

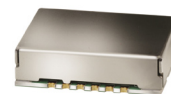
# Frequency Synthesizer

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 application. 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: <ul style="list-style-type: none"><li>• Phase noise: -110 dBc/Hz typ. @ 10 kHz offset</li><li>• Comparison spurious: -95 dBc typ.</li><li>• Reference spurious: -95 dBc typ.</li></ul>	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.



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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"

## Applications

- CATV



CASE STYLE: DK1171

PRICE: \$32.95 ea. QTY (1-9)

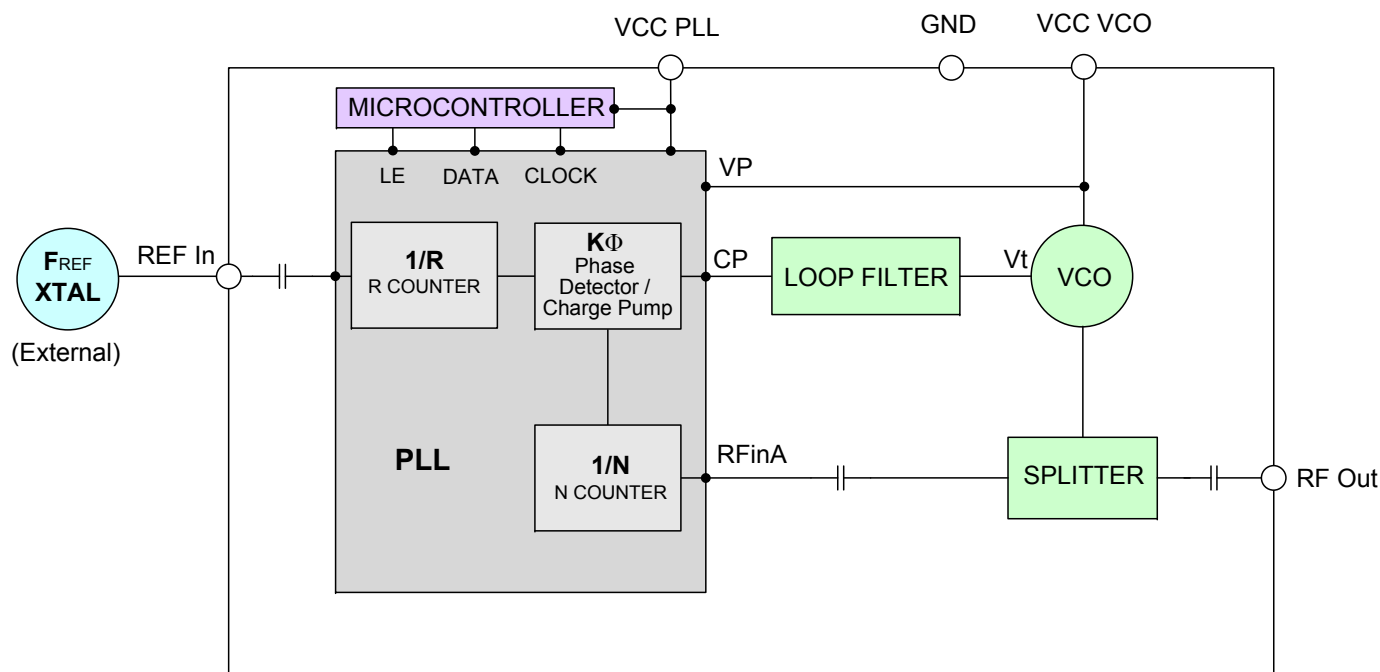
+ RoHS compliant in accordance  
with EU Directive (2002/95/EC)

The +Suffix has been added in order to identify RoHS  
Compliance. See our web site for RoHS Compliance  
methodologies and qualifications.

## General Description

The KSN-2457A-1C19+ is a Frequency Synthesizer, designed to operate 2457.6MHz for CATV application. 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



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REV. OR  
M126018  
EDR-9717/1F1  
KSN-2457A-1C19+  
Category-B4  
RAV  
100323  
Page 2 of 8

