

Frequency Synthesizer

DSN-3019A-119+

50Ω 1788 to 3019 MHz

The Big Deal

- Low phase noise and spurious
- Robust design and construction



CASE STYLE: KL942

Product Overview

The DSN-3019A-119+ is a Frequency Synthesizer, designed to operate from 1788 to 3019 MHz for receiver application. The DSN-3019A-119+ is packaged in a metal case (size of 1.25" x 1.00" x 0.20") to shield against unwanted signals and noise.

Key Features

Feature	Advantages
Low phase noise and spurious: • Phase Noise: -83 dBc/Hz typ. @ 10 kHz offset • Comparison Spurious: -88 dBc typ. • Reference Spurious: -99 dBc typ.	Low phase noise and spurious improve system EVM (Error Vector Magnitude).
Robust design and construction	To enhance the robustness of DSN-3019A-119+, each internal component is secured to the substrate with chip bonder, thereby eliminating the risk of tombstoning during subsequent solder reflow operations by the customer.

Notes

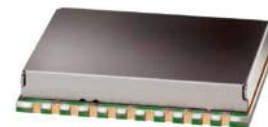
- A. Performance and quality attributes and conditions not expressly stated in this specification document are intended to be excluded and do not form a part of this specification document.
B. Electrical specifications and performance data contained in this specification document are based on Mini-Circuit's applicable established test performance criteria and measurement instructions.
C. The parts covered by this specification document are subject to Mini-Circuits standard limited warranty and terms and conditions (collectively, "Standard Terms"); Purchasers of this part are entitled to the rights and benefits contained therein. For a full statement of the Standard Terms and the exclusive rights and remedies thereunder, please visit Mini-Circuits' website at www.minicircuits.com/MCLStore/terms.jsp



www.minicircuits.com P.O. Box 350166, Brooklyn, NY 11235-0003 (718) 934-4500 sales@minicircuits.com

Features

- Integrated VCO + PLL
- Low phase noise and spurious
- Robust design and construction
- Operating voltage (VCC VCO=+5V, VCC PLL=+15V)



CASE STYLE: KL942

+RoHS Compliant

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

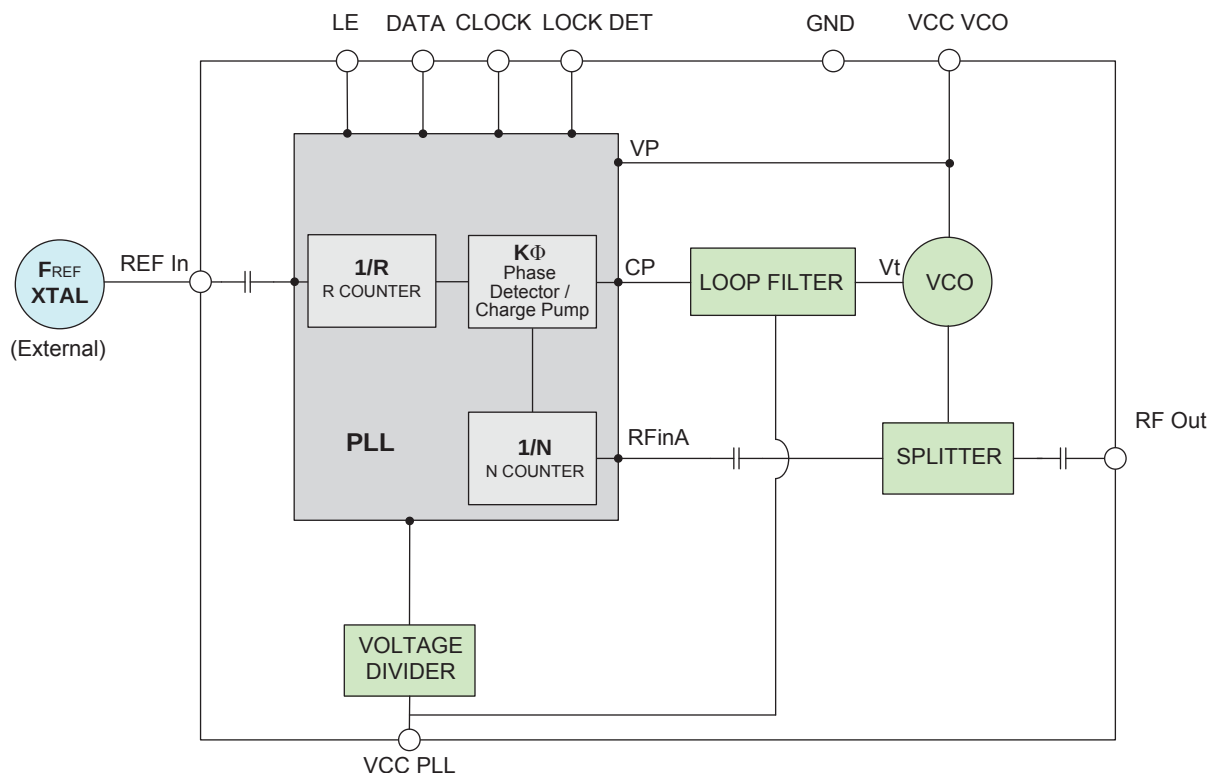
Applications

- Receiver

General Description

The DSN-3019A-119+ is a Frequency Synthesizer, designed to operate from 1788 to 3019 MHz for receiver application. The DSN-3019A-119+ is packaged in a metal case (size of 1.25" x 1.00" x 0.20") to shield against unwanted signals and noise. To enhance the robustness of DSN-3019A-119+, each internal component is secured to the substrate with chip bonder, thereby eliminating the risk of tombstoning during subsequent solder reflow operations by the customer.

Simplified Schematic



Notes

- A. Performance and quality attributes and conditions not expressly stated in this specification document are intended to be excluded and do not form a part of this specification document.
 B. Electrical specifications and performance data contained in this specification document are based on Mini-Circuits' applicable established test performance criteria and measurement instructions.
 C. The parts covered by this specification document are subject to Mini-Circuits standard limited warranty and terms and conditions (collectively, "Standard Terms"); Purchasers of this part are entitled to the rights and benefits contained therein. For a full statement of the Standard Terms and the exclusive rights and remedies thereunder, please visit Mini-Circuits' website at www.minicircuits.com/MCLStore/terms.jsp



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

Parameters		Test Conditions	Min.	Typ.	Max.	Units
Frequency Range		-	1788	-	3019	MHz
Step Size		-	-	100	-	kHz
Settling Time		Within ± 1 kHz	-	20	-	mSec
Output Power		-	-4.0	+1.5	+4.0	dBm
SSB Phase Noise		@ 100 Hz offset	-	-70	-	dBc/Hz
		@ 1 kHz offset	-	-65	-56	
		@ 10 kHz offset	-	-83	-78	
		@ 100 kHz offset	-	-108	-102	
		@ 1 MHz offset	-	-130	-123	
Reference Spurious Suppression		Ref. Freq. 10 MHz	-	-99	-78	dBc
Comparison Spurious Suppression		Step Size 100 kHz	-	-88	-69	
Non - Harmonic Spurious Suppression		-	-	-90	-	
Harmonic Suppression		-	-	-18	-8	
VCO Supply Voltage		+5.00	+4.75	+5.00	+5.25	V
PLL Supply Voltage		+15.00	+14.75	+15.00	+15.25	
VCO Supply Current		-	-	35	41	mA
PLL Supply Current		-	-	13	21	
Reference Input (External)	Frequency	10 (square wave)	-	10	-	MHz
	Amplitude	1	-	1	-	V _{P-P}
	Input impedance	-	-	100	-	K Ω
	Phase Noise @ 1 kHz offset	-	-	-145	-	dBc/Hz
RF Output port Impedance		-	-	50	-	Ω
Input Logic Level	Input high voltage	-	2.65	-	-	V
	Input low voltage	-	-	-	0.65	V
Digital Lock Detect	Locked	-	2.90	-	3.40	V
	Unlocked	-	-	-	0.40	V
Frequency Synthesizer PLL		-	ADF4113			
PLL Programming		-	3-wire serial 3.3V CMOS			
Register Map @ 3019 MHz	F_Register	-	(MSB) 100111111000000000010010 (LSB)			
	N_Register	-	(MSB) 001000111010111100111001 (LSB)			
	R_Register	-	(MSB) 000100000000000110010000 (LSB)			

Absolute Maximum Ratings

Parameters	Ratings
VCO Supply Voltage	6V
PLL Supply Voltage	16V
VCO Supply Voltage to PLL Supply Voltage	N.A
Reference Frequency Voltage	-0.3Vmin, +3.6Vmax
Data, Clock, LE Levels	-0.3Vmin, +3.6Vmax
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

Notes

- A. Performance and quality attributes and conditions not expressly stated in this specification document are intended to be excluded and do not form a part of this specification document.
 B. Electrical specifications and performance data contained in this specification document are based on Mini-Circuit's applicable established test performance criteria and measurement instructions.
 C. The parts covered by this specification document are subject to Mini-Circuits standard limited warranty and terms and conditions (collectively, "Standard Terms"); Purchasers of this part are entitled to the rights and benefits contained therein. For a full statement of the Standard Terms and the exclusive rights and remedies thereunder, please visit Mini-Circuits' website at www.minicircuits.com/MCLStore/terms.jsp



Typical Performance Data

FREQUENCY (MHz)	POWER OUTPUT (dBm)			VCO CURRENT (mA)			PLL CURENT (mA)		
	-45°C	+25°C	+85°C	-45°C	+25°C	+85°C	-45°C	+25°C	+85°C
1788	1.00	1.47	0.84	35.48	36.11	36.25	10.44	13.11	14.95
1888	1.60	1.98	1.32	35.59	36.11	36.26	10.45	13.13	14.96
2016	1.78	2.20	1.47	35.43	36.06	36.29	10.48	13.17	15.00
2144	2.15	2.31	1.62	35.27	36.05	36.34	10.52	13.20	15.03
2272	2.54	2.57	1.92	34.94	35.91	36.35	10.55	13.24	15.06
2400	2.63	2.65	2.01	34.61	35.77	36.33	10.58	13.27	15.09
2528	2.59	2.55	1.84	34.26	35.64	36.33	10.62	13.31	15.12
2656	1.90	1.96	1.09	33.92	35.47	36.29	10.64	13.33	15.14
2784	0.83	1.15	0.46	33.63	35.29	36.21	10.68	13.37	15.17
2912	-0.53	0.20	-0.61	33.36	35.11	36.13	10.70	13.39	15.19
3019	-1.46	-1.03	-1.81	33.10	34.95	36.05	10.73	13.41	15.22

