Engineering Development Model

Frequency Synthesizer DSN-EDR9496/3MP

Important Note

This model has been designed, built and tested in our engineering department. Performance data represents model capability.
At present it is a non-catalog model. On request, we can supply a final specification sheet, part number and price/delivery information.

Please click "Back", and then click "Contact Us" for Applications support.

CASE STYLE : KL942

Not recommended for new designs, Contact applications and/or your account manager for an alternative

ELECTRICAL SPECIFICATIONS 50Ω, over -29°C to +60°C					
Parameter		**Min.**	**Typ.**	**Max.**	**Units**
Frequency		56.25		99.9938	MHz
Step size			6.25		kHz
Settling Time	Within ±1kHz		150		msec
Output Power		-7	+5	+10	dBm
Phase Noise					
	at 100 Hz offset		-41		dBc/Hz
	at 1 kHz offset		-66		dBc/Hz
	at 10 KHz offset		-85		dBc/Hz
	at 100 KHz offset		-102		dBc/Hz
	at 1000 kHz offset		-118		dBc/Hz
Integrated SSB Phase Noise			-37		dBc
Reference Spurious Suppression			-69		dBc
Comparison Spurious Suppression			-99		dBc
Non-Harm. Spurious Suppression			-90		dBc
Harmonic Suppression			-40		dBc
Supply voltage	VCO		5		V
	PLL		17		V
Supply current	VCO		10	32	V
	PLL		6	21	V
Reference In (External)	Frequency		52		MHz
	Amplitude		1		Vp-p
	Impedance		100		kΩ
	Ph. N @ 1kHz		-145		dBc/Hz
Input Logic Levels	Logic high	2.64		3.3	V
	Logic Low			0.66	
Digital Lock Detect	Locked	2.9		3.3	V
	Unlocked			0.4	
Frequency Synthesizer PLL		LMX2306			

ABSOLUTE MAXIMUM RATINGS	
Operating Temperature	-45°C to 85°C
Storage Temperature	-55°C to 100°C
VCO Supply Voltage	6V
PLL Supply Voltage	18V
Reference Frequency voltage	5.8Vp-p
Data, Clock & LE levels	3.6V

Power On sequence: Vcc VCO followed by Vcc PLL
Power Off sequence: Vcc PLL followed by Vcc VCO

PIN CONNECTIONS			
RF OUT	5	**CLOCK**	11
VCC VCO	16	**DATA**	9
VCC PLL	18	**LATCH ENABLE**	7
REF IN	14	**GROUND**	1,2,3,4,6,8,10,13,15, 17,19,20,21,22
LOCK DETECT	7		

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-Circuits 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

Frequency Synthesizer DSN-EDR9496/3MP

Typical Performance Data

FREQ. (MHz)	POWER OUTPUT (dBm)			HARMONICS (dBc)						VCO CURRENT (mA)			PLL CURRENT (mA)		
				F2			F3								
	-29 °C	+25ºC	+60 °C	-29 °C	+25ºC	+60 °C	-29 °C	+25ºC	+60 °C	-29 °C	+25ºC	+60 °C	-29 °C	+25ºC	+60 °C
53.0	6.67	6.69	6.05	-30.67	-33.59	-32.09	-63.77	-71.40	-64.73	11.68	12.21	12.82	7.82	8.07	8.27
56.3	6.69	6.75	6.12	-32.91	-35.89	-34.37	-64.40	-72.62	-65.86	11.52	12.12	12.74	7.82	8.07	8.27
58.2	6.68	6.76	6.12	-34.57	-36.92	-35.53	-63.32	-75.57	-69.33	11.46	12.08	12.69	7.82	8.07	8.27
63.4	6.72	6.72	5.99	-39.53	-40.02	-38.64	-62.93	-80.96	-68.89	11.35	11.99	12.60	7.82	8.07	8.27
68.6	6.79	6.60	5.80	-45.18	-44.91	-43.82	-64.10	-69.89	-63.73	11.30	11.94	12.55	7.82	8.07	8.27
73.8	6.82	6.44	5.60	-53.35	-52.28	-51.43	-66.61	-65.17	-60.15	11.32	11.95	12.53	7.82	8.07	8.27
79.0	6.77	6.31	5.45	-68.63	-65.98	-64.91	-65.06	-62.67	-57.81	11.37	11.98	12.53	7.82	8.07	8.27
84.2	6.70	6.22	5.36	-60.98	-59.92	-57.90	-61.08	-60.96	-56.21	11.44	12.03	12.55	7.82	8.07	8.27
89.4	6.62	6.18	5.28	-56.89	-55.53	-53.96	-57.95	-60.77	-57.58	11.49	12.09	12.58	7.82	8.07	8.27
94.6	6.52	6.06	5.00	-54.90	-53.44	-52.11	-57.13	-62.96	-62.36	11.51	12.11	12.60	7.82	8.07	8.27
99.8	6.27	5.35	3.95	-52.62	-51.10	-49.94	-60.13	-71.15	-71.26	11.44	12.10	12.61	7.82	8.06	8.26
100.0	6.25	5.30	3.89	-52.44	-51.01	-49.83	-60.09	-71.63	-70.60	11.44	12.10	12.60	7.83	8.08	8.28
105.0	5.04	3.37	1.65	-49.16	-47.78	-46.73	-67.22	-63.03	-58.84	11.35	12.09	12.61	7.81	8.06	8.26

