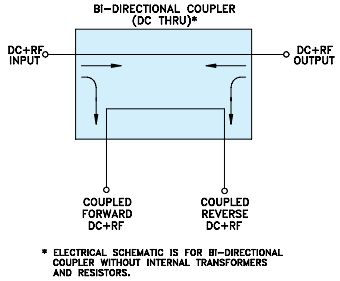
BDCA-7-25+
COUPLING & DIRECTIVITY



BDCA-7-25+
RETURN LOSS



Electrical Schematic



* ELECTRICAL SCHEMATIC IS FOR BI-DIRECTIONAL COUPLER WITHOUT INTERNAL TRANSFORMERS AND RESISTORS.

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.
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REV. G
M151107
ED-10880A/1
BDCA-7-25+
LC/TD/CP/AM
200512

Bi-Directional Coupler BDCA-7-25+

Typical Performance Data

TEST CONDITIONS: INPUT POWER =0 dBm @Temperature = +25°C

FREQ. (MHz)	INSERTION LOSS (dB)		COUPLING (dB)		DIRECTIVITY (dB)		RETURN LOSS (dB)			
	IN-OUT	FWD-REV	IN-FWD	OUT-REV	IN-REV	OUT-FWD	IN	OUT	FWD	REV
500	0.41	0.39	13.17	13.18	22.71	22.74	26.96	26.98	29.95	29.88
600	0.51	0.49	11.82	11.83	23.25	23.28	25.86	26.16	29.16	29.54
700	0.62	0.60	10.74	10.75	23.83	24.02	25.34	25.39	29.09	29.29
800	0.74	0.72	9.85	9.86	24.67	24.89	25.29	25.37	29.28	29.80
900	0.85	0.83	9.12	9.13	25.51	25.88	25.59	25.54	30.44	31.01
1000	0.96	0.94	8.51	8.52	26.34	27.04	26.36	26.15	32.61	33.28
1100	1.07	1.05	8.01	8.01	26.79	27.99	27.55	27.07	35.74	36.54
1150	1.12	1.10	7.79	7.79	26.91	28.38	28.33	27.71	37.91	38.60
1200	1.16	1.15	7.58	7.60	26.89	28.53	29.63	28.52	39.57	40.14
1250	1.21	1.20	7.40	7.41	26.78	28.32	30.96	29.39	39.26	39.77
1300	1.26	1.25	7.24	7.25	26.46	28.23	32.75	30.36	36.34	37.52
1350	1.30	1.29	7.10	7.11	26.14	27.68	35.23	31.55	34.00	34.51
1400	1.34	1.34	6.98	6.98	25.60	27.04	38.48	32.22	31.63	32.02
1450	1.38	1.38	6.86	6.87	25.14	26.27	40.70	32.44	29.83	29.78
1500	1.42	1.42	6.77	6.77	24.49	25.51	38.47	31.84	28.04	28.13
1550	1.45	1.46	6.68	6.69	23.97	24.86	35.17	30.48	26.78	26.57
1600	1.48	1.49	6.61	6.62	23.36	24.12	32.28	29.04	25.59	25.31
1650	1.51	1.52	6.56	6.57	22.85	23.41	29.85	27.58	24.51	24.29
1700	1.54	1.55	6.51	6.52	22.15	22.69	27.83	26.21	23.64	23.44
1750	1.56	1.57	6.48	6.50	21.67	22.16	26.36	25.08	22.86	22.66
1800	1.59	1.59	6.47	6.48	21.17	21.49	24.96	24.04	22.09	21.97
1850	1.60	1.61	6.46	6.47	20.67	20.92	23.84	23.14	21.35	21.29
1900	1.61	1.63	6.47	6.48	20.08	20.30	22.78	22.21	20.61	20.56
1950	1.63	1.64	6.49	6.49	19.71	19.78	21.92	21.40	20.13	20.05
2000	1.63	1.65	6.51	6.52	19.22	19.30	21.12	20.72	19.51	19.58
2050	1.64	1.66	6.55	6.56	18.81	18.75	20.41	20.13	19.08	19.11
2100	1.65	1.66	6.60	6.60	18.42	18.34	19.78	19.55	18.69	18.72
2150	1.65	1.66	6.65	6.65	18.03	17.93	19.25	19.07	18.46	18.48
2200	1.64	1.65	6.72	6.73	17.68	17.54	18.80	18.71	18.23	18.27
2250	1.64	1.64	6.79	6.78	17.41	17.17	18.32	18.28	17.99	18.00
2300	1.63	1.64	6.87	6.86	17.05	16.81	18.00	18.01	17.82	17.86
2350	1.63	1.62	6.96	6.94	16.69	16.45	17.70	17.70	17.70	17.77
2400	1.62	1.61	7.05	7.05	16.33	16.11	17.51	17.55	17.61	17.71
2450	1.59	1.58	7.17	7.16	16.08	15.73	17.36	17.42	17.59	17.64
2500	1.58	1.58	7.28	7.27	15.74	15.33	17.21	17.29	17.52	17.60
2550	1.56	1.55	7.42	7.38	15.43	15.06	17.12	17.21	17.54	17.63
2600	1.53	1.52	7.54	7.52	15.18	14.76	17.08	17.26	17.46	17.59
2700	1.49	1.47	7.86	7.81	14.51	14.02	17.27	17.40	17.67	17.86
2800	1.42	1.41	8.24	8.20	13.90	13.40	17.51	17.74	18.06	18.22
2900	1.34	1.33	8.68	8.64	13.22	12.77	17.99	18.27	18.50	18.78
3000	1.26	1.26	9.18	9.13	12.71	12.26	18.66	18.93	19.00	19.28
3250	1.05	1.05	11.05	10.98	10.68	10.36	20.78	20.94	20.78	21.13
3500	0.88	0.92	14.07	13.98	7.31	7.20	21.91	21.68	20.14	20.71
3750	0.80	0.83	19.88	19.41	0.59	0.21	19.53	19.50	17.56	18.01
4000	0.90	0.97	30.34	26.86	8.04	11.55	15.14	15.24	13.82	14.02
4250	1.17	1.26	20.75	20.26	2.41	3.18	11.72	11.78	10.93	10.94
4500	1.55	1.63	16.38	16.18	1.30	0.70	9.46	9.51	8.96	8.97
4750	1.86	1.94	14.17	14.17	3.12	2.62	8.28	8.36	8.06	7.94
5000	2.04	2.11	12.81	12.87	4.57	4.12	7.93	7.97	7.80	7.67
5250	2.10	2.16	11.65	11.73	5.94	5.57	8.33	8.36	8.16	8.09
5500	2.06	2.12	10.52	10.51	7.54	7.19	9.48	9.43	9.23	9.18
5750	2.02	2.05	9.39	9.38	9.31	9.17	11.34	11.34	11.15	11.34
6000	2.02	2.04	8.43	8.33	10.96	11.04	14.18	14.43	14.20	15.09

