Frequency Synthesizer KSN-2457A-1C19+

50Ω 2457.6 MHz (fixed)

The Big Deal

- Low phase noise and spurious
- Fixed frequency without external programming
- Integrated microcontroller
- Robust design and construction
- Small size 0.80" x 0.58" x 0.24"

CASE STYLE: DK1171

Product Overview

The KSN-2457A-1C19+ is a Frequency Synthesizer, designed to operate 2457.6MHz for CATV applications. The KSN-2457A-1C19+ is packaged in a metal case (size of 0.80" x 0.58" x 0.24") to shield against unwanted signals and noise.

Key Features

Feature	Advantages
Low phase noise and spurious: • Phase noise: -110 dBc/Hz typ. @ 10 kHz offset • Comparison spurious: -95 dBc typ. • Reference spurious: -95 dBc typ.	Low phase noise and spurious improve system EVM (Error Vector Magnitude).
Robust design and construction	To enhance the robustness of KSN-2457A-1C19+, 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.
Small size, 0.80" x 0.58" x 0.24"	The small size enables the KSN-2457A-1C19+ to be used in compact designs.

Surface Mount

Frequency Synthesizer

KSN-2457A-1C19+

50Ω 2457.6 MHz (fixed)

Features

- Fixed frequency without external programming
- Integrated microcontroller
- High reliability over temperature changes
- Robust design and construction
- Low operating voltage (VCC VCO=+5V, VCC PLL=+3.3V)
- Small size 0.80" x 0.58" x 0.24"

CASE STYLE: DK1171
PRICE: $32.95 ea. QTY (1-9)

