Engineering Development Model

Frequency Synthesizer

RSN-EDR10612

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 : JG1228

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

ELECTRICAL SPECIFICATIONS, 50Ω, over -40°C to +85°C					
Parameter		**Min.**	**Typ.**	**Max.**	**Units**
Frequency		1380		1380	MHz
Step size			20000		kHz
Settling Time	**Within ±1kHz**		1.5		msec
Output Power		+4	+7	+11	dBm
Phase Noise					
	at 100 Hz offset		-96		dBc/Hz
	at 1 kHz offset		-104		dBc/Hz
	at 10 KHz offset		-105	-99	dBc/Hz
	at 100 KHz offset		-132	-126	dBc/Hz
	at 1000 kHz offset		-153	-147	dBc/Hz
Integrated SSB Phase Noise			-61		dBc
Reference Spurious Suppression			-92		dBc
Comparison Spurious Suppression			-38		dBc
Non-Harm. Spurious Suppression			-90		dBc
Harmonic Suppression			-34	-28	dBc
Supply voltage	**VCO**		5		V
	PLL		3.3		V
Supply current	**VCO**		47	55	V
	PLL		21	29	V
(External) Reference In (External)	**Frequency**		960		MHz
	Amplitude		1		Vp-p
	Impedance		100		kΩ
	Ph. N @ 1kHz		-145		dBc/Hz
Digital Lock Detect	**Locked**	2.9		3.3	V
	Unlocked			0.4	
Frequency Synthesizer PLL		Self-programmed (internal microcontroller)			

ABSOLUTE MAXIMUM RATINGS	
Operating Temperature	-45°C to 85°C
Storage Temperature	-55°C to 100°C
VCO Supply Voltage	6V
PLL Supply Voltage	4.3V
Reference Frequency voltage	3.6Vp-p

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

PIN CONNECTIONS			
RF OUT	4	**N.C**	8,9,10,16,18
VCC VCO	19	**GROUND**	1,2,3,5,6,11, 13,14,15,20
VCC PLL	17		
REF IN	12		
LOCK DETECT	7		

Notes
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Frequency Synthesizer RSN-EDR10612

Typical Performance Data

FREQ. (MHz)	POWER OUTPUT (dBm)			HARMONICS (dBc)						VCO CURRENT (mA)			PLL CURRENT (mA)		
				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
1380	6.52	7.09	7.03	-36.24	-33.34	-32.77	-55.63	-58.74	-61.87	46.10	47.02	47.56	18.97	20.93	22.75

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
1380	-93.39	-99.79	-103.14	-131.79	-153.40	-97.90	-104.54	-104.99	-131.97	-153.36	-97.60	-106.93	-105.98	-131.35	-152.41

REFERENCE & COMPARISON SPURIOUS ORDER	REFERENCE & COMPARISON SPURIOUS @Fcarrier 1380 MHz± (n*Fcomparison) (dBc) NOTE 1			COMPARISON SPURIOUS @Fcarrier 1380 MHz± (n*Fcomparison) (dBc) NOTE 2		
n	-40°C	+25°C	+85°C	-40°C	+25°C	+85°C
-5	-	-	-	-89.22	-101.01	-96.68
-4	-	-	-	-89.57	-103.55	-94.97
-3	-	-	-	-84.74	-85.56	-82.29
-2	-	-	-	-92.64	-93.39	-89.28
-1	-84.66	-76.15	-77.03	-92.94	-97.01	-91.99
0 note 3	-	-	-	-	-	-
+1	-84.23	-91.79	-93.03	-96.83	-93.95	-93.7
+2	-104.89	-110.3	-116.48	-98.09	-94.05	-94.51
+3	-94.36	-96.93	-96.77	-86.57	-87.73	-83.66
+4	-112.12	-104.59	-112.14	-98.80	-95.48	-90.38
+5	-120.14	-116.4	-119.29	-96.58	-93.24	-91.06

Note 1: Reference frequency 960 MHz.
Note 2: Comparison frequency 20 MHz.
Note 3: All spurs are referenced to carrier signal (n=0).