FREQ. (MHz)	PHASE NOISE (dBc/Hz) @ OFFSETS														
	-29 °C					+25ºC					+60 °C				
	100Hz	1kHz	10kHz	100kHz	1MHz	100Hz	1kHz	10kHz	100kHz	1MHz	100Hz	1kHz	10kHz	100kHz	1MHz
53.0	-57.17	-91.29	-112.41	-132.89	-153.82	-53.63	-86.98	-110.34	-131.70	-154.08	-47.82	-83.48	-106.71	-128.81	-151.60
56.3	-55.26	-86.68	-111.63	-132.03	-152.36	-55.68	-86.75	-110.02	-131.45	-153.20	-49.73	-81.03	-106.08	-128.04	-150.40
58.2	-54.57	-83.91	-110.99	-131.26	-151.74	-55.27	-87.78	-109.85	-131.15	-152.90	-47.33	-81.82	-106.57	-127.74	-150.03
63.4	-53.87	-83.13	-108.38	-129.02	-149.47	-58.53	-89.09	-110.11	-130.67	-151.70	-48.84	-81.11	-105.99	-127.17	-149.07
68.6	-52.15	-82.65	-106.53	-127.39	-147.99	-57.14	-88.04	-110.13	-129.91	-150.24	-50.86	-81.22	-105.03	-126.22	-147.83
73.8	-51.53	-80.52	-105.83	-126.28	-146.70	-54.40	-85.92	-108.50	-128.64	-148.44	-50.65	-85.59	-107.34	-127.70	-148.65
79.0	-51.58	-81.60	-104.80	-125.55	-145.91	-48.46	-83.69	-106.35	-126.66	-146.41	-52.02	-85.18	-106.91	-127.62	-147.66
84.2	-50.67	-80.71	-105.18	-125.60	-145.80	-46.76	-78.89	-104.85	-125.54	-145.69	-50.38	-83.16	-106.21	-126.71	-147.06
89.4	-50.28	-81.33	-105.08	-125.89	-146.09	-47.66	-80.72	-104.25	-124.96	-145.22	-48.83	-80.69	-106.03	-125.89	-146.10
94.6	-55.13	-84.57	-106.98	-127.08	-146.93	-49.18	-79.03	-104.47	-125.21	-145.54	-47.29	-80.35	-105.31	-125.74	-145.95
99.8	-56.89	-84.89	-108.37	-127.97	-147.96	-48.45	-79.37	-105.38	-125.76	-145.82	-48.94	-80.99	-104.87	-125.77	-145.93
100.0	-58.01	-85.17	-108.36	-127.70	-147.91	-49.33	-83.30	-104.65	-125.68	-145.78	-46.31	-79.31	-105.30	-125.86	-146.00
105.0	-55.71	-84.16	-107.71	-128.06	-147.96	-49.24	-81.96	-105.42	-125.82	-145.77	-48.81	-79.17	-104.53	-125.40	-145.30

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

Typical Performance Data

COMPARISON SPURIOUS ORDER	COMPARISON SPURIOUS @Fcarrier 56.25 MHz± (n*Fcomparison) (dBc) NOTE 1			COMPARISON SPURIOUS @Fcarrier 72 MHz± (n*Fcomparison) (dBc) NOTE 1			COMPARISON SPURIOUS @Fcarrier 99.99375 MHz± (n*Fcomparison) (dBc) NOTE 1		
n	-29 °C	+25ºC	+60 °C	-29 °C	+25ºC	+60 °C	-29 °C	+25ºC	+60 °C
-5	-89.13	-87.14	-88.36	-85.29	-83.54	-86.60	-86.51	-85.21	-85.90
-4	-88.70	-90.07	-87.36	-89.95	-87.86	-84.27	-87.95	-88.92	-85.13
-3	-86.57	-87.82	-88.93	-89.99	-87.59	-88.07	-86.80	-84.80	-88.02
-2	-88.65	-85.12	-88.97	-83.68	-85.48	-86.42	-87.05	-87.32	-83.07
-1	-89.63	-90.04	-86.97	-78.08	-81.48	-87.98	-84.35	-84.96	-83.30
0[note 2]	-	-	-	-	-	-			
+1	-89.46	-90.40	-86.00	-76.60	-79.43	-87.36	-84.25	-85.31	-83.74
+2	-88.89	-88.46	-86.19	-81.09	-85.81	-88.79	-86.49	-82.69	-88.57
+3	-86.92	-86.68	-84.32	-88.50	-85.31	-87.44	-87.65	-84.77	-86.88
+4	-89.25	-90.66	-86.69	-85.16	-88.23	-86.22	-86.36	-85.80	-83.99
+5	-84.18	-88.89	-85.94	-85.76	-85.97	-83.33	-89.11	-88.61	-85.41

Note 1: Comparison frequency 6.25 kHz
Note 2: All spurs are referenced to carrier signal (n=0).