**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 $\pm 1$ kHz	-	6	-	mSec
Output Power		-	+1	+4	+7	dBm
SSB Phase Noise	@ 100 Hz offset	-	-	-74	-	dBc/Hz
	@ 1 kHz offset	-	-	-92	-87	
	@ 10 kHz offset	-	-	-110	-105	
	@ 100 kHz offset	-	-	-135	-130	
	@ 1 MHz offset	-	-	-154	-149	
Integrated SSB Phase Noise		@100 Hz to 1 MHz	-	-46	-40	dBc
Reference Spurious Suppression		Ref. Freq. 10.24 MHz	-	-95	-75	
Comparison Spurious Suppression		Step Size 10.24 MHz	-	-95	-75	
Non - Harmonic Spurious Suppression		-	-	-90	-	
Harmonic Suppression		-	-	-33	-25	
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 <sub>P-P</sub>
	Input impedance	-	-	100	-	K $\Omega$
	Phase Noise @ 1 kHz offset	-	-	-135	-	dBc/Hz
RF Output port Impedance		-	-	50	-	$\Omega$
Digital Lock Detect	Locked	-	2.75	-	3.45	V
	Unlocked	-	-	-	0.40	V

**Absolute Maximum Ratings**

Parameters	Ratings
VCO Supply Voltage	5.8V
PLL Supply Voltage	3.6V
VCO Supply Voltage to PLL Supply Voltage	-0.3V to +5.8V
Reference Frequency Voltage	-0.3V min, VCC PLL +0.3V max
Data, Clock, LE Levels	-0.3V min, VCC PLL +0.3V max
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)		
	-5°C	+25°C	+75°C	-5°C	+25°C	+75°C	-5°C	+25°C	+75°C
2457.6	4.46	4.20	3.50	46.20	46.98	48.12	12.54	13.60	14.47

FREQUENCY (MHz)	HARMONICS (dBc)					
	F2			F3		
	-5°C	+25°C	+75°C	-5°C	+25°C	+75°C
2457.6	-39.42	-40.76	-41.23	-33.88	-33.55	-29.70

FREQUENCY	@TEMP.	PHASE NOISE (dBc/Hz)				
		@OFFSETS				
		100Hz	1kHz	10kHz	100kHz	1MHz
2457.6	-5°C	-76.30	-92.61	-111.35	-135.65	-156.42
	+25°C	-73.08	-93.31	-110.94	-134.43	-154.48
	+75°C	-75.15	-91.53	-109.39	-133.46	-153.57

REFERENCE & COMPARISON SPURIOUS ORDER	REFERENCE & COMPARISON SPURIOUS @Fcarrier 2457.6MHz+(n*Fref or Fcomp) (dBc) note 1		
	-5°C	+25°C	+75°C
n			
-5	-105.01	-102.36	-98.25
-4	-107.16	-102.42	-98.12
-3	-106.75	-98.09	-97.80
-2	-103.76	-96.91	-96.03
-1	-103.06	-91.80	-91.58
0 <sup>note 2</sup>	-	-	-
+1	-101.03	-91.75	-94.57
+2	-107.87	-98.36	-100.20
+3	-108.79	-99.83	-105.04
+4	-109.99	-102.78	-102.84
+5	-107.88	-106.22	-103.94

Note 1: Comparison frequency = Reference frequency= 10.24MHz

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



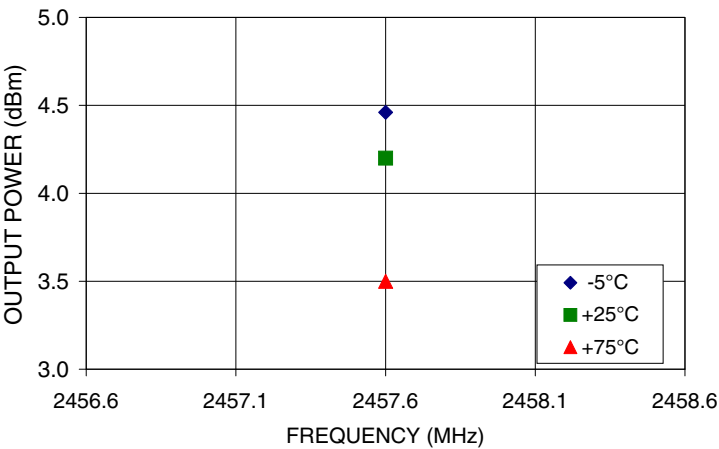
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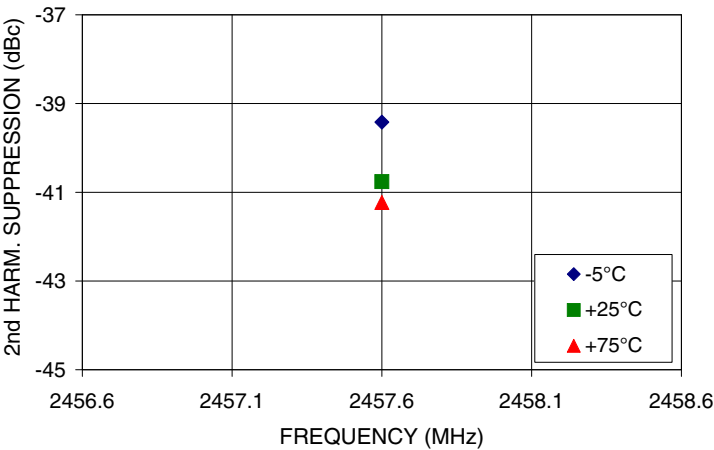
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Typical Performance Curves

