



# Silicon Double Balanced HMIC™ Mixer, 1725 - 2125 MHz

V 1.00

MA4EXP190H-1277

## Features

- +33 dBm Typical Input IP3
- 8.3 dB Typical Conversion Loss
- +17 to +19 dBm LO Drive
- Fully Balanced Passive Mixer
- NO External Matching required
- Low Cost Miniature Plastic MLP Package

## MLP 3mm Package - Circuit Side View



## Description

M/A-COM's MA4EXP190H-1277 is a silicon monolithic 1725-2125 MHz, high barrier, double balanced mixer in a low cost miniature surface mount FQFP-N 3 x 3mm Square 16 lead plastic package. The die uses M/A-COM's unique HMIC silicon/glass process to realize low loss passive elements while retaining the advantages of high barrier silicon schottky barrier diodes.

## Applications

These mixers are well suited for GSM, DCS, PCS, CDMA and UMTS base station applications where small size and high performance are required. Typical applications include frequency conversion, modulation, and demodulation in wireless receivers and transmitters.

## PIN Configuration

| PIN | Function | PIN | Function |
|-----|----------|-----|----------|
| 1   | N/C      | 9   | N/C      |
| 2   | N/C      | 10  | RF       |
| 3   | LO       | 11  | N/C      |
| 4   | N/C      | 12  | N/C      |
| 5   | N/C      | 13  | N/C      |
| 6   | N/C      | 14  | IF       |
| 7   | N/C      | 15  | N/C      |
| 8   | N/C      | 16  | N/C      |

## Ordering Information

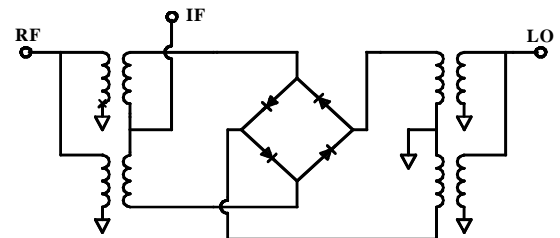
| Part Number      | Package       |
|------------------|---------------|
| MA4EXP190H-1277  | Tube          |
| MA4EXP190H-1277T | Tape and Reel |

## Absolute Maximum Ratings<sup>1</sup>

| Parameter             | Maximum Ratings   |
|-----------------------|-------------------|
| Operating Temperature | -40 °C to +85 °C  |
| Storage Temperature   | -65 °C to +150 °C |
| Incident LO Power     | +20 dBm C.W.      |
| Incident RF Power     | +20 dBm C.W.      |

