

Engineering Development Model

Frequency Synthesizer

SSN-EDR9433/1

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 : 99-01-769

ELECTRICAL SPECIFICATIONS 50Ω, over -45°C to +85°C				
Parameter	Min.	Typ.	Max.	Units
Frequency	5900		6100	MHz
Step size		500		kHz
Settling Time Within ±1kHz		3		msec
Output Power	-3	+2	+6	dBm
Phase Noise				
at 100 Hz offset		-71		dBc/Hz
at 1 kHz offset		-68		dBc/Hz
at 10 KHz offset		-78		dBc/Hz
at 100 KHz offset		-109	-103	dBc/Hz
at 1000 kHz offset		-130		dBc/Hz
Integrated SSB Phase Noise		30		dBc
Reference Spurious Suppression		-89		dBc
Comparison Spurious Suppression		-99		dBc
Non-Harm. Spurious Suppression		-90		dBc
Harmonic Suppression		-22		dBc
Supply voltage		5		V
VCO		5		V
Supply current		67	76	mA
VCO		9	17	mA
Reference In (External)		10		MHz
Frequency		1		Vp-p
Amplitude		100		kΩ
Impedance		-145		dBc/Hz
Ph. N @ 1kHz				
Input Logic	Logic high	4	5	V
Levels	Logic Low		1	V
Digital Lock Detect	Locked	4.6	5	V
	Unlocked		0.4	V
Frequency Synthesizer PLL	ADF4118			

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	5.8Vp-p
Data, Clock & LE levels	5.3V

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		

Notes

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REV. OR
 SSN-EDR9433/1
 150222

Frequency Synthesizer

SSN-EDR9433/1

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
5900	0.94	1.27	2.02	-19.46	-23.79	-24.04	-37.37	-39.69	-37.31	64.92	67.34	68.49	7.72	9.39	10.88
5920	0.96	1.46	2.04	-18.85	-24.34	-25.39	-36.81	-40.32	-38.61	64.99	67.39	68.49	7.67	9.34	10.83
5940	1.46	1.83	2.30	-20.80	-25.50	-26.07	-36.17	-40.13	-37.33	65.09	67.46	68.52	7.69	9.37	10.85
5960	1.72	2.05	2.43	-20.55	-24.77	-25.62	-37.34	-40.20	-36.87	65.18	67.49	68.53	7.71	9.39	10.87
5980	2.11	2.14	2.35	-22.64	-26.29	-26.33	-36.57	-42.03	-36.49	65.13	67.50	68.53	7.74	9.42	10.90
6000	2.30	2.56	2.76	-21.11	-25.53	-26.07	-36.96	-42.93	-36.07	65.18	67.50	68.43	7.68	9.36	10.85
6010	2.33	2.69	2.84	-21.95	-25.66	-25.10	-36.55	-44.67	-36.38	65.16	67.49	68.38	7.74	9.41	10.90
6020	2.44	2.74	2.93	-22.24	-26.90	-25.72	-36.15	-44.99	-37.04	65.13	67.45	68.36	7.71	9.39	10.88
6040	2.41	2.79	2.86	-21.27	-25.74	-26.06	-35.95	-45.05	-36.20	64.99	67.30	68.21	7.73	9.41	10.90
6060	2.76	2.87	2.77	-21.84	-26.37	-25.65	-36.63	-47.10	-35.71	64.98	67.20	68.00	7.76	9.43	10.93
6080	2.94	2.87	2.52	-22.32	-26.36	-25.26	-37.81	-45.56	-35.21	65.01	67.22	67.88	7.71	9.38	10.87
6100	2.90	3.00	2.83	-22.45	-26.73	-26.94	-36.71	-43.57	-35.24	65.06	67.22	67.89	7.73	9.41	10.90