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

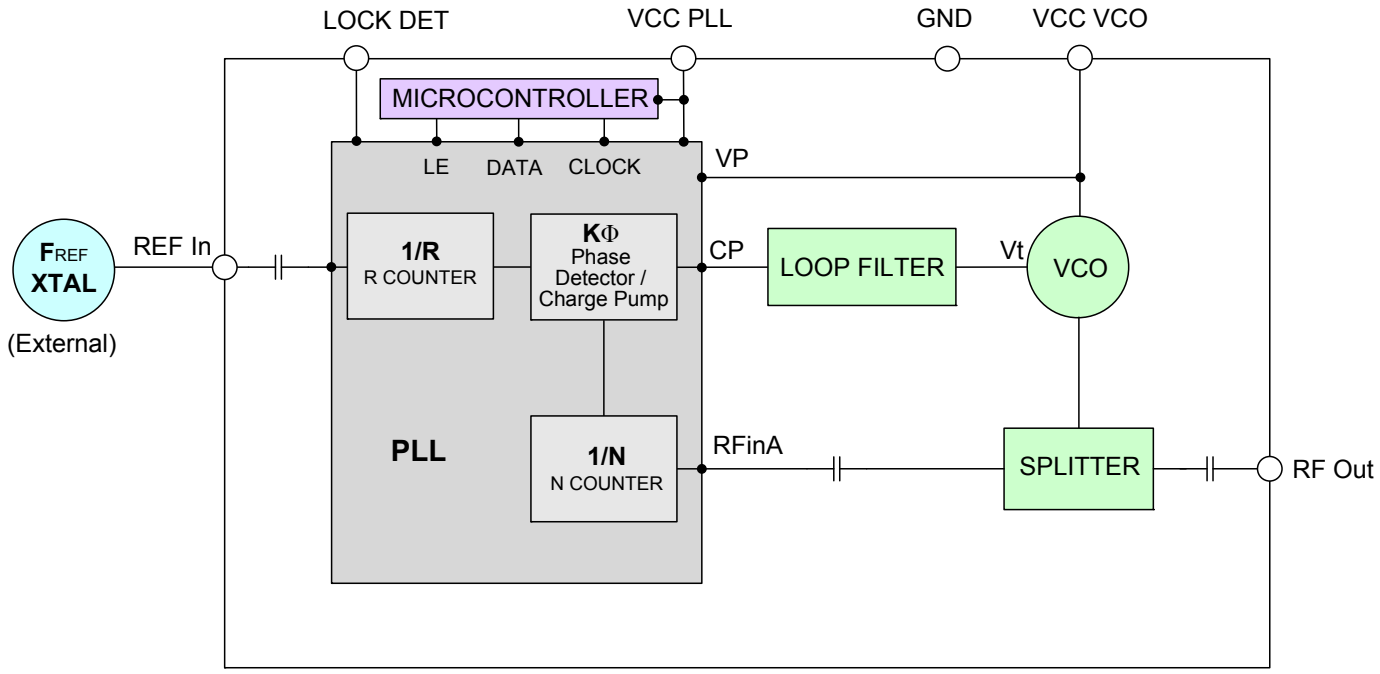
Applications

- CATV

General Description

The KSN-2457A-1C19+ is a Frequency Synthesizer, designed to operate 2457.6MHz for CATV applications. The KSN-2457A-1C19+ is packaged in a metal case (size of 0.80" x 0.58" x 0.24") to shield against unwanted signals and noise. To enhance the robustness of KSN-2457A-1C19+, 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



Electrical Specifications *(over operating temperature 0°C to +70°C)*

Parameters		Test Conditions	Min.	Typ.	Max.	Units
Frequency Range (fixed)		-	2457.6	-	2457.6	MHz
Step size		-	-	10.24		MHz
Settling Time (Power on to lock)		Within ± 1 kHz	-	40	-	mSec
Output Power		-	+1	+4.5	+7	dBm
SSB Phase Noise		@ 100 Hz offset	-	-85	-	dBc/Hz
		@ 1 kHz offset	-	-90	-86	
		@ 10 kHz offset	-	-110	-105	
		@ 100 kHz offset	-	-134	-128	
		@ 1 MHz offset	-	-154	-149	
Integrated SSB Phase Noise		@100 Hz to 1 MHz	-	-55	-44	dBc
Reference Spurious Suppression		Ref. Freq. 10.24 MHz	-	-95	-73	
Comparison Spurious Suppression		Step Size 10.24 MHz	-	-95	-73	
Non - Harmonic Spurious Suppression		-	-	-90	-	
Harmonic Suppression		-	-	-38	-27	
VCO Supply Voltage		+5.00	+4.75	+5.00	+5.25	V
PLL Supply Voltage		+3.30	+3.15	+3.30	+3.45	
VCO Supply Current		-	-	47	55	mA
PLL Supply Current		-	-	11	20	
Reference Input (External)	Frequency	10.24 (square wave)	-	10.24	-	MHz
	Amplitude	1	-	1	-	V_{P-P}
	Input impedance	-	-	100	-	KΩ
	Phase Noise @ 1 kHz offset	-	-	-145	-	dBc/Hz
RF Output port Impedance		-	-	50	-	Ω
Digital Lock Detect	Locked	-	2.75	-	3.45	V
	Unlocked	-	-	-	0.40	V

Absolute Maximum Ratings

Parameters	Ratings
VCO Supply Voltage NOTE 1	5.8V
PLL Supply Voltage NOTE 1	3.6V
VCO Supply Voltage to PLL Supply Voltage NOTE 1	-0.3V to +5.8V
Reference Frequency Voltage	-0.3V min, VCC PLL +0.3V max
Data, Clock, LE Levels	N.A
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

Note 1: Power on/off Sequence:
Power on: VCO Supply Voltage, followed by PLL Supply Voltage.
Power off: PLL Supply Voltage, followed by VCO Supply Voltage.

Typical Performance Data

FREQUENCY (MHz)	POWER OUTPUT (dBm)			VCO CURRENT (mA)			PLL CURRENT (mA)		
	-5°C	+25°C	+75°C	-5°C	+25°C	+75°C	-5°C	+25°C	+75°C
2457.6	4.93	4.70	4.03	46.07	46.82	47.75	9.80	10.50	11.73

