



Chipsmall Limited consists of a professional team with an average of over 10 year of expertise in the distribution of electronic components. Based in Hongkong, we have already established firm and mutual-benefit business relationships with customers from,Europe,America and south Asia,supplying obsolete and hard-to-find components to meet their specific needs.

With the principle of “Quality Parts,Customers Priority,Honest Operation,and Considerate Service”,our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip,ALPS,ROHM,Xilinx,Pulse,ON,Everlight and Freescale. Main products comprise IC,Modules,Potentiometer,IC Socket,Relay,Connector.Our parts cover such applications as commercial,industrial, and automotives areas.

We are looking forward to setting up business relationship with you and hope to provide you with the best service and solution. Let us make a better world for our industry!



Contact us

Tel: +86-755-8981 8866 Fax: +86-755-8427 6832

Email & Skype: info@chipsmall.com Web: www.chipsmall.com

Address: A1208, Overseas Decoration Building, #122 Zhenhua RD., Futian, Shenzhen, China



QPA0163L

100MHz to 1300MHz, CASCADABLE SiGe HBT MMIC AMPLIFIER

The QPA0163L is a high performance SiGe HBT MMIC low noise amplifier. This device has an internal temperature compensation circuit allowing operation from a supply voltage as low as +2.5V. The QPA0163L has been characterized at $V_D = +3V$ for low power and +4V for medium power applications. Only two DC-blocking capacitors, a bias resistor, and an optional RF choke are required for operation from 800MHz to 1300MHz.

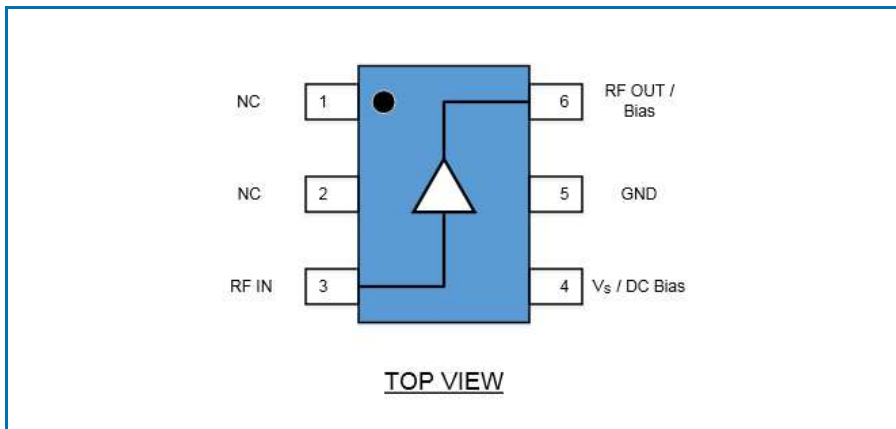


SOT-363 Package

Features

- 100MHz to 1300MHz Operation
- Internally Matched To 50Ω
800MHz to 1300MHz
- High Input/Output Intercept
- Low Noise Figure: 1.5 dB Typical at
900 MHz at +3V
- Low Power Consumption
- Single Voltage Supply
- Internal Temperature Compensation

Functional Block Diagram



Applications

- Receivers, GPS, RFID
- Cellular, Fixed Wireless, Land Mobile

Ordering Information

QPA0163LSQ	Sample Bag with 25 pieces
QPA0163LSR	7" Reel with 100 pieces
QPA0163LTR7	7" Reel with 3000 pieces
QPA0163LPCK401	800MHz to 1300MHz PCBA with 5-piece Sample Bag

QPA0163L

Absolute Maximum Ratings

Parameter	Rating	Units
Device Voltage(V _D)	+5.0	V
Device Current (I _D)	45	mA
RF Input Power ^{Note 1}	+10	dBm
Storage Temperature	-55 to +150	°C
ESD Rating (HBM)	TBD	-
Moisture Sensitivity Level	MSL1	-

Notes:

1. Load Condition 1: Z_L = 50 Ω
2. Operation of this device beyond any one of these limits may cause permanent damage. For reliable continuous operation, the device voltage and current must not exceed the maximum operating values specified in this table.
3. Bias Conditions should also satisfy the following expression: I_DV_D < (T_J - T_L) / R_{TH}, and T_L = T_{LEAD}.