Bi-Directional Coupler BDCA-7-25+

Typical Performance Data

TEST CONDITIONS: INPUT POWER =0 dBm @Temperature = -55°C

FREQ. (MHz)	INSERTION LOSS (dB)		COUPLING (dB)		DIRECTIVITY (dB)		RETURN LOSS (dB)			
	IN-OUT	FWD-REV	IN-FWD	OUT-REV	IN-REV	OUT-FWD	IN	OUT	FWD	REV
500	0.34	0.33	13.17	13.14	23.66	23.65	28.33	28.28	31.94	31.83
600	0.43	0.42	11.80	11.77	24.16	24.12	27.08	27.41	30.71	31.20
700	0.54	0.52	10.71	10.68	24.82	24.89	26.40	26.41	30.80	30.90
800	0.64	0.63	9.82	9.78	25.44	25.77	25.95	25.95	30.84	31.40
900	0.75	0.73	9.08	9.04	26.61	26.81	26.53	26.46	32.00	32.58
1000	0.85	0.84	8.47	8.42	27.21	27.87	26.65	26.42	34.86	35.61
1100	0.95	0.93	7.96	7.91	27.68	28.48	27.68	27.32	38.38	39.03
1150	1.00	0.99	7.73	7.68	27.95	28.67	28.47	28.22	40.09	40.81
1200	1.04	1.03	7.53	7.48	27.52	28.56	29.50	28.72	42.04	41.54
1250	1.09	1.08	7.34	7.29	27.07	28.26	31.50	29.82	42.62	40.14
1300	1.13	1.13	7.17	7.12	26.93	28.19	34.59	31.97	39.39	38.80
1350	1.17	1.17	7.03	6.97	26.58	27.54	36.94	33.20	36.54	36.01
1400	1.21	1.20	6.90	6.84	25.62	26.89	40.96	33.21	33.06	33.07
1450	1.25	1.25	6.78	6.72	25.25	26.20	41.25	34.01	30.34	30.47
1500	1.28	1.28	6.68	6.62	24.50	25.38	40.72	32.74	28.20	28.17
1550	1.31	1.32	6.59	6.53	23.75	24.51	37.41	30.38	26.78	26.16
1600	1.34	1.35	6.52	6.46	23.27	23.65	32.96	29.11	25.60	24.83
1650	1.37	1.38	6.46	6.40	22.92	22.99	29.96	27.70	24.68	24.05
1700	1.39	1.40	6.42	6.35	22.30	22.40	27.82	26.43	23.95	23.45
1750	1.41	1.42	6.38	6.31	21.83	22.05	26.70	25.51	23.14	22.81
1800	1.43	1.44	6.35	6.28	21.23	21.59	25.53	24.51	22.34	22.23
1850	1.44	1.46	6.34	6.27	20.65	21.06	24.47	23.57	21.59	21.55
1900	1.46	1.48	6.34	6.27	20.00	20.31	23.15	22.41	20.82	20.75
1950	1.47	1.48	6.36	6.28	19.78	19.76	22.20	21.67	20.44	20.23
2000	1.47	1.49	6.38	6.30	19.45	19.15	21.51	21.11	19.78	19.54
2050	1.48	1.50	6.42	6.34	18.81	18.41	20.61	20.21	19.06	18.77
2100	1.48	1.50	6.46	6.38	18.27	17.91	19.95	19.60	18.39	18.19
2150	1.48	1.50	6.52	6.42	17.79	17.60	19.35	19.02	18.14	17.98
2200	1.48	1.49	6.58	6.49	17.35	17.33	18.79	18.49	18.02	17.97
2250	1.47	1.47	6.64	6.54	17.31	17.01	18.31	18.16	17.97	17.84
2300	1.47	1.46	6.71	6.61	17.03	16.59	17.72	17.66	17.97	17.80
2350	1.46	1.45	6.79	6.69	16.68	16.20	17.28	17.25	17.89	17.74
2400	1.44	1.44	6.88	6.79	16.49	15.73	17.21	17.36	17.68	17.57
2450	1.43	1.41	7.00	6.88	16.19	15.33	17.03	17.17	17.53	17.39
2500	1.41	1.40	7.09	6.97	15.71	15.15	17.01	17.01	17.34	17.32
2550	1.38	1.37	7.22	7.08	15.53	14.97	17.28	17.26	17.56	17.51
2600	1.34	1.34	7.34	7.22	15.31	14.84	17.19	17.14	17.67	17.66
2700	1.29	1.28	7.61	7.48	14.92	14.13	17.32	17.48	17.68	17.54
2800	1.24	1.21	8.00	7.86	14.05	13.40	17.02	17.01	18.03	18.16
2900	1.14	1.14	8.42	8.27	13.28	12.78	17.76	18.00	18.27	18.47
3000	1.06	1.06	8.90	8.73	13.02	12.05	18.09	18.65	18.57	18.84
3250	0.83	0.84	10.68	10.51	10.94	10.56	20.93	20.99	21.11	21.36
3500	0.63	0.66	13.55	13.34	7.86	7.57	22.60	22.71	19.92	20.48
3750	0.55	0.58	19.06	18.64	1.17	0.90	19.65	19.55	17.43	17.92
4000	0.64	0.68	30.57	26.85	8.08	11.86	15.14	15.13	14.22	14.26
4250	0.87	0.93	21.37	20.82	3.09	3.90	11.93	11.76	11.34	11.13
4500	1.21	1.29	16.48	16.19	1.09	0.37	9.50	9.41	9.02	8.79
4750	1.49	1.56	14.13	13.95	3.04	2.59	8.41	8.26	8.02	7.88
5000	1.66	1.78	12.67	12.56	4.58	3.93	7.93	7.77	7.58	7.28
5250	1.73	1.86	11.50	11.39	5.91	5.51	8.22	7.99	7.71	7.50
5500	1.73	1.78	10.38	10.21	7.38	7.05	8.94	8.74	8.80	8.61
5750	1.68	1.74	9.33	9.13	8.92	8.63	10.52	10.31	10.18	10.13
6000	1.68	1.68	8.34	8.04	10.50	10.14	12.79	12.94	13.16	13.77