FREQUENCY (MHz)	HARMONICS (dBc)					
	F2			F3		
	-45°C	+25°C	+85°C	-45°C	+25°C	+85°C
1788	-22.92	-22.74	-22.78	-21.68	-24.24	-26.04
1888	-23.59	-24.76	-25.97	-22.37	-24.29	-27.68
2016	-21.37	-23.39	-24.31	-24.74	-27.95	-29.20
2144	-19.08	-22.08	-24.08	-26.80	-31.93	-33.95
2272	-17.23	-20.53	-23.11	-29.37	-34.94	-32.95
2400	-16.83	-18.90	-20.79	-29.22	-28.64	-30.22
2528	-15.01	-16.79	-18.11	-21.20	-23.58	-25.23
2656	-12.77	-14.17	-15.18	-30.28	-32.75	-33.19
2784	-11.36	-13.28	-14.55	-27.43	-29.28	-31.78
2912	-13.59	-14.53	-16.73	-33.77	-33.77	-34.55
3019	-14.95	-16.88	-18.67	-32.21	-32.85	-33.75

Notes

- A. Performance and quality attributes and conditions not expressly stated in this specification document are intended to be excluded and do not form a part of this specification document.
 B. Electrical specifications and performance data contained in this specification document are based on Mini-Circuit's applicable established test performance criteria and measurement instructions.
 C. The parts covered by this specification document are subject to Mini-Circuits standard limited warranty and terms and conditions (collectively, "Standard Terms"); Purchasers of this part are entitled to the rights and benefits contained therein. For a full statement of the Standard Terms and the exclusive rights and remedies thereunder, please visit Mini-Circuits' website at www.minicircuits.com/MCLStore/terms.jsp



FREQUENCY (MHz)	PHASE NOISE (dBc/Hz) @OFFSETS				
	+25°C				
	100Hz	1kHz	10kHz	100kHz	1MHz
1788	-75.49	-66.97	-84.59	-109.05	-130.73
1888	-72.26	-65.08	-84.03	-108.13	-129.60
2016	-73.03	-65.55	-83.05	-107.29	-128.82
2144	-74.20	-64.80	-82.03	-106.81	-128.40
2272	-71.08	-65.16	-81.93	-106.93	-128.67
2400	-72.11	-65.17	-82.83	-107.53	-129.29
2528	-74.14	-65.64	-83.73	-108.31	-130.07
2656	-72.31	-65.81	-83.71	-108.84	-130.50
2784	-70.56	-63.92	-85.26	-110.22	-131.71
2912	-69.64	-63.78	-85.80	-110.82	-132.18
3019	-71.09	-63.67	-86.45	-111.28	-132.46

FREQUENCY (MHz)	PHASE NOISE (dBc/Hz) @OFFSETS				
	-45°C				
	100Hz	1kHz	10kHz	100kHz	1MHz
1788	-73.16	-66.05	-85.67	-107.97	-131.57
1888	-69.66	-61.63	-83.75	-107.12	-128.93
2016	-65.82	-59.81	-82.10	-105.77	-127.24
2144	-66.08	-60.53	-81.28	-105.30	-126.79
2272	-67.07	-61.19	-81.52	-105.81	-127.18
2400	-67.27	-59.99	-81.86	-106.02	-127.57
2528	-66.11	-61.10	-83.31	-107.11	-128.86
2656	-68.29	-60.96	-83.85	-107.73	-129.55
2784	-67.53	-60.58	-85.26	-109.58	-131.28
2912	-66.85	-61.31	-86.08	-110.08	-131.87
3019	-67.57	-61.32	-86.58	-111.12	-132.42

FREQUENCY (MHz)	PHASE NOISE (dBc/Hz) @OFFSETS				
	+85°C				
	100Hz	1kHz	10kHz	100kHz	1MHz
1788	-74.19	-68.50	-84.09	-108.44	-130.57
1888	-73.10	-66.26	-84.41	-108.86	-130.26
2016	-71.20	-66.10	-82.81	-108.01	-129.73
2144	-71.66	-66.03	-82.08	-107.55	-129.52
2272	-72.54	-67.06	-82.09	-107.42	-129.60
2400	-71.87	-65.86	-82.60	-107.85	-129.99
2528	-70.51	-65.94	-83.27	-108.55	-130.66
2656	-71.32	-64.43	-83.31	-108.37	-130.57
2784	-70.31	-64.80	-85.00	-109.31	-131.65
2912	-70.19	-64.50	-85.42	-109.60	-131.95
3019	-66.86	-61.87	-85.98	-109.65	-131.81

Notes
A. Performance and quality attributes and conditions not expressly stated in this specification document are intended to be excluded and do not form a part of this specification document.
B. Electrical specifications and performance data contained in this specification document are based on Mini-Circuit's applicable established test performance criteria and measurement instructions.
C. The parts covered by this specification document are subject to Mini-Circuits standard limited warranty and terms and conditions (collectively, "Standard Terms"); Purchasers of this part are entitled to the rights and benefits contained therein. For a full statement of the Standard Terms and the exclusive rights and remedies thereunder, please visit Mini-Circuits' website at www.minicircuits.com/MCLStore/terms.jsp

COMPARISON SPURIOUS ORDER	COMPARISON SPURIOUS @Fcarrier 1788MHz+(n*Fcomparison) (dBc) note 1			COMPARISON SPURIOUS @Fcarrier 2403MHz+(n*Fcomparison) (dBc) note 1			COMPARISON SPURIOUS @Fcarrier 3019MHz+(n*Fcomparison) (dBc) note 1		
	-45°C	+25°C	+85°C	-45°C	+25°C	+85°C	-45°C	+25°C	+85°C
-5	-90.48	-101.76	-105.72	-89.89	-99.46	-100.58	-93.89	-101.19	-106.36
-4	-87.70	-99.86	-104.66	-90.65	-98.34	-100.76	-93.47	-100.83	-105.14
-3	-83.46	-98.78	-98.24	-93.10	-97.06	-98.34	-93.40	-98.78	-103.74
-2	-77.59	-95.14	-96.74	-95.35	-96.68	-99.83	-89.71	-98.41	-99.73
-1	-75.88	-85.84	-82.53	-84.57	-86.35	-83.88	-86.60	-92.51	-89.32
0 ^{note 2}	-	-	-	-	-	-	-	-	-
+1	-76.07	-84.34	-82.77	-83.76	-87.04	-84.14	-85.67	-91.26	-88.88
+2	-76.88	-92.12	-94.16	-91.66	-96.28	-98.51	-89.65	-99.16	-98.43
+3	-83.21	-96.75	-97.67	-94.10	-98.87	-97.79	-92.06	-97.27	-102.27
+4	-87.19	-99.68	-103.56	-90.82	-97.93	-99.61	-93.79	-101.44	-103.94
+5	-89.92	-100.42	-106.06	-89.35	-100.02	-102.14	-93.96	-101.11	-106.88

Note 1: Comparison frequency 100 kHz

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

REFERENCE SPURIOUS ORDER	REFERENCE SPURIOUS @Fcarrier 1788MHz+(n*Freference) (dBc) note 3			REFERENCE SPURIOUS @Fcarrier 2403MHz+(n*Freference) (dBc) note 3			REFERENCE SPURIOUS @Fcarrier 3019MHz+(n*Freference) (dBc) note 3		
	-45°C	+25°C	+85°C	-45°C	+25°C	+85°C	-45°C	+25°C	+85°C
-5	-128.10	-127.82	-119.32	-128.45	-129.08	-126.32	-124.29	-121.83	-123.33
-4	-128.72	-129.16	-120.58	-126.16	-130.62	-124.66	-120.85	-118.80	-120.32
-3	-129.02	-129.10	-120.89	-125.37	-129.99	-125.62	-124.73	-123.41	-117.99
-2	-116.53	-115.96	-116.66	-118.91	-115.81	-115.26	-111.85	-105.63	-113.97
-1	-104.04	-102.93	-106.24	-103.19	-104.76	-95.61	-96.38	-87.69	-108.96
0 ^{note 4}	-	-	-	-	-	-	-	-	-
+1	-101.37	-100.09	-102.24	-103.16	-103.35	-102.72	-98.13	-94.99	-115.09
+2	-118.08	-117.35	-116.97	-111.56	-113.70	-113.53	-117.21	-110.89	-119.80
+3	-128.34	-128.25	-118.80	-123.18	-125.51	-123.88	-119.35	-118.71	-119.83
+4	-126.66	-128.35	-118.88	-128.44	-129.39	-124.68	-119.56	-117.95	-120.84
+5	-128.50	-129.69	-119.14	-127.89	-128.88	-124.40	-122.84	-121.46	-120.03

