

Frequency Synthesizer

KSN-768A-1C19+

50Ω 768 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 0.15"



CASE STYLE: DK801

Product Overview

The KSN-768A-1C19+ is a Frequency Synthesizer, designed to operate 768MHz for WiMAX application. The KSN-768A-1C19+ is packaged in a metal case (size of 0.80" x 0.58" x 0.15") to shield against unwanted signals and noise.

Key Features

Feature	Advantages
Low phase noise and spurious: <ul style="list-style-type: none">• Phase noise: -110 dBc/Hz typ. @ 10 kHz offset• Comparison spurious: -90 dBc typ.• Reference spurious: -90 dBc typ.	Low phase noise and spurious improve system EVM (Error Vector Magnitude).
Robust design and construction	To enhance the robustness of KSN-768A-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 0.15"	The small size enables the KSN-768A-1C19+ to be used in compact designs.



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Frequency Synthesizer

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50Ω 768 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=+3V)
- Small size 0.80" x 0.58" x 0.15"

Applications

- WiMAX



CASE STYLE: DK801
PRICE: \$29.95 ea. QTY (1-9)

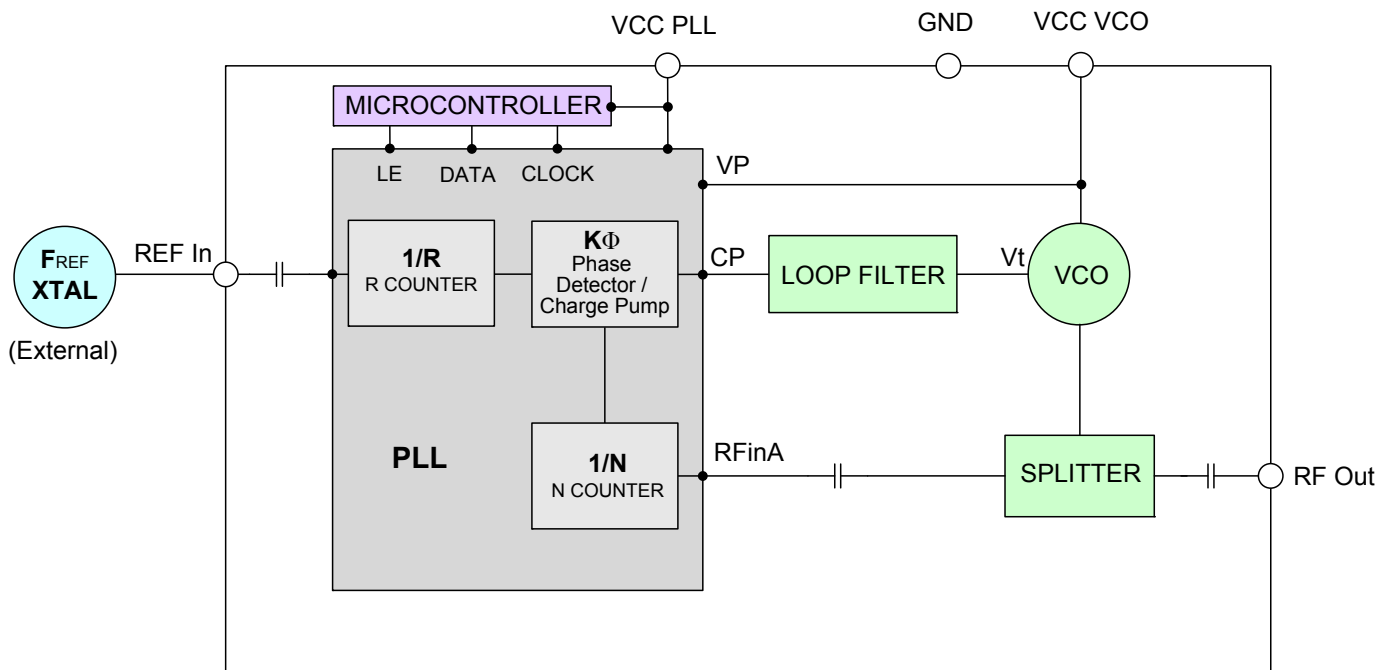
+ RoHS compliant in accordance with EU Directive (2002/95/EC)

