

E band MMIC x4 Frequency Multiplier

E-x4M-7288 Previously named CO-E1340314

GaAs MMIC x4 Frequency Multiplier 72-88GHz

Overview

E-x4M-7288 is a wideband resistive schottky diode frequency multiplier MMIC that transforms frequencies from the 18GHz to 22GHz band into the 72GHz to 88GHz frequency band, E-x4M-7288 provides -15dBm output power across the entire band at a bias voltage of -0.2V and an input drive level of 16dBm.

With all bond pads and the backside of the MMIC gold plated, the E-x4M-7288 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, with 100pF decoupling capacitors on all DC connections and contacted using RF probes.

Features

- 18 – 22GHz input.
- 72 – 88GHz output.
- 25dB conversion loss.
- -15dBm 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-x4M-7288	Issue date: 30 April 2021	DOC REV 4	Page 1 of 7
---	------------------	------------	---------------------------	-----------	-------------

Specification Overview

Parameter	Min.	Typ.	Max.	Units
Input Frequency	18		22	GHz
Output Frequency	72		88	GHz
Conversion Gain	-26	-23		dB
Gain Flatness		±3.5		dB
Input Power	10	16	18	dBm
Drain Voltage		-0.2		V

Notes

The tests indicated have all been performed with 100pF de-coupling capacitors on all bias pads.

All tests are carried out at 25°C.

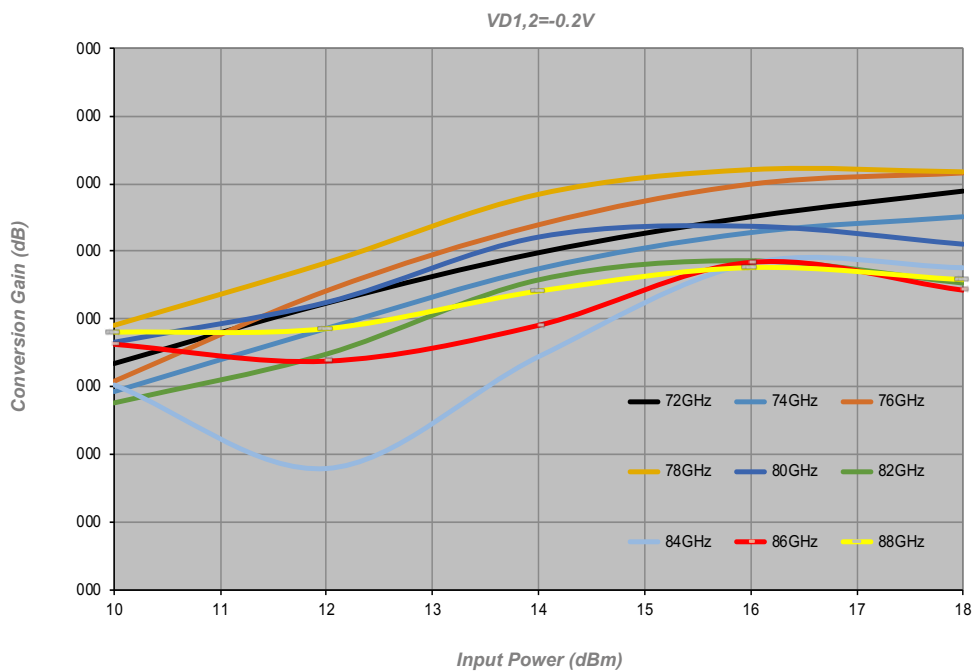
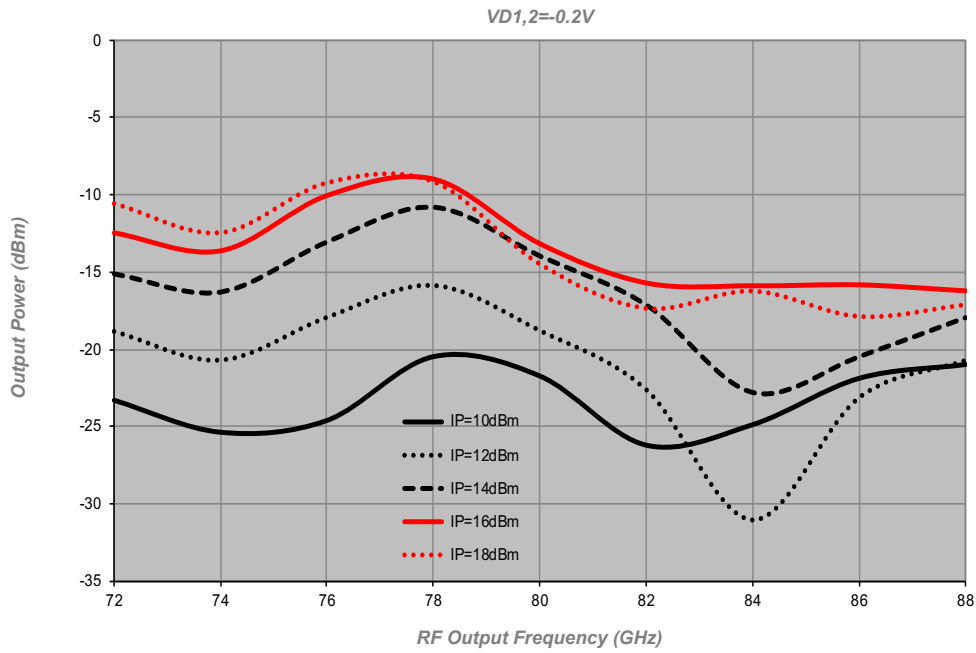
Absolute Maximum Ratings

