Keysight 1GG5-4213
0.2 – 20 GHz Packaged Integrated Directional Detector

Data Sheet

Features

- Frequency range: 0.2 to 20 GHz
- Coupling flatness: ±1 dB
- Directivity: > 15 dB
- Return loss: > 15 dB
- Insertion loss: < 1.5 dB
- Sensitivity: 18 mV/mW
- Max Input power:
  25 dBm @ 70 °C
  2:1 source VSWR
  Output open circuit (see Figure 5)
- RoHS Compliant SMT
- 2 mm x 2 mm QFN surface mount package

KEYSIGHT TECHNOLOGIES

Unlocking Measurement Insights

Description

The 1GG5-4213 is a low-loss, directional detector with an integrated diode, capacitor, and resistors on chip. It is fabricated using the Keysight Technologies, Inc. Modified Barrier Schottky Diode process and is packaged in a compact and easy to mount and low cost QFN package. No external resistors are required for standard operation.

- Package type:
  Quad flat - no leads (SMT QFN)
- Package dimensions:
  2.0 x 2.0 mm (0.079 x 0.079 in)
- Package thickness:
  0.85 ±0.10 mm
  (0.035 ±0.0039 in)
- Lead pitch: 0.40 mm (0.016 in)
- Lead width: 0.20 mm (0.008 in)

Absolute maximum ratings[1] [2]

Symbol	Parameters/conditions	Min	Max	Units
P_{max}	Max instantaneous input power (burn-out damage limit)		25	dBm
T_{stg}	Storage temperature		150	°C
T_{bs}	Package backside temperature	–40	+85	°C
T_{stg}	Storage temperature	–65	+150	°C
T_{assy} [3]	Maximum solder reflow temp. (max. 3 cycles @ 30 sec./cycle)		+260	°C

1. Parameters specified for continuous operation at Tbs ≤ 85 °C.
2. Operation in excess of any one of these conditions may result in permanent damage to this component.
3. Refer to JEDEC J-STD-020D for detailed reflow profile, 3 reflows max.

Application

The 1GC5-4213 is commonly used in ALC (Automatic Leveling Control) loops and power detection at device input and output ports while providing minimum insertion loss..

Moisture Compatibility

Injection mold components like the 1GG5-4213 in QFN are moisture-sensitive. The product is tested to the Moisture and Reflow Sensitivity Level 3 as per IPC/Jedec J-STD-020 and must be mounted within 168 hours of opening the shipping container. Store and handle parts for reflow and for rework per IPC/Jedec J-STD-033B. An example of the moisture sensitivity label is shown in Figure 1.

Tape and Reel

The 1GC5-4213 is available in tape and reel format to facilitate automatic pick and place manufacturing. See Figure 8.

RoHS Compliance

This device is RoHS Compliant. This means the component meets the requirements of the European Parliament and the Council of the European Union Restriction of Hazardous Substances Directive 2011/65/EU, commonly known as RoHS. The six regulated substances are lead, mercury, cadmium, chromium VI (hexavalent), polybrominated biphenyls (PBB) and polybrominated biphenyl ethers (PBDE). RoHS compliance implies that any residual concentration of these substances is below the RoHS Directive's maximum concentration values (MVC); being less than 1000 ppm by weight for all substances except for cadmium which is less than 100 ppm by weight.