Bi-Directional Coupler BDCA-7-25+

Typical Performance Data

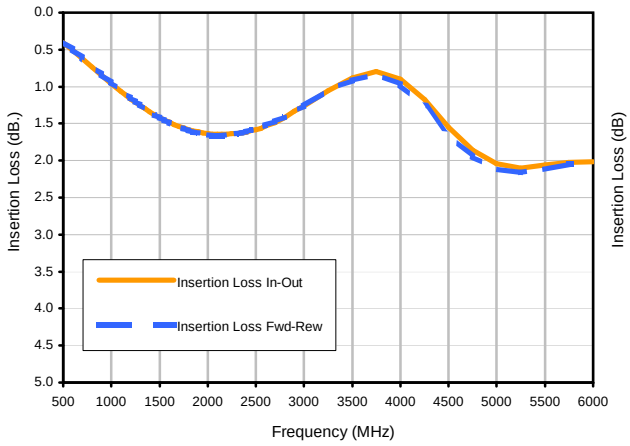
TEST CONDITIONS: INPUT POWER =0 dBm @Temperature = +100°C

FREQ. (MHz)	INSERTION LOSS (dB)		COUPLING (dB)		DIRECTIVITY (dB)		RETURN LOSS (dB)			
	IN-OUT	FWD-REV	IN-FWD	OUT-REV	IN-REV	OUT-FWD	IN	OUT	FWD	REV
500	0.46	0.44	13.15	13.17	21.73	21.76	25.86	25.91	28.33	28.43
600	0.57	0.55	11.80	11.83	22.35	22.41	24.92	25.21	27.82	28.23
700	0.69	0.67	10.73	10.76	22.91	23.10	24.38	24.44	27.79	28.02
800	0.80	0.79	9.86	9.88	23.89	24.03	24.54	24.64	28.19	28.72
900	0.92	0.91	9.13	9.16	24.81	25.14	24.93	24.92	29.51	30.08
1000	1.04	1.02	8.53	8.57	25.85	26.54	26.03	25.86	31.77	32.48
1100	1.15	1.13	8.03	8.07	26.46	27.88	27.42	26.90	35.18	36.11
1150	1.20	1.19	7.82	7.85	26.72	28.49	28.20	27.47	37.58	38.34
1200	1.25	1.24	7.62	7.66	26.82	28.85	29.54	28.21	39.00	39.60
1250	1.30	1.30	7.44	7.48	26.93	28.79	30.99	29.18	38.06	38.88
1300	1.35	1.34	7.29	7.33	26.79	28.85	32.76	30.15	35.26	36.35
1350	1.39	1.39	7.15	7.19	26.60	28.43	35.37	31.28	32.93	33.43
1400	1.44	1.44	7.03	7.07	26.23	27.93	38.91	32.05	30.92	31.42
1450	1.48	1.48	6.92	6.96	25.94	27.14	40.53	32.23	29.53	29.44
1500	1.52	1.52	6.83	6.87	25.36	26.40	37.77	31.75	27.90	27.95
1550	1.56	1.56	6.74	6.79	24.83	25.89	34.81	30.44	26.81	26.80
1600	1.59	1.60	6.68	6.73	24.07	25.18	32.07	28.85	25.72	25.74
1650	1.62	1.63	6.63	6.68	23.55	24.37	29.77	27.60	24.55	24.62
1700	1.64	1.66	6.59	6.64	22.86	23.60	27.92	26.43	23.65	23.67
1750	1.67	1.69	6.57	6.62	22.41	23.09	26.53	25.41	22.97	22.98
1800	1.69	1.71	6.55	6.61	21.97	22.32	25.22	24.38	22.32	22.31
1850	1.71	1.73	6.55	6.61	21.45	21.65	24.04	23.41	21.61	21.60
1900	1.73	1.74	6.56	6.61	20.86	21.10	23.04	22.53	20.97	21.04
1950	1.74	1.76	6.58	6.63	20.48	20.65	22.26	21.80	20.58	20.67
