

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

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				V
VCO		5		V
PLL		17		V
Supply current				V
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	V
Digital Lock Detect				
Locked	2.9		3.3	V
Unlocked			0.4	V
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

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Typical Performance Data

FREQ. (MHz)	POWER OUTPUT (dBm)			HARMONICS (dBc)						VCO CURRENT (mA)			PLL CURRENT (mA)		
				F2			F3								
	-29 °C	+25°C	+60 °C	-29 °C	+25°C	+60 °C	-29 °C	+25°C	+60 °C	-29 °C	+25°C	+60 °C	-29 °C	+25°C	+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					+25°C					+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

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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		
	-29 °C	+25°C	+60 °C	-29 °C	+25°C	+60 °C	-29 °C	+25°C	+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	REFERENCE SPURIOUS @Fcarrier 56.25 MHz± (n*Freffence) (dBc) NOTE 3			REFERENCE SPURIOUS @Fcarrier 72 MHz± (n*Freffence) (dBc) NOTE 3			REFERENCE SPURIOUS @Fcarrier 99.99375 MHz± (n*Freffence) (dBc) NOTE 3		
	-29 °C	+25°C	+60 °C	-29 °C	+25°C	+60 °C	-29 °C	+25°C	+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

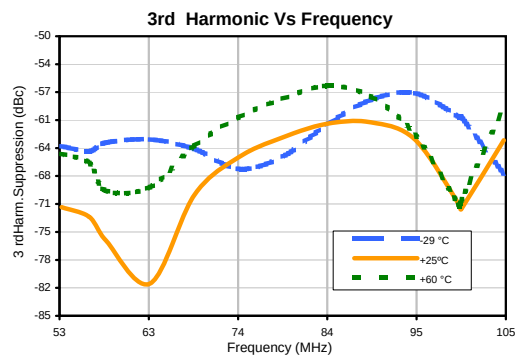
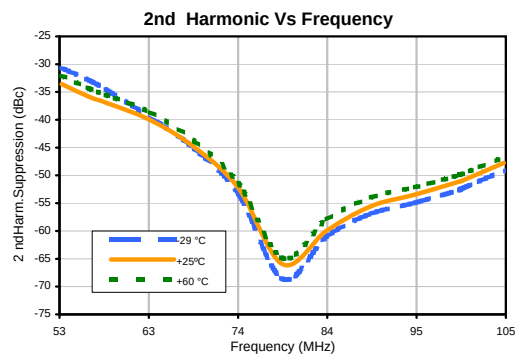
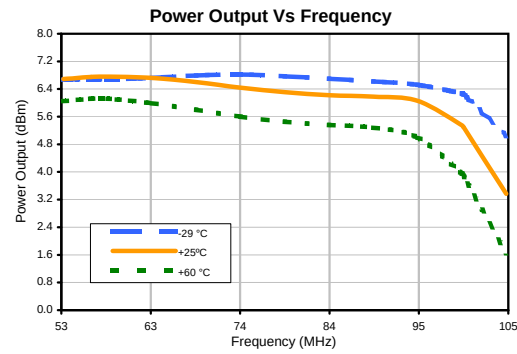
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DSN-EDR9496/3MP