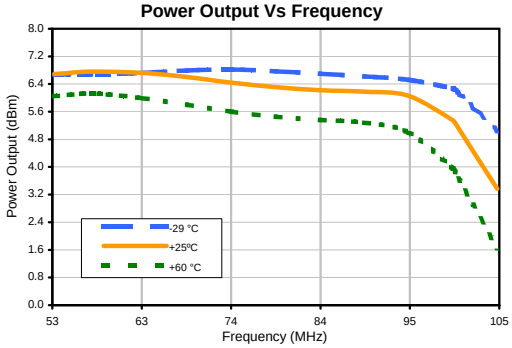
REFERENCE SPURIOUS ORDER	REFFERENCE SPURIOUS @Fcarrier 56.25 MHz± (n*Freffence) (dBc) NOTE 3			REFFERENCE SPURIOUS @Fcarrier 72 MHz± (n*Freffence) (dBc) NOTE 3			REFFERENCE SPURIOUS @Fcarrier 99.99375 MHz± (n*Freffence) (dBc) NOTE 3		
n	-29 °C	+25ºC	+60 °C	-29 °C	+25ºC	+60 °C	-29 °C	+25ºC	+60 °C
-5	-	-	-	-	-	-	-	-	-
-4	-	-	-	-	-	-	-	-	-
-3	-	-	-	-	-	-	-	-	-
-2	-	-	-	-	-	-	-	-	-
-1	-129.30	-129.30	-128.94	-110.87	-107.61	-107.16	-109.04	-104.23	-102.23
0[note 4]	-	-	-	-	-	-			
+1	-123.93	-123.93	-126.55	-123.50	-123.46	-126.87	-128.40	-123.95	-126.34
+2	-129.04	-129.04	-127.73	-128.04	-124.02	-128.16	-126.95	-127.88	-127.54
+3	-128.63	-128.63	-128.15	-126.69	-129.69	-123.25	-128.98	-130.42	-130.96
+4	-128.38	-128.38	-128.34	-128.36	-128.03	-128.63	-127.40	-126.71	-129.36
+5	-123.66	-123.66	-124.03	-123.29	-124.94	-123.50	-123.25	-121.80	-124.80

Note 3: Reference frequency 52 MHz
Note 4: All spurs are referenced to carrier signal (n=0).

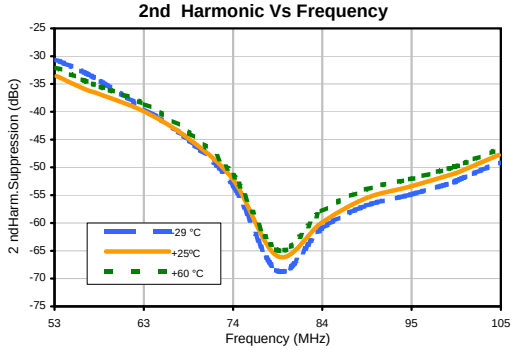
Notes
A. Performance and quality attributes and conditions not expressly stated in this specification document are intended to be excluded and do not form a part of this specification document.
B. Electrical specifications and performance data contained in this specification document are based on Mini-Circuit's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

Typical Performance Data

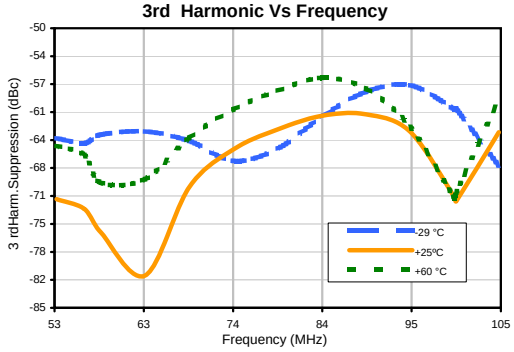
Power Output Vs Frequency



2nd Harmonic Vs Frequency



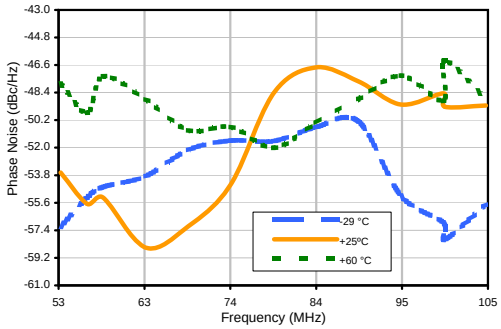
3rd Harmonic Vs Frequency



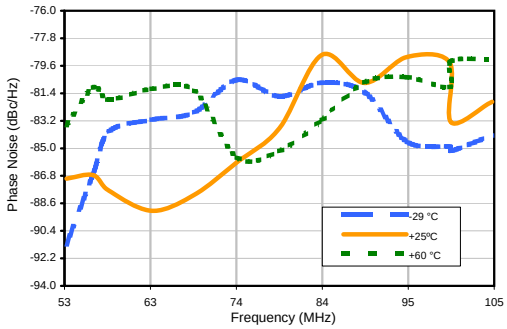
Notes
A. Performance and quality attributes and conditions not expressly stated in this specification document are intended to be excluded and do not form a part of this specification document.
B. Electrical specifications and performance data contained in this specification document are based on Mini-Circuit's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

