

Engineering Development Model

Frequency Synthesizer

DSN-EDR9520

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 -45°C to +85°C				
Parameter	Min.	Typ.	Max.	Units
Frequency	870		1300	MHz
Step size		5000		kHz
Settling Time Within ±1kHz		12		μsec
Output Power	-3	+1	+5	dBm
Phase Noise				
at 100 Hz offset		-93		dBc/Hz
at 1 kHz offset		-103	-97	dBc/Hz
at 10 kHz offset		-104	-98	dBc/Hz
at 100 kHz offset		-103	-97	dBc/Hz
at 1000 kHz offset		-125		dBc/Hz
Integrated SSB Phase Noise		-47		dBc
Comparison Spurious Suppression		-94		dBc
Non-Harm. Spurious Suppression		-90		dBc
Harmonic Suppression		-32		dBc
Supply voltage				V
VCO		5		V
PLL		5		V
Supply current				mA
VCO		42	50	mA
PLL		10	18	mA
Reference In (External)				
Frequency		50		MHz
Amplitude		1		Vp-p
Impedance		100		kΩ
Ph. N @ 1kHz		-145		dBc/Hz
Input Logic Levels				V
Logic high	1.4		3.2	V
Logic Low			0.6	V
Digital Lock Detect				V
Locked	2.8		3.2	V
Unlocked			0.4	V
Frequency Synthesizer PLL	ADF4106			

ABSOLUTE MAXIMUM RATINGS	
Operating Temperature	-45°C to 85°C
Storage Temperature	-55°C to 100°C
VCO Supply Voltage	6V
PLL Supply Voltage	6V
Reference Frequency voltage	3.6Vp-p
Data, Clock & LE levels	3.5V

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

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

Notes

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Typical Performance Data

FREQ. (MHz)	POWER OUTPUT (dBm)			HARMONICS						VCO CURRENT (mA)			PLL CURRENT (mA)		
				(dBc)											
	F2			F3											
-40 °C	+25°C	+85 °C	-40 °C	+25°C	+85 °C	-40 °C	+25°C	+85 °C	-40 °C	+25°C	+85 °C	-40 °C	+25°C	+85 °C	
850	-0.67	0.00	0.36	-16.90	-17.71	-18.08	-48.32	-50.81	-52.13	38.08	40.65	42.23	8.89	9.62	11.26
870	-0.64	0.02	0.38	-18.28	-19.04	-19.36	-51.91	-55.26	-57.99	38.32	40.83	42.40	8.95	9.69	11.33
895	-0.58	0.09	0.43	-20.02	-20.71	-20.95	-56.93	-76.62	-70.26	38.58	41.07	42.58	8.95	9.68	11.32
940	-0.33	0.30	0.59	-22.94	-23.86	-24.37	-54.01	-49.94	-50.13	39.07	41.49	42.84	8.99	9.73	11.36
985	-0.03	0.53	0.74	-24.88	-26.33	-27.55	-46.48	-46.45	-47.35	39.55	41.84	43.03	9.05	9.78	11.42
1030	0.34	0.83	0.97	-27.29	-29.21	-31.02	-45.87	-46.63	-47.71	39.95	42.06	43.10	9.08	9.83	11.46
1075	0.56	0.99	1.06	-29.88	-32.13	-34.54	-45.96	-46.56	-48.36	40.21	42.15	43.09	9.15	9.88	11.53
1120	0.71	1.08	1.11	-32.54	-35.45	-38.69	-45.45	-47.66	-49.62	40.30	42.13	43.01	9.06	9.80	11.47
1165	0.87	1.18	1.17	-35.06	-38.53	-42.91	-49.35	-51.21	-52.27	40.25	42.02	42.89	9.10	9.84	11.50
1210	0.85	1.13	1.08	-36.83	-41.05	-46.72	-46.13	-48.06	-49.54	40.17	41.90	42.76	9.19	9.93	11.59
1255	0.97	1.22	1.14	-39.14	-43.83	-50.05	-44.08	-46.00	-47.49	39.99	41.70	42.57	9.24	9.98	11.64
1300	0.79	1.02	0.90	-41.35	-45.46	-48.41	-41.64	-43.52	-46.07	39.83	41.52	42.40	9.29	10.04	11.70
1320	0.82	1.03	0.88	-42.89	-46.02	-48.44	-41.50	-43.27	-45.63	39.71	41.40	42.30	9.23	9.97	11.64

