

# NON-CATALOG

## Frequency Synthesizer

KSN-1150A-119+

50Ω 1150 to 1160 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-1150A-119+ is a Frequency Synthesizer, designed to operate from 1150 to 1160 MHz for CATV application. The KSN-1150A-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"><li>• Phase Noise: -109 dBc/Hz typ. @ 10 kHz offset</li><li>• Comparison Spurious: -94 dBc typ.</li><li>• Reference Spurious: -114 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-1150A-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-1150A-119+ to be used in compact designs.   |



IF/RF MICROWAVE COMPONENTS • ISO 9001 ISO 14001 AS9100 CERTIFIED RoHS compliant  
P.O. Box 350166, Brooklyn, New York 11235-0003 (718) 934-4500 Fax (718) 332-4661



The Design Engineers Search Engine finds the model you need, Instantly • For detailed performance specs & shopping online see



Notes: 1. Performance and quality attributes and conditions not expressly stated in this specification sheet are intended to be excluded and do not form a part of this specification sheet. 2. Electrical specifications and performance data contained herein are based on Mini-Circuit's applicable established test performance criteria and measurement instructions. 3. The parts covered by this specification sheet are subject to Mini-Circuits standard limited warranty and terms and conditions (collectively, "Standard Terms"); Purchasers of this part are entitled to the rights and benefits contained therein. For a full statement of the Standard Terms and the exclusive rights and remedies thereunder, please visit Mini-Circuits' website at [www.minicircuits.com/MCLStore/terms.jsp](http://www.minicircuits.com/MCLStore/terms.jsp).

50Ω 1150 to 1160 MHz

### Features

- Integrated VCO + PLL
- Low phase noise and spurious
- 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: DK801

+ 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.

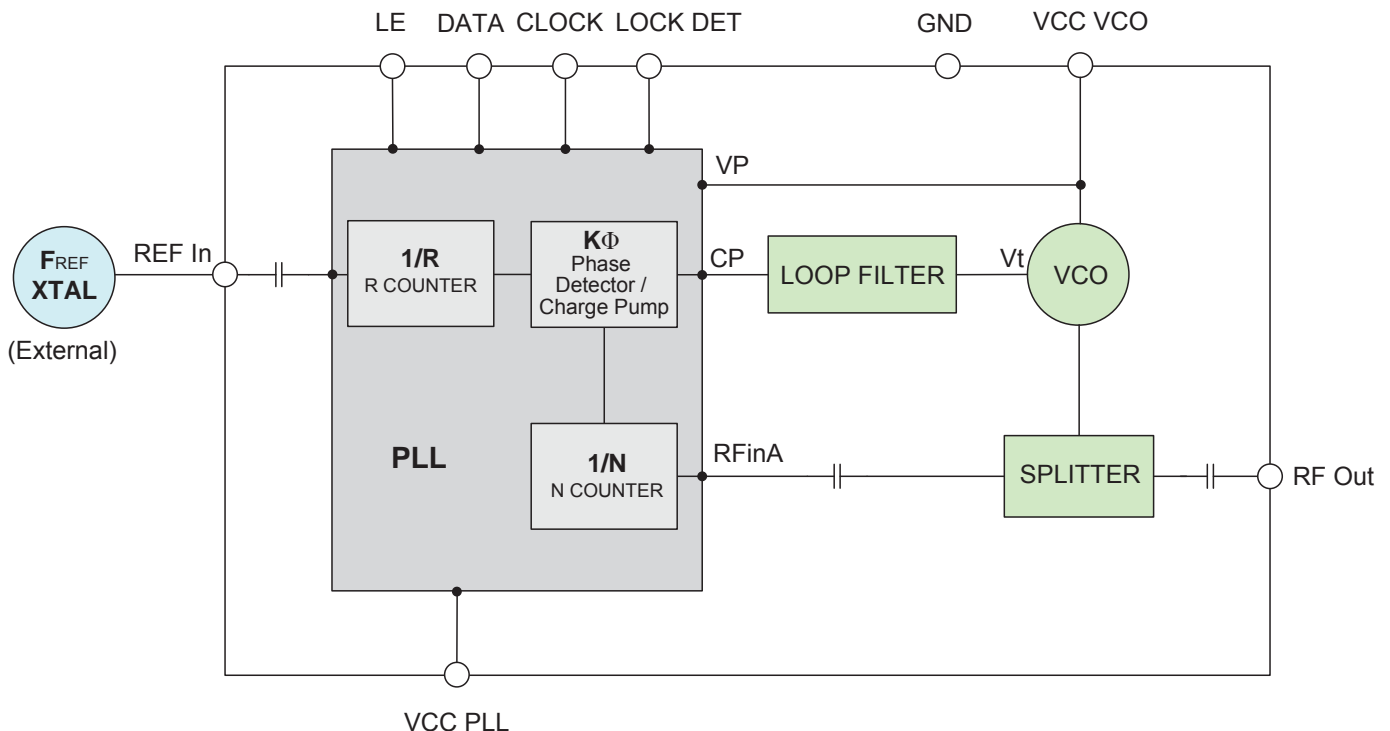
### Applications

- CATV

### General Description

The KSN-1150A-119+ is a Frequency Synthesizer, designed to operate from 1150 to 1160 MHz for CATV application. The KSN-1150A-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-1150A-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



IF/RF MICROWAVE COMPONENTS • ISO 9001 ISO 14001 AS9100 CERTIFIED RoHS compliant  
P.O. Box 350166, Brooklyn, New York 11235-0003 (718) 934-4500 Fax (718) 332-4661



The Design Engineers Search Engine finds the model you need, Instantly • For detailed performance specs & shopping online see



Notes: 1. Performance and quality attributes and conditions not expressly stated in this specification sheet are intended to be excluded and do not form a part of this specification sheet. 2. Electrical specifications and performance data contained herein are based on Mini-Circuit's applicable established test performance criteria and measurement instructions. 3. The parts covered by this specification sheet are subject to Mini-Circuits standard limited warranty and terms and conditions (collectively, "Standard Terms"); Purchasers of this part are entitled to the rights and benefits contained therein. For a full statement of the Standard Terms and the exclusive rights and remedies thereunder, please visit Mini-Circuits' website at [www.minicircuits.com/MCLStore/terms.jsp](http://www.minicircuits.com/MCLStore/terms.jsp).