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
5900	-69.80	-69.79	-76.84	-111.09	-132.82	-74.14	-68.39	-75.16	-109.65	-130.07	-68.15	-67.72	-75.05	-107.73	-128.94
5920	-71.26	-70.10	-76.08	-111.09	-132.19	-71.94	-68.67	-75.20	-109.64	-130.44	-69.23	-67.68	-74.87	-107.67	-128.97
5940	-71.27	-68.15	-75.84	-111.00	-132.03	-71.92	-68.34	-76.45	-109.66	-129.77	-69.66	-67.96	-76.14	-107.66	-128.57
5960	-69.04	-68.39	-76.66	-111.10	-132.17	-70.27	-67.98	-76.99	-109.65	-129.23	-69.66	-65.14	-76.56	-107.51	-128.31
5980	-70.32	-68.80	-77.91	-111.43	-132.71	-68.89	-65.92	-77.14	-109.70	-129.33	-68.43	-66.94	-76.53	-107.53	-128.40
6000	-69.57	-67.86	-78.10	-111.35	-132.38	-70.11	-66.49	-78.32	-109.78	-129.65	-70.27	-64.26	-77.80	-107.43	-128.33
6010	-71.89	-67.86	-78.37	-111.45	-133.31	-68.31	-65.34	-77.79	-109.60	-130.96	-70.26	-63.41	-77.50	-107.43	-127.97
6020	-69.81	-69.45	-79.31	-111.47	-132.57	-70.50	-66.41	-79.11	-109.73	-128.92	-72.16	-66.01	-77.77	-107.28	-127.97
6040	-70.45	-68.86	-79.79	-111.19	-132.62	-66.01	-67.97	-79.14	-109.28	-130.56	-71.31	-62.44	-78.19	-107.40	-127.67
6060	-72.41	-66.32	-78.06	-110.25	-131.83	-70.95	-64.43	-78.12	-108.58	-129.74	-71.47	-62.83	-77.36	-106.78	-126.72
6080	-69.85	-66.53	-78.81	-111.04	-132.41	-70.50	-63.68	-78.78	-109.03	-128.35	-68.81	-63.55	-77.29	-106.09	-126.48
6100	-70.32	-68.66	-79.24	-111.15	-131.93	-69.91	-63.94	-78.99	-109.16	-130.22	-68.21	-64.27	-77.93	-107.03	-127.25

Notes

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Typical Performance Data

COMPARISON SPURIOUS ORDER	COMPARISON SPURIOUS @F _{carrier} 5960 MHz± (n*F _{comparison}) (dBc) NOTE 1			COMPARISON SPURIOUS @F _{carrier} 6010 MHz± (n*F _{comparison}) (dBc) NOTE 1			COMPARISON SPURIOUS @F _{carrier} 6060 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	-94.81	-95.77	-96.25	-93.17	-99.56	-92.57	-93.99	-96.80	-91.82
-4	-91.19	-93.29	-92.86	-90.95	-95.43	-90.01	-91.36	-94.95	-91.18
-3	-88.69	-90.71	-90.60	-86.79	-92.09	-87.89	-90.44	-91.88	-88.63
-2	-84.81	-86.89	-85.77	-82.09	-87.62	-85.94	-85.21	-89.23	-84.76
-1	-73.93	-79.57	-77.82	-72.93	-79.92	-80.85	-74.71	-81.63	-79.22
0 ^{note 2}	-	-	-	-	-	-	-	-	-
+1	-74.19	-78.72	-77.89	-72.53	-78.51	-79.86	-74.33	-80.77	-78.73
+2	-84.08	-85.85	-84.25	-81.82	-86.04	-85.09	-85.06	-88.52	-84.21
+3	-88.77	-88.96	-89.48	-86.86	-89.98	-87.21	-90.26	-90.80	-87.54
+4	-91.31	-90.76	-90.85	-91.16	-92.10	-89.24	-90.74	-91.79	-89.78
+5	-94.37	-93.26	-93.25	-93.68	-95.16	-90.93	-94.49	-93.98	-91.11