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-768A-1C19+ is a Frequency Synthesizer, designed to operate 768MHz for WiMAX application. The KSN-768A-1C19+ is packaged in a metal case (size of 0.80" x 0.58" x 0.15") to shield against unwanted signals and noise. To enhance the robustness of KSN-768A-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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Electrical Specifications (over operating temperature -40°C to $+85^{\circ}\text{C}$)

Parameters	Test Conditions	Min.	Typ.	Max.	Units	
Frequency Range (fixed)	-	768	-	768	MHz	
Step size	-	-	4000	-	kHz	
Settling Time (Power on to lock)	Within ± 1 kHz	-	10	-	mSec	
Output Power	-	0	+3	+6	dBm	
SSB Phase Noise	@ 100 Hz offset	-	-96	-	dBc/Hz	
	@ 1 kHz offset	-	-100	-95		
	@ 10 kHz offset	-	-110	-102		
	@ 100 kHz offset	-	-133	-122		
	@ 1 MHz offset	-	-155	-138		
Integrated SSB Phase Noise	@ 100 Hz to 1 MHz	-	-	-52	dBc	
Reference Spurious Suppression	Ref. Freq. 52 MHz	-	-90	-80	dBc	
Comparison Spurious Suppression	Step Size 4000 kHz	-	-90	-80		
Non - Harmonic Spurious Suppression	-	-	-90	-85		
Harmonic Suppression	-	-	-25	-15		
VCO Supply Voltage	+5.00	+4.75	+5.00	+5.25	V	
PLL Supply Voltage	+3.00	+2.85	+3.00	+3.15		
VCO Supply Current	-	-	31	40	mA	
PLL Supply Current	-	-	10	20		
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	-	-	-140	-	dBc/Hz
RF Output port Impedance	-	-	50	-	Ω	
Digital Lock Detect	Locked	-	2.45	-	3.15	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, VCC PLL +0.3Vmax
Data, Clock, LE Levels	-0.3Vmin, VCC PLL +0.3Vmax
Operating Temperature	-40°C to $+85^{\circ}\text{C}$
Storage Temperature	-55°C to $+100^{\circ}\text{C}$

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)		
	-45°C	+25°C	+85°C	-45°C	+25°C	+85°C	-45°C	+25°C	+85°C
	768	3.53	3.82	3.85	30.85	32.11	33.20	8.13	9.25

FREQUENCY (MHz)	HARMONICS (dBc)					
	F2			F3		
	-45°C	+25°C	+85°C	-45°C	+25°C	+85°C
768	-24.82	-24.82	-25.14	-22.31	-24.36	-27.28

FREQUENCY (MHz)	@TEMP.	PHASE NOISE (dBc/Hz)				
		@OFFSETS				
		100Hz	1kHz	10kHz	100kHz	1MHz
768	-45°C	-97.09	-101.46	-111.36	-135.20	-155.96
	+25°C	-96.15	-101.58	-110.63	-134.34	-155.32
	+85°C	-93.77	-100.70	-109.89	-133.06	-153.85

COMPARISON SPURIOUS ORDER	COMPARISON SPURIOUS @Fcarrier 768MHz+(n*Fcomparison) (dBc) NOTE 1		
	-45°C	+25°C	+85°C
n			
-5	-94.63	-93.46	-93.06
-4	-94.21	-92.98	-93.02
-3	-93.78	-93.22	-92.22
-2	-92.01	-93.73	-90.73
-1	-90.41	-92.94	-87.20
0 note 2	-	-	-
+1	-92.93	-95.56	-93.12
+2	-94.64	-95.75	-99.06
+3	-95.33	-95.65	-100.18
+4	-97.23	-95.93	-99.43
+5	-97.28	-95.91	-99.32

REFERENCE SPURIOUS ORDER	REFERENCE SPURIOUS @Fcarrier 768MHz+(n*Freference) (dBc) NOTE 3		
	-45°C	+25°C	+85°C
n			
-5	-105.23	-99.22	-91.04
-4	-103.10	-102.50	-90.50
-3	-96.81	-92.46	-92.08
-2	-95.27	-92.87	-91.81
-1	-93.78	-93.33	-94.95
0 note 4	-	-	-
+1	-97.29	-99.67	-97.64
+2	-103.23	-99.42	-102.04
+3	-107.56	-102.56	-103.74
+4	-107.81	-99.08	-103.21
+5	-107.26	-99.79	-104.07

