# E-Series Surface Mount Mixer
# 1850 – 1980 MHz

## Features

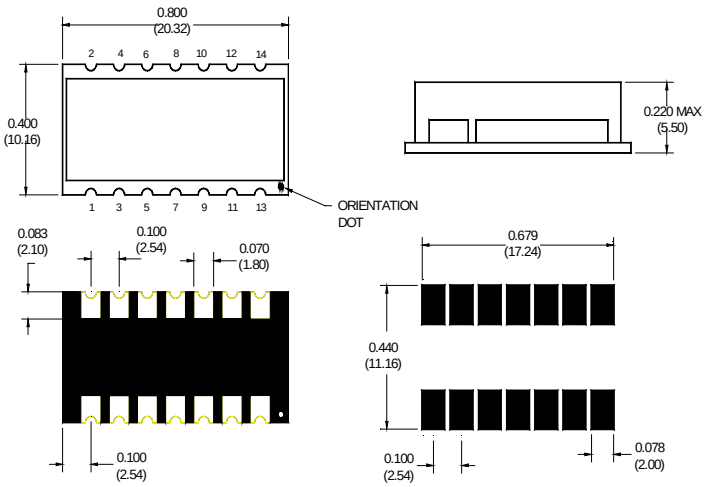
- LO Power +13 dBm
- +22dB Compression Point
- Surface Mount
- +32dBm IIP3
- Up and Down converting

## Description

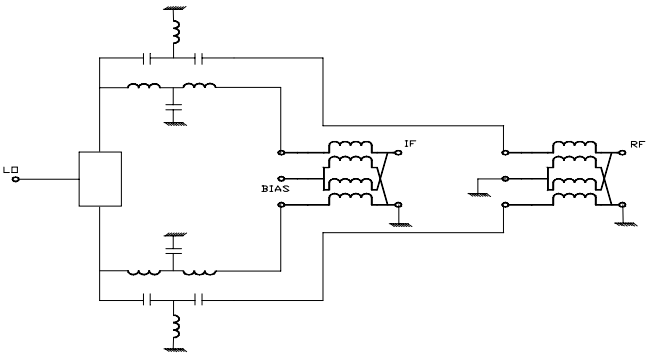
M/A Com's EFM-1900 uses a novel, patent pending design to achieve very high linearity at low LO drive levels. Typically IP3 performance is +32dBm with an LO drive level of just +13dBm. The mixer combines PHEMT devices and carefully matched transformers in a surface mount package which can be used for both up and down converting. It is ideally suited for wireless applications where high linearity is required. Parts are

## SM-106 Package

Note: Non Hermetic Package,Metal Cover.




## Schematic




## Electrical Specifications

| Parameter | | Units | Minimum | Typical | Maximum |
|---|---|---|---|---|---|
| Frequency Range | RF 1850 -1980 MHz | — | — | — | — |
| | LO 1350 - 1880 MHz | — | — | — | — |
| | IF 100 - 500 MHz | — | — | — | — |
| | DC bias 3V ± 0.3V | — | — | — | — |
| Conversion Loss | 1850 - 1980 MHz | dB | — | 7.5 | 9.5 |
| L - R Isolation | 1350 - 1880 MHz | dB | 15.0 | 19.0 | — |
| L - I Isolation | 1350 - 1880 MHz | dB | 22.0 | 28.0 | — |
| R - I Isolation | 1350 - 1880 MHz | dB | 25.0 | 35.0 | — |
| LO VSWR | 1350 - 1880 MHz | — | — | 3.8 | — |
| RF VSWR | 1850 - 1980 MHz | — | — | 3.5 | — |
| IF VSWR | 100 - 500 MHz | — | — | 1.8 | — |
| Input IP3 | | dBm | 28.0 | 32.0 | — |
| Input 1dB Compression | | dBm | — | +22.0 | — |

## Absolute Maximum Ratings

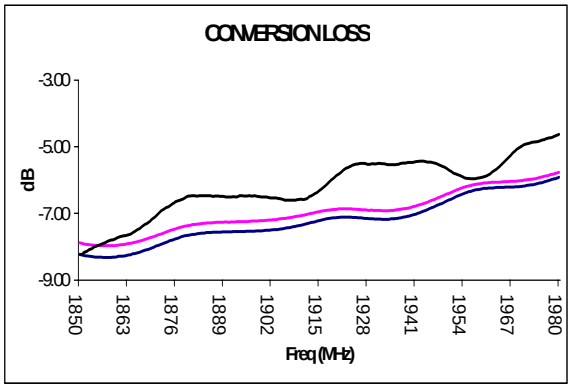
| Parameter | Absolute Maximum |
|---|---|
| RF Power | 200 mW |
| Peak IF Current | 40 mA |
| Storage Temperature | -40°C to +85°C |
| Operating Temperature | -40°C to +85°C |
| ESD Rating | Zero |

## Pin Configuration

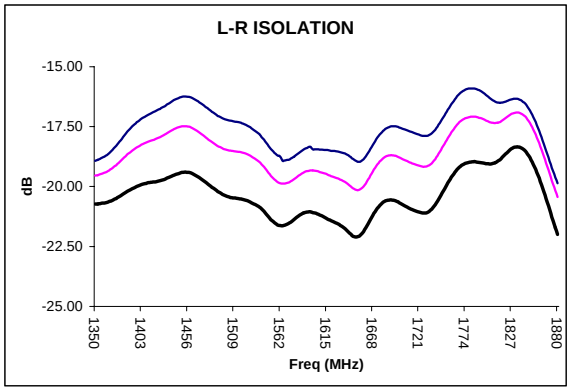
| Function | Pin No. |
|---|---|
| LO | 9 |
| RF | 2 |
| IF | 14 |
| BIAS | 13 |
| Ground | 1,3,4,5,6,7,8,10,11,12 |
| Unconnected | — |

