

Frequency Synthesizer

KSN-3080A-119+

50Ω 3040 to 3080 MHz

The Big Deal

- Low phase noise and spurious
- Robust design and construction
- Small size 0.80" x 0.58" x 0.15"



CASE STYLE: DK801

Product Overview

The KSN-3080A-119+ is a Frequency Synthesizer, designed to operate from 3040 to 3080 MHz for point to point application. The KSN-3080A-119+ 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: -94 dBc/Hz typ. @ 10 kHz offset• Comparison Spurious: -105 dBc typ.• Reference Spurious: -105 dBc typ. | Low phase noise and spurious improve system EVM (Error Vector Magnitude). |
| Robust design and construction | To enhance the robustness of KSN-3080A-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. |
| Small size, 0.80" x 0.58" x 0.15" | The small size enables the KSN-3080A-119+ to be used in compact designs. |



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50Ω 3040 to 3080 MHz



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.

Features

- Integrated VCO + PLL
- Low phase noise and spurious
- Robust Design and Construction
- Low operating voltage (VCC VCO=+5V, VCC PLL=+3V)
- Small size 0.80" x 0.58" x 0.15"

Applications

- Point to point

General Description

The KSN-3080A-119+ is a Frequency Synthesizer, designed to operate from 3040 to 3080 MHz for point to point application. The KSN-3080A-119+ 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-3080A-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



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

| Parameters | Test Conditions | Min. | Typ. | Max. | Units | |
|-------------------------------------|----------------------------|-----------------------|--------------------------------------|-------|------------------|---|
| Frequency Range | - | 3040 | - | 3080 | MHz | |
| Step Size | - | - | 10 | - | MHz | |
| Settling Time | Within ± 1 kHz | - | 0.5 | - | mSec | |
| Output Power | - | 0 | +3.7 | +6 | dBm | |
| SSB Phase Noise | @ 100 Hz offset | - | -85 | - | dBc/Hz | |
| | @ 1 kHz offset | - | -95 | -90 | | |
| | @ 10 kHz offset | - | -94 | -89 | | |
| | @ 100 kHz offset | - | -113 | -106 | | |
| | @ 1 MHz offset | - | -135 | -129 | | |
| Reference Spurious Suppression | Ref. Freq. 10MHz | - | -105 | -85 | dBc | |
| Comparison Spurious Suppression | Step Size 10MHz | - | -105 | -85 | | |
| Non - Harmonic Spurious Suppression | - | - | -90 | - | | |
| Harmonic Suppression | - | - | -25 | -18 | | |
| 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 | - | - | 46 | 55 | mA | |
| PLL Supply Current | - | - | 14 | 22 | | |
| Reference Input (External) | Frequency | 10 (square wave) | - | 10 | MHz | |
| | Amplitude | 1 | - | 1 | V _{P-P} | |
| | Input impedance | - | - | 100 | KΩ | |
| | Phase Noise @ 1 kHz offset | - | - | -147 | dBc/Hz | |
| RF Output port Impedance | - | - | 50 | - | Ω | |
| Input Logic Level | Input high voltage | - | 2.55 | - | V | |
| | Input low voltage | - | - | 0.55 | V | |
| Digital Lock Detect | Locked | - | 2.45 | - | 3.15 | V |
| | Unlocked | - | - | - | 0.40 | V |
| Frequency Synthesizer PLL | - | ADF4106 | | | | |
| PLL Programming | - | 3-wire serial 3V CMOS | | | | |
| Register Map @ 3080 MHz | F_Register | - | (MSB) 010111111000000010010011 (LSB) | | | |
| | N_Register | - | (MSB) 001000000001001100010001 (LSB) | | | |
| | R_Register | - | (MSB) 00010000000000000000100 (LSB) | | | |

