Engineering Development Model

Frequency Synthesizer

SSN-EDR11277SA

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 : KJ1367

ELECTRICAL SPECIFICATIONS 50Ω, over -15°C to +75°C					
Parameter		**Min.**	**Typ.**	**Max.**	**Units**
Frequency		1380		1480	MHz
Step size			100		kHz
Settling Time	**Within ±1kHz**		8.5		msec
Output Power		-3	+1	+5	dBm
Phase Noise					
	at 100 Hz offset		-89		dBc/Hz
	at 1 kHz offset		-92		dBc/Hz
	at 10 KHz offset		-100	-94	dBc/Hz
	at 100 KHz offset		-125		dBc/Hz
	at 1000 kHz offset		-146	-140	dBc/Hz
Integrated SSB Phase Noise			-52		dBc
Ref & Comp Spurious Suppression			-81		dBc
0.5 Step size Spurious Suppression			-96		dBc
Non-Harm. Spurious Suppression			-90		dBc
Harmonic Suppression			-37		dBc
Supply voltage	**VCO**		5		V
	PLL		3.3		V
Supply current	**VCO**		48	56	V
	PLL		14	23	V
Reference In (External)	**Frequency**		10		MHz
	Amplitude		1		Vp-p
	Impedance		100		kΩ
	Ph. N @ 1kHz		-145		dBc/Hz
Input Logic Levels	**Logic high**	1.4		3.3	V
	Logic Low			0.6	
Digital Lock Detect	**Locked**	1.4		3.3	V
	Unlocked			0.4	
Frequency Synthesizer PLL		ADF4153			

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
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	9	**CLOCK**	1
VCC VCO	7	**DATA**	2
VCC PLL	12	**LATCH ENABLE**	3
REF IN	4	**GROUND**	5,6,8,10
LOCK DETECT	11		

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Frequency Synthesizer SSN-EDR11277/SA

Typical Performance Data

FREQ. (MHz)	POWER OUTPUT (dBm)			HARMONICS (dBc)						VCO CURRENT (mA)			PLL CURRENT (mA)		
				F2			F3								
	-15 °C	+25ºC	+75 °C	-15 °C	+25ºC	+75 °C	-15 °C	+25ºC	+75 °C	-15 °C	+25ºC	+75 °C	-15 °C	+25ºC	+75 °C
1360	1.09	1.38	1.43	-23.68	-25.05	-26.55	-35.98	-39.37	-38.68	47.46	48.32	49.09	11.98	13.71	15.51
1376	0.88	1.18	1.25	-26.99	-28.45	-29.10	-39.01	-42.66	-41.66	47.35	48.23	49.02	13.01	14.80	16.64
1380	0.85	1.16	1.23	-27.66	-29.26	-29.91	-38.86	-42.22	-41.42	47.33	48.21	49.01	11.98	13.75	15.57
1392	0.85	1.15	1.20	-26.34	-27.99	-30.03	-39.65	-43.04	-40.93	47.27	48.16	48.98	12.90	14.70	16.56
1408	0.83	1.15	1.19	-30.53	-31.66	-31.28	-38.98	-42.72	-41.30	47.19	48.10	48.92	12.94	14.75	16.61
1424	0.81	1.11	1.13	-34.39	-35.90	-35.07	-35.72	-41.10	-41.59	47.11	48.03	48.88	12.99	14.81	16.68
1440	0.65	0.95	0.95	-35.88	-36.23	-34.56	-37.16	-44.91	-41.64	47.05	47.98	48.84	11.97	13.76	15.60
1456	0.45	0.75	0.76	-45.90	-41.87	-36.95	-36.74	-44.57	-40.35	47.00	47.95	48.82	13.00	14.82	16.69
1472	0.30	0.59	0.58	-43.98	-41.33	-37.33	-38.04	-46.68	-40.35	46.98	47.93	48.81	12.89	14.71	16.59
1480	0.27	0.56	0.53	-45.07	-42.81	-37.86	-37.70	-45.15	-39.55	46.97	47.92	48.80	11.97	13.77	15.61
1488	0.27	0.56	0.51	-46.47	-45.11	-39.10	-38.43	-43.85	-39.45	46.95	47.92	48.80	12.93	14.76	16.63
1504	0.36	0.63	0.53	-38.65	-40.78	-38.72	-37.49	-40.03	-38.18	46.91	47.88	48.78	12.99	14.82	16.70
1520	0.27	0.54	0.44	-35.39	-39.35	-38.69	-36.34	-35.60	-37.71	46.89	47.86	48.77	11.97	13.77	15.62