Typical Performance Data



Notes

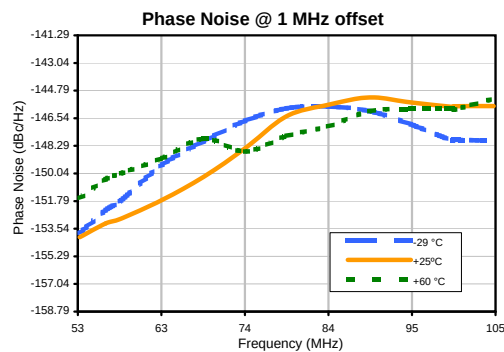
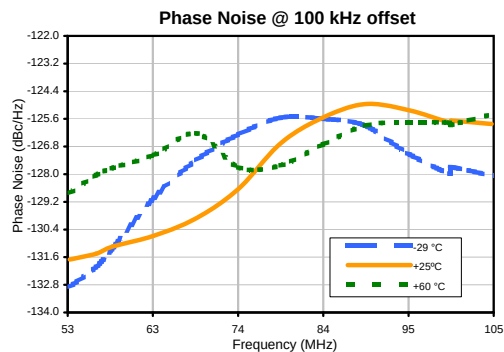
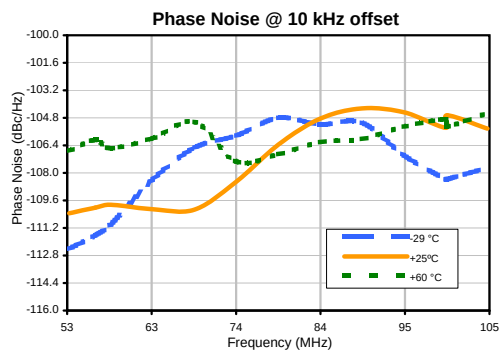
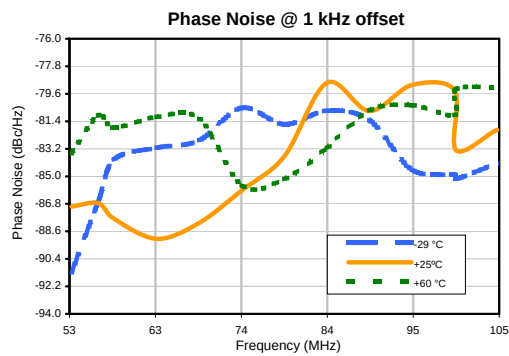
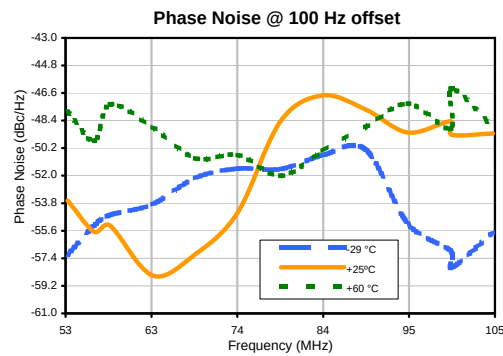
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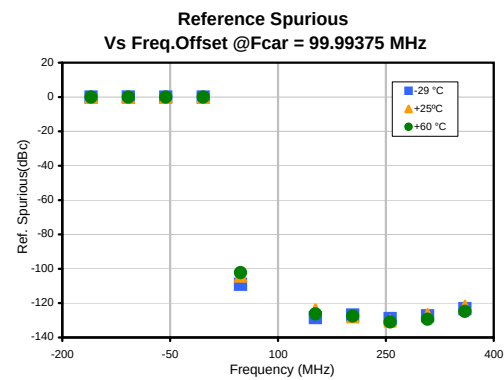
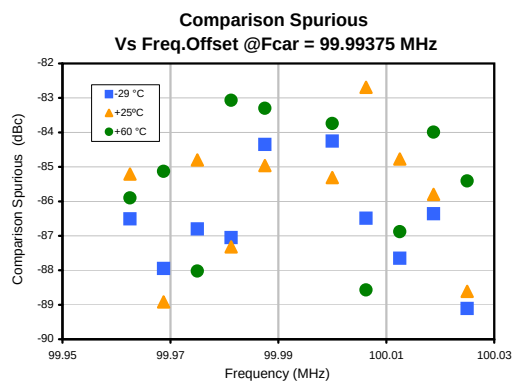
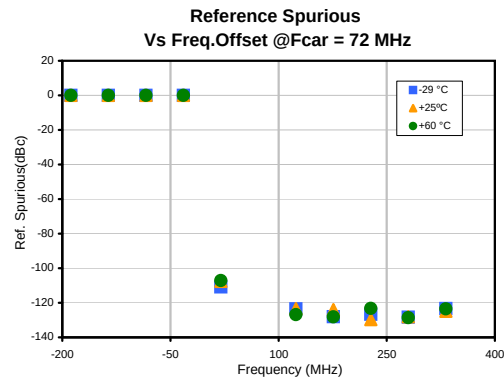
