

MEQ3-20CSP1

Chip Scale Package MMIC 20 GHz 3 dB Equalizer

DEVICE OVERVIEW

General Description

The MEQ3-20CSP1 is a passive MMIC equalizer CSP ideal for compensating for low pass filtering effects in RF/microwave and high speed digital systems. The MEQ3-20CSP1 provides 2.5dB positive slope equalization from DC to 20GHz with a DC attenuation of 3dB. The chip scale package allows for extreme miniaturization of the SMT footprint. The unique design offers superior 25dB return loss to competitors in an extremely small footprint. GaAs MMIC technology provides consistent unit-to-unit performance in a small, low cost form factor.



[Download s-parameters here](#)

Features

- Small 1.5 x 1.5 mm package size
- DC attenuation of 3dB
- Typical Insertion Loss 0.6dB at 20GHz
- Typical VSWR of 1.12 Over Operating Band
- Low SWaP
- This product embodies Marki Microwave's U.S. Pat. 11,869,858.

Applications

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

Functional Block Diagram



Part Ordering Options

Part Number	Description	Package	Green Status	Product Lifecycle	Export Classification
MEQ3-20CSP1	Chip Scale Package MMIC 20 GHz 3 dB Equalizer	CSP1	REACH RoHS	Released	EAR99
EVB-MEQ3-20	Evaluation Board, Chip Scale Package MMIC 20 GHz Equalizer	EVB	REACH RoHS	Released	EAR99

MEQ3-20CSP1

Chip Scale Package MMIC 20 GHz 3 dB Equalizer

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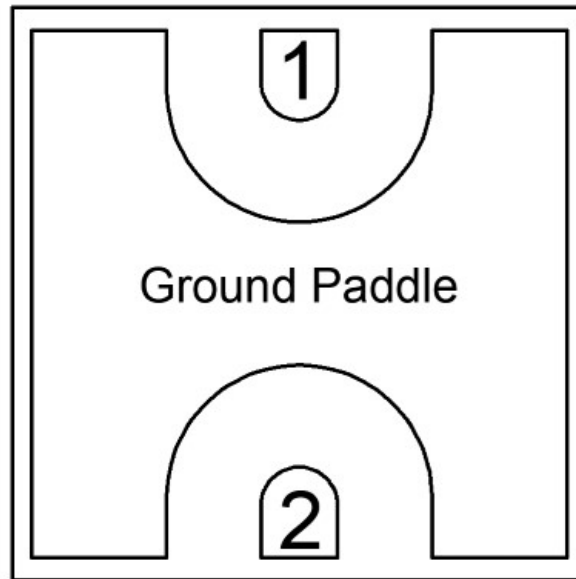
Revision History

Revision Code	Revision Date	Comment
-	2025-06-13	Initial Release


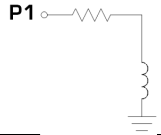
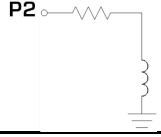
Port Configuration and Functions

Port Diagram

An x-ray view of the MEQ3-20CSP1 package outline drawing is shown below. The MEQ equalizers are symmetrical allowing Port 1 or Port 2 to be used as the input.



Port Functions

Port	Function	Description	DC Equivalent Circuit
GND	Ground	SM package ground path is provided through the ground paddle.	Pad 
Pin 1	Input/Output	Pin 1 is DC connected to ground through a resistor. DC block is required if voltage present.	P1 
Pin 2	Input/Output	Pin 2 is DC connected to ground through a resistor. DC block is required if voltage present.	P2 

Specifications

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	Unit
Maximum Operating Temperature	100	°C
Maximum Storage Temperature	125	°C
Minimum Operating Temperature	-55	°C
Minimum Storage Temperature	-65	°C

Package Information

Parameter	Details	Rating
ESD	250 to < 500 Volts	HBM Class 1A
Weight	Package name: CSP1	0.04g
Dimensions	-	1.50 x 1.50 mm
Moisture Sensitivity Level	-	MSL 3