FREQ. (MHz)	PHASE NOISE (dBc/Hz) @ OFFSETS														
	-15 °C					+25ºC					+75 °C				
	100Hz	1kHz	10kHz	100kHz	1MHz	100Hz	1kHz	10kHz	100kHz	1MHz	100Hz	1kHz	10kHz	100kHz	1MHz
1360	-86.41	-93.99	-100.37	-127.27	-147.92	-87.38	-94.78	-99.77	-126.25	-146.53	-90.87	-95.12	-98.87	-124.09	-144.37
1376	-88.06	-94.93	-101.02	-127.46	-148.13	-88.50	-93.41	-100.39	-125.95	-146.40	-87.58	-93.23	-99.10	-124.17	-144.23
1380	-88.75	-93.96	-100.90	-127.49	-147.92	-89.21	-91.11	-99.37	-125.85	-146.44	-89.56	-92.43	-99.00	-123.93	-143.97
1392	-90.69	-94.40	-101.03	-127.43	-147.91	-87.38	-93.09	-100.50	-125.94	-146.33	-94.27	-93.09	-99.84	-123.80	-143.82
1408	-87.39	-92.83	-100.12	-127.41	-147.80	-89.88	-92.04	-99.92	-125.93	-146.08	-89.96	-91.87	-98.57	-123.50	-143.69
1424	-88.73	-93.47	-100.51	-127.13	-147.70	-89.36	-92.91	-100.40	-125.54	-145.90	-90.11	-92.70	-98.59	-123.24	-143.57
1440	-88.20	-92.68	-100.02	-127.13	-147.78	-87.78	-93.23	-99.80	-125.59	-145.80	-87.91	-91.21	-98.07	-123.01	-143.25
1456	-88.40	-93.39	-99.78	-126.84	-147.32	-88.79	-93.00	-99.82	-125.20	-145.43	-90.23	-92.22	-97.69	-123.02	-143.10
1472	-87.72	-91.88	-100.14	-126.60	-145.91	-88.23	-90.99	-99.68	-123.24	-145.24	-88.69	-90.80	-97.86	-122.88	-142.86
1480	-88.11	-92.83	-99.85	-126.67	-147.06	-90.40	-92.21	-99.47	-125.10	-145.32	-85.71	-89.71	-97.90	-122.66	-142.92
1488	-87.36	-92.59	-100.04	-126.55	-147.12	-88.51	-92.98	-99.44	-123.94	-145.28	-91.65	-88.56	-98.21	-122.62	-142.77
1504	-87.81	-93.04	-99.93	-126.21	-146.55	-89.50	-90.58	-98.90	-123.82	-144.96	-87.15	-87.86	-98.03	-122.35	-142.50
1520	-89.55	-92.29	-99.88	-125.92	-146.44	-90.77	-91.27	-98.71	-124.32	-144.69	-87.27	-89.39	-97.99	-122.21	-142.27

Notes
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Typical Performance Data