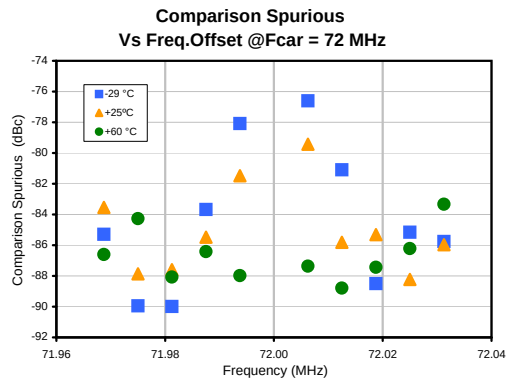
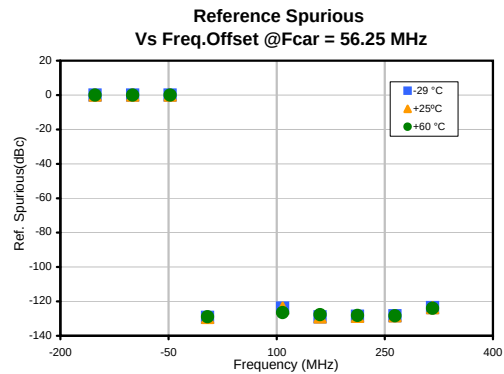
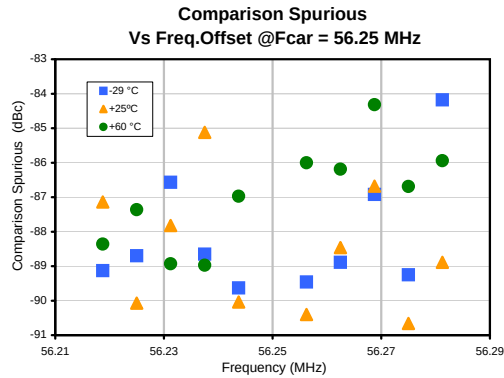
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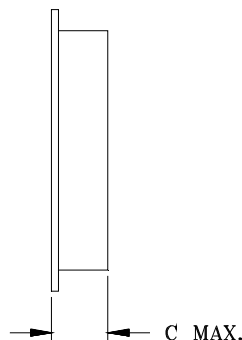
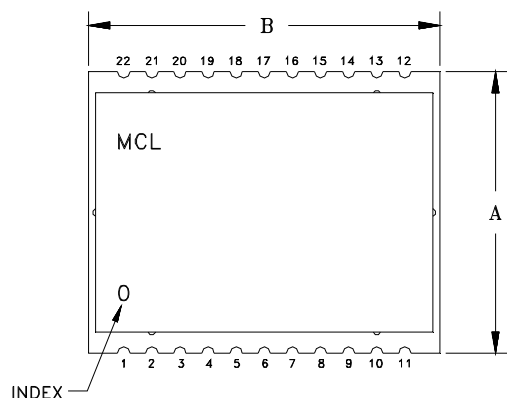
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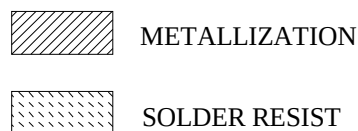
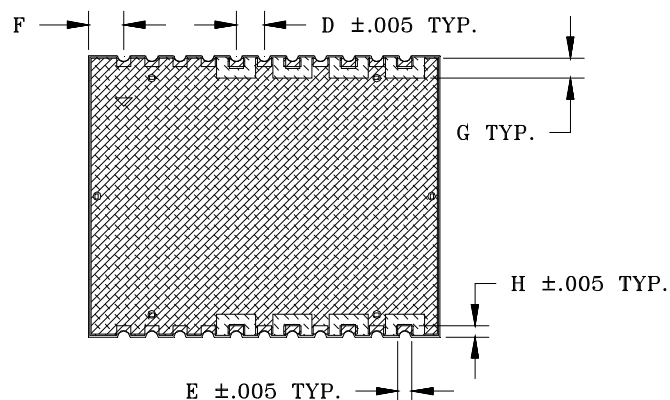
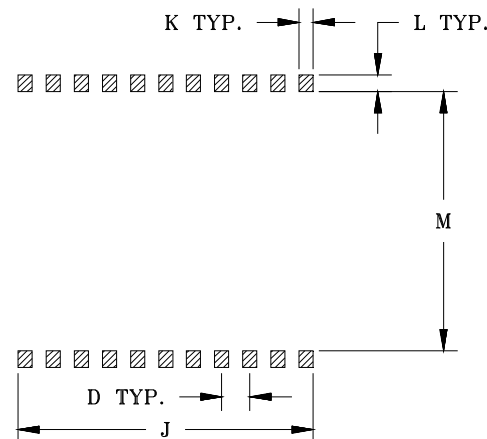