Caution! ESD sensitive device.



RFMD Green: RoHS status based on EU Directive 2011/65/EU (at time of this document revision), halogen free per IEC 61249-2-21, < 1000 ppm each of antimony trioxide in polymeric materials and red phosphorus as a flame retardant, and <2% antimony in solder.

Exceeding any one or a combination of the Absolute Maximum Rating conditions may cause permanent damage to the device. Extended application of Absolute Maximum Rating conditions to the device may reduce device reliability. Specified typical performance or functional operation of the device under Absolute Maximum Rating conditions is not implied.

Recommended Operating Conditions

Parameter	Rating			Units
	Min	Typ	Max	
Operating Temperature Range	-40		+105	°C
Junction Temperature (T _J)			+125	°C
Operating Voltage	+2.5		+4.5	V

Electrical Specifications – General

Parameter	Specification (V _S = + 3V)		Specification (V _S = + 4V)		Units	Conditions
	Min	Max	Min	Max		
Small Signal Gain, S21		16.5		17.7	dB	800MHz
		15.7		16.8	dB	900MHz
		14.9		16.0	dB	1000MHz
Output Power at 1 dB Compression		+6.0		+13.2	dBm	800MHz
		+6.4		+13.7	dBm	900MHz
		+6.8		+14.0	dBm	1000MHz
Output Third Order Intercept Point		+26.1		+30.4	dBm	800MHz
		+26.8		+31.0	dBm	900MHz
		+27.0		+31.3	dBm	1000MHz
Input Return Loss, S11		15.4		12.8	dB	900MHz
Output Return Loss, S22		9.0		9.4	dB	900MHz
Reverse Isolation, S12		25.0		24.6	dB	900MHz
Noise Figure		1.45		2.7	dB	800MHz
		1.48		2.6	dB	900MHz
		1.58		2.5	dB	1000MHz
Device Operating Current		13.8		30.7	mA	
Thermal Resistance		TBD		TBD	°C/W	

Test Conditions unless otherwise specified: V_S = +3V, I_D = 13.8mA or V_S = +4V, I_D = 30.7 mA, OIP3 Tone Spacing=1 MHz, P_{OUT} per tone = -13 dBm, T_L = +25°C, Z_S = Z_L =50 Ω