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

| Parameters                          | Test Conditions            | Min.                  | Typ.                                 | Max.  | Units    |                  |
|-------------------------------------|----------------------------|-----------------------|--------------------------------------|-------|----------|------------------|
| Frequency Range                     | -                          | 1150                  | -                                    | 1160  | MHz      |                  |
| Step Size                           | -                          | -                     | 250                                  | -     | kHz      |                  |
| Settling Time                       | Within $\pm 1$ kHz         | -                     | 5                                    | -     | mSec     |                  |
| Output Power                        | -                          | -0.5                  | +2.0                                 | +4.5  | dBm      |                  |
| SSB Phase Noise                     | @ 100 Hz offset            | -                     | -85                                  | -     | dBc/Hz   |                  |
|                                     | @ 1 kHz offset             | -                     | -85                                  | -76   |          |                  |
|                                     | @ 10 kHz offset            | -                     | -109                                 | -101  |          |                  |
|                                     | @ 100 kHz offset           | -                     | -134                                 | -126  |          |                  |
|                                     | @ 1 MHz offset             | -                     | -154                                 | -146  |          |                  |
| Integrated SSB Phase Noise          | @100 Hz - 1 MHz            | -                     | -49                                  | -46   | dBc      |                  |
| Reference Spurious Suppression      | Ref. Freq. 20 MHz          | -                     | -114                                 | -89   | dBc      |                  |
| Comparison Spurious Suppression     | Step Size 250 kHz          | -                     | -94                                  | -73   |          |                  |
| Non - Harmonic Spurious Suppression | -                          | -                     | -90                                  | -     |          |                  |
| Harmonic Suppression                | -                          | -                     | -38                                  | -26   |          |                  |
| 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                  | -                          | -                     | 35                                   | 42    | mA       |                  |
| PLL Supply Current                  | -                          | -                     | 20                                   | 27    |          |                  |
| Reference Input<br>(External)       | Frequency                  | 20 (square wave)      | -                                    | 20    | -        | MHz              |
|                                     | Amplitude                  | 1                     | -                                    | 1     | -        | V <sub>P-P</sub> |
|                                     | Input impedance            | -                     | -                                    | 100   | -        | K $\Omega$       |
|                                     | Phase Noise @ 1 kHz offset | -                     | -                                    | -145  | -        | dBc/Hz           |
| RF Output port Impedance            | -                          | -                     | 50                                   | -     | $\Omega$ |                  |
| Input Logic Level                   | Input high voltage         | -                     | 2.50                                 | -     | -        | V                |
|                                     | Input low voltage          | -                     | -                                    | -     | 0.55     | V                |
| Digital Lock Detect                 | Locked                     | -                     | 2.40                                 | -     | 3.15     | V                |
|                                     | Unlocked                   | -                     | -                                    | -     | 0.40     | V                |
| Frequency Synthesizer PLL           | -                          | ADF4106               |                                      |       |          |                  |
| PLL Programming                     | -                          | 3-wire serial 3V CMOS |                                      |       |          |                  |
| Register Map @1160MHz               | F_Register                 | -                     | (MSB) 000111111000000010010011 (LSB) |       |          |                  |
|                                     | N_Register                 | -                     | (MSB) 001000100100010000000001 (LSB) |       |          |                  |
|                                     | R_Register                 | -                     | (MSB) 000100000000000101000000 (LSB) |       |          |                  |

### Absolute Maximum Ratings

| Parameters                               | Ratings             |
|--|---------------------|
| VCO Supply Voltage                       | 5.8V                |
| PLL Supply Voltage                       | 5.8V                |
| VCO Supply Voltage to PLL Supply Voltage | -0.3V to +5.8V      |
| Reference Frequency Voltage              | -0.3Vmin, +3.15Vmax |
| Data, Clock, LE Levels                   | -0.3Vmin, +3.15Vmax |
| 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



IF/RF MICROWAVE COMPONENTS • ISO 9001 ISO 14001 AS 9100 CERTIFIED RoHS compliant

P.O. Box 350166, Brooklyn, New York 11235-0003 (718) 934-4500 Fax (718) 332-4661



The Design Engineers Search Engine finds the model you need, Instantly • For detailed performance specs & shopping online see



Notes: 1. Performance and quality attributes and conditions not expressly stated in this specification sheet are intended to be excluded and do not form a part of this specification sheet. 2. Electrical specifications and performance data contained herein are based on Mini-Circuit's applicable established test performance criteria and measurement instructions. 3. The parts covered by this specification sheet are subject to Mini-Circuits standard limited warranty and terms and conditions (collectively, "Standard Terms"); Purchasers of this part are entitled to the rights and benefits contained therein. For a full statement of the Standard Terms and the exclusive rights and remedies thereunder, please visit Mini-Circuits' website at [www.minicircuits.com/MCLStore/terms.jsp](http://www.minicircuits.com/MCLStore/terms.jsp).

# NON-CATALOG

Frequency Synthesizer

KSN-1150A-119+

## Typical Performance Data

| FREQUENCY<br>(MHz) | POWER OUTPUT<br>(dBm) |       |       | VCO CURRENT<br>(mA) |       |       | PLL CURENT<br>(mA) |       |       |
|--------------------|-----------------------|-------|-------|---------------------|-------|-------|--------------------|-------|-------|
|                    | -45°C                 | +25°C | +85°C | -45°C               | +25°C | +85°C | -45°C              | +25°C | +85°C |
|                    | 1150.0                | 2.07  | 2.19  | 2.20                | 33.03 | 35.17 | 36.55              | 19.79 | 20.27 |
| 1152.0             | 2.05                  | 2.17  | 2.18  | 33.02               | 35.17 | 36.55 | 19.79              | 20.27 | 21.24 |
| 1154.0             | 2.03                  | 2.14  | 2.16  | 33.02               | 35.17 | 36.56 | 19.79              | 20.27 | 21.24 |
| 1156.0             | 2.01                  | 2.12  | 2.14  | 33.01               | 35.17 | 36.56 | 19.79              | 20.27 | 21.24 |
| 1158.0             | 1.99                  | 2.10  | 2.12  | 33.01               | 35.17 | 36.56 | 19.79              | 20.27 | 21.25 |
| 1160.0             | 1.96                  | 2.07  | 2.09  | 33.00               | 35.17 | 36.55 | 19.79              | 20.27 | 21.25 |

