

W band MMIC x4 Frequency Multiplier

W-x4M-8590

Previously named TU-W1340312

GaAs Diode MMIC x4 Frequency Multiplier, 85-90GHz

Overview

W-x4M-8590 is a resistive MMIC diode x4 frequency multiplier designed to convert frequencies in the 21.25 – 22.5GHz band into the 85 – 90GHz band. W-x4M-8590 is fabricated using GaAs diode technology and offers a typical conversion loss of less than 30dB across the band with an input drive level of 15dBm.

With the underside of the die gold plated, this MMIC is compatible with precision die attach methods, as well as thermo-compression and thermosonic wire bonding, making it ideal for MCM and hybrid microcircuit applications.

Features

- Input frequency 21.25 - 22.5GHz.
- Output frequency 85 - 90GHz.
- 30dB conversion loss.
- 15dBm drive level.
- No DC consumption.

Applications

- High speed data communications.
- Space communications.
- High frequency radar.
- IOT.
- Security.

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Specification Overview

Parameter	Min.	Typ.	Max.	Units
Input Frequency	21.25		22.5	GHz
Output Frequency	85		90	GHz
LO Drive		15		dBm
Conversion Loss	27	30		dB

Notes

All tests are carried out at 25°C.

Absolute Maximum Ratings

Parameter	Rating
LO Drive	25dBm
Storage Temperature	-65°C to +175°C
Channel Temperature	+175°C
Operating Temperature	-40°C to +85°C



ESD (electrostatic discharge) sensitive device. Charged devices and circuit boards can discharge without detection. Although this product features proprietary protection circuitry, damage may occur on devices subjected to ESD. Proper ESD precautions should be taken to avoid performance degradation or loss of functionality.