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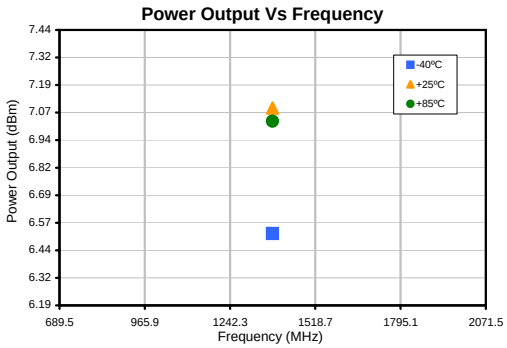
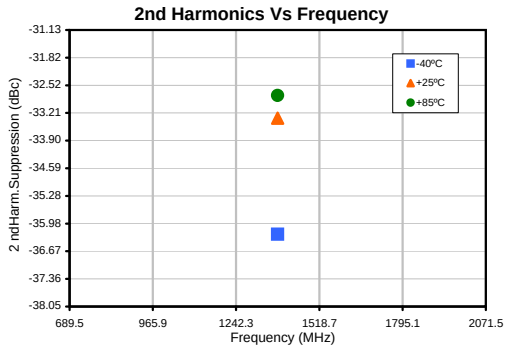
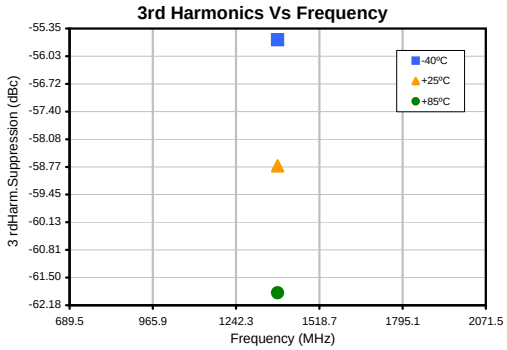
Frequency Synthesizer RSN-EDR10612

Typical Performance Data







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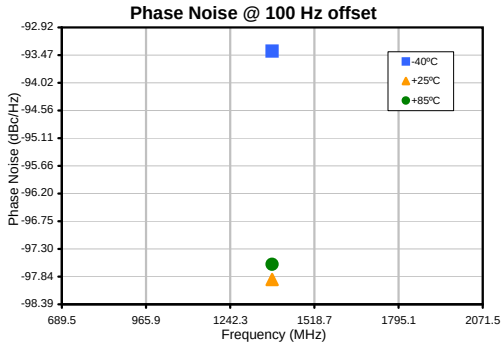
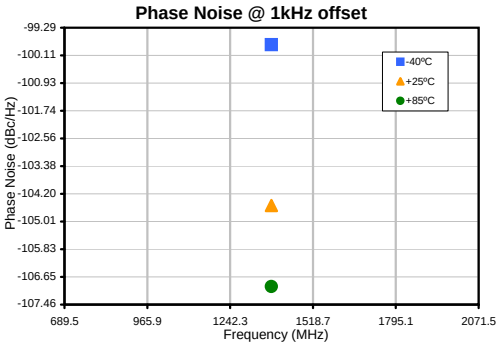
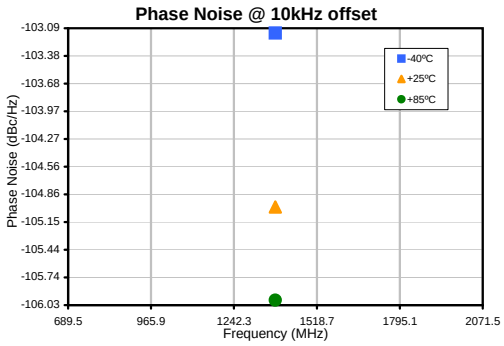
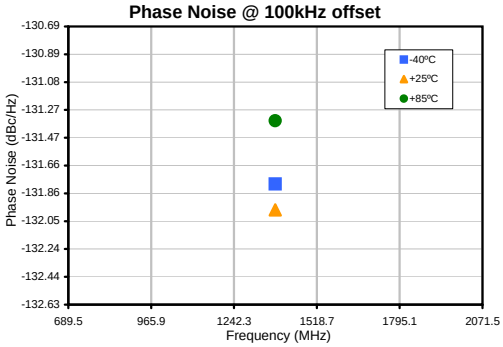
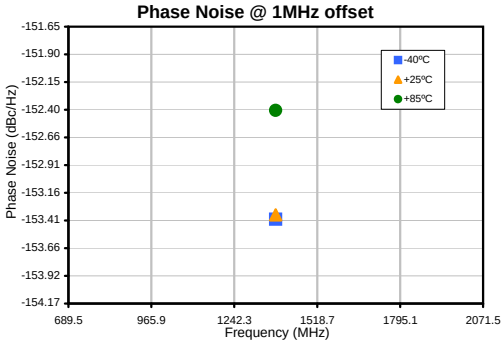
Typical Performance Data











