

# E band MMIC x2 Frequency Multiplier

**E-x2M-6085** Previously named CO-E1340315

**GaAs MMIC x2 Frequency Multiplier 60-85GHz**

## Overview

E-x2M-6085 is a wideband passive Schottky diode frequency multiplier MMIC that transforms frequencies from the 30GHz to 42.5GHz band into the 60GHz to 85GHz frequency band, with  $<\pm 1.5$ dB conversion loss variation in this region), this MMIC provides 4dBm output power with an input drive level of 18dBm.

With all bond pads and the backside of the MMIC are gold plated, the 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. All data shown is measured with the chip in a 50 Ohm environment and contacted using RF probes.

## Features

- 30 – 42.5GHz input.
- 60 – 85GHz output.
- 14dB conversion loss.
- 4dBm output power.

## Applications

- Millimeter-wave imaging.
- High resolution radar.
- Sensing.
- P2P communications; short haul / high capacity / low interference links.
- Medical.
- Automotive radar.

|   |                  |            |                           |           |             |
|---|------------------|------------|---------------------------|-----------|-------------|
|  | E band Datasheet | E-x2M-6085 | Issue date: 30 April 2021 | DOC REV 4 | Page 1 of 7 |
|---|------------------|------------|---------------------------|-----------|-------------|

## Specification Overview

| Parameter        | Min. | Typ. | Max. | Units |
|------------------|------|------|------|-------|
| Input Frequency  | 30   |      | 42.5 | GHz   |
| Output Frequency | 60   |      | 85   | GHz   |
| Conversion Loss  | 16   | 14   | 10   | dB    |
| Gain Flatness    |      | ±1.5 |      | dB    |
| Input Power      | 10   | 16   | 18   | dBm   |

### Notes

All tests are carried out at 25°C.

## Absolute Maximum Ratings

| Parameter             | Rating          |
|-----------------------|-----------------|
| RF Input Power        | 22dBm           |
| Storage Temperature   | -65°C to +150°C |
| Channel Temperature   | +150°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