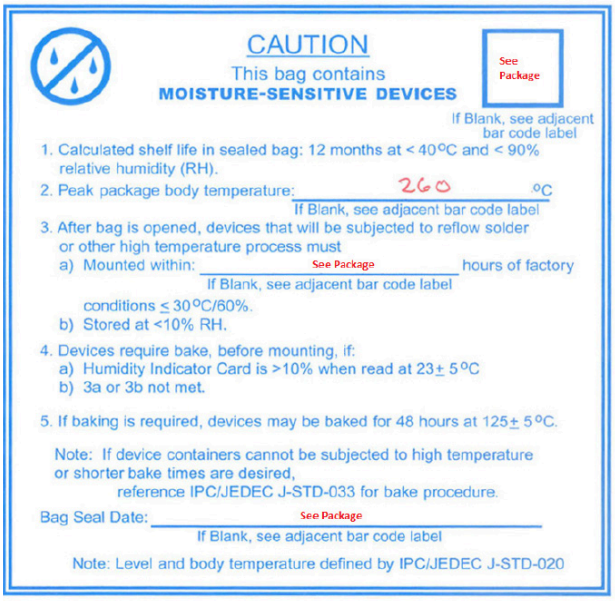


Figure 1. Moisture sensitivity label

ESD and Handling Precautions

GaAs MMICs in either chip or SMT packages are ESD sensitive. ESD preventive measures must be employed in all aspects of storage, handling, and assembly.

MMIC ESD precautions, handling considerations, die attach and bonding methods are critical factors in successful GaAs MMIC performance and reliability.

The Keysight Technologies *GaAs MMIC ESD, Die Attach and Bonding Guidelines - Application Note* (5991-3484EN) provides basic information on these subjects.

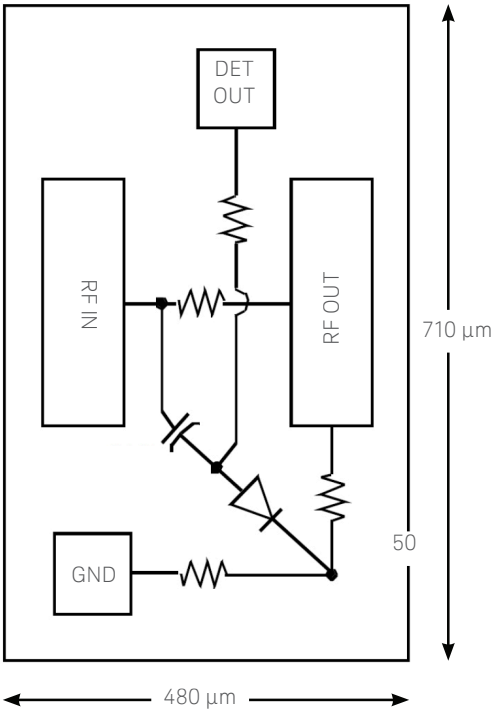


Figure 2. 1GG5-4213 schematic

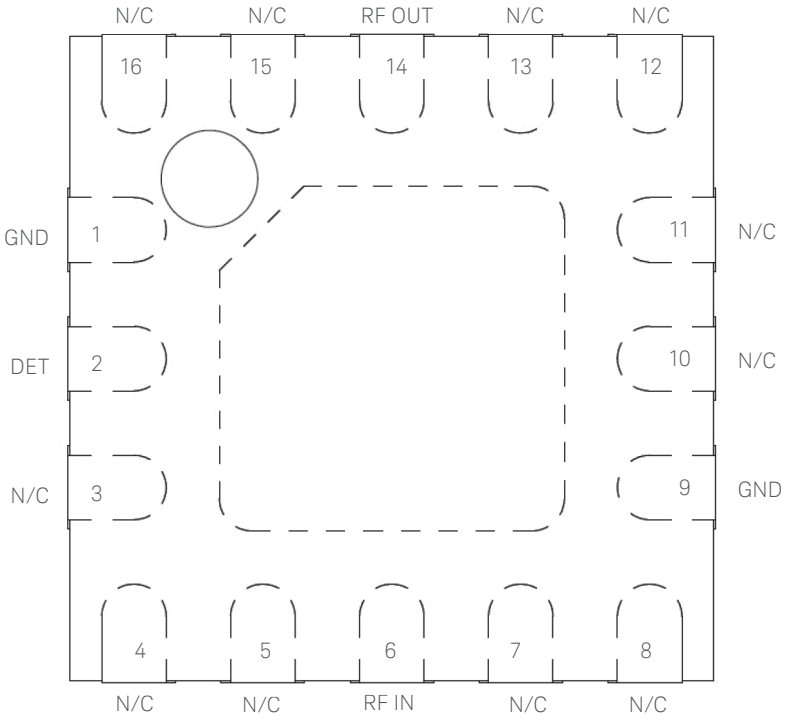


Figure 3. 1GG5-4213 pin out diagram

This footprint is optimized for 10 mil Rogers 4350 layer 1 - 2 microstrip with a width of 20 mils.

