Frequency Synthesizer KSN-700A-1C19+

50Ω 700 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: DK1042

Product Overview

The KSN-700A-1C19+ is a Frequency Synthesizer, designed to operate 700MHz for industrial microvave and RF patient monitor application. The KSN-700A-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: • Phase noise: -111 dBc/Hz typ. @ 10 kHz offset • Comparison spurious: -85 dBc typ. • Reference spurious: -85 dBc typ.	Low phase noise and spurious improve system EVM (Error Vector Magnitude).
Robust design and construction	To enhance the robustness of KSN-700A-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-700A-1C19+ to be used in compact designs.

Surface Mount

Frequency Synthesizer

KSN-700A-1C19+

50Ω 700 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=+5V)
- Small size 0.80" x 0.58" x 0.15"

CASE STYLE: DK1042

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

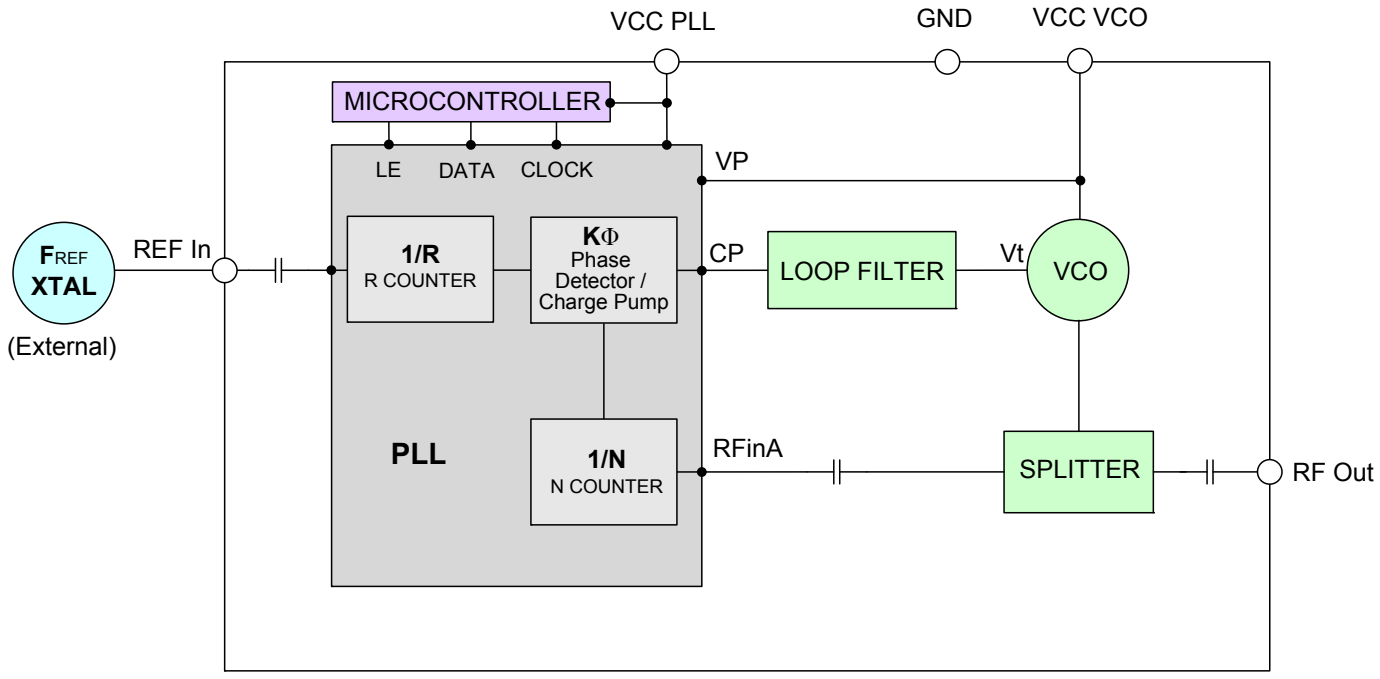
Applications

- Industrial microvave and RF patient monitor

General Description

The KSN-700A-1C19+ is a Frequency Synthesizer, designed to operate 700MHz for industrial microvave and RF patient monitor application.The KSN-700A-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-700A-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 +50°C)*