1. Exceeding these limits may cause permanent damage.

## Mixer Schematic

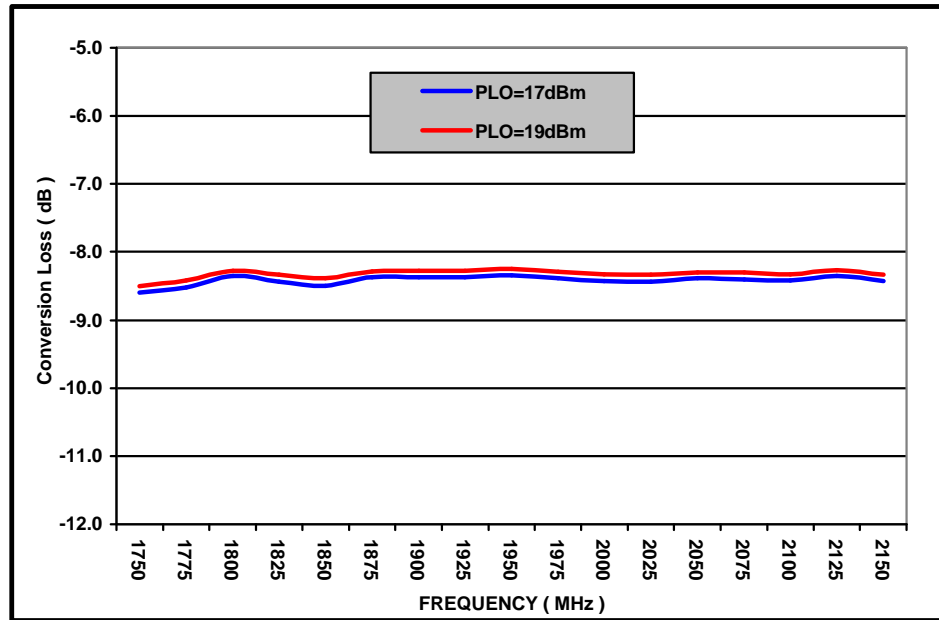


## Electrical Specifications: @ + 25 °C

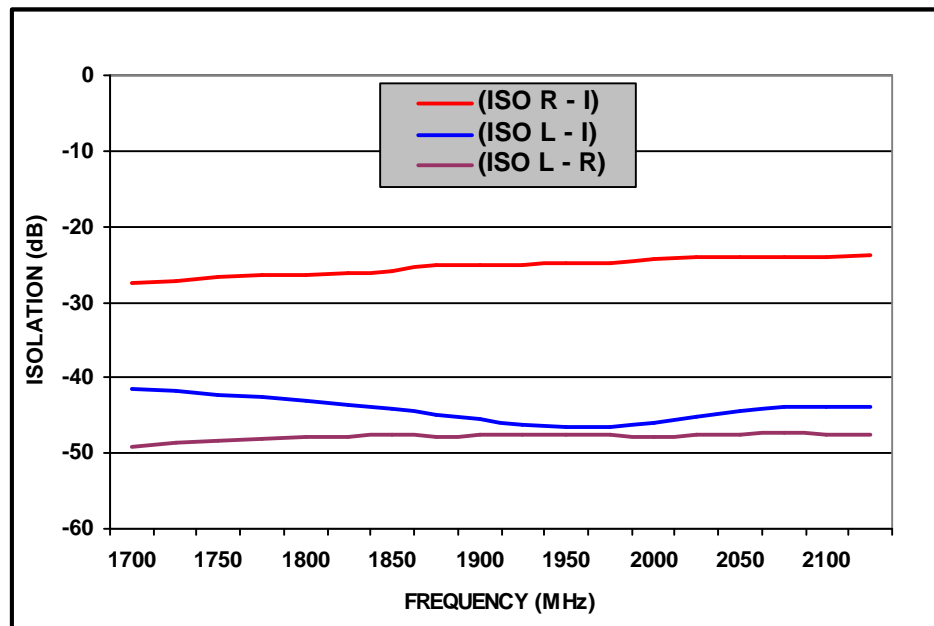
| Parameter              | Frequency Range           | Test Conditions                                 | Units | Min.   | Avg.           | Max.       |
|------------------------|---------------------------|---|-------|--------|----------------|------------|
| Conversion Loss        | 1925 MHz<br>1725-2125 MHz | LO Drive = +19 dBm<br>RF = -10 dBm, IF = 60 MHz | dB    | -<br>- | 8.3<br>8.4     | 9.5<br>9.5 |
| L - R Isolation        | 1925 MHz<br>1725-2125 MHz | LO Drive = +17 dBm<br>RF Level = -10 dBm        | dB    | -<br>- | 48.0<br>48.0   | -<br>-     |
| L - I Isolation        | 1925 MHz<br>1725-2125 MHz | LO Drive = +17 dBm<br>RF Level = -10 dBm        | dB    | -<br>- | 46.0<br>44.0   | -<br>-     |
| R - I Isolation        | 1925 MHz<br>1725-2125 MHz | LO Drive = +17 dBm<br>RF Level = -10 dBm        | dB    | -<br>- | 25.0<br>25.0   | -<br>-     |
| RF VSWR                | 1925 MHz<br>1725-2125 MHz | LO Drive = +17 dBm<br>RF Level = -10 dBm        | Ratio | -<br>- | 1.1:1<br>1.3:1 | -<br>-     |
| IF VSWR                | DC - 500 MHz              | LO Drive = +17 dBm<br>RF Level = -10 dBm        | Ratio | -<br>- | 1.6:1          | -          |
| Input IP3              | 2025 MHz<br>1725-2125 MHz | LO Drive = +19 dBm<br>RF = -10 dBm, IF = 60 MHz | dBm   | -<br>- | 34.0<br>33.0   | -<br>-     |
| Input 1 dB Compression | 1925 MHz<br>1725-2125 MHz | LO Drive = +17 dBm<br>IF = 60 MHz               | dBm   | -<br>- | 11.3<br>11.0   | -<br>-     |
| IF 1 dB Bandwidth      | DC - 400 MHz              | LO = 1850 MHz @ +17 dBm                         | MHz   | 0      | -              | 400        |

Typical Performance Curves (LO Drive = +17 dBm, RF = -10 dBm, IF = 60 MHz)