| FREQUENCY<br>(MHz) | HARMONICS (dBc) |        |        |        |        |        |
|--------------------|-----------------|--------|--------|--------|--------|--------|
|                    | F2              |        |        | F3     |        |        |
|                    | -45°C           | +25°C  | +85°C  | -45°C  | +25°C  | +85°C  |
| 1150.0             | -41.18          | -39.54 | -43.01 | -33.44 | -36.50 | -38.49 |
| 1152.0             | -42.28          | -39.95 | -43.73 | -33.66 | -36.84 | -38.82 |
| 1154.0             | -43.37          | -40.37 | -44.46 | -33.89 | -37.19 | -39.16 |
| 1156.0             | -44.47          | -40.78 | -45.18 | -34.11 | -37.53 | -39.49 |
| 1158.0             | -46.33          | -41.70 | -46.47 | -33.75 | -37.43 | -39.56 |
| 1160.0             | -48.19          | -42.62 | -47.76 | -33.38 | -37.33 | -39.62 |

| FREQUENCY<br>(MHz) | PHASE NOISE (dBc/Hz) @OFFSETS |        |         |         |         |
|--------------------|-------------------------------|--------|---------|---------|---------|
|                    | +25°C                         |        |         |         |         |
|                    | 100Hz                         | 1kHz   | 10kHz   | 100kHz  | 1MHz    |
| 1150.0             | -83.65                        | -85.74 | -109.60 | -134.66 | -153.90 |
| 1152.0             | -84.82                        | -85.65 | -109.53 | -134.66 | -154.18 |
| 1154.0             | -86.00                        | -85.55 | -109.45 | -134.67 | -154.45 |
| 1156.0             | -87.17                        | -85.46 | -109.38 | -134.67 | -154.73 |
| 1158.0             | -87.57                        | -85.51 | -109.33 | -134.54 | -154.70 |
| 1160.0             | -87.97                        | -85.56 | -109.27 | -134.40 | -154.66 |

| FREQUENCY<br>(MHz) | PHASE NOISE (dBc/Hz) @OFFSETS |        |         |         |         |
|--------------------|-------------------------------|--------|---------|---------|---------|
|                    | -45°C                         |        |         |         |         |
|                    | 100Hz                         | 1kHz   | 10kHz   | 100kHz  | 1MHz    |
| 1150.0             | -82.72                        | -86.28 | -107.49 | -131.99 | -151.86 |
| 1152.0             | -83.71                        | -86.42 | -107.33 | -131.87 | -151.59 |
| 1154.0             | -84.69                        | -86.57 | -107.16 | -131.76 | -151.32 |
| 1156.0             | -85.68                        | -86.71 | -107.00 | -131.64 | -151.05 |
| 1158.0             | -85.14                        | -85.37 | -107.19 | -131.58 | -150.77 |
| 1160.0             | -84.60                        | -84.03 | -107.37 | -131.52 | -150.48 |

| FREQUENCY<br>(MHz) | PHASE NOISE (dBc/Hz) @OFFSETS |        |         |         |         |
|--------------------|-------------------------------|--------|---------|---------|---------|
|                    | +85°C                         |        |         |         |         |
|                    | 100Hz                         | 1kHz   | 10kHz   | 100kHz  | 1MHz    |
| 1150.0             | -84.73                        | -88.32 | -108.52 | -132.39 | -152.44 |
| 1152.0             | -85.65                        | -86.70 | -108.53 | -132.40 | -152.44 |
| 1154.0             | -86.58                        | -85.09 | -108.53 | -132.41 | -152.45 |
| 1156.0             | -87.50                        | -83.47 | -108.54 | -132.42 | -152.45 |
| 1158.0             | -86.77                        | -82.78 | -108.25 | -132.41 | -152.17 |
| 1160.0             | -86.03                        | -82.08 | -107.96 | -132.40 | -151.89 |



IF/RF MICROWAVE COMPONENTS • ISO 9001 ISO 14001 AS9100 CERTIFIED RoHS compliant  
P.O. Box 350166, Brooklyn, New York 11235-0003 (718) 934-4500 Fax (718) 332-4661



The Design Engineers Search Engine finds the model you need, Instantly • For detailed performance specs & shopping online see



Notes: 1. Performance and quality attributes and conditions not expressly stated in this specification sheet are intended to be excluded and do not form a part of this specification sheet. 2. Electrical specifications and performance data contained herein are based on Mini-Circuit's applicable established test performance criteria and measurement instructions. 3. The parts covered by this specification sheet are subject to Mini-Circuits standard limited warranty and terms and conditions (collectively, "Standard Terms"); Purchasers of this part are entitled to the rights and benefits contained therein. For a full statement of the Standard Terms and the exclusive rights and remedies thereunder, please visit Mini-Circuits' website at [www.minicircuits.com/MCLStore/terms.jsp](http://www.minicircuits.com/MCLStore/terms.jsp).

