

Engineering Development Model

Frequency Synthesizer

DSN-EDR10553

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 : KL1294

ELECTRICAL SPECIFICATIONS 50Ω, over -45°C to +85°C				
Parameter	Min.	Typ.	Max.	Units
Frequency	3700		4300	MHz
Step size		10000		kHz
Settling Time Within ±1kHz		180		μsec
Output Power	+4	+8	+12	dBm
Phase Noise				
at 100 Hz offset		-87		dBc/Hz
at 1 kHz offset		-94		dBc/Hz
at 10 kHz offset		-94		dBc/Hz
at 100 kHz offset		-104		dBc/Hz
at 1000 kHz offset		-135	-130	dBc/Hz
Integrated SSB Phase Noise		-44		dBc
Reference Spurious Suppression		-96		dBc
Comparison Spurious Suppression		-101		dBc
Non-Harm. Spurious Suppression		-90		dBc
Harmonic Suppression		-36		dBc
Supply voltage				V
VCO		10		V
PLL		14		V
Supply current				V
VCO		47	55	V
PLL		27	35	V
Reference In (External)				MHz
Frequency		960		MHz
Amplitude		1		Vp-p
Impedance		100		kΩ
Ph. N @ 1kHz		-145		dBc/Hz
Input Logic Levels				V
Logic high	2.64		3.3	V
Logic low			0.66	V
Digital Lock Detect				V
Locked	2.9		3.3	V
Unlocked			0.4	V
Frequency Synthesizer PLL		ADF4113		

ABSOLUTE MAXIMUM RATINGS	
Operating Temperature	-45°C to 85°C
Storage Temperature	-55°C to 100°C
VCO Supply Voltage	11V
PLL Supply Voltage	15V
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	3	CLOCK	10
VCC VCO	5	DATA	11
VCC PLL	1	LATCH ENABLE	12
REF IN	7	GROUND	2,4,6,8,13,14
LOCK DETECT	9		

Notes

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Typical Performance Data

FREQ. (MHz)	POWER OUTPUT (dBm)			HARMONICS (dBc)						VCO CURRENT (mA)			PLL CURRENT (mA)		
				F2			F3								
	-45 °C	+25°C	+85 °C	-45 °C	+25°C	+85 °C	-45 °C	+25°C	+85 °C	-45 °C	+25°C	+85 °C	-45 °C	+25°C	+85 °C
3680	8.26	7.75	6.84	-30.92	-31.79	-36.53	-41.98	-43.86	-47.49	46.09	46.93	47.56	23.96	26.06	29.12
3700	8.30	7.77	6.89	-30.27	-31.43	-35.94	-42.96	-43.88	-48.58	46.11	46.94	47.58	24.08	26.23	29.30
3740	8.32	7.77	6.93	-31.69	-31.46	-35.92	-45.41	-45.87	-49.59	46.13	46.96	47.58	24.23	26.40	29.47
3800	8.39	7.86	7.02	-32.54	-32.92	-38.15	-48.87	-48.76	-53.46	46.16	46.99	47.61	24.43	26.63	29.70
3860	8.41	7.90	7.06	-32.65	-34.05	-39.51	-50.65	-50.17	-53.86	46.19	47.01	47.62	24.15	26.34	29.39
3920	8.53	8.04	7.14	-35.29	-35.95	-42.22	-50.06	-49.87	-51.79	46.19	47.03	47.63	24.37	26.57	29.63
3980	8.52	8.01	7.18	-34.61	-35.72	-40.38	-48.45	-47.57	-49.50	46.22	47.05	47.64	24.57	26.79	29.86
4040	8.69	8.21	7.31	-36.58	-36.88	-40.67	-46.97	-45.22	-47.46	46.18	47.03	47.63	24.27	26.48	29.53
4100	8.65	8.12	7.29	-38.07	-37.25	-41.22	-43.79	-44.41	-45.92	46.20	47.06	47.66	24.48	26.70	29.76
4160	8.63	8.22	7.34	-40.03	-40.05	-43.48	-43.31	-45.57	-45.81	46.18	47.05	47.64	24.15	26.36	29.40
4220	8.62	8.22	7.40	-40.13	-40.63	-44.94	-43.92	-47.22	-46.46	46.18	47.06	47.65	24.41	26.64	29.69
4300	8.50	8.09	7.32	-41.11	-42.12	-46.44	-42.47	-45.46	-45.31	46.19	47.07	47.67	24.69	26.92	29.99
4320	8.51	8.13	7.35	-42.41	-43.07	-46.96	-42.80	-45.56	-45.21	46.19	47.06	47.66	24.19	26.41	29.45