Conversion Loss

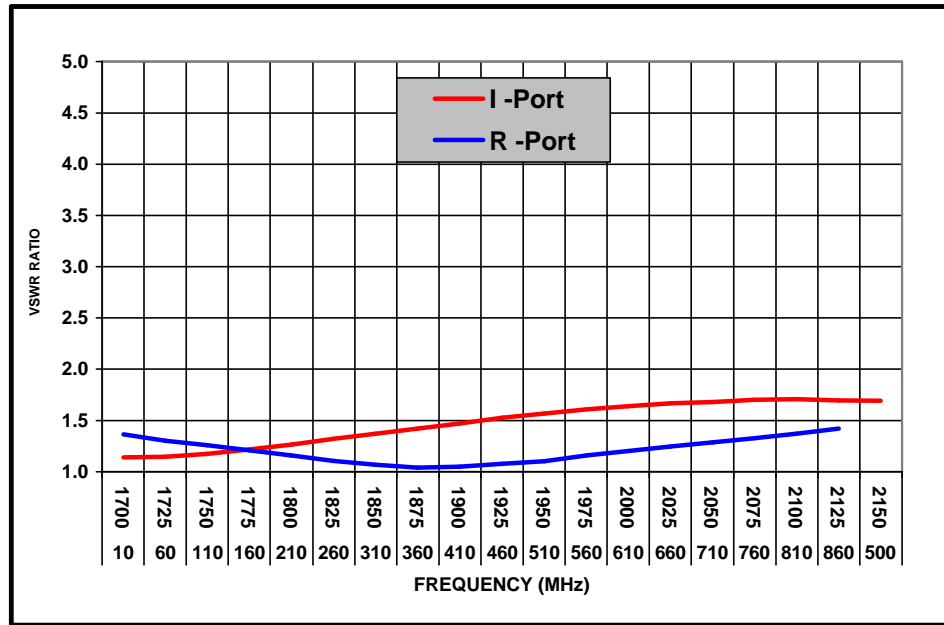


Isolation

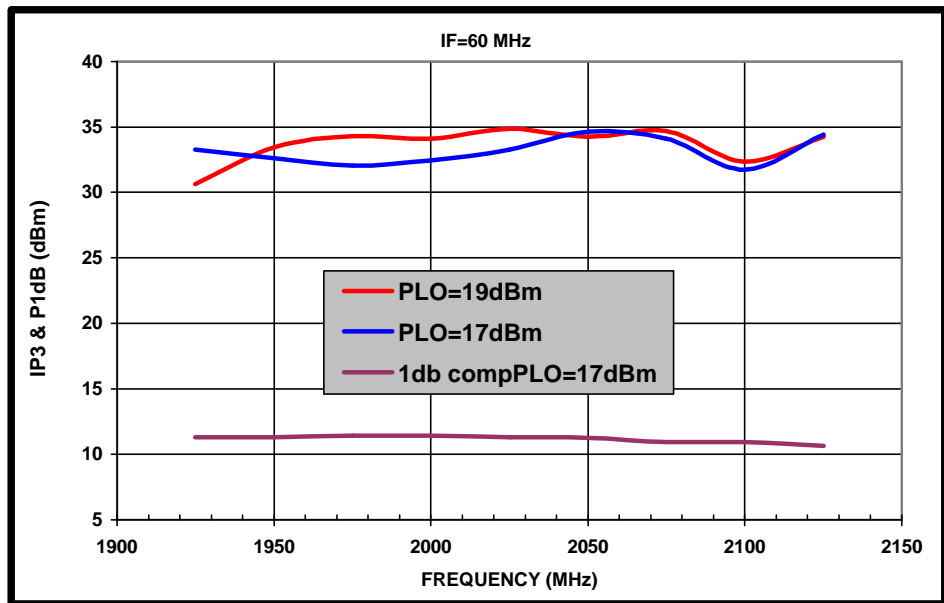


Typical Performance Curves (LO Drive = +17 dBm, RF = -10 dBm, IF = 60 MHz)