COMPARISON SPURIOUS ORDER	COMPARISON SPURIOUS @Fcarrier 1380.1 MHz± (n*Fcomparison) (dBc) NOTE 1			COMPARISON SPURIOUS @Fcarrier 1430.1 MHz± (n*Fcomparison) (dBc) NOTE 1			COMPARISON SPURIOUS @Fcarrier 1480.1 MHz± (n*Fcomparison) (dBc) NOTE 1		
n	-15 °C	+25ºC	+75 °C	-15 °C	+25ºC	+75 °C	-15 °C	+25ºC	+75 °C
-5	-79.39	-78.80	-83.62	-79.21	-79.43	-81.87	-78.75	-80.72	-79.58
-4	-79.48	-78.89	-85.11	-79.63	-78.42	-84.23	-78.18	-79.97	-81.87
-3	-80.48	-80.00	-82.31	-80.75	-78.79	-83.25	-78.50	-80.21	-82.29
-2	-83.44	-83.02	-81.08	-83.40	-80.87	-82.37	-80.89	-81.63	-80.31
-1	-92.84	-89.40	-88.07	-88.81	-85.77	-83.89	-86.55	-87.20	-80.43
0[note 2]	-	-	-	-	-	-	-	-	-
+1	-86.40	-84.88	-77.82	-84.59	-88.99	-76.91	-88.32	-91.18	-76.74
+2	-80.95	-79.45	-75.77	-79.48	-81.98	-76.32	-81.61	-82.04	-75.30
+3	-78.28	-77.17	-80.94	-77.39	-78.92	-80.92	-78.40	-78.76	-79.66
+4	-75.73	-75.12	-85.48	-75.64	-76.35	-87.36	-75.87	-76.47	-90.14
+5	-74.54	-74.34	-75.92	-74.74	-74.79	-76.78	-74.37	-75.04	-77.90

Note 1: Comparison & Reference frequency 10 MHz
Note 2: All spurs are referenced to carrier signal (n=0).

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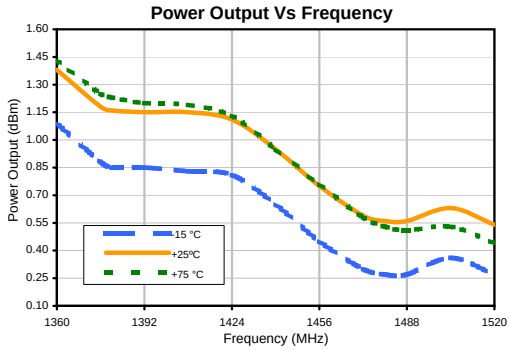
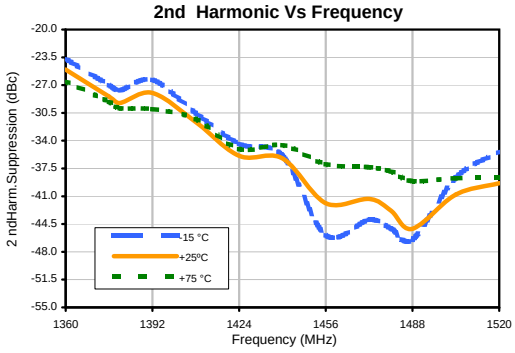
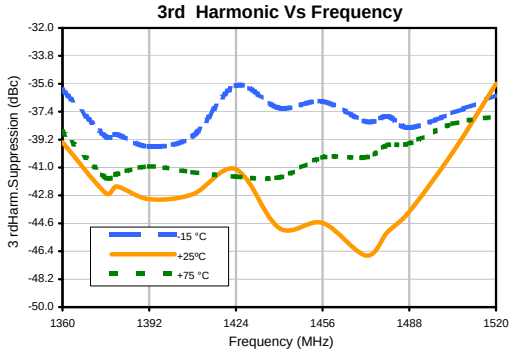
Typical Performance Data







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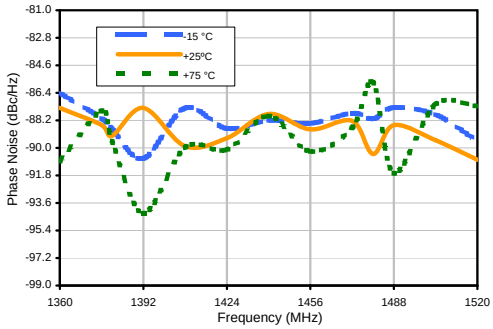
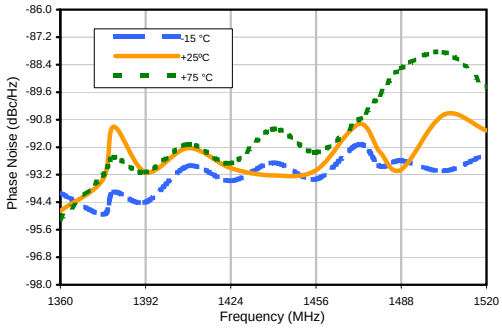
Typical Performance Data