Note 3: Reference frequency 10 MHz

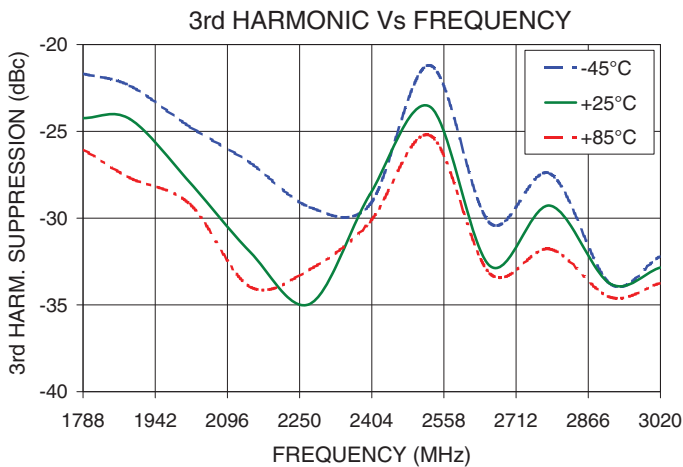
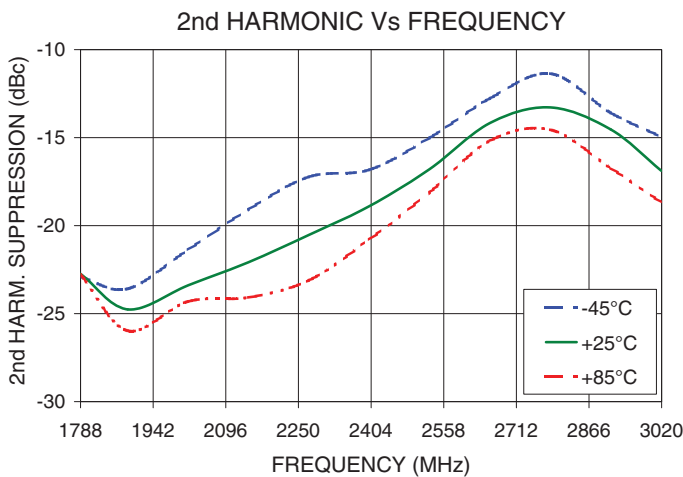
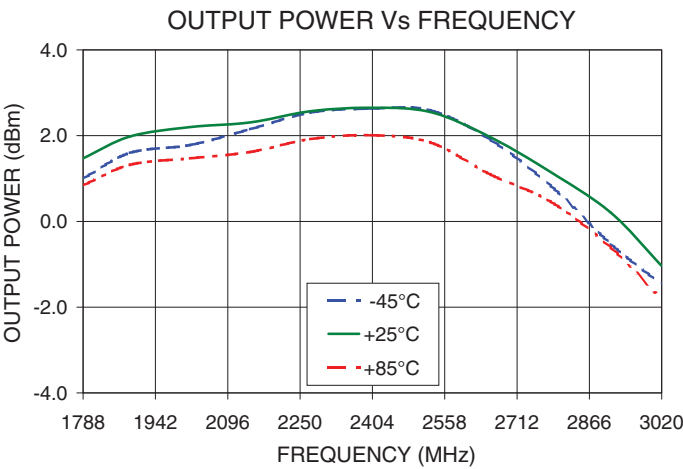
Note 4: All spurs are referenced to carrier signal (n=0).

Notes

- A. Performance and quality attributes and conditions not expressly stated in this specification document are intended to be excluded and do not form a part of this specification document.
 B. Electrical specifications and performance data contained in this specification document are based on Mini-Circuits' applicable established test performance criteria and measurement instructions.
 C. The parts covered by this specification document are subject to Mini-Circuits standard limited warranty and terms and conditions (collectively, "Standard Terms"); Purchasers of this part are entitled to the rights and benefits contained therein. For a full statement of the Standard Terms and the exclusive rights and remedies thereunder, please visit Mini-Circuits' website at www.minicircuits.com/MCLStore/terms.jsp



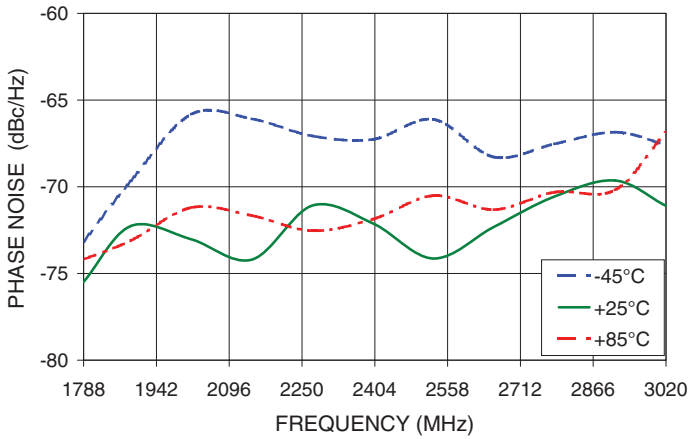
Typical Performance Curves



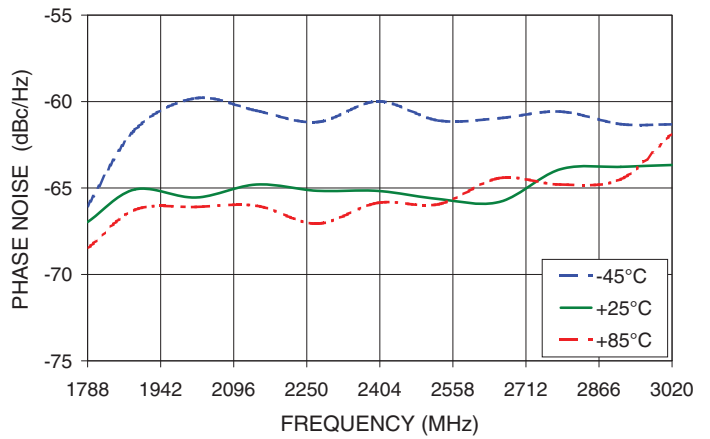
Notes
A. Performance and quality attributes and conditions not expressly stated in this specification document are intended to be excluded and do not form a part of this specification document.
B. Electrical specifications and performance data contained in this specification document are based on Mini-Circuits' applicable established test performance criteria and measurement instructions.
C. The parts covered by this specification document are subject to Mini-Circuits standard limited warranty and terms and conditions (collectively, "Standard Terms"); Purchasers of this part are entitled to the rights and benefits contained therein. For a full statement of the Standard Terms and the exclusive rights and remedies thereunder, please visit Mini-Circuits' website at www.minicircuits.com/MCLStore/terms.jsp