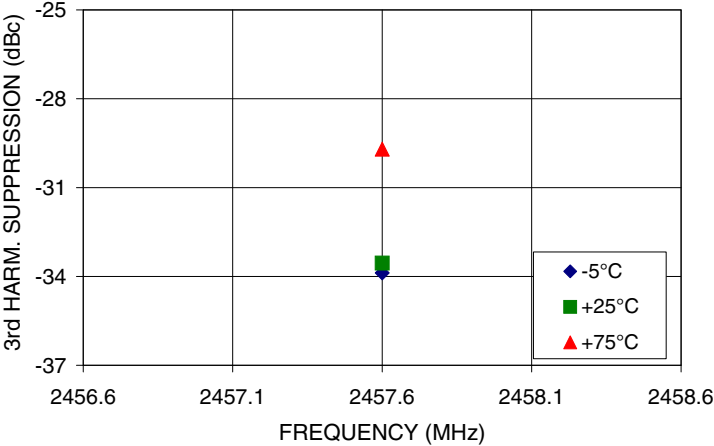
OUTPUT POWER Vs FREQUENCY



2nd HARMONIC Vs FREQUENCY



3rd HARMONIC Vs FREQUENCY



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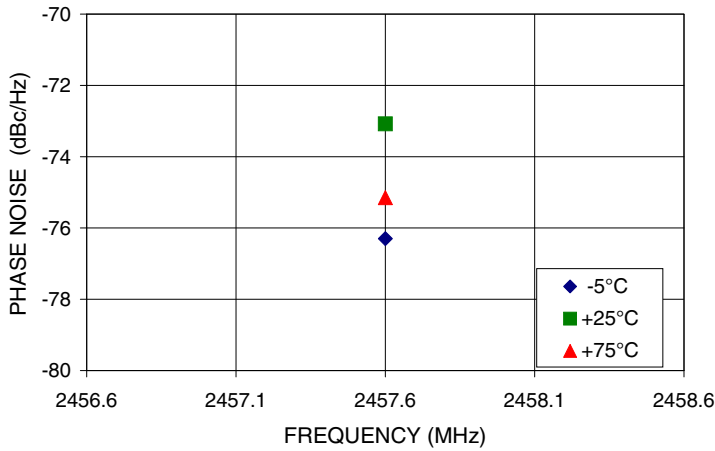


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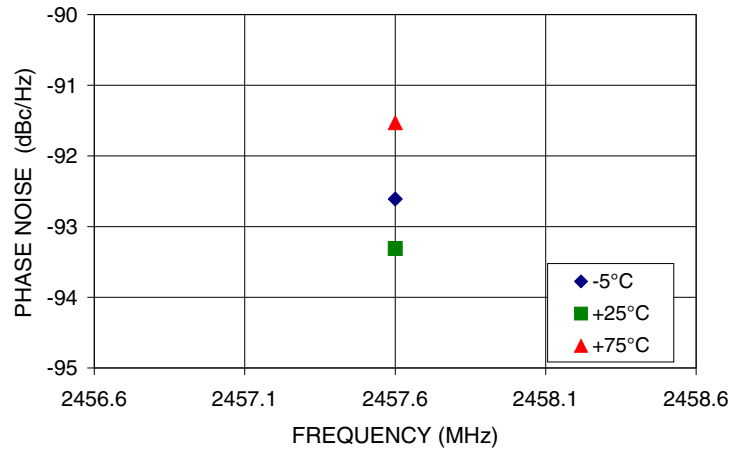


