

# 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 mother-board 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-8-63+

50Ω    8dB    DC to 6 GHz

### Product Features

- 8.2 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-8-63+ is an absorptive Gain Equalizer fabricated using highly repetitive GaAs IPD MMIC process incorporating resistors, capacitors and inductors having negative insertion loss slope. EQY-8-63+ has a nominal attenuation slope of 8.2 dB and is packaged in tiny 2 x 2 mm, 8-Lead MCLP™ package.



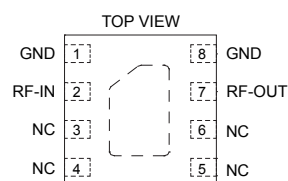
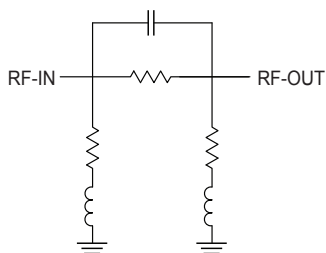
Generic photo used for illustration purposes only

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.**

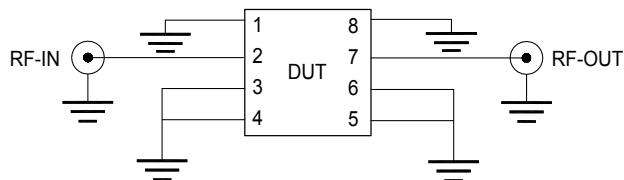
| Parameter       | Condition (GHz) | Min. | Typ. | Max. | Units |
|-----------------|-----------------|------|------|------|-------|
| Frequency Range |                 | DC   |      | 6    | GHz   |
| Insertion Loss  | 0.01            | 8.3  | 8.7  | 8.9  | dB    |
|                 | 1               | —    | 7.2  | —    |       |
|                 | 2               | —    | 4.8  | —    |       |
|                 | 3               | 2.4  | 2.7  | 3.0  |       |
|                 | 4               | —    | 1.5  | —    |       |
|                 | 5               | —    | 0.8  | —    |       |
|                 | 6               | 0.1  | 0.5  | 0.7  |       |
| VSWR            | 0.01 - 1        | —    | 1.14 | —    | :1    |
|                 | 1 - 2           | —    | 1.12 | —    |       |
|                 | 2 - 3           | —    | 1.14 | —    |       |
|                 | 3 - 4           | —    | 1.16 | —    |       |
|                 | 4 - 5           | —    | 1.19 | —    |       |
|                 | 5 - 6           | —    | 1.21 | —    |       |

1. Measured on Mini-Circuits Characterization Test Board TB-1041-8-63+. 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-1041-8-63+

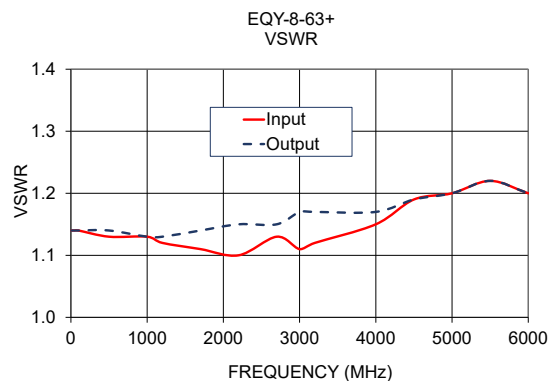
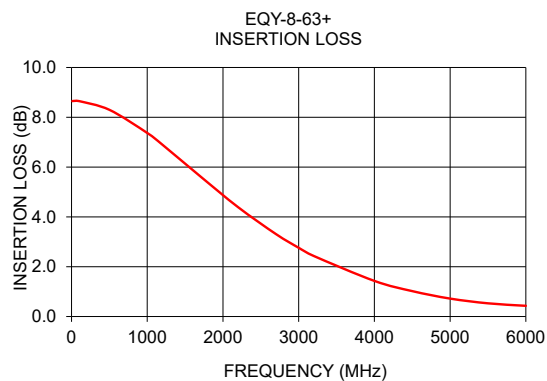
**Conditions:** Attenuation & Return Loss Pin=0 dBm