FREQ. (MHz)	PHASE NOISE (dBc/Hz) @ OFFSETS														
	-45 °C					+25°C					+85 °C				
	100Hz	1kHz	10kHz	100kHz	1MHz	100Hz	1kHz	10kHz	100kHz	1MHz	100Hz	1kHz	10kHz	100kHz	1MHz
3680	-87.12	-93.44	-94.75	-101.34	-135.74	-86.12	-95.20	-93.66	-102.42	-134.53	-88.15	-93.50	-95.07	-102.16	-133.05
3700	-89.02	-96.11	-95.50	-101.92	-135.45	-85.25	-92.28	-93.36	-103.27	-134.85	-89.58	-94.43	-95.63	-102.64	-133.41
3740	-88.50	-94.76	-96.77	-102.36	-136.25	-86.05	-94.57	-94.86	-103.64	-134.96	-88.27	-95.25	-96.27	-103.02	-133.49
3800	-84.98	-92.14	-94.28	-104.26	-136.63	-89.94	-94.15	-96.33	-103.78	-135.45	-84.53	-94.26	-94.28	-104.14	-134.01
3860	-84.67	-91.27	-92.13	-105.08	-136.41	-87.05	-92.40	-91.56	-104.86	-135.12	-86.40	-94.51	-94.24	-103.79	-133.71
3920	-89.41	-96.59	-96.38	-103.75	-135.44	-85.51	-94.00	-95.41	-104.38	-135.39	-86.24	-94.57	-95.44	-103.40	-133.87
3980	-84.25	-94.84	-94.20	-104.49	-136.29	-87.22	-94.80	-95.78	-103.93	-135.43	-87.47	-96.01	-94.75	-103.83	-134.09
4040	-84.77	-92.68	-92.38	-104.12	-134.56	-85.97	-91.79	-92.93	-104.14	-134.87	-85.97	-92.23	-94.28	-103.40	-133.36
4100	-86.98	-94.19	-94.79	-104.47	-136.46	-88.57	-94.55	-94.60	-104.41	-135.40	-86.57	-94.28	-93.92	-104.08	-133.85
4160	-85.83	-92.13	-94.16	-103.73	-135.49	-87.63	-93.23	-93.65	-103.67	-134.66	-83.54	-96.38	-94.33	-103.02	-133.16
4220	-86.53	-90.63	-91.59	-104.68	-136.17	-85.96	-92.71	-93.31	-104.59	-135.30	-85.45	-93.92	-94.12	-103.60	-133.72
4300	-87.09	-91.52	-93.03	-104.01	-135.89	-87.81	-92.63	-93.49	-104.50	-135.25	-89.18	-92.94	-93.63	-103.63	-133.63
4320	-87.90	-94.25	-94.12	-103.91	-135.66	-86.23	-93.35	-92.48	-104.83	-135.12	-84.18	-93.58	-94.05	-103.91	-133.63

Notes

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Typical Performance Data

COMPARISON SPURIOUS ORDER	COMPARISON SPURIOUS @F _{carrier} 3700 MHz± (n*F _{comparison}) (dBc) NOTE 1			COMPARISON SPURIOUS @F _{carrier} 4000 MHz± (n*F _{comparison}) (dBc) NOTE 1			COMPARISON SPURIOUS @F _{carrier} 4300 MHz± (n*F _{comparison}) (dBc) NOTE 1		
	-45 °C	+25°C	+85 °C	-45 °C	+25°C	+85 °C	-45 °C	+25°C	+85 °C
-5	-96.05	-95.74	-91.59	-101.55	-105.51	-97.27	-105.83	-103.37	-104.66
-4	-93.81	-93.61	-89.49	-100.35	-104.17	-94.85	-93.64	-102.04	-98.24
-3	-90.91	-91.96	-86.84	-100.69	-105.21	-95.76	-101.93	-99.16	-101.78
-2	-88.40	-88.07	-83.37	-101.03	-104.40	-94.98	-98.23	-97.20	-99.52
-1	-80.76	-82.74	-77.20	-100.62	-99.39	-90.48	-92.60	-90.17	-94.58
0 ^{note 2}	-	-	-	-	-	-	-	-	-
+1	-80.55	-83.32	-77.40	-103.37	-95.42	-93.28	-91.71	-89.42	-96.01
+2	-88.45	-90.48	-84.71	-102.33	-97.79	-99.13	-96.59	-95.58	-102.44
+3	-90.08	-93.50	-87.72	-101.44	-99.64	-99.43	-100.28	-98.12	-105.15
+4	-92.50	-95.89	-90.88	-103.99	-101.50	-100.06	-91.36	-109.92	-98.64
+5	-94.33	-97.83	-93.33	-103.56	-102.19	-99.81	-103.23	-101.83	-109.70

Note 1: Comparison frequency 10 MHz

Note 2: All spurs are referenced to carrier signal (n=0).