2000	1.75	1.77	6.61	6.66	19.96	20.14	21.53	21.20	19.94	20.17
2050	1.76	1.77	6.65	6.70	19.62	19.60	20.88	20.71	19.61	19.78
2100	1.77	1.78	6.69	6.74	19.27	19.20	20.26	20.15	19.40	19.56
2150	1.76	1.78	6.76	6.80	18.91	18.73	19.73	19.73	19.26	19.35
2200	1.76	1.77	6.83	6.88	18.58	18.32	19.30	19.36	18.93	19.05
2250	1.76	1.76	6.90	6.95	18.13	17.96	18.89	18.92	18.59	18.75
2300	1.75	1.76	6.98	7.03	17.73	17.67	18.70	18.73	18.33	18.61
2350	1.75	1.75	7.08	7.13	17.27	17.36	18.47	18.50	18.22	18.52
2400	1.73	1.74	7.18	7.23	17.01	17.01	18.26	18.34	18.20	18.46
2450	1.72	1.72	7.32	7.35	16.70	16.51	18.02	18.16	18.27	18.43
2500	1.71	1.70	7.44	7.48	16.34	16.08	17.72	17.91	18.18	18.37
2550	1.70	1.68	7.60	7.63	15.92	15.59	17.50	17.77	18.15	18.33
2600	1.67	1.66	7.73	7.76	15.59	15.28	17.43	17.68	17.85	18.11
2700	1.62	1.62	8.07	8.08	14.79	14.62	17.69	17.83	18.00	18.44
2800	1.55	1.56	8.48	8.49	14.06	13.82	17.94	18.26	18.16	18.45
2900	1.48	1.49	8.96	8.97	13.39	13.12	18.36	18.64	18.62	19.05
3000	1.43	1.42	9.53	9.52	12.67	12.51	19.05	19.10	19.30	19.50
3250	1.23	1.24	11.46	11.45	10.45	10.25	20.23	20.21	19.97	20.28
3500	1.09	1.13	14.79	14.69	6.39	6.24	20.72	20.32	19.34	19.81
3750	1.03	1.08	20.81	20.30	0.21	0.77	18.46	18.46	16.85	17.30
4000	1.16	1.24	29.81	26.52	7.63	11.00	14.72	14.90	13.38	13.67
4250	1.45	1.55	20.28	19.80	1.75	2.56	11.42	11.74	10.61	10.80
4500	1.83	1.92	16.11	16.13	1.50	1.05	9.50	9.72	9.02	9.11
4750	2.15	2.25	14.08	14.27	3.20	2.79	8.34	8.53	8.10	8.07
5000	2.35	2.42	12.84	13.07	4.52	4.24	8.09	8.22	8.05	7.99
5250	2.42	2.48	11.77	11.95	5.95	5.61	8.57	8.67	8.47	8.46
5500	2.38	2.46	10.65	10.75	7.59	7.20	9.90	9.93	9.70	9.64
5750	2.36	2.36	9.49	9.60	9.35	9.15	11.93	11.97	12.15	12.18
6000	2.36	2.38	8.55	8.61	10.83	11.35	15.43	15.48	15.52	16.40

