

X2 Frequency Multiplier

50Ω Output 20 to 2000 MHz

FK-5



Generic photo used for illustration purposes only

Maximum Ratings

| | |
|-----------------------|----------------|
| Operating Temperature | -55°C to 100°C |
| Storage Temperature | -55°C to 100°C |
| RF Input Power | 200mW |

Permanent damage may occur if any of these limits are exceeded.

Features

- wideband, 20 to 2000 MHz
- low insertion loss, 13 dB typ.
- rugged shielded case

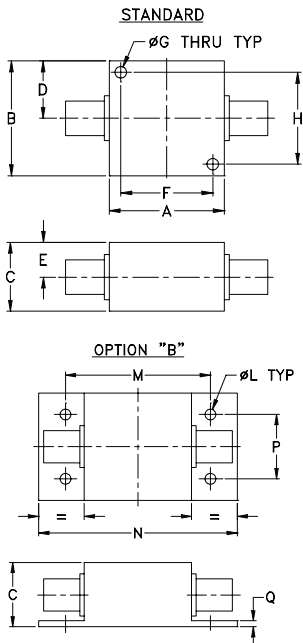
Applications

- synthesizers
- local oscillators

CASE STYLE: H16

| Connectors | Model |
|----------------------|--------|
| BNC | FK-5 |
| N-TYPE | FK-5-N |
| SMA | FK-5-S |
| BRACKET (OPTION "B") | |

Outline Drawing



Outline Dimensions (inch/mm)

| A | B | C | D | E | F | G | H |
|-------|-------|-------|-------|-------|-------|------|-------|
| 1.25 | 1.25 | .75 | .63 | .38 | 1.000 | .125 | 1.000 |
| 31.75 | 31.75 | 19.05 | 16.00 | 9.65 | 25.40 | 3.18 | 25.40 |
| J | K | L | M | N | P | Q | wt |
| -- | -- | .125 | 1.688 | 2.18 | .750 | .06 | grams |
| -- | -- | 3.18 | 42.88 | 55.37 | 19.05 | 1.52 | 70.0 |

Electrical Specifications

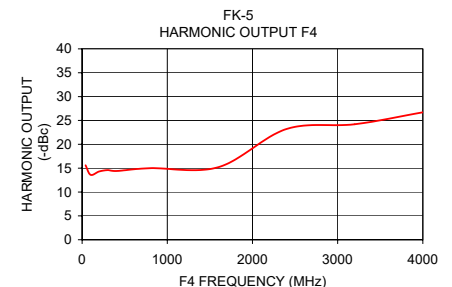
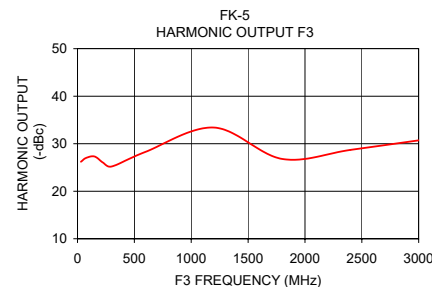
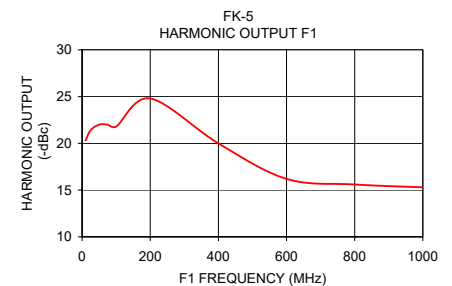
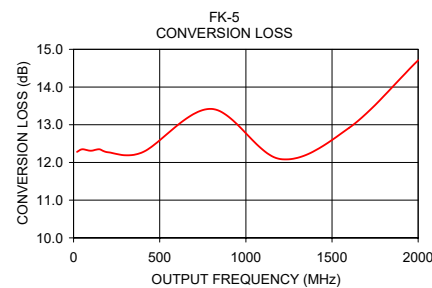
| MULTIPLICATION FACTOR | FREQUENCY (MHz) | | INPUT POWER (dBm) | | CONVERSION LOSS (dB) | | *HARMONIC OUTPUT (dBc) | | | | | |
|-----------------------|-----------------|-----------|-------------------|------|----------------------|------|------------------------|------|------|------|------|------|
| | F1 | F2 | | | | | F1 | | F3 | | F4 | |
| | Input | Output | Min. | Max. | Typ. | Max. | Typ. | Min. | Typ. | Min. | Typ. | Min. |
| 2 | 10-600 | 20-1200 | 10** | 20 | 13.0 | 15.0 | 20 | 10 | 16 | 20 | 15 | 10 |
| | 600-1000 | 1200-2000 | 10** | 20 | 14.0 | 17.0 | 20 | 10 | 25 | 20 | 25 | 15 |

