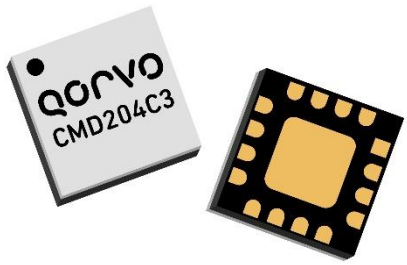
CMD204C3

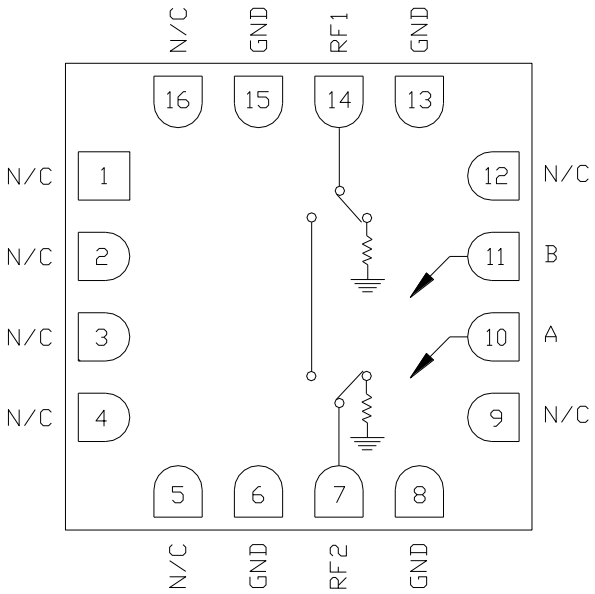
DC-20 GHz SPST Non-reflective Switch

Product Overview

The CMD204C3 is a general purpose broadband high isolation non-reflective MMIC SPST switch housed in a leadless 3x3 mm surface mount package. Covering DC to 20 GHz, the CMD204C3 features a low insertion loss of 1.3 dB and high isolation of 48 dB at 10 GHz. The CMD204C3 operates using complementary control voltage logic lines of 0/-5 V and requires no bias supply.



Functional Block Diagram



Key Features

- Low Loss Broadband Performance
- High Isolation
- Fast Switching Speed
- Non-Reflective Design - RF1 and RF2
- Pb-Free RoHs Compliant 3x3 SMT Package

Ordering Information

Part No.	Description
CMD204C3	100 pcs on 7'' reel
CMD204C3-EVB	Evaluation Baord

Electrical Performance (V_{ctl} = 0/-5 V, T_A = 25° C, F = 10 GHz)

Parameter	Min	Typ	Max	Units
Frequency Range		DC - 20		GHz
Insertion Loss		1.3		dB
Isolation		48		dB
Return Loss - On State		15		dB
Return Loss - Off State		22		dB
Input P0.1dB		25		dBm
Switching Characteristics tRISE, tFALL (10/90% RF) tON, tOFF (50% CTL to 10/90% RF)		 1.8 18/7		 ns ns

Absolute Maximum Ratings

Parameter	Rating
RF Input Power	+27 dBm
Control Voltage Range (A, B)	+0.5V to -7.5V
Channel Temperature, Tch	150° C
Operating Temperature	-40 to 85° C
Storage Temperature	-55 to 150° C
Power Dissipation, Pdiss (isolation state)	631 mW
Thermal Resistance, Q_{JC} (isolation state)	96.2° C / W

Exceeding any one or combination of the maximum ratings may cause permanent damage to the device.

Control Voltages

State	Bias Condition
Low	0 to -0.5V @ 1 uA Typ
High	-3V @ 1 uA Typ to -7V @ 6 uA Typ

