

E-Series Surface Mount Mixer
1850 – 1980 MHz

EFM-1900
V2

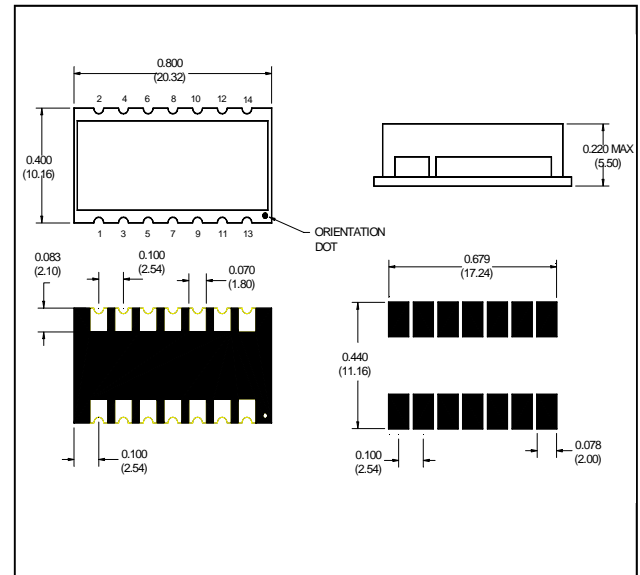
Features

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

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 packaged in tape & reel.

SM - 106 - Non Hermetic Package



Electrical Specifications: $T_A = 25^\circ\text{C}$, $Z_0 = 50\Omega$ ¹

| Parameter | Test Conditions | Frequency | Units | Min | Typ | Max |
|-----------------|-------------------|-------------|-------|------|------|-----|
| RF Frequency | DC bias 3V ± 0.3V | 1850 - 1980 | MHz | — | — | — |
| LO Frequency | DC bias 3V ± 0.3V | 1350 - 1880 | MHz | — | — | — |
| IF Frequency | DC bias 3V ± 0.3V | 100 - 500 | MHz | — | — | — |
| Conversion Loss | — | 1850 - 1980 | dB | - | 7.5 | 9.5 |
| Isolation | LO to RF | 1350 - 1880 | dB | 15.0 | 19.0 | — |
| Isolation | LO to IF | 1350 - 1880 | dB | 22.0 | 28.0 | — |
| Isolation | RF to IF | 1350 - 1880 | dB | 25.0 | 35.0 | — |
| VSWR | LO | 1350 - 1880 | — | — | 3.8 | — |
| VSWR | RF | 1850 - 1980 | — | — | 3.5 | — |

Ordering Information

| Part Number | Package |
|-------------|--------------------------------|
| EFM-1900TR | Tape and Reel (300 piece Reel) |

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Visit www.macom.com for additional data sheets and product information.

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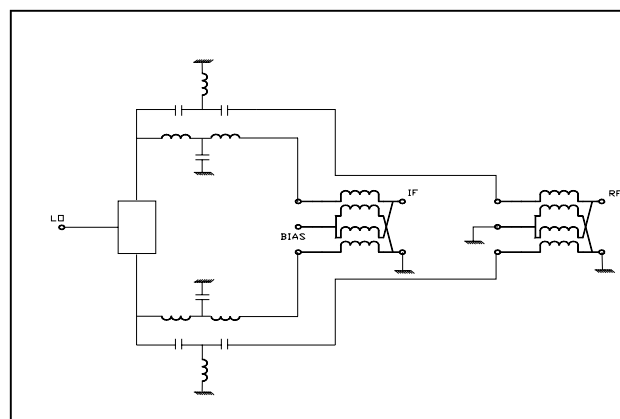
Electrical Specifications: $T_A = 25^\circ\text{C}$, $Z_0 = 50\Omega$ ¹

| Parameter | Test Conditions | Frequency | Units | Min | Typ | Max |
|-----------------------|-----------------|-------------|-------|------|------|-----|
| IF VSWR | — | 100 - 500 | — | — | 1.8 | — |
| Input IP3 | — | — | dBm | 28.0 | 32.0 | — |
| Input 1dB Compression | — | 1850 - 1980 | dBm | — | 22.0 | — |