Typical Performance Data

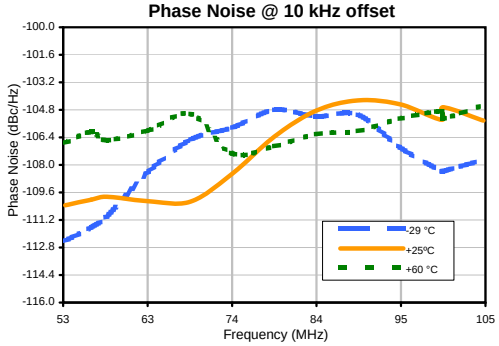
Phase Noise @ 100 Hz offset



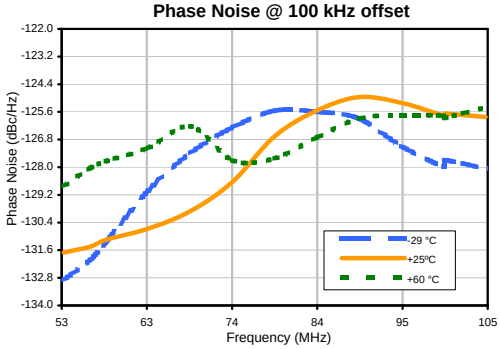
Phase Noise @ 1 kHz offset



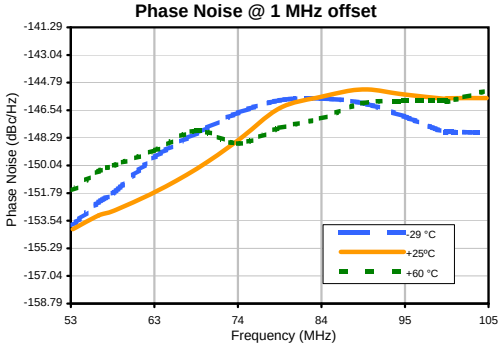
Phase Noise @ 10 kHz offset



Phase Noise @ 100 kHz offset



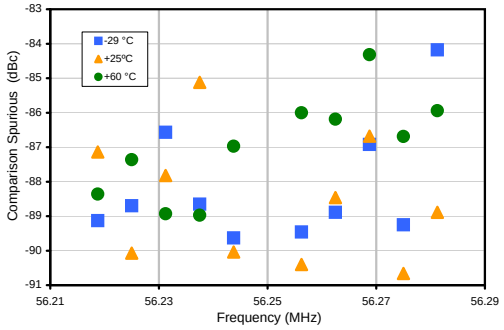
Phase Noise @ 1 MHz offset



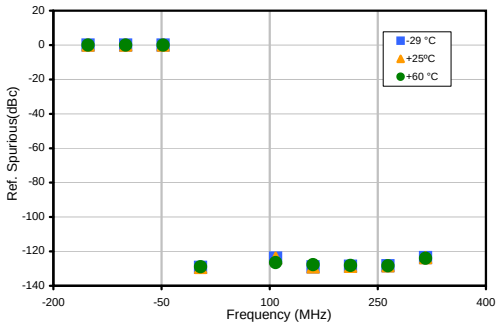
Notes
A. Performance and quality attributes and conditions not expressly stated in this specification document are intended to be excluded and do not form a part of this specification document.
B. Electrical specifications and performance data contained in this specification document are based on Mini-Circuit's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

Typical Performance Data

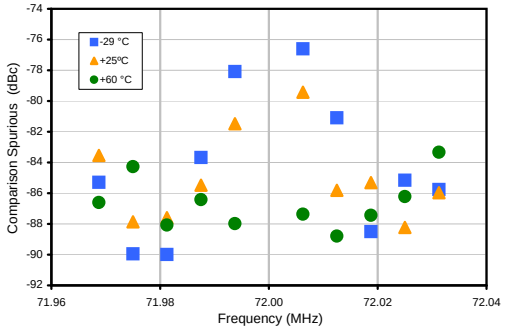
Comparison Spurious
Vs Freq.Offset @Fcar = 56.25 MHz



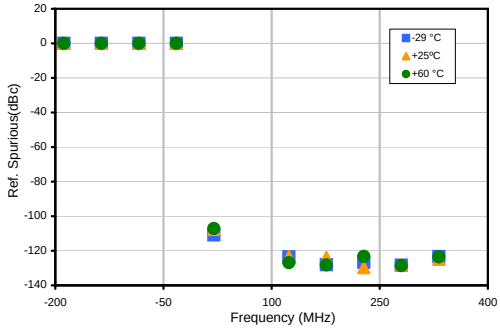
Reference Spurious
Vs Freq.Offset @Fcar = 56.25 MHz



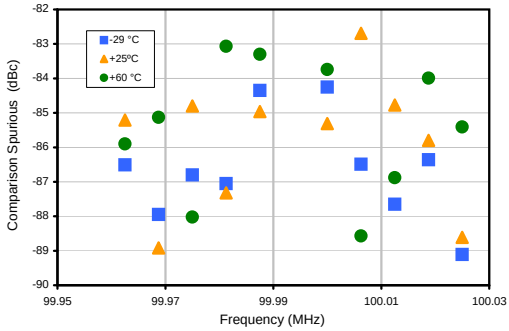
Comparison Spurious
Vs Freq.Offset @Fcar = 72 MHz



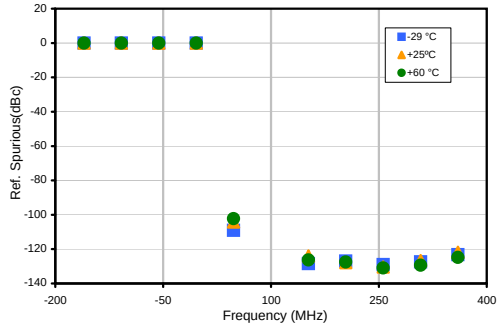
Reference Spurious
Vs Freq.Offset @Fcar = 72 MHz



Comparison Spurious
Vs Freq.Offset @Fcar = 99.99375 MHz



Reference Spurious
Vs Freq.Offset @Fcar = 99.99375 MHz

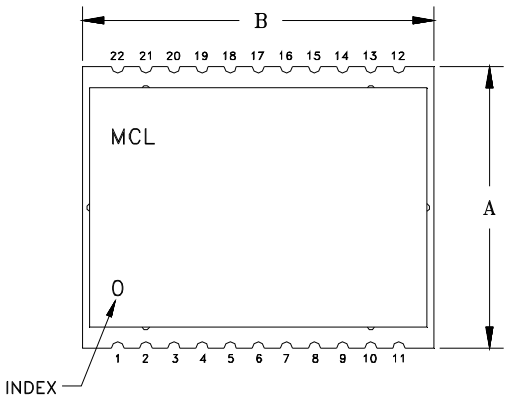


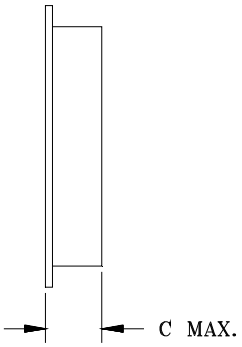
Notes
A. Performance and quality attributes and conditions not expressly stated in this specification document are intended to be excluded and do not form a part of this specification document.
B. Electrical specifications and performance data contained in this specification document are based on Mini-Circuit's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