REFERENCE SPURIOUS ORDER	REFERENCE SPURIOUS @F _{carrier} 3700 MHz± (n*F _{reference}) (dBc) NOTE 3			REFERENCE SPURIOUS @F _{carrier} 4000 MHz± (n*F _{reference}) (dBc) NOTE 3			REFERENCE SPURIOUS @F _{carrier} 4300 MHz± (n*F _{reference}) (dBc) NOTE 3		
	-45 °C	+25°C	+85 °C	-45 °C	+25°C	+85 °C	-45 °C	+25°C	+85 °C
-5	-	-	-	-	-	-	-	-	-
-4	-	-	-	-	-	-	-	-	-
-3	-103.89	-88.64	-103.06	-94.13	-107.35	-88.27	-91.18	-101.73	-100.34
-2	-98.55	-109.54	-102.46	-98.69	-98.19	-100.02	-94.94	-99.50	-101.71
-1	-91.69	-85.96	-94.44	-76.80	-92.96	-94.78	-84.69	-90.47	-96.46
0 ^{note 4}	-	-	-	-	-	-	-	-	-
+1	-76.12	-81.13	-84.21	-76.13	-81.35	-83.90	-79.97	-86.32	-87.93
+2	-97.90	-106.09	-117.33	-99.29	-110.71	-120.84	-109.67	-117.91	-118.19
+3	-101.08	-110.32	-119.98	-98.92	-105.38	-111.38	-103.88	-105.39	-116.09
+4	-96.63	-104.15	-116.61	-101.74	-106.40	-115.03	-103.74	-106.78	-108.96
+5	-86.55	-100.07	-108.50	-87.75	-98.55	-103.35	-99.14	-106.34	-108.78

Note 3: Reference frequency 960 MHz

Note 4: All spurs are referenced to carrier signal (n=0).

Notes

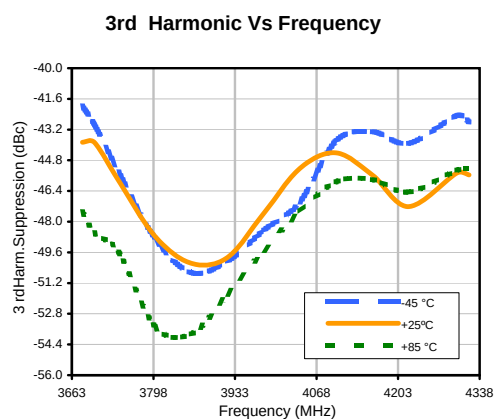
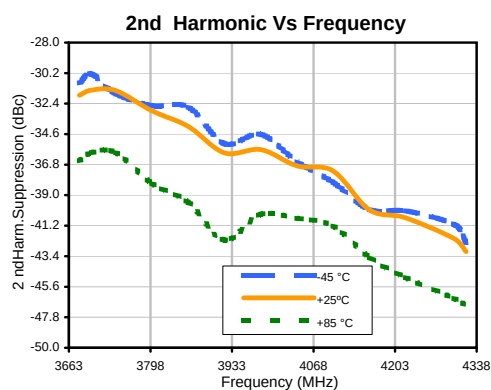
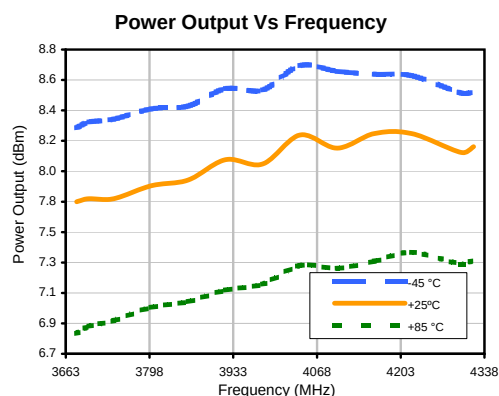
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Frequency Synthesizer