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 | -0.3Vmin, VCC PLL +0.3Vmax |
| Data, Clock, LE Levels | -0.3Vmin, VCC PLL +0.3Vmax |
| 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) | | |
|--------------------|-----------------------|-------|-------|---------------------|-------|-------|--------------------|-------|-------|
| | -45°C | +25°C | +85°C | -45°C | +25°C | +85°C | -45°C | +25°C | +85°C |
| | 3040 | 3.72 | 3.78 | 3.37 | 43.44 | 46.37 | 48.09 | 12.71 | 14.79 |
| 3044 | 3.68 | 3.74 | 3.33 | 43.46 | 46.39 | 48.11 | 12.71 | 14.79 | 17.48 |
| 3048 | 3.64 | 3.70 | 3.29 | 43.48 | 46.41 | 48.14 | 12.71 | 14.80 | 17.50 |
| 3052 | 3.62 | 3.68 | 3.27 | 43.50 | 46.43 | 48.16 | 12.73 | 14.82 | 17.53 |
| 3056 | 3.63 | 3.67 | 3.26 | 43.53 | 46.46 | 48.19 | 12.76 | 14.85 | 17.57 |
| 3060 | 3.63 | 3.66 | 3.25 | 43.56 | 46.48 | 48.21 | 12.79 | 14.89 | 17.61 |
| 3064 | 3.66 | 3.68 | 3.27 | 43.58 | 46.50 | 48.24 | 12.80 | 14.90 | 17.63 |
| 3068 | 3.69 | 3.71 | 3.30 | 43.60 | 46.53 | 48.27 | 12.81 | 14.91 | 17.65 |
| 3072 | 3.72 | 3.73 | 3.33 | 43.62 | 46.55 | 48.29 | 12.83 | 14.93 | 17.67 |
| 3076 | 3.75 | 3.76 | 3.36 | 43.64 | 46.57 | 48.32 | 12.84 | 14.94 | 17.68 |
| 3080 | 3.78 | 3.79 | 3.39 | 43.66 | 46.59 | 48.34 | 12.85 | 14.95 | 17.70 |

| FREQUENCY (MHz) | HARMONICS (dBc) | | | | | |
|--------------------|-----------------|--------|--------|--------|--------|--------|
| | F2 | | | F3 | | |
| | -45°C | +25°C | +85°C | -45°C | +25°C | +85°C |
| 3040 | -23.55 | -25.35 | -28.10 | -39.35 | -38.96 | -37.63 |
| 3044 | -23.51 | -25.38 | -28.08 | -39.09 | -38.68 | -37.40 |
| 3048 | -23.47 | -25.41 | -28.05 | -38.84 | -38.40 | -37.17 |
| 3052 | -23.49 | -25.45 | -28.03 | -38.49 | -38.09 | -36.90 |
| 3056 | -23.56 | -25.51 | -28.02 | -38.06 | -37.76 | -36.57 |
| 3060 | -23.64 | -25.57 | -28.00 | -37.62 | -37.42 | -36.24 |
| 3064 | -23.80 | -25.67 | -28.07 | -37.89 | -37.15 | -36.08 |
| 3068 | -23.97 | -25.77 | -28.14 | -38.16 | -36.88 | -35.93 |
| 3072 | -24.06 | -25.83 | -28.20 | -38.19 | -36.74 | -35.95 |
| 3076 | -24.09 | -25.84 | -28.25 | -38.00 | -36.73 | -36.16 |
| 3080 | -24.11 | -25.86 | -28.29 | -37.81 | -36.72 | -36.37 |