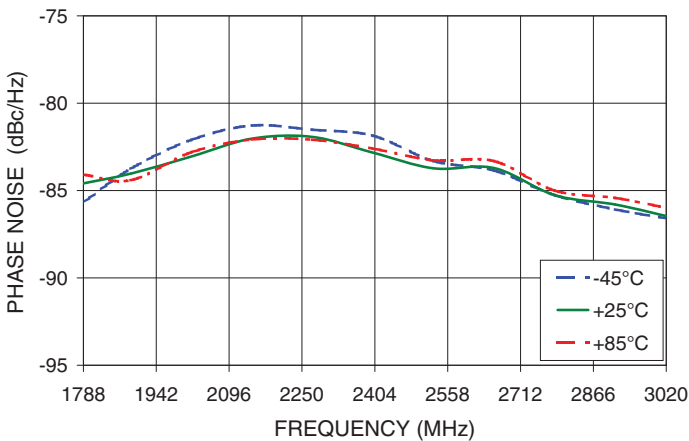
PHASE NOISE @ 100Hz offset



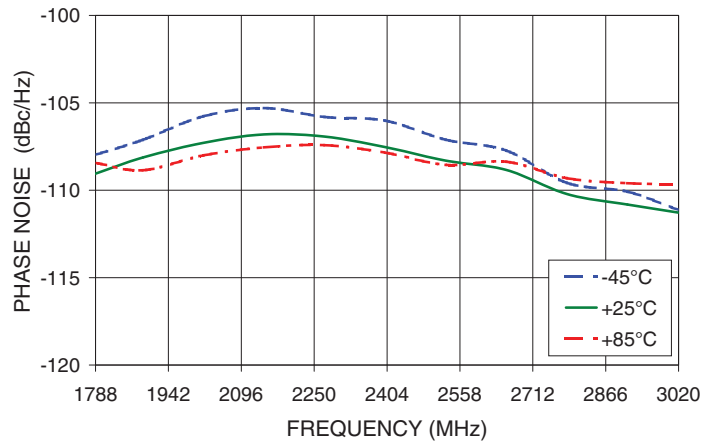
PHASE NOISE @ 1kHz offset



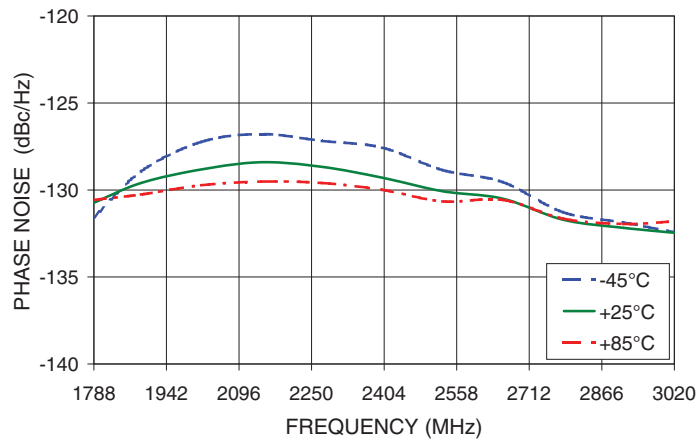
PHASE NOISE @ 10 kHz offset



PHASE NOISE @ 100 kHz offset



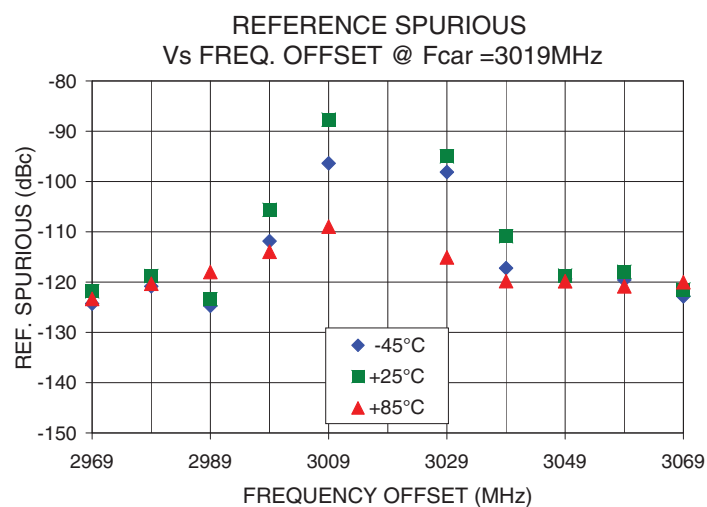
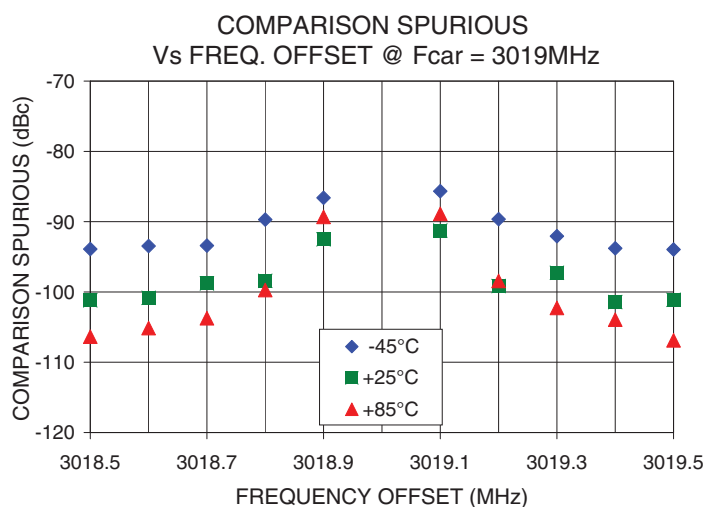
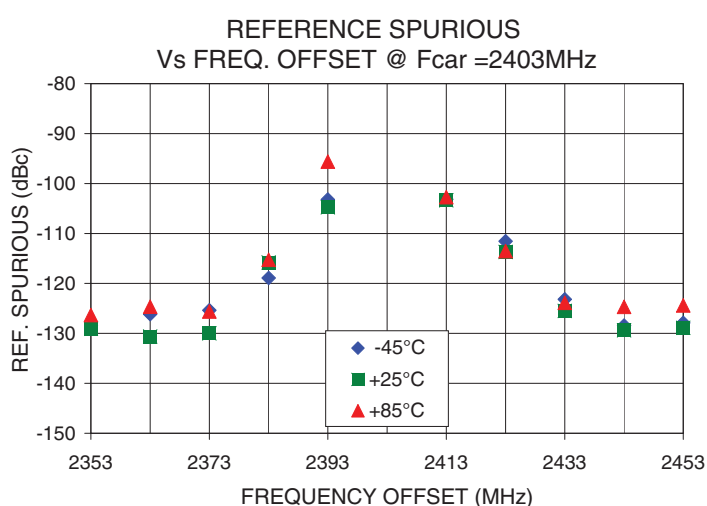
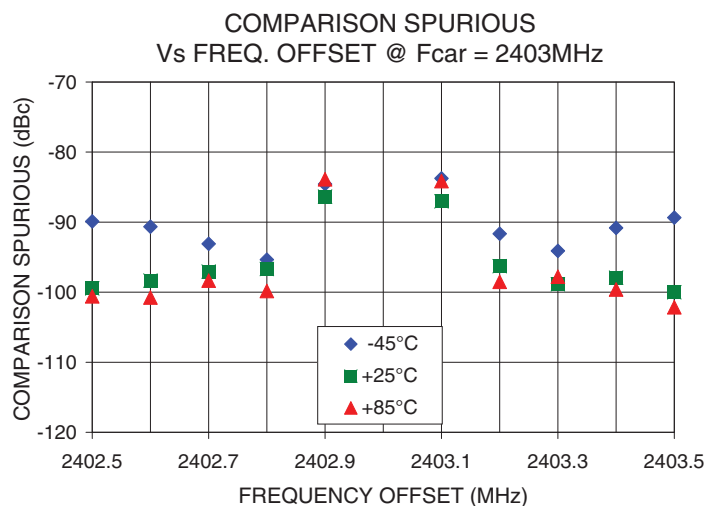
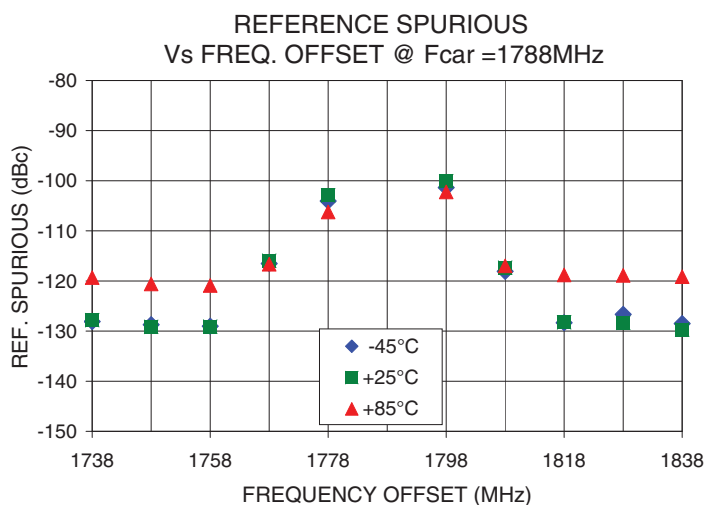
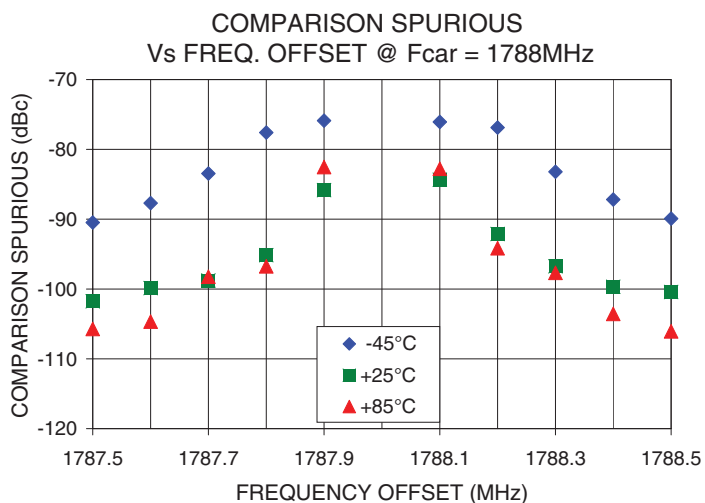
PHASE NOISE @ 1MHz offset



Notes

- A. Performance and quality attributes and conditions not expressly stated in this specification document are intended to be excluded and do not form a part of this specification document.
- B. Electrical specifications and performance data contained in this specification document are based on Mini-Circuits' applicable established test performance criteria and measurement instructions.
- C. The parts covered by this specification document are subject to Mini-Circuits standard limited warranty and terms and conditions (collectively, "Standard Terms"); Purchasers of this part are entitled to the rights and benefits contained therein. For a full statement of the Standard Terms and the exclusive rights and remedies thereunder, please visit Mini-Circuits' website at www.minicircuits.com/MCLStore/terms.jsp



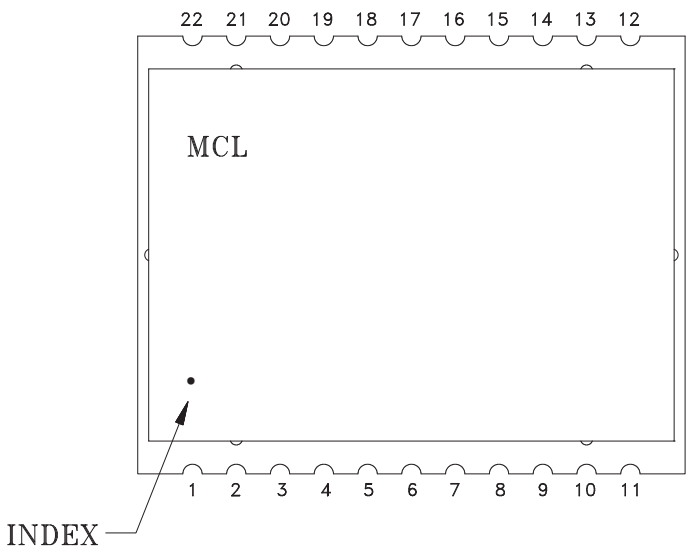


Notes

- A. Performance and quality attributes and conditions not expressly stated in this specification document are intended to be excluded and do not form a part of this specification document.
 B. Electrical specifications and performance data contained in this specification document are based on Mini-Circuits' applicable established test performance criteria and measurement instructions.
 C. The parts covered by this specification document are subject to Mini-Circuits standard limited warranty and terms and conditions (collectively, "Standard Terms"); Purchasers of this part are entitled to the rights and benefits contained therein. For a full statement of the Standard Terms and the exclusive rights and remedies thereunder, please visit Mini-Circuits' website at www.minicircuits.com/MCLStore/terms.jsp



Pin Configuration

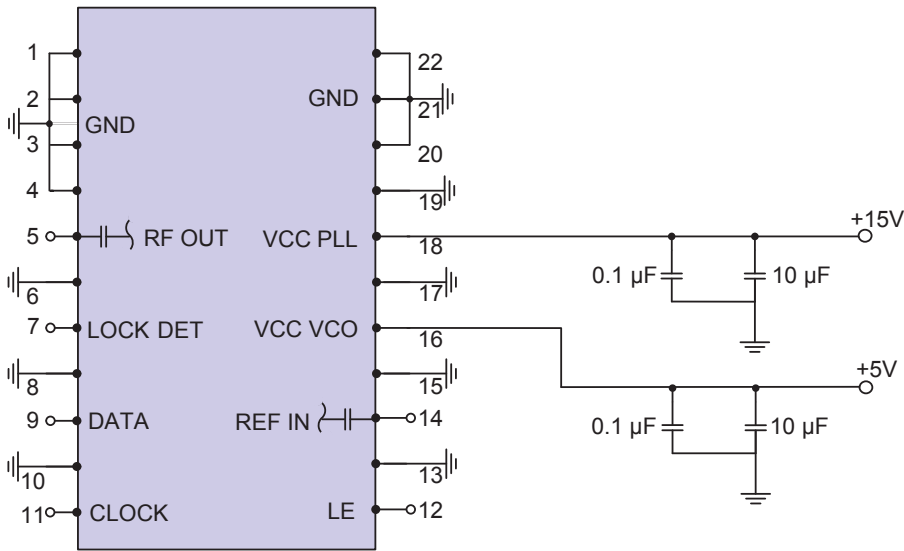


Pin Connection

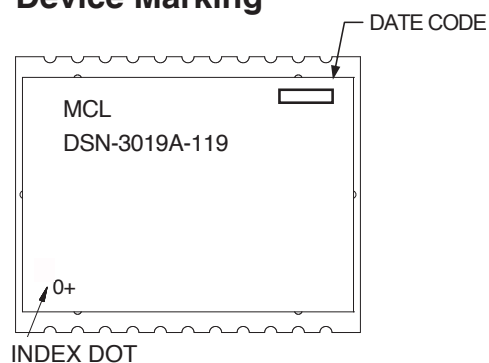
Pin Number	Function	Pin Number	Function
1	GND	12	LE
2	GND	13	GND
3	GND	14	REF IN
4	GND	15	GND
5	RF OUT	16	VCC VCO
6	GND	17	GND
7	LOCK DET	18	VCC PLL
8	GND	19	GND
9	DATA	20	GND
10	GND	21	GND
11	CLOCK	22	GND