# NON-CATALOG

Frequency Synthesizer

KSN-1150A-119+

| COMPARISON SPURIOUS ORDER | COMPARISON SPURIOUS @Fcarrier<br>1150MHz+(n*Fcomparison)<br>(dBc) note 1 |         |         | COMPARISON SPURIOUS @Fcarrier<br>1155MHz+(n*Fcomparison)<br>(dBc) note 1 |         |         | COMPARISON SPURIOUS @Fcarrier<br>1160MHz+(n*Fcomparison)<br>(dBc) note 1 |         |         |         |
|---------------------------|--|---------|---------|--|---------|---------|--|---------|---------|---------|
|                           | n  | -45°C   | +25°C   | +85°C  | -45°C   | +25°C   | +85°C  | -45°C   | +25°C   | +85°C   |
|                           | -5   | -104.15 | -119.49 | -104.75  | -100.97 | -108.03 | -109.49  | -96.30  | -107.01 | -116.86 |
| -4                        | -99.88   | -120.25 | -105.25 | -96.28   | -106.06 | -114.36 | -93.82   | -104.85 | -114.69 |         |
| -3                        | -97.52   | -116.59 | -103.93 | -94.29   | -104.27 | -107.46 | -90.34   | -105.06 | -110.74 |         |
| -2                        | -93.99   | -108.40 | -99.24  | -90.73   | -101.82 | -103.44 | -87.89   | -101.74 | -111.14 |         |
| -1                        | -87.91   | -99.42  | -91.40  | -83.17   | -94.54  | -95.62  | -81.45   | -89.58  | -98.38  |         |
| 0 <sup>note 2</sup>       | -  | -       | -       | -  | -       | -       | -  | -       | -       |         |
| +1                        | -85.38   | -97.03  | -91.36  | -83.49   | -93.13  | -99.20  | -81.22   | -93.24  | -99.23  |         |
| +2                        | -94.21   | -111.07 | -100.97 | -90.53   | -100.83 | -102.15 | -87.25   | -100.62 | -112.71 |         |
| +3                        | -97.96   | -113.01 | -103.58 | -94.42   | -103.08 | -107.06 | -90.17   | -104.54 | -115.62 |         |
| +4                        | -99.10   | -118.99 | -103.80 | -96.31   | -105.58 | -110.06 | -93.12   | -105.04 | -115.51 |         |
| +5                        | -102.18  | -119.02 | -104.03 | -99.36   | -105.51 | -108.74 | -95.01   | -105.64 | -119.54 |         |

Note 1: Comparison frequency 250 kHz

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

| REFERENCE SPURIOUS ORDER | REFERENCE SPURIOUS @Fcarrier<br>1150MHz+(n*Freference)<br>(dBc) note 3 |         |         | REFERENCE SPURIOUS @Fcarrier<br>1155MHz+(n*Freference)<br>(dBc) note 3 |         |         | REFERENCE SPURIOUS @Fcarrier<br>1160MHz+(n*Freference)<br>(dBc) note 3 |         |         |         |
|--------------------------|--|---------|---------|--|---------|---------|--|---------|---------|---------|
|                          | n  | -45°C   | +25°C   | +85°C  | -45°C   | +25°C   | +85°C  | -45°C   | +25°C   | +85°C   |
|                          | -5   | -109.78 | -115.93 | -117.25  | -116.76 | -115.34 | -120.75  | -108.21 | -109.12 | -113.51 |
| -4                       | -111.55  | -122.04 | -118.56 | -114.26  | -121.44 | -125.59 | -110.20  | -120.65 | -117.28 |         |
| -3                       | -115.69  | -130.83 | -127.67 | -119.79  | -121.51 | -127.37 | -108.99  | -110.07 | -110.39 |         |
| -2                       | -109.47  | -122.13 | -120.43 | -112.93  | -117.03 | -124.90 | -111.11  | -117.30 | -118.69 |         |
| -1                       | -113.12  | -113.92 | -115.57 | -110.55  | -113.13 | -114.29 | -106.31  | -114.92 | -121.72 |         |
| 0 <sup>note 4</sup>      | -  | -       | -       | -  | -       | -       | -  | -       | -       |         |
| +1                       | -108.84  | -114.17 | -112.80 | -110.00  | -115.20 | -114.92 | -109.46  | -107.00 | -110.78 |         |
| +2                       | -116.18  | -116.71 | -115.37 | -121.73  | -121.01 | -122.66 | -109.87  | -111.27 | -116.38 |         |
| +3                       | -117.68  | -125.89 | -126.89 | -113.51  | -119.93 | -127.02 | -119.01  | -111.24 | -112.48 |         |
| +4                       | -114.51  | -121.14 | -120.99 | -113.42  | -116.08 | -116.64 | -104.48  | -108.40 | -124.53 |         |
| +5                       | -123.73  | -124.55 | -125.43 | -115.59  | -121.77 | -126.29 | -107.88  | -114.54 | -111.04 |         |

Note 3: Reference frequency 20 MHz

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



IF/RF MICROWAVE COMPONENTS • ISO 9001 ISO 14001 AS 9100 CERTIFIED RoHS compliant

P.O. Box 350166, Brooklyn, New York 11235-0003 (718) 934-4500 Fax (718) 332-4661

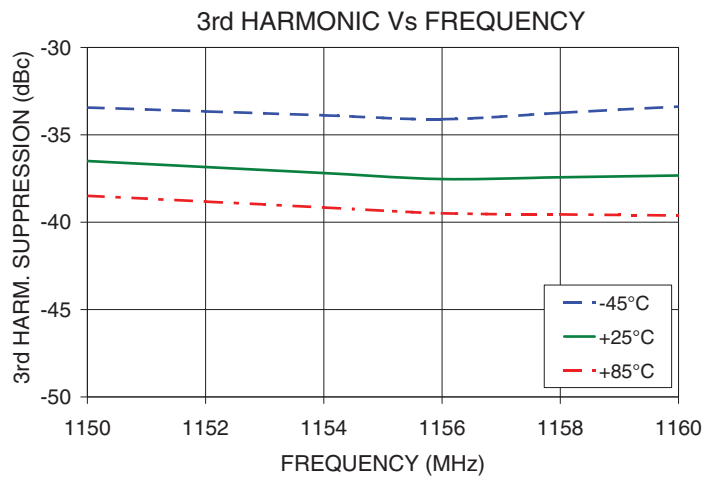
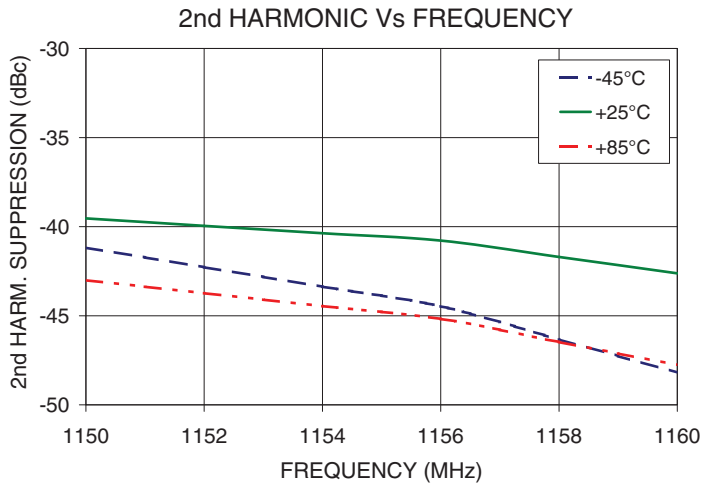
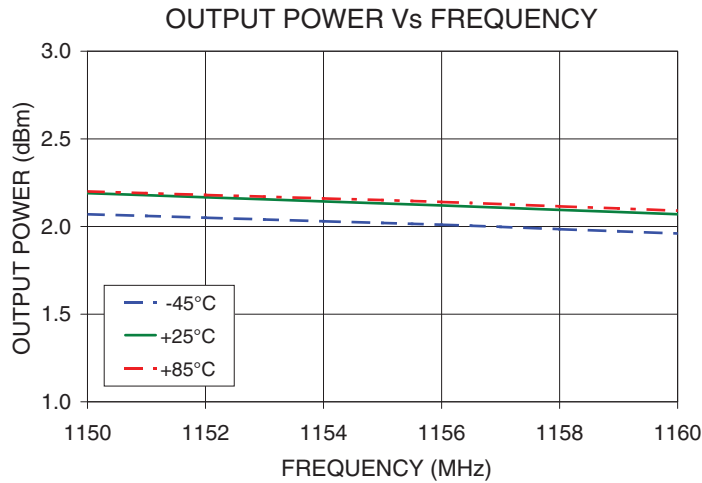