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| FREQUENCY (MHz) | PHASE NOISE (dBc/Hz) @OFFSETS | | | | |
|--------------------|-------------------------------|--------|--------|---------|---------|
| | +25°C | | | | |
| | 100Hz | 1kHz | 10kHz | 100kHz | 1MHz |
| 3040 | -85.52 | -97.13 | -94.06 | -113.21 | -135.66 |
| 3044 | -85.30 | -96.87 | -94.21 | -113.18 | -135.69 |
| 3048 | -85.08 | -96.62 | -94.36 | -113.15 | -135.72 |
| 3052 | -85.56 | -96.20 | -94.59 | -113.13 | -135.71 |
| 3056 | -86.74 | -95.61 | -94.90 | -113.13 | -135.67 |
| 3060 | -87.92 | -95.03 | -95.21 | -113.13 | -135.63 |
| 3064 | -87.42 | -94.93 | -94.69 | -113.16 | -135.66 |
| 3068 | -86.91 | -94.82 | -94.18 | -113.19 | -135.69 |
| 3072 | -86.55 | -94.92 | -94.08 | -113.31 | -135.70 |
| 3076 | -86.32 | -95.21 | -94.41 | -113.50 | -135.70 |
| 3080 | -86.10 | -95.50 | -94.73 | -113.70 | -135.70 |

| FREQUENCY (MHz) | PHASE NOISE (dBc/Hz) @OFFSETS | | | | |
|--------------------|-------------------------------|--------|--------|---------|---------|
| | -45°C | | | | |
| | 100Hz | 1kHz | 10kHz | 100kHz | 1MHz |
| 3040 | -87.08 | -96.24 | -95.70 | -114.75 | -137.42 |
| 3044 | -87.48 | -95.60 | -95.45 | -114.69 | -137.41 |
| 3048 | -87.88 | -94.95 | -95.20 | -114.62 | -137.40 |
| 3052 | -88.04 | -94.75 | -95.25 | -114.58 | -137.40 |
| 3056 | -87.95 | -95.00 | -95.60 | -114.57 | -137.41 |
| 3060 | -87.86 | -95.24 | -95.96 | -114.55 | -137.43 |
| 3064 | -88.02 | -96.13 | -96.00 | -114.47 | -137.50 |
| 3068 | -88.19 | -97.02 | -96.04 | -114.40 | -137.57 |
| 3072 | -87.93 | -97.14 | -96.05 | -114.39 | -137.57 |
| 3076 | -87.24 | -96.49 | -96.04 | -114.44 | -137.50 |
| 3080 | -86.55 | -95.85 | -96.03 | -114.49 | -137.43 |

| FREQUENCY (MHz) | PHASE NOISE (dBc/Hz) @OFFSETS | | | | |
|--------------------|-------------------------------|--------|--------|---------|---------|
| | +85°C | | | | |
| | 100Hz | 1kHz | 10kHz | 100kHz | 1MHz |
| 3040 | -85.28 | -94.36 | -92.92 | -111.08 | -132.85 |
| 3044 | -84.57 | -94.66 | -93.13 | -111.12 | -132.91 |
| 3048 | -83.86 | -94.96 | -93.34 | -111.15 | -132.97 |
| 3052 | -83.76 | -94.94 | -93.54 | -111.19 | -133.07 |
| 3056 | -84.28 | -94.61 | -93.75 | -111.24 | -133.20 |
| 3060 | -84.80 | -94.28 | -93.95 | -111.28 | -133.33 |
| 3064 | -84.11 | -95.07 | -93.65 | -111.35 | -133.41 |
| 3068 | -83.42 | -95.86 | -93.36 | -111.42 | -133.49 |
| 3072 | -83.39 | -96.10 | -93.19 | -111.49 | -133.51 |
| 3076 | -84.02 | -95.81 | -93.14 | -111.56 | -133.48 |
| 3080 | -84.64 | -95.52 | -93.10 | -111.64 | -133.44 |