FREQ. (MHz)	PHASE NOISE (dBc/Hz) @ OFFSETS														
	-40 °C					+25°C					+85 °C				
	100Hz	1kHz	10kHz	100kHz	1MHz	100Hz	1kHz	10kHz	100kHz	1MHz	100Hz	1kHz	10kHz	100kHz	1MHz
850	-94.22	-105.16	-105.23	-102.51	-127.81	-93.55	-105.56	-105.97	-104.39	-127.09	-96.24	-103.14	-103.91	-102.84	-126.95
870	-96.05	-103.24	-104.71	-103.79	-126.21	-94.96	-104.22	-105.51	-104.78	-126.39	-95.55	-104.64	-103.46	-102.63	-126.91
895	-93.33	-104.87	-104.59	-103.55	-125.82	-94.09	-102.53	-106.14	-104.16	-126.26	-92.72	-103.27	-103.62	-102.12	-126.82
940	-94.10	-104.21	-103.53	-102.41	-125.68	-95.05	-103.34	-104.98	-103.12	-126.12	-93.49	-104.42	-103.10	-102.17	-126.18
985	-91.99	-103.20	-103.27	-102.17	-124.84	-95.21	-102.03	-104.01	-102.07	-125.90	-94.36	-103.27	-102.85	-102.12	-125.05
1030	-94.47	-103.04	-103.21	-102.32	-123.83	-90.89	-102.30	-103.62	-101.63	-124.98	-91.83	-100.44	-102.83	-101.57	-123.93
1075	-98.59	-103.60	-102.52	-102.30	-122.77	-93.90	-102.04	-102.86	-101.86	-123.65	-93.88	-102.28	-101.57	-100.95	-123.02
1120	-94.81	-103.91	-102.02	-100.96	-122.79	-92.74	-103.87	-103.69	-102.09	-122.77	-92.34	-101.91	-101.45	-101.37	-122.10
1165	-92.32	-103.11	-101.52	-100.41	-122.73	-92.03	-101.78	-102.80	-101.87	-122.43	-91.38	-103.09	-100.70	-101.28	-121.68
1210	-92.19	-101.46	-101.39	-100.85	-122.58	-92.91	-101.24	-102.07	-101.46	-122.47	-92.78	-102.43	-100.76	-101.26	-121.47
1255	-90.37	-103.61	-101.51	-100.94	-122.10	-88.05	-102.04	-102.17	-100.88	-122.84	-92.26	-101.29	-100.82	-100.67	-121.98
1300	-94.20	-101.67	-101.33	-100.43	-122.75	-90.09	-103.43	-102.32	-100.04	-123.66	-89.49	-103.58	-100.10	-99.48	-123.23
1320	-90.93	-103.05	-100.88	-99.99	-123.32	-92.62	-102.17	-102.00	-99.67	-124.13	-90.57	-101.51	-100.59	-99.02	-124.06

Notes

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Typical Performance Data

COMPARISON SPURIOUS ORDER	COMPARISON SPURIOUS @F _{carrier} 2721.52 MHz± (n*F _{comparison}) (dBc) NOTE 1			COMPARISON SPURIOUS @F _{carrier} 2729.52 MHz± (n*F _{comparison}) (dBc) NOTE 1			COMPARISON SPURIOUS @F _{carrier} 2737.52 MHz± (n*F _{comparison}) (dBc) NOTE 1		
	-40 °C	+25°C	+85 °C	-40 °C	+25°C	+85 °C	-40 °C	+25°C	+85 °C
-5	-91.15	-88.35	-97.05	-99.37	-96.94	-103.31	-104.53	-92.61	-103.06
-4	-100.36	-92.03	-96.38	-98.99	-97.30	-101.16	-107.87	-92.28	-100.74
-3	-91.99	-87.72	-92.51	-98.01	-95.82	-100.43	-107.96	-90.95	-96.29
-2	-95.74	-87.54	-89.68	-95.85	-96.95	-95.65	-111.03	-90.72	-93.17
-1	-96.21	-93.54	-103.18	-97.42	-94.98	-90.71	-92.05	-90.61	-94.12
0 ^{note 2}	-	-	-	-	-	-	-	-	-
+1	-84.16	-91.32	-108.66	-95.08	-100.44	-97.10	-96.05	-92.29	-95.94
+2	-82.65	-90.49	-90.02	-94.80	-100.63	-106.06	-102.38	-89.50	-89.96
+3	-85.24	-89.93	-91.12	-97.58	-95.07	-105.32	-104.28	-90.70	-92.23
+4	-84.76	-88.85	-91.92	-97.65	-97.93	-110.36	-106.22	-91.18	-95.43
+5	-86.85	-89.98	-94.55	-97.85	-97.88	-106.03	-102.59	-90.09	-97.83

Note 1: Comparison frequency 5 MHz

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

REFERENCE SPURIOUS ORDER	REFERENCE SPURIOUS @F _{carrier} 2721.52 MHz± (n*F _{reference}) (dBc) NOTE 3			REFERENCE SPURIOUS @F _{carrier} 2729.52 MHz± (n*F _{reference}) (dBc) NOTE 3			REFERENCE SPURIOUS @F _{carrier} 2737.52 MHz± (n*F _{reference}) (dBc) NOTE 3		
	-40 °C	+25°C	+85 °C	-40 °C	+25°C	+85 °C	-40 °C	+25°C	+85 °C
-5	-91.15	-88.35	-97.05	-99.37	-96.94	-103.31	-104.53	-92.61	-103.06
-4	-100.36	-92.03	-96.38	-98.99	-97.30	-101.16	-107.87	-92.28	-100.74
-3	-91.99	-87.72	-92.51	-98.01	-95.82	-100.43	-107.96	-90.95	-96.29
-2	-95.74	-87.54	-89.68	-95.85	-96.95	-95.65	-111.03	-90.72	-93.17
-1	-96.21	-93.54	-103.18	-97.42	-94.98	-90.71	-92.05	-90.61	-94.12
0 ^{note 4}	-	-	-	-	-	-	-	-	-
+1	-84.16	-91.32	-108.66	-95.08	-100.44	-97.10	-96.05	-92.29	-95.94
+2	-82.65	-90.49	-90.02	-94.80	-100.63	-106.06	-102.38	-89.50	-89.96
+3	-85.24	-89.93	-91.12	-97.58	-95.07	-105.32	-104.28	-90.70	-92.23
+4	-84.76	-88.85	-91.92	-97.65	-97.93	-110.36	-106.22	-91.18	-95.43
+5	-86.85	-89.98	-94.55	-97.85	-97.88	-106.03	-102.59	-90.09	-97.83