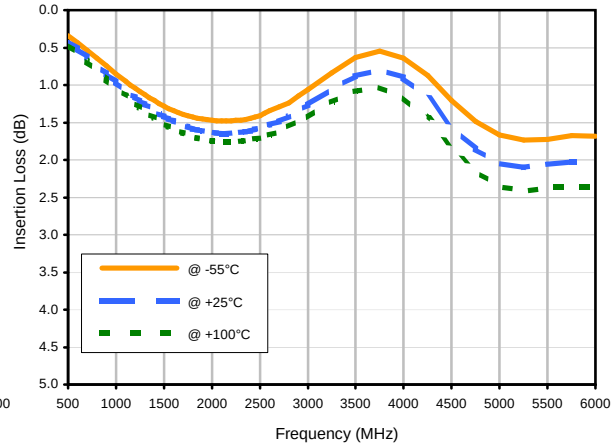
Bi-Directional Coupler BDCA-7-25+

Typical Performance Curves

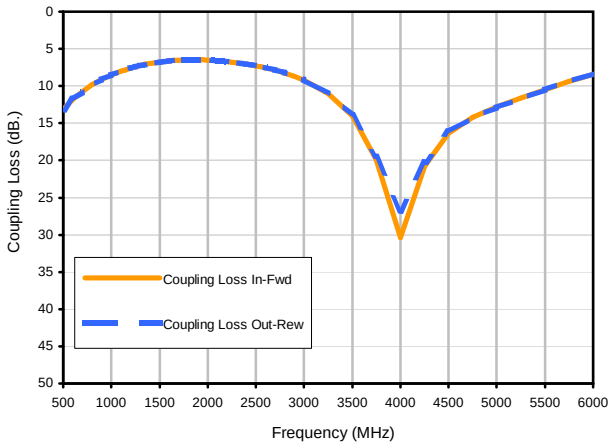
Insertion Loss



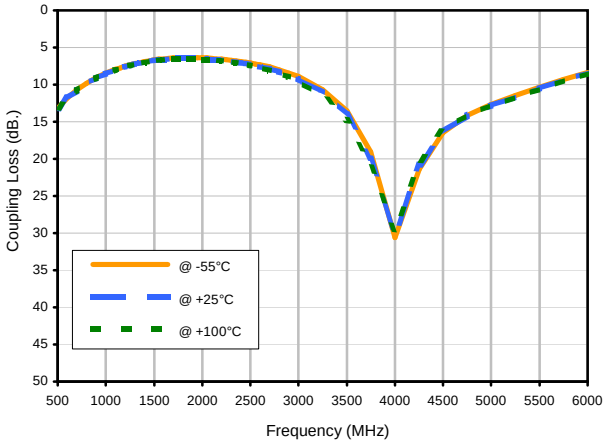
Insertion Loss vs. TEMPERATURE



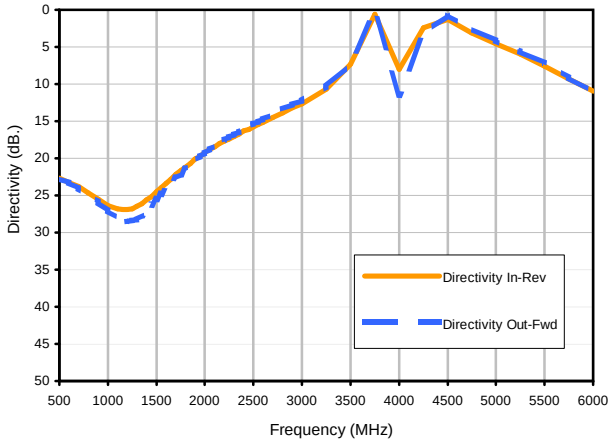
Coupling Loss



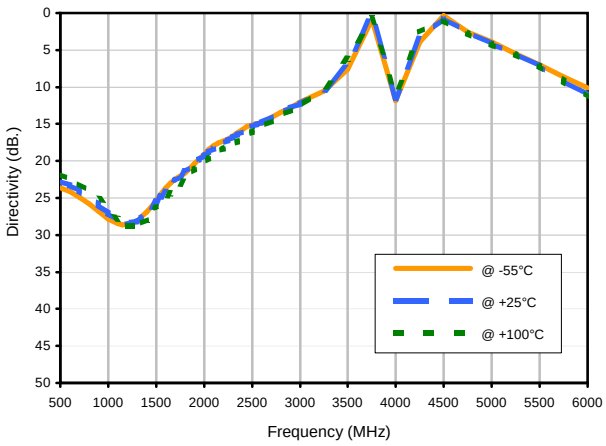
Coupling Loss vs. TEMPERATURE



Directivity

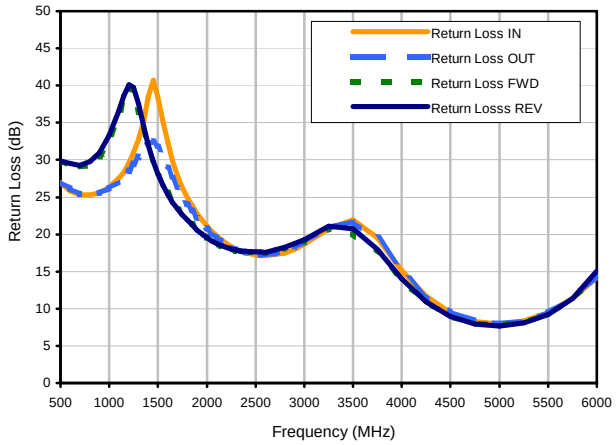


Directivity vs. TEMPERATURE

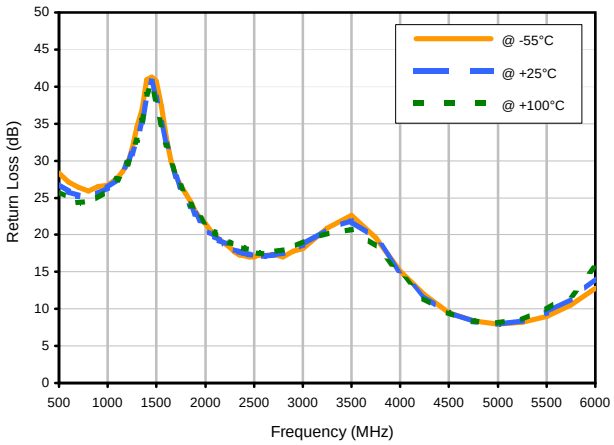


Typical Performance Curves

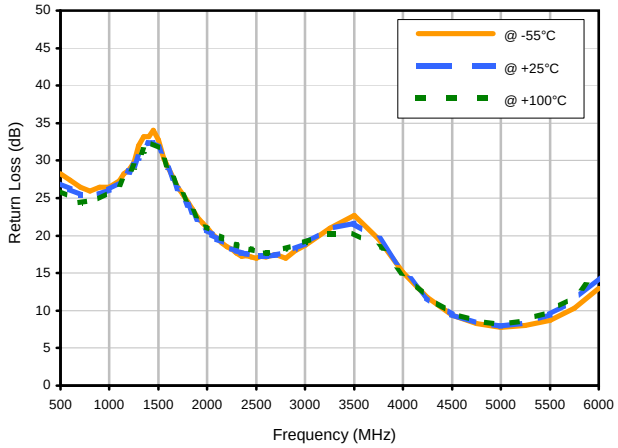
Return Loss



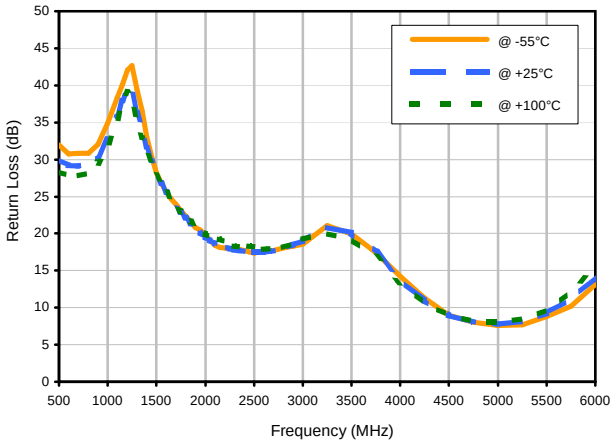
Return Loss In vs. TEMPERATURE



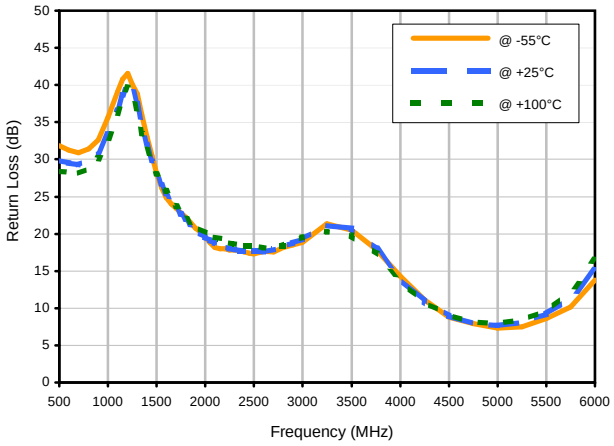
Return Loss Out vs. TEMPERATURE