Recommended Application Circuit

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



Notes
A. Performance and quality attributes and conditions not expressly stated in this specification document are intended to be excluded and do not form a part of this specification document.
B. Electrical specifications and performance data contained in this specification document are based on Mini-Circuit's applicable established test performance criteria and measurement instructions.
C. The parts covered by this specification document are subject to Mini-Circuits standard limited warranty and terms and conditions (collectively, "Standard Terms"); Purchasers of this part are entitled to the rights and benefits contained therein. For a full statement of the Standard Terms and the exclusive rights and remedies thereunder, please visit Mini-Circuits' website at www.minicircuits.com/MCLStore/terms.jsp

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: KL942

Tape & Reel: TR-F97

Suggested Layout for PCB Design: PL-318

Evaluation Board: TB-553+

Environment Ratings: ENV03T2

Notes

- A. Performance and quality attributes and conditions not expressly stated in this specification document are intended to be excluded and do not form a part of this specification document.
B. Electrical specifications and performance data contained in this specification document are based on Mini-Circuit's applicable established test performance criteria and measurement instructions.
C. The parts covered by this specification document are subject to Mini-Circuits standard limited warranty and terms and conditions (collectively, "Standard Terms"); Purchasers of this part are entitled to the rights and benefits contained therein. For a full statement of the Standard Terms and the exclusive rights and remedies thereunder, please visit Mini-Circuits' website at www.minicircuits.com/MCLStore/terms.jsp



Typical Performance Data

FREQ. (MHz)	POWER OUTPUT (dBm)			HARMONICS						VCO CURRENT (mA)			PLL CURENT (mA)		
				(dBc)											
	-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
1788	1.00	1.47	0.84	-22.92	-22.74	-22.78	-21.68	-24.24	-26.04	35.48	36.11	36.25	10.44	13.11	14.95
1888	1.60	1.98	1.32	-23.59	-24.76	-25.97	-22.37	-24.29	-27.68	35.59	36.11	36.26	10.45	13.13	14.96
2016	1.78	2.20	1.47	-21.37	-23.39	-24.31	-24.74	-27.95	-29.20	35.43	36.06	36.29	10.48	13.17	15.00
2144	2.15	2.31	1.62	-19.08	-22.08	-24.08	-26.80	-31.93	-33.95	35.27	36.05	36.34	10.52	13.20	15.03
2272	2.54	2.57	1.92	-17.23	-20.53	-23.11	-29.37	-34.94	-32.95	34.94	35.91	36.35	10.55	13.24	15.06
2400	2.63	2.65	2.01	-16.83	-18.90	-20.79	-29.22	-28.64	-30.22	34.61	35.77	36.33	10.58	13.27	15.09
2528	2.59	2.55	1.84	-15.01	-16.79	-18.11	-21.20	-23.58	-25.23	34.26	35.64	36.33	10.62	13.31	15.12
2656	1.90	1.96	1.09	-12.77	-14.17	-15.18	-30.28	-32.75	-33.19	33.92	35.47	36.29	10.64	13.33	15.14
2784	0.83	1.15	0.46	-11.36	-13.28	-14.55	-27.43	-29.28	-31.78	33.63	35.29	36.21	10.68	13.37	15.17
2912	-0.53	0.20	-0.61	-13.59	-14.53	-16.73	-33.77	-33.77	-34.55	33.36	35.11	36.13	10.70	13.39	15.19
3019	-1.46	-1.03	-1.81	-14.95	-16.88	-18.67	-32.21	-32.85	-33.75	33.10	34.95	36.05	10.73	13.41	15.22

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
1788	-73.16	-66.05	-85.67	-107.97	-131.57	-75.49	-66.97	-84.59	-109.05	-130.73	-74.19	-68.50	-84.09	-108.44	-130.57
1888	-69.66	-61.63	-83.75	-107.12	-128.93	-72.26	-65.08	-84.03	-108.13	-129.60	-73.10	-66.26	-84.41	-108.86	-130.26
2016	-65.82	-59.81	-82.10	-105.77	-127.24	-73.03	-65.55	-83.05	-107.29	-128.82	-71.20	-66.10	-82.81	-108.01	-129.73
2144	-66.08	-60.53	-81.28	-105.30	-126.79	-74.20	-64.80	-82.03	-106.81	-128.40	-71.66	-66.03	-82.08	-107.55	-129.52
2272	-67.07	-61.19	-81.52	-105.81	-127.18	-71.08	-65.16	-81.93	-106.93	-128.67	-72.54	-67.06	-82.09	-107.42	-129.60
2400	-67.27	-59.99	-81.86	-106.02	-127.57	-72.11	-65.17	-82.83	-107.53	-129.29	-71.87	-65.86	-82.60	-107.85	-129.99
2528	-66.11	-61.10	-83.31	-107.11	-128.86	-74.14	-65.64	-83.73	-108.31	-130.07	-70.51	-65.94	-83.27	-108.55	-130.66
2656	-68.29	-60.96	-83.85	-107.73	-129.55	-72.31	-65.81	-83.71	-108.84	-130.50	-71.32	-64.43	-83.31	-108.37	-130.57
2784	-67.53	-60.58	-85.26	-109.58	-131.28	-70.56	-63.92	-85.26	-110.22	-131.71	-70.31	-64.80	-85.00	-109.31	-131.65
2912	-66.85	-61.31	-86.08	-110.08	-131.87	-69.64	-63.78	-85.80	-110.82	-132.18	-70.19	-64.50	-85.42	-109.60	-131.95
3019	-67.57	-61.32	-86.58	-111.12	-132.42	-71.09	-63.67	-86.45	-111.28	-132.46	-66.86	-61.87	-85.98	-109.65	-131.81

Typical Performance Data

COMPARISON SPURIOUS ORDER	COMPARISON SPURIOUS @Fcarrier 1788MHz± (n*Fcomparison) (dBc) NOTE 1			COMPARISON SPURIOUS @Fcarrier 2403MHz± (n*Fcomparison) (dBc) NOTE 1			COMPARISON SPURIOUS @Fcarrier 3019MHz± (n*Fcomparison) (dBc) NOTE 1		
	-45°C	+25°C	+85°C	-45°C	+25°C	+85°C	-45°C	+25°C	+85°C
-5	-90.48	-101.76	-105.72	-89.89	-99.46	-100.58	-93.89	-101.19	-106.36
-4	-87.70	-99.86	-104.66	-90.65	-98.34	-100.76	-93.47	-100.83	-105.14
-3	-83.46	-98.78	-98.24	-93.10	-97.06	-98.34	-93.40	-98.78	-103.74
-2	-77.59	-95.14	-96.74	-95.35	-96.68	-99.83	-89.71	-98.41	-99.73
-1	-75.88	-85.84	-82.53	-84.57	-86.35	-83.88	-86.60	-92.51	-89.32
0 ^{note 2}	-	-	-	-	-	-	-	-	-
+1	-76.07	-84.34	-82.77	-83.76	-87.04	-84.14	-85.67	-91.26	-88.88
+2	-76.88	-92.12	-94.16	-91.66	-96.28	-98.51	-89.65	-99.16	-98.43
+3	-83.21	-96.75	-97.67	-94.10	-98.87	-97.79	-92.06	-97.27	-102.27
+4	-87.19	-99.68	-103.56	-90.82	-97.93	-99.61	-93.79	-101.44	-103.94
+5	-89.92	-100.42	-106.06	-89.35	-100.02	-102.14	-93.96	-101.11	-106.88

Note 1: Comparison frequency 100 kHz

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

REFERENCE SPURIOUS ORDER	REFERENCE SPURIOUS @Fcarrier 1788MHz± (n*Freference) (dBc) NOTE 3			REFERENCE SPURIOUS @Fcarrier 2403MHz± (n*Freference) (dBc) NOTE 3			REFERENCE SPURIOUS @Fcarrier 3019MHz± (n*Freference) (dBc) NOTE 3		
	-45°C	+25°C	+85°C	-45°C	+25°C	+85°C	-45°C	+25°C	+85°C
-5	-128.10	-127.82	-119.32	-128.45	-129.08	-126.32	-124.29	-121.83	-123.33
-4	-128.72	-129.16	-120.58	-126.16	-130.62	-124.66	-120.85	-118.80	-120.32
-3	-129.02	-129.10	-120.89	-125.37	-129.99	-125.62	-124.73	-123.41	-117.99
-2	-116.53	-115.96	-116.66	-118.91	-115.81	-115.26	-111.85	-105.63	-113.97
-1	-104.04	-102.93	-106.24	-103.19	-104.76	-95.61	-96.38	-87.69	-108.96
0 ^{note 4}	-	-	-	-	-	-	-	-	-
+1	-101.37	-100.09	-102.24	-103.16	-103.35	-102.72	-98.13	-94.99	-115.09
+2	-118.08	-117.35	-116.97	-111.56	-113.70	-113.53	-117.21	-110.89	-119.80
+3	-128.34	-128.25	-118.80	-123.18	-125.51	-123.88	-119.35	-118.71	-119.83
+4	-126.66	-128.35	-118.88	-128.44	-129.39	-124.68	-119.56	-117.95	-120.84
+5	-128.50	-129.69	-119.14	-127.89	-128.88	-124.40	-122.84	-121.46	-120.03