Note 3: Reference frequency 50 MHz

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

Notes

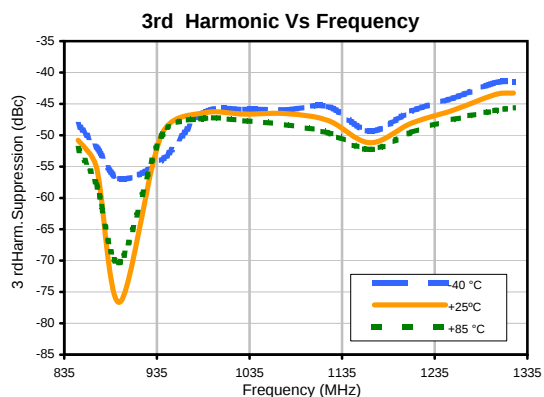
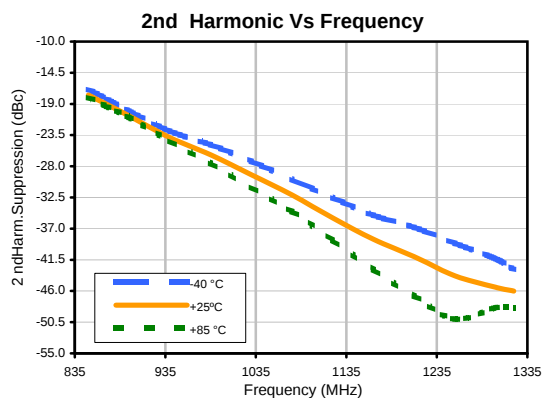
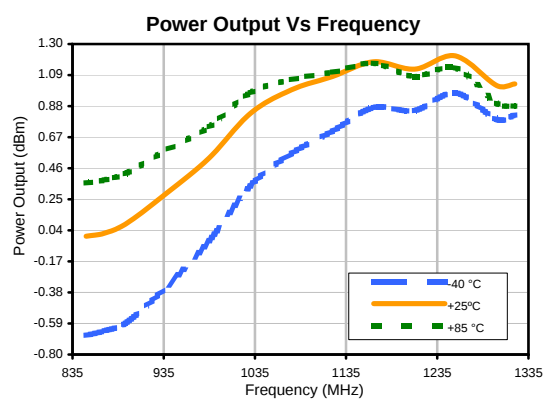
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Frequency Synthesizer