Case Style KL

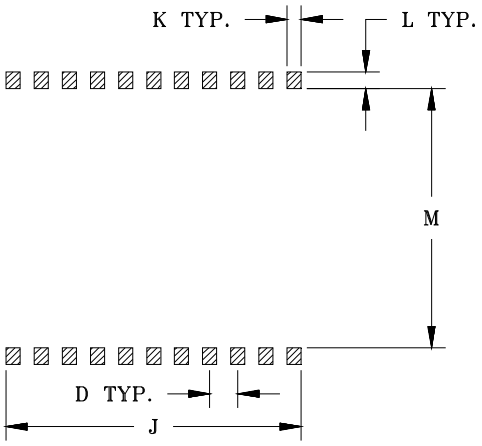
Outline Dimensions

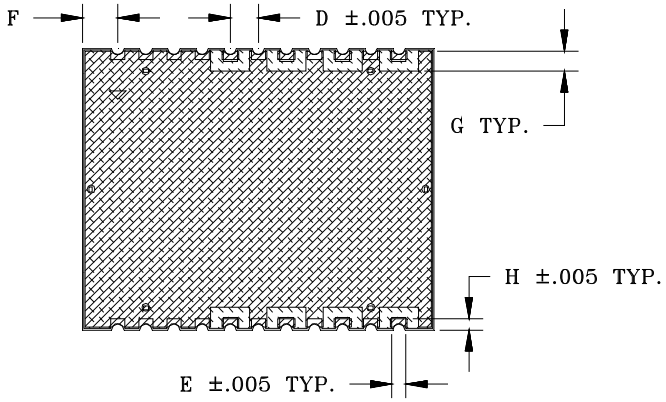
KL942

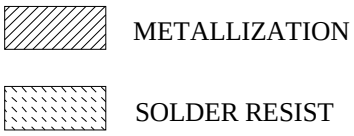




Suggested PCB Land Pattern







CASE#	A	B	C	D	E	F	G	H	J	K	L	M	WT. GRAM
KL942	1.000 (25.40)	1.250 (31.75)	.200 (5.08)	.100 (2.54)	.050 (1.27)	.125 (3.18)	.080 (2.03)	.040 (1.02)	1.05 (26.67)	.050 (1.27)	.060 (1.52)	.920 (23.37)	5.8

Dimensions are in inches (mm). Tolerances: 2PL. +/- .03; 3PL. +/- .015

Notes:

1. Case material: Nickel-Silver alloy.
2. Base: Printed wiring laminate.
3. Termination finish:

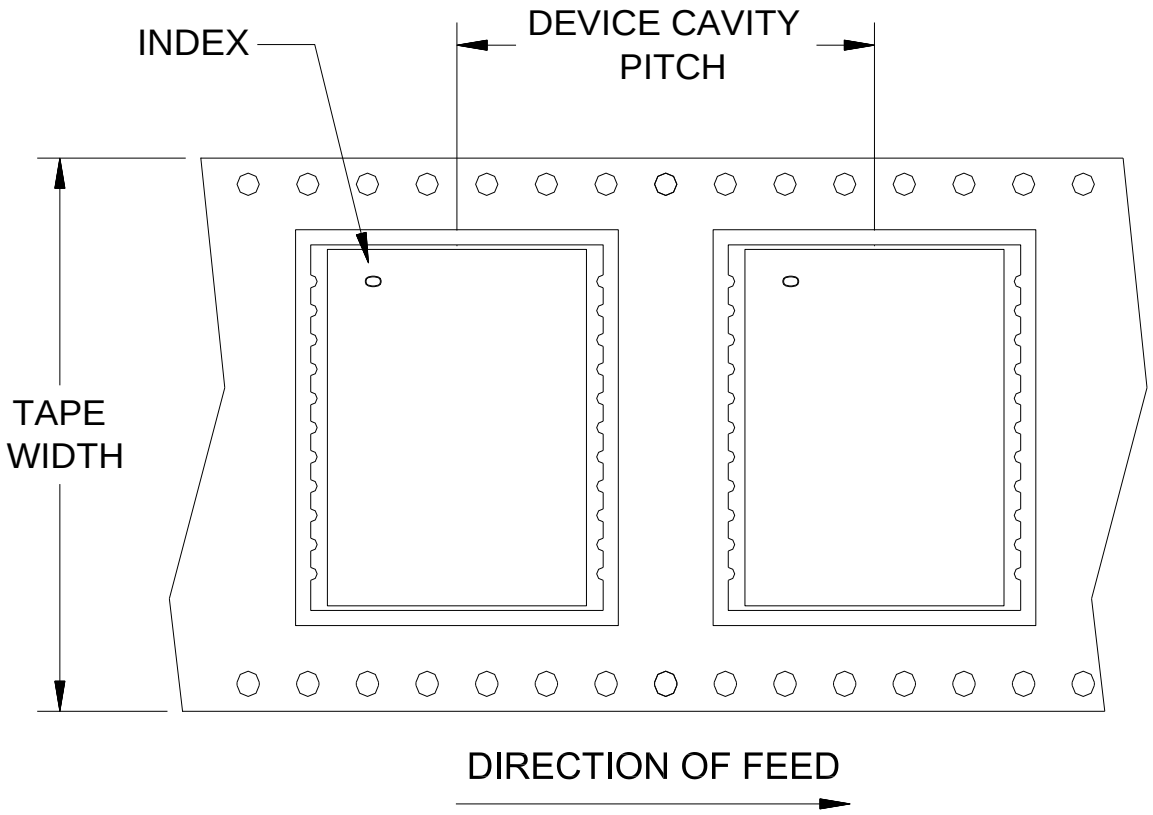
   For RoHS Case Styles: 2-5 µ inch (.05-.13 microns) Gold over 120-240 µ inch (3.05-6.10 microns) Nickel plate. All models, (+) suffix.