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| REFERENCE & COMPARISON SPURIOUS ORDER | REFERENCE & COMPARISON SPURIOUS @ Fcarrier 3040MHz+(n*Fcomp or Fref) (dBc) note 1 | | | REFERENCE & COMPARISON SPURIOUS @ Fcarrier 3060MHz+(n*Fcomp or Fref) (dBc) note 1 | | | REFERENCE & COMPARISON SPURIOUS @ Fcarrier 3080MHz+(n*Fcomp or Fref) (dBc) note 1 | | |
|---------------------------------------|---|---------|---------|---|---------|---------|---|---------|---------|
| | -45°C | +25°C | +85°C | -45°C | +25°C | +85°C | -45°C | +25°C | +85°C |
| | n | | | | | | | | |
| -5 | -102.60 | -104.33 | -104.82 | -101.78 | -102.33 | -114.61 | -101.20 | -104.96 | -111.30 |
| -4 | -104.48 | -106.71 | -106.42 | -103.21 | -102.15 | -109.45 | -98.69 | -103.62 | -104.87 |
| -3 | -107.32 | -106.92 | -107.37 | -101.44 | -103.03 | -111.81 | -100.65 | -106.50 | -110.89 |
| -2 | -106.77 | -108.47 | -104.51 | -100.83 | -100.71 | -113.97 | -100.26 | -106.13 | -113.48 |
| -1 | -104.44 | -110.10 | -98.59 | -102.52 | -105.18 | -108.71 | -99.72 | -104.77 | -106.84 |
| 0 ^{note 2} | - | - | - | - | - | - | - | - | - |
| +1 | -104.71 | -103.76 | -97.87 | -107.80 | -112.39 | -101.51 | -103.49 | -99.58 | -99.27 |
| +2 | -114.24 | -113.70 | -117.29 | -105.26 | -113.74 | -111.23 | -108.18 | -103.74 | -104.94 |
| +3 | -116.83 | -113.66 | -115.30 | -109.73 | -116.23 | -113.51 | -111.44 | -106.34 | -104.18 |
| +4 | -113.04 | -116.84 | -110.50 | -105.56 | -114.46 | -116.35 | -105.53 | -104.23 | -104.60 |
| +5 | -114.88 | -116.24 | -110.87 | -106.94 | -115.86 | -114.37 | -106.24 | -105.09 | -105.52 |

Note 1: Reference frequency = Comparison frequency = 10MHz

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



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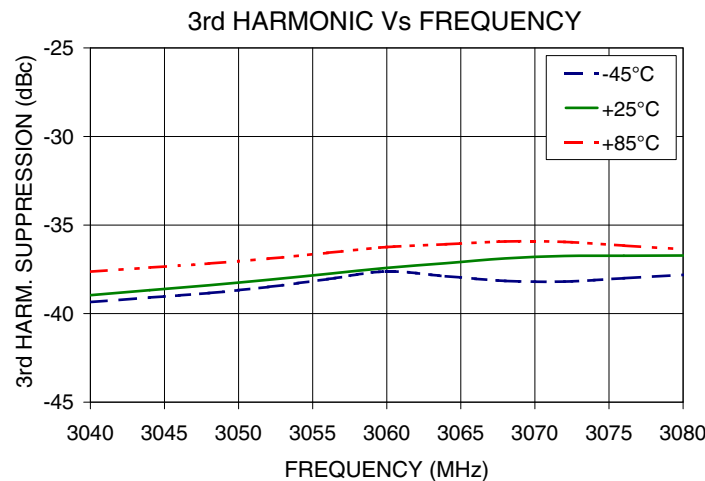
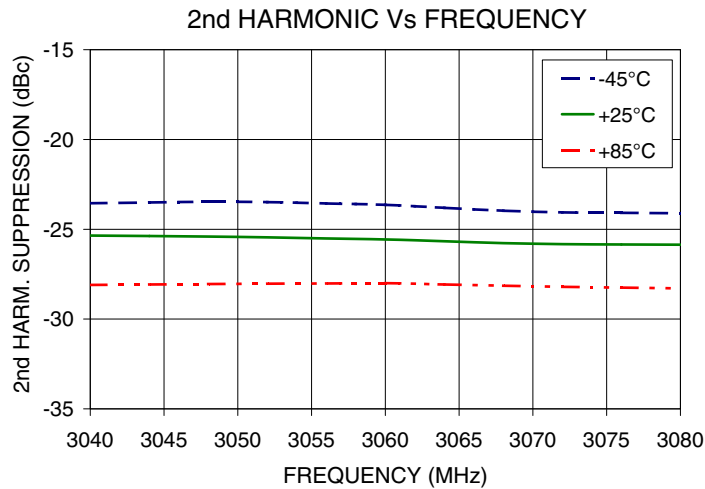
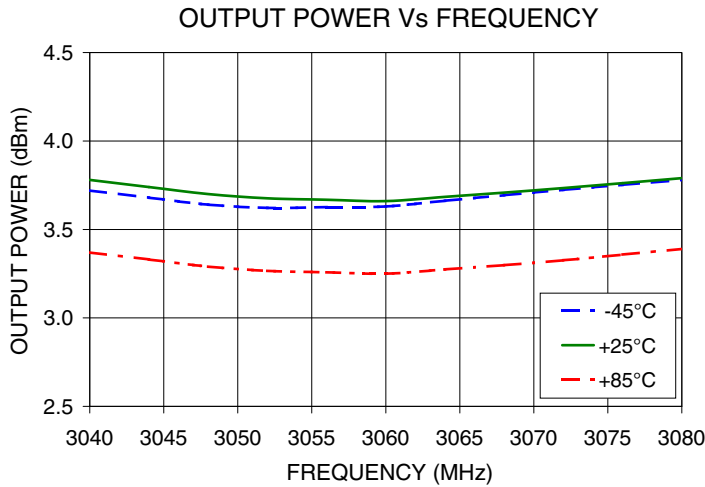