Typical Performance Data

DSN-EDR9520



Notes

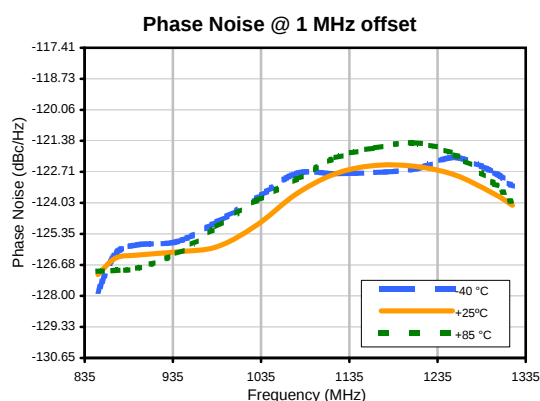
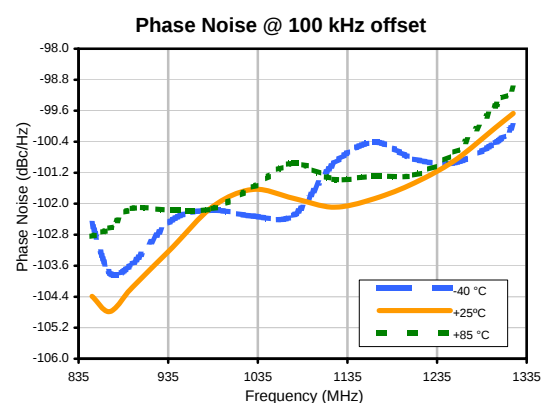
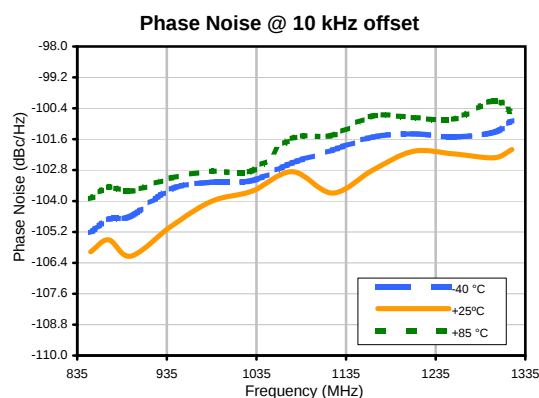
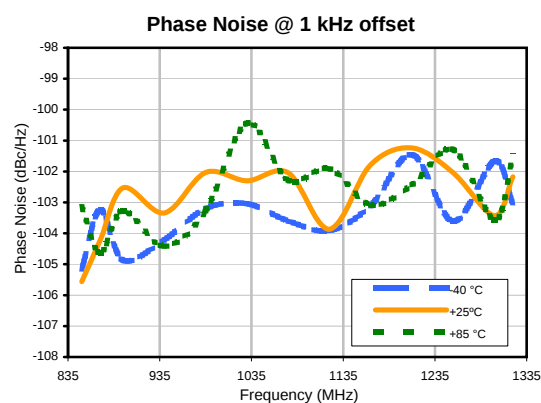
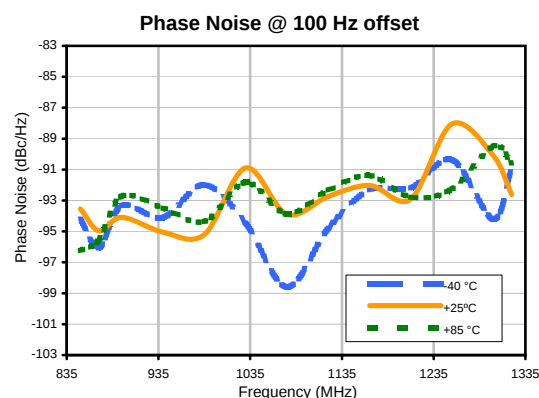
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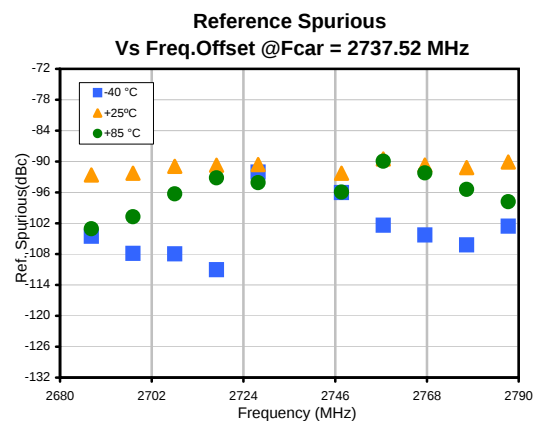
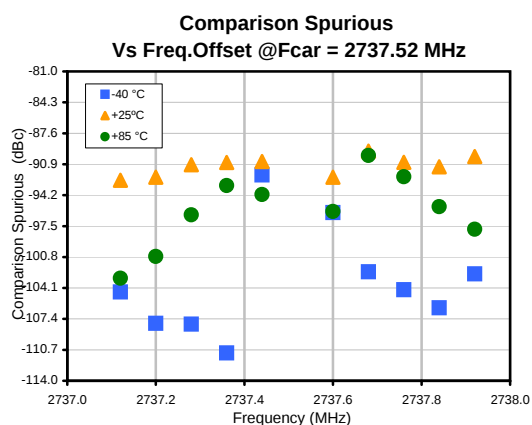
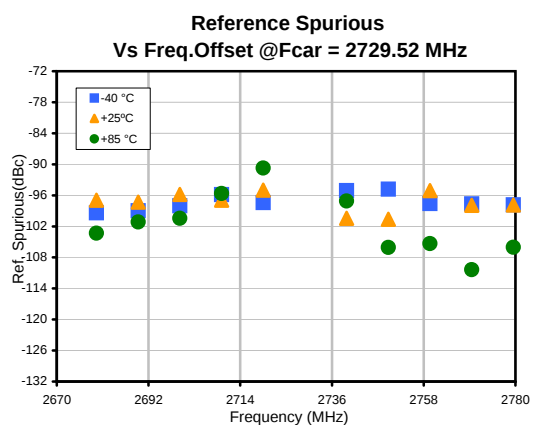