Truth Table

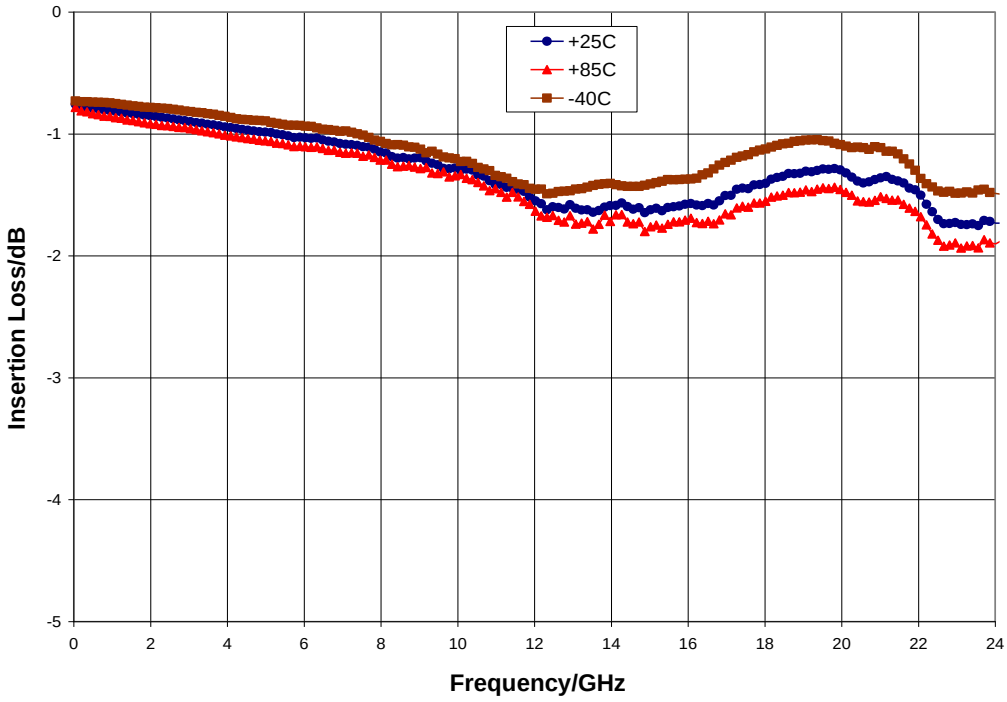
Control Input		Signal Path State
A	B	RF1 to RF2
High	Low	On
Low	High	Off

Electrical Specifications (V_{ctl} = 0/-5 V, T_A = 25° C)

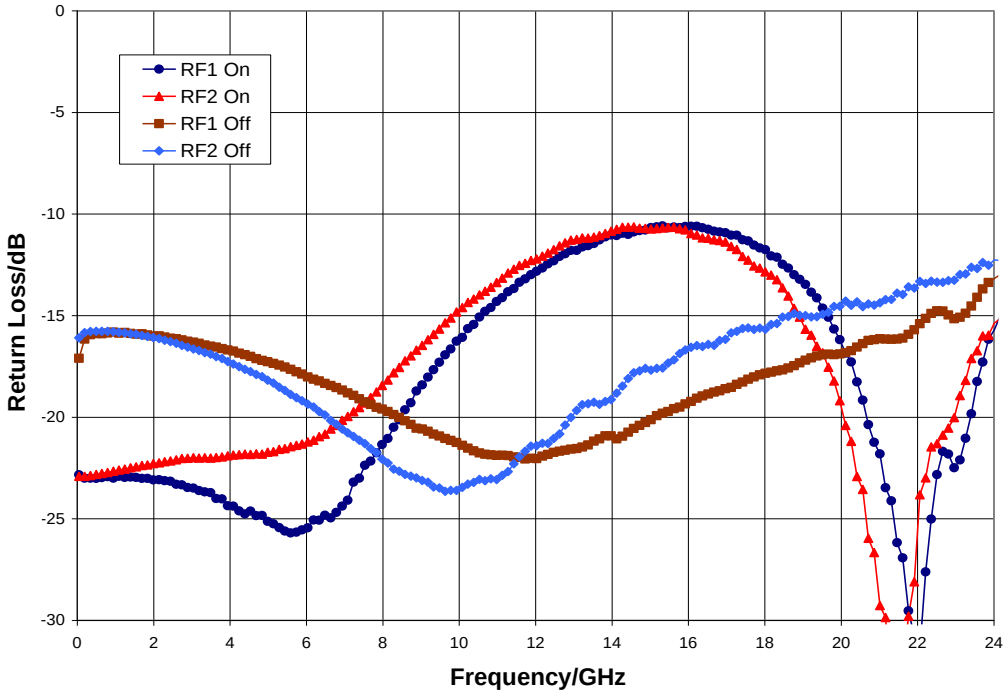
Parameter	Min	Typ	Max	Min	Typ	Max	Units
Frequency Range		DC - 10			10 - 18		GHz
Insertion Loss		1.0	1.7		1.5	2.0	dB
Isolation	43	50		35	43		dB
Return Loss - On State		20			12		dB
Return Loss - RF1, 2 - Off State		18			18		dB
Input P0.1dB		24			22		dBm
Input IP3		38			37		dBm
Switching Characteristics tRISE, tFALL (10/90% RF) tON, tOFF (50% CTL to 10/90% RF)		 1.8 18/7			 1.8 18/7		 ns ns