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Typical Performance Curves



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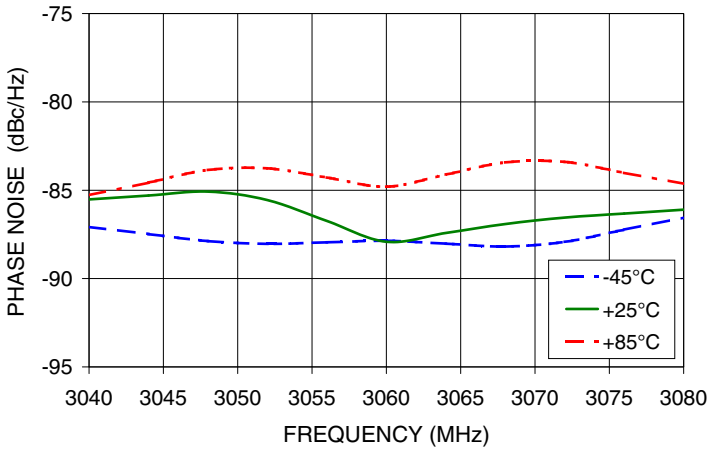


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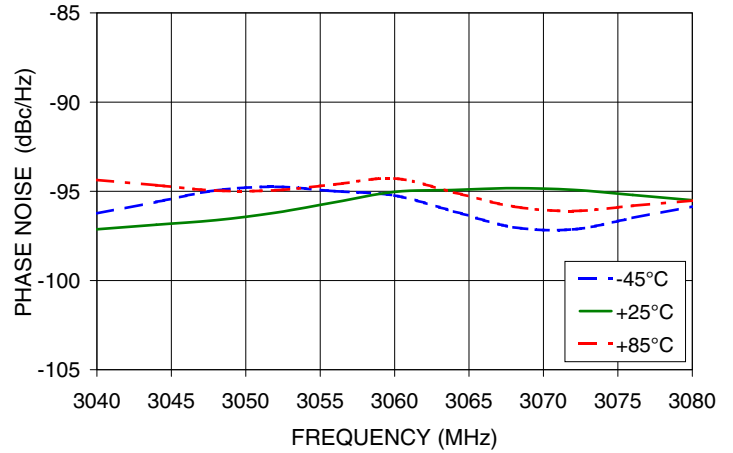