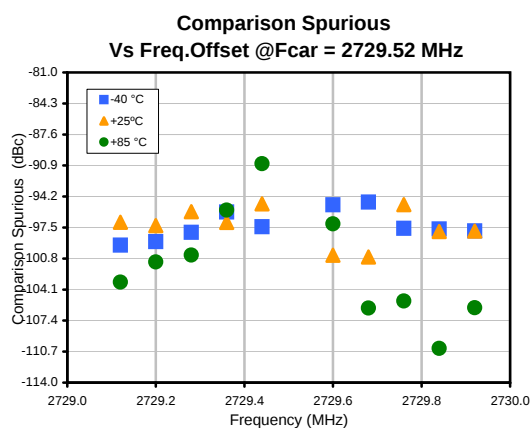
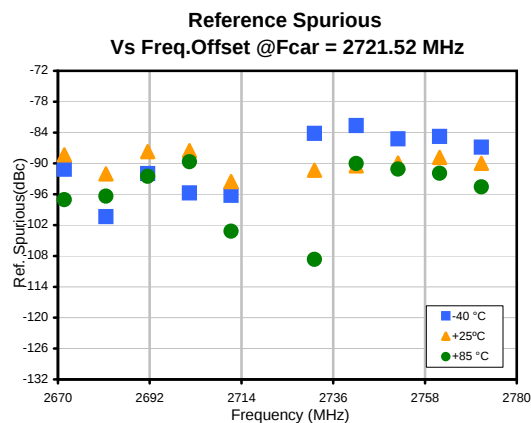
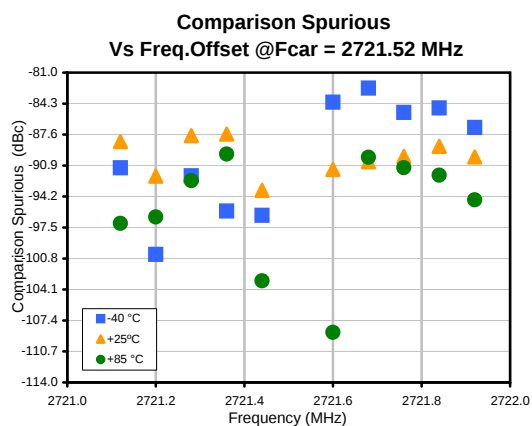
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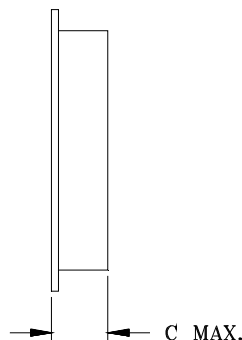
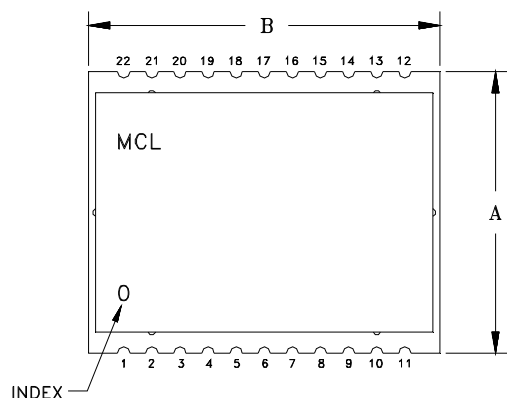
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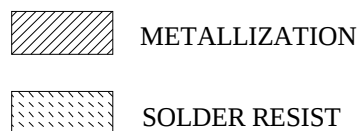
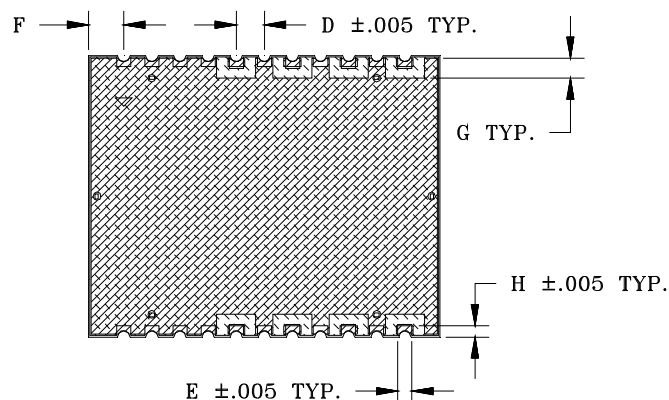
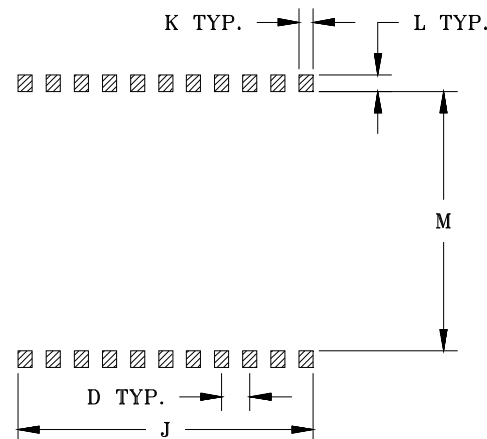