## Typical Performance

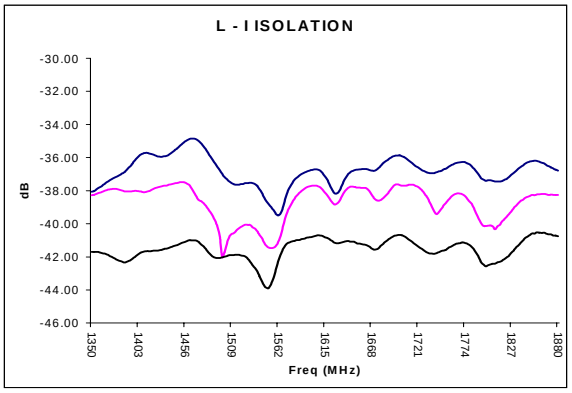
### Conversion Loss



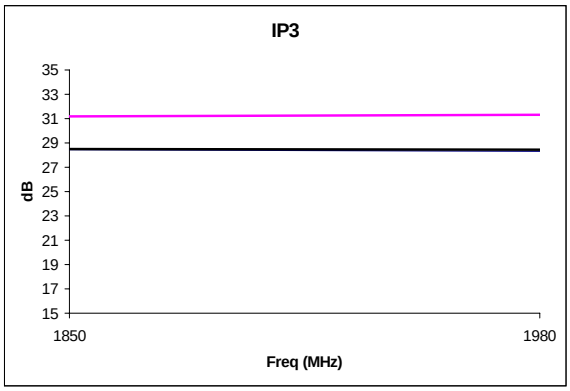

### L - R Isolation



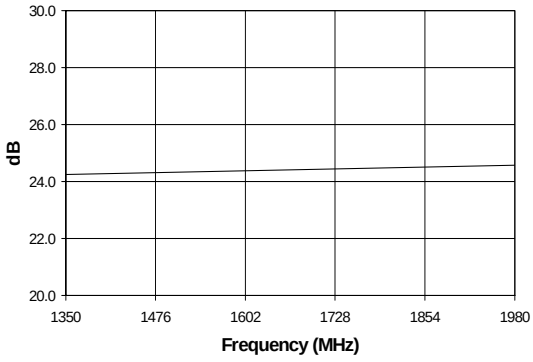

### L-I Isolation




### Input IP3




### 1dB Compression Point



## Spurious Table: 1850MHz

**(In dBc below IF, assuming down conversion)**

| | | $nf_{LO}$ - $mf_{RF}$ | | | | |
|---|---|---|---|---|---|---|
| | 0 | X | 16 | 8 | 16 | 16 |
| | 1 | 26 | 0 | 42 | 47 | 58 |
| RF | 2 | 67 | 77 | 55 | 77 | 77 |
| (n) | 3 | 77 | 77 | 77 | 77 | 77 |
| | 4 | 77 | 77 | 77 | 77 | 77 |
| | | 0 | 1 | 2 | 3 | 4 |

LO (m)

RF = 1850 MHz, 0dBm
LO = 1750 MHz, +13dBm
IF = 100 MHz

## Spurious Table: 1850MHz

**(In dBc below IF, assuming down conversion)**

| | | $nf_{LO}$ - $mf_{RF}$ | | | | |
|---|---|---|---|---|---|---|
| | 0 | X | 13 | 29 | 27 | 25 |
| | 1 | 27 | 0 | 17 | 58 | 45 |
| RF | 2 | 58 | 77 | 53 | 49 | 74 |
| (n) | 3 | 77 | 77 | 77 | 77 | 70 |
| | 4 | 77 | 77 | 77 | 77 | 77 |
| | | 0 | 1 | 2 | 3 | 4 |

LO (m)

RF = 1850 MHz, 0dBm
LO = 1350 MHz, +13dBm
IF = 500 MHz

## Spurious Table: 1980MHz

**(In dBc below IF, assuming down conversion)**

| | | $nf_{LO}$ - $mf_{RF}$ | | | | |
|---|---|---|---|---|---|---|
| | 0 | X | 9 | 25 | 34 | 17 |
| | 1 | 30 | 0 | 55 | 62 | 60 |
| RF | 2 | 77 | 69 | 66 | 74 | 77 |
| (n) | 3 | 77 | 77 | 77 | 77 | 77 |
| | 4 | 77 | 77 | 77 | 77 | 77 |
| | | 0 | 1 | 2 | 3 | 4 |

LO (m)

RF = 1980 MHz, 0dBm
LO = 1880 MHz, +13dBm
IF = 100 MHz

## Spurious Table: 1980MHz

**(In dBc below IF, assuming down conversion)**

| | | $nf_{LO}$ - $mf_{RF}$ | | | | |
|---|---|---|---|---|---|---|
| | 0 | X | 12 | 18 | 14 | 25 |
| | 1 | 30 | 0 | 21 | 59 | 58 |
| RF | 2 | 70 | 77 | 66 | 60 | 75 |
| (n) | 3 | 77 | 77 | 77 | 77 | 77 |
| | 4 | 77 | 77 | 77 | 77 | 77 |
| | | 0 | 1 | 2 | 3 | 4 |

LO (m)

RF = 1980 MHz, 0dBm
LO = 1480 MHz, +13dBm
IF = 500 MHz