Parameters		Test Conditions	Min.	Typ.	Max.	Units
Frequency Range (fixed)		-	700	-	700	MHz
Step Size		-	-	5	-	MHz
Settling Time (Power on to lock)		Within ± 1 kHz	-	30	-	mSec
Output Power		-	+5	+7	+9	dBm
SSB Phase Noise		@ 100 Hz offset	-	-98	-	dBc/Hz
		@ 1 kHz offset	-	-98	-92	
		@ 10 kHz offset	-	-111	-105	
		@ 100 kHz offset	-	-135	-130	
		@ 1 MHz offset	-	-155	-140	
Reference Spurious Suppression		Ref. Freq. 25 MHz	-	-85	-70	dBc
Comparison Spurious Suppression		Step Size. 5 MHz	-	-85	-65	
Non - Harmonic Spurious Suppression		-	-	-90	-	
Harmonic Suppression		-	-	-20	-15	dBc
VCO Supply Voltage		+5.00	+4.75	+5.00	+5.25	V
PLL Supply Voltage		+5.00	+4.75	+5.00	+5.25	
VCO Supply Current		-	-	38	43	mA
PLL Supply Current		-	-	12	18	
Reference Input (External)	Frequency	25 (square wave)	-	25	-	MHz
	Amplitude	1	-	1	-	V_{P-P}
	Input impedance	-	-	100	-	KΩ
	Phase Noise @ 1 kHz offset	-	-	-130	-	dBc/Hz
RF Output port Impedance		-	-	50	-	Ω
Digital Lock Detect	Locked	-	4.35	-	5.25	V
	Unlocked	-	-	-	0.40	V

Absolute Maximum Ratings

Parameters	Ratings
VCO Supply Voltage	6V
PLL Supply Voltage	6V
VCO Supply Voltage to PLL Power Supply	-0.3V to +5.5V
Reference Frequency Voltage	-0.3Vmin,VCC PLL +0.3Vmax
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

Notes
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Typical Performance Data

FREQUENCY (MHz)	POWER OUTPUT (dBm)			VCO CURRENT (mA)			PLL CURENT (mA)		
	-5°C	+25°C	+55°C	-5°C	+25°C	+55°C	-5°C	+25°C	+55°C
700	7.17	7.18	7.14	37.22	38.07	38.96	10.59	11.50	12.53

FREQUENCY (MHz)	HARMONICS (dBc)					
	F2			F3		
	-5°C	+25°C	+55°C	-5°C	+25°C	+55°C
700	-21.58	-22.23	-22.53	-27.09	-28.08	-28.99

FREQUENCY	@TEMP.	PHASE NOISE (dBc/Hz) @OFFSETS				
		100Hz	1kHz	10kHz	100kHz	1MHz
700	-5°C	-98.39	-101.43	-112.84	-136.86	-156.88
	+25°C	-98.75	-99.49	-112.91	-136.60	-156.58
	+55°C	-98.19	-101.80	-112.47	-135.88	-155.66

COMPARISON SPURIOUS ORDER	COMPARISON SPURIOUS @Fcarrier 700MHz+(n*Fcomparison) (dBc) note 1		
n	-5°C	+25°C	+55°C
-5	-87.61	-91.26	-85.27
-4	-89.90	-92.58	-95.71
-3	-89.95	-93.31	-96.50
-2	-88.30	-89.11	-105.63
-1	-85.93	-86.78	-106.29
0 note 2	-	-	-
+1	-93.95	-90.74	-94.64
+2	-97.58	-89.27	-93.21
+3	-100.11	-92.21	-92.40
+4	-99.75	-95.53	-92.14
+5	-89.09	-86.82	-86.69