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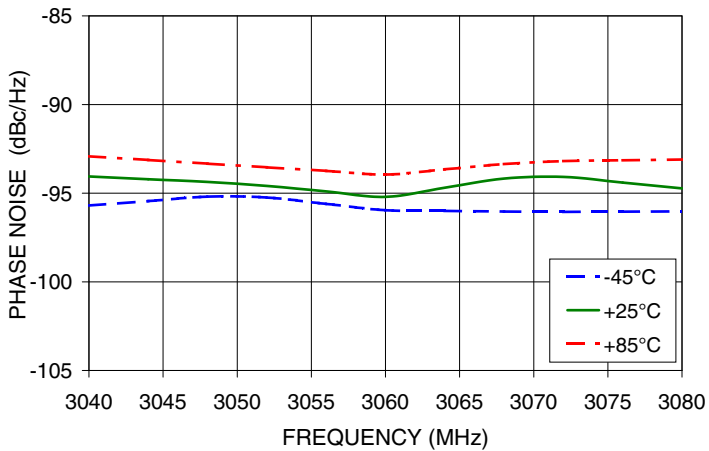
PHASE NOISE @ 100Hz offset



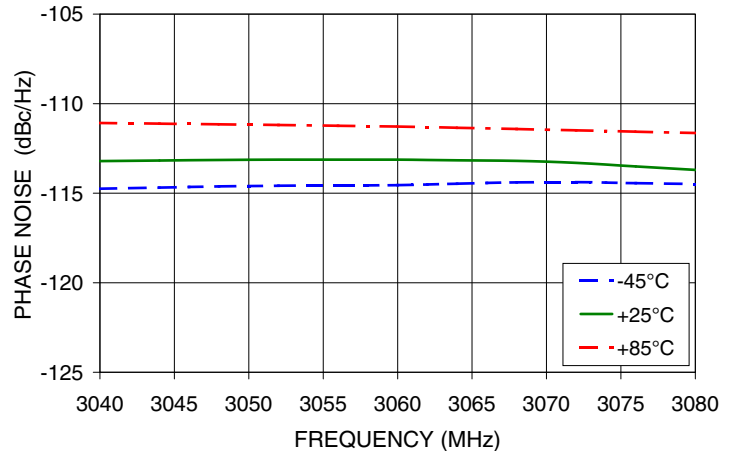
PHASE NOISE @ 1kHz offset



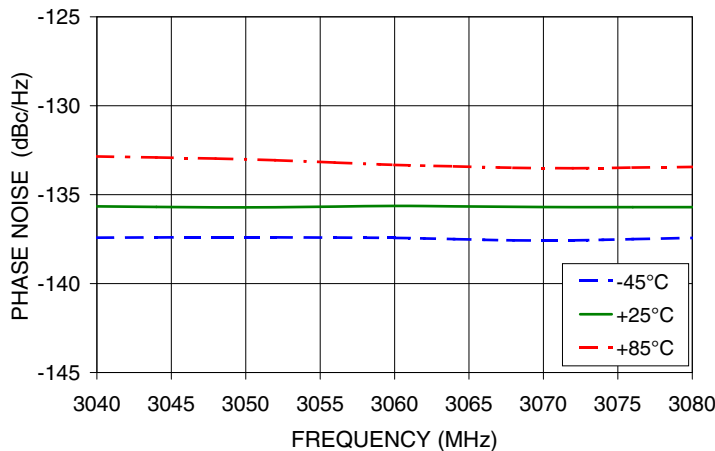
PHASE NOISE @ 10kHz offset