Outline Dimensions

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.



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

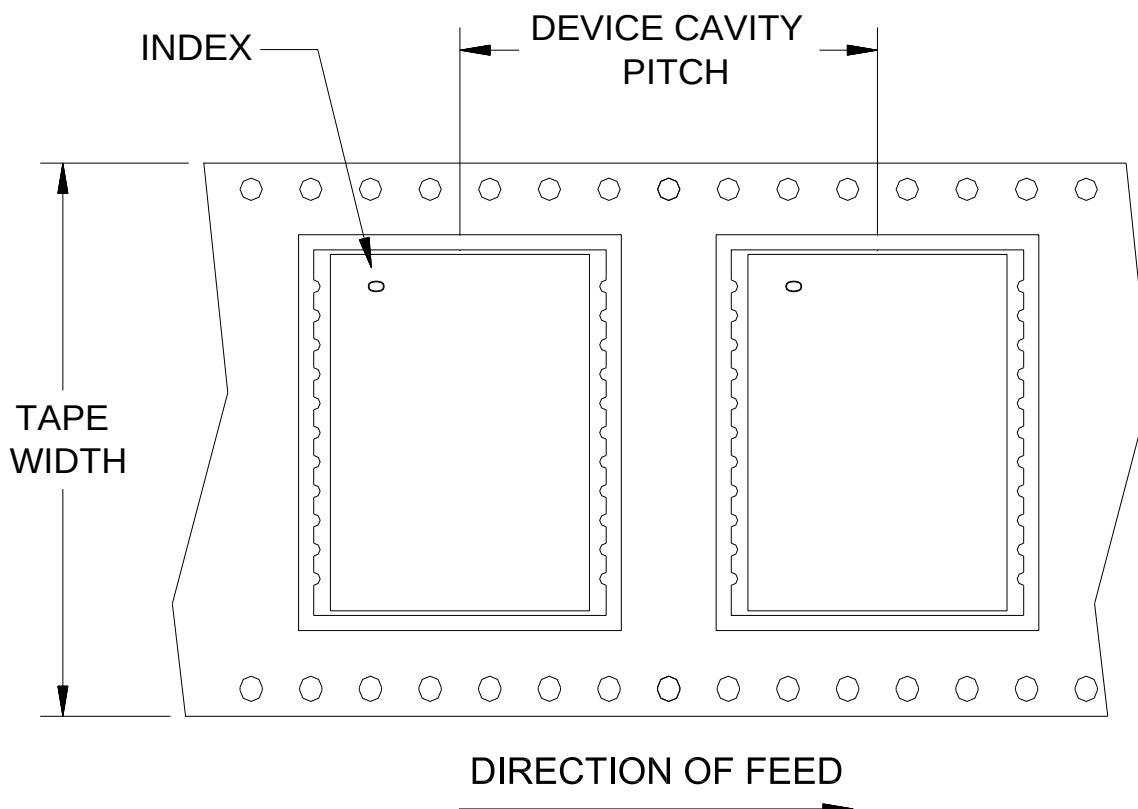
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Tape & Reel Packaging TR-F97