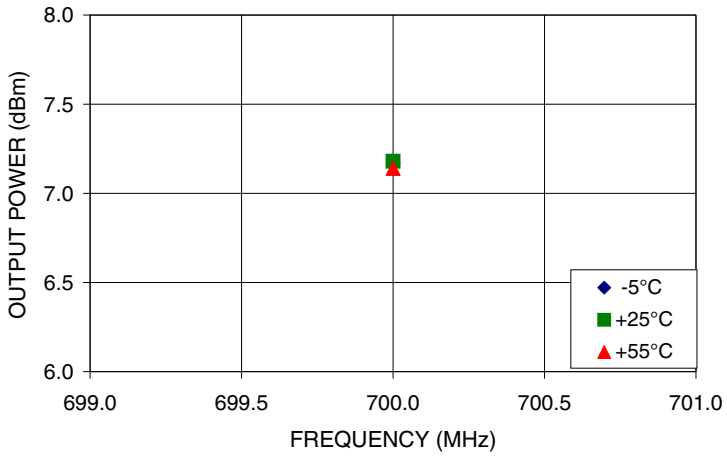
Note 1: Comparison frequency 5 MHz
Note 2: All spurs are referenced to carrier signal (n=0).

REFERENCE SPURIOUS ORDER	REFERENCE SPURIOUS @Fcarrier 700MHz+(n*Freference) (dBc) note 3		
n	-5°C	+25°C	+55°C
-5	-86.75	-86.04	-86.48
-4	-106.02	-84.74	-85.33
-3	-81.20	-81.40	-83.11
-2	-92.00	-82.05	-85.17
-1	-87.72	-91.21	-85.33
0 note 4	-	-	-
+1	-89.11	-86.78	-86.61
+2	-92.48	-104.40	-90.70
+3	-87.46	-87.71	-85.63
+4	-88.33	-95.60	-100.63
+5	-89.04	-90.04	-90.40

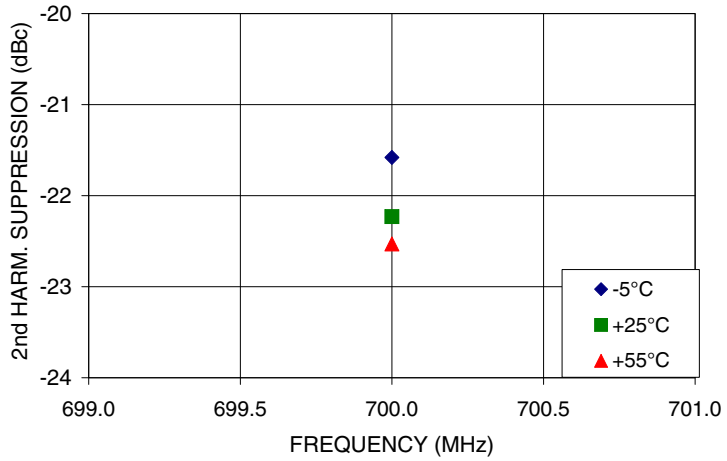
Note 3: Reference frequency 25 MHz
Note 4: All spurs are referenced to carrier signal (n=0).