Note 1: Comparison frequency 500 kHz

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

REFERENCE SPURIOUS ORDER	REFERENCE SPURIOUS @F _{carrier} 5960 MHz± (n*F _{reference}) (dBc) NOTE 3			REFERENCE SPURIOUS @F _{carrier} 6010 MHz± (n*F _{reference}) (dBc) NOTE 3			REFERENCE SPURIOUS @F _{carrier} 6060 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	-105.69	-103.43	-103.55	-107.41	-104.06	-106.99	-104.87	-102.63	-104.43
-4	-96.29	-96.03	-95.85	-96.92	-96.13	-97.71	-95.73	-94.85	-95.69
-3	-105.24	-101.48	-103.09	-104.82	-103.30	-106.82	-101.29	-99.09	-101.38
-2	-93.99	-92.70	-94.09	-96.58	-97.21	-100.66	-92.93	-91.87	-93.80
-1	-93.52	-94.87	-95.16	-87.92	-87.45	-85.68	-94.33	-96.29	-95.22
0 ^{note 4}	-	-	-	-	-	-	-	-	-
+1	-91.19	-89.58	-89.98	-90.17	-88.54	-87.43	-93.43	-93.00	-93.07
+2	-93.82	-95.27	-96.03	-94.96	-97.38	-99.35	-94.12	-94.93	-96.53
+3	-103.35	-102.64	-109.57	-103.89	-106.69	-110.27	-103.13	-104.70	-107.55
+4	-95.54	-99.14	-97.42	-96.05	-97.46	-97.36	-97.00	-99.09	-98.20
+5	-104.98	-112.55	-107.63	-104.47	-109.74	-107.49	-107.09	-110.86	-108.13

Note 3: Reference frequency 10 MHz

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

Notes

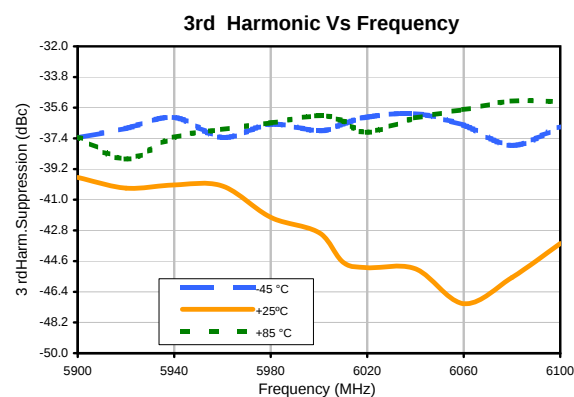
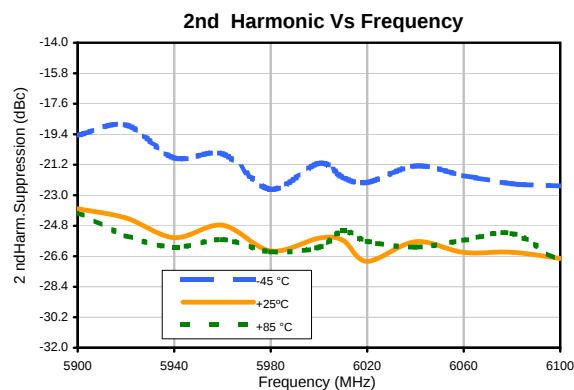
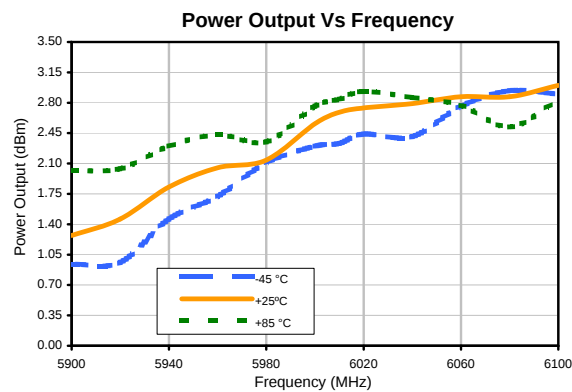
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Frequency Synthesizer