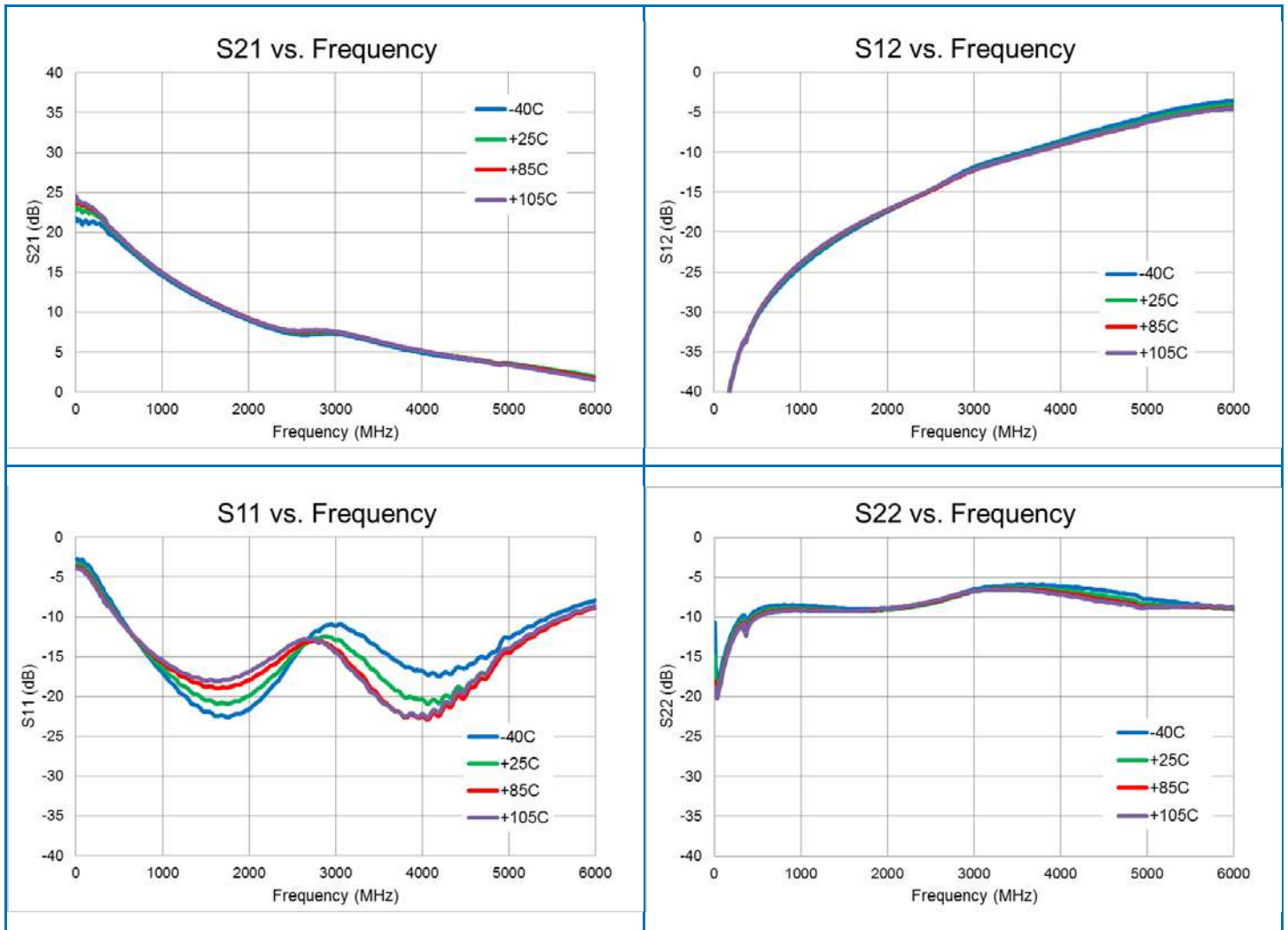
Preliminary



RFMD + TriQuint = Qorvo

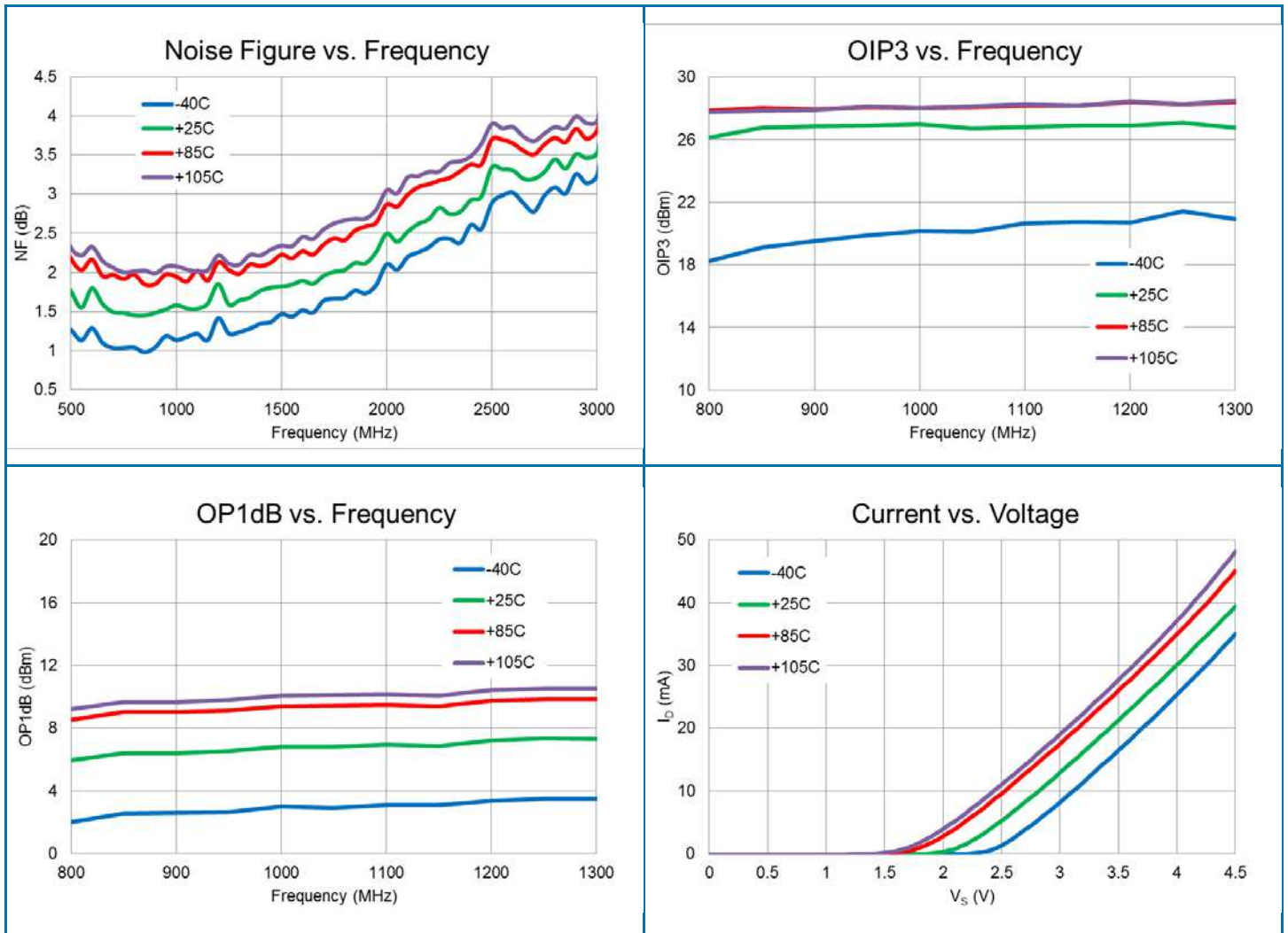
QPA0163L