Typical Performance Curves

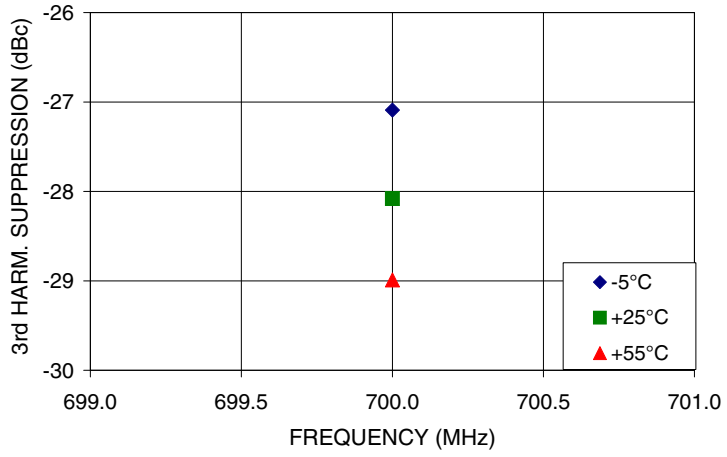
OUTPUT POWER Vs FREQUENCY



2nd HARMONIC Vs FREQUENCY



3rd HARMONIC Vs FREQUENCY



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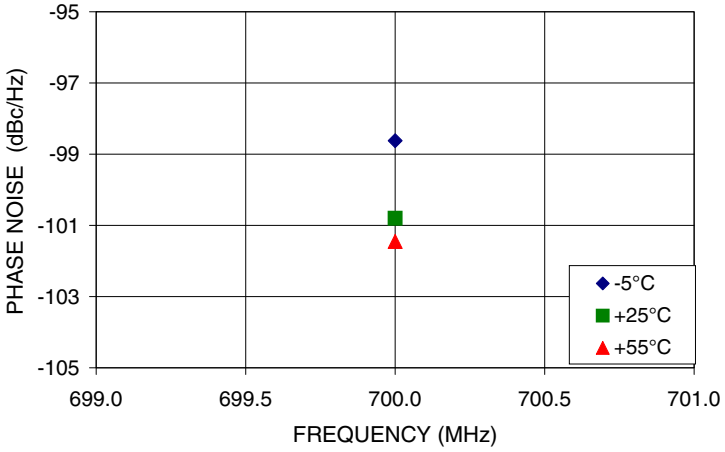
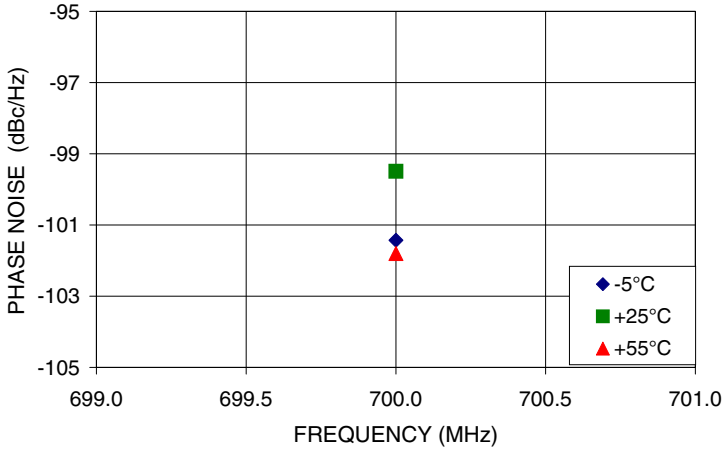
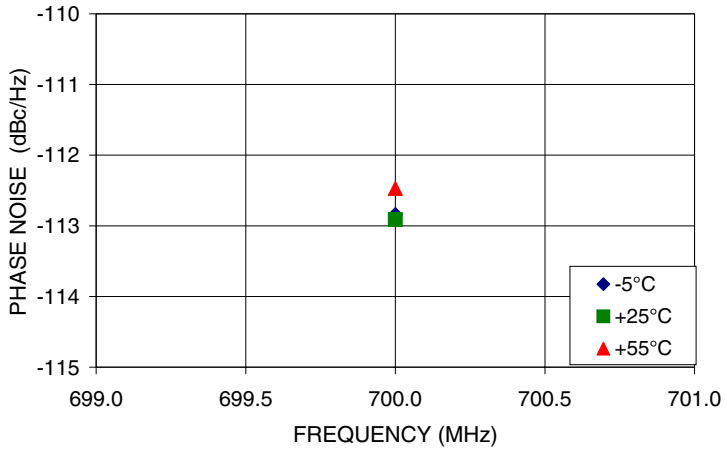
PHASE NOISE @100Hz offset