Measured Performance Data

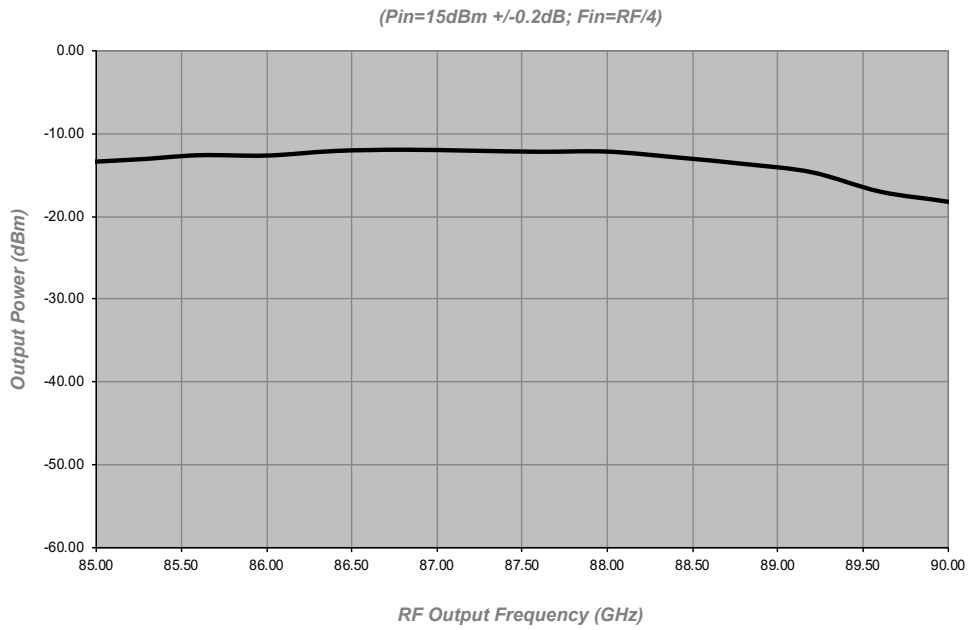


Figure 1
Output Power

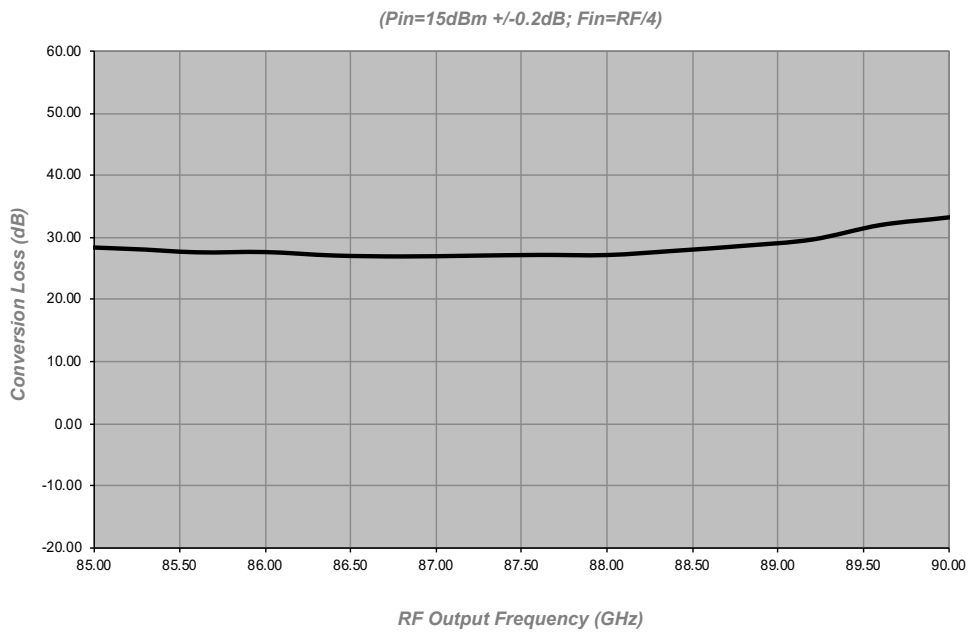
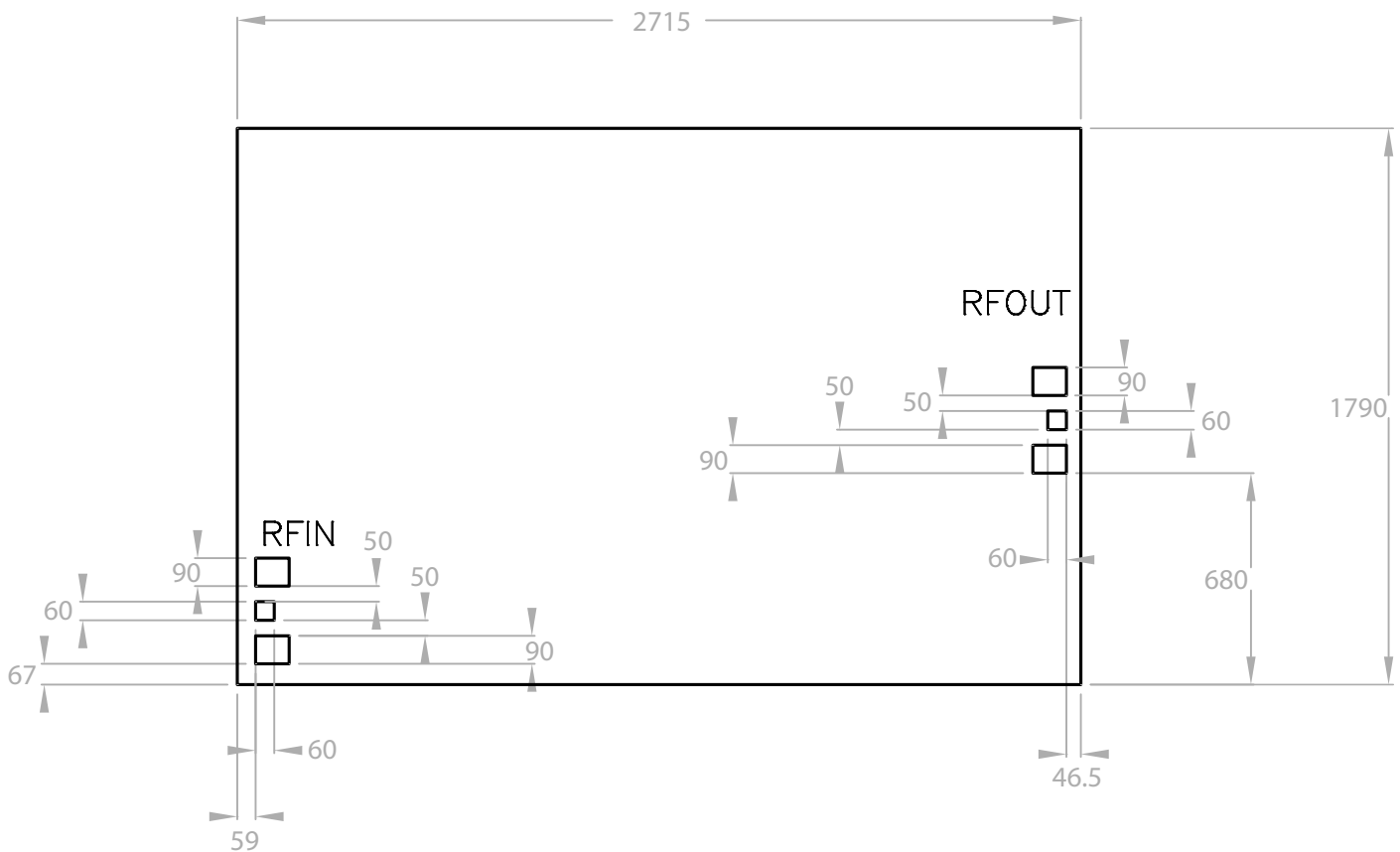


Figure 2
Conversion Loss

Outline Drawing



Notes

1. All dimensions are in um.
2. RF bond pads are 60um square.
3. Gold backside metalisation.
4. Backside metal is ground.
5. Die thickness is 50um.

Pad Descriptions

Name	Description
RFIN	This is the input frequency pad. This pad is AC coupled
RFOUT	This is the output frequency pad (X4). This pad is AC coupled
BOTTOM	The die backside must be connected to RF/DC ground

Die Packing Information

All die are delivered using gel-paks unless otherwise requested.

General Notes on Assembly



Die should be mounted on conductive material such as gold-plated metal to provide a good ground and suitable heat sink, if necessary.

1. Attaching the die using Au/Sn preforms is preferable. The Eutectic melt for Au/Sn occurs at approximately 280°C so the die (plus mount and preform) is initially heated up to 180°C and then it is heated for approximately 10 seconds to 280°C using a nitrogen heat gun. The device will survive 10 seconds at this temperature. The static breakdown for GaAs devices is approximately 330°C.
2. Pure, dry nitrogen should be used as the heat source
3. If the devices cannot be lifted/ placed by a vacuum device, then ESD die-lifting tweezers are preferable.
4. Aluminium wire must not be used.

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