DSN-EDR10553

Typical Performance Data



Notes

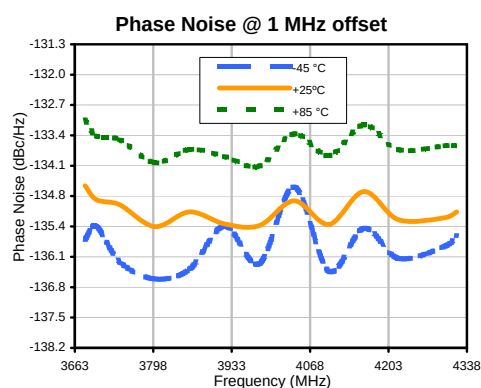
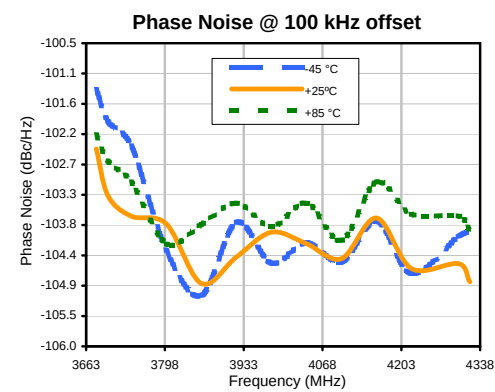
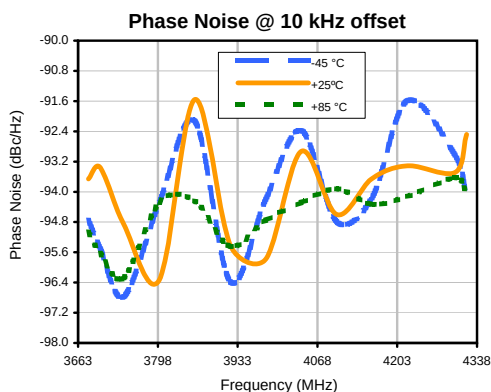
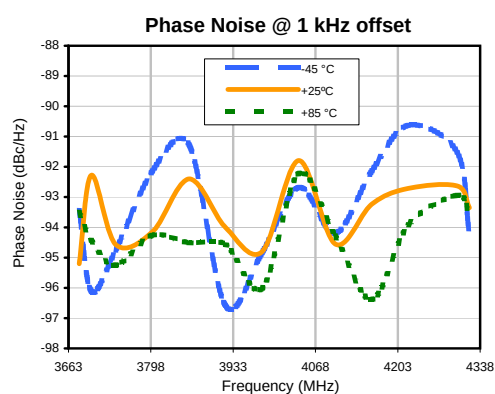
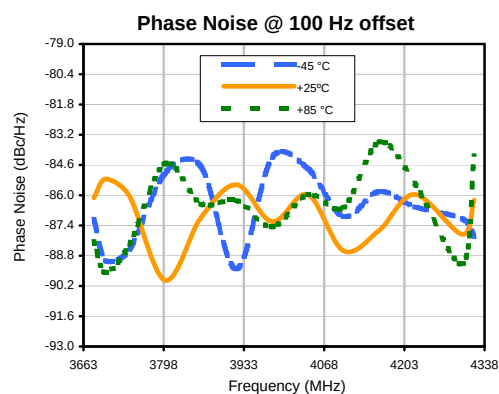
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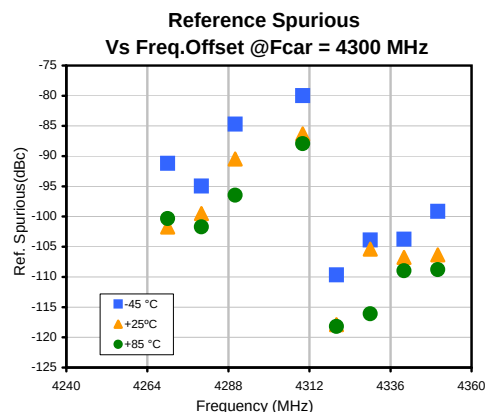
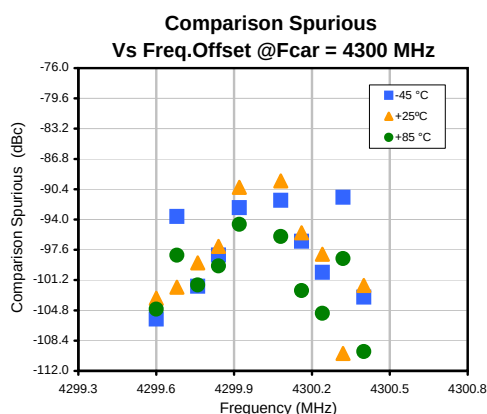
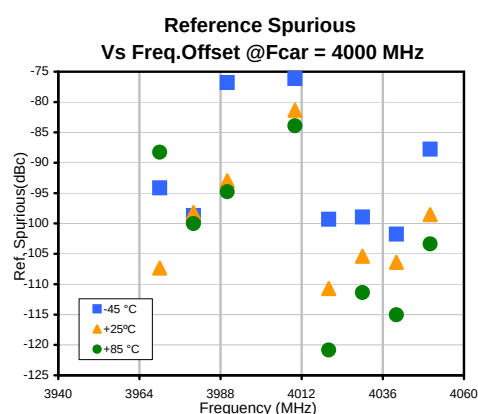
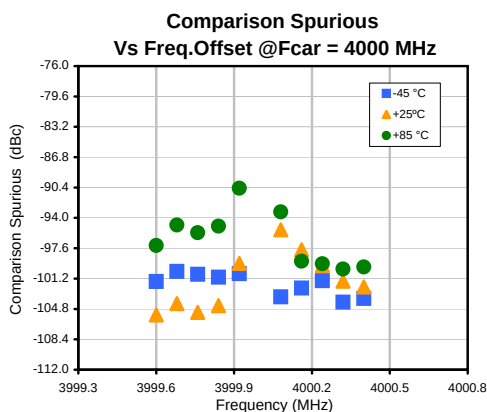
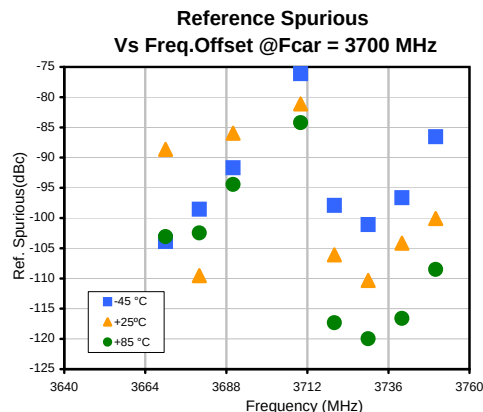
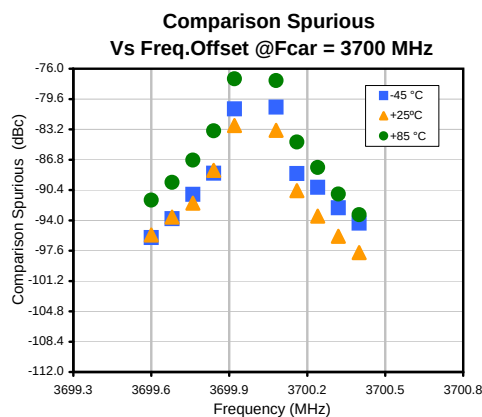
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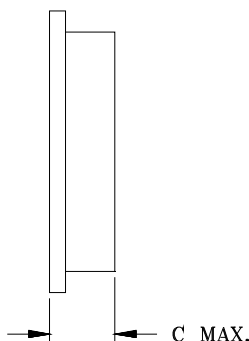
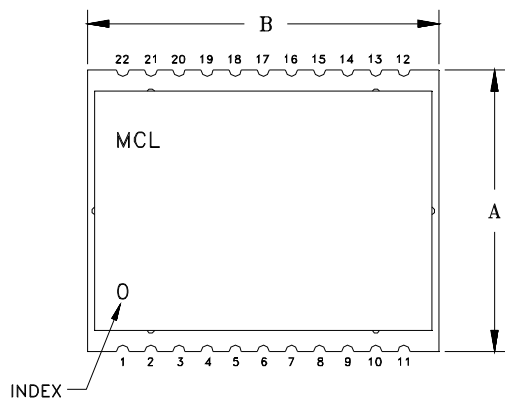