Typical Performance

Insertion Loss vs. Temperature

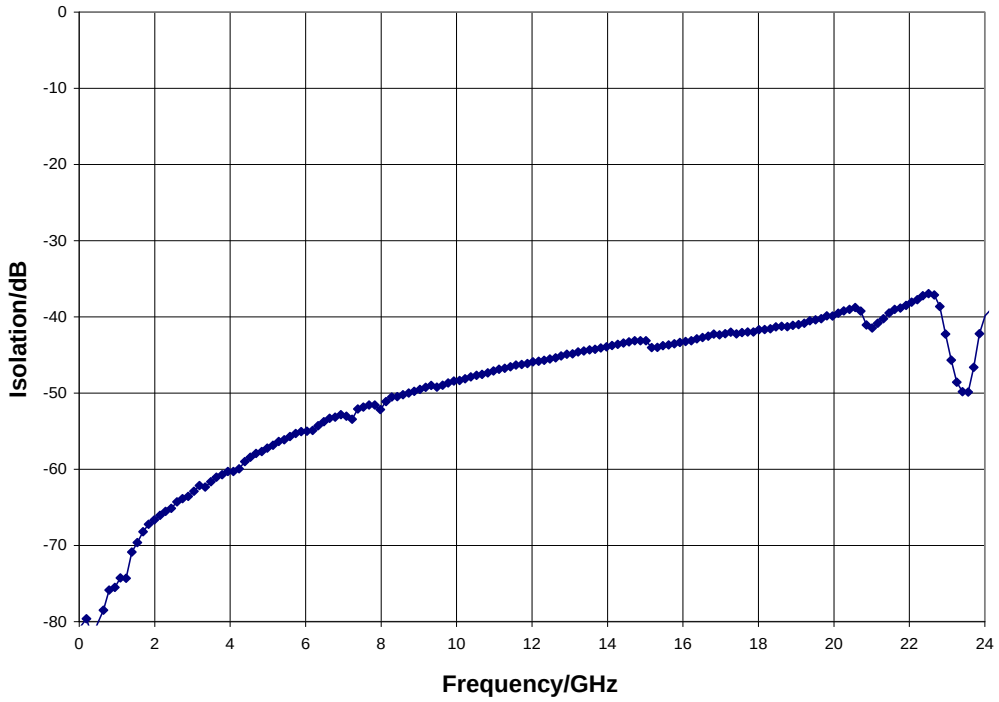


Return Loss

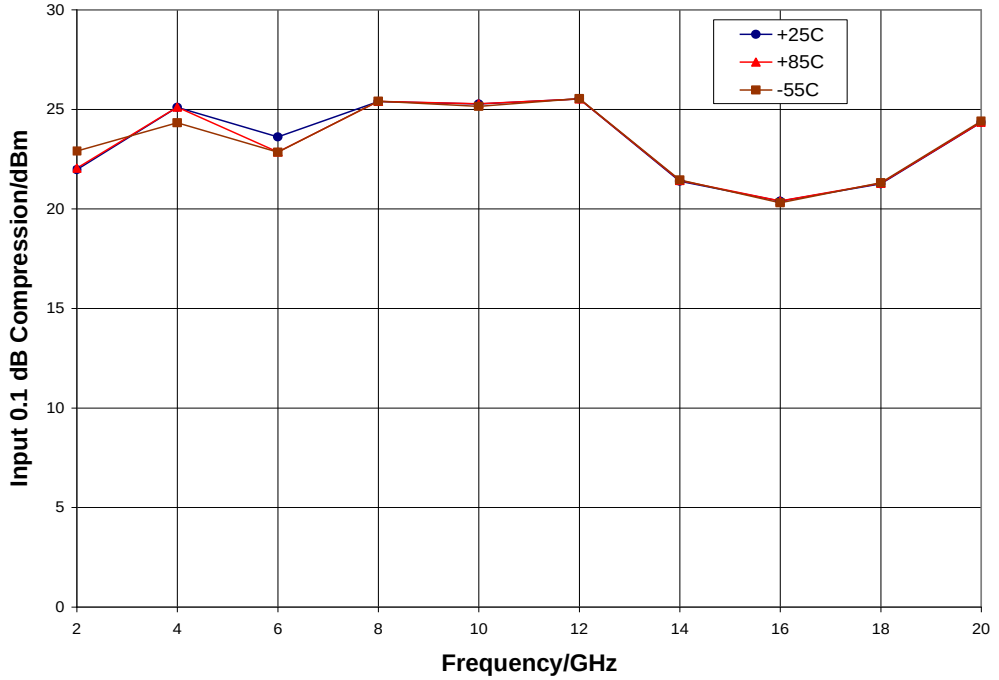


Typical Performance

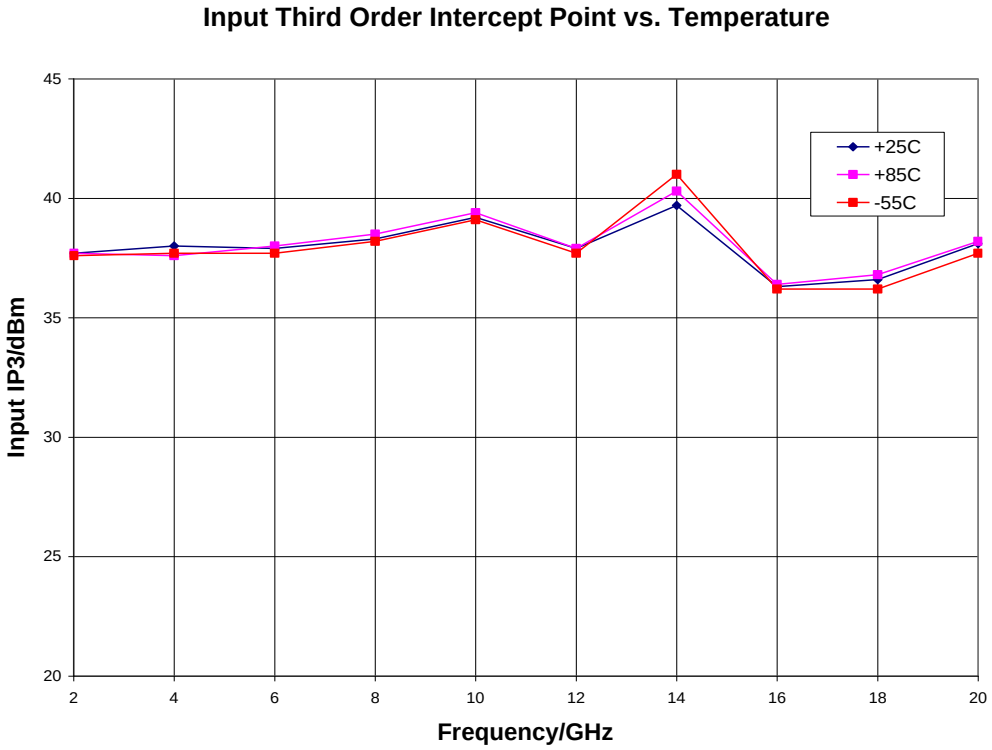
Isolation Between Ports RF1 and RF2



Input P0.1dB Compression Point vs. Temperature

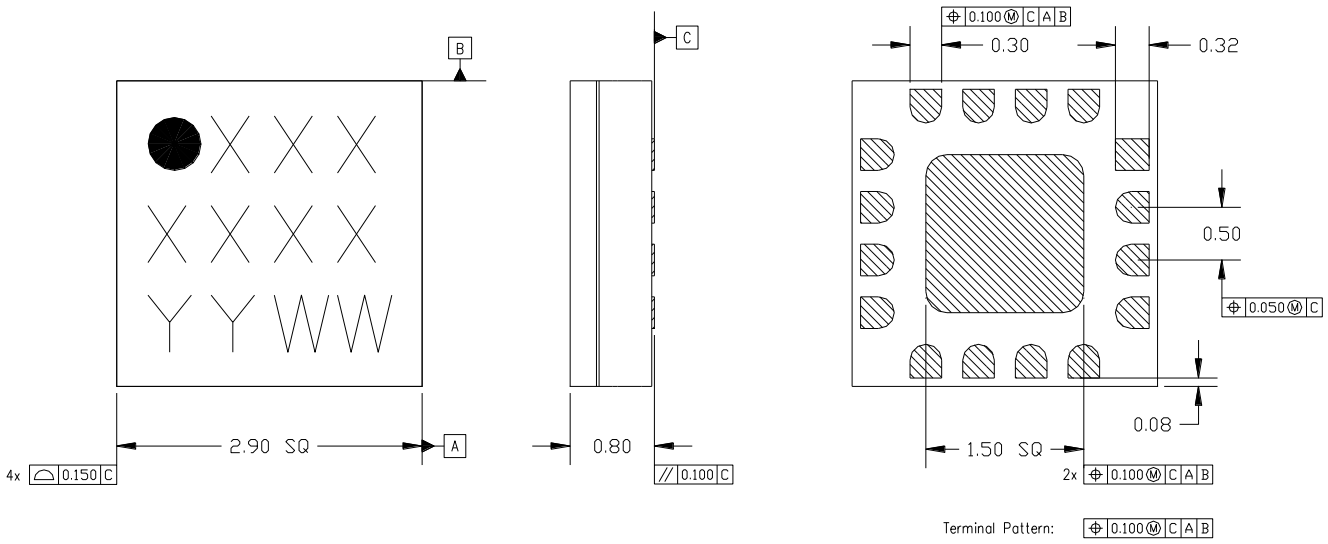


Typical Performance



Mechanical Information

Package Information and Dimensions



Notes:

1. All dimensions shown in mm.
2. Material: Black alumina
3. Lead finish