RF & IF VSWR

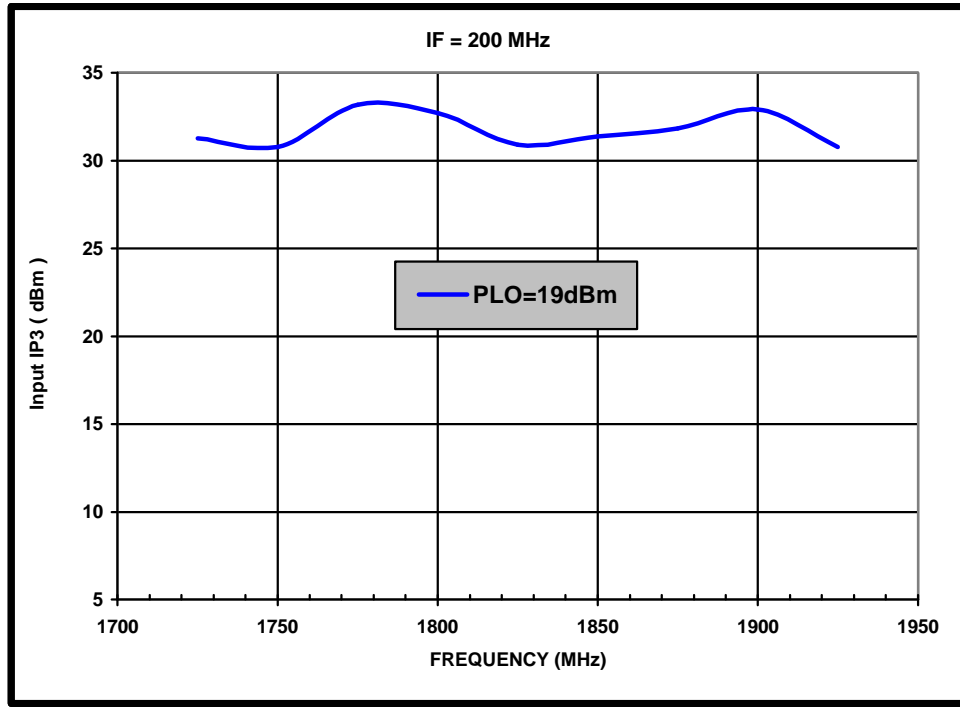


INPUT IP3 & 1 dB Compression Power

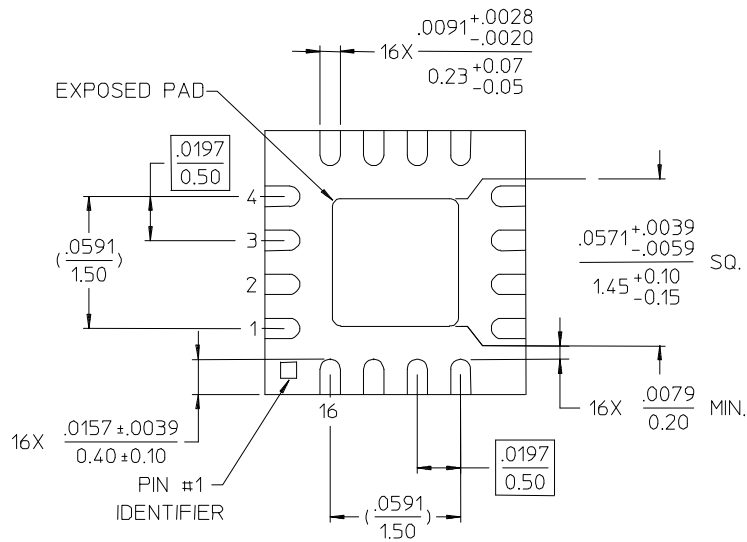
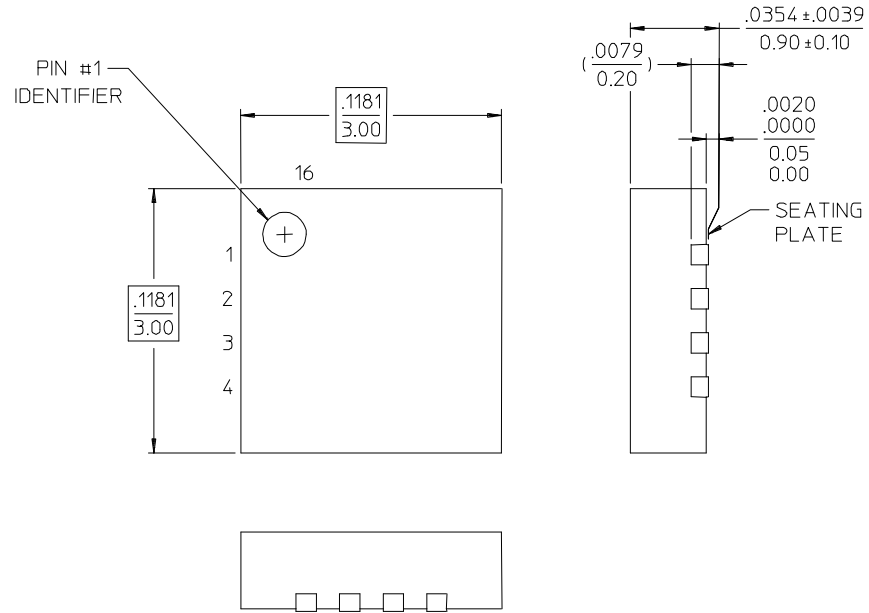


Typical Performance Curves (LO Drive = +19 dBm, RF = -10 dBm, IF = 200 MHz)

*Input IP3*



MA4EXP190H-1277 Outline – 3mm FQFP-N 16 Lead Saw Singulated



- NOTES: 1. REFER TO JEDEC MO-220, VAR. VBBD-1 FOR ADDITIONAL DIMENSIONAL AND TOLERANCE INFORMATION.  
 2. REFER TO S2083 APPLICATION NOTE FOR PCB FOOTPRINT INFORMATION.  
 3. ALL DIMENSIONS SHOWN AS INCHES/MM.

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