Vias must be filled and plated over VIPPO recommend 7.9 mil FHS (no solder mask)

Use grounded 'area filled' copper on opposite side of board for proper heatsinking.

Interconnected layers using grouns vias at maximum density around the perimeter of the part for additional heatsinking.

For footprints compatible with outer layout tools, please email MMIC_Helpline@keysight.com

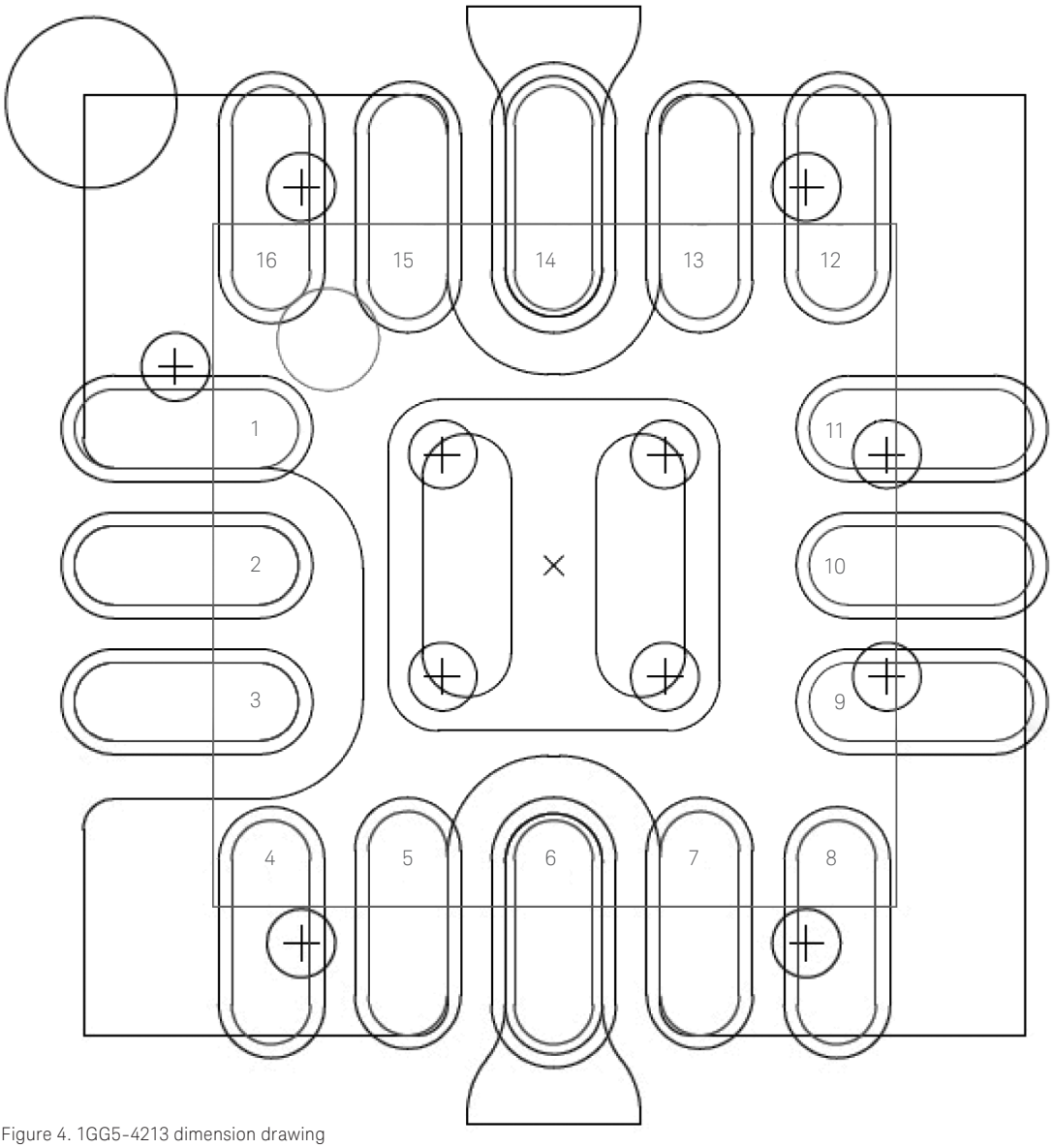


