

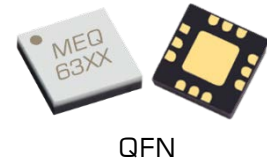
## Passive GaAs MMIC 14 GHz Equalizer Family

## MEQX-14ASM

### 1 Device Overview

#### 1.1 General Description

The MEQX-14ASM family of passive MMIC equalizer QFN are an ideal solution for compensating for low pass filtering effects in RF/microwave and high speed digital systems. They provide positive slope from DC to 14GHz with DC attenuation options between 3 and 10dB. The unique design offers superior return loss to competitors. GaAs MMIC technology provides consistent unit-to-unit performance in a small, low cost form factor.



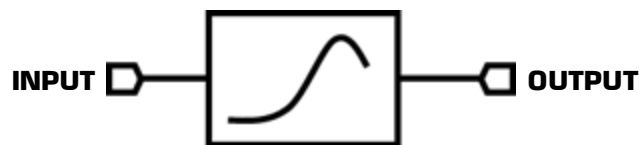
#### 1.2 Features

- DC attenuation options from 3 to 10dB
- Typical Insertion Loss 0.8 dB at 14GHz
- VSWR < 1.5:1 Over Entire Band
- S2P data: [MEQX-XASM.zip](#)

#### 1.3 Applications

- RF Transceivers
- High-Speed Data
- Telecom
- Cable Loss Compensation
- Amplifier Compensation

#### 1.4 Functional Block Diagram



#### 1.5 Part Ordering Options<sup>1</sup>

| Part Number           | Loss at DC (dB) | Description               | Package | Green Status | Product Lifecycle | Export Classification |
|-----------------------|-----------------|---------------------------|---------|--------------|-------------------|-----------------------|
| <b>MEQ3-14ASM</b>     | 3               | 3x3 mm QFN                | SM      | RoHS         | Active            | EAR99                 |
| <b>MEQ6-14ASM</b>     | 6               |                           |         |              |                   |                       |
| <b>MEQ10-14ASM</b>    | 10              |                           |         |              |                   |                       |
| <b>EVAL-MEQ3-14A</b>  | 3               | Connectorized Eval Module | Module  |              |                   |                       |
| <b>EVAL-MEQ6-14A</b>  | 6               |                           |         |              |                   |                       |
| <b>EVAL-MEQ10-14A</b> | 10              |                           |         |              |                   |                       |

<sup>1</sup> Refer to our [website](#) for a list of definitions for terminology presented in this table.

## Table of Contents

|     |   |   |       |                                    |   |
|-----|---|---|-------|------------------------------------|---|
| 1   | Device Overview .....                   | 1 | 3     | Specifications .....               | 4 |
| 1.1 | General Description .....               | 1 | 3.1   | Absolute Maximum Ratings .....     | 4 |
| 1.2 | Features .....                          | 1 | 3.2   | Package Information .....          | 4 |
| 1.3 | Applications .....                      | 1 | 3.3   | Electrical Specifications .....    | 4 |
| 1.4 | Functional Block Diagram .....          | 1 | 3.4   | Typical Performance Plots .....    | 5 |
| 1.5 | Part Ordering Options .....             | 1 | 3.4.1 | Insertion Loss .....               | 5 |
| 2   | Port Configurations and Functions ..... | 3 | 3.4.2 | Return Loss & Group Delay ..       | 6 |
| 2.1 | Port Diagram .....                      | 3 | 4     | Mechanical Data .....              | 7 |
| 2.2 | Port Functions .....                    | 3 | 4.1   | SM Package Outline Drawing .....   | 7 |
|     |   |   | 4.2   | Eval Package Outline Drawing ..... | 8 |

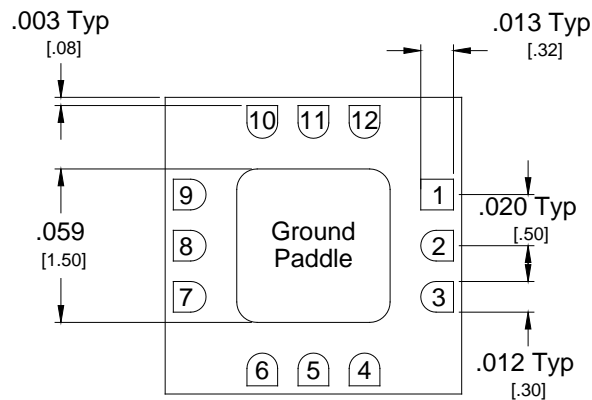
## Revision History

| Revision Code | Revision Date | Comment                   |
|---------------|---------------|---------------------------|
| -             | June 27, 2018 | Datasheet Initial Release |
| A             | August 2018   | Added Eval Board          |