* Harmonics of input frequency below the power level of F2

** Minimum input power +13 dBm above 700 MHz.

Typical Performance Data

| Input Frequency (MHz) | Conversion Loss (dB) F2 | Harmonic Output (-dBc) | | | |
|-----------------------|-------------------------|------------------------|-------|-------|--|
| | | F1 | F3 | F4 | |
| 10.00 | 12.28 | 20.30 | 26.20 | 15.60 | |
| 25.00 | 12.35 | 21.40 | 27.00 | 13.60 | |
| 50.00 | 12.31 | 22.00 | 27.30 | 14.30 | |
| 75.00 | 12.35 | 22.00 | 26.00 | 14.60 | |
| 100.00 | 12.27 | 21.80 | 25.20 | 14.40 | |
| 200.00 | 12.27 | 24.80 | 28.30 | 15.00 | |
| 400.00 | 13.42 | 20.00 | 33.40 | 15.20 | |
| 600.00 | 12.09 | 16.20 | 26.80 | 23.20 | |
| 800.00 | 12.92 | 15.60 | 28.70 | 24.20 | |
| 1000.00 | 14.71 | 15.30 | 30.70 | 26.70 | |



Notes

- Performance and quality attributes and conditions not expressly stated in this specification document are intended to be excluded and do not form a part of this specification document.
- Electrical specifications and performance data contained in this specification document are based on Mini-Circuit's applicable established test performance criteria and measurement instructions.
- The parts covered by this specification document 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



Frequency Multiplier (Doublers)

FK-5

Typical Performance Data

| FREQUENCY (MHz) | | | | CONVERSION LOSS (dB) | HARMONIC OUTPUT* | | |
|--------------------|------------|------------|------------|----------------------------|------------------|------------|------------|
| X 1 OUTPUT | X 2 OUTPUT | X 3 OUTPUT | X 4 OUTPUT | | X 1 OUTPUT | X 3 OUTPUT | X 4 OUTPUT |
| 10 | 20 | 30 | 40 | 12.28 | 20.30 | 26.20 | 15.60 |
| 25 | 50 | 75 | 100 | 12.35 | 21.40 | 27.00 | 13.60 |
| 50 | 100 | 150 | 200 | 12.31 | 22.00 | 27.30 | 14.30 |
| 75 | 150 | 225 | 300 | 12.35 | 22.00 | 26.00 | 14.60 |
| 100 | 200 | 300 | 400 | 12.27 | 21.80 | 25.20 | 14.40 |
| 200 | 400 | 600 | 800 | 12.27 | 24.80 | 28.30 | 15.00 |
| 400 | 800 | 1200 | 1600 | 13.42 | 20.00 | 33.40 | 15.20 |
| 600 | 1200 | 1800 | 2400 | 12.09 | 16.20 | 26.80 | 23.20 |
| 800 | 1600 | 2400 | 3200 | 12.92 | 15.60 | 28.70 | 24.20 |
| 1000 | 2000 | 3000 | 4000 | 14.71 | 15.30 | 30.70 | 26.70 |

*Harmonic Output below power level of X 2 Output .

