

# K band MMIC IQ Mixer

**K-IQM-1721** Previously named LE-Ka1340301

**GaAs Diode IQ MMIC Mixer 17-21 GHz**

## Overview

K-IQM-1721 is an I/Q MMIC diode mixer with integrated quadrature coupler for single sideband (LO-IF/LO-RF) operation in either upconverter or downconverter modes. This MMIC is fabricated using GaAs Schottky diode technology and is designed for output frequencies in the range from 17 GHz to 21GHz using fixed LO (24 GHz) and varying IF (2GHz–7GHz) or vice versa. The circuit typically supplies flat conversion loss at moderate levels of LO power.

The underside of the die is 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 herein is measured with the chip in a 50 Ohm environment and contacted with RF probes, with results calibrated to the probe tips.

## Features

- 17 - 21 GHz RF.
- 2 - 7 GHz IF.
- 10 dB conversion loss.
- 13 dBm LO drive.
- 30 dB IF/ LO isolation.

## Applications

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

	K band Datasheet	K-IQM-1721	Issue date: 30 April 21	DOC REV 3	Page 1 of 8
---	------------------	------------	-------------------------	-----------	-------------

## Specification Overview

(based on tests where IF = 4 GHz, LO = +13 dBm)

Parameter	Min.	Typ.	Max.	Units
Frequency	17		21	GHz
LO Frequency		24		GHz
LO Power	10	13	16	dBm
IF Frequency	2	4	7	GHz
Conversion Loss		10	13	dB
LO-IF Isolation		30		dB

### Notes

All tests are carried out at 25°C.

## Absolute Maximum Ratings

Parameter	Rating
LO Power	25 dBm
IF / RF Power	22 dBm
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