Typical Performance Data

SSN-EDR9433/1



Notes

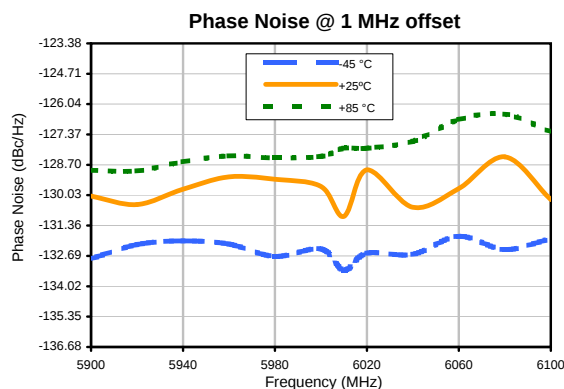
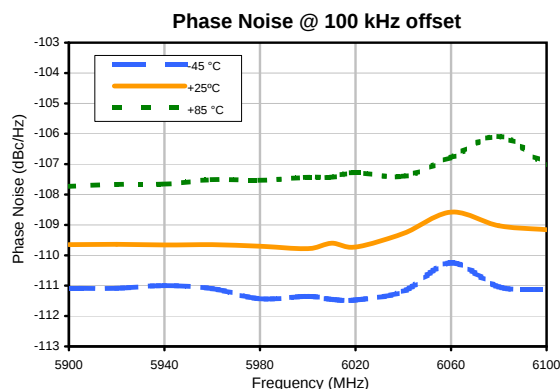
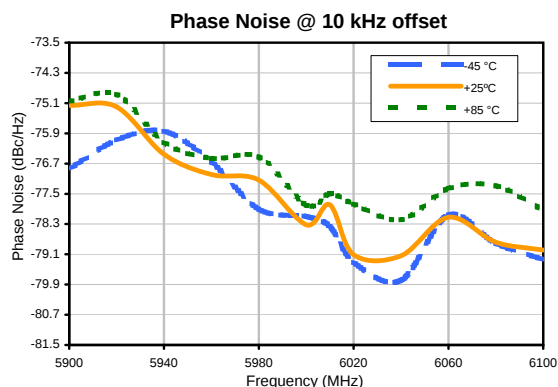
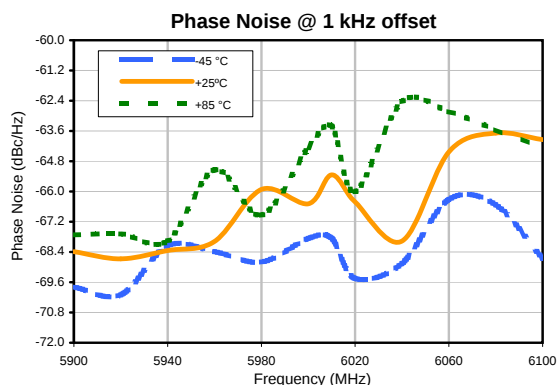
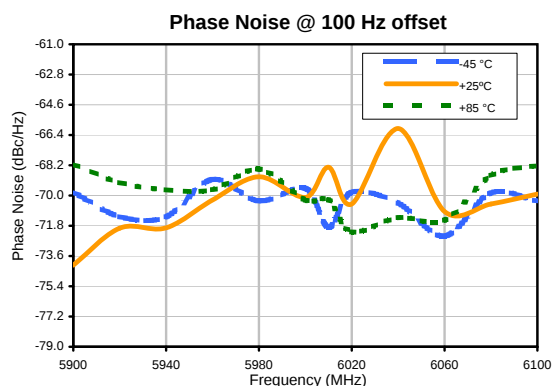
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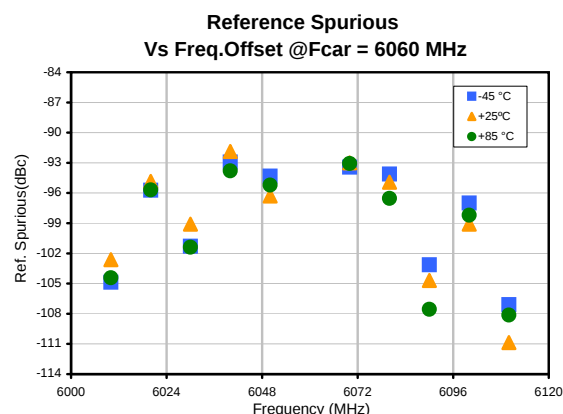
