

# Microwave Gain Equalizers

## EQY-SERIES

50Ω DC to 6 GHz



CASE STYLE: MC1631-1

### The Big Deal

- Excellent Return Loss, 20dB typ.
- Wide bandwidth, DC - 6 GHz
- Small Size, 2 mm x 2 mm

### Product Overview

EQY series of absorptive Gain Equalizers are fabricated using highly repetitive GaAs IPD\* MMIC process incorporating resistors, capacitors and inductors having negative insertion loss slope. EQYs are available with nominal attenuation slope of 1,2,3,4,5,6,8 & 10 dB. They are packaged in tiny 2 x 2 mm 8-Lead MCLP™ package.

### Key Features

| Feature  | Advantages  |
|--|---|
| Negative Insertion Loss Slope vs. Frequency      | Useful for compensating negative gain slope of amplifiers, receivers, transmitters to achieve flat gain versus frequency.   |
| Wide range of values<br>1,2,3,4,5,6,8 & 10 dB    | Enables circuit designer to change nominal insertion loss values without motherboard redesign making the EQY series ideal for select at test application.                                   |
| Wideband operation, DC to 6 GHz                  | Supports a wide array of applications including wireless cellular, microwave communications, satellite, defense and aerospace, medical broadband and optic applications.                    |
| Excellent Power Handling Capability<br>31/32 dBm | Enables its use at the output of a variety of amplifiers  |
| Small Size and simple to use<br>(2 mm x 2 mm)    | As a single chip solution, the EQY series occupies less board space than a lumped element approach, minimizes component count and ensures repeatable performance over wide frequency range. |

\*GaAs IPD (Gallium Arsenide Integrated Passive Device)

# Microwave Gain Equalizer

## EQY-5-63+

50Ω 5dB DC to 6 GHz

### Product Features

- 5.0 dB Slope
- Small Package 2 x 2 mm MCLP
- Wide Bandwidth, DC-6 GHz
- Excellent Return Loss, 20 dB typ.

### Typical Applications

- Cellular
- PCS
- Communications
- Radar
- Defense

### General Description

EQY-5-63+ is an absorptive Gain Equalizer fabricated using highly repetitive GaAs IPD MMIC process incorporating resistors, capacitors and inductors having negative insertion loss slope. EQY-5-63+ has a nominal attenuation slope of 5.0 dB and is packaged in tiny 2 x 2 mm, 8-Lead MCLP™ package.



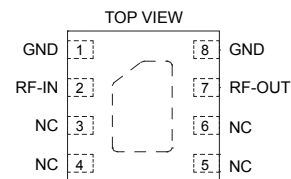
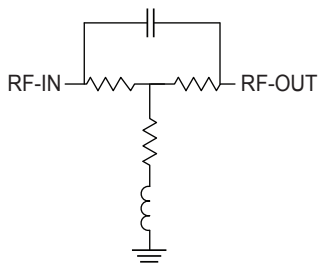
Generic photo used for illustration purposes only

CASE STYLE: MC1631-1

#### +RoHS Compliant

The +Suffix identifies RoHS Compliance. See our web site for RoHS Compliance methodologies and qualifications

### simplified schematic & pad description



| Function | Pad Number   | Description                      |
|----------|--------------|----------------------------------|
| RF-IN    | 2            | RF-Input pad                     |
| RF-OUT   | 7            | RF-Output pad                    |
| GND      | 1,8 & Paddle | Ground                           |
| NC       | 3-6          | No connection, ground externally |

**Electrical Specifications<sup>1</sup> at 25°C, 50Ω, unless otherwise noted.**

| Parameter       | Condition (GHz) | Min. | Typ. | Max. | Units |
|-----------------|-----------------|------|------|------|-------|
| Frequency Range |                 | DC   |      | 6    | GHz   |
| Insertion Loss  | 0.01            | 5.7  | 6.0  | 6.4  | dB    |
|                 | 1               | —    | 5.6  | —    |       |
|                 | 2               | —    | 4.6  | —    |       |
|                 | 3               | 3.0  | 3.5  | 3.8  |       |
|                 | 4               | —    | 2.4  | —    |       |
|                 | 5               | —    | 1.6  | —    |       |
| VSWR            | 6               | 0.4  | 1.0  | 1.3  | :1    |
|                 | 0.01 - 1        | —    | 1.04 | —    |       |
|                 | 1 - 2           | —    | 1.08 | —    |       |
|                 | 2 - 3           | —    | 1.11 | —    |       |
|                 | 3 - 4           | —    | 1.12 | —    |       |
|                 | 4 - 5           | —    | 1.14 | —    |       |
|                 | 5 - 6           | —    | 1.24 | —    |       |

1. Measured on Mini-Circuits Characterization Test Board TB-1041-5-63+. See Characterization Test Circuit (Fig. 1)

**Absolute Maximum Ratings<sup>2</sup>**

|                            |                |
|----------------------------|----------------|
| Operating Case Temperature | -40°C to 85°C  |
| Storage Temperature        | -65°C to 150°C |
| RF Input Power             | 31 dBm         |

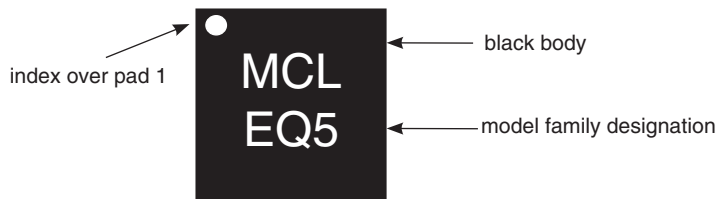
2. Permanent damage may occur if any of these limits are exceeded.