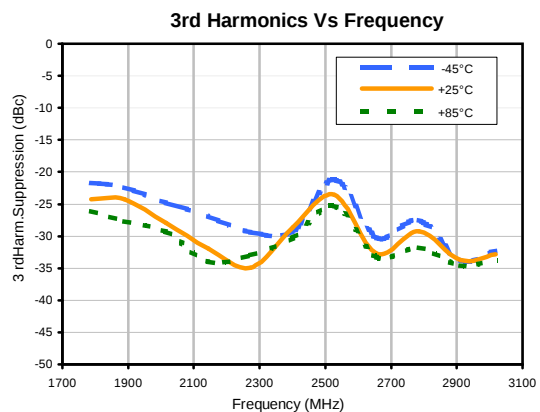
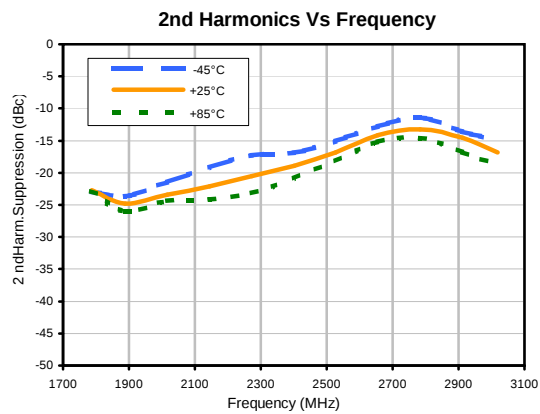
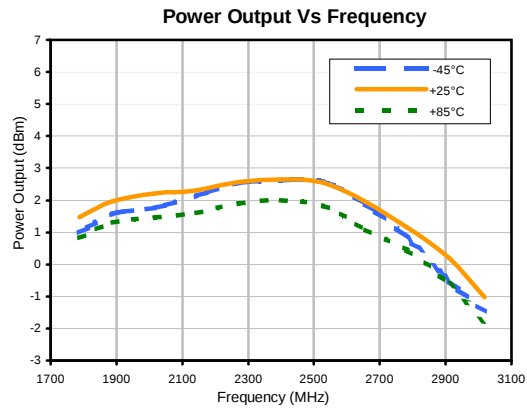
Note 3: Reference frequency 10 MHz

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

Frequency Synthesizer

Typical Performance Data

DSN-3019A-119+



REV. X1
DSN-3019A-119+
100121
Page 1 of 3



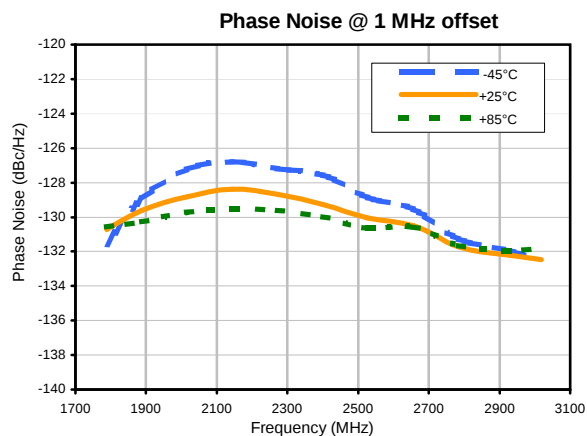
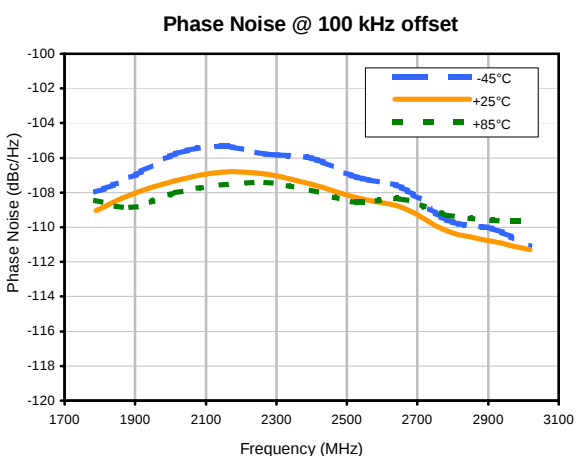
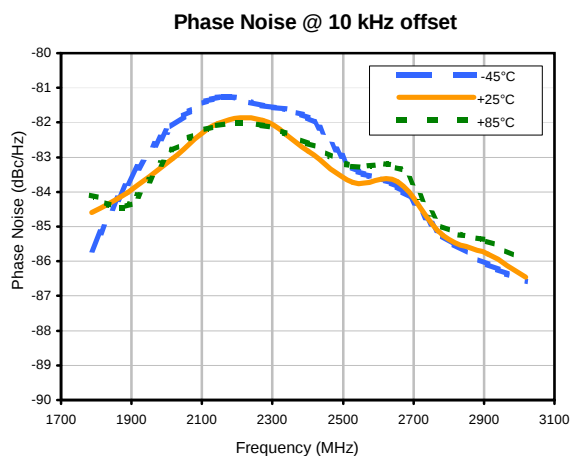
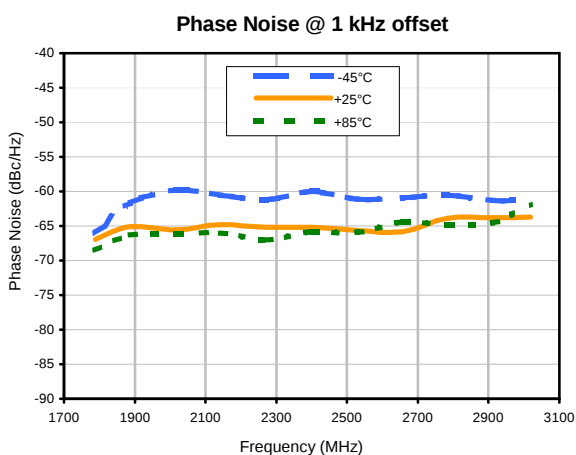
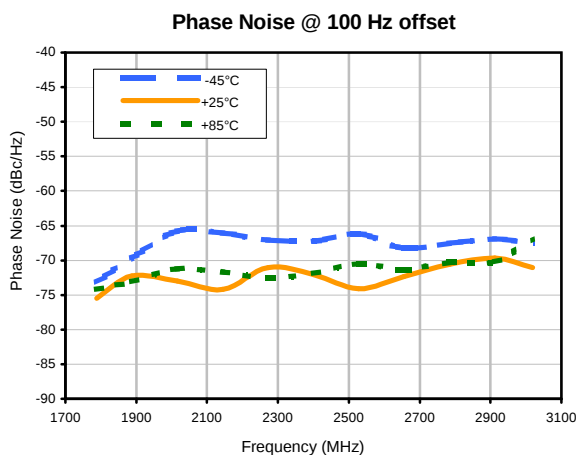
IF/RF MICROWAVE COMPONENTS • ISO 9001 ISO 14001 AS 9100 CERTIFIED RoHS compliant
P.O. Box 350166, Brooklyn, New York 11235-0003 (718) 934-4500 Fax (718) 332-4661



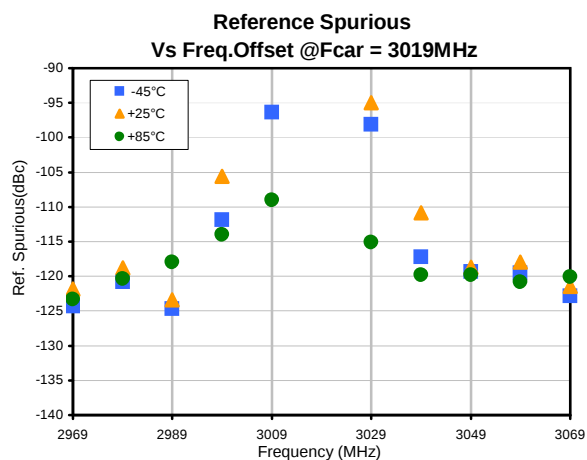
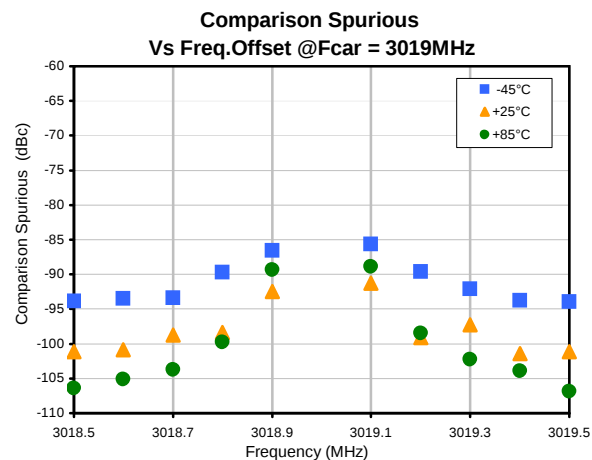
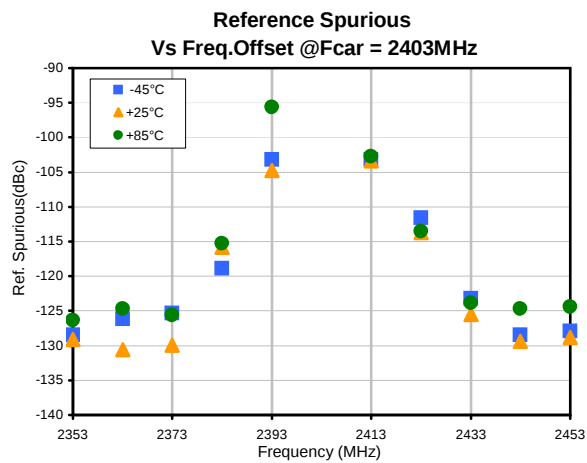
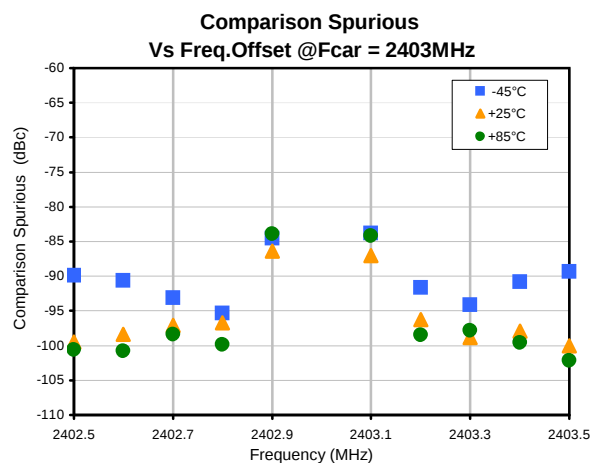
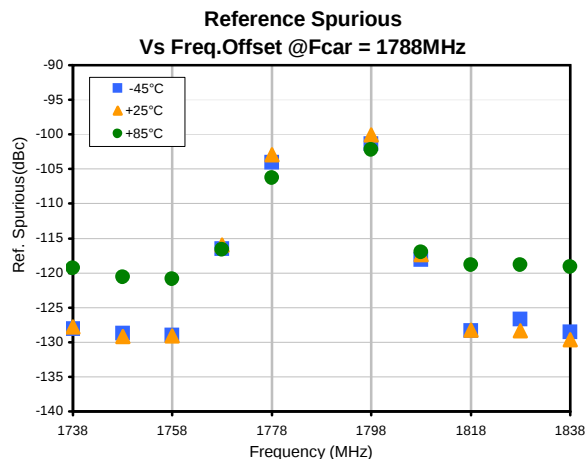
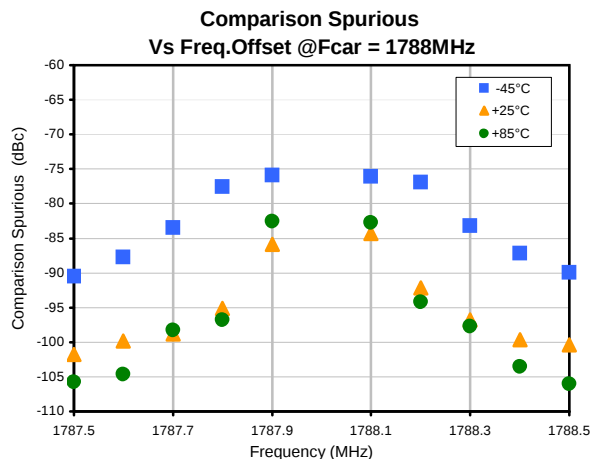
The Design Engineers Search Engine finds the model you need, Instantly • For detailed performance specs & shopping online see