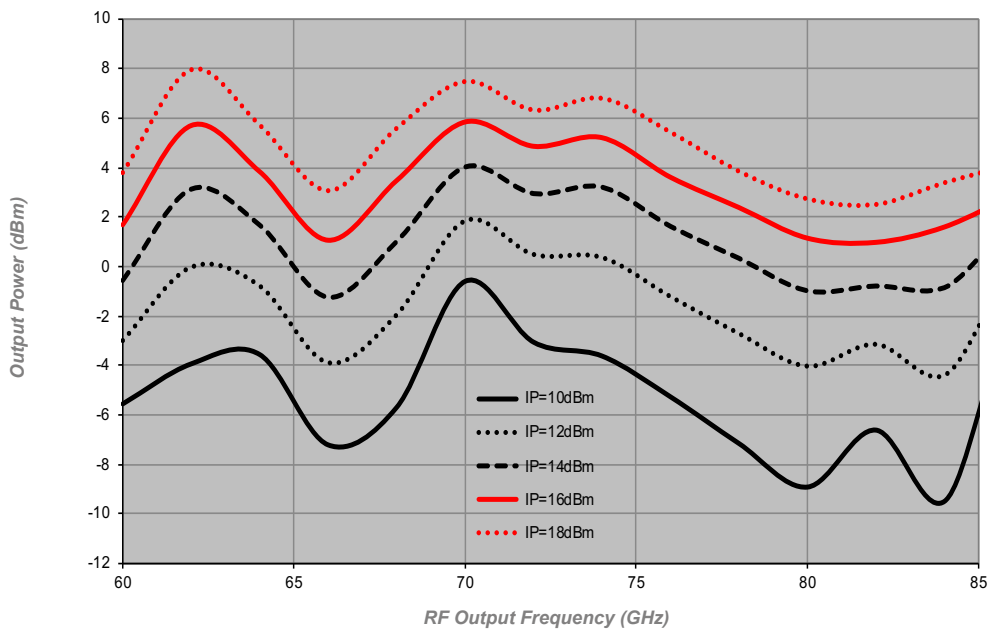


Figure 1  
 Output Power

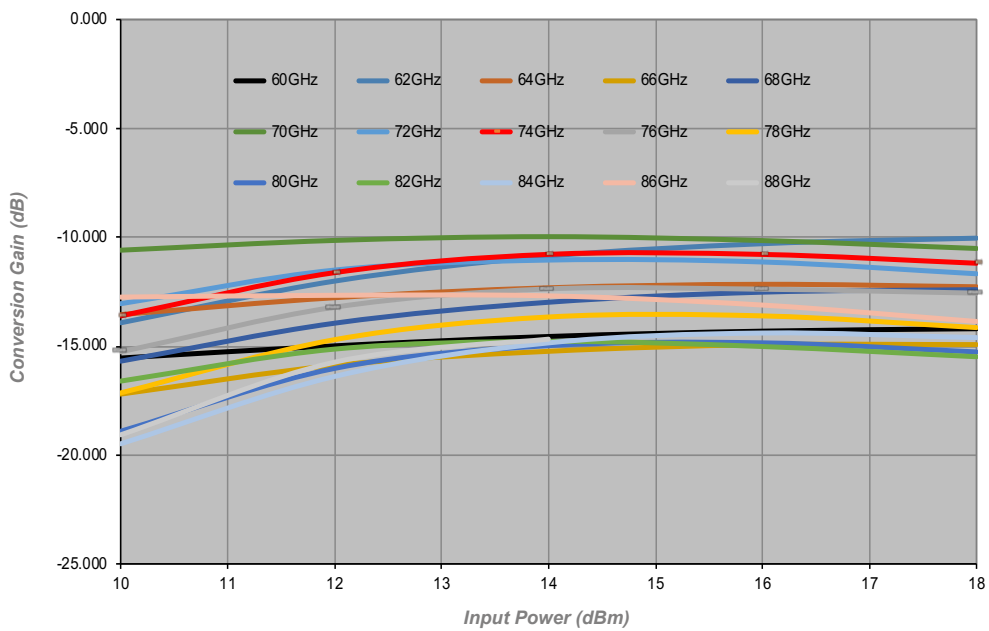
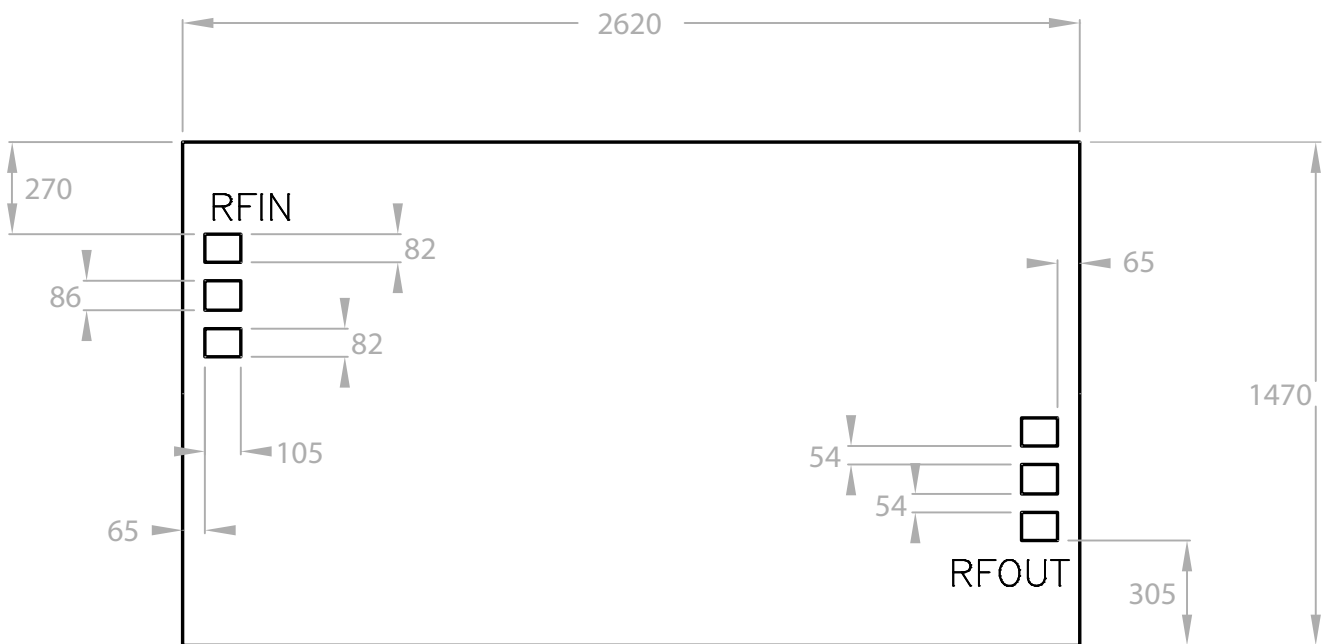