Note 1: Comparison frequency 4000 kHz

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

Note 3: Reference frequency 52 MHz

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



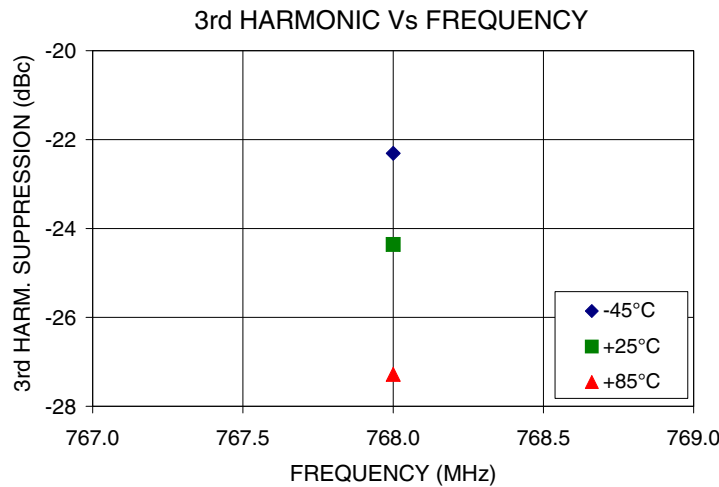
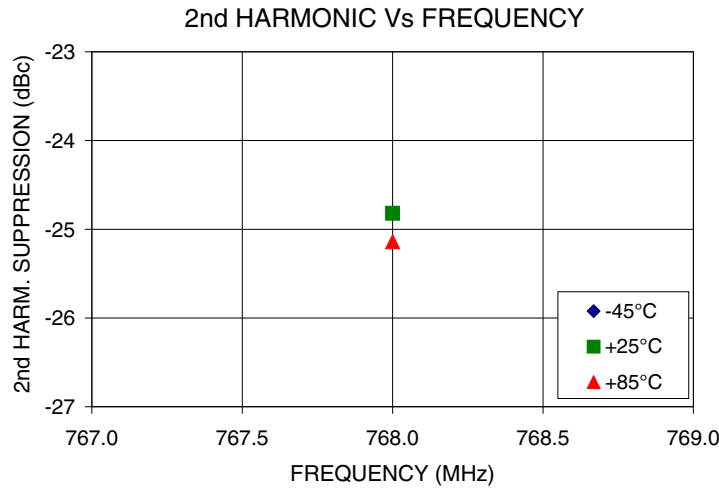
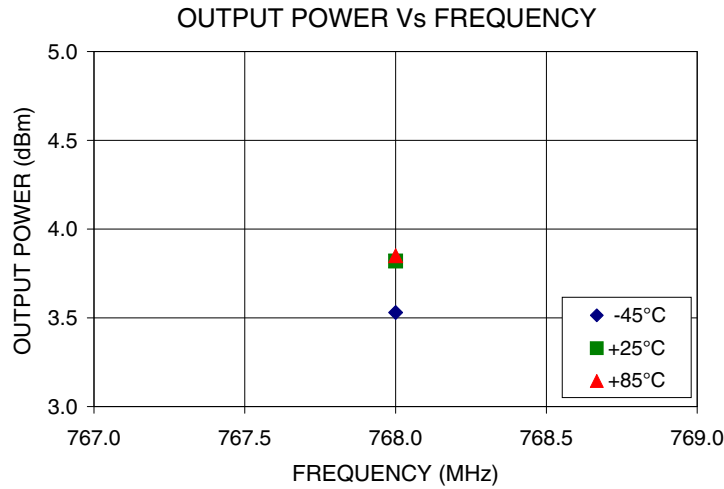
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Typical Performance Curves