The Design Engineers Search Engine finds the model you need, Instantly • For detailed performance specs & shopping online see



Notes: 1. Performance and quality attributes and conditions not expressly stated in this specification sheet are intended to be excluded and do not form a part of this specification sheet. 2. Electrical specifications and performance data contained herein are based on Mini-Circuit's applicable established test performance criteria and measurement instructions. 3. The parts covered by this specification sheet are subject to Mini-Circuits standard limited warranty and terms and conditions (collectively, "Standard Terms"); Purchasers of this part are entitled to the rights and benefits contained therein. For a full statement of the Standard Terms and the exclusive rights and remedies thereunder, please visit Mini-Circuits' website at [www.minicircuits.com/MCLStore/terms.jsp](http://www.minicircuits.com/MCLStore/terms.jsp).

### Typical Performance Curves



IF/RF MICROWAVE COMPONENTS • ISO 9001 ISO 14001 AS9100 CERTIFIED RoHS compliant  
 P.O. Box 350166, Brooklyn, New York 11235-0003 (718) 934-4500 Fax (718) 332-4661



The Design Engineers Search Engine finds the model you need, Instantly • For detailed performance specs & shopping online see

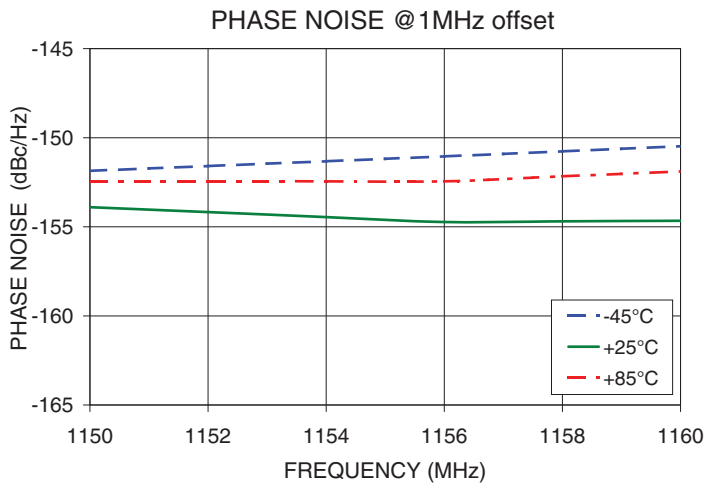
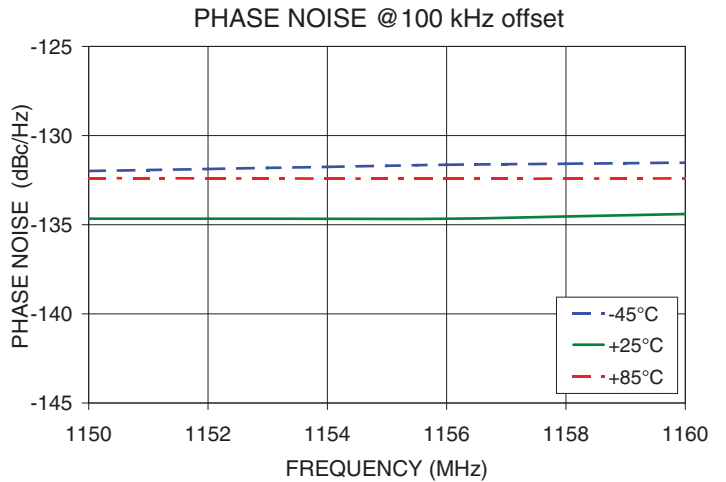
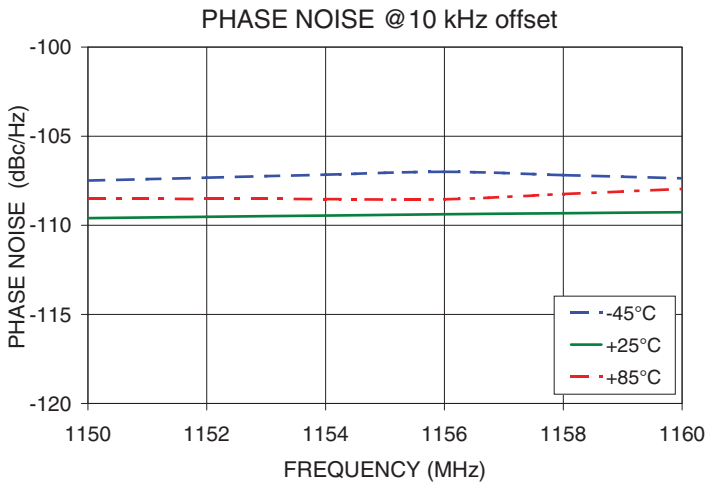
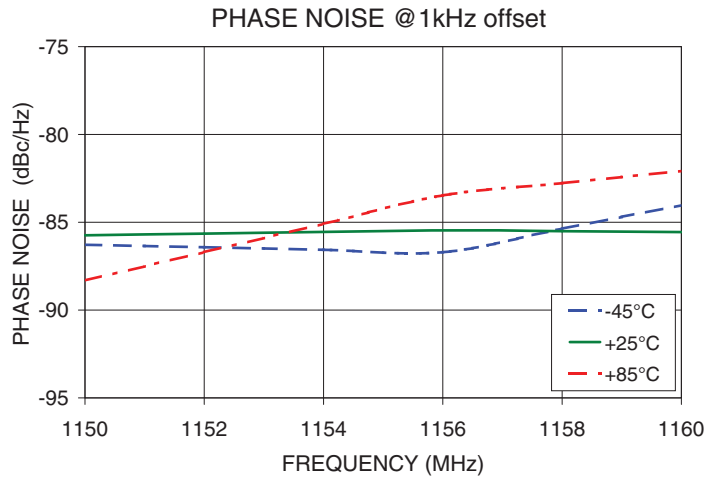
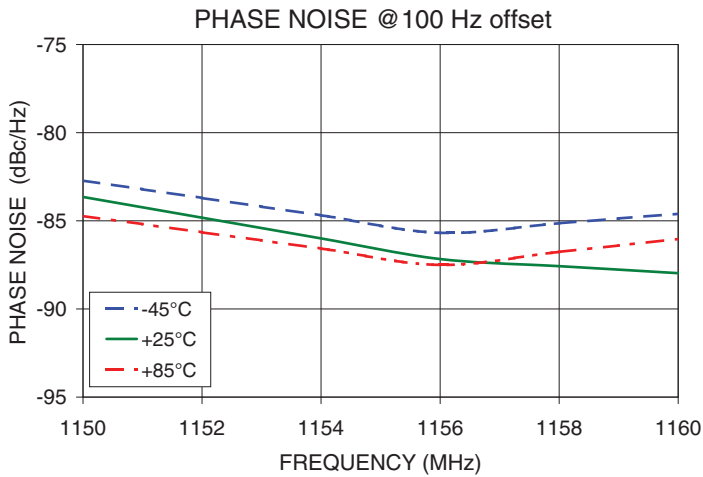