   - 3.1. Ni: 8.89um max, 1.27um min
   - 3.2. Pd: 0.17um max, 0.07um min
   - 3.3. Au: 0.254um max, 0.03um min
4. Marking
   - 4.1. Line 1: Part number
     - 4.1.1. Example: CMD196C3 shall be marked as 196
   - 4.2. Line 2: Lot number
   - 4.3. Line 3: Date code - Last 2 digits of the year of manufacture followed by a 2 digit week code
5. Alternate pin #1 identifier is a single square pad
6. Alternate die paddle may have chamfered corners

Recommended PCB Land Pattern

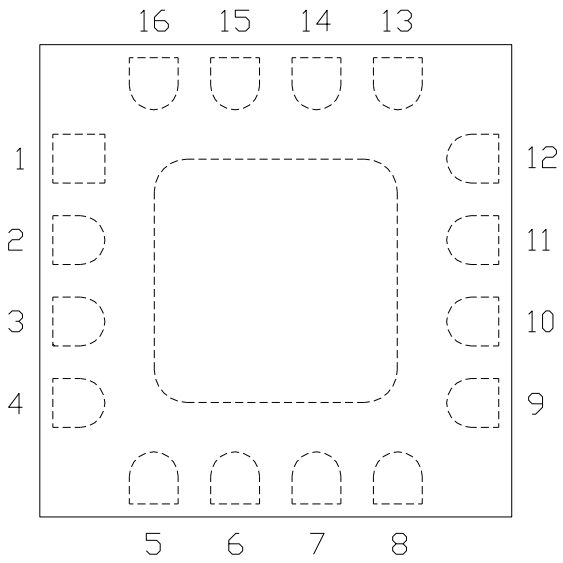
Qorvo recommends that the user develop the land pattern that will provide the best design for proper solder reflow and device attach for their specific application. Please review Qorvo Application Note AN 105 for a recommended land pattern approach.

Recommended Solder Reflow Profile

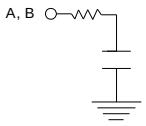
Qorvo recommends screen printing with belt furnace reflow to ensure proper solder reflow and device attach. Please review Qorvo Application Note AN 102 for a recommended solder reflow profile.