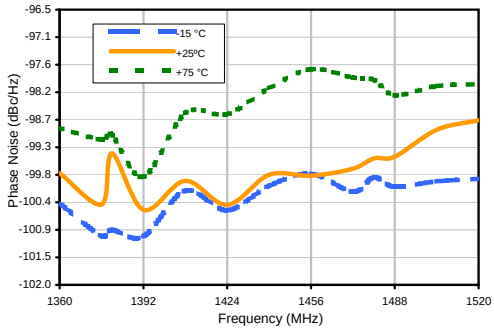
Phase Noise @ 100 Hz offset



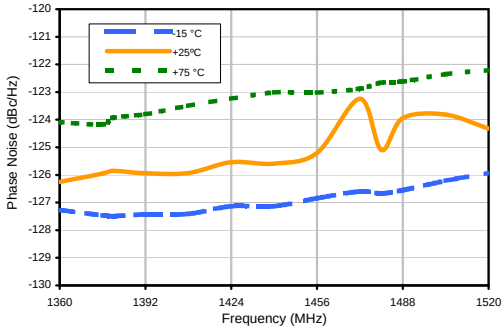
Phase Noise @ 1 kHz offset



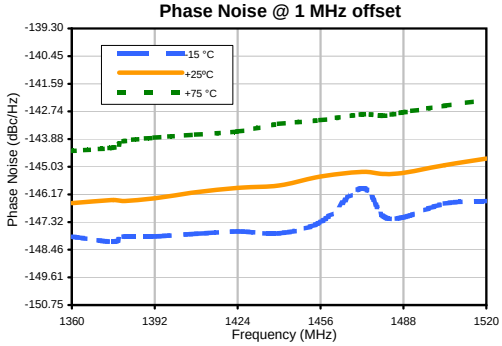
Phase Noise @ 10 kHz offset



Phase Noise @ 100 kHz offset



Phase Noise @ 1 MHz offset



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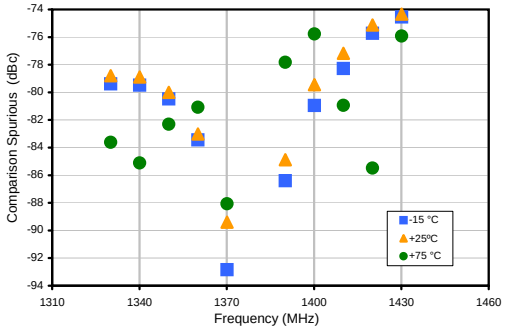
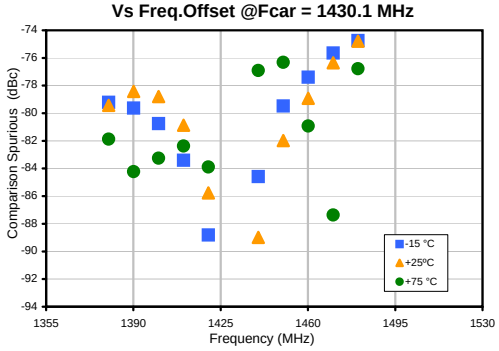
Typical Performance Data

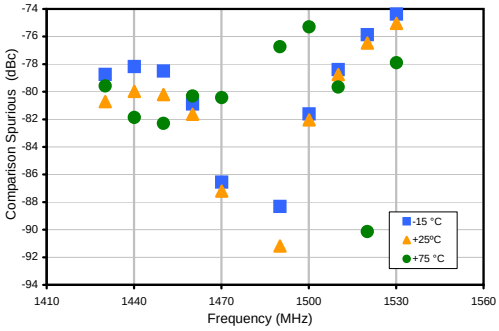
Comparison & Reference Spurious
Vs Freq.Offset @Fcar = 1380.1 MHz