Mini-Circuits®
INTERNET http://www.minicircuits.com
P.O. Box 350166, Brooklyn, New York 11235-0003 (718) 934-4500 Fax (718) 332-4661
Distribution Centers NORTH AMERICA 800-654-7949 • 417-335-5935 • Fax 417-335-5945 • EUROPE 44-1252-832600 • Fax 44-1252-837010
Mini-Circuits ISO 9001 & ISO 14001 Certified

This document and its contents are the property of Mini-Circuits

Tape & Reel Packaging TR-F97

DEVICE ORIENTATION IN T&R



Tape Width, mm	Device Cavity Pitch, mm	Reel Size, inches	Devices per Reel	
44	32	13	Small quantity standards (see note)	20
				50
				100
			Standard	200

Note: Please consult individual model data sheet to determine device per reel availability.

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

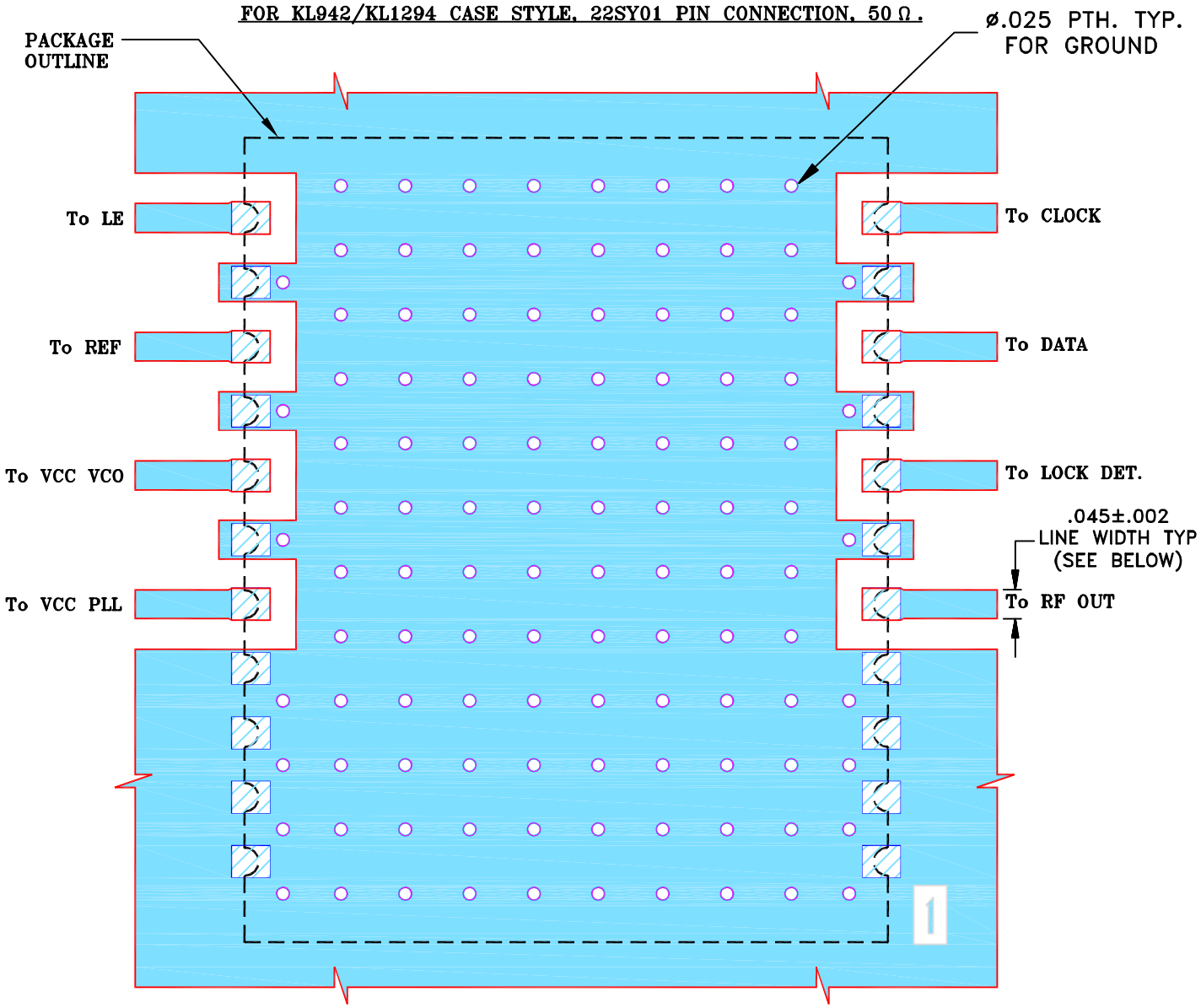
Mini-Circuits®
INTERNET http://www.minicircuits.com
P.O. Box 350166, Brooklyn, New York 11235-0003 (718) 934-4500 Fax (718) 332-4661
Distribution Centers NORTH AMERICA 800-654-7949 • 417-335-5935 • Fax 417-335-5945 • EUROPE 44-1252-832600 • Fax 44-1252-837010
Mini-Circuits ISO 9001 & ISO 14001 Certified

This document and its contents are the property of Mini-Circuits.