Pin Description

Pin Diagram

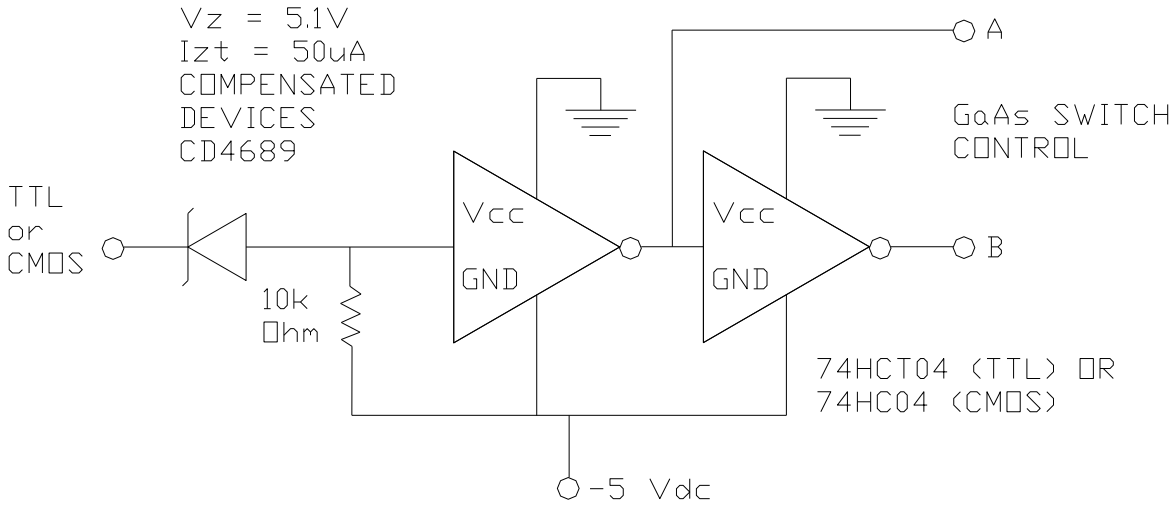


Functional Description

Pin	Function	Description	Schematic
1 - 5, 9, 12, 16	N/C	No connection required These pins may be connected to RF / DC ground	
6, 8, 13, 15 and die paddle	Ground	Connect to RF / DC ground	
7, 14	RF2, RF1	These pins are DC coupled and matched to 50 ohm Blocking capacitors are required if RF line potential is not equal to 0 V	
10	CTLA	See truth table and control voltage table	
11	CTLB	See truth table and control voltage table	

Applications Information

Suggested Driver Circuit



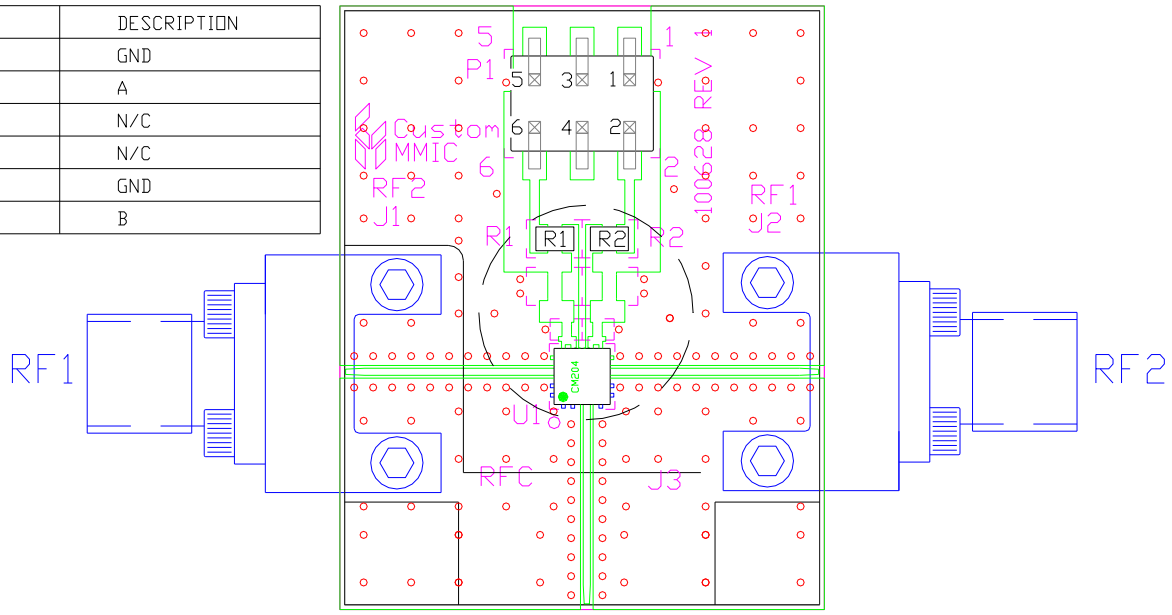
GaAs MMIC devices are susceptible to damage from Electrostatic Discharge. Proper precautions should be observed during handling, assembly and test.