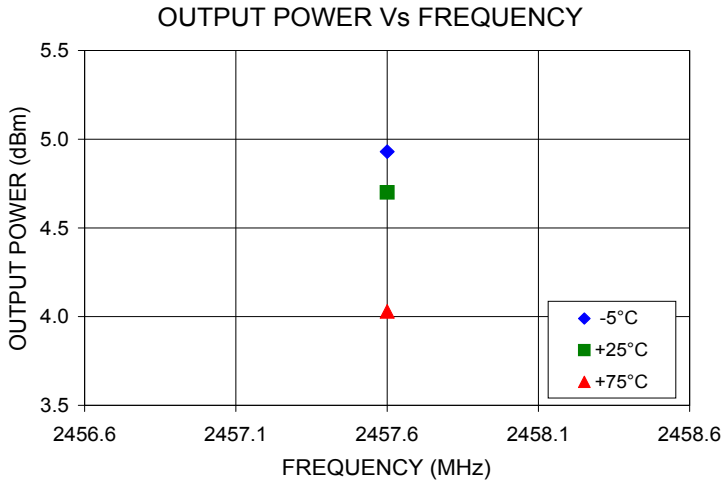
FREQUENCY (MHz)	HARMONICS (dBc)					
	F2			F3		
	-5°C	+25°C	+75°C	-5°C	+25°C	+75°C
2457.6	-36.18	-39.52	-48.25	-36.38	-37.76	-41.87

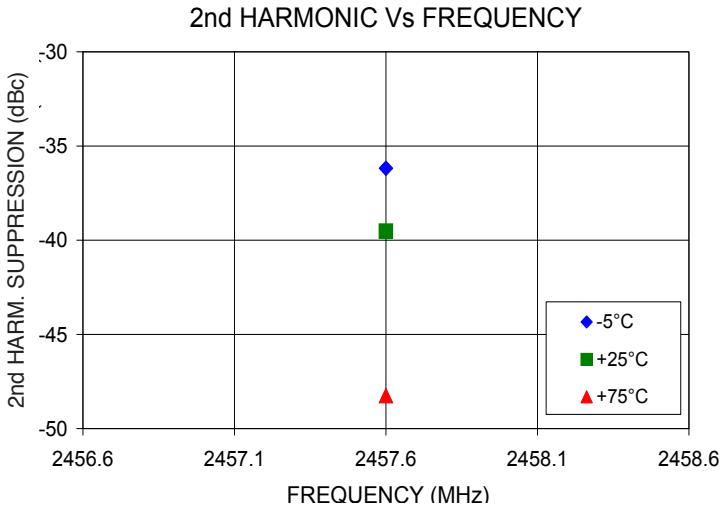
FREQUENCY	@TEMP.	PHASE NOISE (dBc/Hz) @OFFSETS				
		100Hz	1kHz	10kHz	100kHz	1MHz
2457.6	-5°C	-88.70	-92.94	-111.54	-134.55	-156.27
	+25°C	-87.68	-89.68	-111.17	-134.46	-154.35
	+75°C	-87.33	-90.61	-109.94	-133.54	-153.40

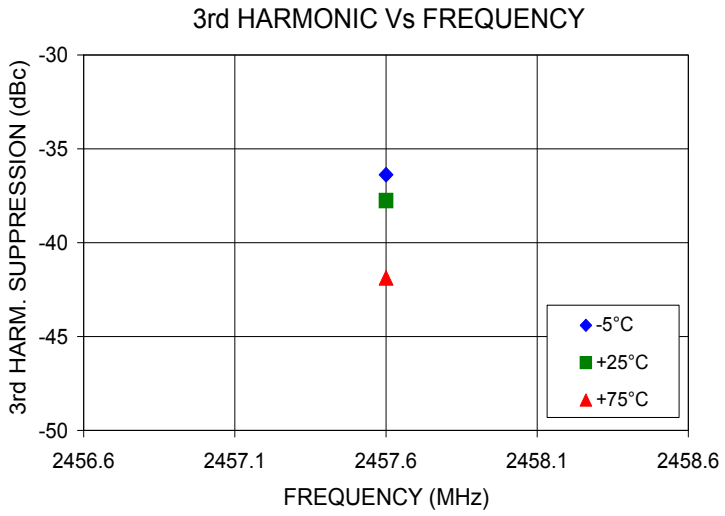
REFERENCE & COMPARISON SPURIOUS ORDER n	REFERENCE & COMPARISON SPURIOUS @Fcarrier 2457.6MHz+(n*Fref or Fcomp) (dBc) note 1		
	-5°C	+25°C	+75°C
-5	-100.07	-101.15	-109.00
-4	-100.40	-100.00	-103.00
-3	-103.57	-99.54	-102.90
-2	-104.77	-98.56	-98.12
-1	-103.30	-101.03	-90.64
0 note 2	-	-	-
+1	-95.78	-96.60	-89.47
+2	-101.15	-100.19	-94.08
+3	-104.67	-100.53	-96.82
+4	-104.36	-100.20	-98.17
+5	-105.16	-99.98	-99.40