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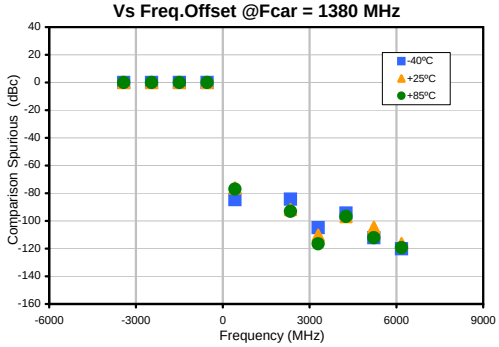
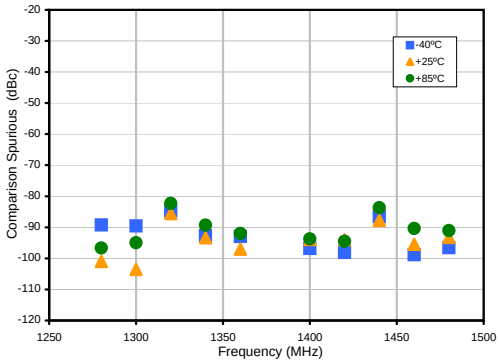
Typical Performance Data

Reference Spurious
Vs Freq.Offset @Fcar = 1380 MHz



Comparison Spurious
Vs Freq.Offset @Fcar = 1380 MHz



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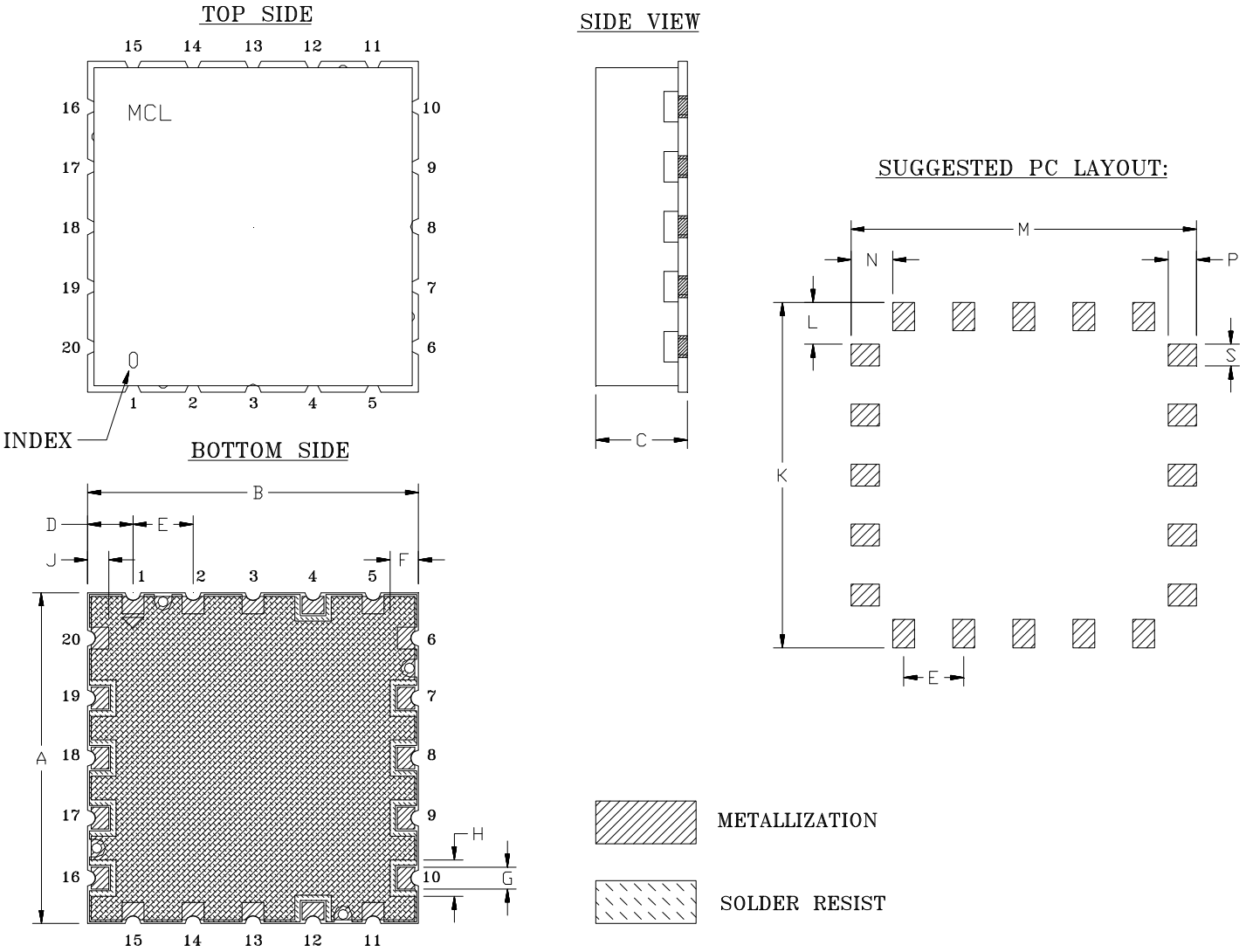
Case Style JG