Outline Dimensions

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>

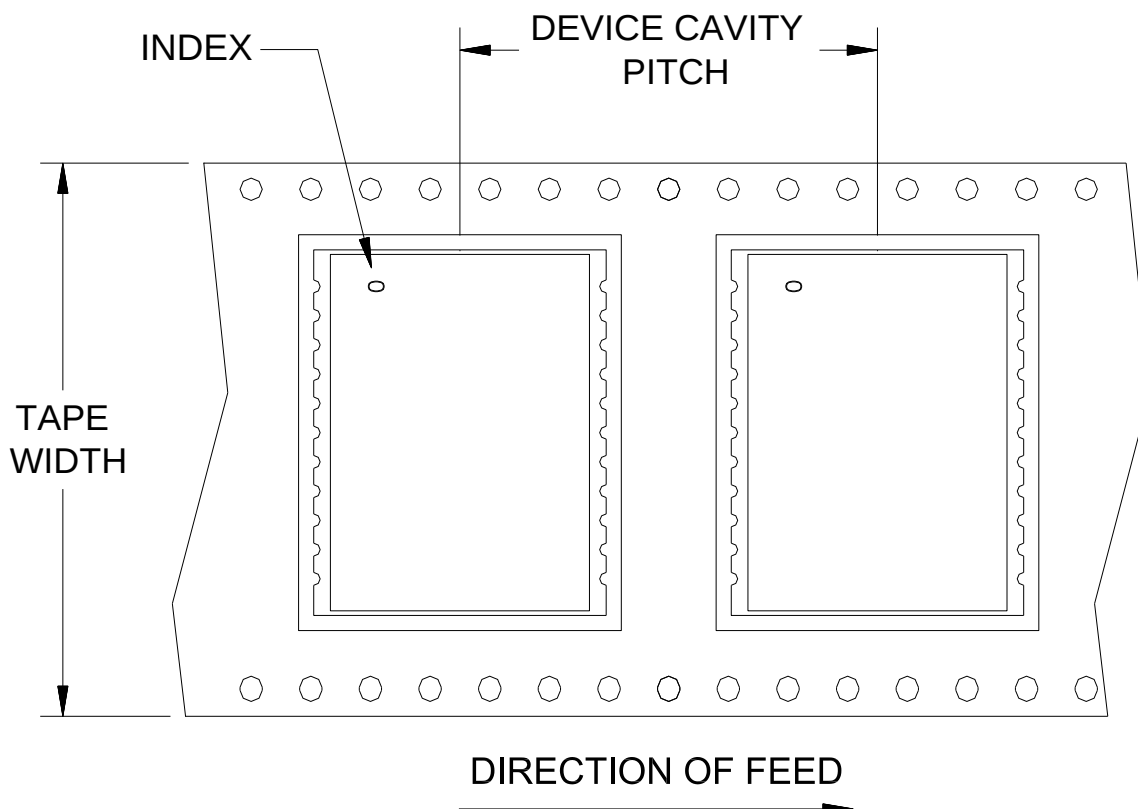
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Mini-Circuits ISO 9001 & ISO 14001 Certified

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

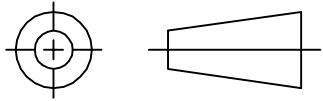
Note: Please consult individual model data sheet to determine device per reel availability.

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.