Case Style

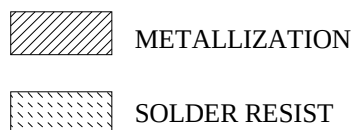
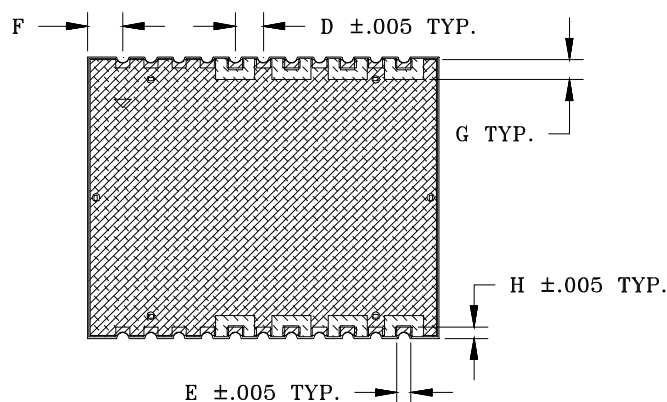
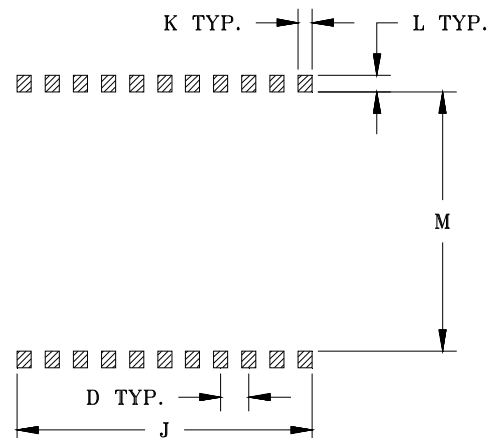
KL

Outline Dimensions

KL1294



Suggested PCB Land Pattern



CASE#	A	B	C	D	E	F	G	H	J	K	L	M	WT.GRAM
KL1294	1.000 (25.40)	1.250 (31.75)	.232 (5.89)	.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)	6.0