Note 1: Comparison frequency = Reference frequency= 10.24MHz
Note 2: All spurs are referenced to carrier signal (n=0).

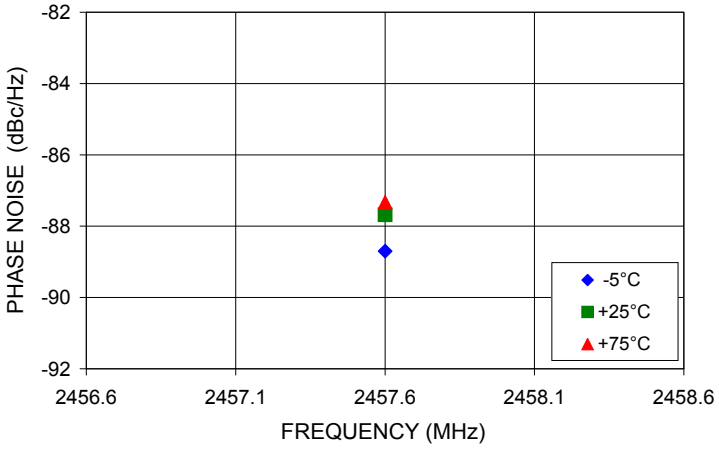
Typical Performance Curves



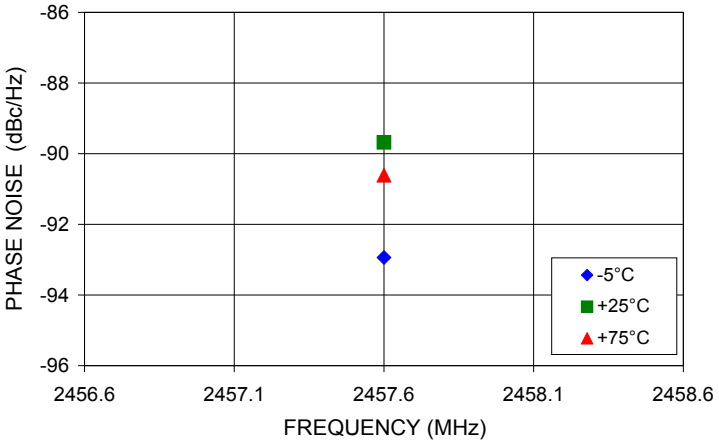




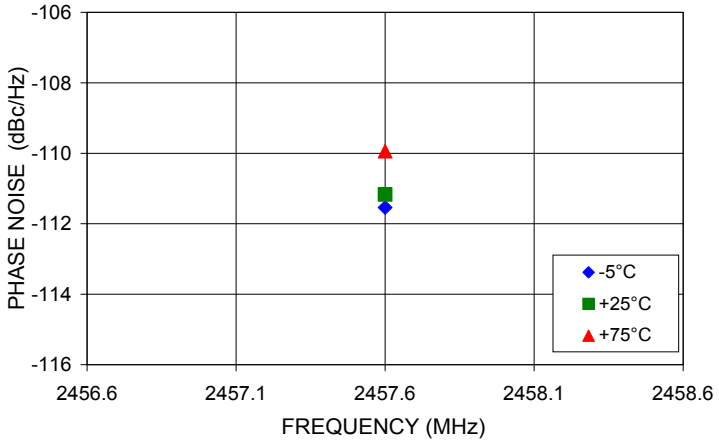
PHASE NOISE @100Hz offset



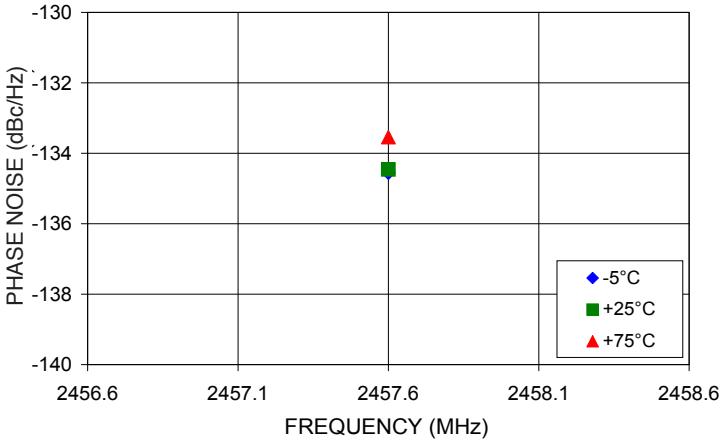
PHASE NOISE @1kHz offset



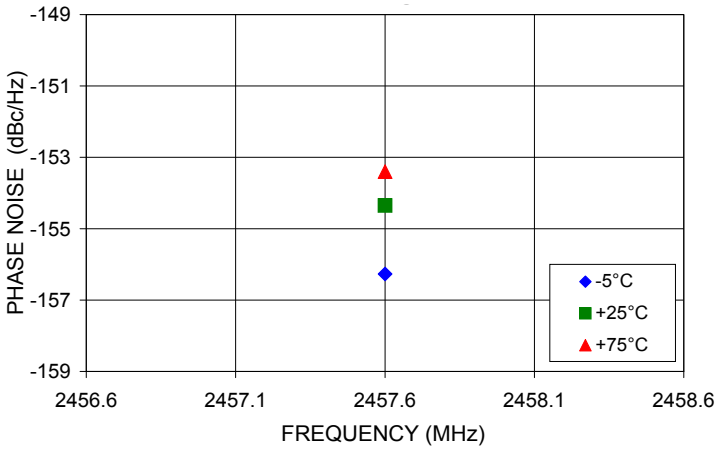