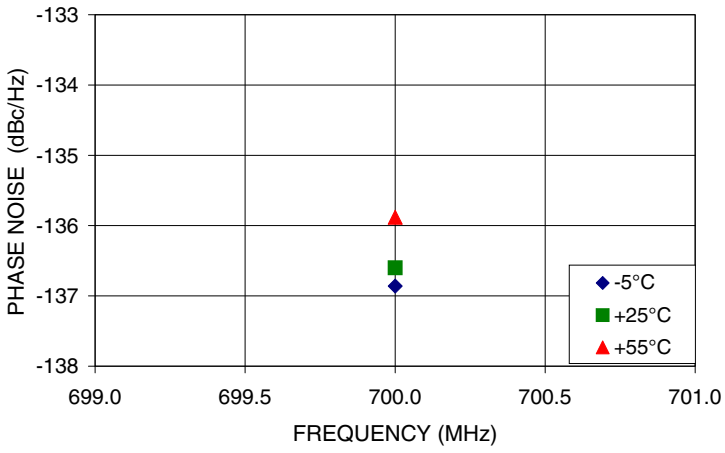
PHASE NOISE @1kHz offset



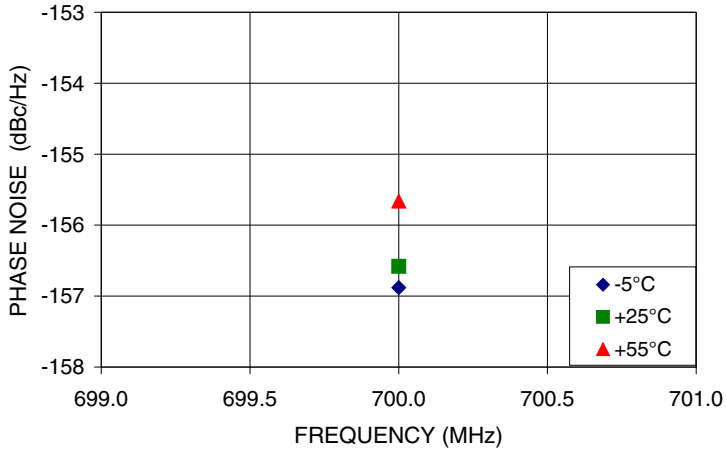
PHASE NOISE @10kHz offset



PHASE NOISE @100kHz offset



PHASE NOISE @1MHz offset



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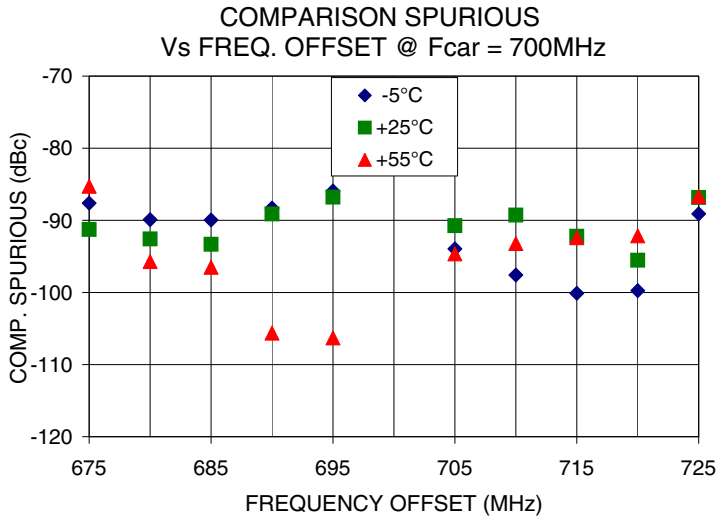
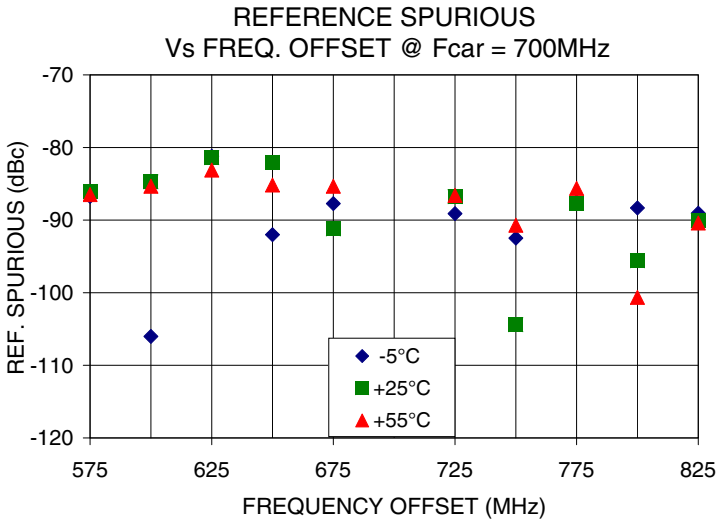
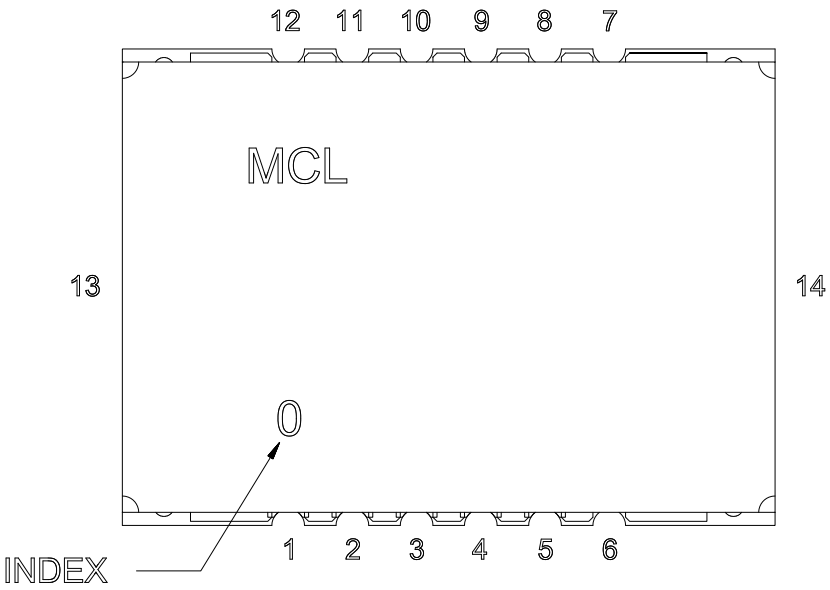




