

Frequency Synthesizer

RSN-795AF-119+

50Ω 760.6 to 795.4 MHz

The Big Deal

- Fast settling time, 0.03 msec max
- Low phase noise and spurious
- High reliability over temperature changes



CASE STYLE: JG1228

Product Overview

The RSN-795AF-119+ is a Frequency Synthesizer, designed to operate from 760.6 to 795.4 MHz for GSM application. The RSN-795AF-119+ is packaged in a metal case (size of 0.910" x 0.910" x 0.252") to shield against unwanted signals and noise. The RSN-795AF-119+ Frequency Synthesizer can be used as local oscillators in the upconversion and down-conversion sections of wireless receivers and transmitters, with very high reliability over temperature changes due to use of high quality components which are secured to substrate with chip adhesive in addition to solder

Key Features

Feature	Advantages
Low phase noise and spurious: • Phase Noise: -103 dBc/Hz typ. @ 10 kHz offset • Step Size Spurious: -77 dBc typ. • Comparison Spurious: -113 dBc typ. • Reference Spurious: -124 dBc typ.	Low phase noise and spurious improve system EVM (Error Vector Magnitude).
Fast settling time	Less than 0.03 msec Max within 5.4deg can be used for fast settling applications.
Small size, 0.910" x 0.910" x 0.252"	The small size enables the RSN-795AF-119+ to be used in compact designs.

Notes

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Surface Mount

Frequency Synthesizer

RSN-795AF-119+

50Ω 760.6 to 795.4 MHz

Features

- Fractional N synthesizer
- Fast settling time, 0.03 msec max
- Low phase noise and spurious
- High reliability over temperature changes
- Low operating voltage (VCC VCO=+5.5V, VCC PLL=+3.3V VCC CP=+5.0V)
- Small size 0.910" x 0.910" x 0.252"



CASE STYLE: JG1228

+RoHS Compliant

The +Suffix identifies RoHS Compliance. See our web site for RoHS Compliance methodologies and qualifications

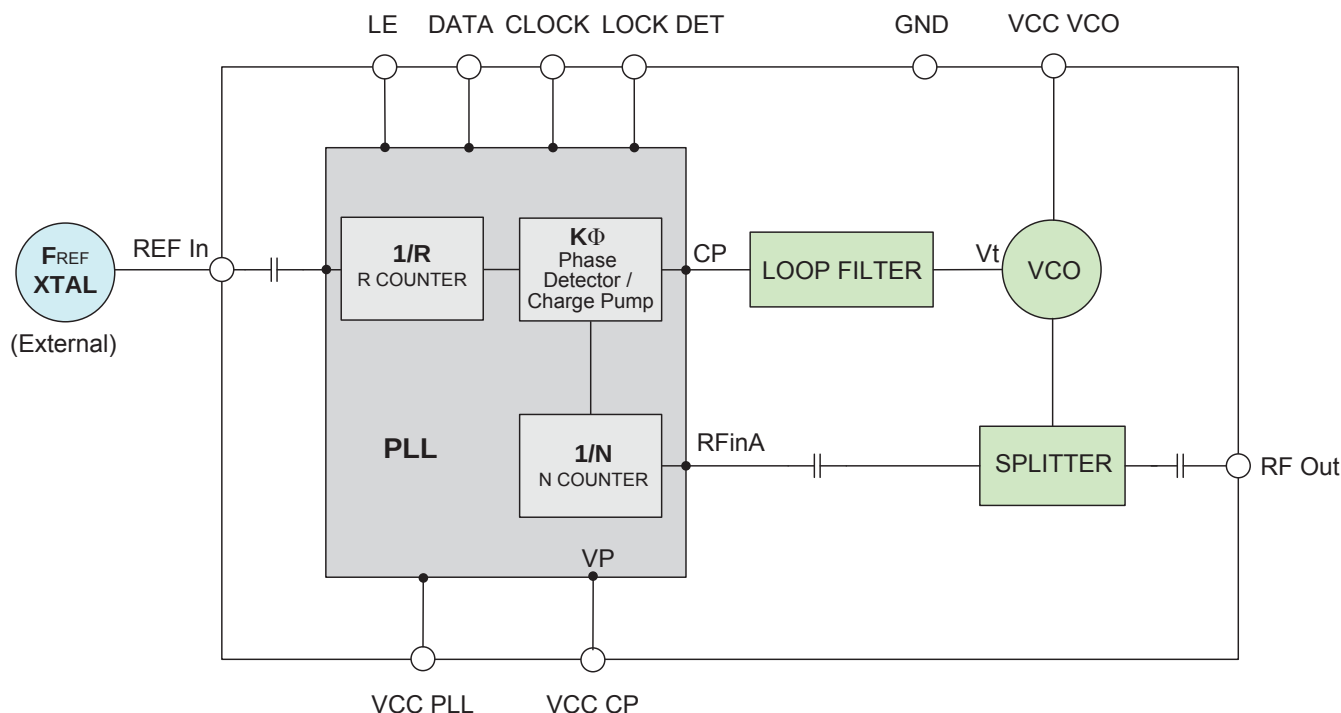
Applications

- GSM

General Description

The RSN-795AF-119+ is a Frequency Synthesizer, designed to operate from 760.6 to 795.4 MHz for GSM application. The RSN-795AF-119+ is packaged in a metal case (size of 0.910" x 0.910" x 0.252") to shield against unwanted signals and noise. The RSN-795AF-119+ Frequency Synthesizer can be used as local oscillators in the upconversion and down-conversion sections of wireless receivers and transmitters, with very high reliability over temperature changes due to use of high quality components which are secured to substrate with chip adhesive in addition to solder.

Simplified Schematic



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REV. B
M151108
EDR-8430/7F1
RSN-795AF-119+
Category-F8
RAV
151013
Page 2 of 13

Electrical Specifications (over operating temperature -40°C to +85°C)

Parameters		Test Conditions	Min.	Typ.	Max.	Units
Frequency Range		-	760.6	-	795.4	MHz
Step Size		-	-	200	-	kHz
Comparison Frequency		-	-	13	-	MHz
Settling Time		Within ± 5.4 deg	-	0.02	0.03	mSec
Output Power		-	+2	+5	+8	dBm
SSB Phase Noise		@ 100 Hz offset	-	-88	-	dBc/Hz
		@ 1 kHz offset	-	-103	-96	
		@ 10 kHz offset	-	-103	-96	
		@ 100 kHz offset	-	-108	-104	
		@ 1 MHz offset	-	-154	-148	
Step Size Spurious Suppression		Step Size 200 kHz	-	-77	-55	dBc
0.5 Step Size Spurious Suppression		0.5 Step Size 100 kHz	-	-85	-65	
Reference Spurious Suppression		Ref. Freq. 52 MHz	-	-124	-90	
Comparison Spurious Suppression		Comp. Freq. 13 MHz	-	-113	-90	
Non - Harmonic Spurious Suppression		-	-	-90	-	
Harmonic Suppression		-	-	-37	-31	V
VCO Supply Voltage		+5.50	+5.20	+5.50	+5.80	
PLL Supply Voltage		+3.30	+3.15	+3.30	+3.45	
CP Supply Voltage		+5.00	+4.80	+5.00	+5.20	mA
VCO Supply Current		-	-	51	65	
PLL Supply Current		-	-	23	30	
CP Supply Current		-	-	41	50	
Reference Input (External)	Frequency	52 (square wave)	-	52	-	MHz
	Amplitude	1	-	1	-	V _{p-p}
	Input impedance	-	-	100	-	K Ω
	Phase Noise @ 1 kHz offset	-	-	-135	-	dBc/Hz
RF Output port Impedance		-	-	50	-	Ω
Input Logic Level	Input high voltage	-	2.80	-	-	V
	Input low voltage	-	-	-	0.60	V
Digital Lock Detect	Locked	-	2.75	-	3.45	V
	Unlocked	-	-	-	0.40	V
Frequency Synthesizer PLL		-	ADF4193			
PLL Programming (Note*)		-	3-wire serial 3.3V CMOS			
Register Map @ 795.4 MHz	R0_Register	-	(MSB) 111101000000001100000 (LSB)			
	R1_Register	-	(MSB) 10000010000001000001001 (LSB)			
	R2_Register	-	(MSB) 1111010 (LSB)			
	R3_Register	-	(MSB) 1111011 (LSB)			
	R4_Register	-	(MSB) 100001110010100 (LSB)			
	R5_Register	-	(MSB) 101 (LSB)			
	R6_Register	-	(MSB) 1001000000001110 (LSB)			
	R7_Register	-	(MSB) 111 (LSB)			

Note* : Tested with GSM900RX_13M_PHASE CODE (GSM900/GSM850 RX, version 1.0)
from "Analog Devices" recommendation for ADF4193 PLL.

[Download Phase Code file](#)

Absolute Maximum Ratings

Parameters	Ratings
VCO Supply Voltage	+6.3V
PLL Supply Voltage	+3.6V
CP Supply Voltage	+5.8V
CP Supply Voltage to PLL Supply Voltage	-0.3V to 5.8V
Reference Frequency Voltage	-0.3Vmin, VCC PLL +0.3Vmax
Data, Clock, LE Levels	-0.3Vmin, VCC PLL +0.3Vmax
Operating Temperature	-40°C to +85°C
Storage Temperature	-55°C to +100°C

Permanent damage may occur if any of these limits are exceeded

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Typical Performance Data

FREQUENCY (MHz)	POWER OUTPUT (dBm)			VCO CURRENT (mA)			PLL CURENT (mA)			CP CURENT (mA)		
	-45°C	+25°C	+85°C	-45°C	+25°C	+85°C	-45°C	+25°C	+85°C	-45°C	+25°C	+85°C
760.6	6.12	5.80	5.20	48.69	51.66	53.19	20.74	22.94	25.95	40.86	41.34	41.93
765.0	6.01	5.68	5.12	48.65	51.66	53.19	20.78	23.16	25.97	40.65	41.15	41.75
770.0	5.86	5.53	5.02	48.60	51.66	53.20	20.71	22.98	26.02	40.42	40.93	41.55
775.0	5.70	5.38	4.90	48.57	51.65	53.19	20.75	22.91	26.13	40.20	40.72	41.35
780.0	5.47	5.22	4.77	49.18	51.64	53.18	20.75	23.56	25.97	39.96	40.49	41.13
785.0	5.27	5.06	4.63	48.83	51.62	53.18	20.88	23.17	25.95	39.73	40.28	40.93
790.0	5.07	4.91	4.49	48.71	51.61	53.17	20.48	23.01	25.95	39.49	40.06	40.73
795.0	4.88	4.76	4.34	48.64	51.59	53.17	20.85	23.19	26.05	39.26	39.84	40.53
795.4	4.88	4.75	4.33	48.62	51.60	53.17	20.85	23.11	26.11	39.24	39.82	40.51

FREQUENCY (MHz)	HARMONICS (dBc)					
	F2			F3		
	-45°C	+25°C	+85°C	-45°C	+25°C	+85°C
760.6	-35.09	-36.14	-36.80	-42.82	-47.12	-51.89
765.0	-35.52	-36.75	-37.26	-42.84	-47.37	-51.98
770.0	-36.27	-37.76	-38.33	-42.41	-46.85	-51.73
775.0	-36.66	-38.51	-39.33	-42.90	-47.34	-52.39
780.0	-36.38	-38.49	-39.67	-43.88	-48.50	-53.42
785.0	-36.25	-38.28	-39.60	-44.65	-49.37	-53.97
790.0	-36.46	-38.43	-39.77	-45.32	-50.17	-54.32
795.0	-36.85	-38.79	-40.10	-45.06	-49.60	-53.14
795.4	-36.90	-38.77	-40.13	-45.04	-49.49	-53.05