Typical Performance Data

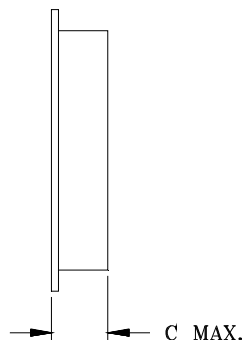
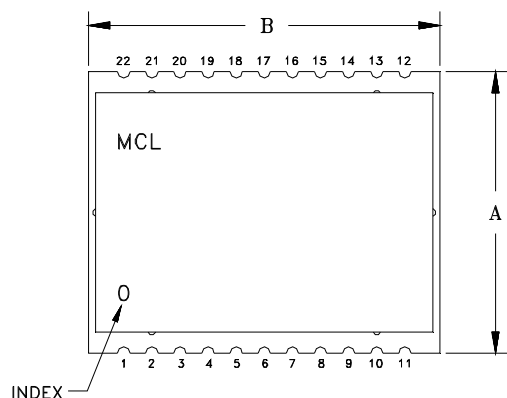


Typical Performance Data

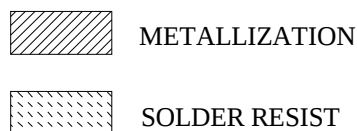
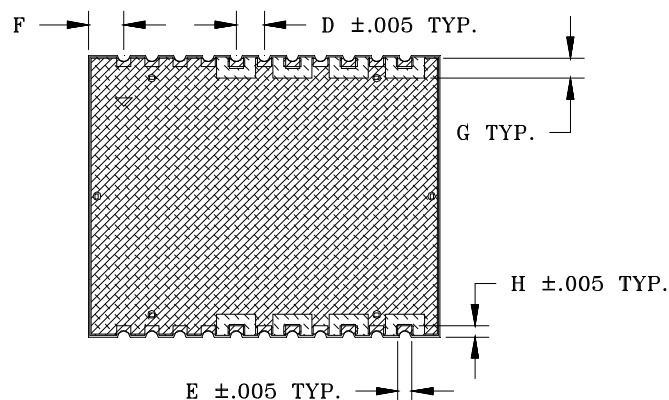
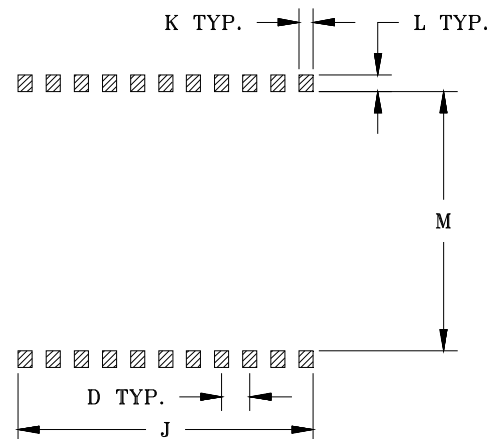


Outline Dimensions

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>

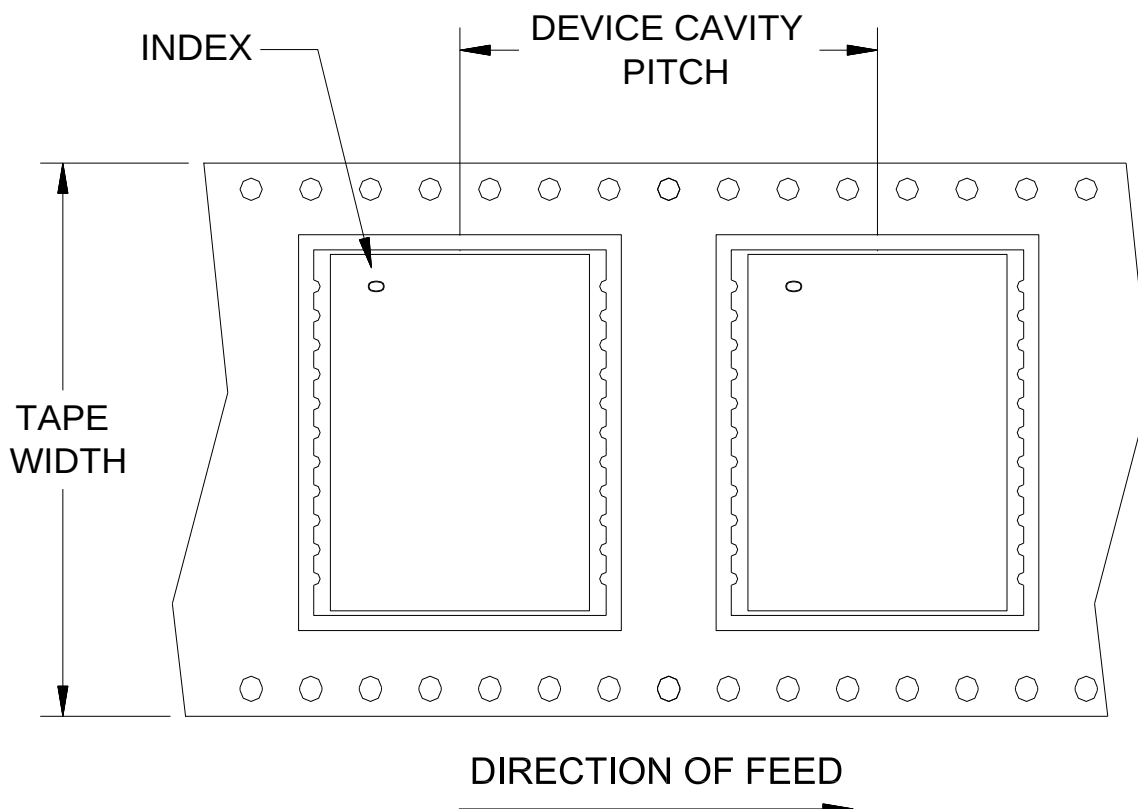
P.O. Box 350166, Brooklyn, New York 11235-0003 (718) 934-4500 Fax (718) 332-4661

Distribution Centers NORTH AMERICA 800-654-7949 • 417-335-5935 • Fax 417-335-5945 • EUROPE 44-1252-832600 • Fax 44-1252-837010

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.

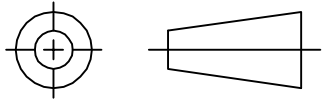
Go to: www.minicircuits.com/pages/pdfs/tape.pdf

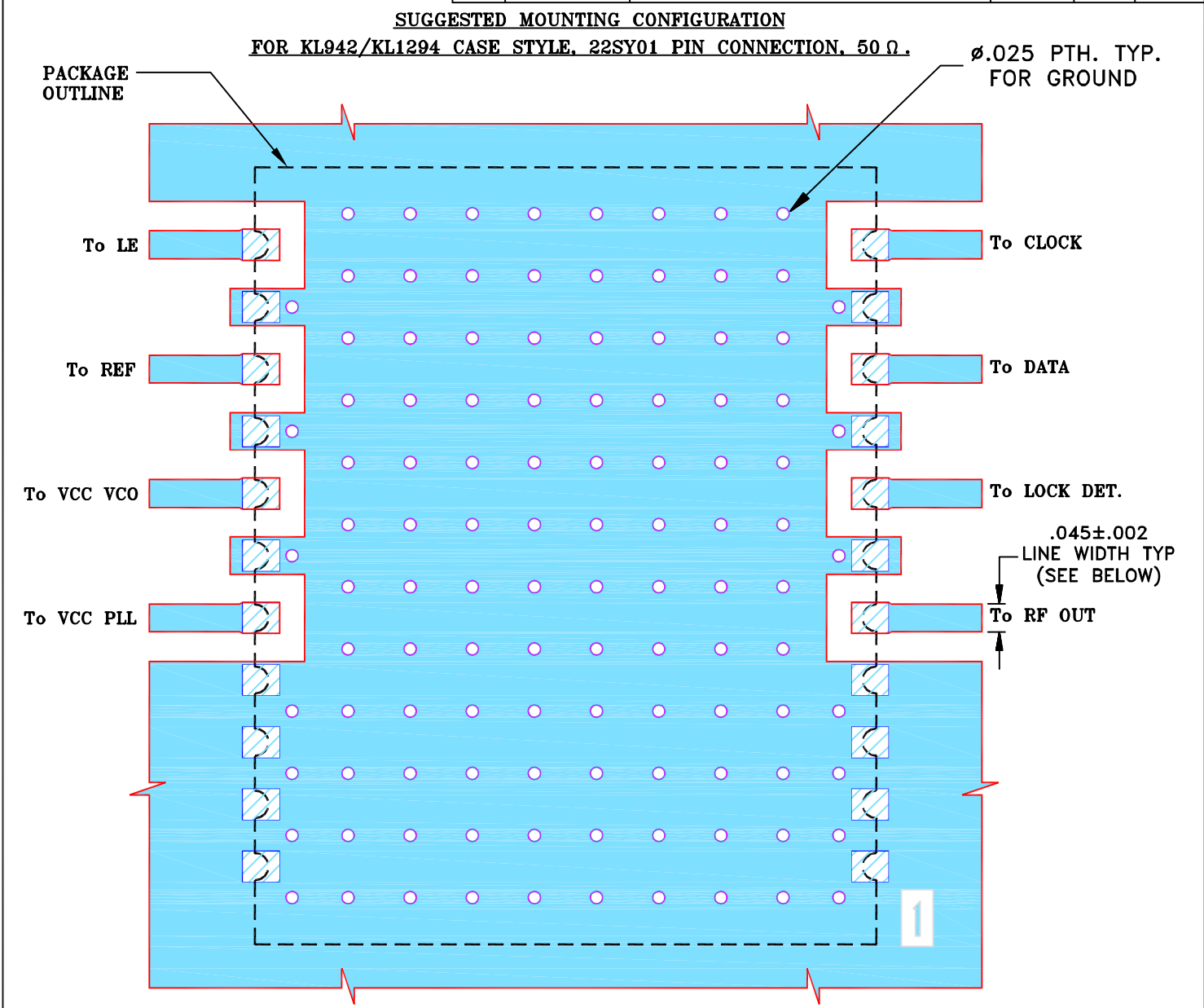


Mini-Circuits®
Distribution Centers NORTH AMERICA 800-654-7949 • 417-335-5935 • Fax 417-335-5945 • EUROPE 44-1252-832600 • Fax 44-1252-837010
Mini-Circuits ISO 9001 & ISO 14001 Certified

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

P.O. Box 350166, Brooklyn, New York 11235-0003 (718) 934-4500 Fax (718) 332-4661

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



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.