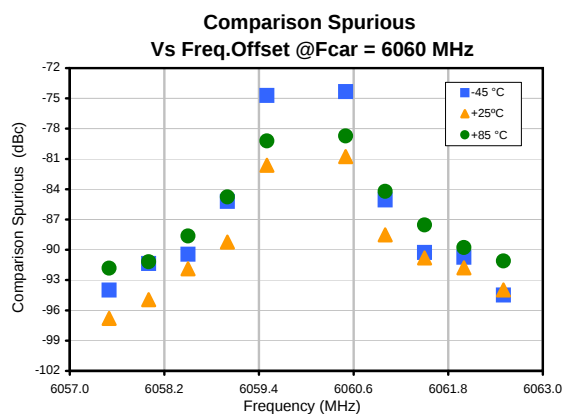
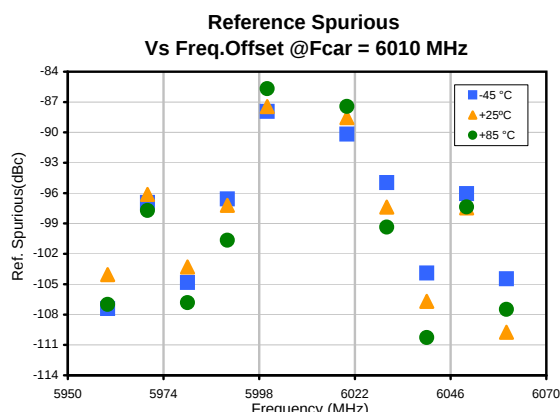
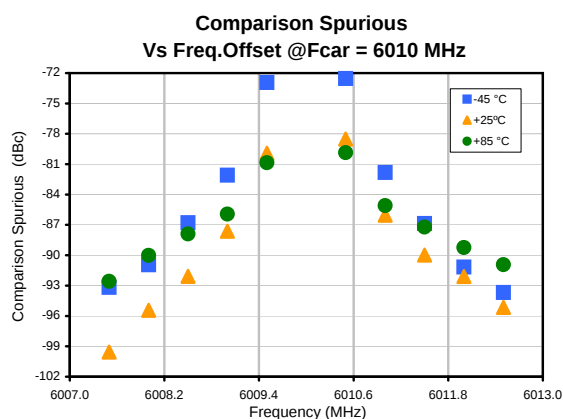
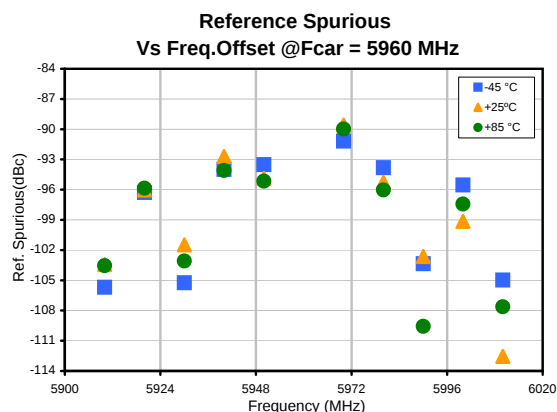
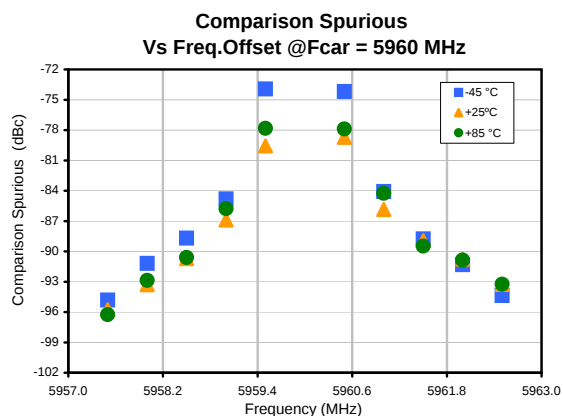
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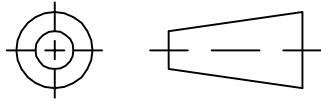