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FREQUENCY (MHz)	PHASE NOISE (dBc/Hz) @OFFSETS				
	+25°C				
	100Hz	1kHz	10kHz	100kHz	1MHz
760.6	-88.42	-103.06	-103.97	-108.27	-155.16
765.0	-87.91	-104.10	-104.19	-108.28	-155.12
770.0	-87.47	-103.44	-103.98	-108.48	-155.08
775.0	-87.17	-104.44	-103.98	-108.60	-154.91
780.0	-88.32	-102.45	-103.62	-108.96	-155.16
785.0	-87.85	-104.32	-103.70	-108.86	-154.57
790.0	-88.11	-103.14	-103.71	-109.07	-154.61
795.0	-87.11	-103.02	-103.44	-109.13	-152.98
795.4	-88.63	-103.58	-103.71	-109.09	-152.50

FREQUENCY (MHz)	PHASE NOISE (dBc/Hz) @OFFSETS				
	-45°C				
	100Hz	1kHz	10kHz	100kHz	1MHz
760.6	-85.94	-103.21	-104.01	-109.11	-152.04
765.0	-86.49	-103.54	-104.24	-109.08	-153.40
770.0	-87.22	-103.52	-104.07	-109.36	-155.27
775.0	-86.87	-102.45	-104.06	-109.51	-156.13
780.0	-85.55	-103.06	-103.75	-109.61	-156.84
785.0	-86.05	-102.59	-104.09	-109.63	-156.59
790.0	-87.40	-103.65	-104.00	-109.78	-155.23
795.0	-87.08	-102.70	-103.81	-109.90	-155.54
795.4	-87.83	-102.60	-103.85	-109.86	-155.23

FREQUENCY (MHz)	PHASE NOISE (dBc/Hz) @OFFSETS				
	+85°C				
	100Hz	1kHz	10kHz	100kHz	1MHz
760.6	-82.80	-105.53	-103.72	-108.04	-152.73
765.0	-81.65	-104.04	-103.47	-108.00	-151.50
770.0	-83.22	-104.53	-103.56	-108.13	-152.87
775.0	-83.31	-104.63	-103.46	-108.21	-153.17
780.0	-81.20	-103.50	-103.40	-108.48	-153.54
785.0	-82.03	-104.89	-103.24	-108.42	-153.38
790.0	-82.17	-103.19	-103.25	-108.67	-153.28
795.0	-82.05	-103.91	-103.34	-108.71	-153.29
795.4	-82.11	-104.97	-103.00	-108.68	-153.27

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COMPARISON SPURIOUS ORDER	COMPARISON SPURIOUS @Fcarrier 760.6MHz+(n*Fcomparison) (dBc) note 1			COMPARISON SPURIOUS @Fcarrier 778MHz+(n*Fcomparison) (dBc) note 1			COMPARISON SPURIOUS @Fcarrier 795.4MHz+(n*Fcomparison) (dBc) note 1		
	-45°C	+25°C	+85°C	-45°C	+25°C	+85°C	-45°C	+25°C	+85°C
-5	-133.22	-125.90	-132.22	-132.98	-122.00	-124.09	-121.55	-131.28	-125.16
-4	-126.73	-119.73	-126.25	-126.42	-120.44	-123.75	-122.04	-125.76	-127.47
-3	-124.72	-116.38	-126.86	-123.23	-119.58	-125.79	-117.45	-120.96	-125.44
-2	-124.48	-113.96	-123.97	-121.05	-119.42	-118.92	-114.19	-121.30	-118.83
-1	-116.28	-109.12	-117.42	-112.21	-114.86	-110.78	-110.01	-116.40	-112.77
0 ^{note 2}	-	-	-	-	-	-	-	-	-
+1	-114.67	-109.91	-117.58	-111.43	-115.72	-113.02	-110.53	-114.52	-112.69
+2	-123.77	-116.65	-126.61	-119.55	-120.31	-122.41	-117.10	-120.16	-121.64
+3	-130.74	-122.37	-131.72	-124.84	-124.50	-126.47	-119.91	-124.23	-122.41
+4	-129.63	-130.50	-133.13	-127.25	-126.31	-130.95	-122.90	-126.14	-125.27
+5	-135.29	-133.94	-134.43	-135.73	-131.04	-132.01	-131.35	-127.27	-129.09

Note 1: Comparison frequency 13 MHz

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

REFERENCE SPURIOUS ORDER	REFERENCE SPURIOUS @Fcarrier 760.6MHz+(n*Freference) (dBc) note 3			REFERENCE SPURIOUS @Fcarrier 778MHz+(n*Freference) (dBc) note 3			REFERENCE SPURIOUS @Fcarrier 795.4MHz+(n*Freference) (dBc) note 3		
	-45°C	+25°C	+85°C	-45°C	+25°C	+85°C	-45°C	+25°C	+85°C
-5	-131.15	-132.08	-127.61	-128.24	-123.64	-130.66	-128.92	-125.45	-125.88
-4	-129.49	-123.98	-129.35	-124.53	-125.19	-129.59	-120.49	-123.08	-129.58
-3	-123.03	-132.54	-129.58	-122.04	-122.88	-125.09	-121.75	-122.47	-131.23
-2	-122.16	-130.91	-129.54	-119.09	-131.36	-131.11	-120.01	-122.13	-127.11
-1	-127.47	-118.94	-126.30	-124.07	-120.55	-123.12	-119.81	-124.48	-126.82
0 ^{note 4}	-	-	-	-	-	-	-	-	-
+1	-129.88	-127.69	-137.97	-127.36	-128.68	-130.97	-121.16	-125.65	-126.57
+2	-123.01	-120.05	-123.14	-122.78	-120.79	-120.43	-124.49	-119.26	-123.28
+3	-136.44	-132.57	-128.71	-131.52	-133.82	-131.97	-133.15	-132.49	-131.19
+4	-128.63	-125.76	-134.01	-131.18	-125.71	-133.02	-128.46	-123.73	-131.17
+5	-126.07	-123.19	-130.42	-127.10	-126.16	-128.83	-126.65	-124.29	-128.96

Note 3: Reference frequency 52 MHz

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

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STEP SIZE SPURIOUS ORDER	0.5 STEP SIZE & STEP SIZE SPURIOUS @Fcarrier 760.6MHz+(n*Fstep size) (dBc) note 5			0.5 STEP SIZE & STEP SIZE SPURIOUS @Fcarrier 778MHz+(n*Fstep size) (dBc) note 5			0.5 STEP SIZE & STEP SIZE SPURIOUS @Fcarrier 795.4MHz+(n*Fstep size) (dBc) note 5		
	-45°C	+25°C	+85°C	-45°C	+25°C	+85°C	-45°C	+25°C	+85°C
-5.0	-120.41	-105.68	-104.96	-110.84	-113.41	-102.76	-111.53	-107.39	-110.29
-4.5	-119.70	-119.12	-118.35	-119.97	-119.54	-120.94	-119.54	-121.54	-119.99
-4.0	-97.52	-97.55	-115.96	-112.43	-102.64	-106.51	-113.00	-109.24	-108.43
-3.5	-119.71	-118.63	-119.00	-117.56	-119.60	-119.92	-117.28	-117.99	-121.77
-3.0	-118.14	-103.87	-93.87	-92.33	-89.77	-102.50	-100.17	-96.06	-98.76
-2.5	-113.99	-113.67	-115.68	-113.29	-114.79	-113.52	-115.38	-111.99	-115.51
-2.0	-85.40	-93.99	-85.19	-92.53	-87.55	-102.81	-84.23	-92.60	-93.33
-1.5	-105.05	-105.22	-103.84	-101.31	-108.82	-108.19	-110.94	-104.17	-107.64
-1.0	-70.19	-84.39	-81.22	-79.46	-80.93	-82.63	-70.27	-76.37	-76.71
-0.5	-87.76	-83.58	-84.92	-83.27	-85.47	-87.39	-85.60	-84.13	-86.44
0 ^{note 6}	-	-	-	-	-	-	-	-	-
+0.5	-86.05	-88.14	-88.90	-87.27	-87.24	-84.12	-88.88	-88.13	-85.29
+1.0	-70.39	-85.10	-82.54	-79.67	-80.67	-82.28	-70.07	-76.22	-76.77
+1.5	-107.12	-105.81	-105.24	-108.22	-106.63	-107.01	-103.85	-105.71	-107.02
+2.0	-85.49	-94.22	-85.01	-93.33	-87.64	-101.97	-84.11	-92.70	-93.86
+2.5	-113.70	-116.46	-114.62	-108.51	-105.91	-105.56	-116.29	-111.60	-117.13
+3.0	-116.92	-104.84	-93.46	-92.35	-89.55	-87.61	-99.71	-96.19	-97.89
+3.5	-118.83	-119.35	-115.68	-119.79	-119.82	-120.03	-119.64	-115.74	-122.02
+4.0	-98.06	-98.68	-117.33	-114.13	-103.35	-104.93	-114.94	-113.86	-107.65
+4.5	-121.26	-120.10	-121.62	-117.91	-123.31	-122.82	-123.11	-122.76	-121.67
+5.0	-122.96	-105.40	-105.56	-111.74	-113.06	-112.75	-109.69	-106.89	-106.98

Note 5: Step size 200 kHz

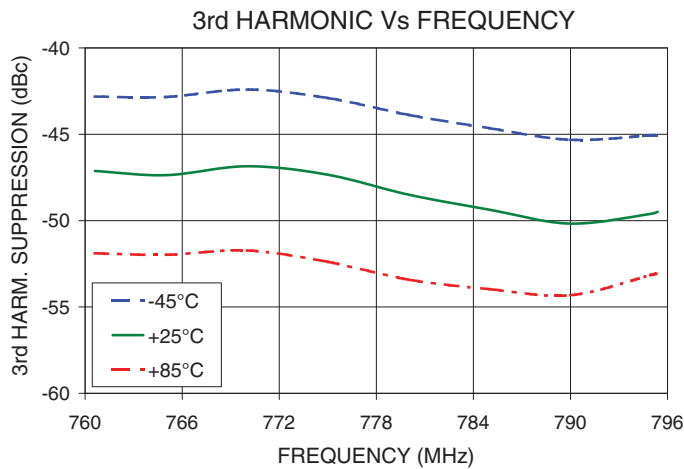
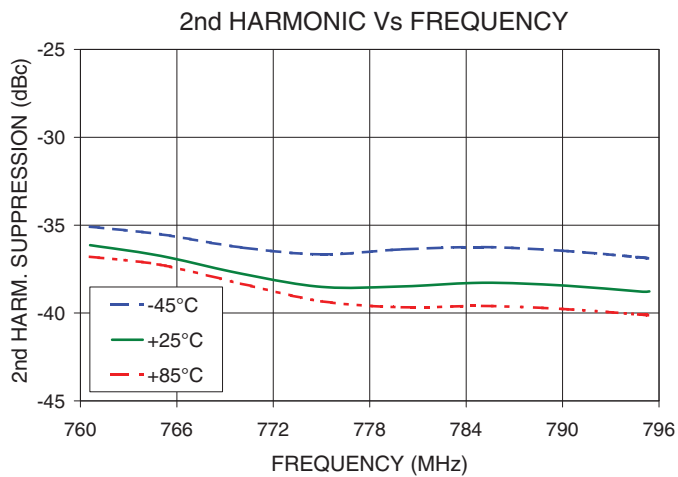
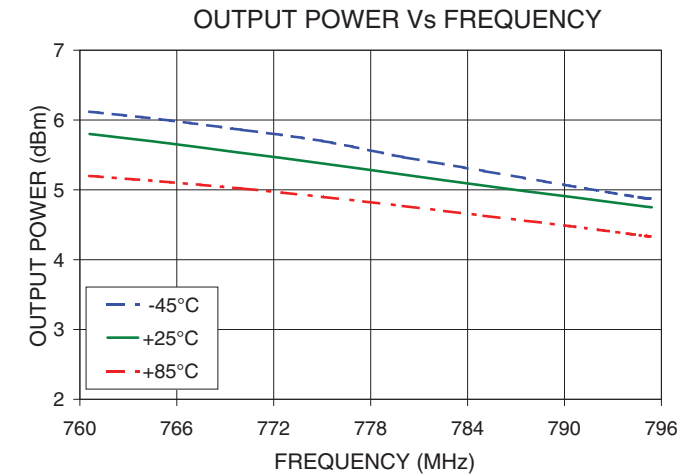
Note 6: All spurs are referenced to carrier signal (n=0).