Pin Configuration

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

Schematic



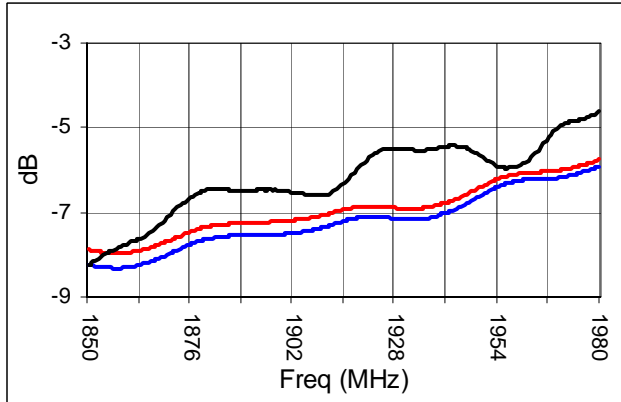
Absolute Maximum Ratings ¹

| Parameter | Absolute Maximum |
|-----------------------|------------------|
| Max RF Power | 200 mW |
| Peak IF Current | 40 mA |
| Operating Temperature | -40°C to +85°C |
| Storage Temperature | -55°C to +125°C |
| ESD Rating | Zero |

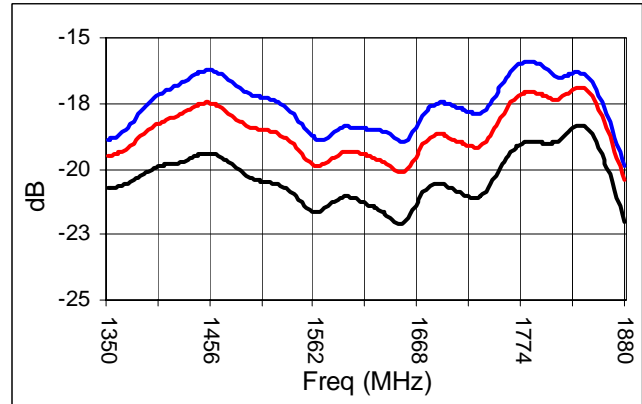
1. Operation of this device above any one of these parameters may cause permanent damage.

Typical Performance Curves

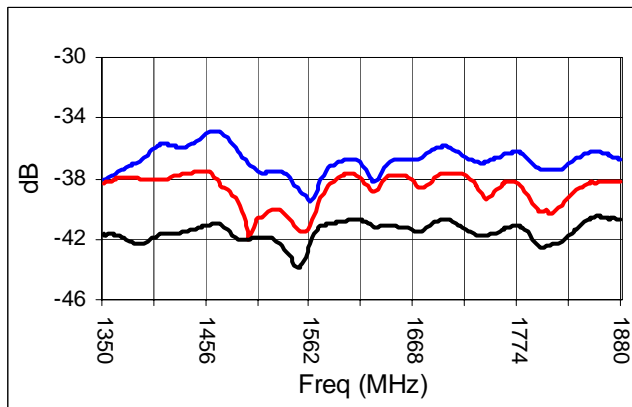
Conversion Loss



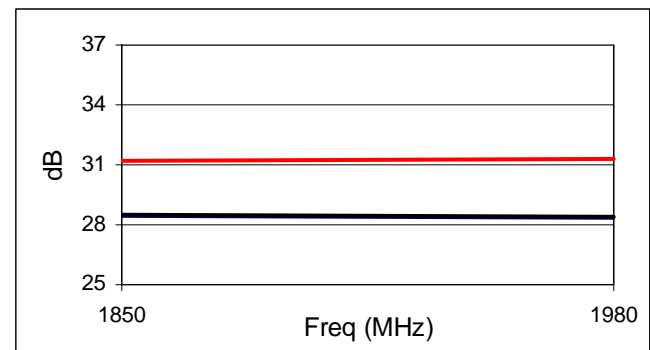
LO - RF Isolation



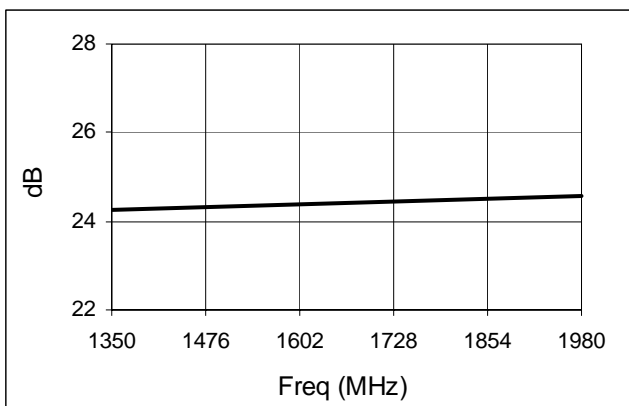
LO-IF Isolation



IIP3



1 dB Compression Point



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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