PHASE NOISE @10kHz offset



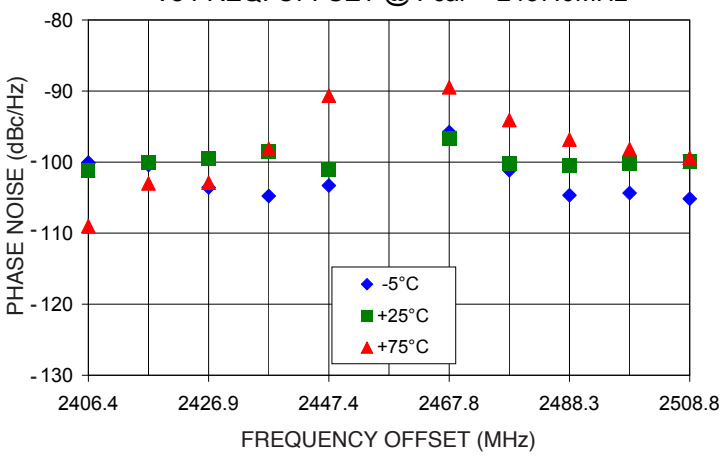
PHASE NOISE @100kHz offset



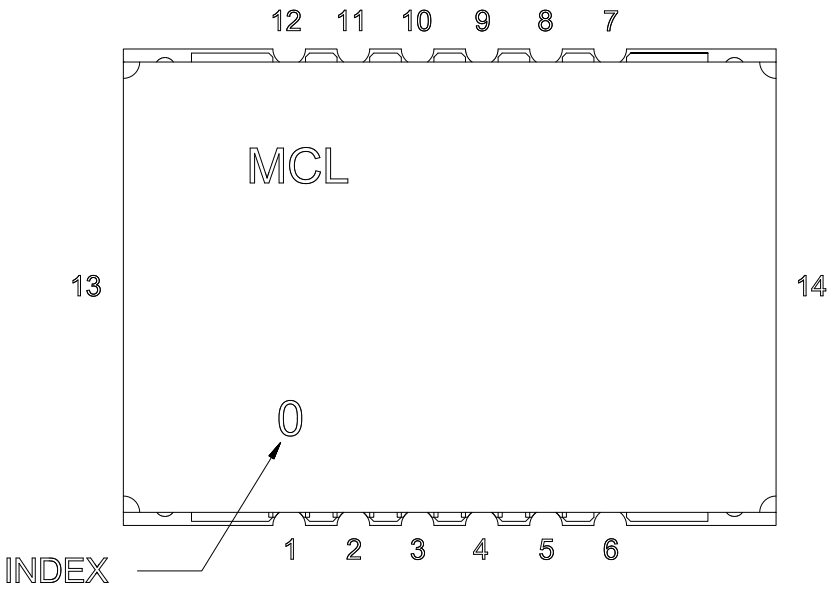
PHASE NOISE @1MHz offset



REFERENCE & COMPARISON SPURIOUS
Vs FREQ. OFFSET @ Fcar = 2457.6MHz



Pin Configuration

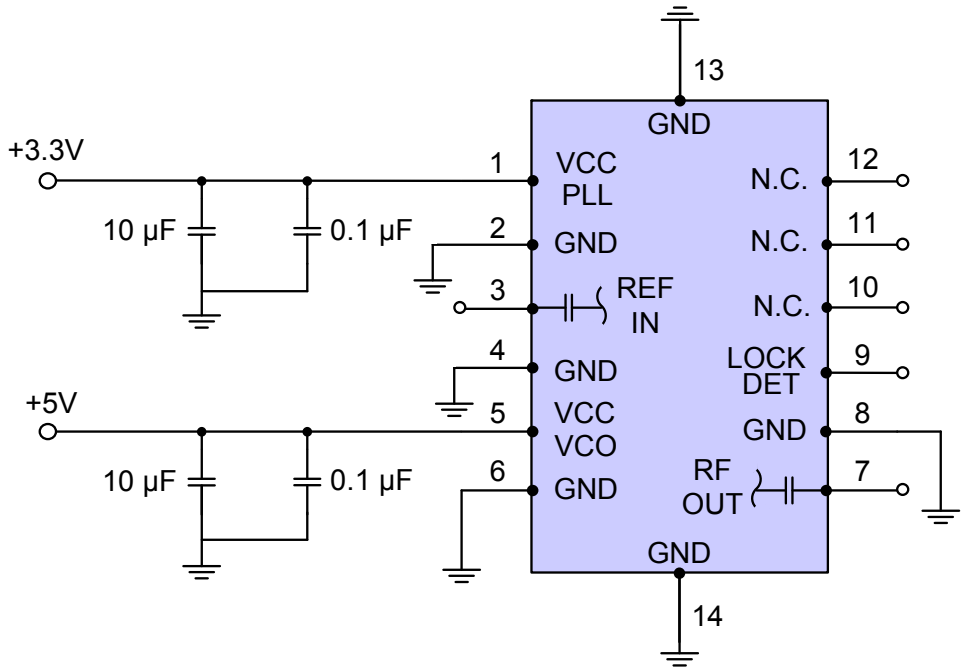


Pin Connection

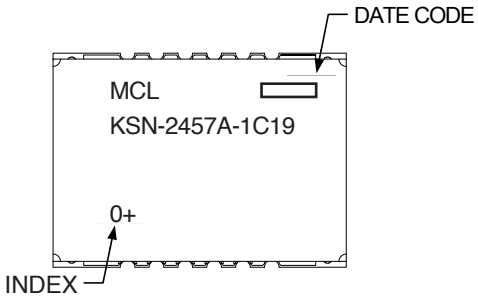
Pin Number	Function
1	VCC PLL
2	GND
3	REF IN
4	GND
5	VCC VCO
6	GND
7	RF OUT
8	GND
9	LOCK DET
10	NOT CONNECTED
11	NOT CONNECTED
12	NOT CONNECTED
13	GND
14	GND

Recommended Application Circuit

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



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: DK1171

Tape & Reel: TR-F28

Suggested Layout for PCB Design: PL-249

Evaluation Board: TB-567-1+F

Environment Ratings: ENV03T2