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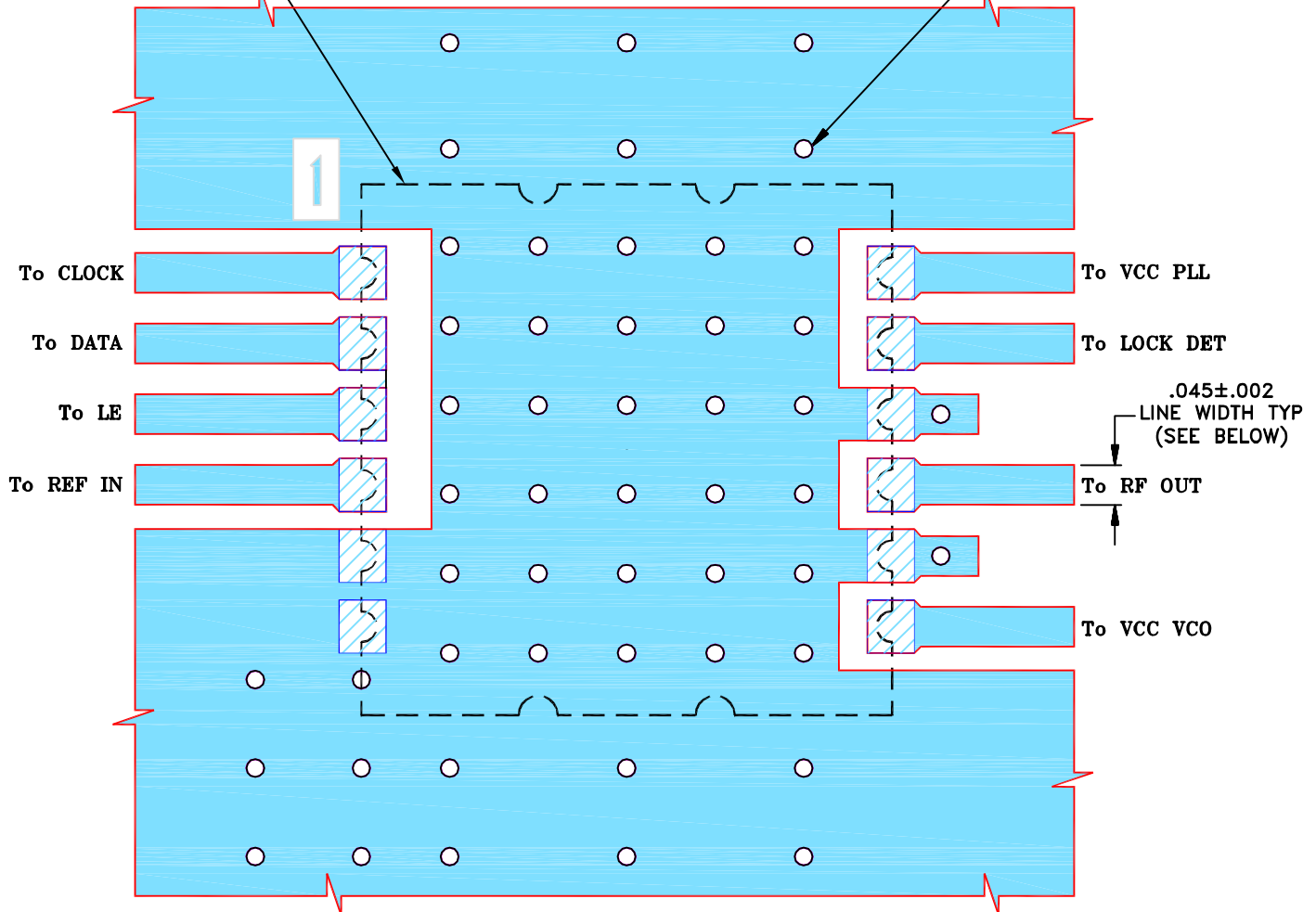
THIRD ANGLE PROJECTION



