



# HMJ4

## High Dynamic Range FET Mixer

**TriQuint**  
SEMICONDUCTOR

### Product Features

- +36 dBm IIP3
- No External Matching Elements Required
- RF 1700-1880 MHz
- LO 1550-1830 MHz
- IF 50 - 150 MHz
- +17 dBm LO Drive Level
- +3V Bias (18 mA)
- Low Cost SMT J-Lead Package

### Product Description

The HMJ4 is a high dynamic range GaAs FET mixer. This active FET mixer realizes a typical third order intercept point of +36 dBm at an LO drive level of +17 dBm. The HMJ4 comes in a low cost, 18-pin J-Lead package. Typical applications include frequency up/down conversion, modulation and demodulation for receivers and transmitters used in communications systems.

### Functional Diagram



| Function | Pin No.        |
|----------|----------------|
| IF       | 2              |
| LO       | 11             |
| RF       | 17             |
| +3V      | 8              |
| Ground   | All other pins |

### Specifications <sup>(1)</sup>

| Parameter              | Units | Min | Typ       | Max | Condition |
|------------------------|-------|-----|-----------|-----|-----------|
| RF Frequency Range     | MHz   |     | 1700-1880 |     |           |
| LO Frequency Range     | MHz   |     | 1550-1830 |     |           |
| IF Frequency Range     | MHz   |     | 50 - 150  |     |           |
| SSB Conversion Loss    | dB    |     | 8.8       | 9.4 |           |
| Noise Figure           | dB    |     | 11        |     |           |
| LO-RF Isolation        | dB    | 18  | 34        |     |           |
| LO-IF Isolation        | dB    | 23  | 33        |     |           |
| RF-IF Isolation        | dB    |     | 14        |     |           |
| Input IP3              | dBm   | 31  | 36        |     |           |
| RF Return Loss         | dB    |     | 11        |     |           |
| LO Return Loss         | dB    |     | 9         |     |           |
| IF Return Loss         | dB    |     | 15        |     |           |
| Input P1dB             | dBm   |     | +29       |     |           |
| LO Drive Level         | dBm   |     | +17       |     |           |
| DC Current at +3V Bias | mA    |     | 18        | 30  |           |

1. Test conditions unless otherwise noted: 25 °C, RF = 1800 MHz @ -10 dBm, LO = 1700 MHz @ +17 dBm, IF = 100 MHz

### Absolute Maximum Rating

| Parameters                 | Rating         |
|----------------------------|----------------|
| Operating Case Temperature | -40 to +85 °C  |
| Storage Temperature        | -65 to +100 °C |
| Maximum Input Power        | +25 dBm        |

1. Operation of this device above any of these parameters may cause permanent damage.  
2. Total sum of LO port and RF port power should not exceed 25 dBm

### Ordering Information

| Part No. | Description                         |
|----------|-------------------------------------|
| HMJ4     | High Dynamic Range FET Mixer        |
| HMJ4-PCB | Fully Assembled Application Circuit |