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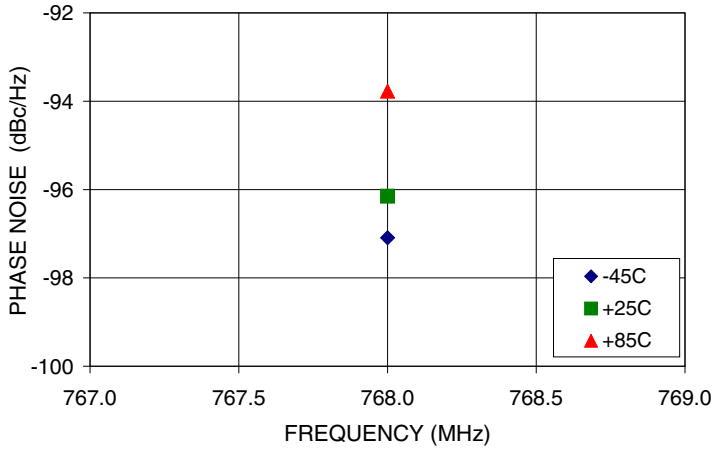


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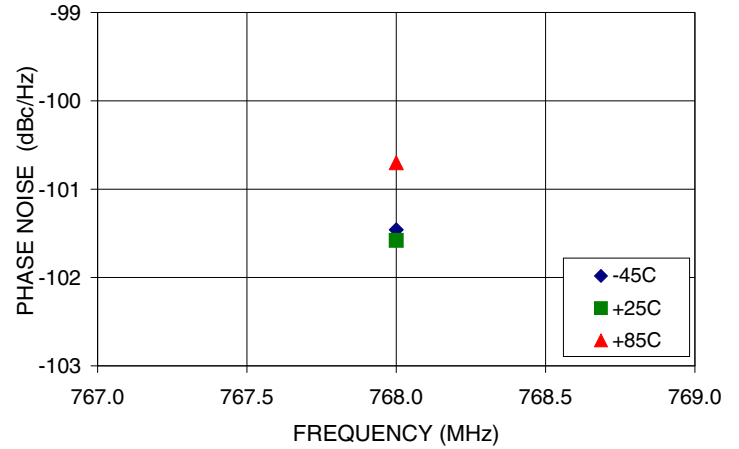


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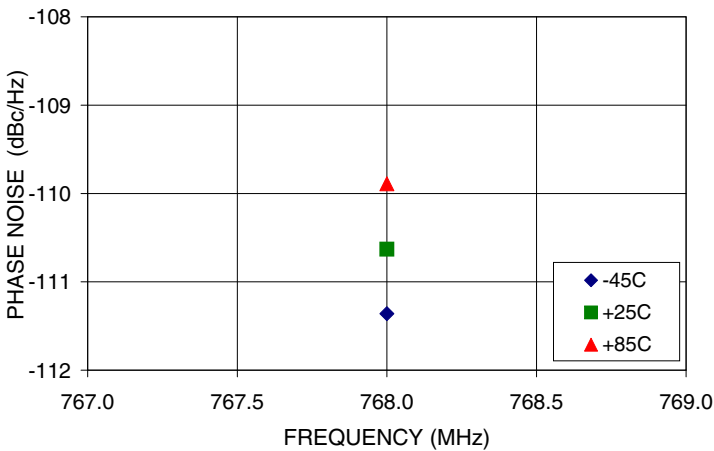
PHASE NOISE @ 100Hz offset