Notes: 1. Performance and quality attributes and conditions not expressly stated in this specification sheet are intended to be excluded and do not form a part of this specification sheet. 2. Electrical specifications and performance data contained herein are based on Mini-Circuit's applicable established test performance criteria and measurement instructions. 3. The parts covered by this specification sheet are subject to Mini-Circuits standard limited warranty and terms and conditions (collectively, "Standard Terms"); Purchasers of this part are entitled to the rights and benefits contained therein. For a full statement of the Standard Terms and the exclusive rights and remedies thereunder, please visit Mini-Circuits' website at [www.minicircuits.com/MCLStore/terms.jsp](http://www.minicircuits.com/MCLStore/terms.jsp).

# NON-CATALOG

## Frequency Synthesizer

## KSN-1150A-119+



IF/RF MICROWAVE COMPONENTS • ISO 9001 ISO 14001 AS 9100 CERTIFIED RoHS compliant  
 P.O. Box 350166, Brooklyn, New York 11235-0003 (718) 934-4500 Fax (718) 332-4661

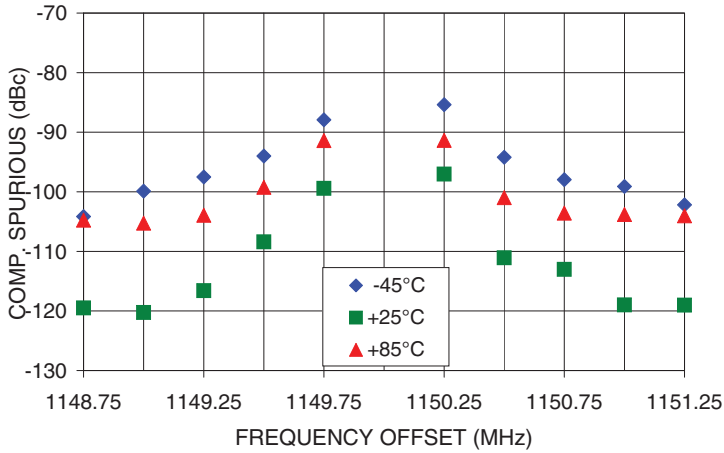


The Design Engineers Search Engine finds the model you need, Instantly • For detailed performance specs & shopping online see

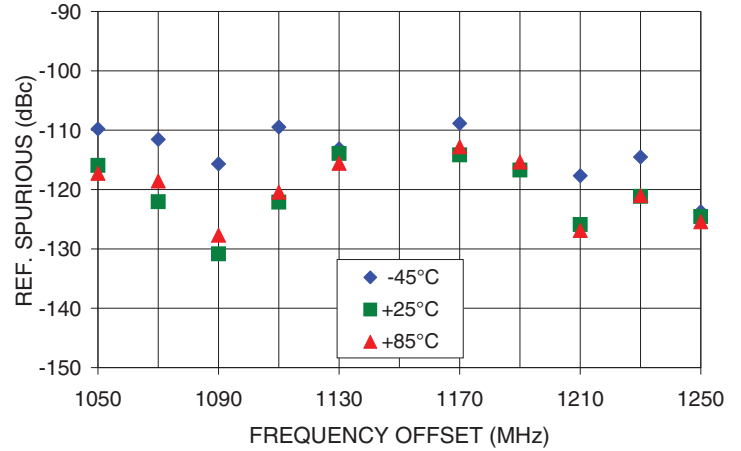


Notes: 1. Performance and quality attributes and conditions not expressly stated in this specification sheet are intended to be excluded and do not form a part of this specification sheet. 2. Electrical specifications and performance data contained herein are based on Mini-Circuit's applicable established test performance criteria and measurement instructions. 3. The parts covered by this specification sheet are subject to Mini-Circuit's standard limited warranty and terms and conditions (collectively, "Standard Terms"); Purchasers of this part are entitled to the rights and benefits contained therein. For a full statement of the Standard Terms and the exclusive rights and remedies thereunder, please visit Mini-Circuits' website at [www.minicircuits.com/MCLStore/terms.jsp](http://www.minicircuits.com/MCLStore/terms.jsp).