Comparison & Reference Spurious
Vs Freq.Offset @Fcar = 1430.1 MHz



Comparison & Reference Spurious
Vs Freq.Offset @Fcar = 1480.1 MHz



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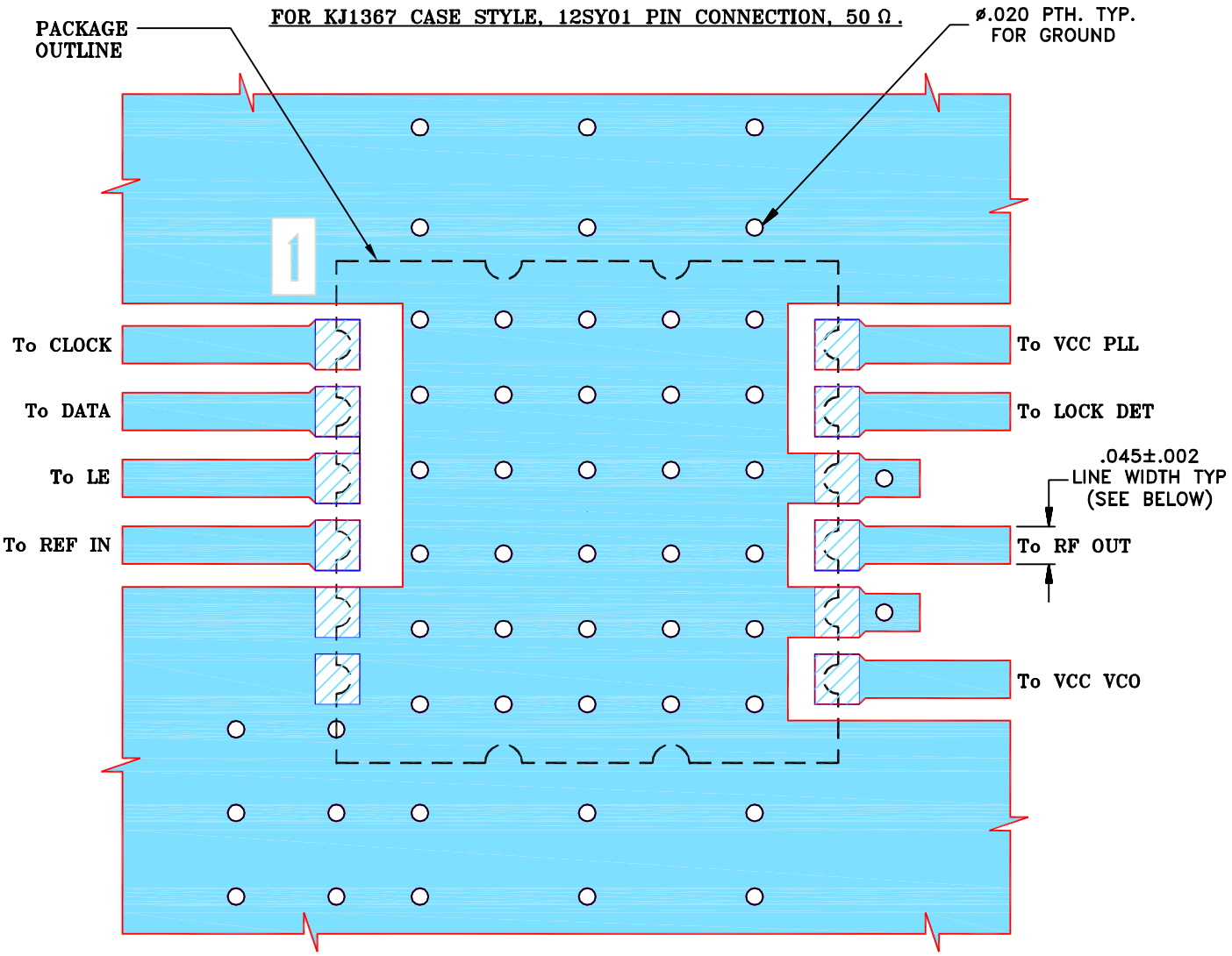
THIRD ANGLE PROJECTION

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 KJ1367 CASE STYLE, 12SY01 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