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



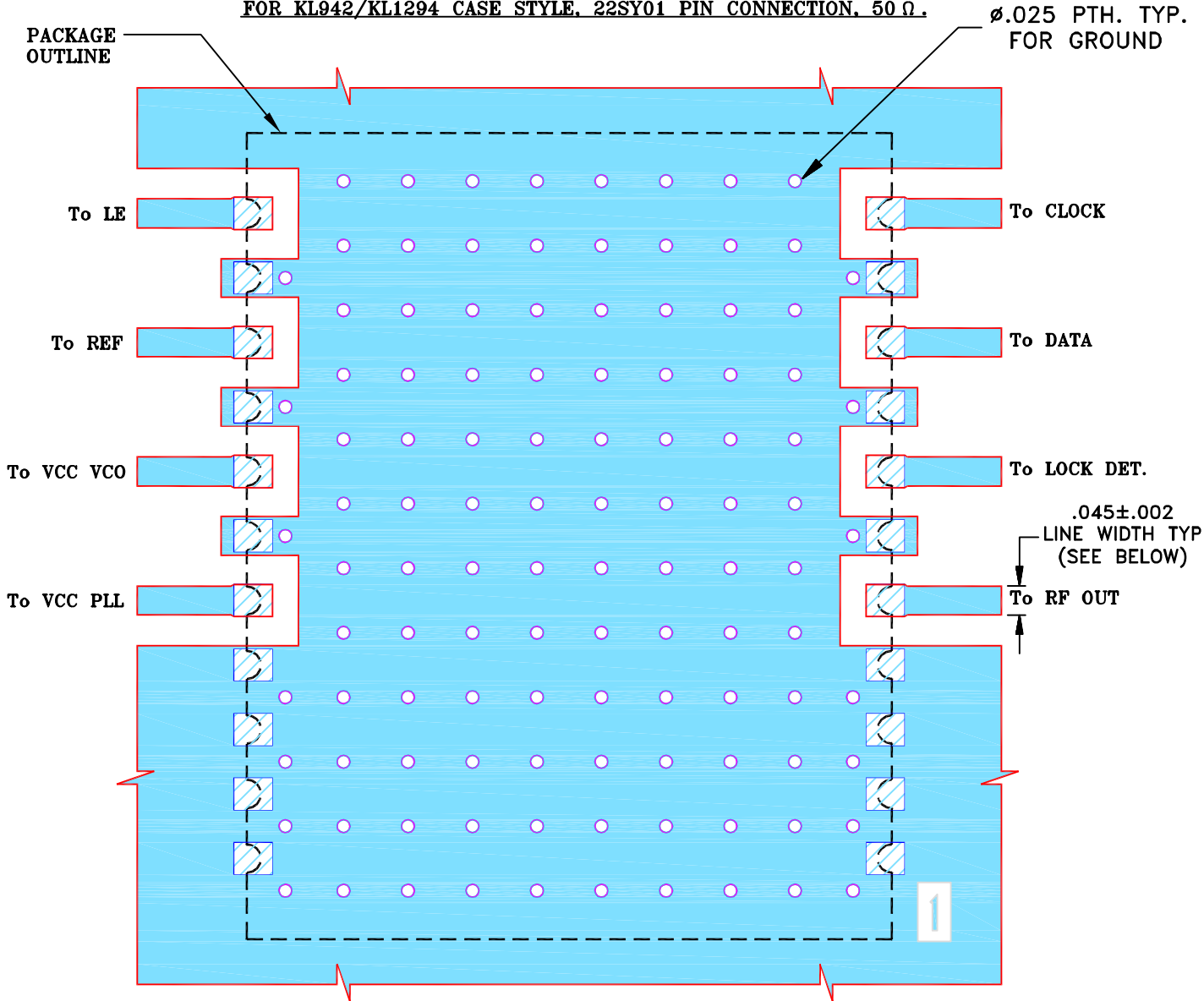
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THIRD ANGLE PROJECTION		REVISIONS					
	REV	ECN No.	DESCRIPTION		DATE	DR	AUTH
	OR	M124738	NEW RELEASE		04/10	DK	HH
	OR	R77823	NEW RELEASE		04/10	DK	HH