Return Loss Fwd vs. TEMPERATURE



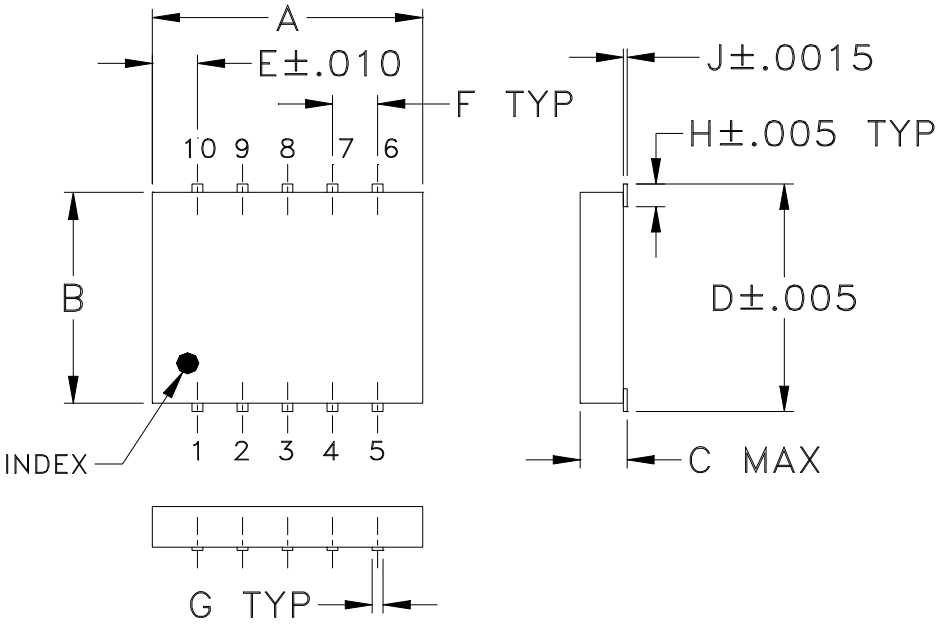
Return Loss Rev vs. TEMPERATURE



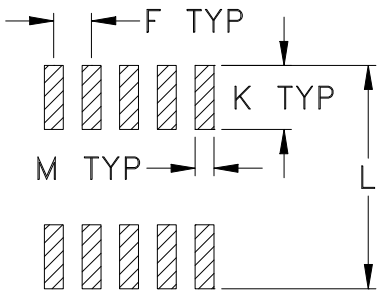
Case Style DZ

DZ944

Outline Dimensions



PCB Land Pattern



Suggested Layout,
Tolerance to be within ±.002

CASE#	A	B	C	D	E	F	G	H	J	K	L	M	WT. GRAMS
DZ944	.30 (7.62)	.250 (6.35)	.052 (1.32)	.266 (6.76)	.050 (1.27)	.050 (1.27)	.012 (0.30)	.029 (0.74)	.004 (0.10)	.085 (2.16)	.296 (7.52)	.030 (0.76)	0.25

Dimensions are in inches (mm). Tolerances: 2Pl. ± .01; 3Pl. ± .005

Notes:

1. Case material: Ceramic.
2. Termination finish:
   For RoHS Case Styles: Tin plate. All models, (+) suffix.
   For RoHS-5 Case Styles: Tin-Lead plate. All models, no (+) suffix.