Electrical Specifications

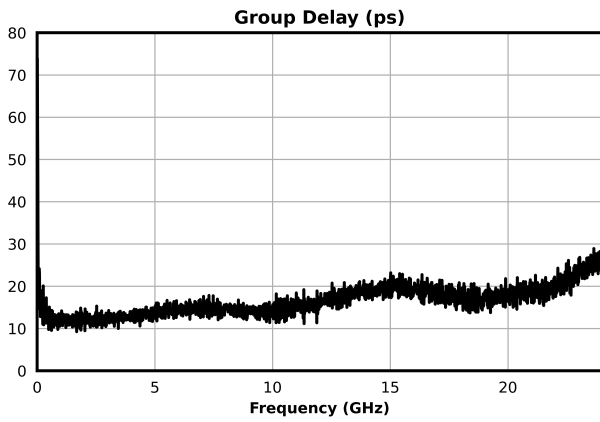
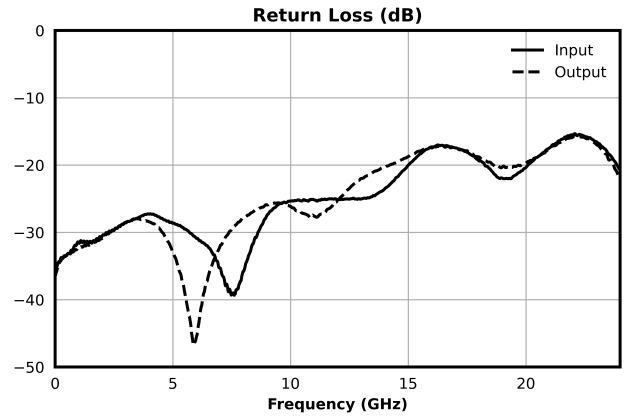
The electrical specifications apply at TA=+25°C in a 50Ω system. Typical data shown is for the equalizer in a SM package with a sine wave input applied to port 1. Min and Max limits are guaranteed at TA=+25°C. All bare die are 100% DC tested and visually inspected.

Parameter	Test Conditions	Minimum Frequency (GHz)	Maximum Frequency (GHz)	Min	Typ	Max	Unit
Insertion Loss at DC	Configuration A, Temp = 25°C	0	0	-	3.0	-	dB
Insertion Loss	Configuration A, Temp = 25°C	10	10	-	2.1	-	dB
Insertion Loss	Configuration A, Temp = 25°C	20	20	-	0.6	-	dB
Equalization Value ¹	Configuration A, Temp = 25°C	0	20	-	2.5	-	dB
Return Loss	Configuration A, Temp = 25°C	0	20	-	25	-	dB
Group Delay	Configuration A, Temp = 25°C	0	20	-	15	-	ps

^[1] Equalization Value = Max Insertion Loss - Min Insertion Loss

Equalizer is symmetrical. Reverse measurement is equivalent to forward measurement. All measurements taken in EVB package and de-embedded to the CSP1 pad interface.