Notes

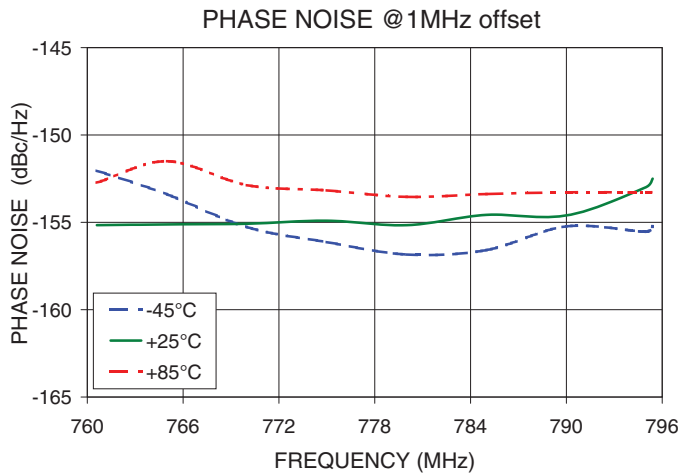
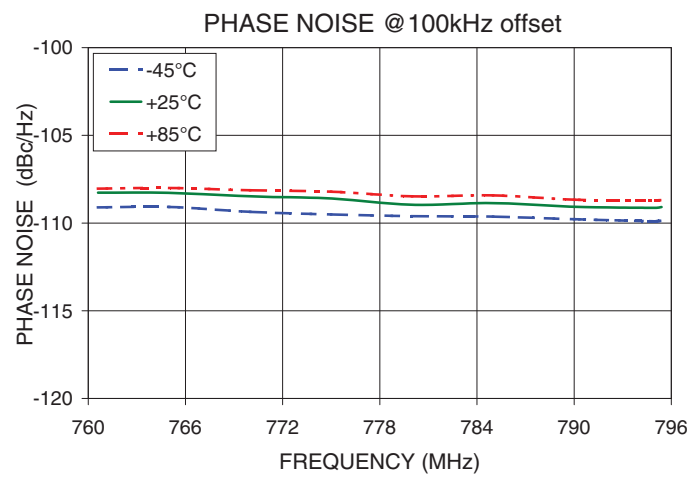
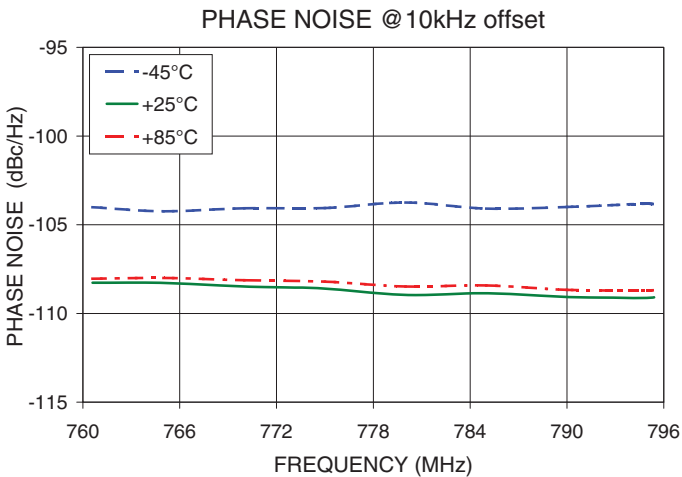
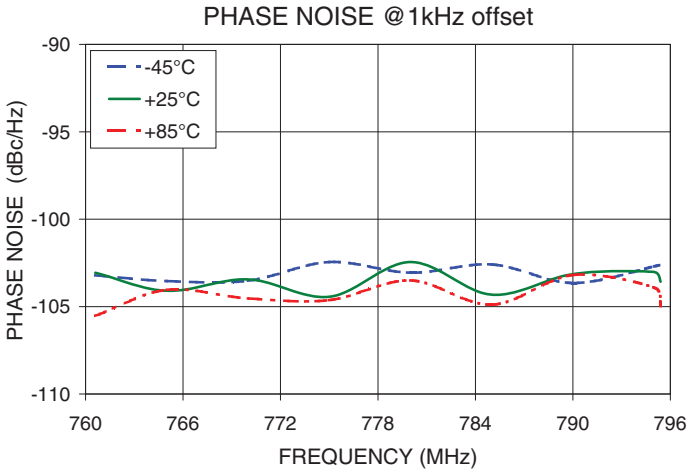
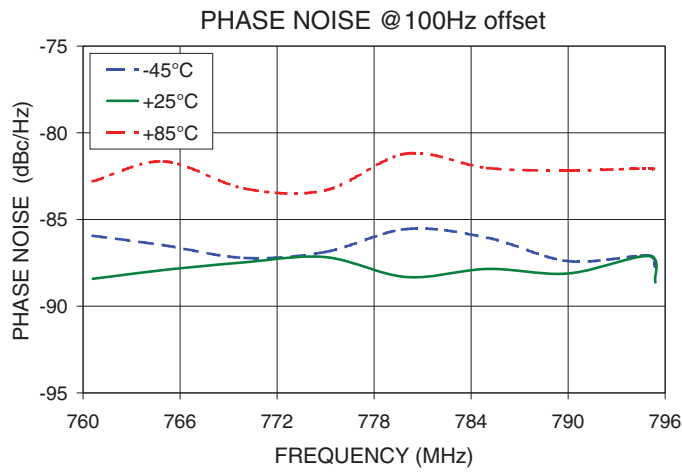
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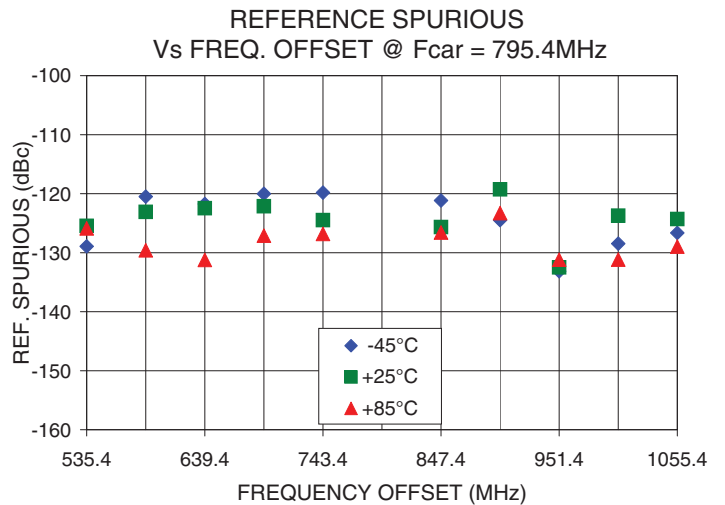
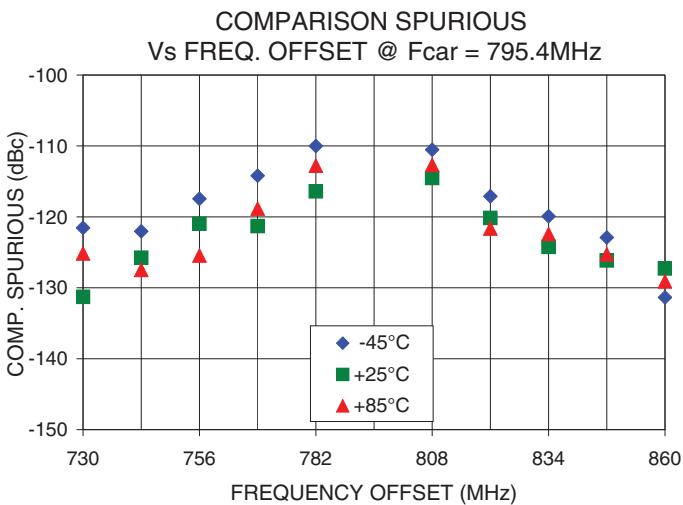
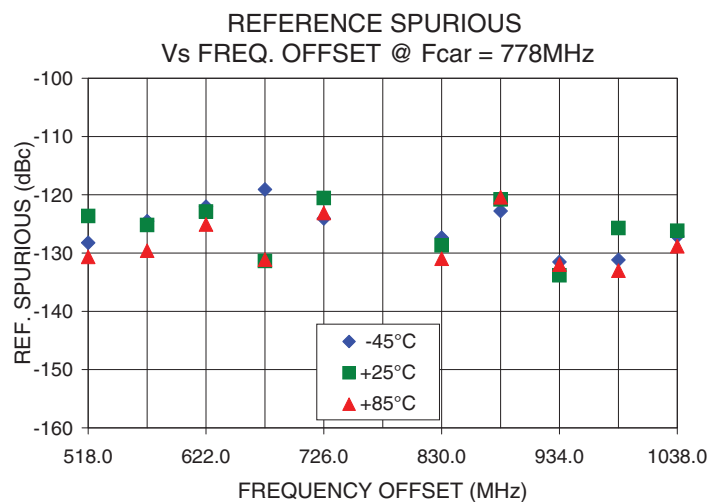
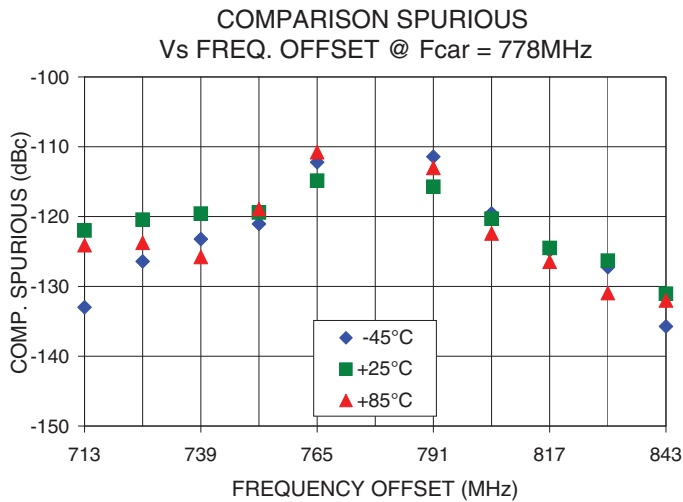
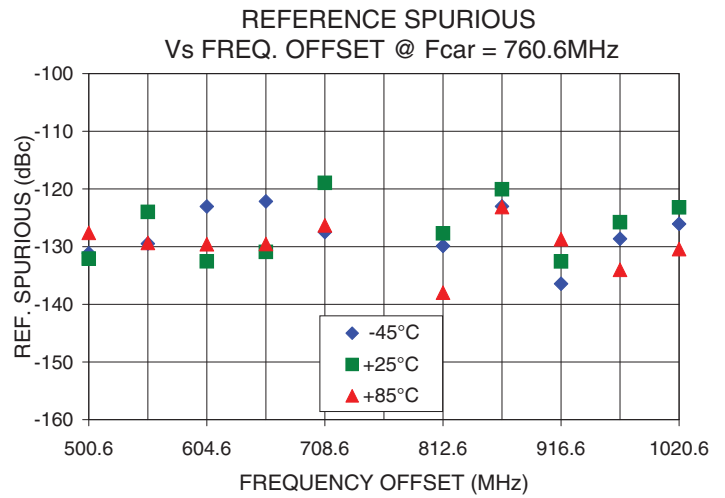
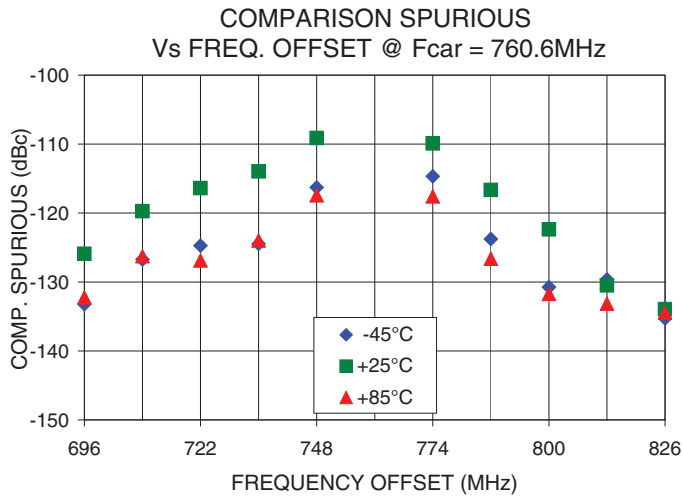
Typical Performance Curves