Outline Dimensions

JG1228



CASE#	A	B	C	D	E	F	G	H	J	K	L	M	N	P	S	WT, GRAM
JG1228	.910" (23.11)	.910" (23.11)	.252" (6.40)	.125" (3.18)	.165" (4.19)	.078" (1.98)	.060" (1.52)	.100" (2.54)	.058" (1.47)	.950" (24.13)	.115" (2.92)	.950" (24.13)	.115" (2.92)	.078" (1.98)	.060" (1.52)	8.5

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.
   For RoHS-5 Case Styles: Tin-Lead plate.

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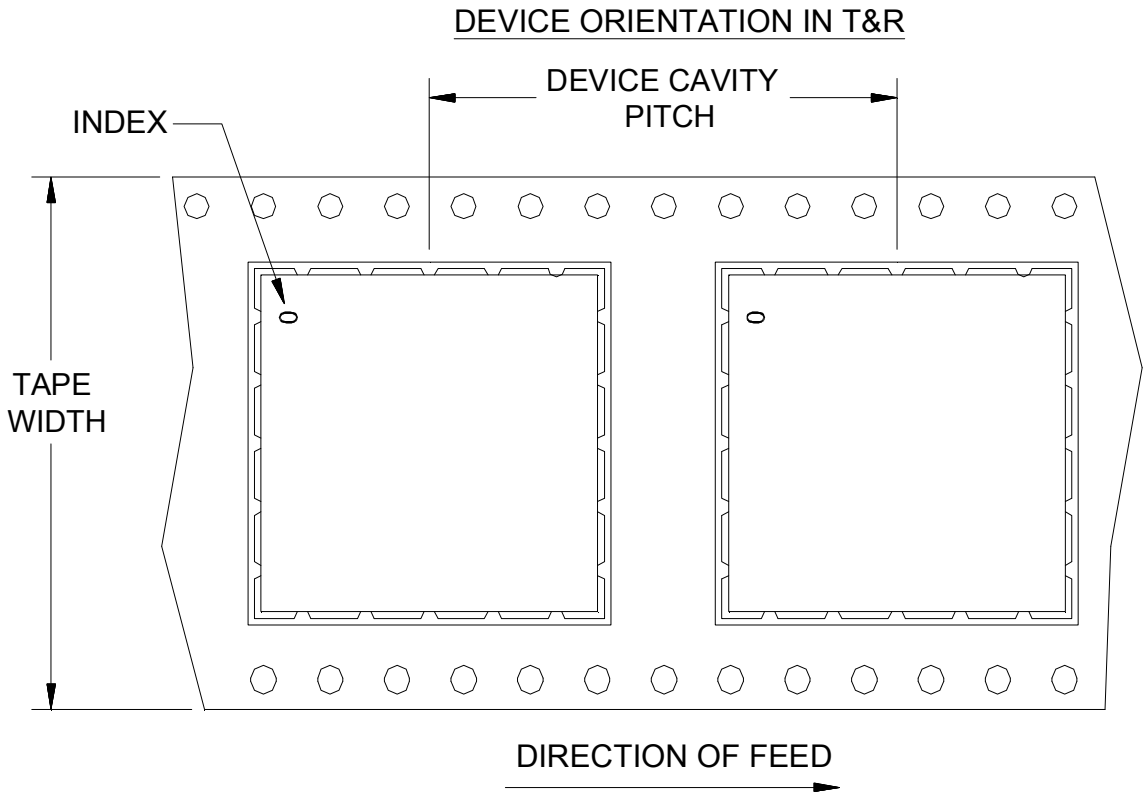
Tape & Reel Packaging TR-F99