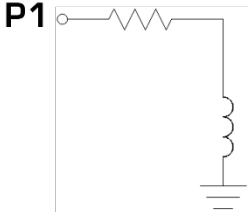
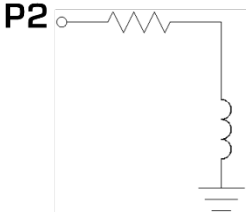
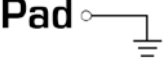
## 2 Port Configurations and Functions

### 2.1 Port Diagram

A top-down view of the MEQX-14ASM package outline drawing is shown below. The MEQ equalizers are symmetrical allowing Port 1 or Port 2 to be used as the input.



### 2.2 Port Functions

| Port  | Function     | Description   | Equivalent Circuit  |
|-------|--------------|---|---|
| Pin 1 | Input/Output | Port 1 is DC connected to ground through a resistor. DC block is required if voltage present. |  |
| Pin 9 | Input/Output | Port 2 is DC connected to ground through a resistor. DC block is required if voltage present. |  |
| GND   | Ground       | SM package ground path is provided through the ground paddle.                                 |  |

### 3 Specifications

#### 3.1 Absolute Maximum Ratings

The Absolute Maximum Ratings indicate limits beyond which damage may occur to the device. If these limits are exceeded, the device may be inoperable or have a reduced lifetime.

| Parameter                   | Maximum Rating | Units |
|-----------------------------|----------------|-------|
| Port 1 DC Current           | 40             | mA    |
| Port 2 DC Current           | 40             | mA    |
| Power Handling, at any Port | +30            | dBm   |
| Operating Temperature       | -55 to +100    | °C    |
| Storage Temperature         | -65 to +125    | °C    |

#### 3.2 Package Information

| Parameter | Details  | Rating |
|-----------|--|--------|
| ESD       | Human Body Model (HBM), per MIL-STD-750, Method 1020 | TBD    |

#### 3.3 Electrical Specifications<sup>2</sup>

The electrical specifications apply at  $T_A=+25^{\circ}\text{C}$  in a  $50\Omega$  system. Typical data shown is for the equalizer in a CH package with a sine wave input applied to port 1.

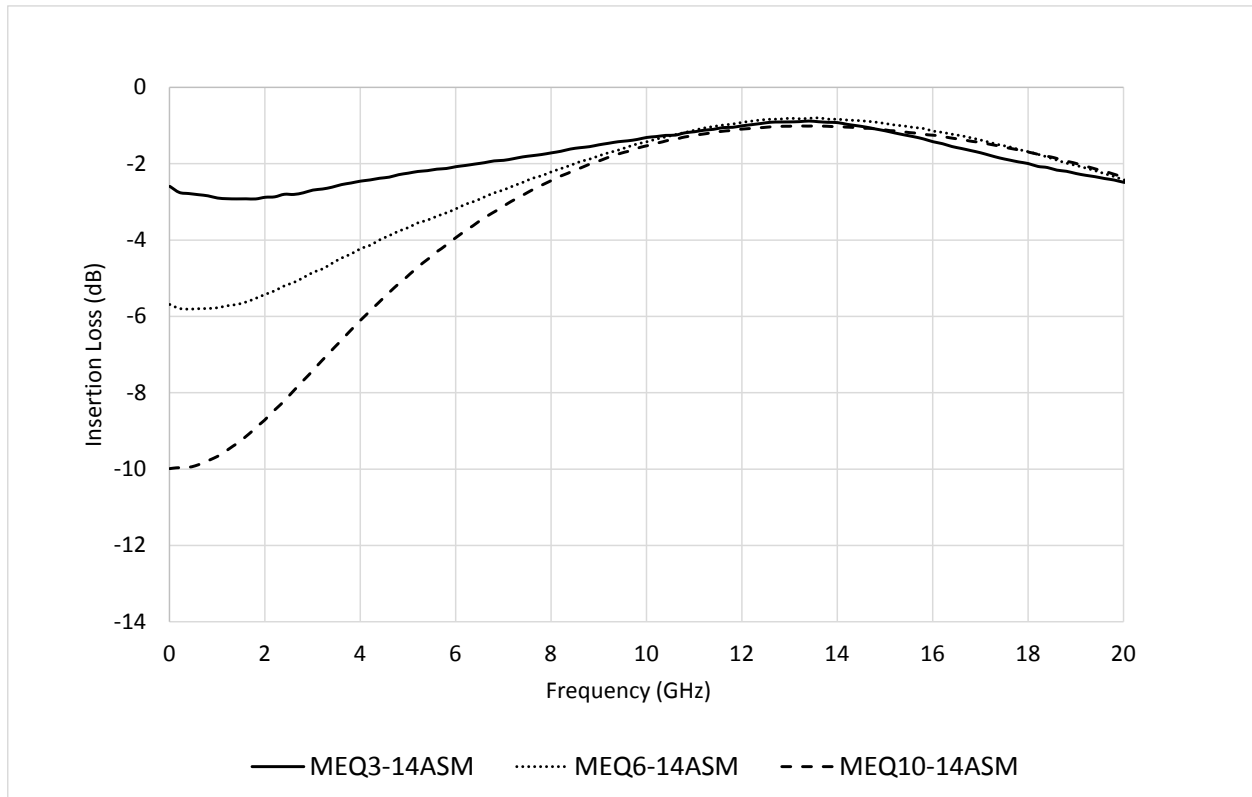
Min and Max limits are guaranteed at  $T_A=+25^{\circ}\text{C}$ . All bare die are 100% DC tested and visually inspected.