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

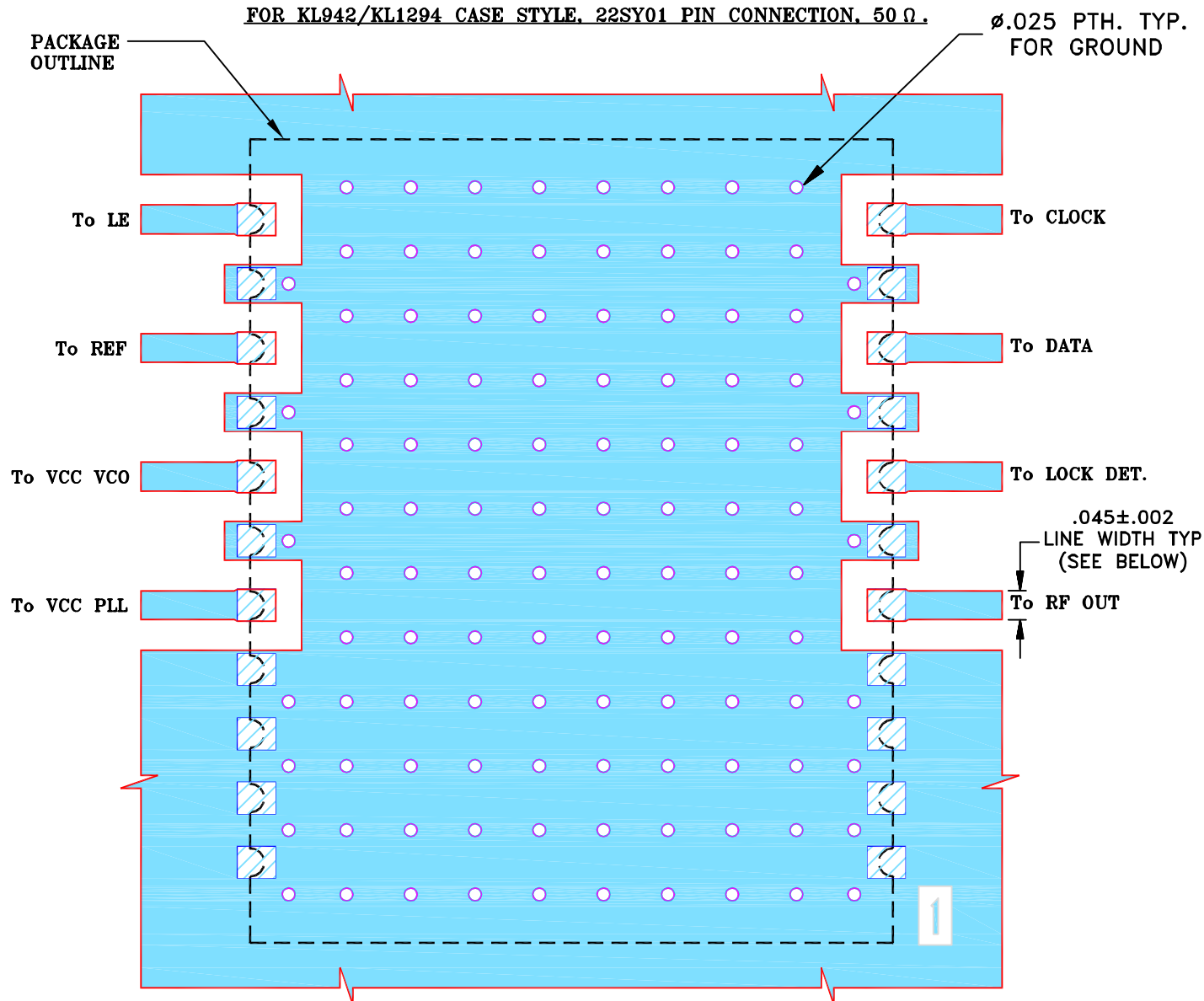


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THIRD ANGLE PROJECTION		REVISIONS					
		REV	ECN No.	DESCRIPTION	DATE	DR	AUTH
		OR	M124738	NEW RELEASE	04/10	DK	HH
		OR	R77823	NEW RELEASE	04/10	DK	HH

SUGGESTED MOUNTING CONFIGURATION

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



NOTES:

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



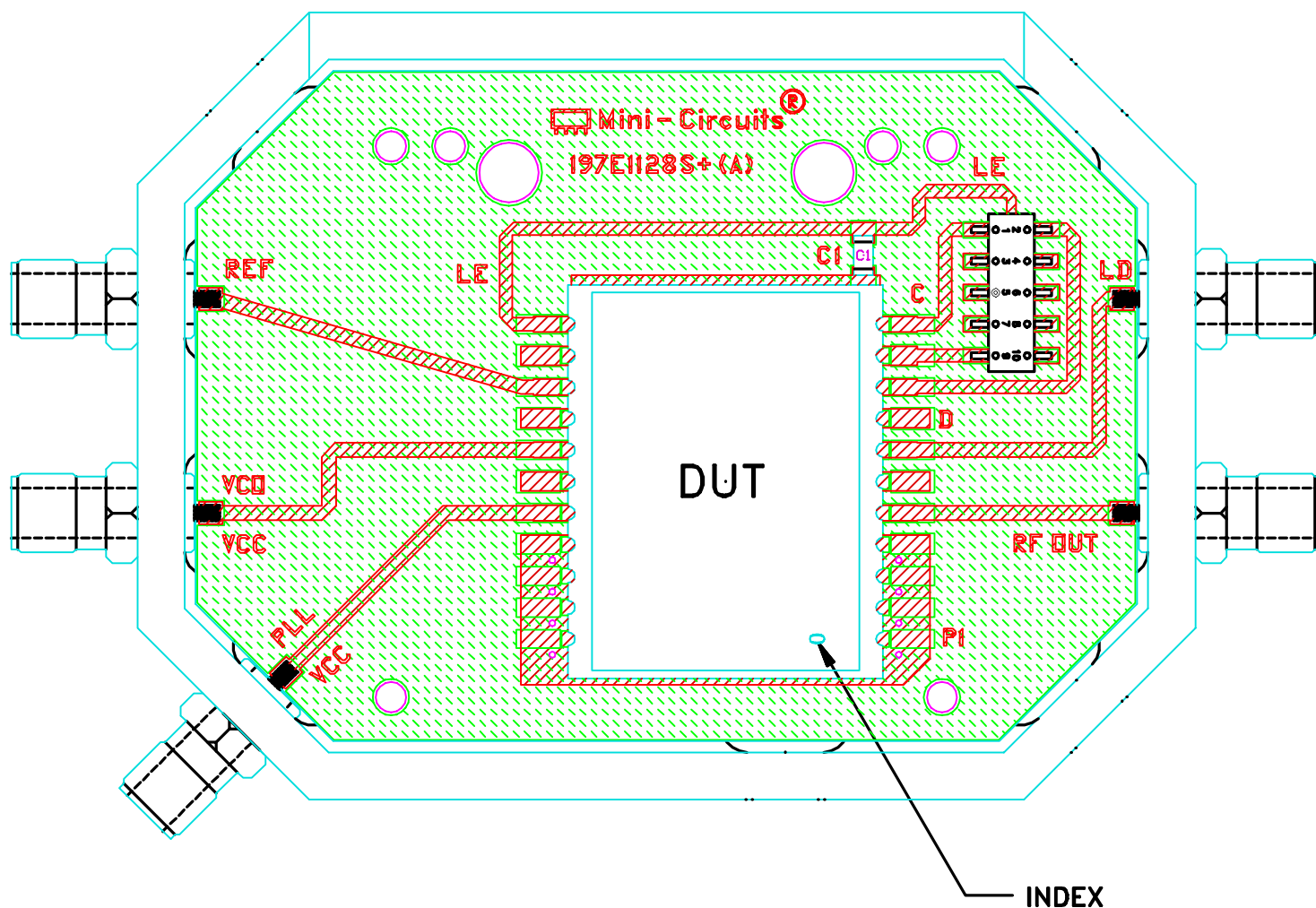
DENOTES PCB COPPER LAYOUT WITH SMOBC
(SOLDER MASK OVER BARE COPPER)