THIRD ANGLE PROJECTION

REVISIONS					
REV	ECN No.	DESCRIPTION	DATE	DR	AUTH
OR	M124738	NEW RELEASE	04/10	DK	HH
OR	R77823	NEW RELEASE	04/10	DK	HH

SUGGESTED MOUNTING CONFIGURATION
FOR KL942/KL1294 CASE STYLE, 22SY01 PIN CONNECTION, 50 Ω.



NOTES:

1. TRACE WIDTH IS SHOWN FOR 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 SOLDERMASK

UNLESS OTHERWISE SPECIFIED		INITIALS	DATE
DIMENSIONS ARE IN INCHES	DRAWN	DK (RAVON)	06 APR 10
TOLERANCES ON:	CHECKED	DH (RAVON)	07 APR 10
2 PL DECIMALS ±	APPROVED	HH (RAVON)	07 APR 10
3 PL DECIMALS ± .005			
ANGLES ±			
FRACTIONS ±			

Mini-Circuits®
THIS DOCUMENT AND ITS CONTENTS ARE THE PROPERTY OF MINI-CIRCUITS. EXCEPT FOR USE EXPRESSLY GRANTED, IN WRITING, TO ITS VENDORS, VENDEE AND THE UNITED STATES GOVERNMENT, MINI-CIRCUITS RESERVES ALL PROPRIETARY DESIGN, USE , MANUFACTURING AND REPRODUCTION RIGHTS THERETO. THESE CONTENTS SHALL NOT BE USED, DUPLICATED OR DISCLOSED TO ANY OUTSIDE PARTY, IN WHOLE OR IN PART, WITHOUT WRITTEN PERMISSION OF MINI-CIRCUITS.

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

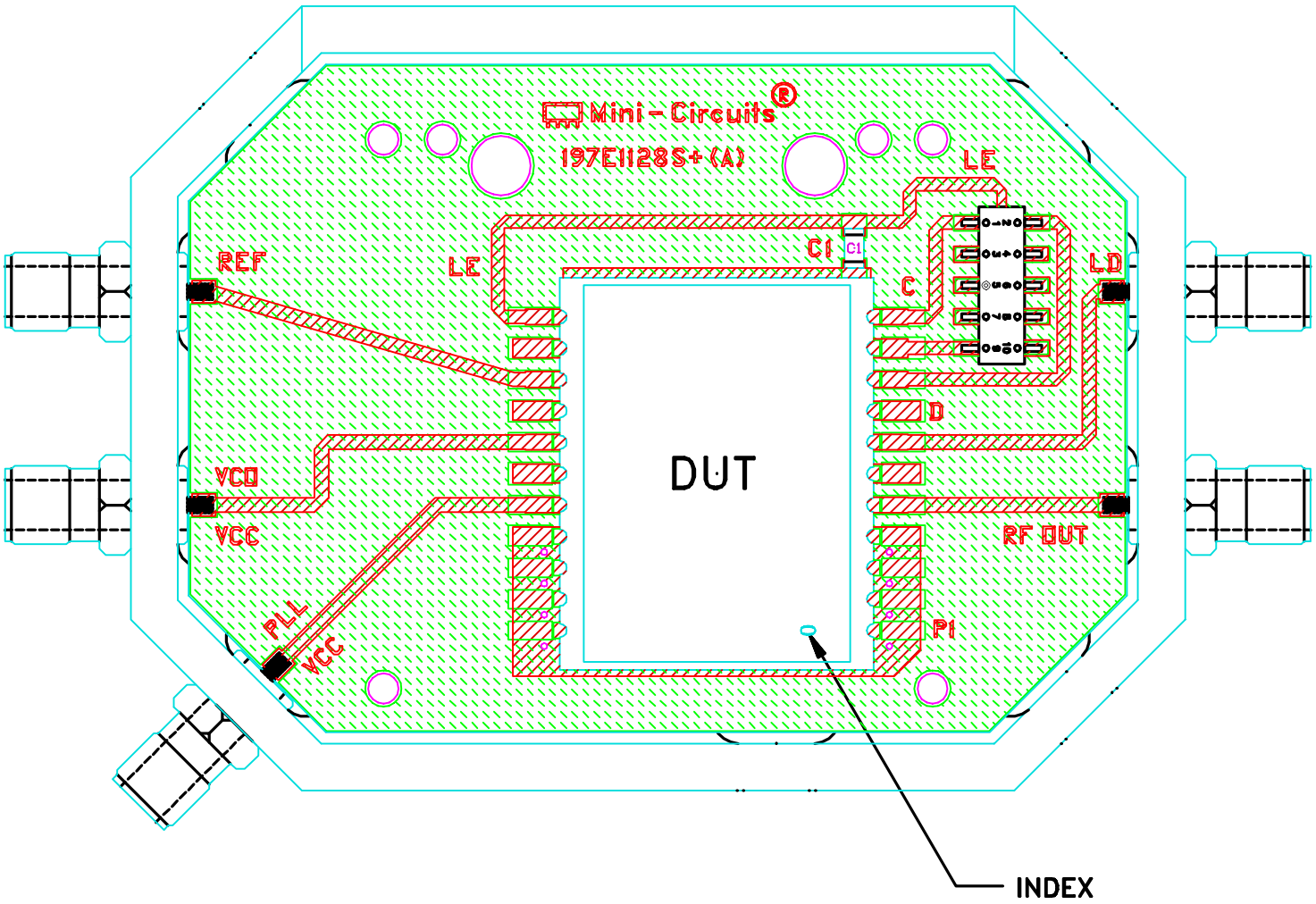
Mini-Circuits® 13 Neptune Avenue Brooklyn NY 11235