PHASE NOISE @ 100kHz offset



PHASE NOISE @ 1MHz offset



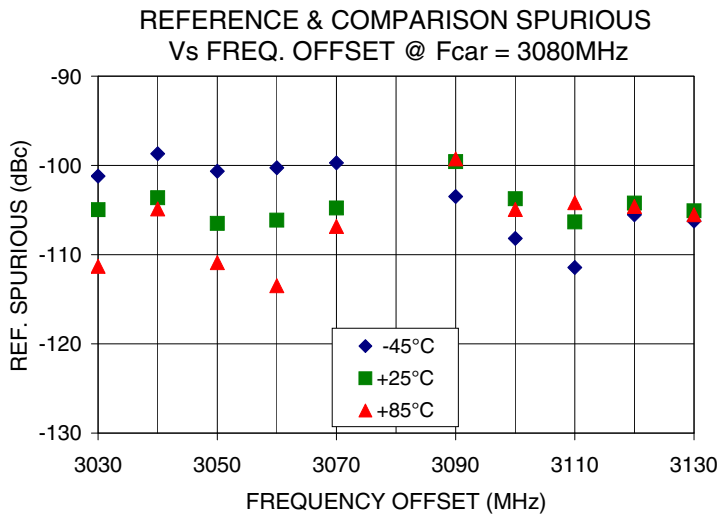
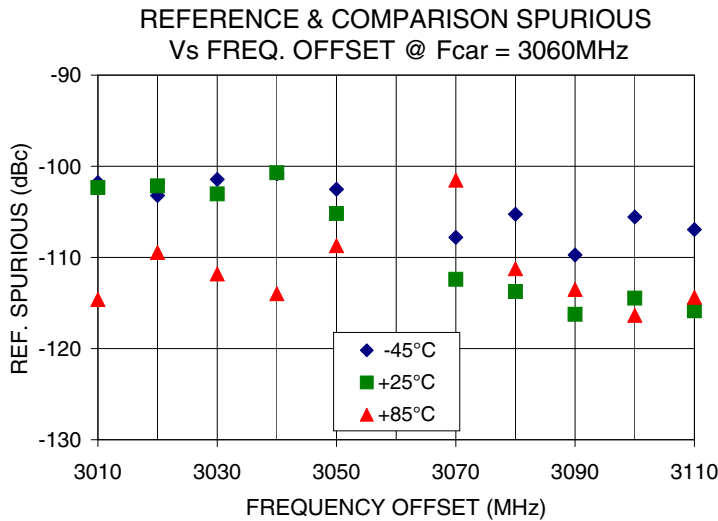
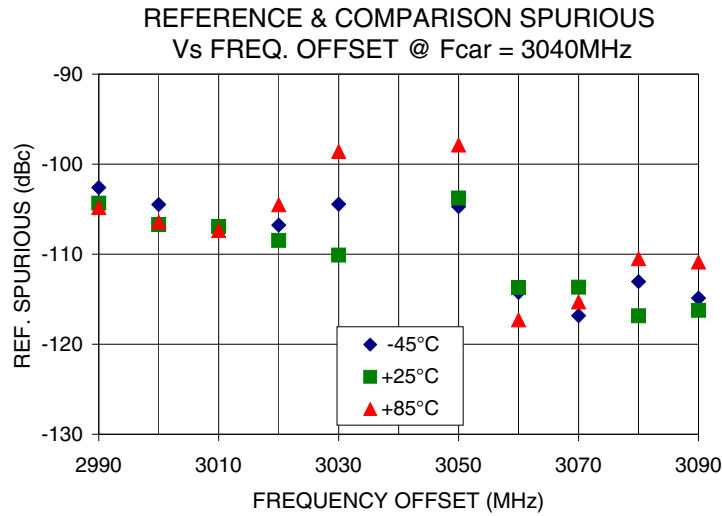
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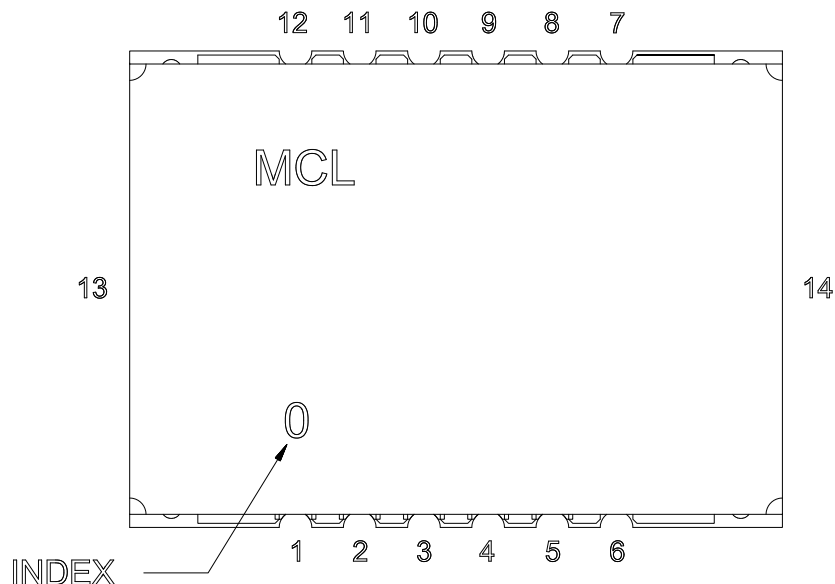