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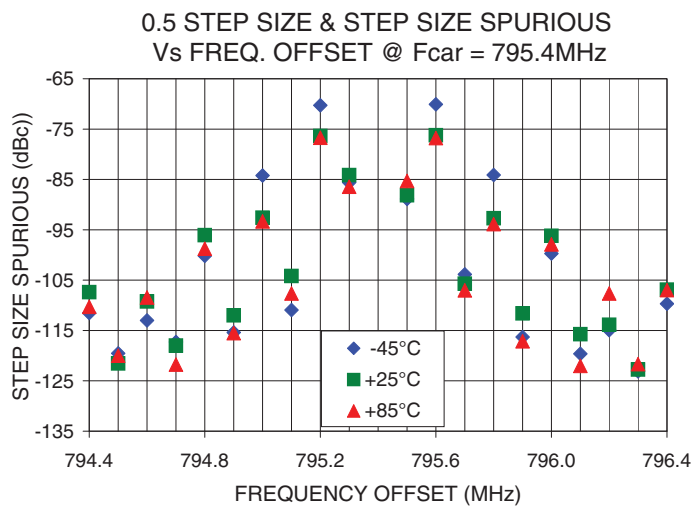
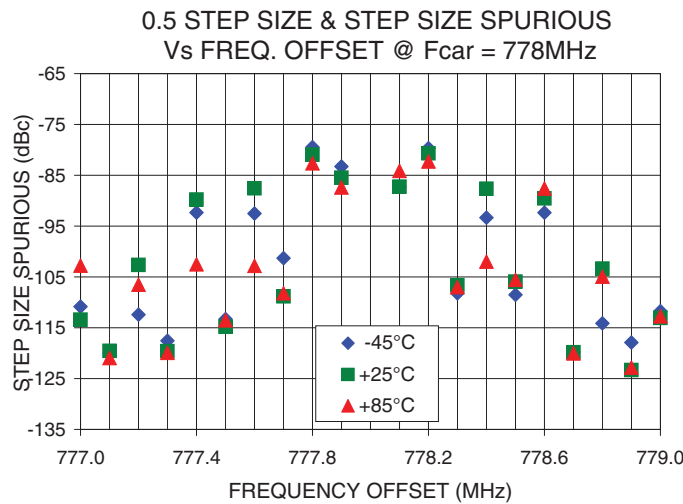
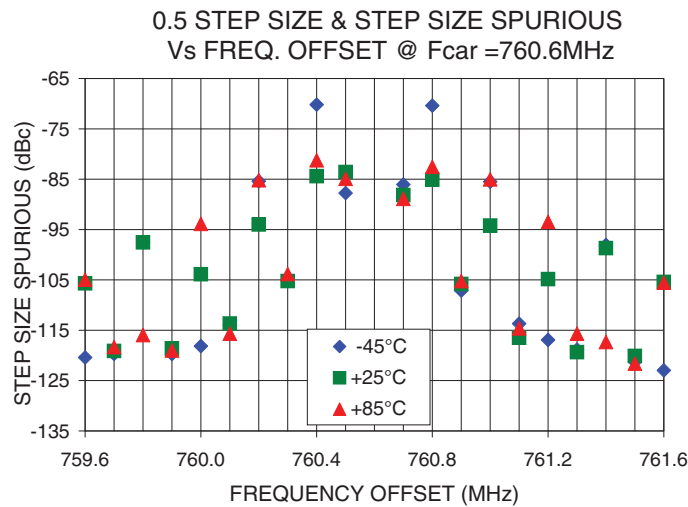
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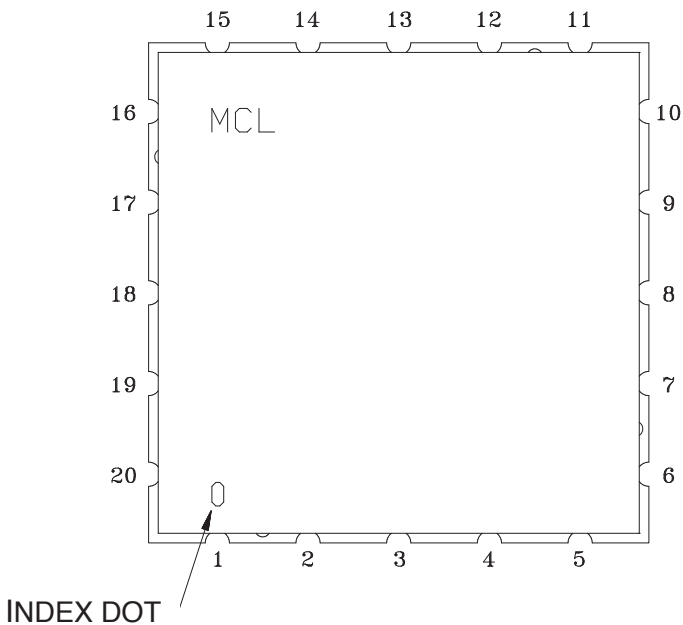




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Pin Configuration

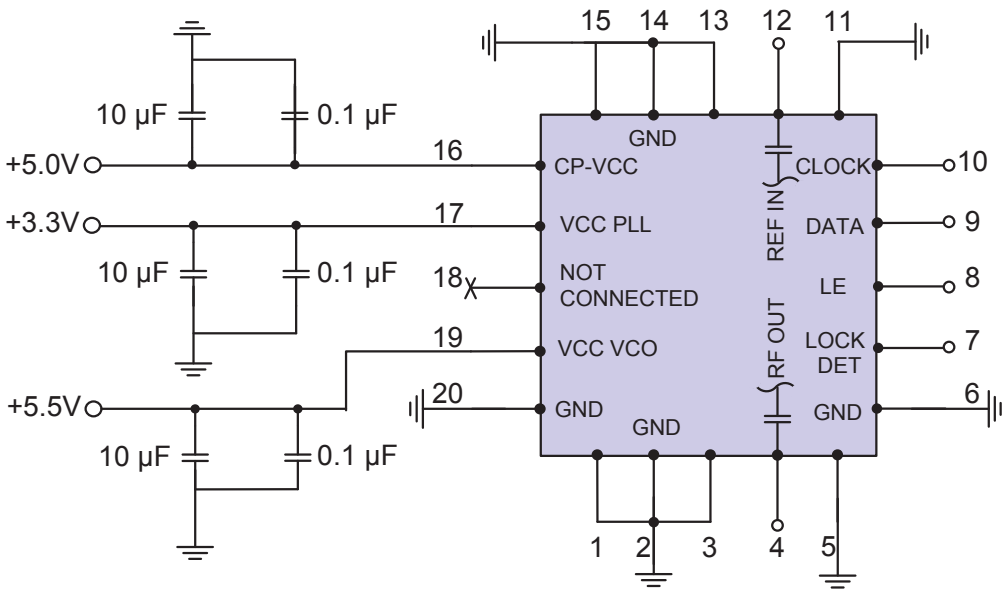


Pin Connection

Pin Number	Function
1	GND
2	GND
3	GND
4	RF OUT
5	GND
6	GND
7	LOCK DET
8	LE
9	DATA
10	CLOCK
11	GND
12	REF IN
13	GND
14	GND
15	GND
16	VCC CP
17	VCC PLL
18	Not Connected
19	VCC VCO
20	GND

Recommended Application Circuit

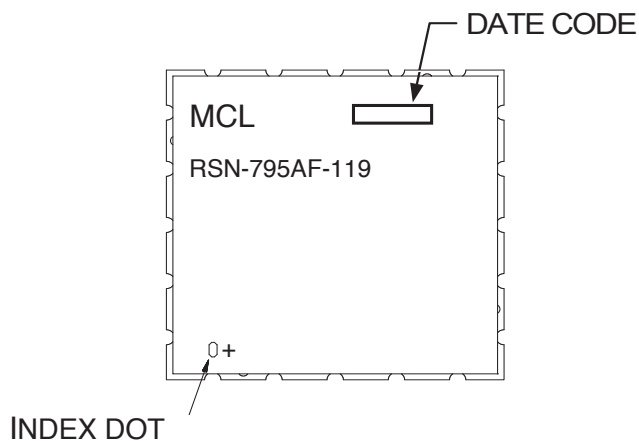
Note: REF IN and RF OUT ports are internally AC coupled.



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Device Marking

**Additional Detailed Technical Information**

Additional information is available on our web site. To access this information enter the model number on our web site home page.