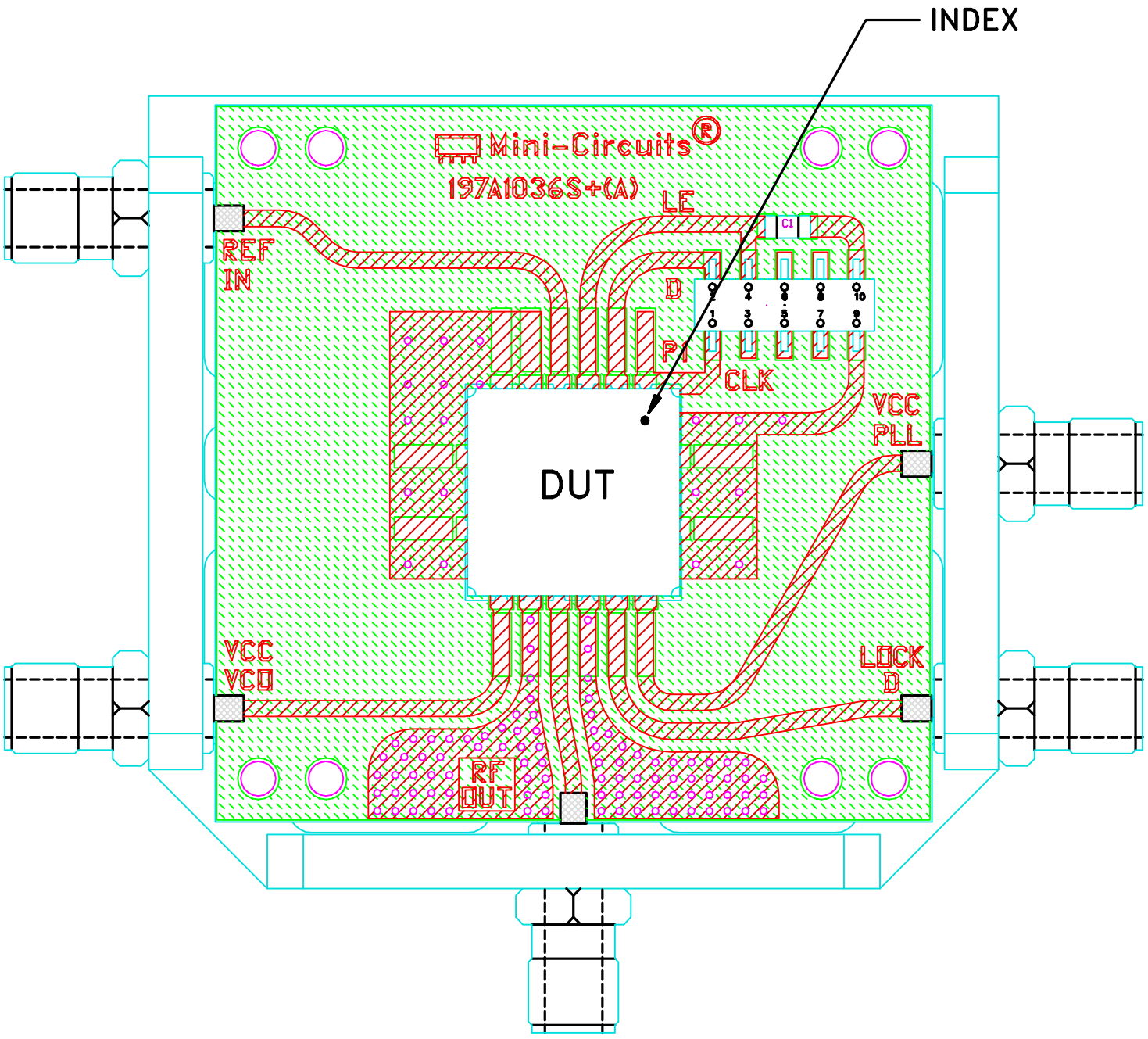
Mini-Circuits®
13 Neptune Avenue
Brooklyn NY 11235

PL, 12SY01, KJ1367, SSN
TB-552+ (50 Ω)