Pin Configuration

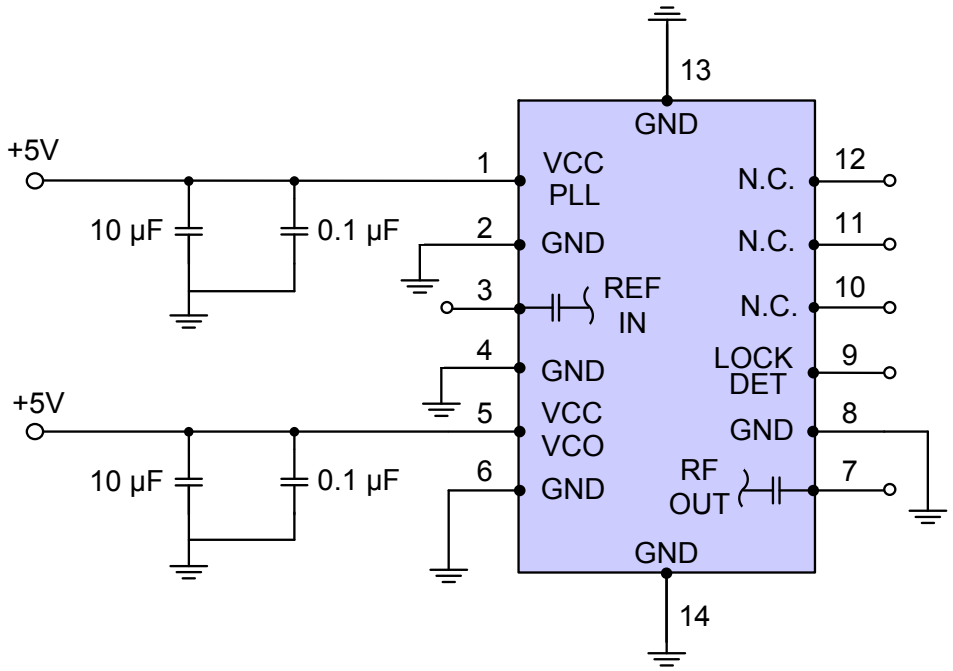


Pin Connection

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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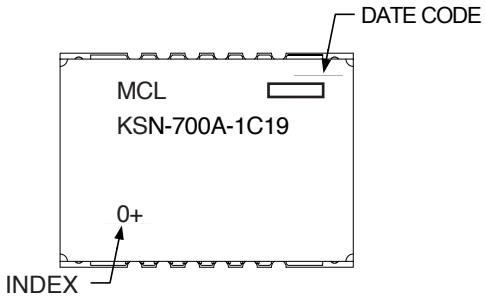
Device Marking



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: DK1042

Tape & Reel: TR-F28

Suggested Layout for PCB Design: PL-249

Evaluation Board: TB-567+F

Environment Ratings: ENV03T2