DENOTES COPPER LAND PATTERN
FREE OF SOLDERMASK

UNLESS OTHERWISE SPECIFIED		INITIALS		DATE		Mini-Circuits® 13 Neptune Avenue Brooklyn NY 11235							
DIMENSIONS ARE IN INCHES		DRAWN	DK (RAVON)	06 APR 10		PL, 22SY01, KL942/KL1294, DSN TB-553+ (50 Ω)							
TOLERANCES ON:		CHECKED	DH (RAVON)	07 APR 10									
2 PL DECIMALS ±		APPROVED	HH (RAVON)	07 APR 10									
3 PL DECIMALS ± .005													
ANGLES ±						SIZE A							
FRACTIONS ±										CODE IDENT 15542			
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ASHEETA1.DWG REV:A DATE:01/12/95						REV: OR		FILE: 98PL318		SCALE: 4:1		SHEET: 1 OF 1	

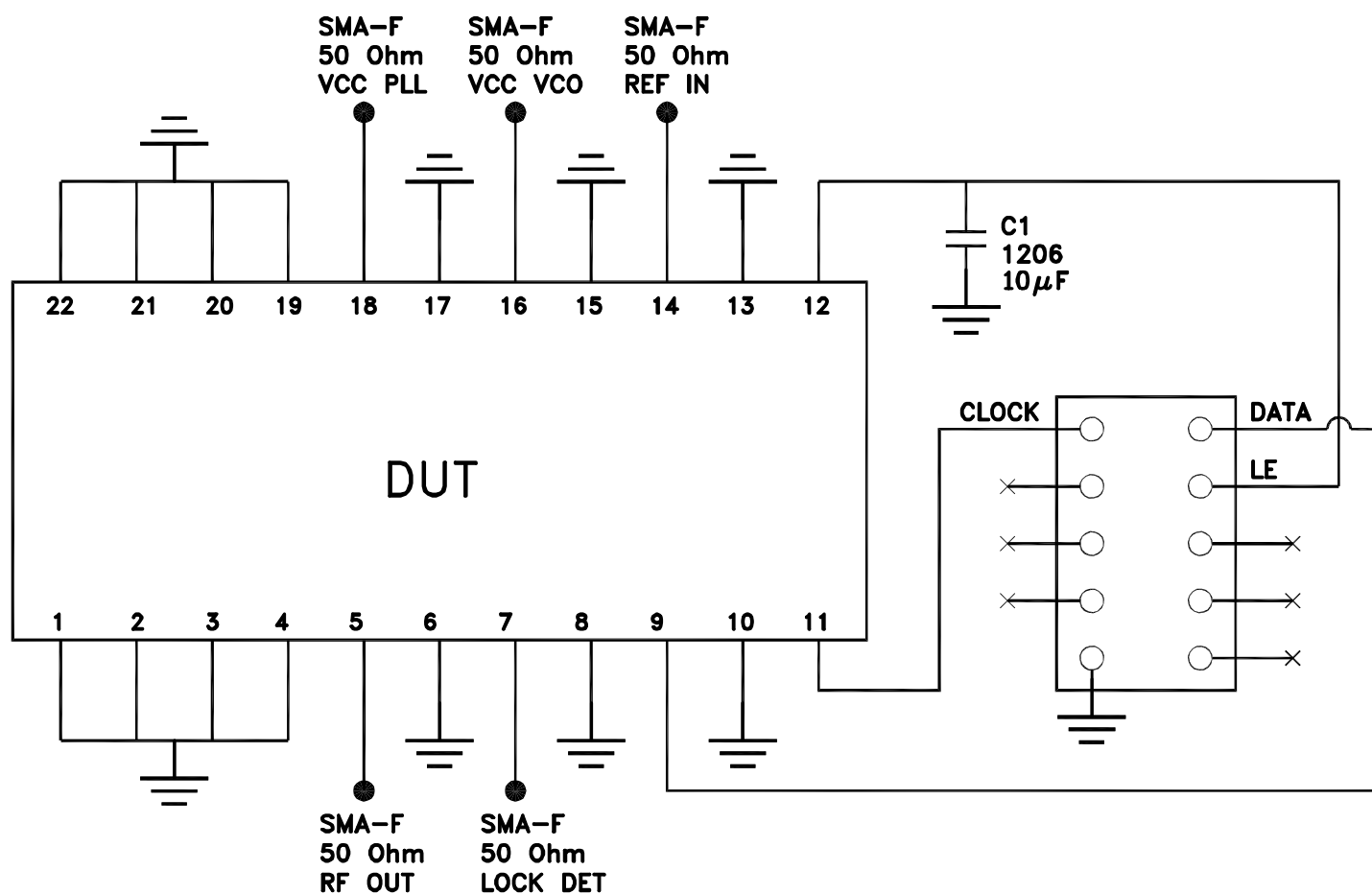
Evaluation Board and Circuit



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	-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