Parameter	Rating
Drain Voltage	-0.3V to 0.3V
RF Input Power	22dBm
Storage Temperature	-65°C to +150°C
Channel Temperature	+150°C
Operating Temperature	-40°C to +85°C



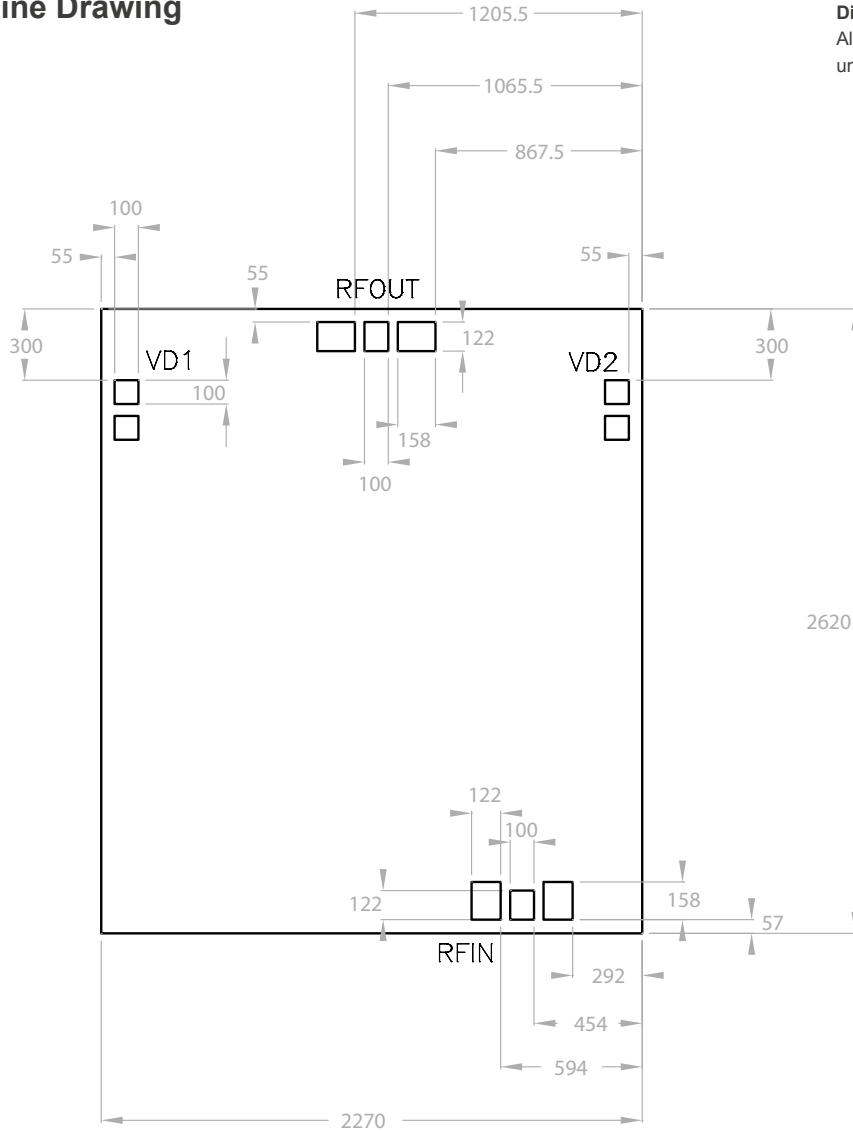
ESD (electrostatic discharge) sensitive device. Charged devices and circuit boards can discharge without detection. Although this product features proprietary protection circuitry, damage may occur on devices subjected to ESD. Proper ESD precautions should be taken to avoid performance degradation or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

Measured Performance Data



No licence is granted under any patent or any patent rights of Arralis. Information furnished by Arralis is believed to be accurate. No responsibility is assumed by Arralis for its use, nor for any infringements on the rights of other parties that may result for the use of the information herein. All specifications are subject to change without notice.