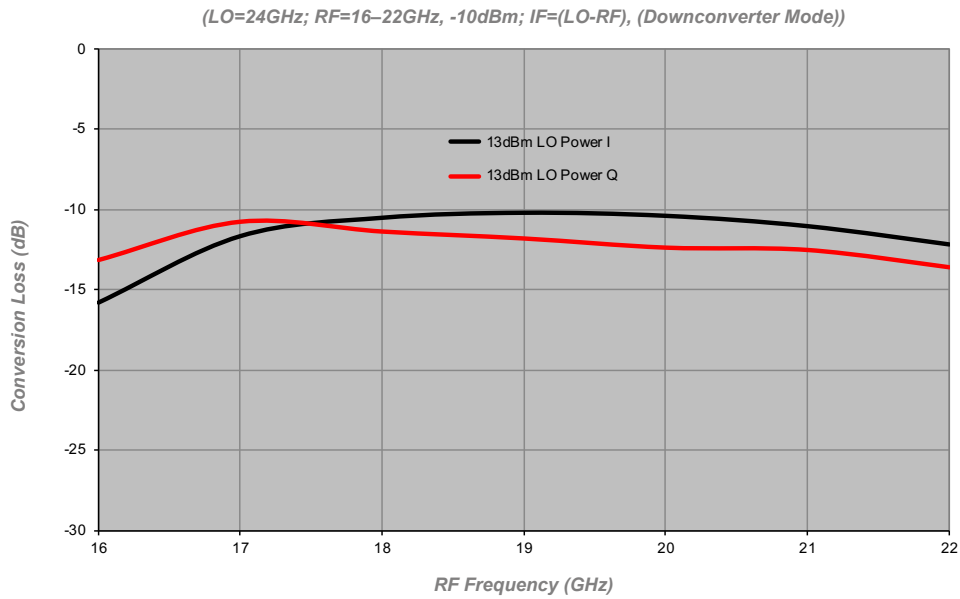


Figure 1  
 Conversion Loss v IF Frequency

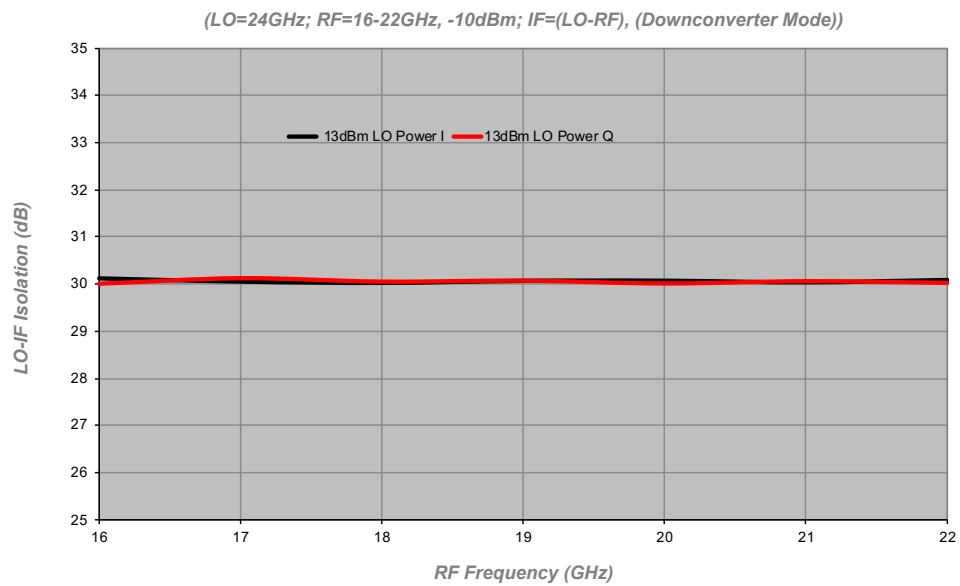


Figure 2  
 LO-IF Isolation

### Measured Performance Data

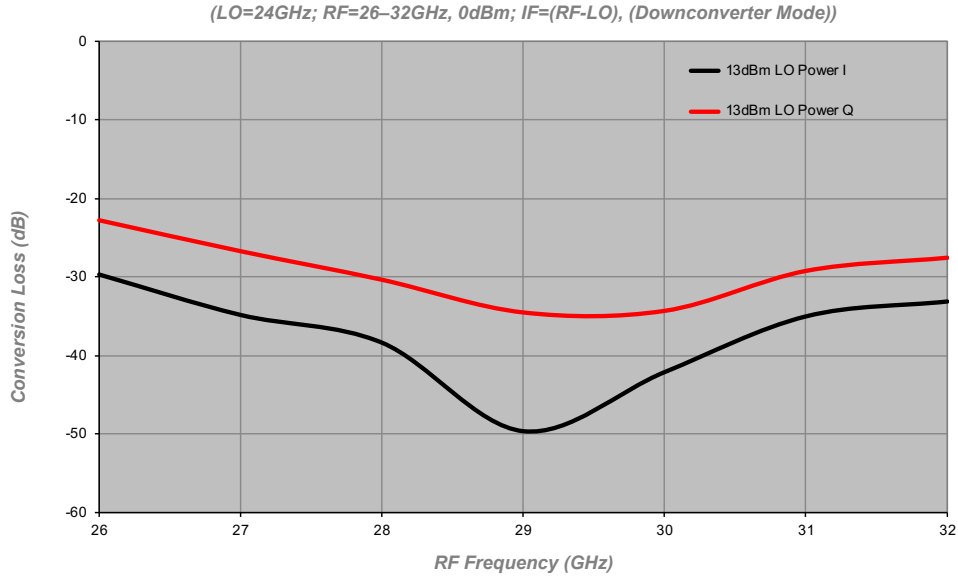


Figure 3  
 Conversion Loss (Image Band)