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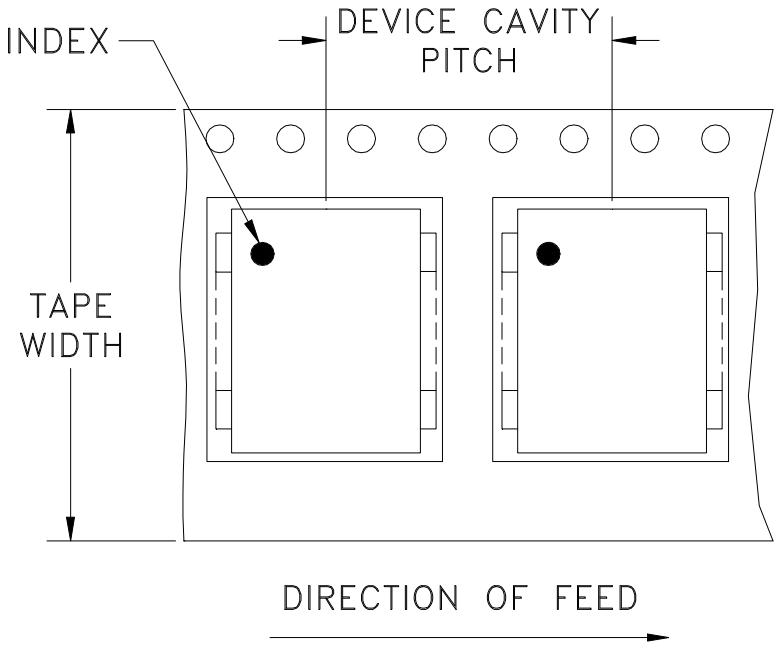
Tape & Reel Packaging TR-F34

DEVICE ORIENTATION IN T&R



Tape Width, mm	Device Cavity Pitch, mm	Reel Size, inches	Devices per Reel see note	
16	12	7	Small quantity standard (see note)	20
				50
				100
				200
		13	Standard	500
				1000

Note: Availability of small reel quantity varies by model.
Refer to pricing and availability on individual model dashboard.

Mini-Circuits carrier tape materials provide protection from ESD (Electro-Static Discharge) during handling and transportation. Tapes are static dissipative and comply with industry standards EIA-481/EIA-541.

Go to: www.minicircuits.com/pages/pdfs/tape.pdf

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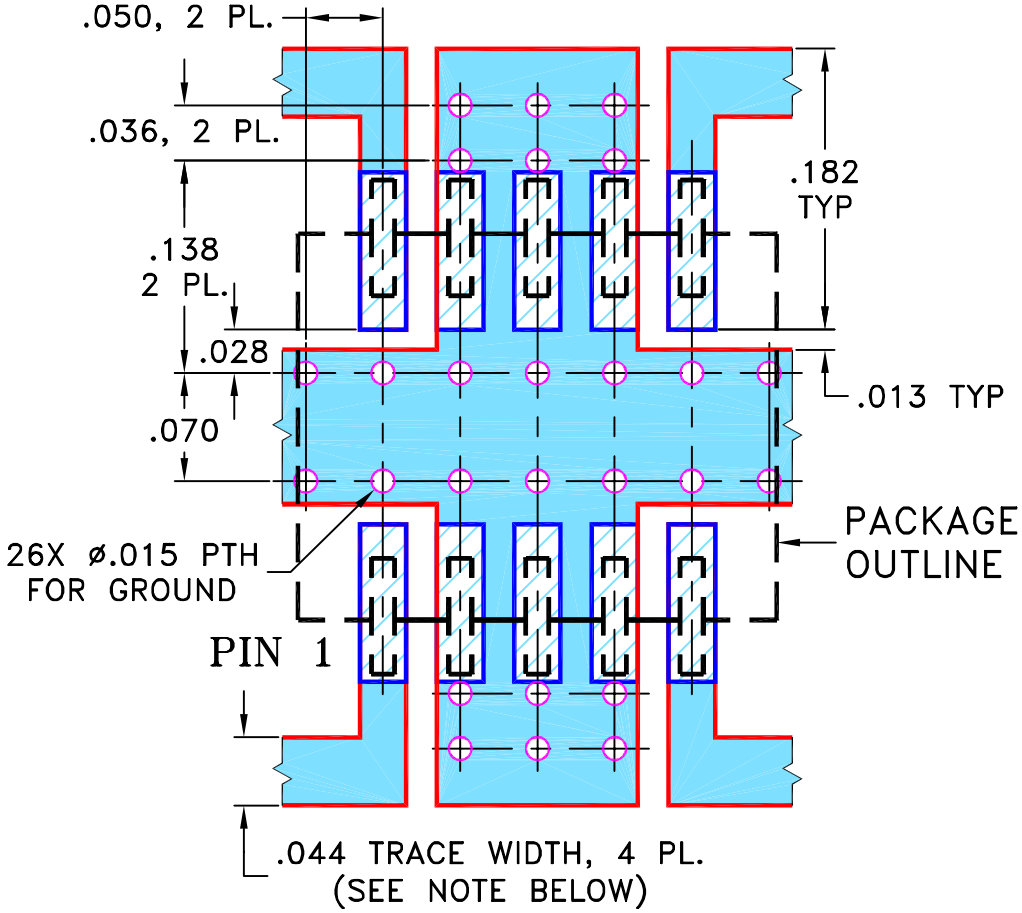
THIRD ANGLE PROJECTION

REVISIONS					
REV	ECN No.	DESCRIPTION	DATE	DR	AUTH
A	M82377	UPDATED DRAWING	07/31/02	AV	DB
B	M101085	UPDATED DRAWING, ADDED	10/06/05	MMG	HY
		DZ944 CASE STYLE & NOTE 2			
C	M102713	UPDATED NOTES	01/10/06	MMG	ABD

SUGGESTED MOUNTING CONFIGURATION FOR SM1L/SM33/DZ944 CASE STYLES, "lf/nl" PIN CONNECTIONS



NOTE: 1. TRACE WIDTH IS SHOWN FOR ROGERS RO4350B WITH DIELECTRIC THICKNESS .020 ± .0015; COPPER: 1/2 OZ. EACH SIDE. FOR OTHER MATERIALS TRACE WIDTH MAY NEED TO BE MODIFIED.