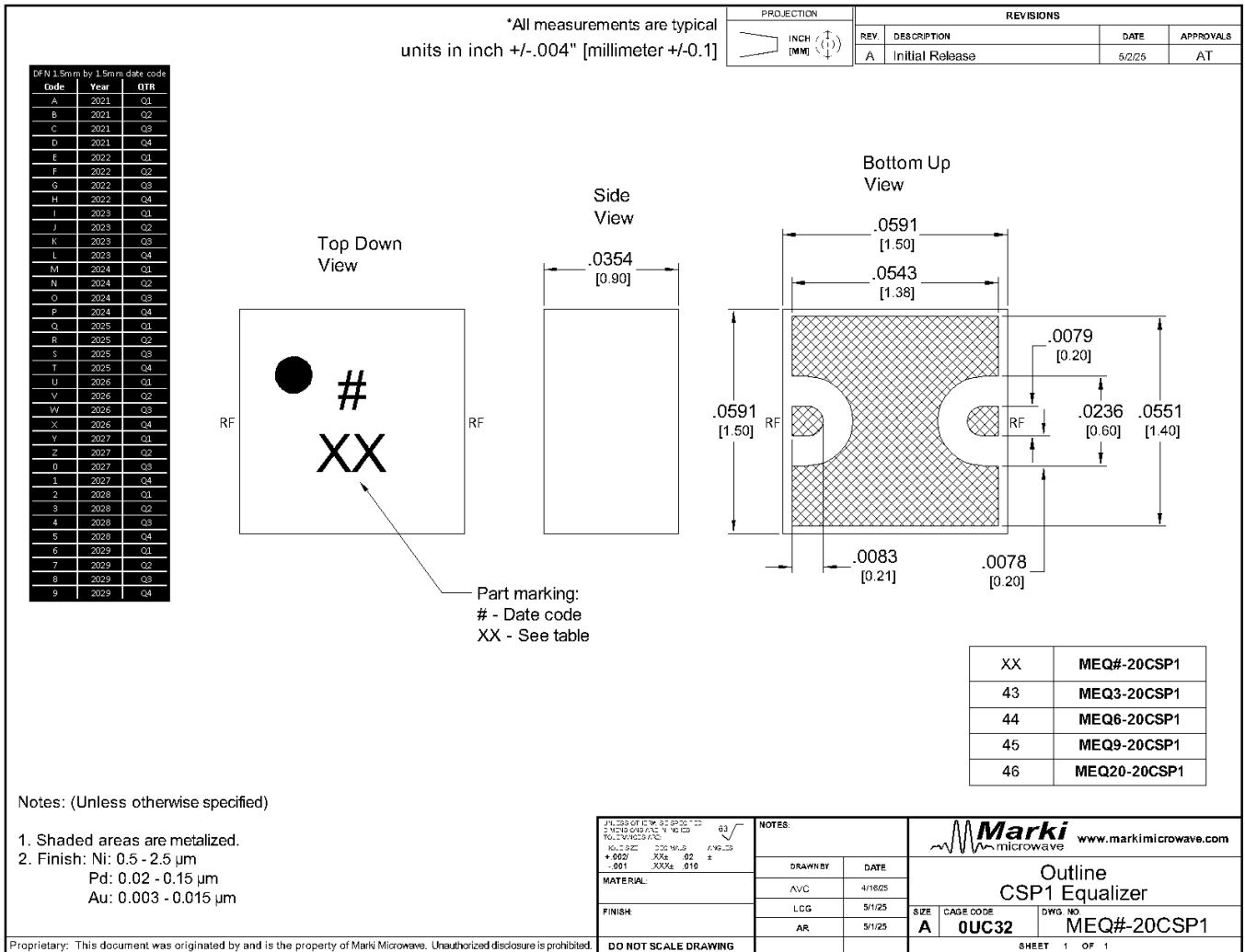
Typical Performance Plot



Mechanical Data

Outline Drawing

Download : [Outline 2D Drawing](#) | [Outline 3D Drawing](#) | [Outline 3D STP](#)