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Pin Configuration

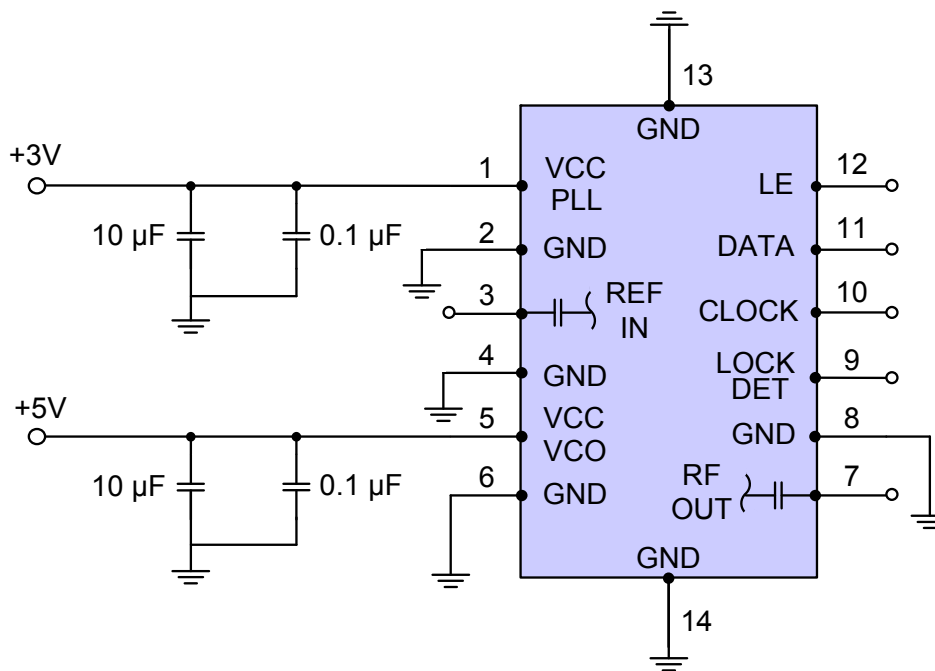


Pin Connection

| 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 | CLOCK |
| 11 | DATA |
| 12 | LE |
| 13 | GND |
| 14 | GND |

Recommended Application Circuit

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



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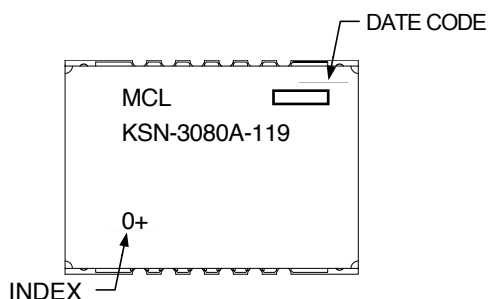


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Device Marking



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+

Environment Ratings: ENV03T2



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