SIZE	CODE IDENT	DRAWING NO:	REV:
A	15542	98-PL-317	OR

FILE:	SCALE:	SHEET:
98PL317	5:1	1 OF 1

Evaluation Board and Circuit



TB-552+

NOTES:

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

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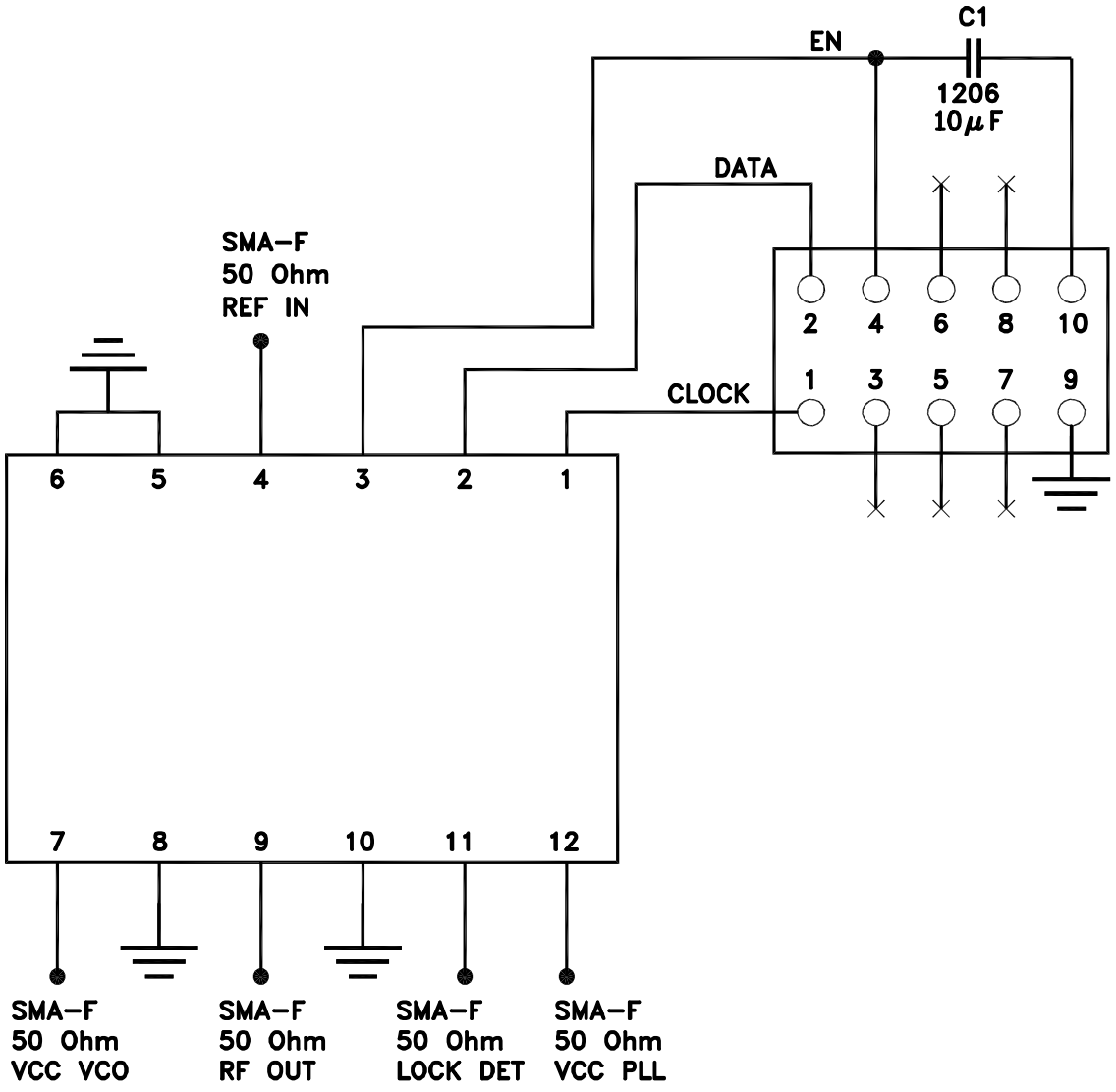

TB-552+

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

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