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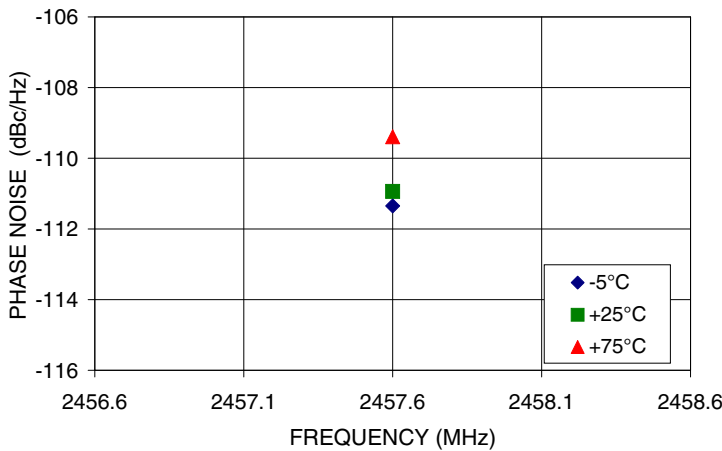
PHASE NOISE @ 100Hz offset



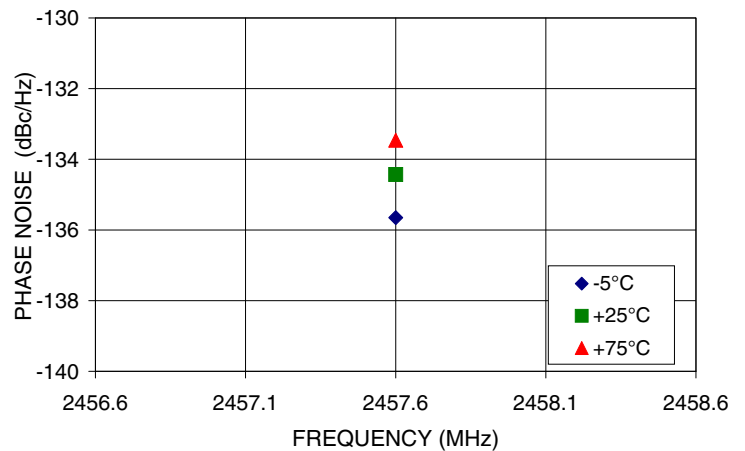
PHASE NOISE @ 1kHz offset



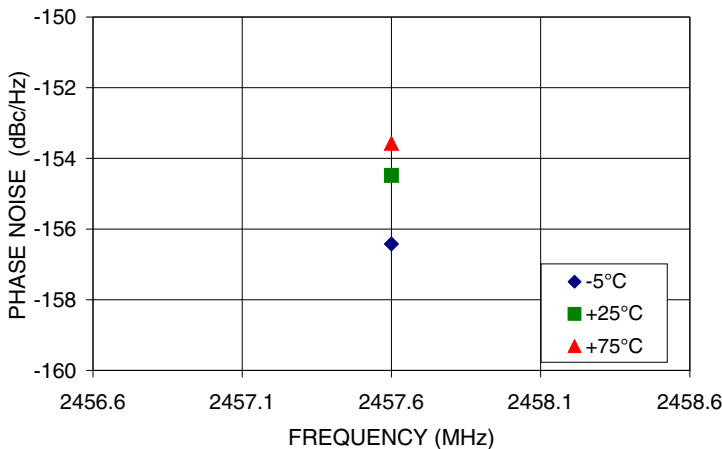
PHASE NOISE @ 10kHz offset



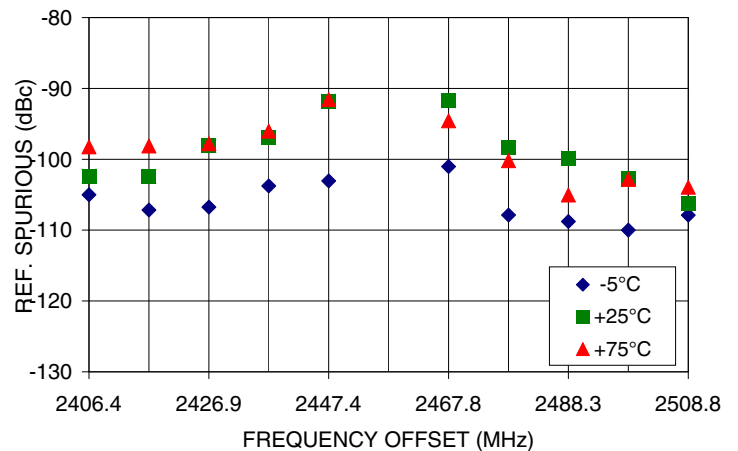
PHASE NOISE @ 100kHz offset



PHASE NOISE @ 1MHz offset



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



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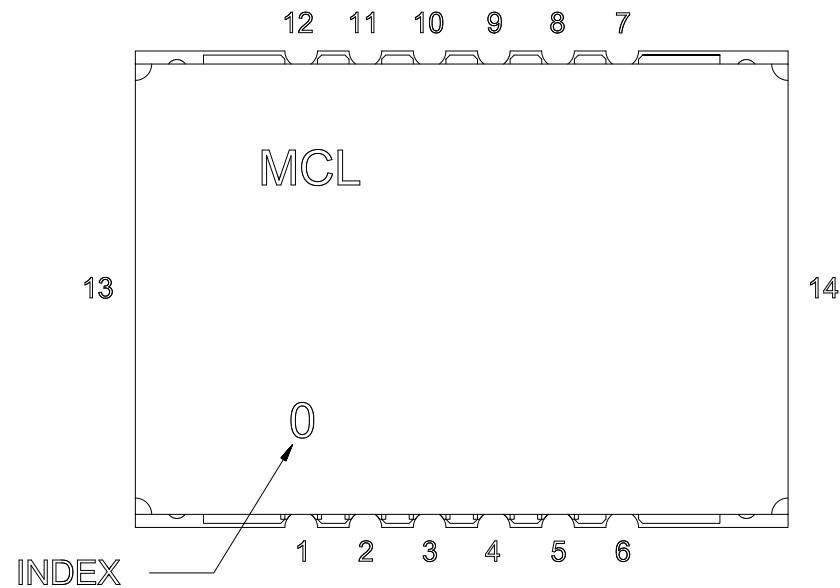