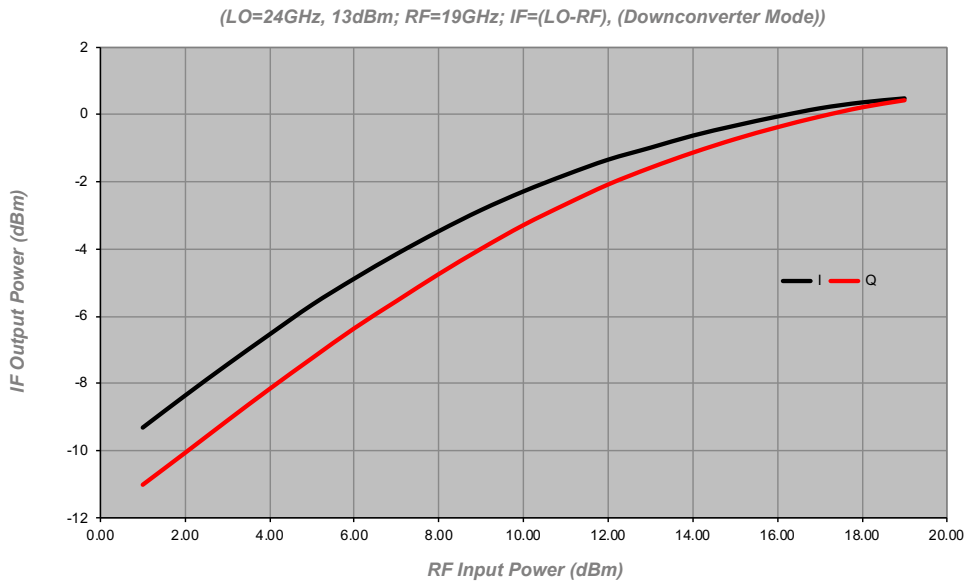
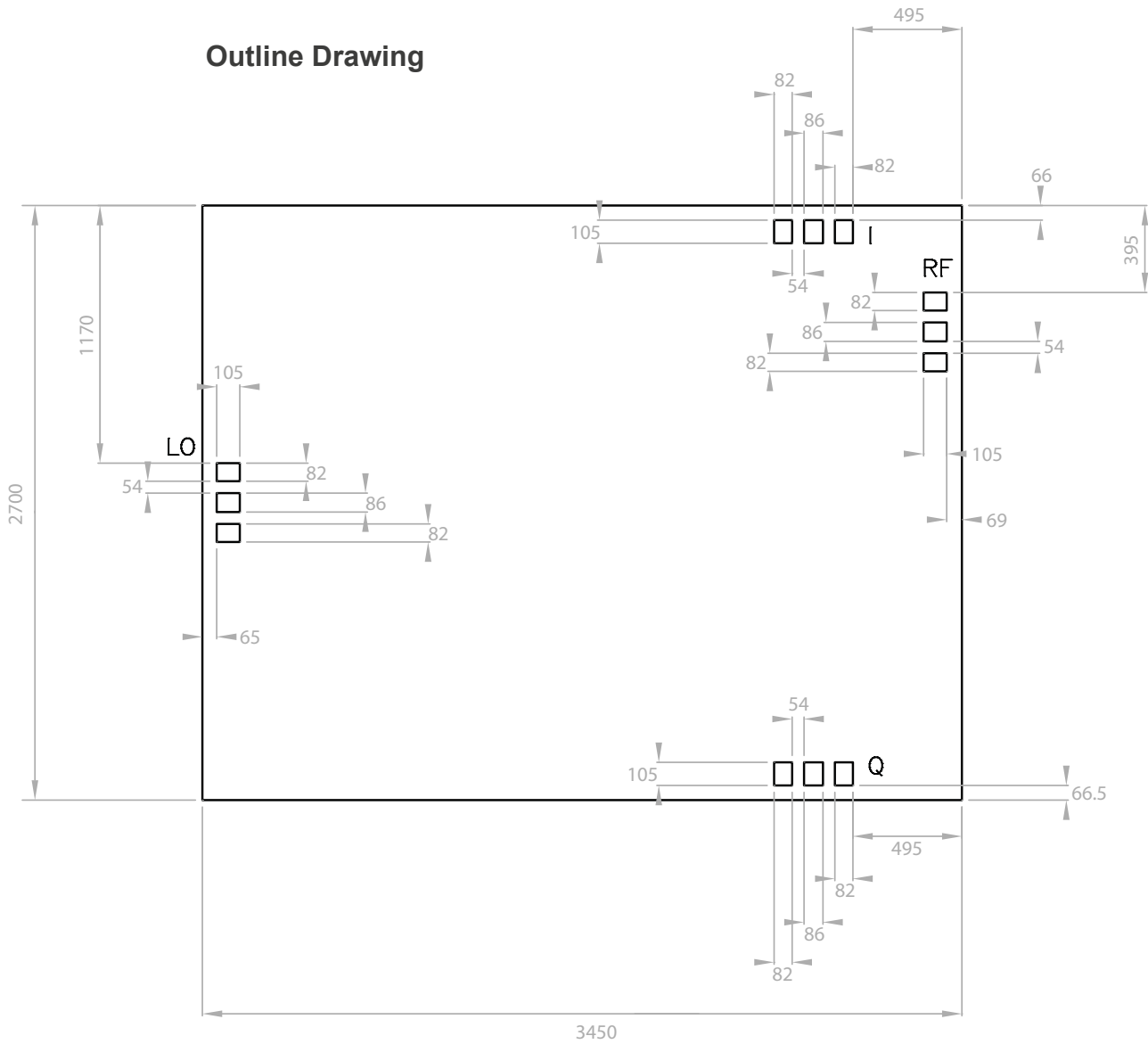