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

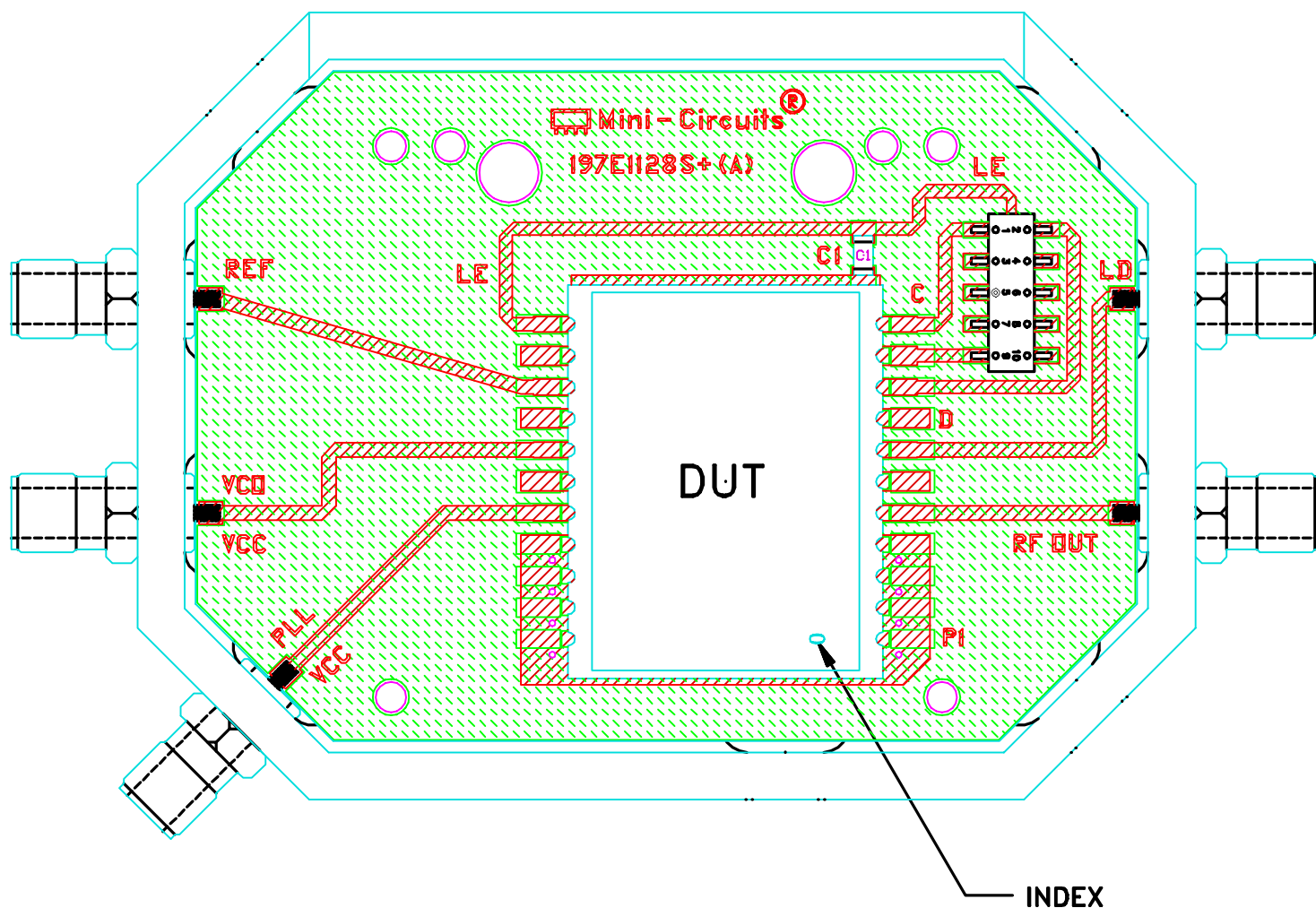


- NOTES:**
- 1. TRACE WIDTH IS SHOWN FOR R04350B WITH DIELECTRIC THICKNESS. .020"±.0015". COPPER: 1/2 OZ. EACH SIDE.
FOR OTHER MATERIALS TRACE WIDTH MAY NEED TO BE MODIFIED.
 - 2. BOTTOM SIDE OF THE PCB IS CONTINUOUS GROUND PLANE.

DENOTES PCB COPPER LAYOUT WITH SMOBC (SOLDER MASK OVER BARE COPPER) DENOTES COPPER LAND PATTERN FREE OF SOLDERMASK

UNLESS OTHERWISE SPECIFIED		INITIALS		DATE		Mini-Circuits® 13 Neptune Avenue Brooklyn NY 11235							
DIMENSIONS ARE IN INCHES TOLERANCES ON: 2 PL DECIMALS ± 3 PL DECIMALS ± .005 ANGLES ± FRACTIONS ± 		DRAWN	DK (RAVON)	06 APR 10									
		CHECKED	DH (RAVON)	07 APR 10									
		APPROVED	HH (RAVON)	07 APR 10									
						PL, 22SY01, KL942/KL1294, DSN TB-553+ (50 Ω)							
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ASHEETA1.DWG REV:A DATE:01/12/95						FILE: 98PL318		SCALE: 4:1		SHEET: 1 OF 1			