Case Style: JG1228

Tape & Reel: TR-F99

Suggested Layout for PCB Design: PL-319

Evaluation Board: TB-554+

Environment Ratings: ENV65T2

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Frequency Synthesizer

RSN-1618AF-119+

Typical Performance Data

FREQ. (MHz)	POWER OUTPUT (dBm)			HARMONICS (dBc)					
	-45°C	+25°C	+85°C	F2			F3		
				-45°C	+25°C	+85°C	-45°C	+25°C	+85°C
1543	4.07	4.56	4.67	-25.15	-27.16	-29.03	-21.89	-25.49	-29.84
1550	4.11	4.58	4.67	-25.78	-27.84	-29.58	-21.67	-25.28	-29.78
1560	4.17	4.62	4.67	-27.07	-29.59	-30.96	-22.81	-26.66	-31.75
1570	4.17	4.62	4.65	-27.77	-30.61	-31.43	-23.39	-28.17	-33.81
1580	4.18	4.64	4.63	-27.97	-30.77	-30.98	-22.50	-27.49	-33.56
1590	4.22	4.69	4.64	-28.45	-31.37	-31.59	-22.16	-26.30	-31.84
1600	4.26	4.73	4.64	-28.66	-31.66	-32.66	-22.44	-26.43	-31.82
1610	4.30	4.75	4.64	-28.85	-31.98	-33.40	-21.03	-25.67	-31.49
1618	4.29	4.72	4.59	-28.84	-32.21	-33.79	-21.02	-25.84	-32.09

FREQ. (MHz)	VCO CURRENT (mA)			PLL CURENT (mA)			CP CURENT (mA)		
	-45°C	+25°C	+85°C	-45°C	+25°C	+85°C	-45°C	+25°C	+85°C
1543	41.02	42.4	43.67	16.74	18.39	21.08	42.54	42.83	42.49
1550	41.05	42.39	43.67	16.54	18.21	20.88	42.37	42.67	42.33
1560	40.97	42.36	43.65	16.23	17.91	20.56	42.12	42.43	42.11
1570	40.96	42.34	43.64	16.53	18.23	20.89	41.89	42.20	41.89
1580	40.97	42.31	43.62	16.62	18.34	20.98	41.65	41.98	41.68
1590	40.95	42.28	43.60	16.75	18.47	21.11	41.42	41.75	41.45
1600	40.90	42.24	43.59	16.92	18.66	21.30	41.18	41.52	41.24
1610	40.55	42.21	43.57	16.62	18.35	20.99	40.95	41.29	41.04
1618	40.86	42.20	43.56	16.82	18.57	21.20	40.77	41.11	40.87

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
1543	-90.71	-94.88	-98.67	-106.40	-146.62	-92.95	-95.85	-98.65	-106.22	-145.14	-90.46	-95.18	-98.24	-105.49	-142.08
1550	-88.84	-95.27	-98.41	-106.52	-147.38	-89.16	-95.99	-98.64	-106.38	-144.55	-88.82	-96.88	-97.63	-105.76	-142.47
1560	-87.78	-96.10	-98.81	-106.37	-147.44	-90.52	-96.98	-98.64	-106.42	-145.60	-87.68	-95.69	-97.54	-105.82	-143.18
1570	-87.91	-95.48	-98.82	-106.68	-146.70	-92.54	-95.33	-98.63	-106.54	-144.20	-93.36	-95.36	-97.79	-105.86	-142.67
1580	-86.22	-95.17	-98.58	-106.73	-147.28	-89.03	-94.97	-98.78	-106.42	-145.54	-88.61	-96.91	-97.82	-105.90	-143.18
1590	-89.33	-95.22	-98.86	-106.83	-147.50	-91.53	-94.75	-98.94	-106.58	-144.68	-89.77	-95.22	-97.99	-106.05	-142.40
1600	-89.46	-95.97	-98.77	-107.04	-147.46	-86.98	-95.82	-98.46	-106.62	-145.50	-90.65	-96.13	-97.59	-106.06	-143.25
1610	-92.74	-96.02	-98.46	-106.94	-146.29	-88.35	-96.14	-98.41	-106.71	-144.36	-91.88	-96.74	-97.01	-105.99	-143.21
1618	-89.59	-95.08	-98.67	-106.91	-147.48	-88.12	-94.79	-98.38	-106.48	-145.34	-88.13	-95.30	-97.62	-105.85	-143.22

Typical Performance Data

COMPARISON SPURIOUS ORDER	COMPARISON SPURIOUS @Fcarrier 1543MHz± (n*Fcomparison) (dBc) NOTE 1			COMPARISON SPURIOUS @Fcarrier 1580MHz± (n*Fcomparison) (dBc) NOTE 1			COMPARISON SPURIOUS @Fcarrier 1618MHz± (n*Fcomparison) (dBc) NOTE 1		
	-45°C	+25°C	+85°C	-45°C	+25°C	+85°C	-45°C	+25°C	+85°C
-5	-99.32	-102.69	-105.11	-99.55	-106.22	-108.48	-103.52	-111.95	-109.85
-4	-99.00	-112.89	-110.91	-102.21	-121.47	-107.27	-105.13	-115.46	-102.22
-3	-100.26	-113.00	-108.90	-101.77	-112.76	-108.50	-109.51	-116.49	-102.18
-2	-98.98	-106.24	-112.11	-101.52	-108.39	-114.43	-110.82	-116.42	-104.37
-1	-96.24	-101.07	-111.61	-101.84	-106.55	-109.58	-109.66	-107.10	-102.82
0 ^{note 2}	-	-	-	-	-	-	-	-	-
+1	-95.21	-93.91	-101.18	-96.39	-96.50	-109.58	-98.28	-105.92	-104.38
+2	-97.47	-97.08	-105.68	-98.23	-100.83	-125.60	-100.37	-111.21	-107.99
+3	-98.80	-98.38	-106.08	-98.41	-102.15	-111.50	-100.60	-106.70	-115.21
+4	-100.96	-102.91	-110.03	-99.92	-107.15	-108.23	-102.76	-107.81	-107.53
+5	-105.43	-109.53	-101.00	-106.12	-106.79	-99.64	-102.47	-101.03	-99.11

Note 1: Comparison frequency 13 MHz

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

REFERENCE SPURIOUS ORDER	REFERENCE SPURIOUS @Fcarrier 1543MHz± (n*Freference) (dBc) NOTE 3			REFERENCE SPURIOUS @Fcarrier 1580MHz± (n*Freference) (dBc) NOTE 3			REFERENCE SPURIOUS @Fcarrier 1618MHz± (n*Freference) (dBc) NOTE 3		
	-45°C	+25°C	+85°C	-45°C	+25°C	+85°C	-45°C	+25°C	+85°C
-5	-93.98	-98.86	-97.75	-92.94	-96.90	-98.53	-92.33	-97.02	-98.36
-4	-95.88	-100.79	-98.00	-93.84	-97.17	-97.11	-94.56	-96.37	-97.03
-3	-95.04	-100.34	-97.53	-95.18	-98.42	-100.00	-94.39	-98.75	-98.86
-2	-80.63	-85.49	-89.13	-89.21	-91.60	-94.01	-94.47	-94.99	-95.27
-1	-106.33	-115.23	-111.43	-111.85	-118.45	-107.71	-107.27	-115.25	-102.24
0 ^{note 4}	-	-	-	-	-	-	-	-	-
+1	-117.62	-103.51	-111.25	-107.92	-107.14	-108.41	-114.24	-107.01	-107.49
+2	-79.64	-84.05	-88.58	-85.99	-89.60	-92.76	-87.49	-91.89	-92.17
+3	-96.66	-100.31	-97.20	-100.15	-97.92	-95.75	-104.44	-97.89	-94.44
+4	-91.85	-92.94	-93.01	-90.52	-91.72	-92.92	-89.79	-91.67	-93.07
+5	-89.25	-92.98	-96.72	-89.86	-91.67	-97.67	-90.94	-92.14	-96.93

Note 3: Reference frequency 52 MHz

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

Typical Performance Data

STEP SIZE SPURIOUS ORDER n	0.5 STEP SIZE & STEP SIZE SPURIOUS @ Fcarrier 1543 MHz± (n*Fstep size) (dBc) NOTE 5			0.5 STEP SIZE & STEP SIZE SPURIOUS @ Fcarrier 1580 MHz± (n*Fstep size) (dBc) NOTE 5			0.5 STEP SIZE & STEP SIZE SPURIOUS @ Fcarrier 1618 MHz± (n*Fstep size) (dBc) NOTE 5		
	-45°C	+25°C	+85°C	-45°C	+25°C	+85°C	-45°C	+25°C	+85°C
-5.0	-106.11	-113.54	-104.90	-99.61	-100.29	-100.90	-104.50	-112.17	-112.92
-4.5	-129.54	-128.51	-129.58	-129.57	-130.40	-128.11	-129.57	-129.37	-127.73
-4.0	-109.92	-107.32	-111.72	-103.15	-99.38	-101.54	-101.32	-99.59	-101.94
-3.5	-127.77	-127.02	-125.88	-127.87	-126.13	-126.02	-128.92	-127.21	-123.64
-3.0	-92.98	-102.04	-109.13	-96.92	-96.52	-94.96	-97.54	-94.81	-91.04
-2.5	-125.15	-124.06	-124.66	-125.78	-120.40	-122.99	-124.28	-124.71	-122.84
-2.0	-85.41	-83.64	-84.27	-91.43	-91.64	-86.29	-81.37	-81.78	-82.11
-1.5	-120.24	-119.57	-115.89	-120.12	-119.45	-115.86	-116.84	-119.15	-116.57
-1.0	-67.38	-66.39	-65.74	-77.11	-72.51	-72.09	-64.46	-63.78	-63.44
-0.5	-95.82	-96.90	-95.33	-97.00	-96.78	-95.80	-96.76	-95.74	-94.72
0 ^{note 6}	-	-	-	-	-	-	-	-	-
+0.5	-96.83	-95.89	-95.50	-95.84	-95.01	-95.75	-96.04	-96.39	-95.23
+1.0	-67.33	-66.42	-65.54	-77.10	-72.54	-72.05	-64.39	-63.76	-63.47
+1.5	-119.97	-119.32	-117.61	-119.60	-119.18	-116.46	-119.35	-118.29	-116.44
+2.0	-85.41	-83.71	-83.86	-91.04	-91.75	-86.14	-81.42	-81.79	-82.04
+2.5	-125.30	-123.94	-121.94	-124.28	-122.21	-122.54	-125.89	-124.78	-124.85
+3.0	-92.77	-101.53	-110.04	-97.40	-96.13	-94.71	-97.68	-94.80	-90.51
+3.5	-127.65	-127.64	-126.54	-128.26	-128.61	-127.93	-127.84	-128.03	-125.97
+4.0	-110.60	-107.01	-112.71	-103.07	-99.18	-100.70	-101.54	-99.44	-101.36
+4.5	-129.92	-129.10	-128.90	-129.56	-129.38	-127.99	-130.43	-129.12	-128.41
+5.0	-106.45	-113.47	-105.67	-99.79	-100.74	-100.83	-104.44	-112.65	-115.94

Note 5: Step size 200 kHz

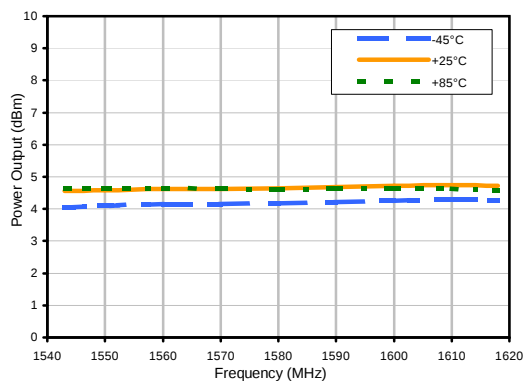
Note 6: All spurs are referenced to carrier signal (n=0).