Figure 2  
 Conversion Gain

## Outline Drawing

**Die Packing Information**  
All die are delivered using gel-paks unless otherwise requested.

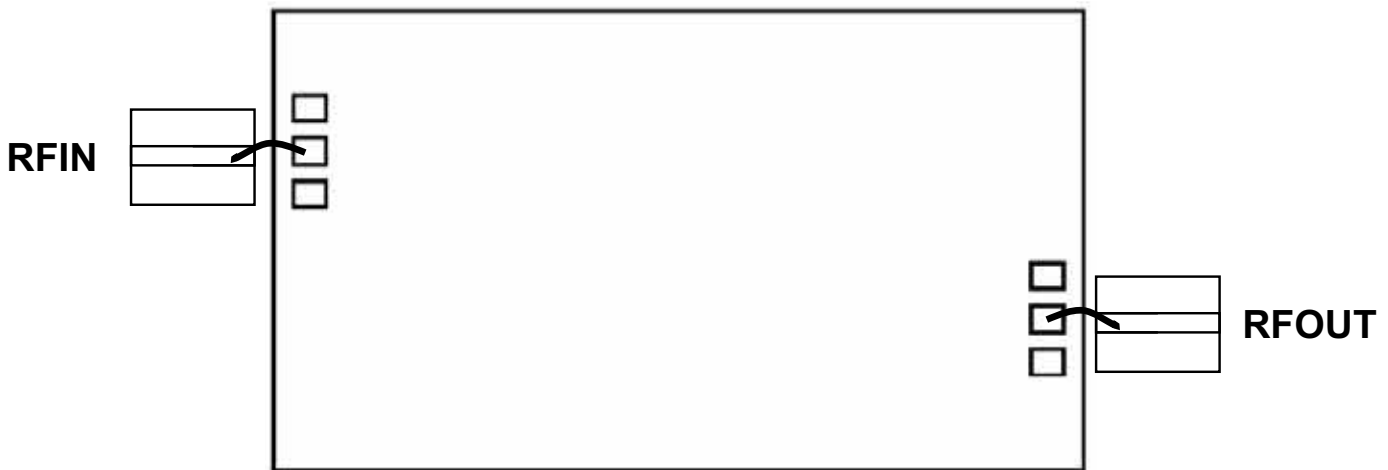


### Notes

1. All dimensions are in μm.
2. RF bond pads are 86 x 105μm.
3. All pads have gold metalisation.
4. Gold backside metalisation.
5. Backside metal is ground.
6. Die thickness is 100μm.

## Pad Descriptions

| Name   | Description   |
|--------|---|
| RFIN   | Input RF pad. This pad is ac coupled.               |
| RFOUT  | Output RF pad. This pad is ac coupled.              |
| BOTTOM | The die backside must be connected to RF/DC ground. |



## 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. Supply lines should be decoupled with 100pF capacitors. Larger planar capacitors could be used if available.
5. Aluminium wire must not be used.

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|---|-------------------------|-------------------|---------------------------|------------------|-------------|
|  | <b>E band Datasheet</b> | <b>E-x2M-6085</b> | Issue date: 30 April 2021 | <b>DOC REV 4</b> | Page 6 of 7 |
|---|-------------------------|-------------------|---------------------------|------------------|-------------|

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|  <b>Arralis</b> | <b>E band Datasheet</b> | <b>E-x2M-6085</b> | Issue date: 30 April 2021 | <b>DOC REV 4</b> | Page 7 of 7 |
|--|-------------------------|-------------------|---------------------------|------------------|-------------|

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