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>

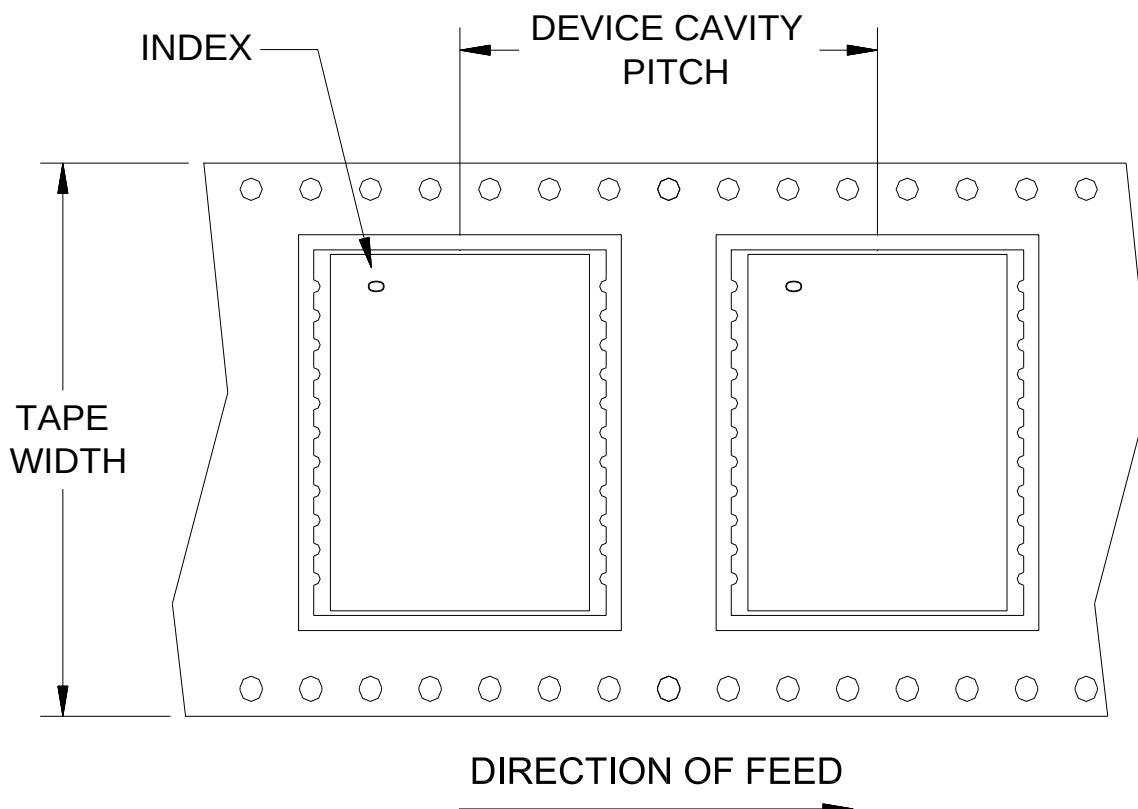
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Mini-Circuits ISO 9001 & ISO 14001 Certified

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.

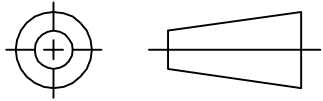
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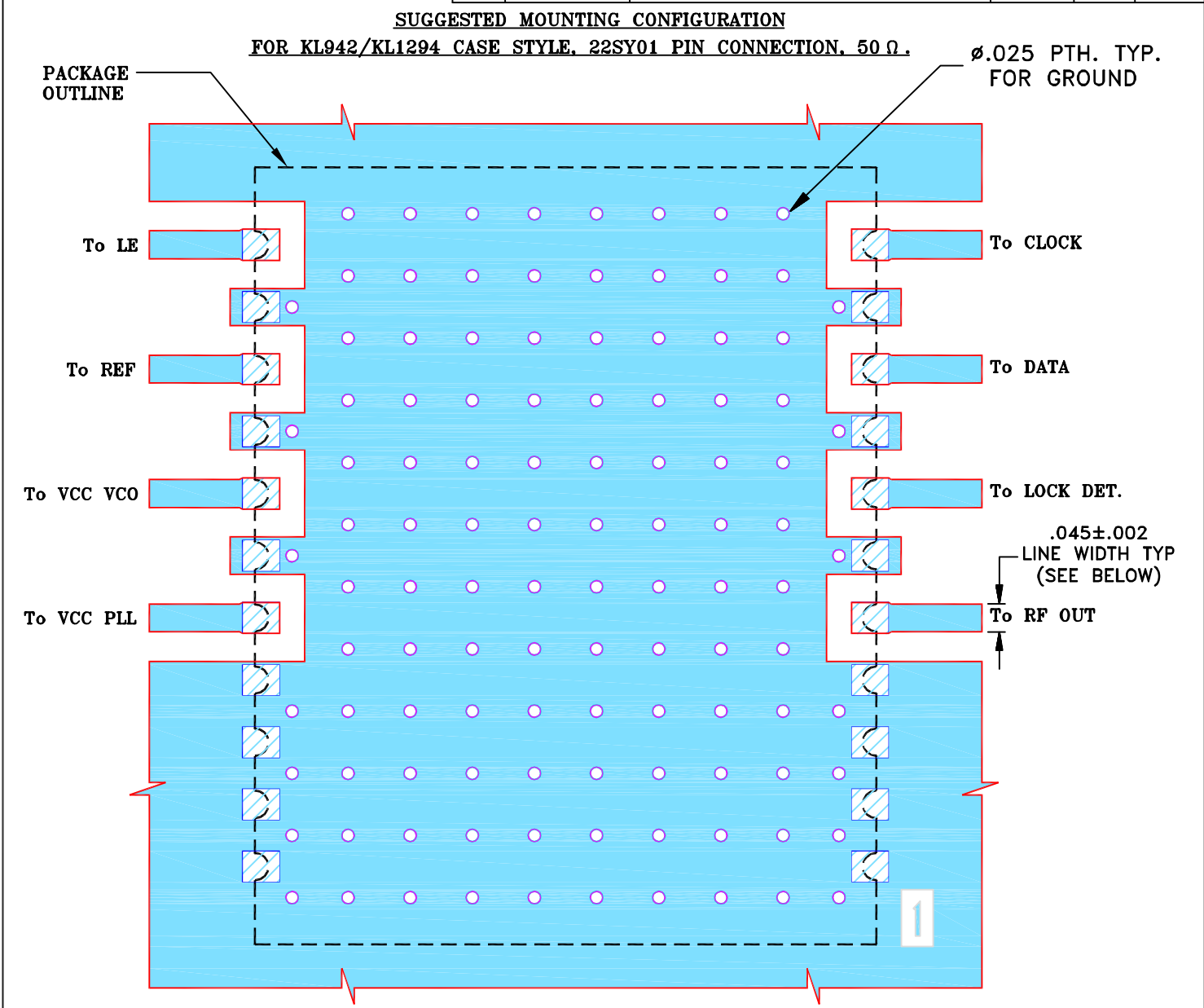