**Product Marking**

Marking may contain other features or characters for internal lot control

Typical Performance Data at 25°C

| Frequency<br>(MHz) | Insertion<br>Loss<br>(dB) | Input<br>VSWR<br>(:1) | Output<br>VSWR<br>(:1) |
|--------------------|---------------------------|-----------------------|------------------------|
| 10                 | 8.65                      | 1.14                  | 1.14                   |
| 50                 | 8.66                      | 1.14                  | 1.14                   |
| 100                | 8.65                      | 1.14                  | 1.14                   |
| 500                | 8.30                      | 1.13                  | 1.14                   |
| 1000               | 7.37                      | 1.13                  | 1.13                   |
| 1200               | 6.90                      | 1.12                  | 1.13                   |
| 1700               | 5.63                      | 1.11                  | 1.14                   |
| 2200               | 4.39                      | 1.10                  | 1.15                   |
| 2700               | 3.31                      | 1.13                  | 1.15                   |
| 3000               | 2.76                      | 1.11                  | 1.17                   |
| 3200               | 2.43                      | 1.12                  | 1.17                   |
| 4000               | 1.43                      | 1.15                  | 1.17                   |
| 4500               | 1.02                      | 1.19                  | 1.19                   |
| 5000               | 0.72                      | 1.20                  | 1.20                   |
| 5500               | 0.53                      | 1.22                  | 1.22                   |
| 6000               | 0.43                      | 1.20                  | 1.20                   |



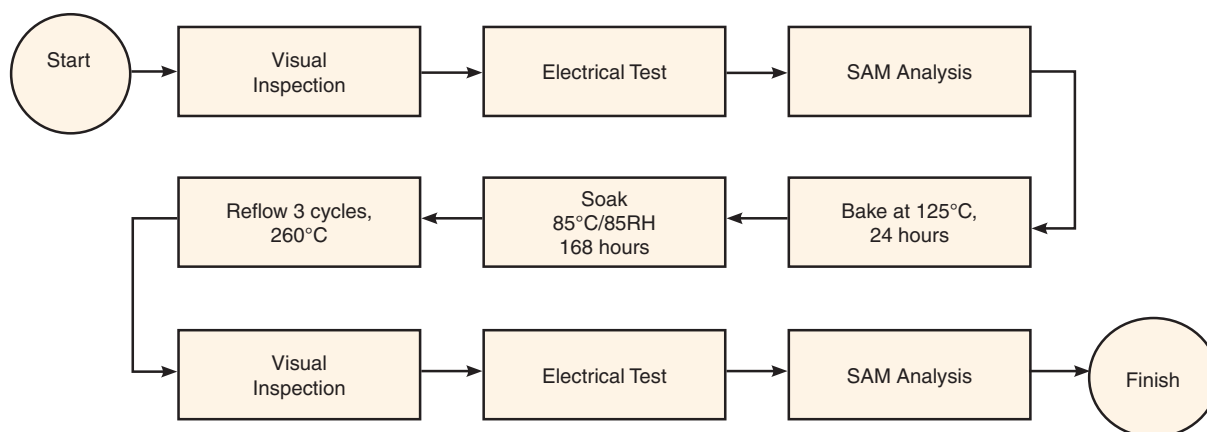
**Additional Detailed Technical Information**

additional information is available on our dash board. To access this information [click here](#)

|                                                                 |                                                              |
|-----------------------------------------------------------------|--------------------------------------------------------------|
| <b>Performance Data</b>                                         | Data Table                                                   |
|                                                                 | Swept Graphs                                                 |
| <b>Case Style</b>                                               | MC1631-1 Plastic package, Lead finish: Matte-tin             |
| <b>Tape &amp; Reel</b><br>Standard quantities available on reel | F66<br>7" reels with 20, 50, 100, 200, 500, 1K or 2K devices |
| <b>Suggested Layout for PCB Design</b>                          | PL-576                                                       |
| <b>Evaluation Board</b>                                         | TB-1041-8-63+                                                |
| <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)