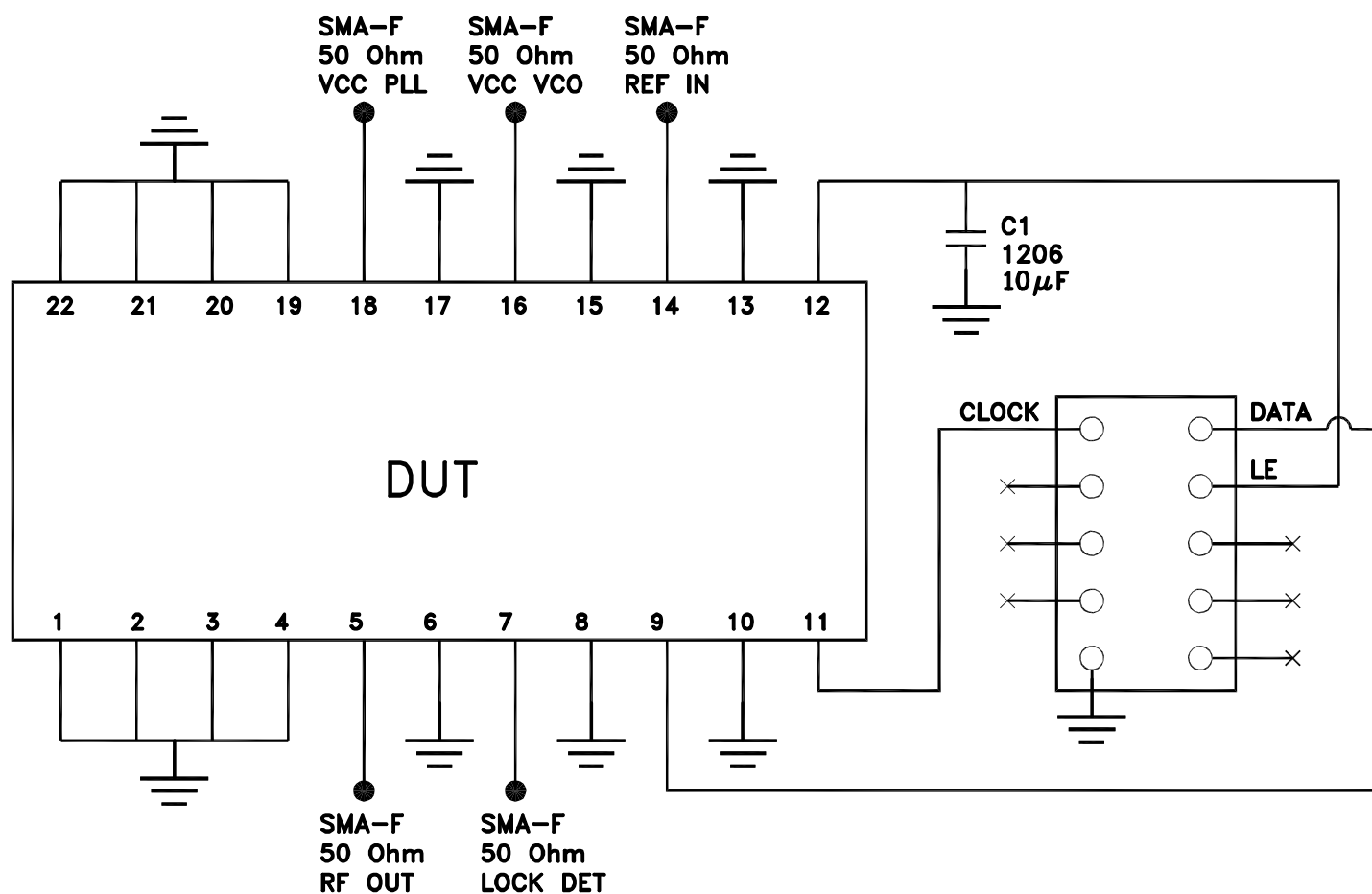
Evaluation Board and Circuit



TB-553+

NOTES:

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



TB-553+ Schematic Diagram



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