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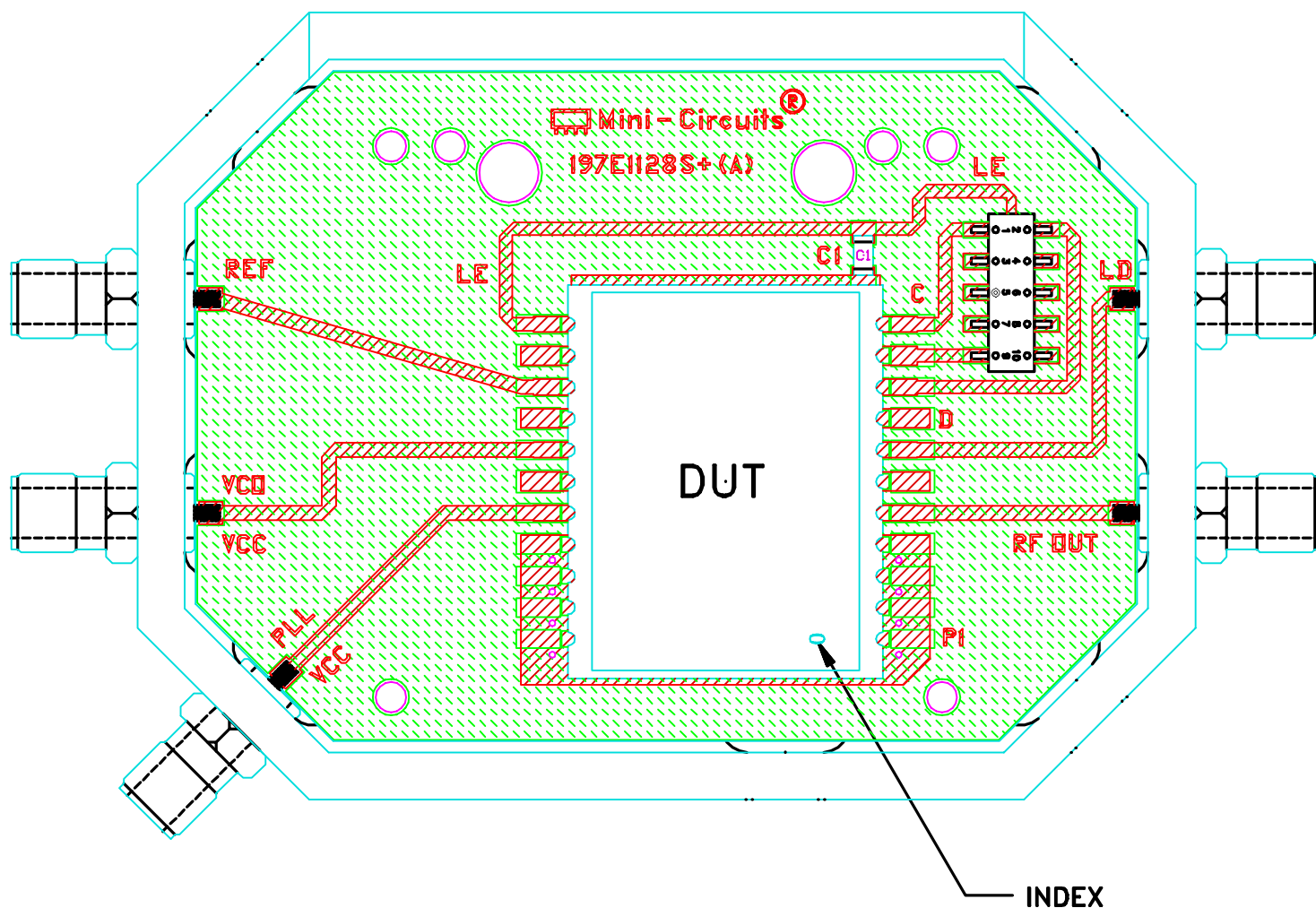
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THIRD ANGLE PROJECTION		REVISIONS					
		REV	ECN No.	DESCRIPTION	DATE	DR	AUTH
		OR	M124738	NEW RELEASE	04/10	DK	HH
		OR	R77823	NEW RELEASE	04/10	DK	HH