Tape Width, mm	Device Cavity Pitch, mm	Reel Size, inches	Devices per Reel
44	32	13	125

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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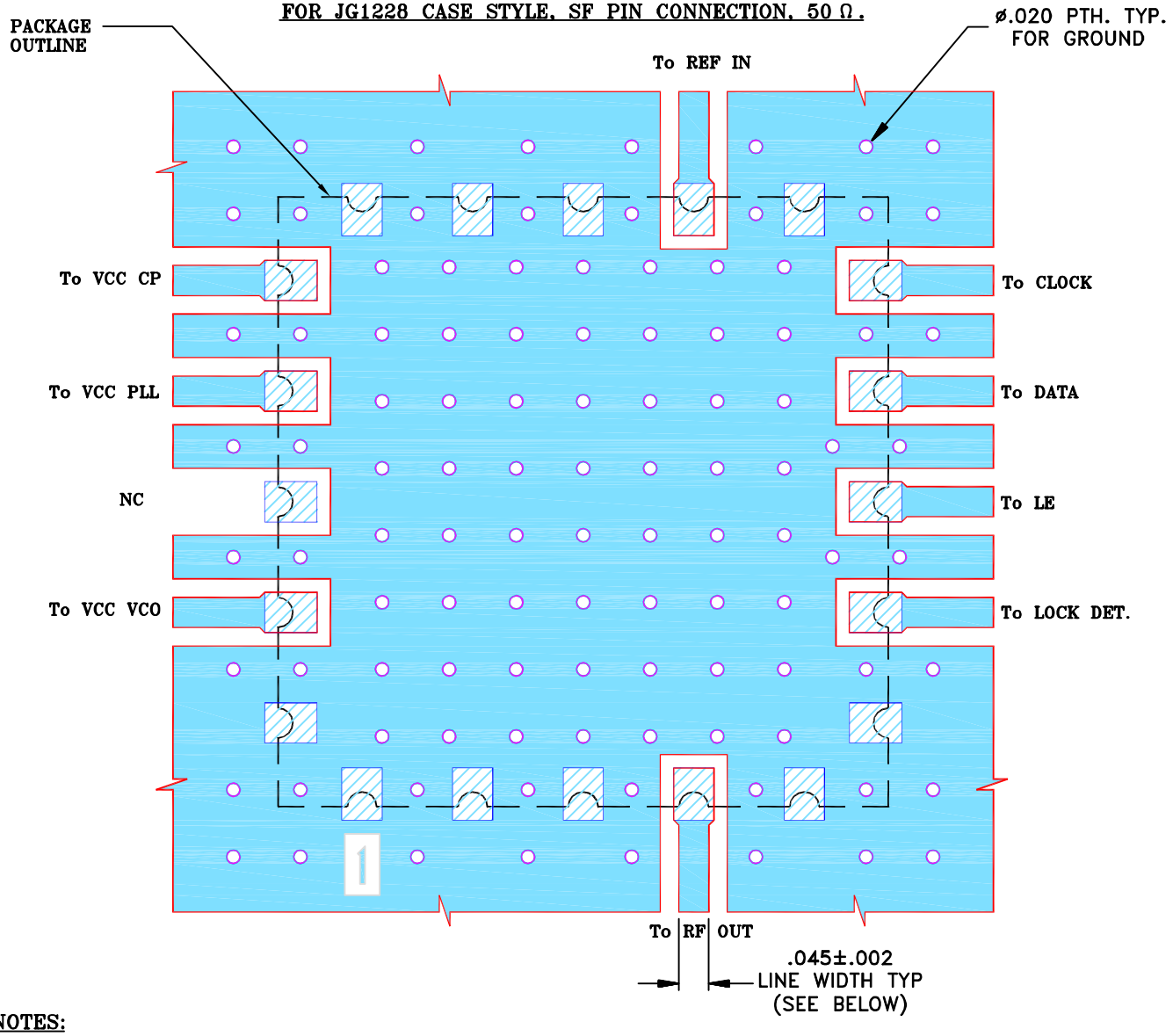
THIRD ANGLE PROJECTION