REVISIONS

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

SUGGESTED MOUNTING CONFIGURATION

FOR KJ1367 CASE STYLE, 12SY01 PIN CONNECTION, 50 Ω .Ø.020 PTH. TYP.
FOR GROUNDPACKAGE
OUTLINE

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

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



Mini-Circuits® 13 Neptune Avenue
Brooklyn NY 11235

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

SIZE
A

CODE IDENT
15542

DRAWING NO:
98-PL-317

REV:
OR

FILE: 98PL317

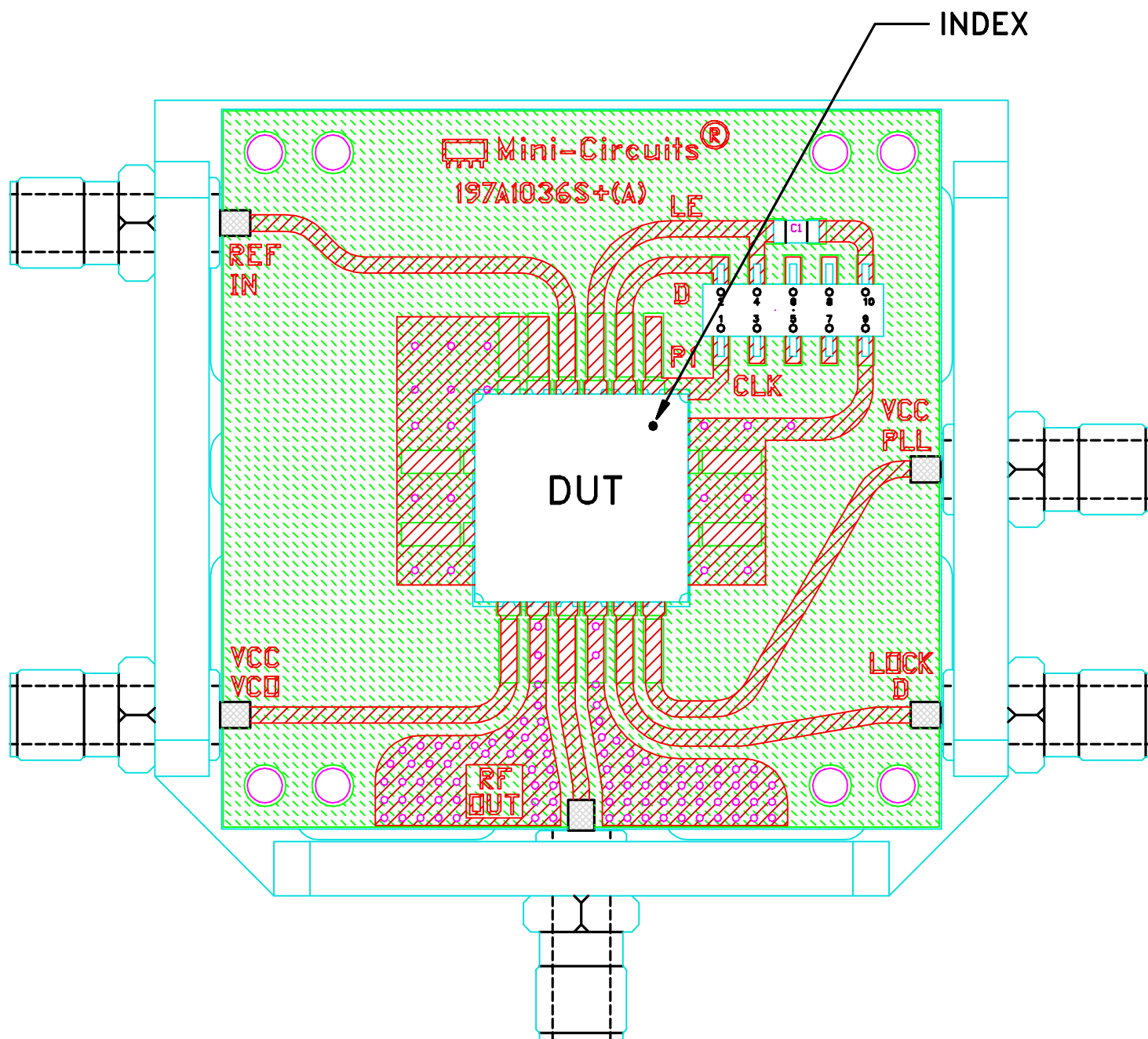
SCALE: 5:1

SHEET: 1 OF 1

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

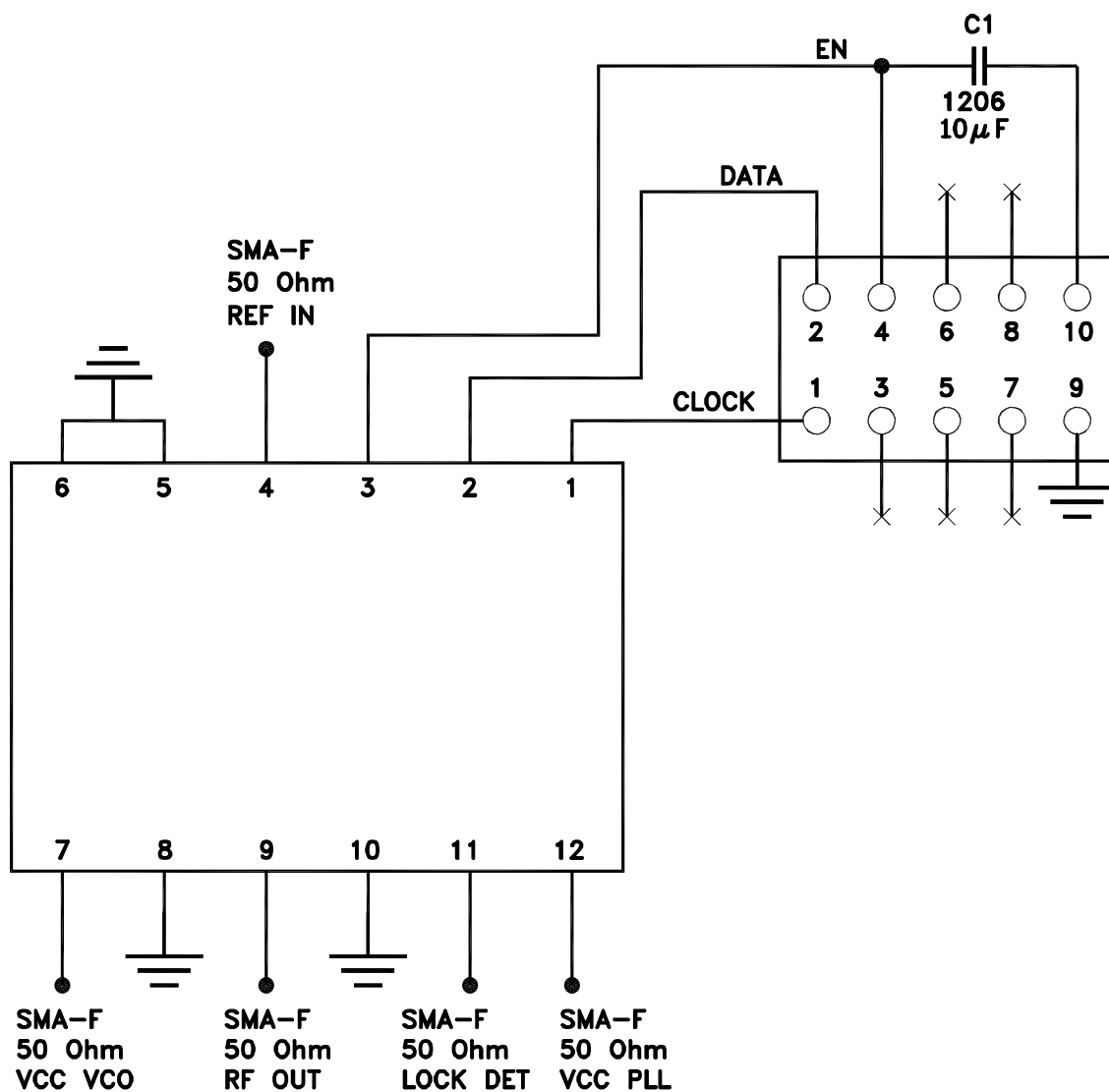
Evaluation Board and Circuit



TB-552+

NOTES:

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



TB-552+ 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