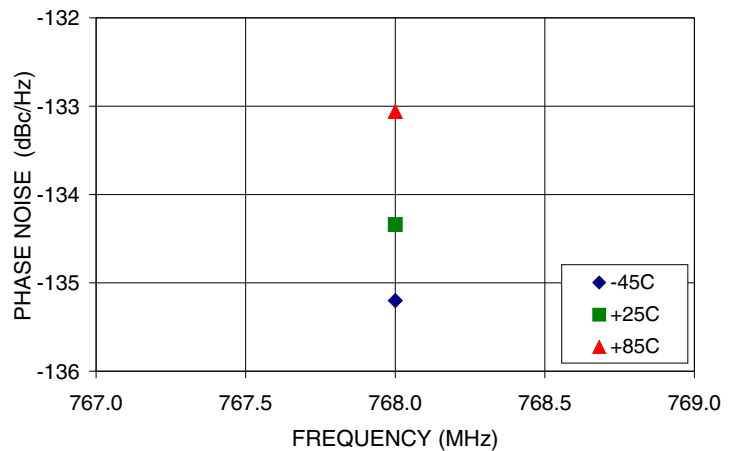
PHASE NOISE @ 1kHz offset



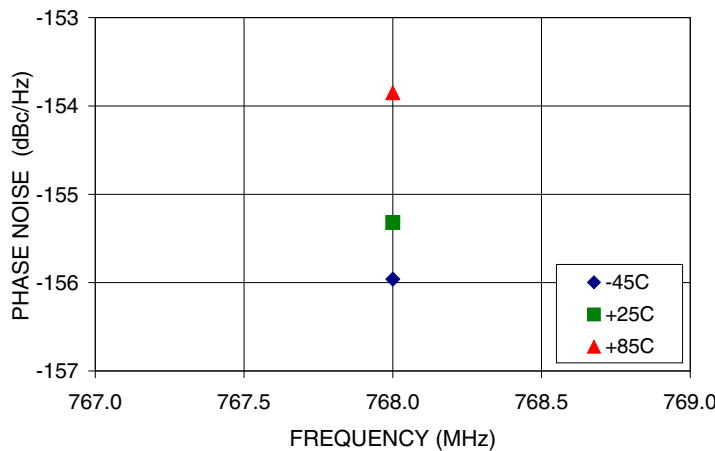
PHASE NOISE @ 10kHz offset



PHASE NOISE @ 100kHz offset



PHASE NOISE @ 1MHz offset



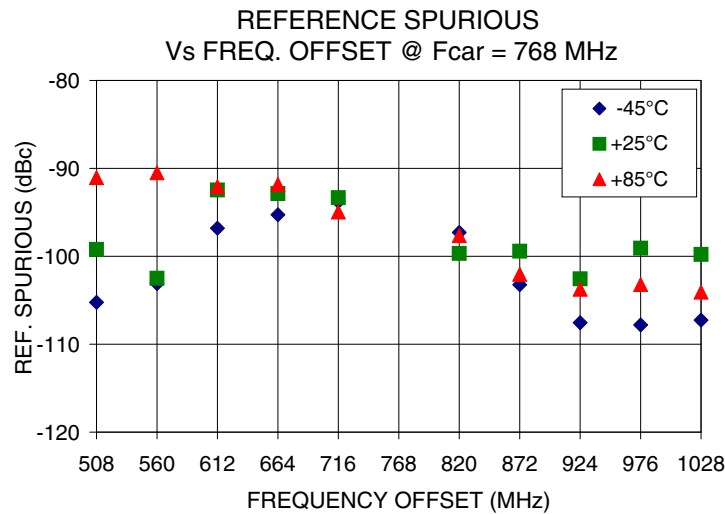
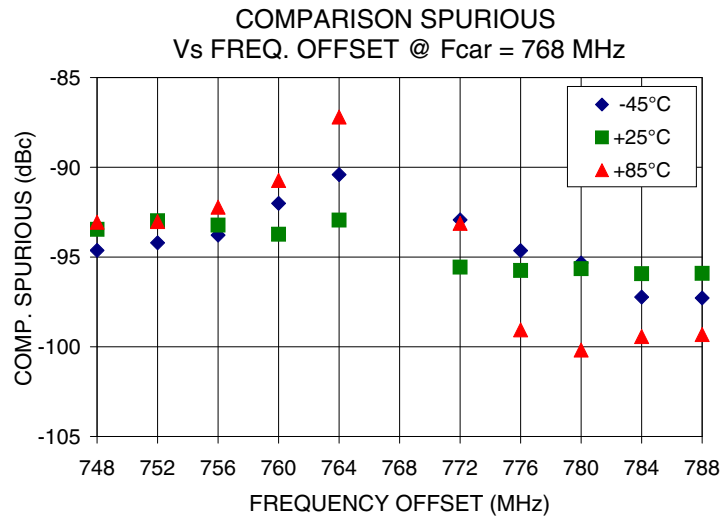
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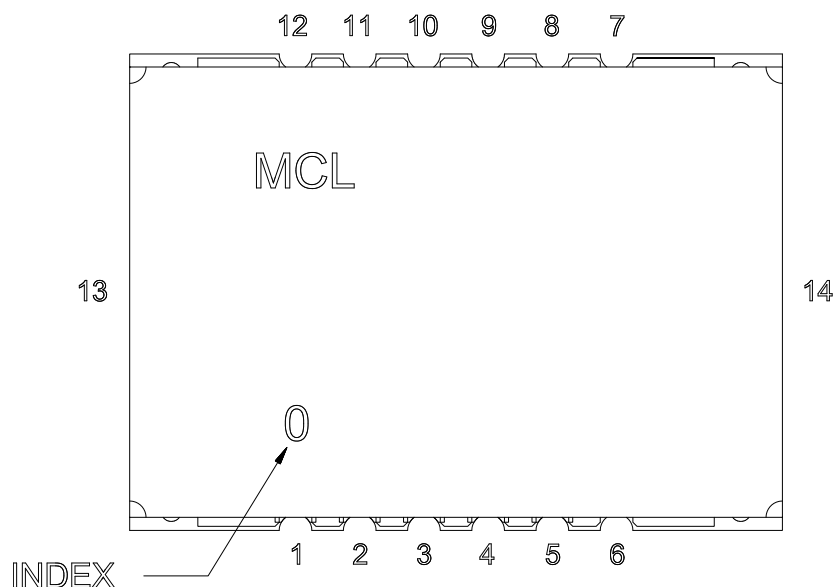