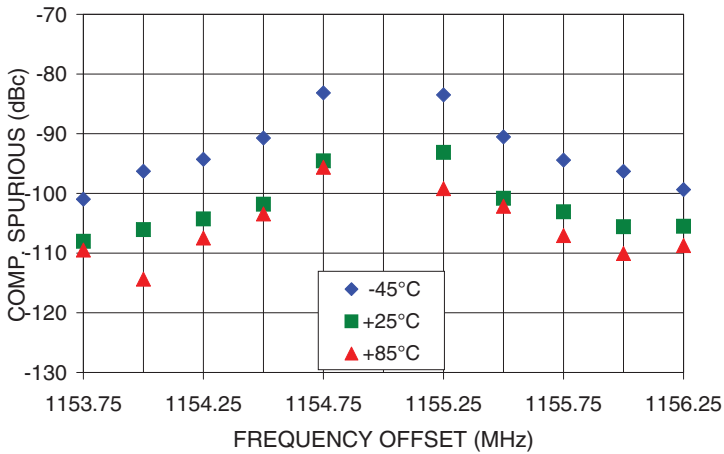
COMPARISON SPURIOUS  
Vs FREQ. OFFSET @ Fcar = 1150MHz



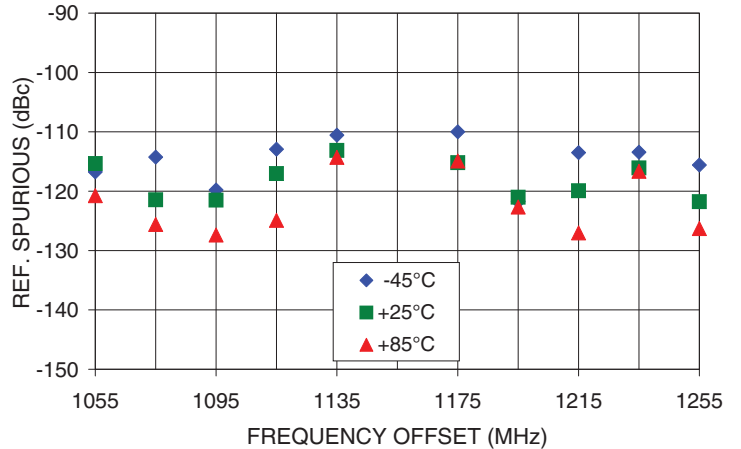
REFERENCE SPURIOUS  
Vs FREQ. OFFSET @ Fcar = 1150MHz



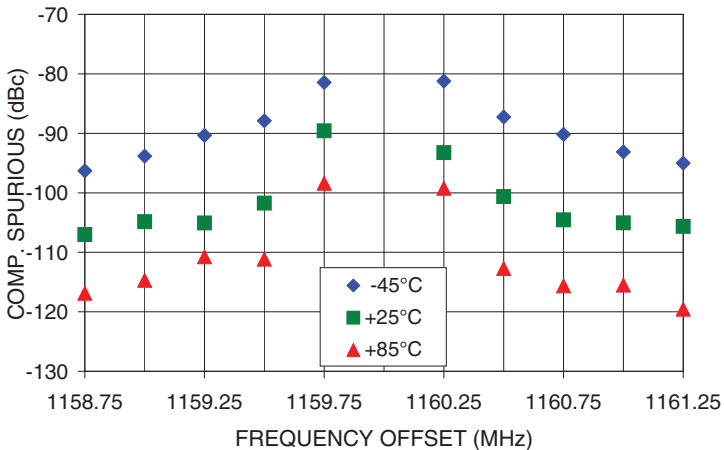
COMPARISON SPURIOUS  
Vs FREQ. OFFSET @ Fcar = 1155MHz



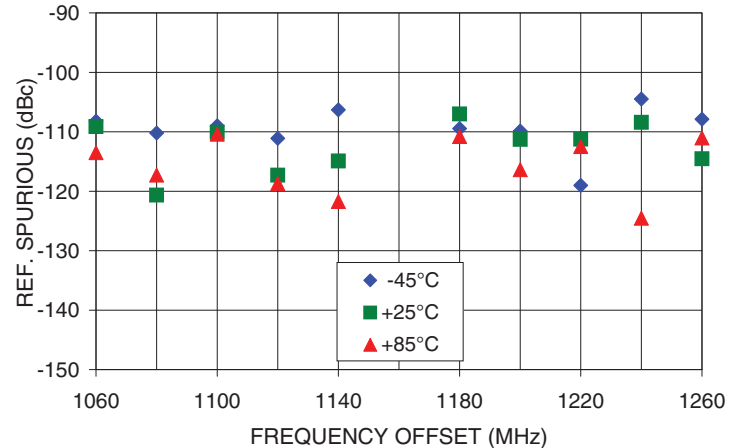
REFERENCE SPURIOUS  
Vs FREQ. OFFSET @ Fcar = 1155MHz



COMPARISON SPURIOUS  
Vs FREQ. OFFSET @ Fcar = 1160MHz



REFERENCE SPURIOUS  
Vs FREQ. OFFSET @ Fcar = 1160MHz



IF/RF MICROWAVE COMPONENTS • ISO 9001 ISO 14001 AS9100 CERTIFIED RoHS compliant  
P.O. Box 350166, Brooklyn, New York 11235-0003 (718) 934-4500 Fax (718) 332-4661



The Design Engineers Search Engine finds the model you need, Instantly • For detailed performance specs & shopping online see



Notes: 1. Performance and quality attributes and conditions not expressly stated in this specification sheet are intended to be excluded and do not form a part of this specification sheet. 2. Electrical specifications and performance data contained herein are based on Mini-Circuit's applicable established test performance criteria and measurement instructions. 3. The parts covered by this specification sheet are subject to Mini-Circuits standard limited warranty and terms and conditions (collectively, "Standard Terms"); Purchasers of this part are entitled to the rights and benefits contained therein. For a full statement of the Standard Terms and the exclusive rights and remedies thereunder, please visit Mini-Circuits' website at [www.minicircuits.com/MCLStore/terms.jsp](http://www.minicircuits.com/MCLStore/terms.jsp).