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Pin Configuration

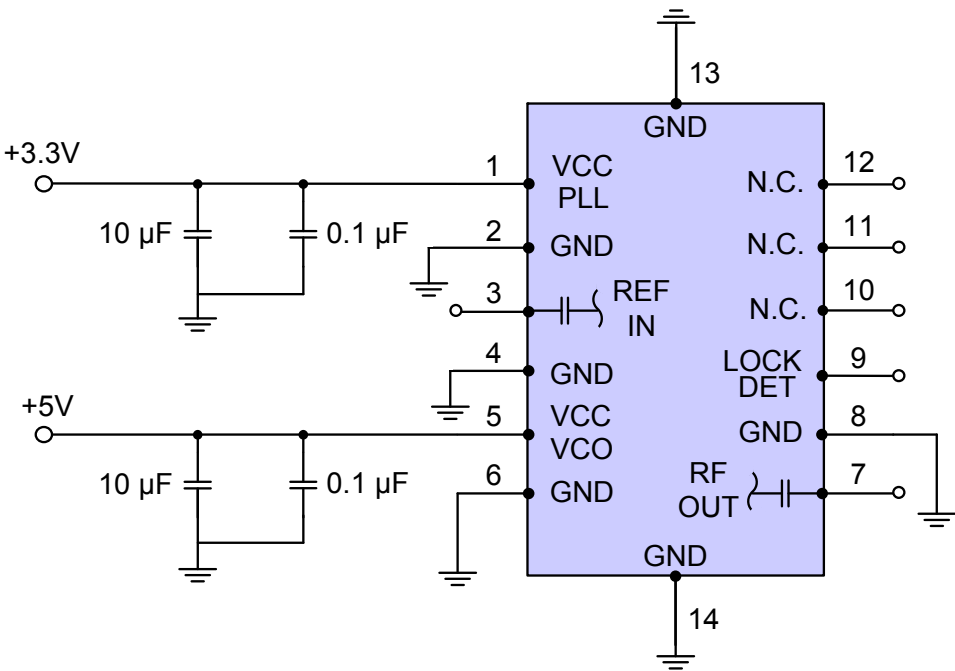


Pin Connection

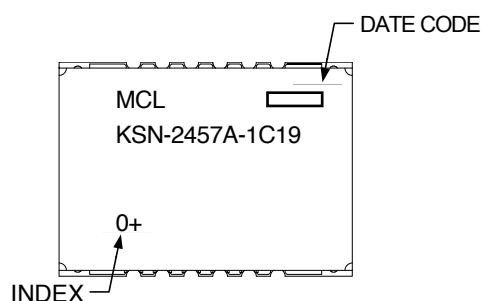
Pin Number	Function
1	VCC PLL
2	GND
3	REF IN
4	GND
5	VCC VCO
6	GND
7	RF OUT
8	GND
9	LOCK DET
10	NOT CONNECTED
11	NOT CONNECTED
12	NOT CONNECTED
13	GND
14	GND

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



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