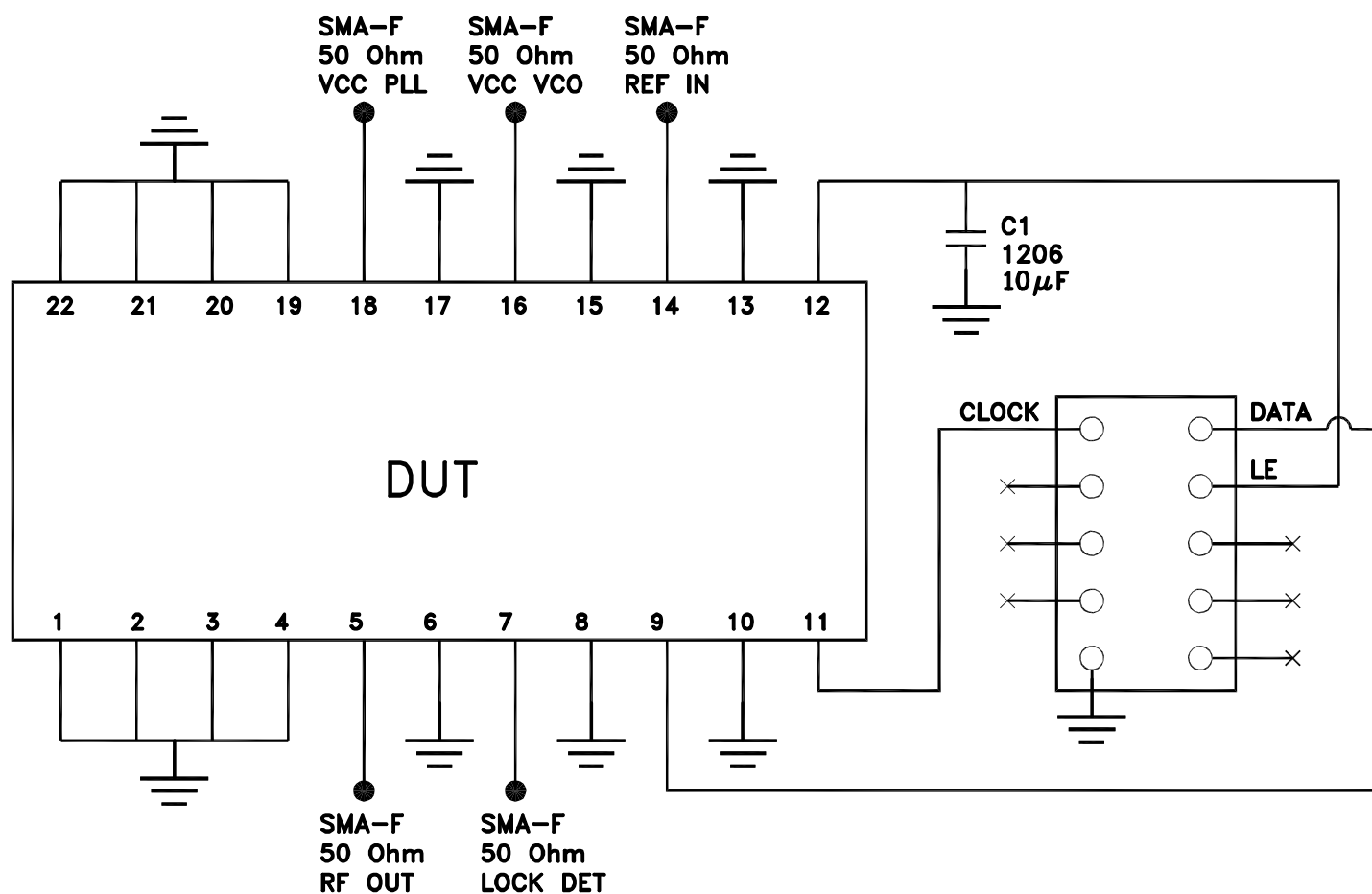
Evaluation Board and Circuit



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	-45° 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