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Pin Configuration

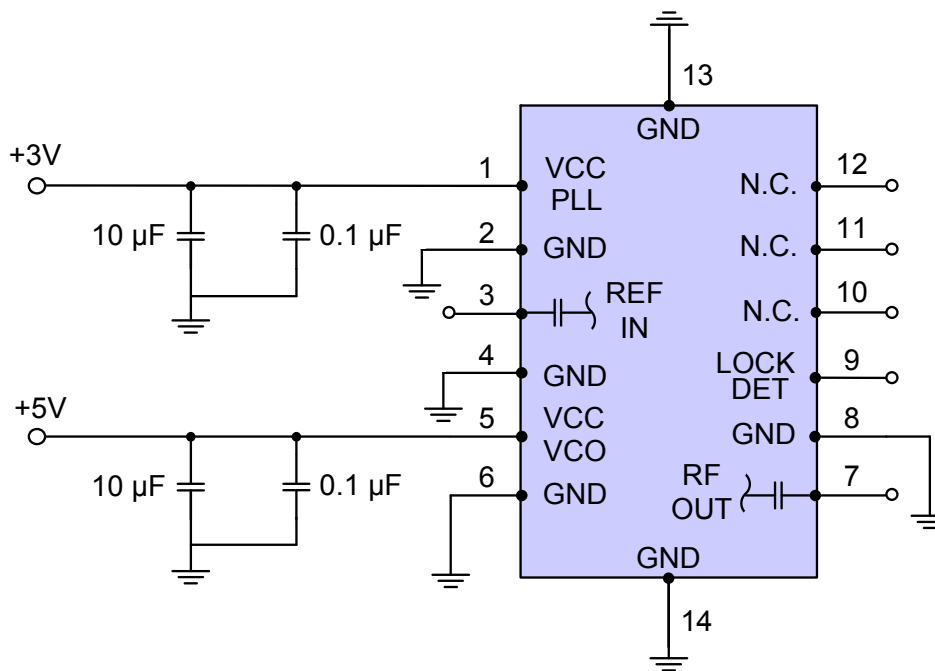


Pin Connection

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.



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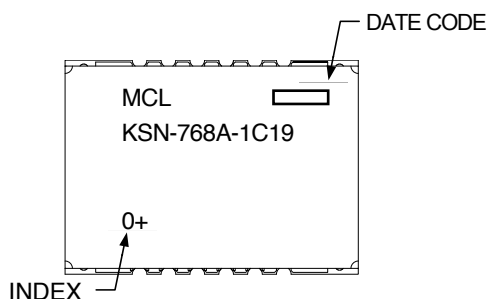


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Device Marking



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: DK801

Tape & Reel: TR-F28

Suggested Layout for PCB Design: PL-249

Evaluation Board: TB-567-2+F

Environment Ratings: ENV03T2



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Patent Pending

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