Figure 4  
 Pin v Pout

### Outline Drawing



#### Notes

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

#### Die Packing Information

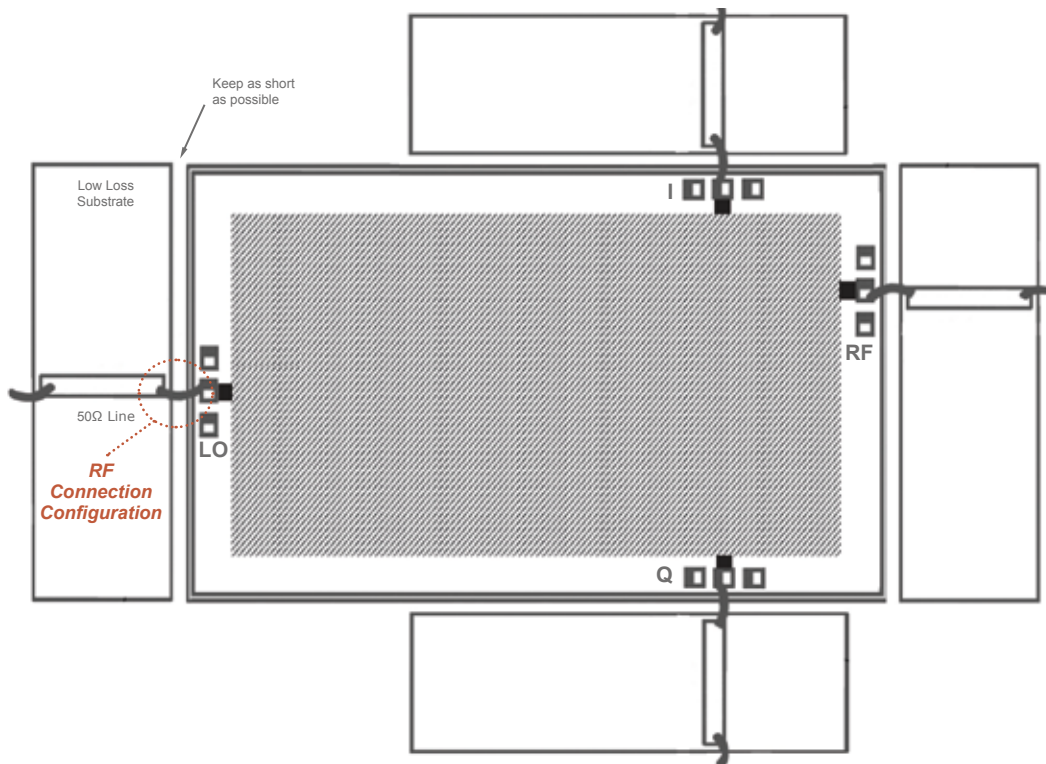
All die are delivered using gel-paks unless otherwise requested.

	K band Datasheet	K-IQM-1721	Issue date: 30 April 21	DOC REV 3	Page 5 of 8
---	------------------	------------	-------------------------	-----------	-------------

## Pad Descriptions

Name	Description
LO	LO pad. This pad is AC coupled.
RF	RF pad. This pad is AC coupled.
I	I pad. This pad is AC coupled.
Q	Q pad. This pad is AC coupled.
BOTTOM	The die backside must be connected to RF/DC ground.

## 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. 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

	<b>K band Datasheet</b>	<b>K-IQM-1721</b>	Issue date: 30 April 21	<b>DOC REV 3</b>	Page 7 of 8
---	-------------------------	-------------------	-------------------------	------------------	-------------

©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

 <b>Arralis</b>	<b>K band Datasheet</b>	<b>K-IQM-1721</b>	Issue date: 30 April 21	<b>DOC REV 3</b>	Page 8 of 8
--	-------------------------	-------------------	-------------------------	------------------	-------------

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.