Applications Information

Evaluation Board

The circuit board shown has been developed for optimized assembly at Qorvo. A sufficient number of via holes should be used to connect the top and bottom ground planes. As surface mount processes vary, careful process development is recommended.

P1	DESCRIPTION
1	GND
2	A
3	N/C
4	N/C
5	GND
6	B



Bill of Material

Designator	Value	Description
J1, J2		SMA End Launch Connector
P1		6 Pin Header
R1, R2	100 Ω	Resistor, 0805
U1		CMD204C3 SPST Switch
PCB		100628 Evaluation PCB

Handling Precautions

Parameter	Rating	Standard
ESD – Human Body Model (HBM)	Class 1A	ESDA / JEDEC JS-001-2012
MSL – Moisture Sensitivity Level	Level 1	JEDEC standard IPC/JEDEC J-STD-020

Caution!
ESD-Sensitive Device

RoHS Compliance

This part is compliant with 2011/65/EU RoHS directive (Restrictions on the Use of Certain Hazardous Substances in Electrical and Electronic Equipment) as amended by Directive 2015/863/EU.

This product also has the following attributes:

- Lead Free
- Antimony Free
- TBBP-A ($C_{15}H_{12}Br_4O_2$) Free
- SVHC Free
- PFOS Free
- Halogen Free

Contact Information

For the latest specifications, additional product information, worldwide sales and distribution locations:

Web: www.qorvo.com
Tel: 1-844-890-8163
Email: customer.support@qorvo.com

Important Notice

The information contained in this Data Sheet and any associated documents ("Data Sheet Information") is believed to be reliable; however, Qorvo makes no warranties regarding the Data Sheet Information and assumes no responsibility or liability whatsoever for the use of said information. All Data Sheet Information is subject to change without notice. Customers should obtain and verify the latest relevant Data Sheet Information before placing orders for Qorvo® products. Data Sheet Information or the use thereof does not grant, explicitly, implicitly or otherwise any rights or licenses to any third party with respect to patents or any other intellectual property whether with regard to such Data Sheet Information itself or anything described by such information.

DATA SHEET INFORMATION DOES NOT CONSTITUTE A WARRANTY WITH RESPECT TO THE PRODUCTS DESCRIBED HEREIN, AND QORVO HEREBY DISCLAIMS ANY AND ALL WARRANTIES WITH RESPECT TO SUCH PRODUCTS WHETHER EXPRESS OR IMPLIED BY LAW, COURSE OF DEALING, COURSE OF PERFORMANCE, USAGE OF TRADE OR OTHERWISE, INCLUDING THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. Without limiting the generality of the foregoing, Qorvo® products are not warranted or authorized 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. Applications described in the Data Sheet Information are for illustrative purposes only. Customers are responsible for validating that a particular product described in the Data Sheet Information is suitable for use in a particular application.

X-ON Electronics

Largest Supplier of Electrical and Electronic Components

Click to view similar products for RF Development Tools ***category:***

Click to view products by Qorvo ***manufacturer:***

Other Similar products are found below :

MAAM-011117 MAAP-015036-DIEEV2 EV1HMC1113LP5 EV1HMC6146BLC5A EV1HMC637ALP5 EVAL-ADG919EBZ ADL5363-EVALZ LMV228SDEVAL SKYA21001-EVB SMP1331-085-EVB EV1HMC618ALP3 EVAL01-HMC1041LC4 MAAL-011111-000SMB MAAM-009633-001SMB MASW-000936-001SMB 107712-HMC369LP3 107780-HMC322ALP4 SP000416870 EV1HMC470ALP3 EV1HMC520ALC4 EV1HMC244AG16 MAX2614EVKIT# 124694-HMC742ALP5 SC20ASATEA-8GB-STD MAX2837EVKIT+ MAX2612EVKIT# MAX2692EVKIT# EV1HMC629ALP4E SKY12343-364LF-EVB 108703-HMC452QS16G EV1HMC863ALC4 EV1HMC427ALP3E 119197-HMC658LP2 EV1HMC647ALP6 ADL5725-EVALZ MAX2371EVKIT# 106815-HMC441LM1 EV1HMC1018ALP4 UXN14M9PE MAX2016EVKIT EV1HMC939ALP4 MAX2410EVKIT MAX2204EVKIT+ EV1HMC8073LP3D SIMSA868-DKL SIMSA868C-DKL SKY65806-636EK1 SKY68020-11EK1 SKY67159-396EK1 SKY66181-11-EK1