Outline Drawing



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

Notes

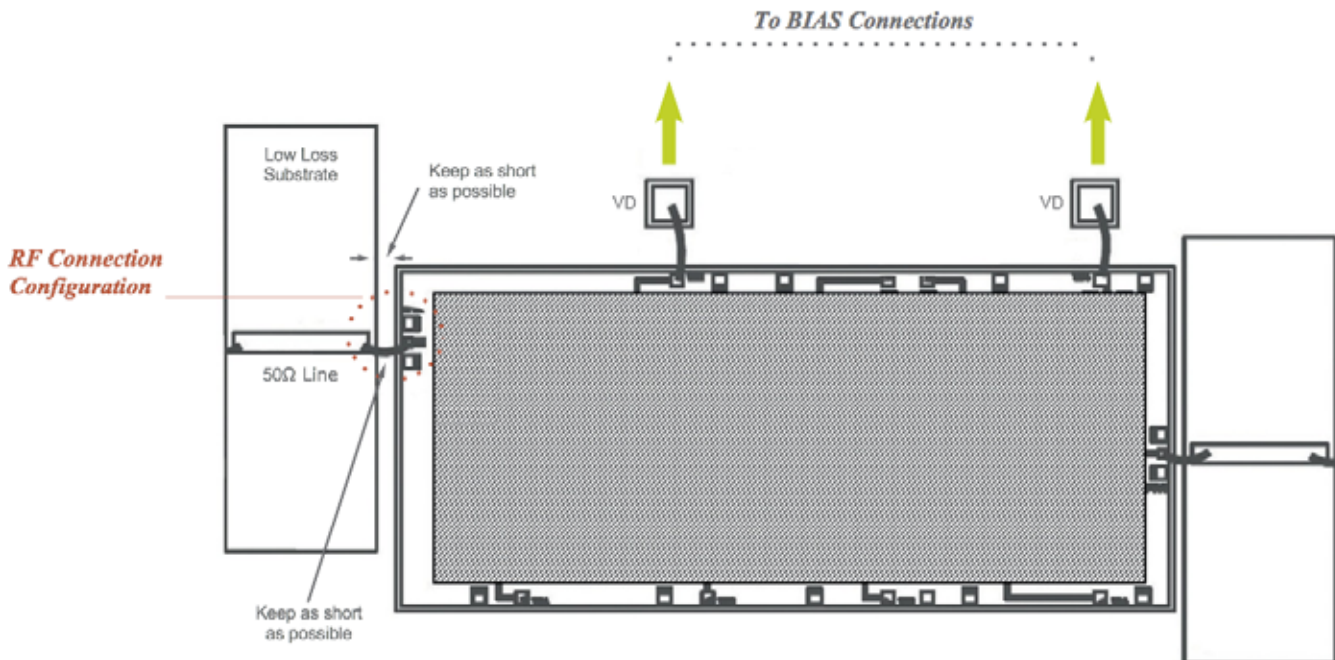
1. All dimensions are in um.
2. Typical DC bond pads are 100um square.
3. RF bond pads are 100 x 122um.
4. All pads have gold metalisation.
5. Gold backside metalisation.
6. Backside metal is ground.
7. Connections are not required for unlabeled bond pads.
8. Die thickness is 100um.

Pad Descriptions

Name	Description
RFIN	Input RF pad. This pad is ac coupled.
RFOUT	Output RF pad. This pad is ac coupled.
VDx	Bias pad for diode x. VDx should be identical for all cases.
BOTTOM	The die backside must be connected to RF/dc ground.

(Not actual die – these rules are applied to all MMICs unless otherwise stated)

Connection Configurations



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.

Disclaimer

The information contained herein is believed to be reliable; however, Arralis makes no warranties regarding the information and assumes no responsibility or liability whatsoever for the use of the information contained herein. All information is subject to change without notice, therefore customers should obtain the latest relevant information before placing orders for Arralis products. The information contained herein does not grant, explicitly or implicitly, to any party any patent rights, licenses, or any other intellectual property rights.

This information does not constitute a warranty with respect to the product described, and Arralis disclaims any and all warranties either expressed or implied, relating to sale and/or use of Arralis products including liability or warranties relating to fitness for a particular purpose, consequential or incidental damages, merchantability, or infringement of any patent, copyright or other intellectual property right.

Without limiting the generality of the foregoing, Arralis products are not warranted or authorised for use as critical components in medical, life-saving, or life-sustaining applications, or other applications where a failure would reasonably be expected to cause severe personal injury or death.

Copyright 2021 © Arralis

	E band Datasheet	E-x4M-7288	Issue date: 30 April 2021	DOC REV 4	Page 6 of 7
---	------------------	------------	---------------------------	-----------	-------------

©2021 Arralis Ltd. All rights reserved. Trademarks and registered trademarks are the property of their respective owners.

Arralis European Offices
t: +(44) 1793 239670 (UK)
e: sales@arralis.com

arralis.com

Arralis USA Office
+(1) 386 301 3249 (USA)
e: emilie.wren@arralis.com

	E band Datasheet	E-x4M-7288	Issue date: 30 April 2021	DOC REV 4	Page 7 of 7
---	-------------------------	-------------------	---------------------------	------------------	-------------

No licence is granted under any patent or any patent rights of Arralis. Information furnished by Arralis is believed to be accurate. No responsibility is assumed by Arralis for its use, nor for any infringements on the rights of other parties that may result for the use of the information herein. All specifications are subject to change without notice.