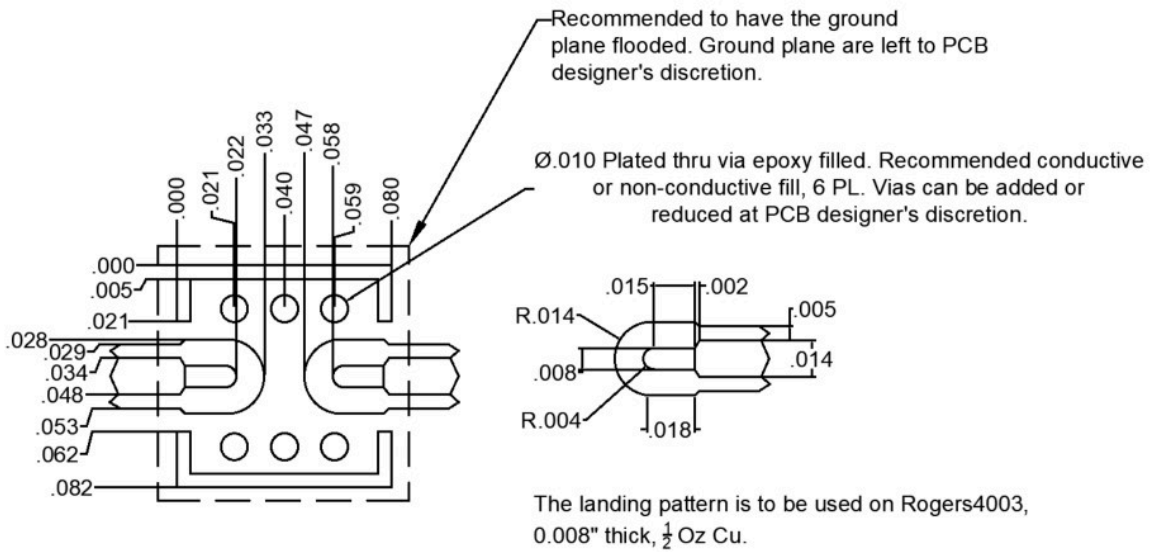


MEQ3-20CSP1

Chip Scale Package MMIC 20 GHz 3 dB Equalizer

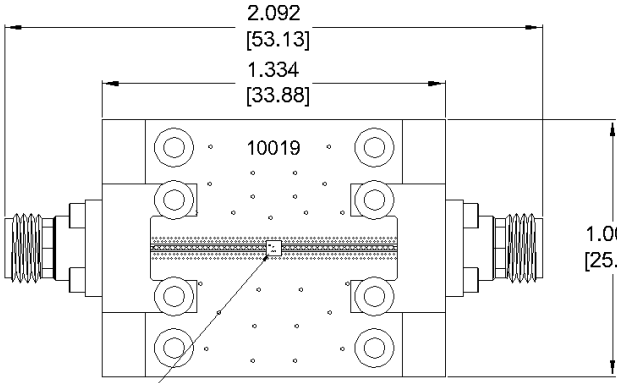
Footprint Image

Download : [Footprint Drawing](#)

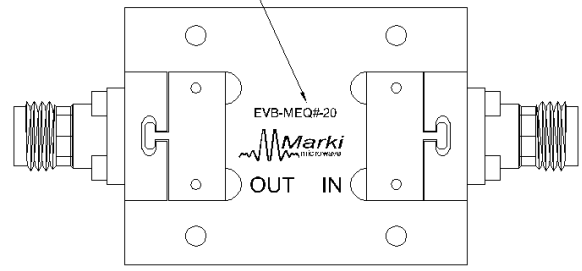


Evaluation Board - Outline Drawing

All measurements are typical



Top View



Bottom-up View

Part marking:
#: Date code
XX: See table

XX	Surface Mount P/N	EVB P/N
43	MEQ3-20CSP1	EVB-MEQ3-20
44	MEQ6-20CSP1	EVB-MEQ6-20
45	MEQ9-20CSP1	EVB-MEQ9-20
46	MEQ20-20CSP1	EVB-MEQ20-20

Port	Connector Type
1, 2	2.92mm Female

Note: Connectors are not removable.

REVISIONS		DATE	APPROVALS
REV	DESCRIPTION		
A	Initial Release	5/29/25	AT

RoHS Compliant (SN96.5/AG3.5) Components/Assembly

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NOTES:

1. ALL DIMENSIONS ARE IN INCHES UNLESS OTHERWISE SPECIFIED.

2. TOLERANCES UNLESS OTHERWISE SPECIFIED:

+.002 / .001 .010 / .005 .020 / .010

3. FINISH: XX# .02 ± .010

MATERIAL:

FINISH:

DO NOT SCALE DRAWING

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Outline
MEQ Eval Board CSP1

SIZE	CAGE CODE	DWG. NO.
A	0UC32	EVB-MEQ#-20

SHEET 1 OF 1

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