Figure 4. 1GG5-4213 dimension drawing

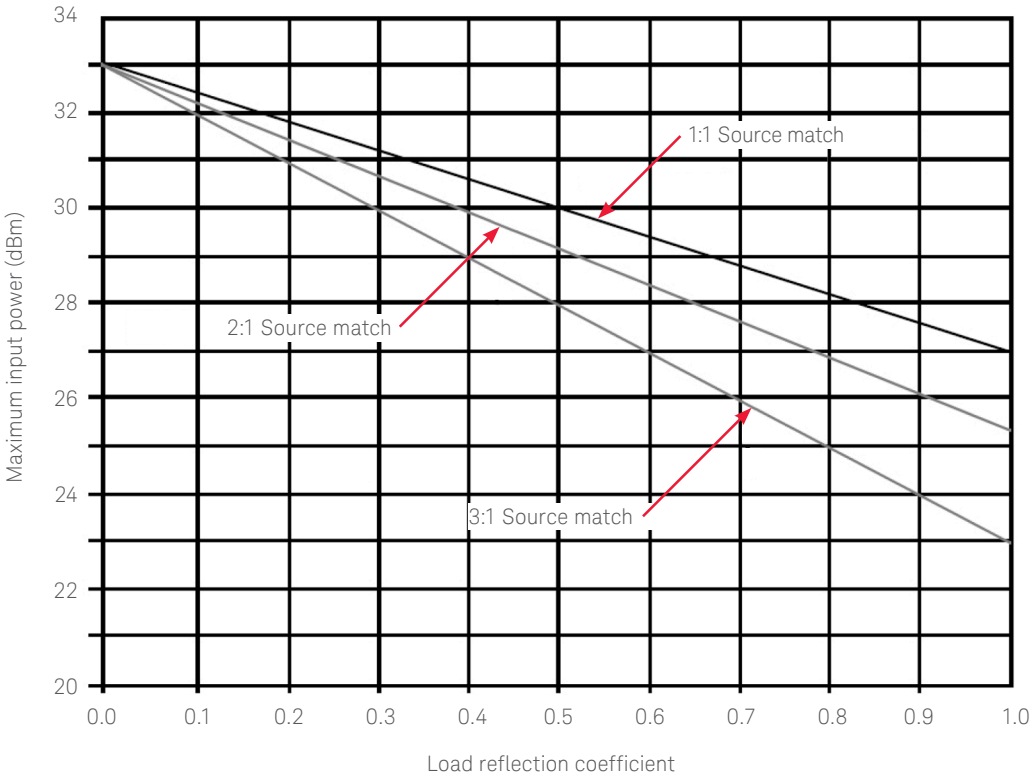


Figure 5. 1GG5-4213 safe operating region T_{case}: +70 °C

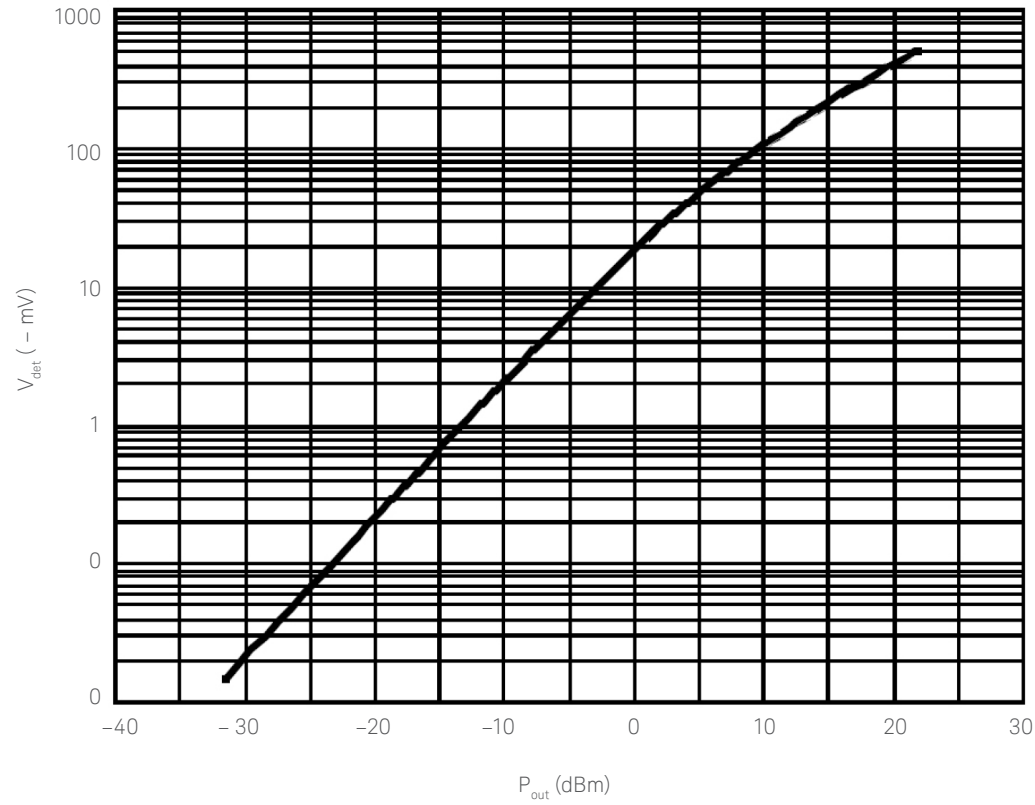
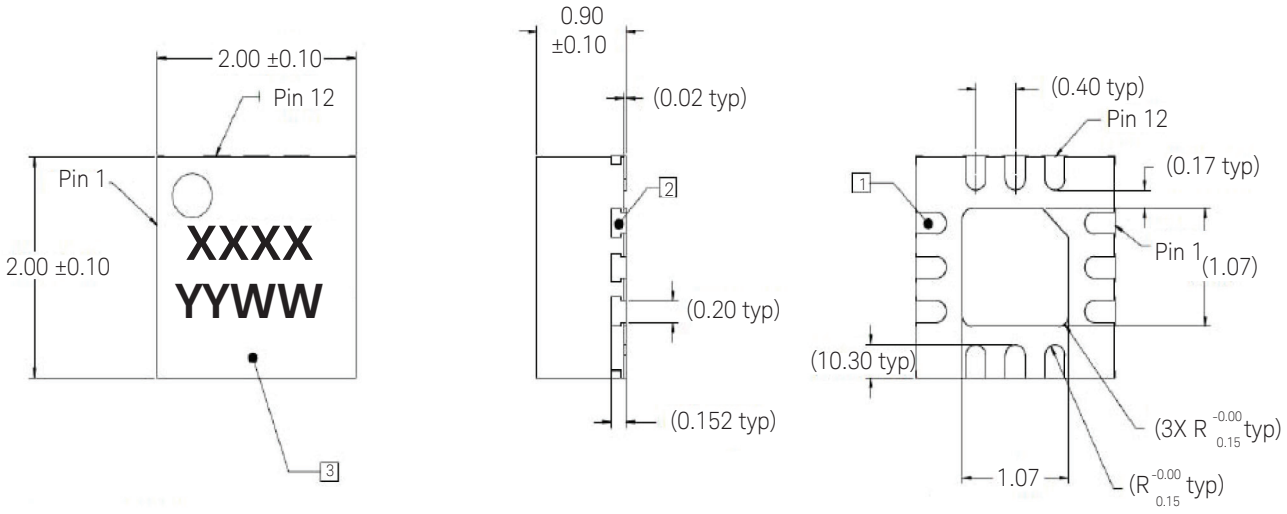