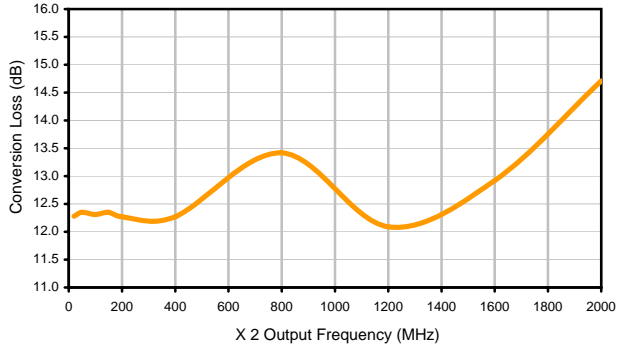


Frequency Multiplier (Doubler)

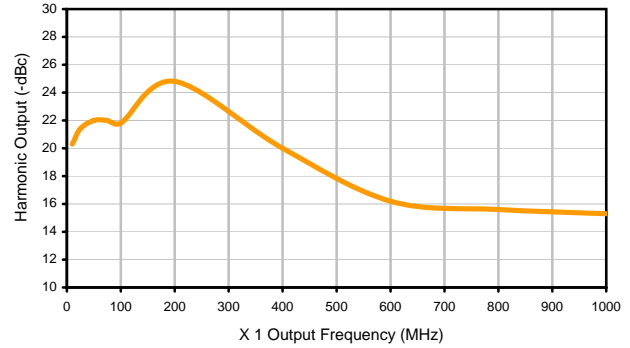
FK-5

Typical Performance Curves

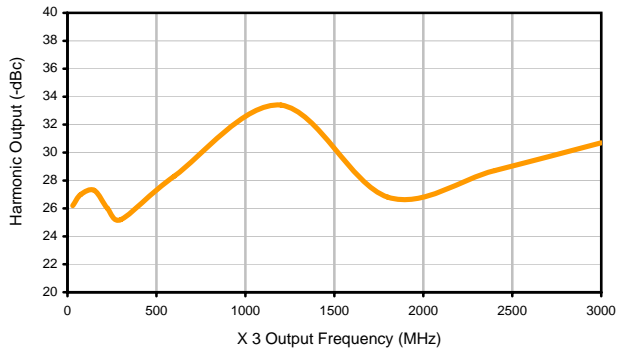
Conversion Loss X 2 Output



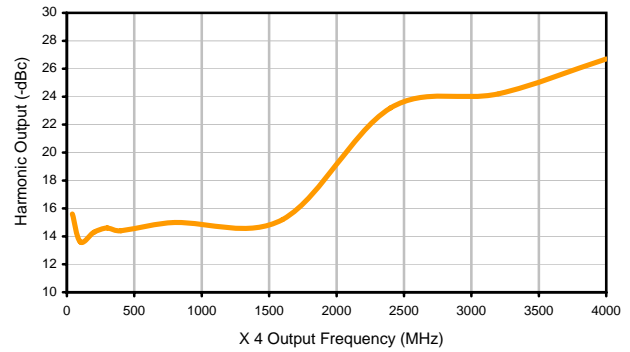
Harmonic X 1 Output



Harmonic X 3 Output

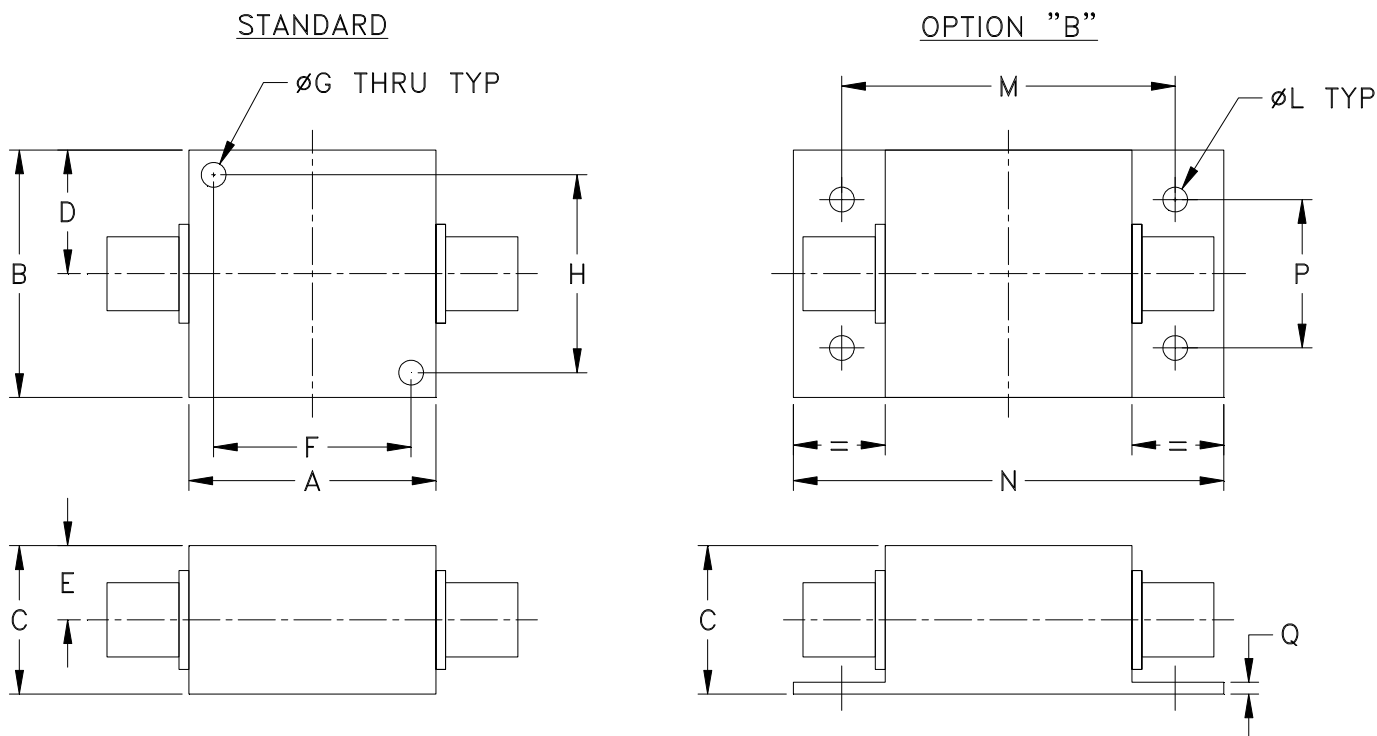


Harmonic X 4 Output



Outline Dimensions

H16



| CASE# | A | B | C | D | E | F | G | H | J | K | L | M | N |
|-------|-----------------|-----------------|-----------------|----------------|---------------|------------------|----------------|------------------|----|----|----------------|------------------|-----------------|
| H16 | 1.25 (31.75) | 1.25 (31.75) | .750 (19.05) | .63 (16.00) | .38 (9.65) | 1.000 (25.40) | .125 (3.18) | 1.000 (25.40) | -- | -- | .125 (3.18) | 1.688 (42.88) | 2.18 (55.37) |

| CASE# | P | Q | WT.GRAMS |
|-------|-----------------|---------------|----------|
| H16 | .750 (19.05) | .06 (1.52) | 70 |

Dimensions are in inches (mm). Tolerances: 2PL. $\pm .03$; 3PL. $\pm .015$

Notes:

1. Case material: Aluminum alloy.
2. Case finish:
For RoHS Case Styles: Clear chemical conversion coating, non-chrome or trivalent chrome based.
3. Mounting bracket available on request. Add suffix B to part number.
4. Bracket version, option B, dimension "C" changes from .75 to .94 inches when connectors are type N.
5. Refer to the individual model data sheet for the type of connectors available.

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RF/IF MICROWAVE COMPONENTS

All Mini-Circuits products are manufactured under exacting quality assurance and control standards, and are capable of meeting published specifications after being subjected to any or all of the following physical and environmental test.

| Specification | Test/Inspection Condition | Reference/Spec |
|----------------------------|--|--------------------------------------|
| Operating Temperature | -55° to 100°C Ambient Environment | Individual Model Data Sheet |
| Storage Temperature | -55° to 100° C Ambient Environment | Individual Model Data Sheet |
| Barometric Pressure | 100,000 Feet | MIL-STD-202, Method 105, Condition D |
| Humidity | 90% RH, 65°C Units may require bake-out after humidity to restore full performance. | MIL-STD-202, Method 103 |
| Thermal Shock | -65° to 125°C, 5 cycles | MIL-STD-202, Method 107, Condition B |
| Vibration (High Frequency) | 20g peak, 10-2000 Hz, 12 times in each of three perpendicular directions (total 36) | MIL-STD-202, Method 204, Condition D |
| Mechanical Shock | 100g, 6ms sawtooth, 3 shocks each direction 3 axes (total 18) | MIL-STD-202, Method 213, Condition I |