2. BOTTOM SIDE OF THE PCB IS CONTINUOUS GROUND PLANE.

DENOTES PCB COPPER LAYOUT WITH SMOBC (SOLDER MASK OVER BARE COPPER)

DENOTES COPPER LAND PATTERN FREE OF SOLDER MASK

UNLESS OTHERWISE SPECIFIED		INITIALS	DATE
DIMENSIONS ARE IN INCHES	DRAWN	MMG	04/12/00
TOLERANCES ON:	CHECKED	WP	04/27/00
2 PL DECIMALS ±	APPROVED	DB	04/27/00
3 PL DECIMALS ± .005			
ANGLES ±			
FRACTIONS ±			

ASHEETA1.DWG REV:A DATE:01/12/95

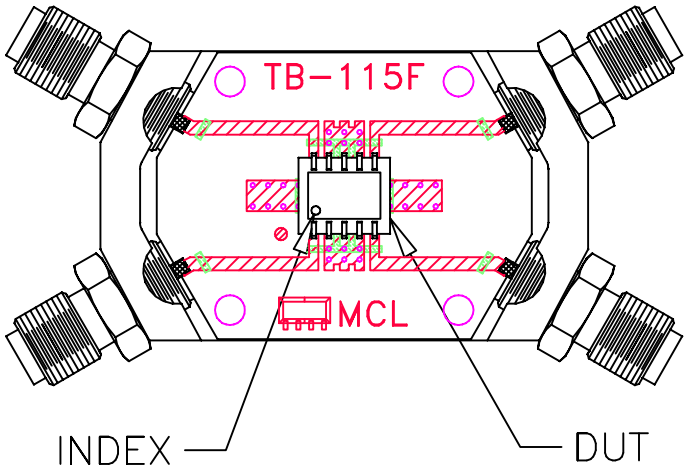
Mini-Circuits® 13 Neptune Avenue Brooklyn NY 11235

PL, lf/nl, SM1L/SM33/DZ944, BDCA/QBA, TB-115

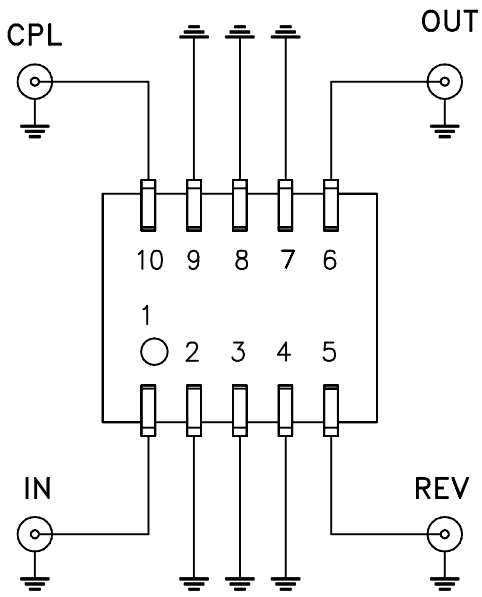
SIZE	CODE IDENT	DRAWING NO:	REV:
A	15542	98-PL-004	C

FILE:	SCALE:	SHEET:
98PL004	8:1	1 OF 1

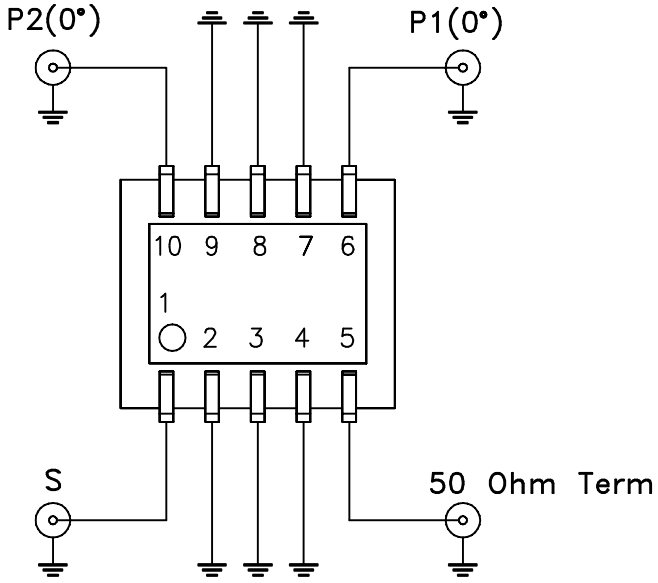
Evaluation Board and Circuit



TB-115+



BDCA MODELS



QBA MODELS

SCHEMATIC DIAGRAM

Notes:

1. SMA Female connectors.
2. PCB Material: Rogers RO4350 or equivalent, Dielectric Constant=3.5, Thickness=.020 inch.

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Environmental Specifications ENV02T2

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 100°C Ambient Environment	Individual Model Data Sheet
Storage Temperature	-55° to 100° C Ambient Environment	Individual Model Data Sheet
Humidity	90 to 95% RH, 240 hours, 50°C	MIL-STD-202, Method 103, Condition A, Except 50°C and end-point electrical test done within 12 hours
Thermal Shock	-55° to 100°C, 100 cycles	MIL-STD-202, Method 107, Condition A-3, except +100°C
Solder Reflow Heat	Sn-Pb Eutetic Process: 225°C peak Pb-Free Process 245° - 250°C peak	J-STD-020, Table 4-1, 4-2 and 5-2, Figure 5-1
Solderability	10X Magnification	J-STD-002, 95% Coverage
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
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