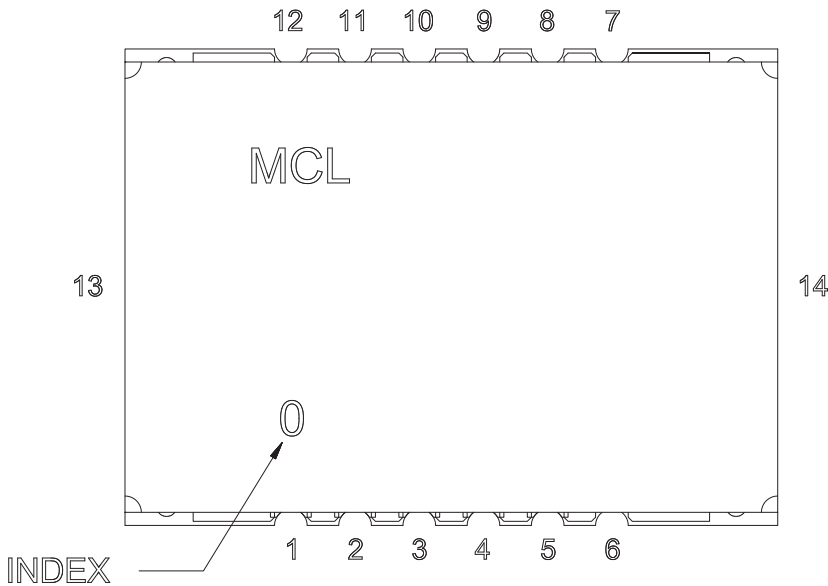


# NON-CATALOG

Frequency Synthesizer

KSN-1150A-119+

## Pin Configuration

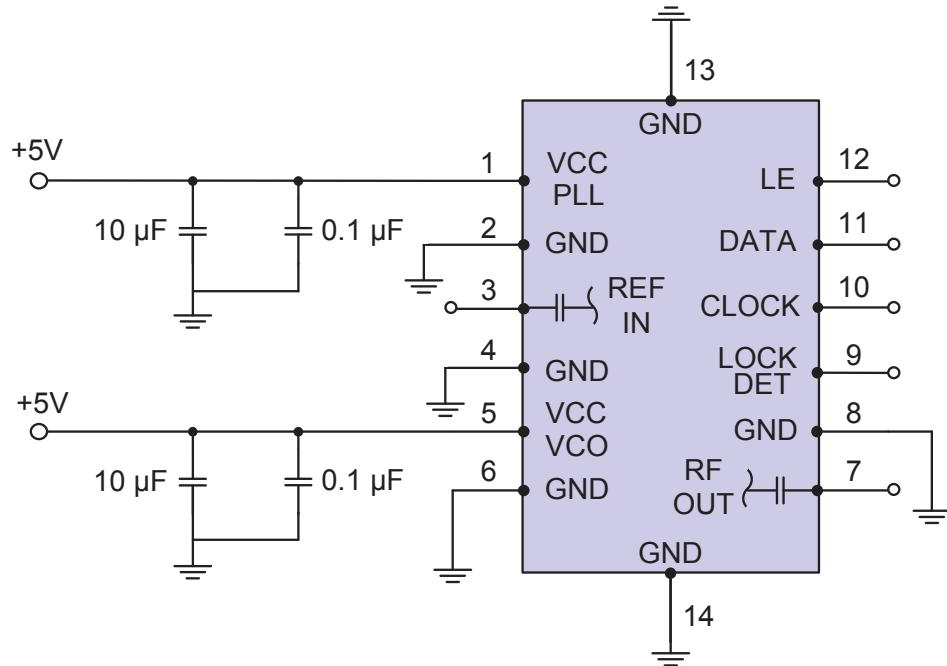


## Pin Connection

| 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.



IF/RF MICROWAVE COMPONENTS • ISO 9001 ISO 14001 AS 9100 CERTIFIED RoHS compliant  
P.O. Box 350166, Brooklyn, New York 11235-0003 (718) 934-4500 Fax (718) 332-4661

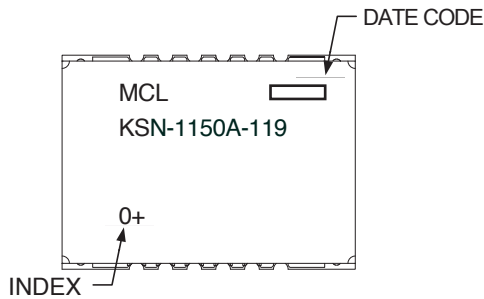


The Design Engineers Search Engine finds the model you need, Instantly • For detailed performance specs & shopping online see



Notes: 1. Performance and quality attributes and conditions not expressly stated in this specification sheet are intended to be excluded and do not form a part of this specification sheet. 2. Electrical specifications and performance data contained herein are based on Mini-Circuit's applicable established test performance criteria and measurement instructions. 3. The parts covered by this specification sheet are subject to Mini-Circuits standard limited warranty and terms and conditions (collectively, "Standard Terms"); Purchasers of this part are entitled to the rights and benefits contained therein. For a full statement of the Standard Terms and the exclusive rights and remedies thereunder, please visit Mini-Circuits' website at [www.minicircuits.com/MCLStore/terms.jsp](http://www.minicircuits.com/MCLStore/terms.jsp).

### 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+

**Environment Ratings:** ENV03T2



IF/RF MICROWAVE COMPONENTS • ISO 9001 ISO 14001 AS9100 CERTIFIED RoHS compliant  
P.O. Box 350166, Brooklyn, New York 11235-0003 (718) 934-4500 Fax (718) 332-4661



The Design Engineers Search Engine finds the model you need, Instantly • For detailed performance specs & shopping online see



Notes: 1. Performance and quality attributes and conditions not expressly stated in this specification sheet are intended to be excluded and do not form a part of this specification sheet. 2. Electrical specifications and performance data contained herein are based on Mini-Circuit's applicable established test performance criteria and measurement instructions. 3. The parts covered by this specification sheet are subject to Mini-Circuits standard limited warranty and terms and conditions (collectively, "Standard Terms"); Purchasers of this part are entitled to the rights and benefits contained therein. For a full statement of the Standard Terms and the exclusive rights and remedies thereunder, please visit Mini-Circuits' website at [www.minicircuits.com/MCLStore/terms.jsp](http://www.minicircuits.com/MCLStore/terms.jsp).