| Part Number | Typical Insertion Loss |        | Typical Return Loss | Units |
|-------------|------------------------|--------|---------------------|-------|
|             | DC                     | 14 GHz | DC-14 GHz           |       |
| MEQ3-14ASM  | 3                      | 0.8    | 23                  | dB    |
| MEQ6-14ASM  | 6                      | 0.8    | 28                  | dB    |
| MEQ10-14ASM | 10                     | 0.8    | 29                  | dB    |

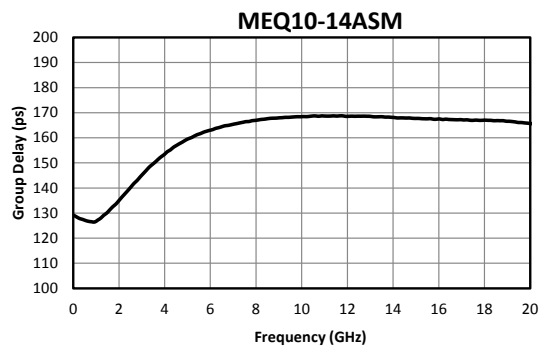
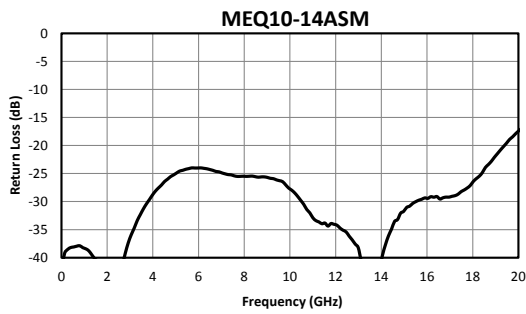
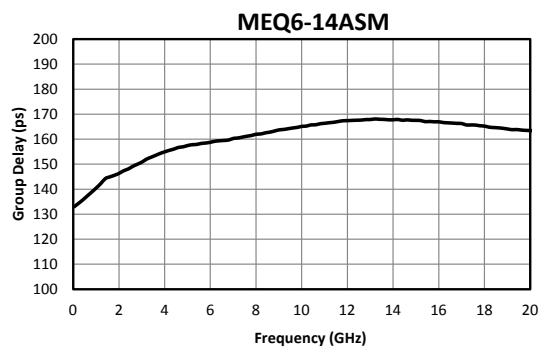
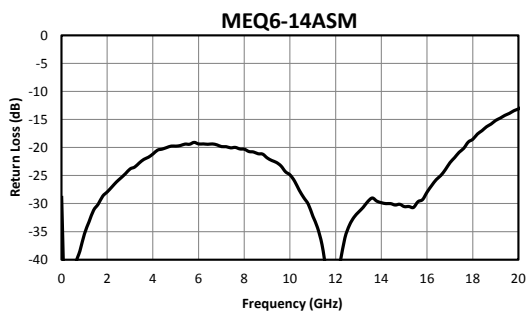
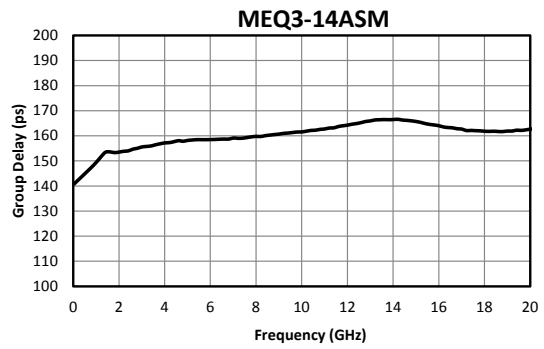
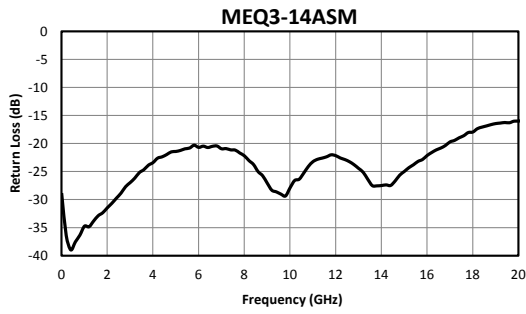
<sup>2</sup> Equalizer is symmetrical. Reverse measurement is equivalent to forward measurement. All measurements taken in eval board without de-embedding.