Frequency Synthesizer

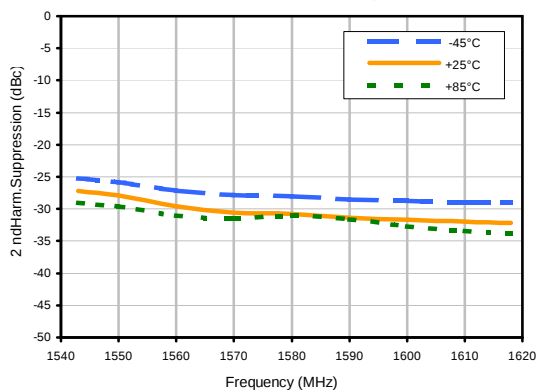
Typical Performance Data

RSN-1618AF-119+

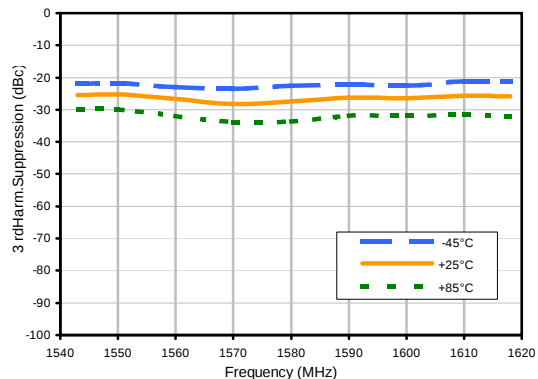
Power Output Vs Frequency



2nd Harmonics Vs Frequency



3rd Harmonics Vs Frequency



REV. X1
RSN-1618AF-119+
100208
Page 1 of 4



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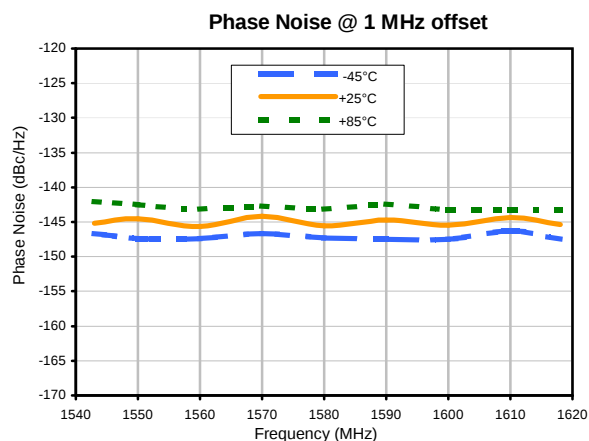
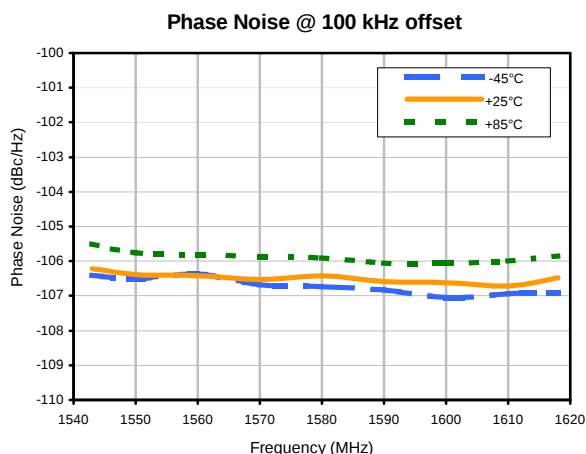
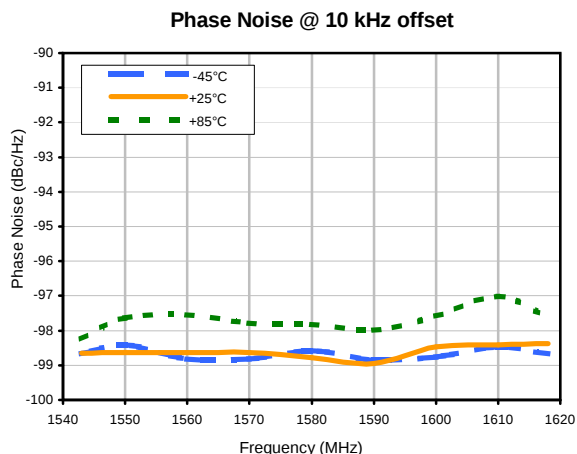
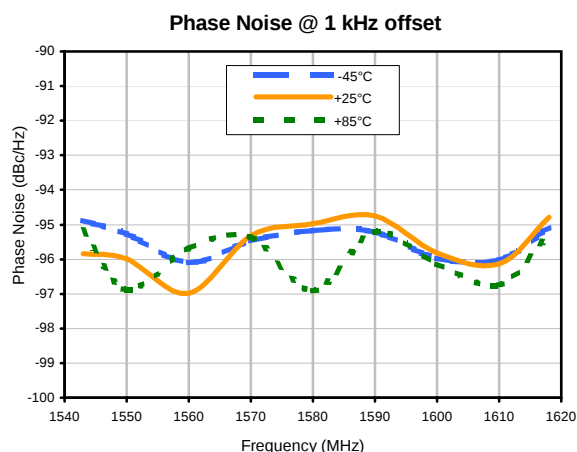
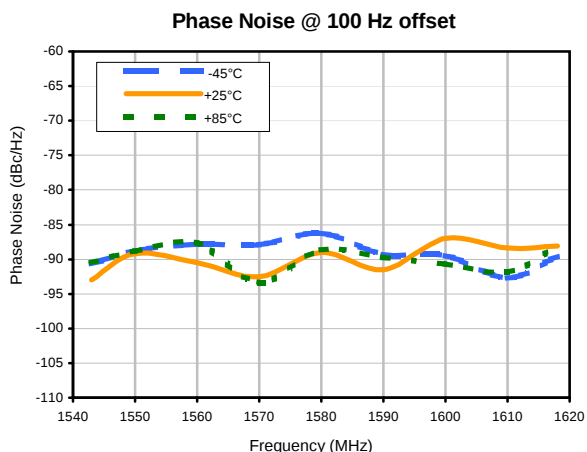
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Frequency Synthesizer

RSN-1618AF-119+

Typical Performance Data



REV. X1
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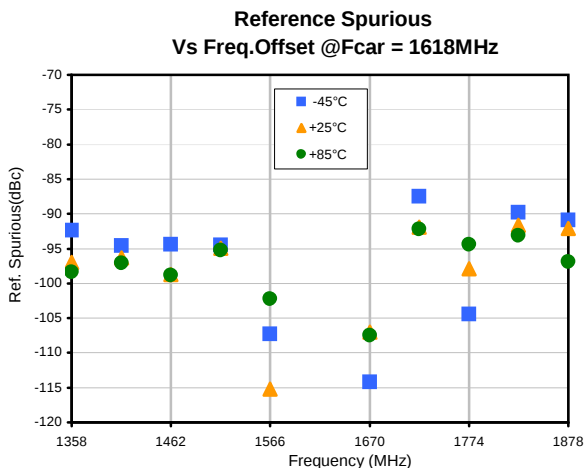
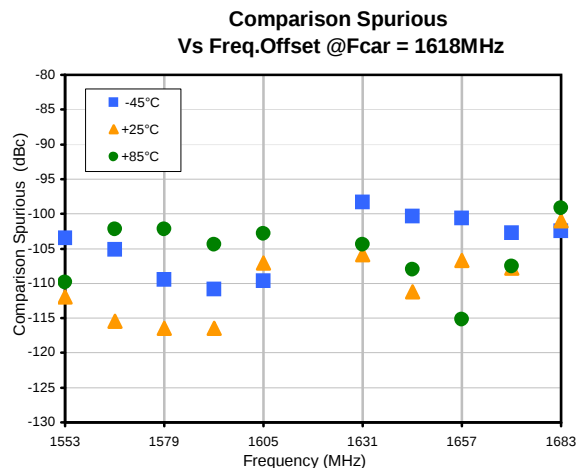
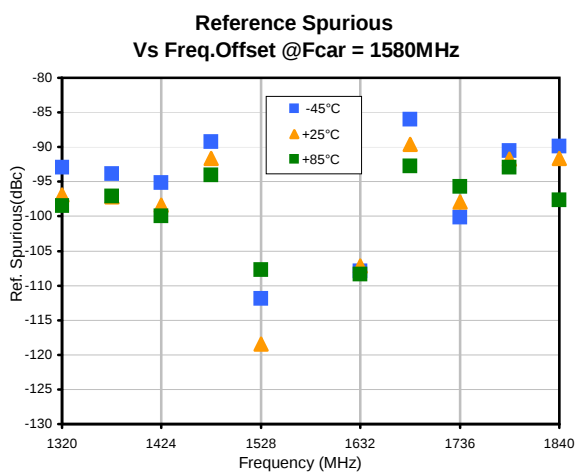
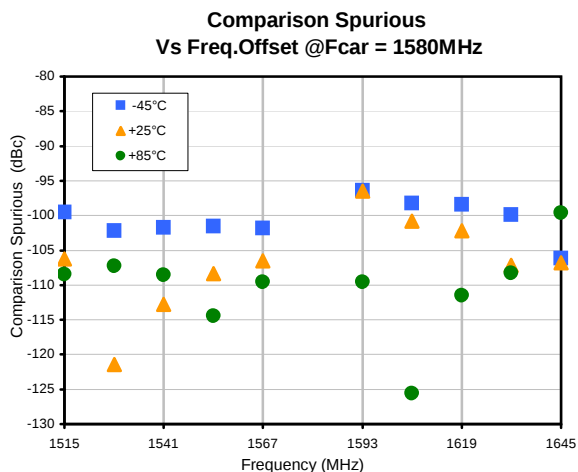
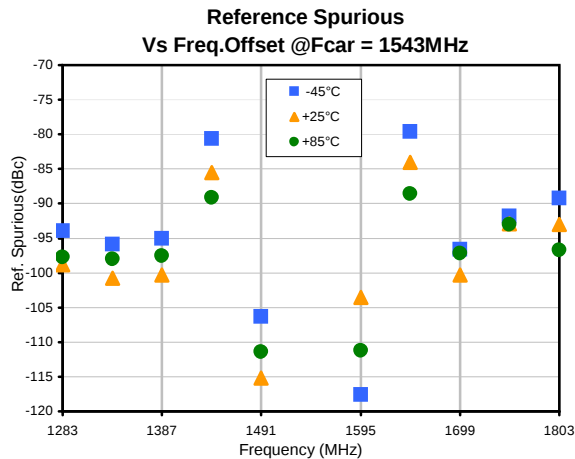
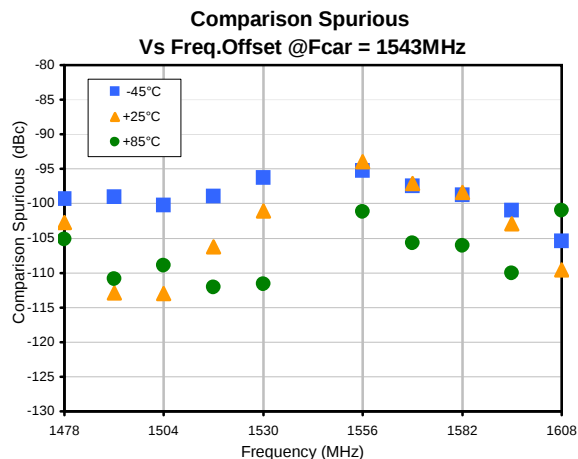
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Frequency Synthesizer