Specifications and information are subject to change without notice

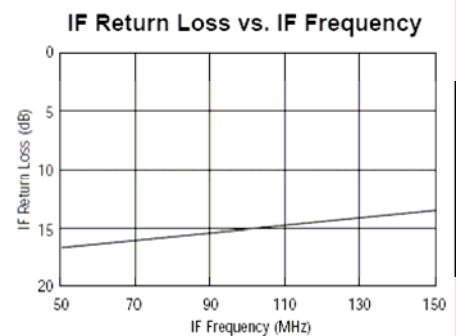
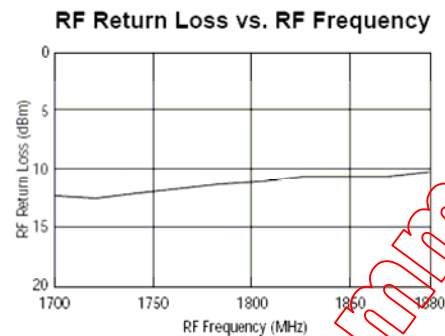
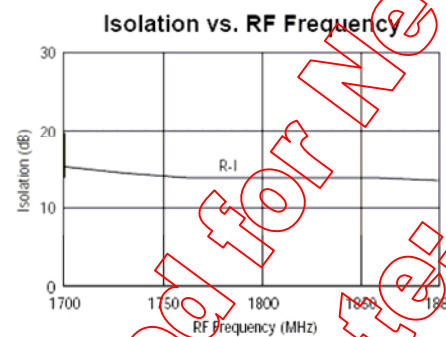
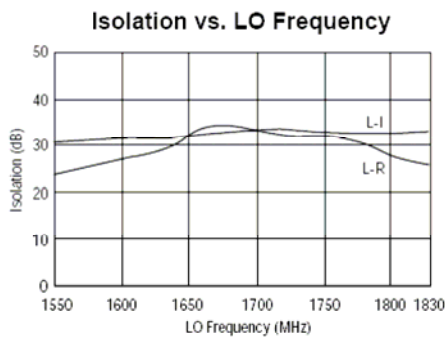
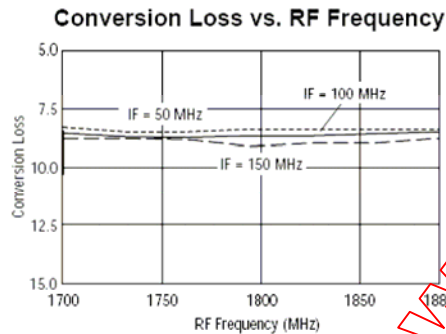
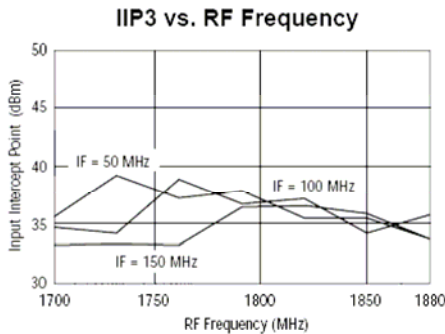


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### Typical Performance Data



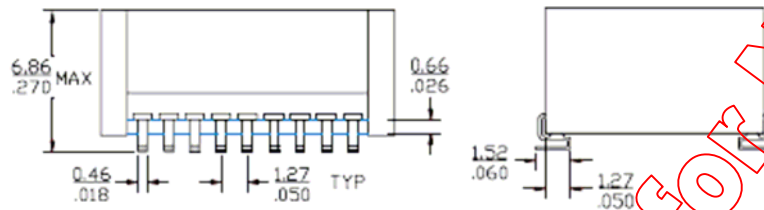
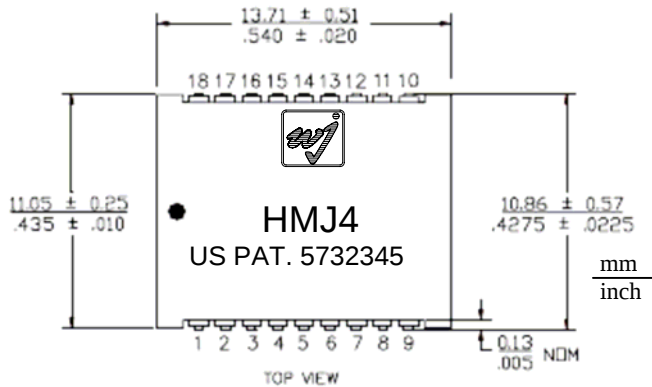


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### Outline Drawing



### Product Marking

The component will be marked with an "HMJ4" designator with a four-digit alphanumeric lot number XXXX.

Tape and reel specifications for this part are located on the website in the "Application Notes" section.

### ESD Information



**Caution!** ESD sensitive device.

ESD Rating: Class 2  
 Value: Passes at 2000 V  
 Test: Human Body Model (HBM)  
 Standard: JEDEC Standard JESD22-A114

ESD Rating: Class IV  
 Value: Passes at 2000 V  
 Test: Charged Device Model (CDM)  
 Standard: JEDEC Standard JESD22-C101

### Mounting Config. Notes

1. Ground vias are critical for thermal and RF grounding considerations.
2. A minimum of 28 ground vias are required for 14 mil FR4 boards.
3. If your PCB design rules allow, ground vias should be placed under the land pattern for better RF performance. Otherwise ground vias should be placed as close to the land pattern as possible.
4. Trace width depends on the PCB material.

### Land Pattern / Mounting Configuration