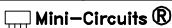


DENOTES PCB COPPER LAYOUT WITH SMOBC (SOLDER MASK OVER BARE COPPER)



DENOTES COPPER LAND PATTERN FREE OF SOLDERMASK

UNLESS OTHERWISE SPECIFIED	INITIALS		DATE
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 ±			



THIS DOCUMENT AND ITS CONTENTS ARE THE PROPERTY OF MINI-CIRCUITS. EXCEPT FOR USE EXPRESSLY GRANTED, IN WRITING, TO ITS VENDORS, VENDEE AND THE UNITED STATES GOVERNMENT, MINI-CIRCUITS RESERVES ALL PROPRIETARY DESIGN, USE, MANUFACTURING AND REPRODUCTION RIGHTS THERETO. THESE CONTENTS SHALL NOT BE USED, DUPLICATED OR DISCLOSED TO ANY OUTSIDE PARTY, IN WHOLE OR IN PART, WITHOUT WRITTEN PERMISSION OF MINI-CIRCUITS.

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

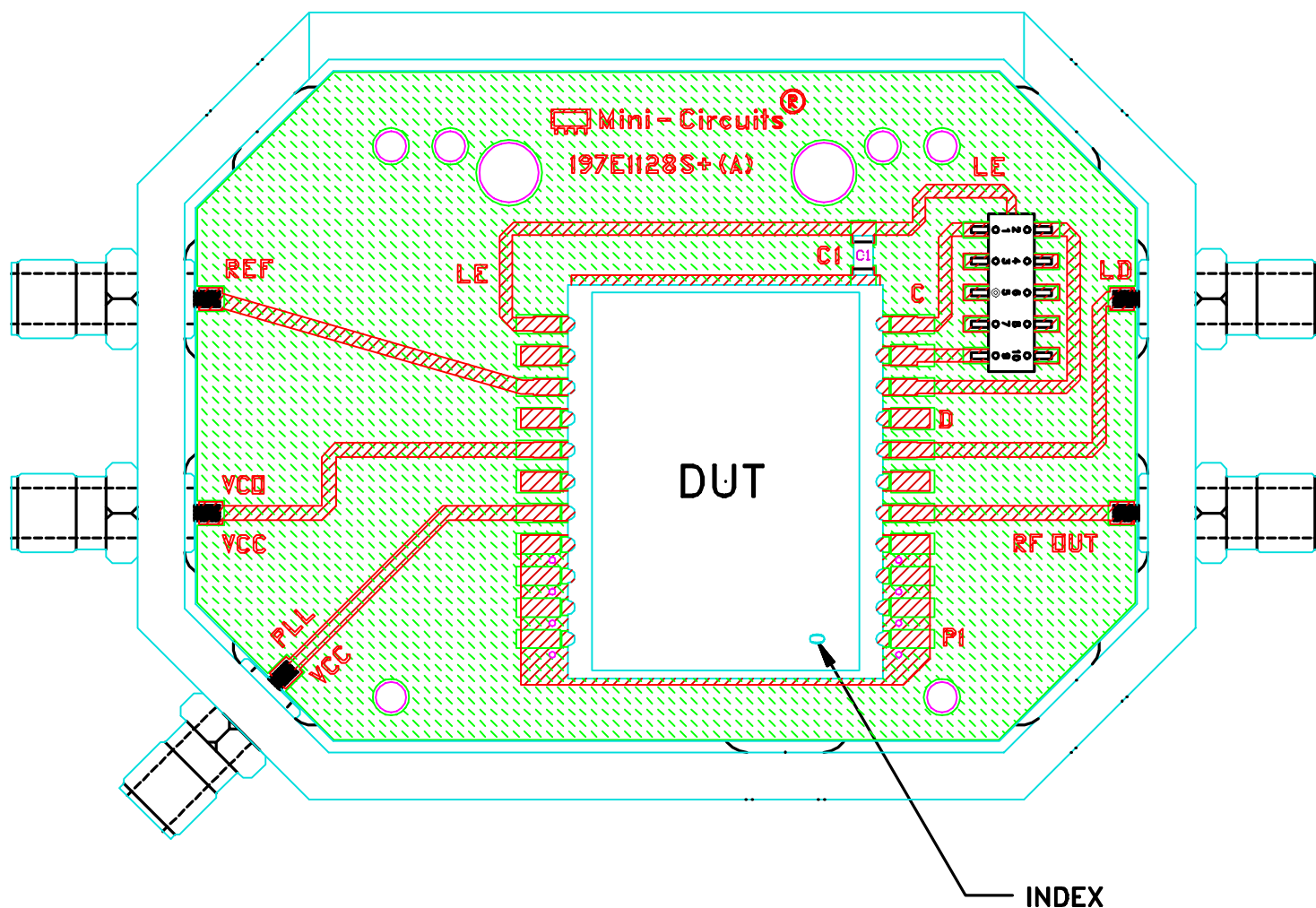


Mini-Circuits®
13 Neptune Avenue
Brooklyn NY 11235

PL, 22SY01, KL942/KL1294, DSN
TB-553+ (50 Ω)

SIZE A	CODE IDENT 15542	DRAWING NO: 98-PL-318	REV: OR
FILE: 98PL318	SCALE: 4:1	SHEET: 1 OF 1	

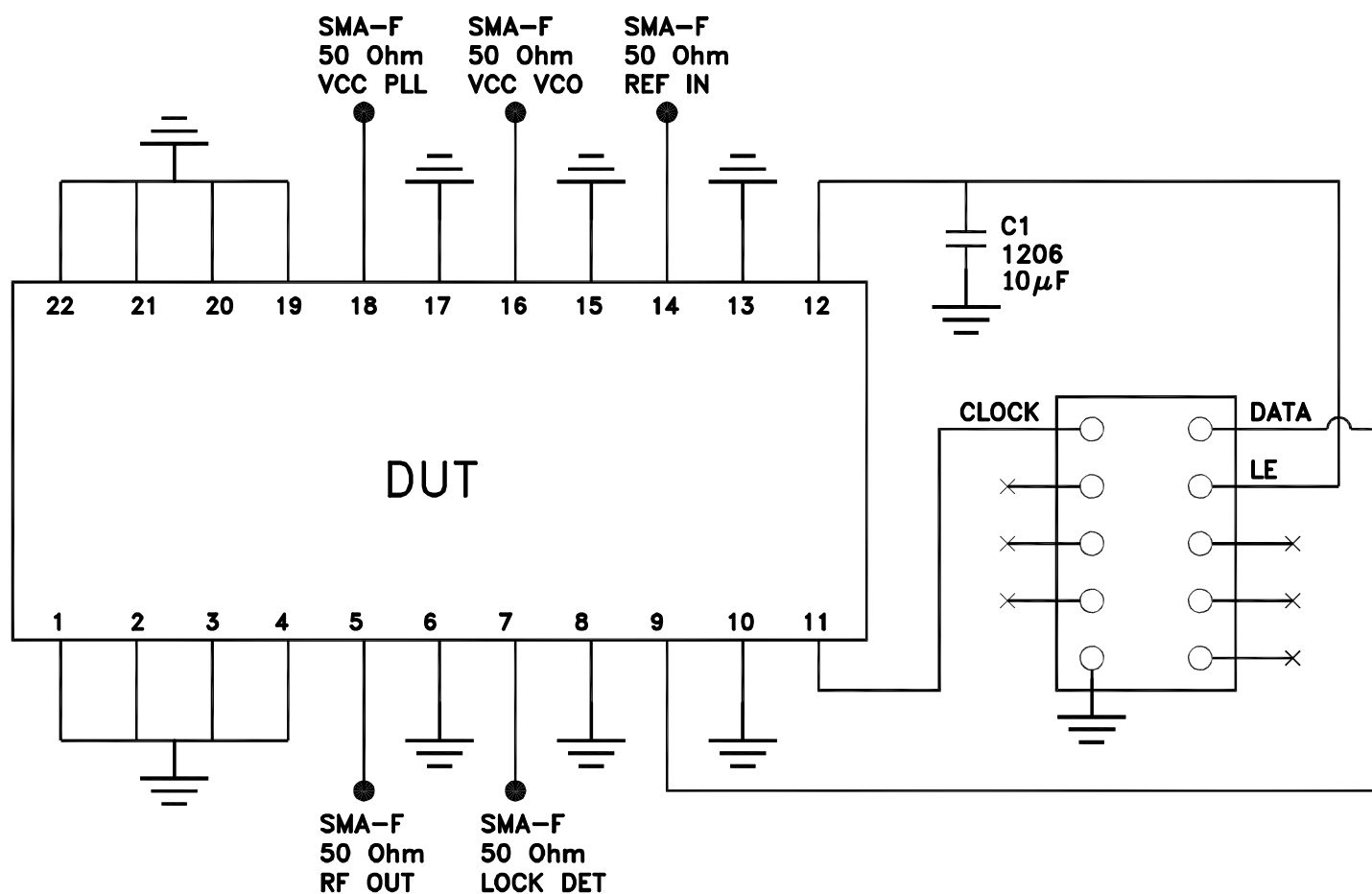
Evaluation Board and Circuit



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	-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