RSN-1618AF-119+

Typical Performance Data



REV. X1

RSN-1618AF-119+

100208

Page 3 of 4



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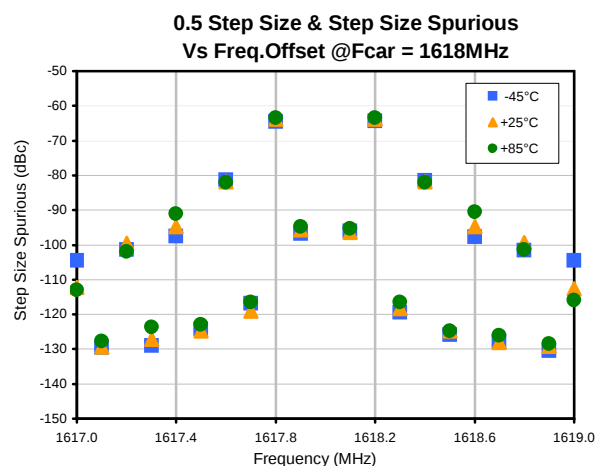
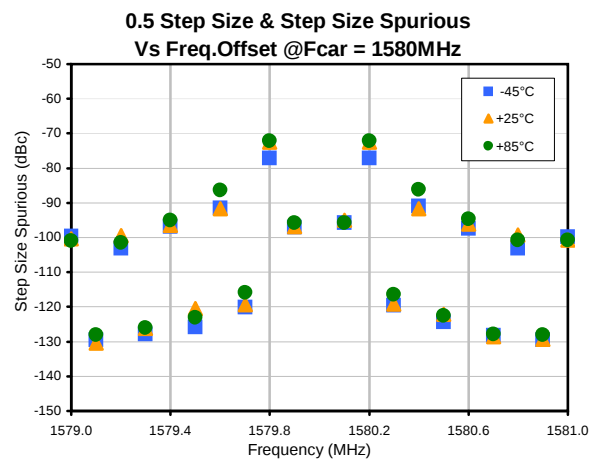
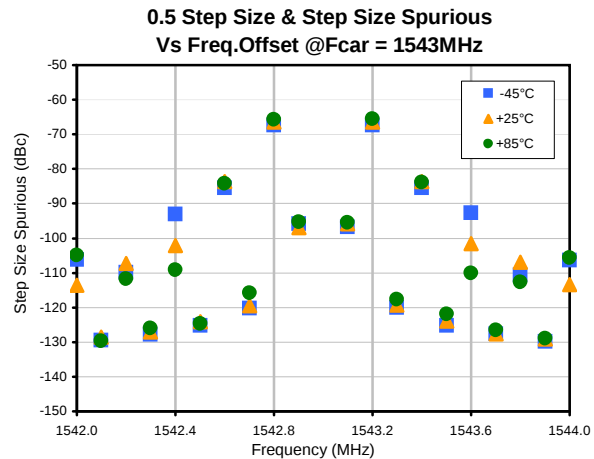
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The Design Engineers Search Engine finds the model you need, Instantly • For detailed performance specs & shopping online see

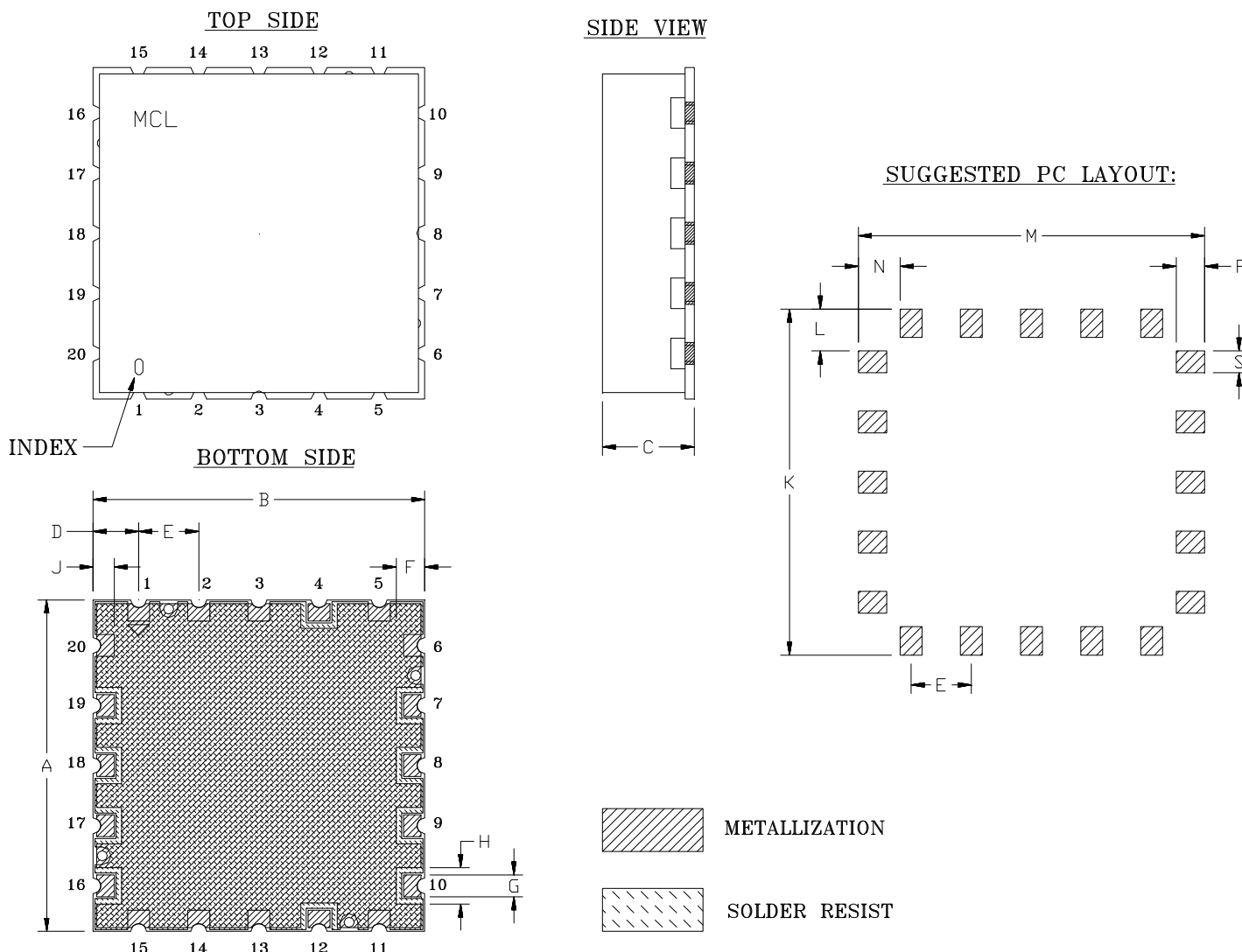


Typical Performance Data



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:

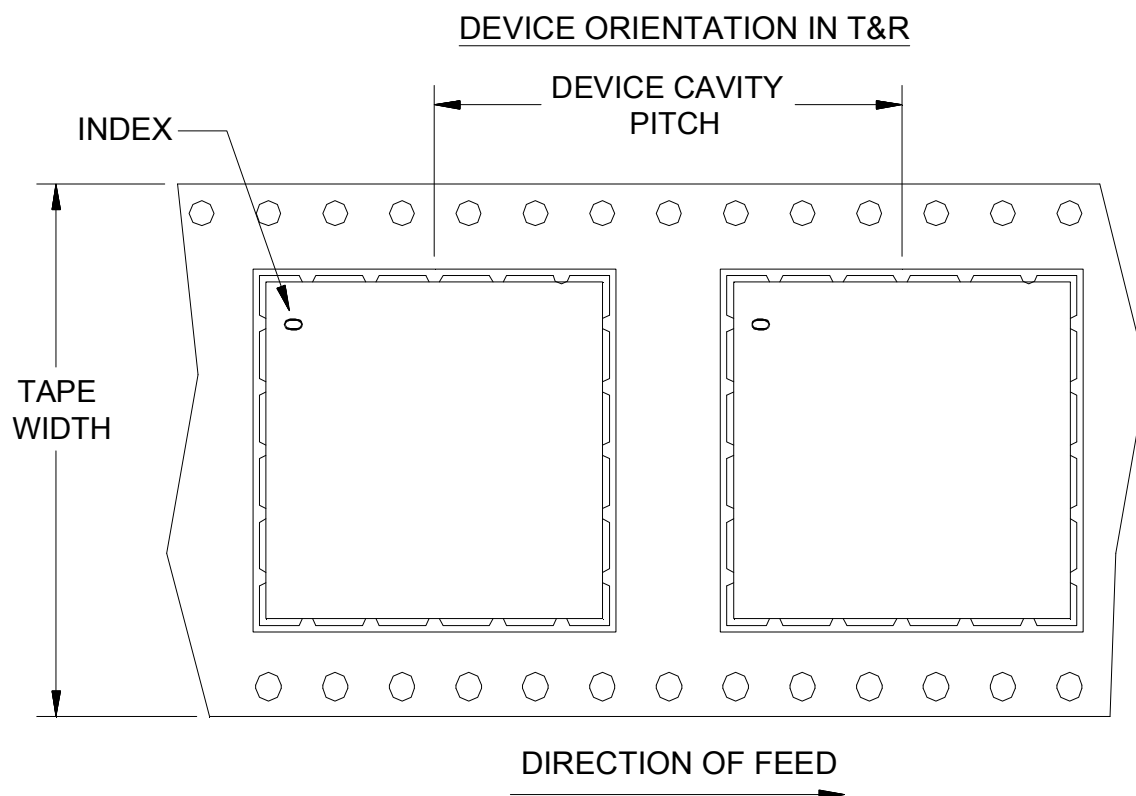
1. Case material: Nickel-Silver alloy.
2. Base: Printed wiring laminate.
3. Termination finish:

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.



INTERNET <http://www.minicircuits.com>
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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

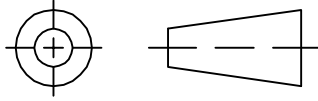
Mini-Circuits carrier tape materials provide protection from ESD (Electro-Static Discharge) during handling and transportation. Tapes are static dissipative and comply with industry standards EIA-481/EIA-541.