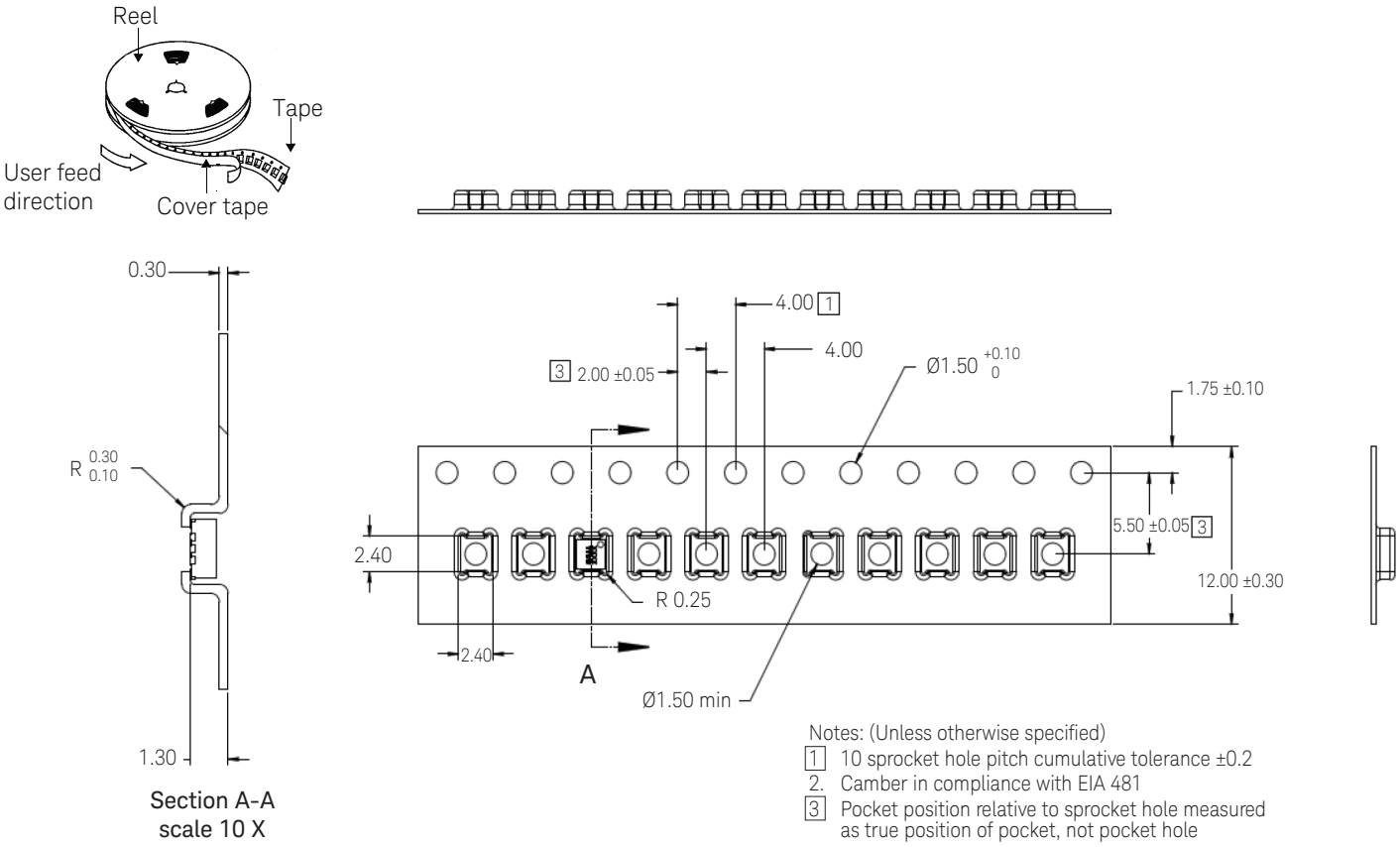
Figure 6. 1GG5-4213 Typical transfer characteristic temp = +25 °C