**Characterization Test Circuit**



**Fig 1.** Block Diagram of Test Circuit used for characterization. Test Board TB-1041-5-63+  
**Conditions:** Attenuation & Return Loss Pin=0 dBm

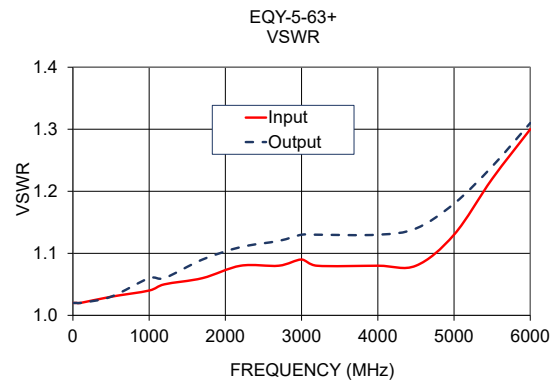
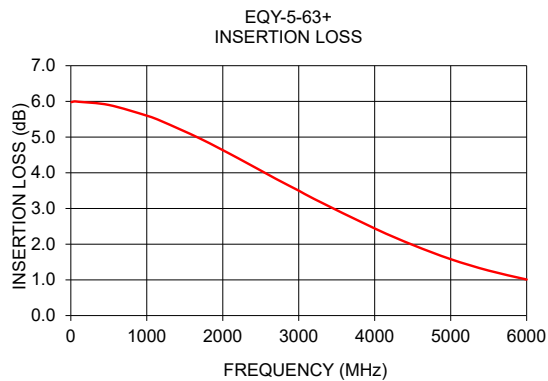
**Product Marking**



Marking may contain other features or characters for internal lot control

**Typical Performance Data at 25°C**

| Frequency (MHz) | Insertion Loss (dB) | Input VSWR (:1) | Output VSWR (:1) |
|-----------------|---------------------|-----------------|------------------|
| 10              | 5.98                | 1.02            | 1.02             |
| 50              | 6.00                | 1.02            | 1.02             |
| 100             | 5.99                | 1.02            | 1.02             |
| 500             | 5.90                | 1.03            | 1.03             |
| 1000            | 5.60                | 1.04            | 1.06             |
| 1200            | 5.44                | 1.05            | 1.06             |
| 1700            | 4.96                | 1.06            | 1.09             |
| 2200            | 4.41                | 1.08            | 1.11             |
| 2700            | 3.83                | 1.08            | 1.12             |
| 3000            | 3.50                | 1.09            | 1.13             |
| 3200            | 3.27                | 1.08            | 1.13             |
| 4000            | 2.44                | 1.08            | 1.13             |
| 4500            | 1.98                | 1.08            | 1.14             |
| 5000            | 1.58                | 1.13            | 1.18             |
| 5500            | 1.26                | 1.22            | 1.24             |
| 6000            | 1.01                | 1.30            | 1.31             |



| <b>Additional Detailed Technical Information</b>  |   |
|---|---|
| <i>additional information is available on our dash board. To access this information <a href="#">click here</a></i> |   |
| <b>Performance Data</b>   | Data Table  |
|   | Swept Graphs  |
| <b>Case Style</b>   | MC1631-1 <i>Plastic package, Lead finish: Matte-tin</i>             |
| <b>Tape &amp; Reel</b><br>Standard quantities available on reel   | F66<br><i>7" reels with 20, 50, 100, 200, 500, 1K or 2K devices</i> |
| <b>Suggested Layout for PCB Design</b>  | PL-576  |
| <b>Evaluation Board</b>   | TB-1041-5-63+   |
| <b>Environmental Ratings</b>  | ENV08T1   |

## ESD Rating

Human Body Model (HBM): Class 2 (Pass 2000V) in accordance with ANSI/ESD STM 5.1 - 2001 Machine.

## MSL Test Flow Chart



### Additional Notes

- Performance and quality attributes and conditions not expressly stated in this specification document are intended to be excluded and do not form a part of this specification document.
- Electrical specifications and performance data contained in this specification document are based on Mini-Circuit's applicable established test performance criteria and measurement instructions.
- The parts covered by this specification document are subject to Mini-Circuits standard limited warranty and terms and conditions (collectively, "Standard Terms"); Purchasers of this part are entitled to the rights and benefits contained therein. For a full statement of the Standard Terms and the exclusive rights and remedies thereunder, please visit Mini-Circuits' website at [www.minicircuits.com/MCLStore/terms.jsp](http://www.minicircuits.com/MCLStore/terms.jsp)