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



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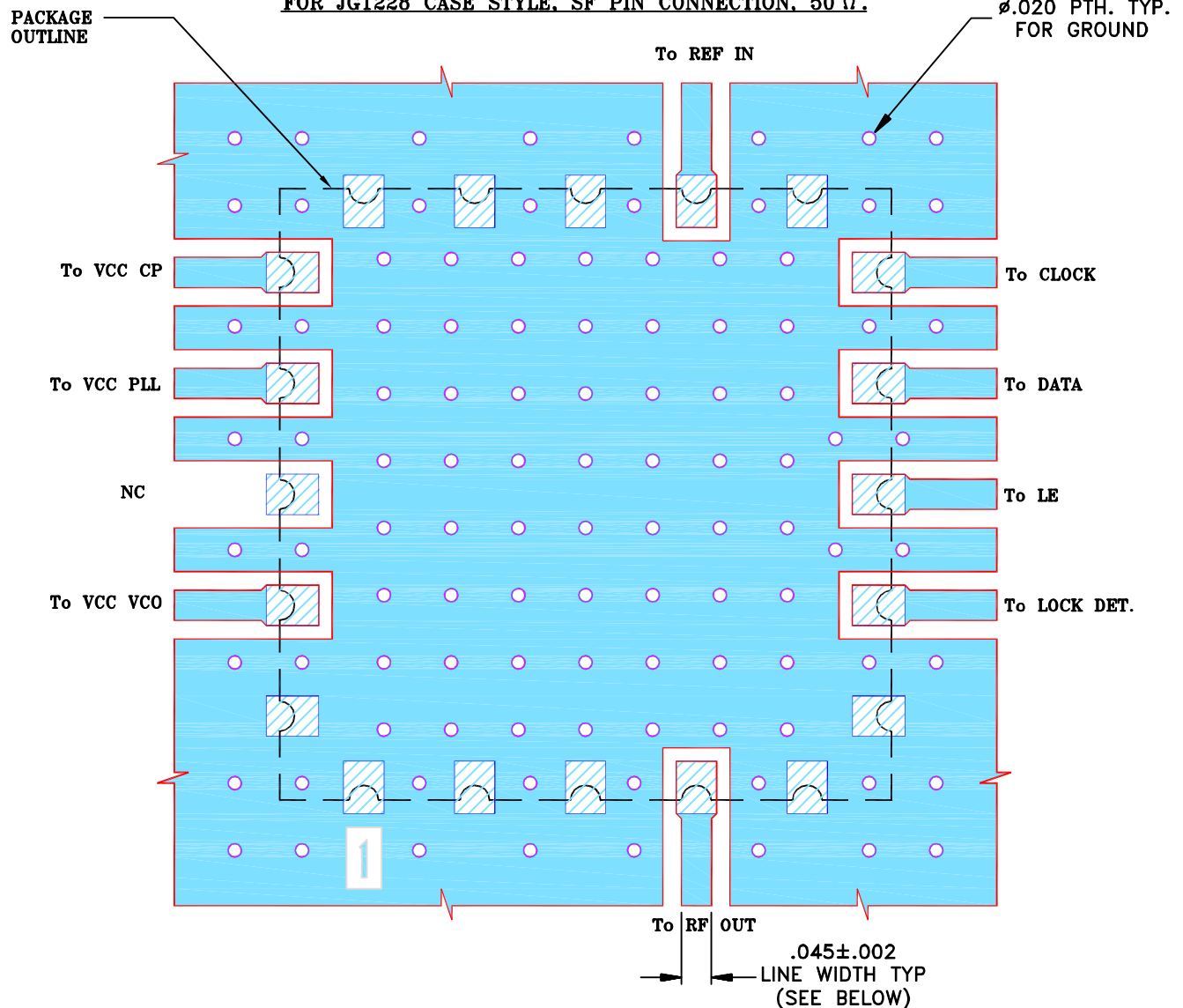
THIRD ANGLE PROJECTION



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 JG1228 CASE STYLE, SF PIN CONNECTION, 50 Ω.

**NOTES:**

- TRACE WIDTH IS SHOWN FOR R04350B WITH DIELECTRIC THICKNESS. $.020 \pm .0015$ ". 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
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

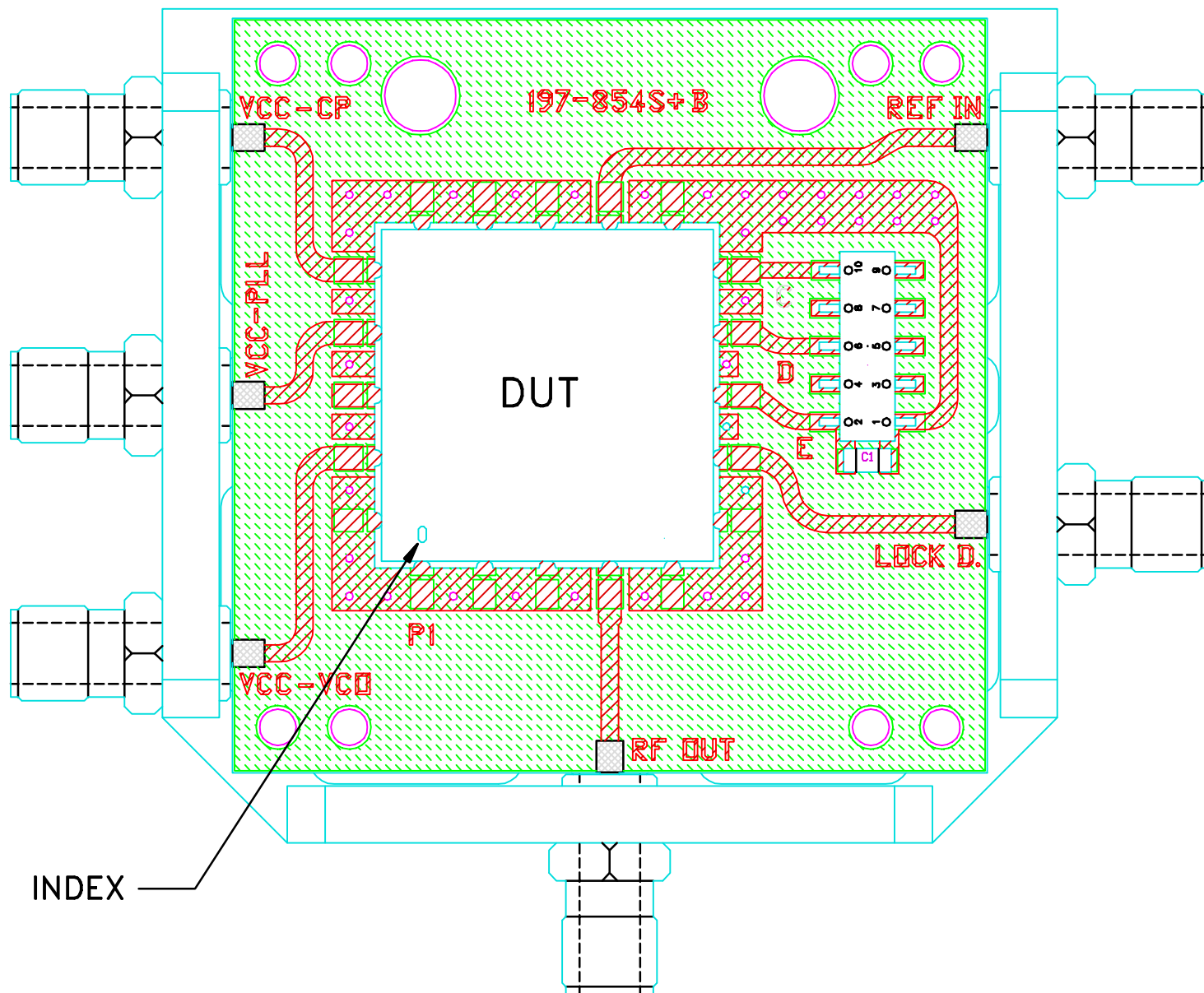


Mini-Circuits® 13 Neptune Avenue
Brooklyn NY 11235

PL, SF, JG1228, RSN
TB-554+ (50 Ω)

SIZE	CODE IDENT	DRAWING NO:	REV:
A	15542	98-PL-319	OR
FILE:	98PL319	SCALE: 4:1	SHEET: 1 OF 1

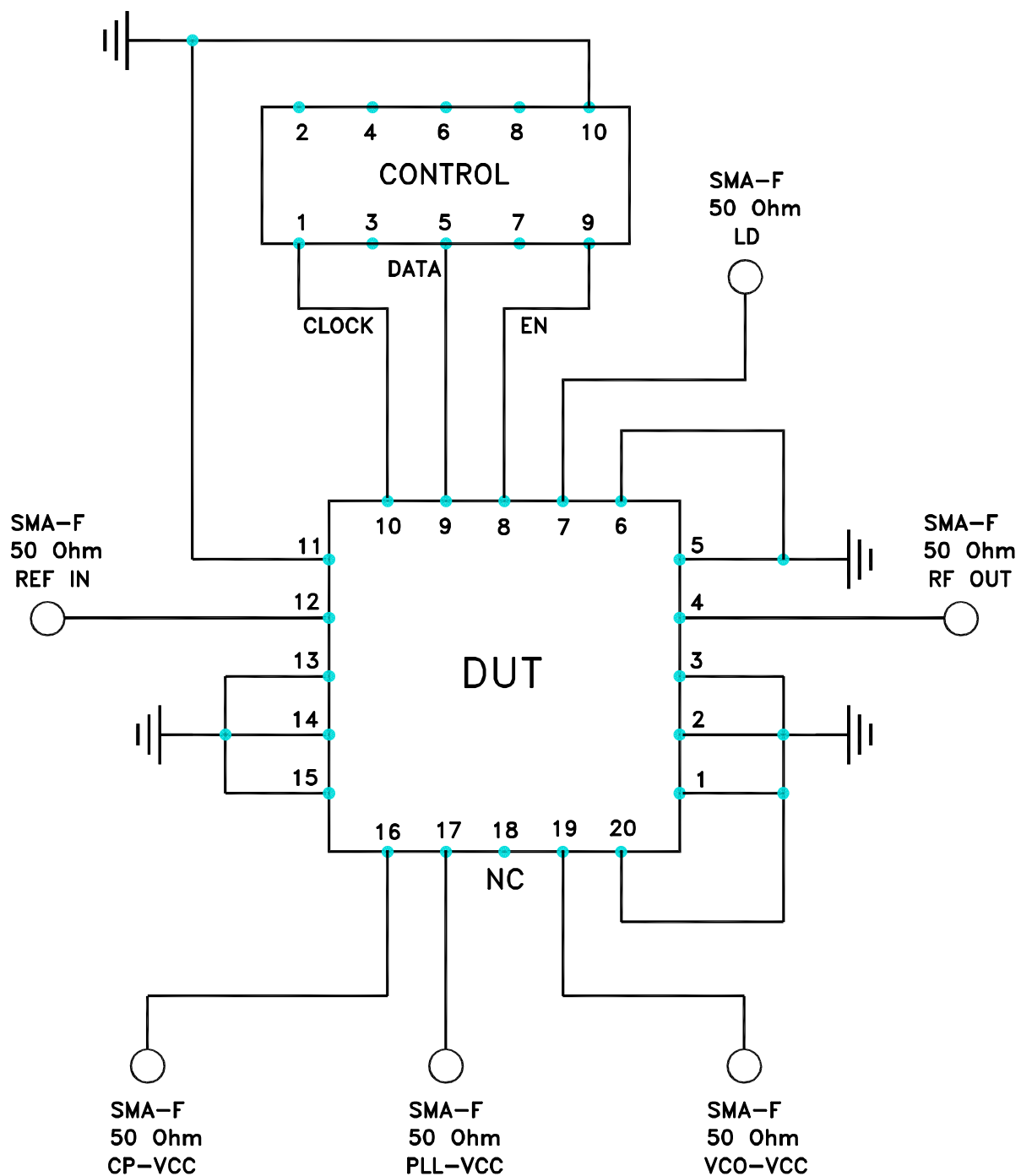
Evaluation Board and Circuit



TB-554+

NOTES:

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



TB-554+
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	-40° to 85° C Ambient Environment	Individual Model Data Sheet
Storage Temperature	-55° to 100° C Ambient Environment	Individual Model Data Sheet
HAST	130°C, 85% RH, 96 hours	JESD22-A110
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