### 3.4 Typical Performance Plots

#### 3.4.1 Insertion Loss



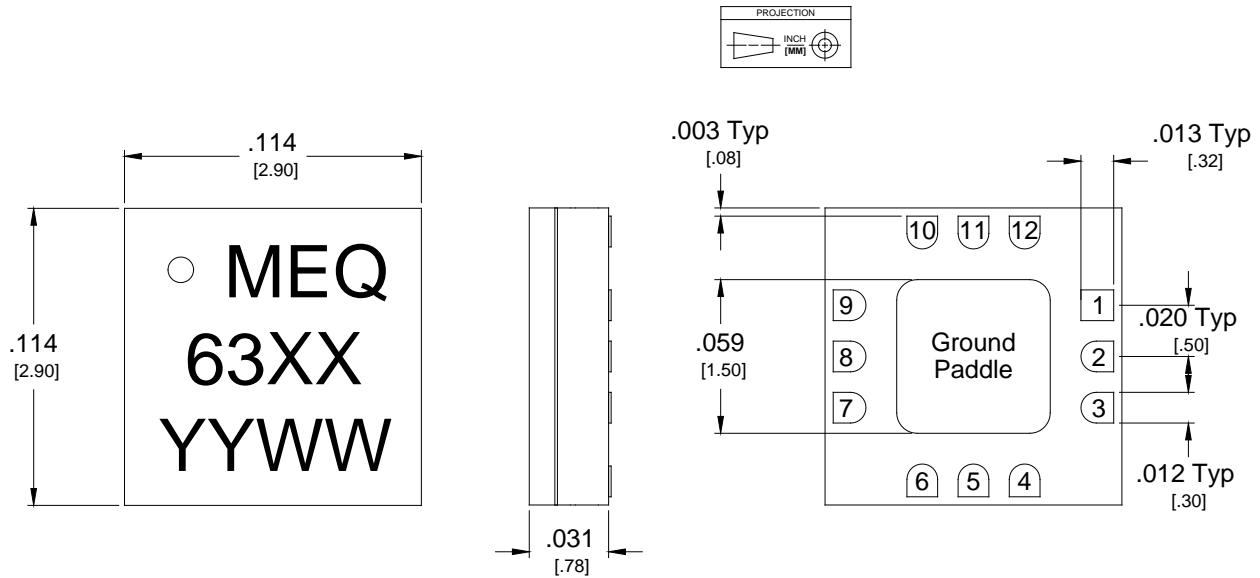
### 3.4.2 Return Loss & Group Delay<sup>3</sup>



<sup>3</sup> Group delay measured in eval board without de-embedding.

## 4 Mechanical Data

### 4.1 SM Package Outline Drawing



1. Substrate material is ceramic.
2. I/O Leads and Ground Paddle plating is (from base to finish):
  - Ni: 8.89um MAX 1.27um MIN
  - Pd: 0.17um MAX 0.07um MIN
  - Au 0.254um MAX 0.03um MIN
3. All unconnected pads should be connected to PCB RF ground.

| Part Number        | Circuit Number |
|--------------------|----------------|
| <b>MEQ3-14ASM</b>  | 6336           |
| <b>MEQ6-14ASM</b>  | 6337           |
| <b>MEQ10-14ASM</b> | 6338           |

## 4.2 Eval Package Outline Drawing