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 JG1228 CASE STYLE, SF 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 ±			

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

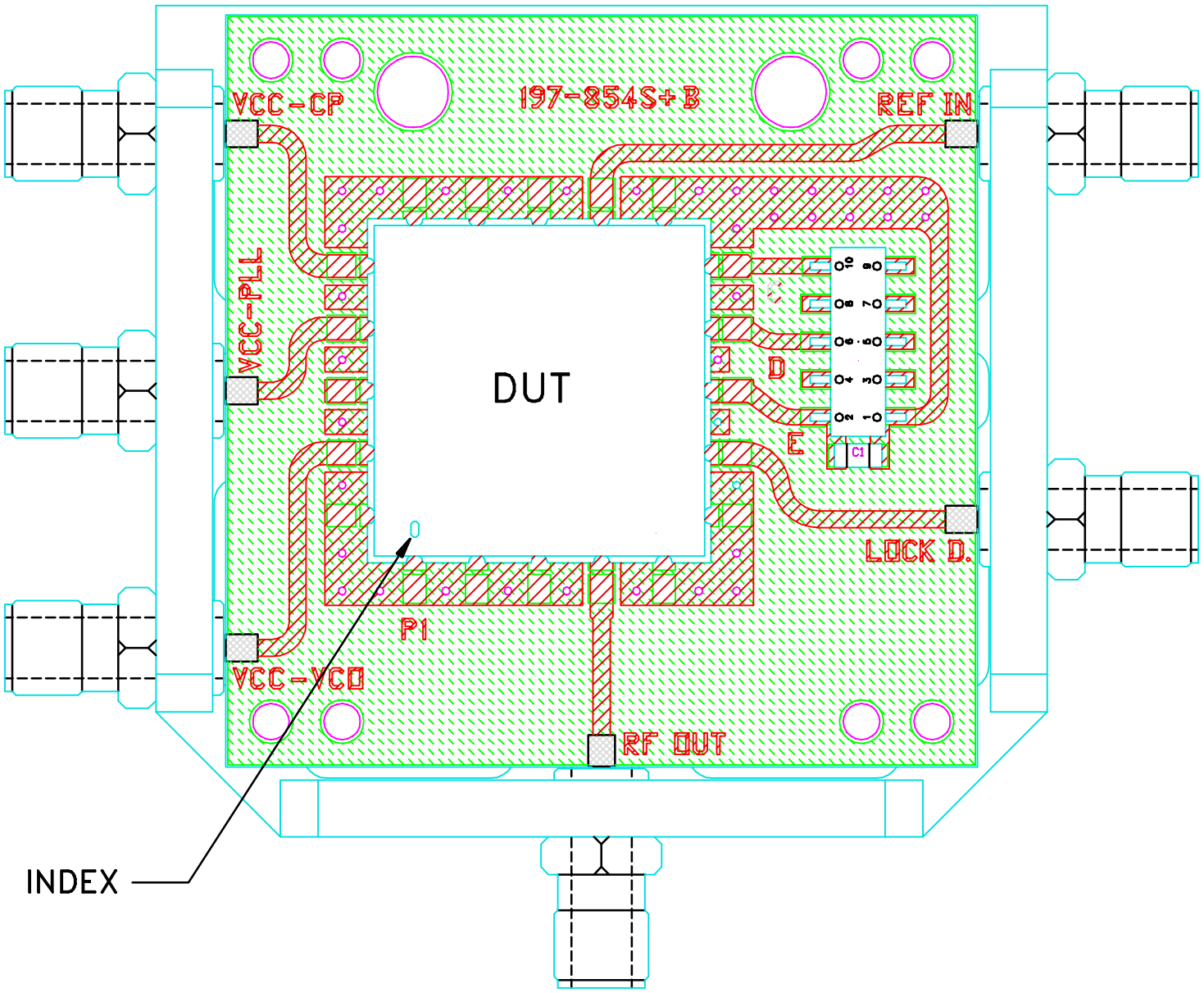
Mini-Circuits®
13 Neptune Avenue
Brooklyn NY 11235