PL, 22SY01, KL942/KL1294, DSN TB-553+ (50 Ω)

SIZE	CODE IDENT	DRAWING NO:	REV:
A	15542	98-PL-318	OR

FILE:	SCALE:	SHEET:
98PL318	4:1	1 OF 1

Evaluation Board and Circuit

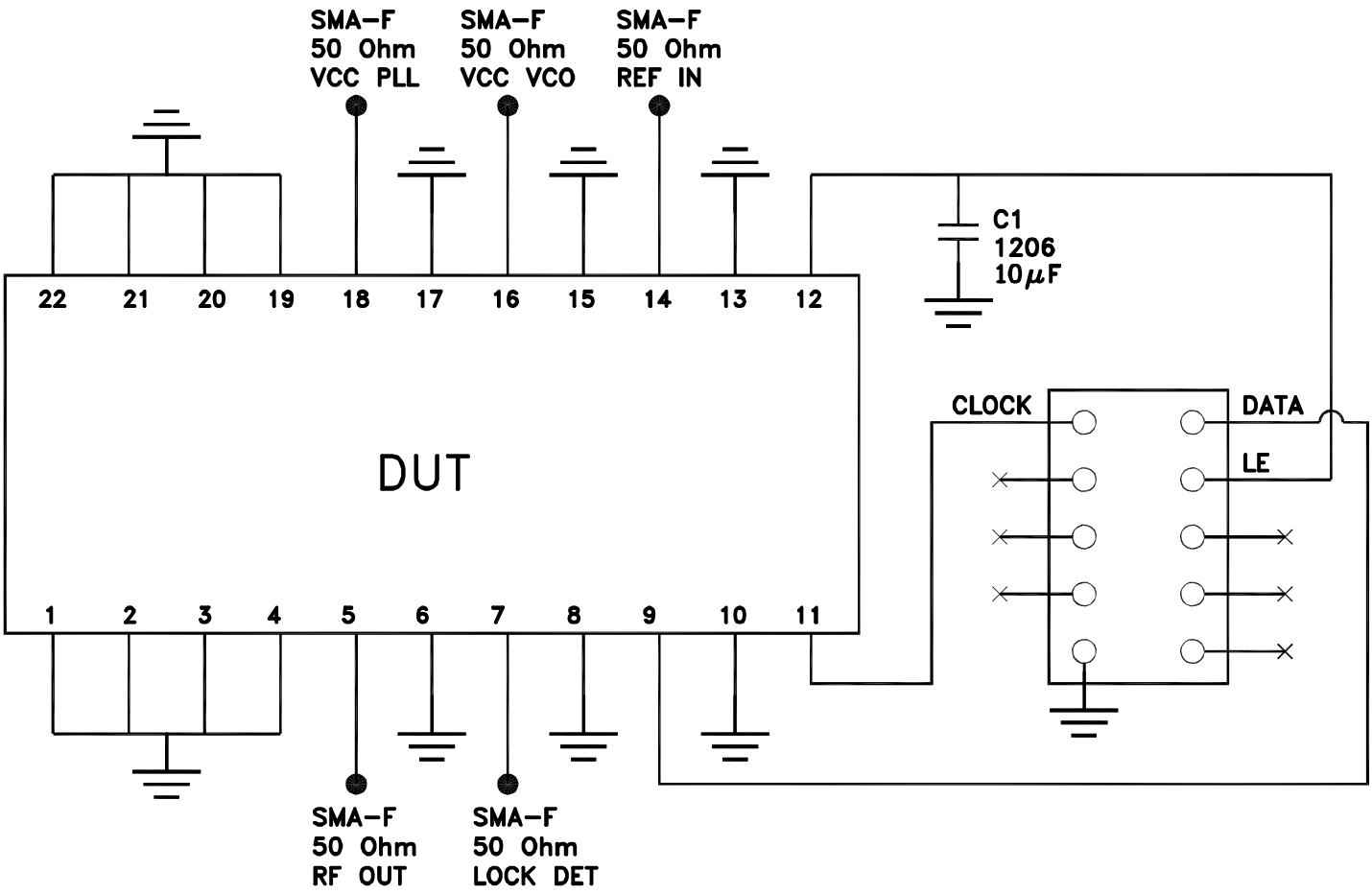


TB-553+

NOTES:

1. SMA FEMALE CONNECTORS.
2. PCB MATERIAL: RO4350B OR EQUIVALENT, DIALECTRIC CONSTANT=3.5, DIALECTRIC THICKNESS=.020 INCH.

THIS DOCUMENT AND ITS CONTENTS ARE THE PROPERTY OF MINI-CIRCUITS.



TB-553+

Schematic Diagram

Mini-Circuits

Environmental Specifications ENV65T2

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 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 Eutectic Process: 225°C peak Pb-Free Process, 245°C peak	J-STD-020, Table 4-1, 4-2 and 5-2, Figure 5-1
Solderability	10X Magnification	J-STD-002, Para 4.2.5, Test S, 95% Coverage
Vibration (High Frequency)	20g peak, 20-2000 Hz, 4 times in each of three axes (total 12)	MIL-STD-883, Method 2007.3, Condition A
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

This document and its contents are the property of Mini-Circuits.