Topside label:
nnXX-nnXX = Keysight 4x4 part number
YYWW = Year - Work Week

3 Permanently mark 4x4 part number without leading '1G' and '42,' and date code (Example: 'C145' for 1GC1-4245 year, work week)
2 Side of lead is not plated (bare copper alloy) max burr 0.05 mm
1 Lead plating per assembly drawing
Notes: (Unless otherwise specified)

Figure 7. 1GG5-4213 dimension drawing (dimensions in mm)

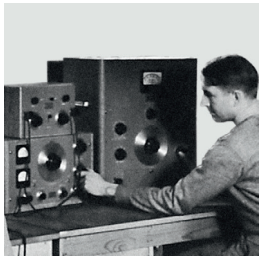


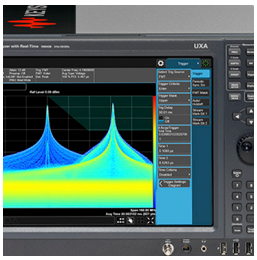
Notes: (Unless otherwise specified)
1 10 sprocket hole pitch cumulative tolerance ±0.2
2. Camber in compliance with EIA 481
3 Pocket position relative to sprocket hole measured as true position of pocket, not pocket hole

Figure 8. Tape and reel information

Evolving

Our unique combination of hardware, software, support, and people can help you reach your next breakthrough. We are unlocking the future of technology.





From Hewlett-Packard to Agilent to Keysight

myKeysight

myKeysight
www.keysight.com/find/mykeysight
A personalized view into the information most relevant to you.

KEYSIGHT SERVICES
Accelerate Technology Adoption.
Lower costs.

Keysight Services
www.keysight.com/find/service
Keysight Services can help from acquisition to renewal across your instrument's lifecycle. Our comprehensive service offerings—one-stop calibration, repair, asset management, technology refresh, consulting, training and more—helps you improve product quality and lower costs.

Keysight Channel Partners
www.keysight.com/find/channelpartners
Get the best of both worlds: Keysight's measurement expertise and product breadth, combined with channel partner convenience.

This data sheet contains a variety of typical and guaranteed performance data. The information supplied should not be interpreted as a complete list of circuit specifications. Customers considering the use of this, or other Keysight Technologies GaAs ICs, for their design should obtain the current production specifications from Keysight. In this data sheet the term typical refers to the 50th percentile performance. For additional information contact Keysight at MMIC_Helpline@keysight.com.

The product described in this data sheet is RoHS Compliant and RoHS Process Compatible with a maximum temperature of 260 °C and a maximum of 3 temperature cycles.

www.keysight.com/find/mmic

For more information on Keysight Technologies' products, applications or services, please contact your local Keysight office. The complete list is available at:
www.keysight.com/find/contactus

Americas

Canada	(877) 894 4414
Brazil	55 11 3351 7010
Mexico	001 800 254 2440
United States	(800) 829 4444

Asia Pacific

Australia	1 800 629 485
China	800 810 0189
Hong Kong	800 938 693
India	1 800 11 2626
Japan	0120 (421) 345
Korea	080 769 0800
Malaysia	1 800 888 848
Singapore	1 800 375 8100
Taiwan	0800 047 866
Other AP Countries	(65) 6375 8100

Europe & Middle East

Austria	0800 001122
Belgium	0800 58580
Finland	0800 523252
France	0805 980333
Germany	0800 6270999
Ireland	1800 832700
Israel	1 809 343051
Italy	800 599100
Luxembourg	+32 800 58580
Netherlands	0800 0233200
Russia	8800 5009286
Spain	800 000154
Sweden	0200 882255
Switzerland	0800 805353 Opt. 1 (DE) Opt. 2 (FR) Opt. 3 (IT)
United Kingdom	0800 0260637

For other unlisted countries:
www.keysight.com/find/contactus
(BP-06-08-16)

DEKRA Certified
ISO9001 Quality Management System

www.keysight.com/go/quality
Keysight Technologies, Inc.
DEKRA Certified ISO 9001:2015
Quality Management System

KEYSIGHT TECHNOLOGIES
Unlocking Measurement Insights

Published in USA, October 3, 2016
5992-1843EN
www.keysight.com