PL, SF, JG1228, RSN
TB-554+ (50 Ω)

SIZE	CODE IDENT	DRAWING NO:	REV:
A	15542	98-PL-319	OR

FILE:	SCALE:	SHEET:
98PL319	4:1	1 OF 1

Evaluation Board and Circuit



TB-554+

NOTES:

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

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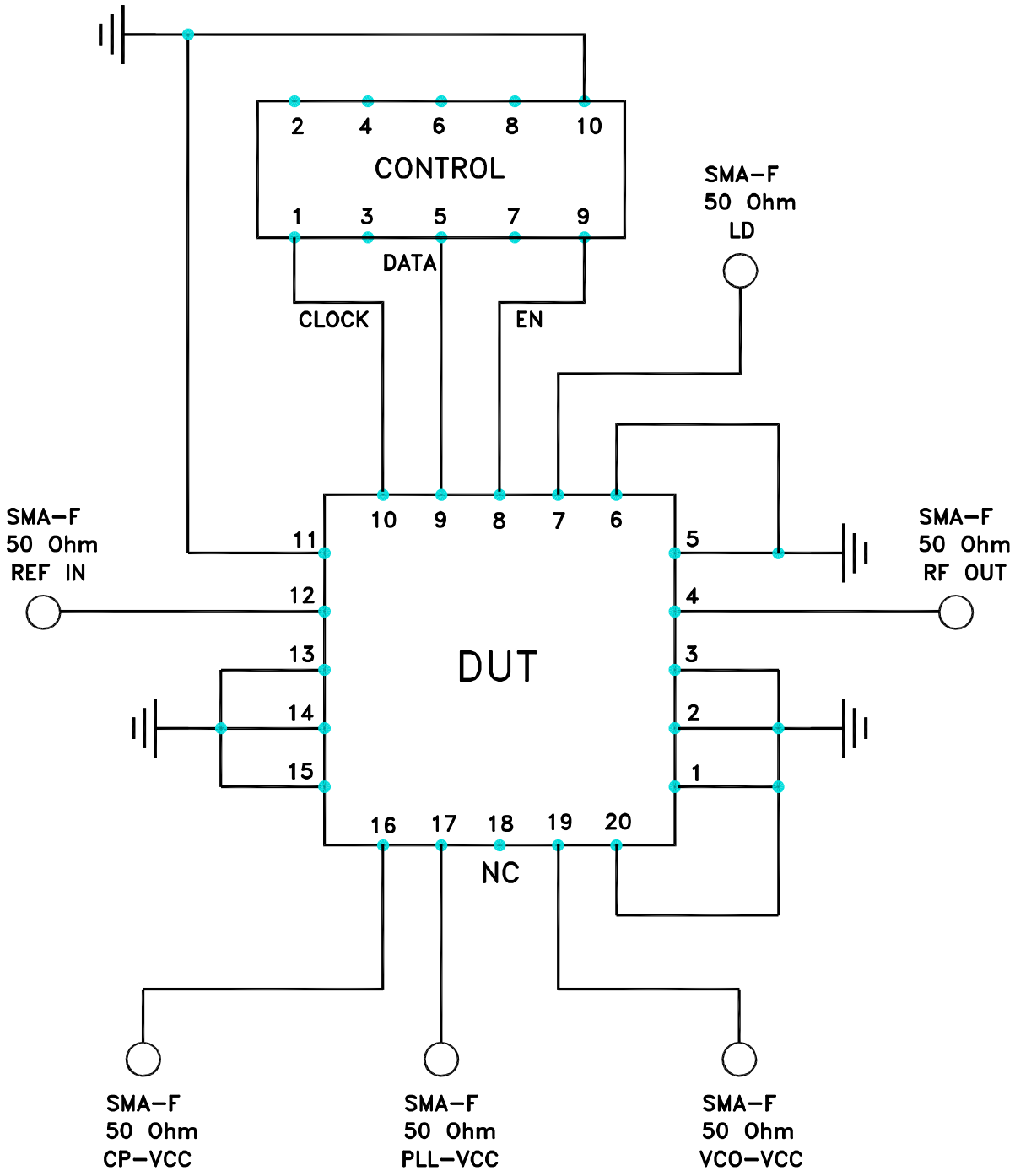

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Schematic Diagram

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Environmental Specifications ENV65T2

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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

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