Typical Performance Using 800MHz–1300MHz Application Circuit At +3V



QPA0163L

Typical Performance Using 800MHz–1300MHz Application Circuit At +3V



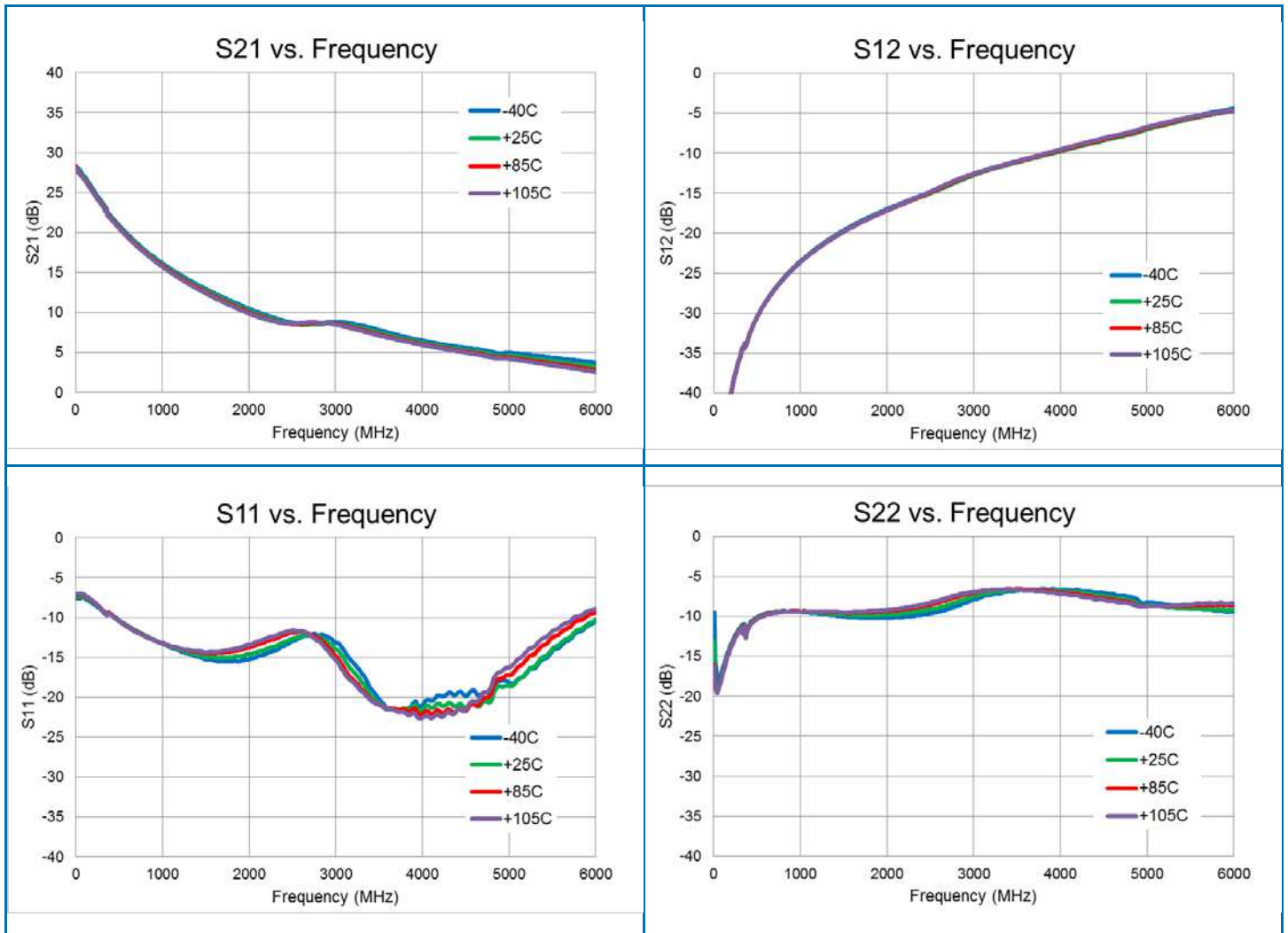
Preliminary



RFMD + TriQuint = Qorvo

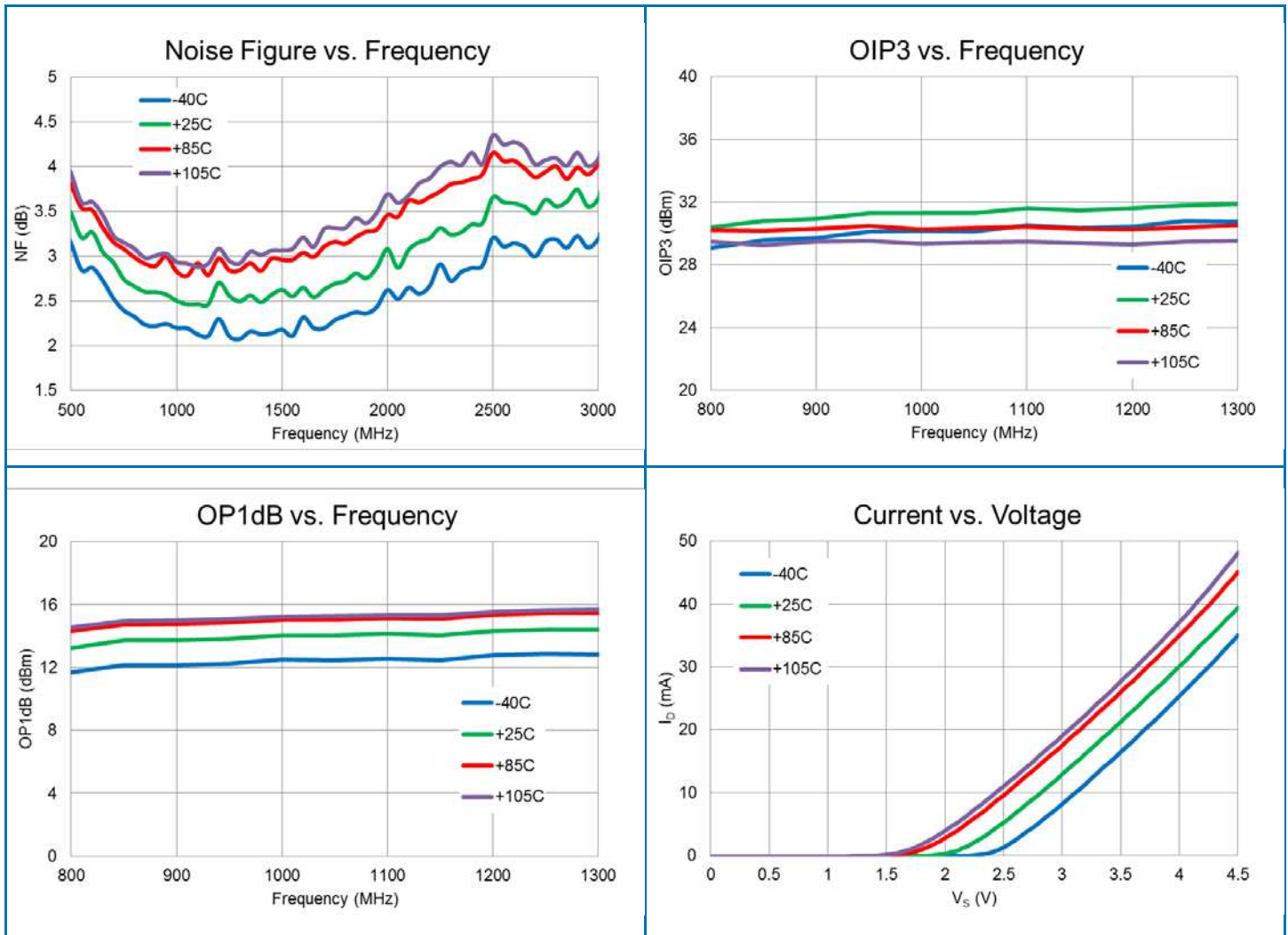
QPA0163L

Typical Performance Using 800MHz–1300MHz Application Circuit At +4V



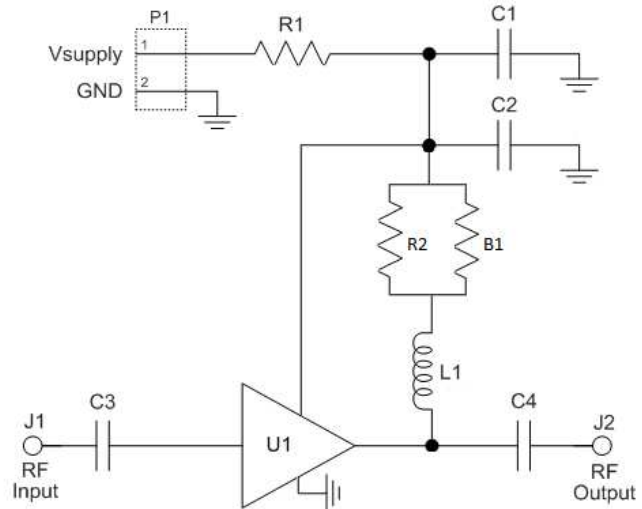
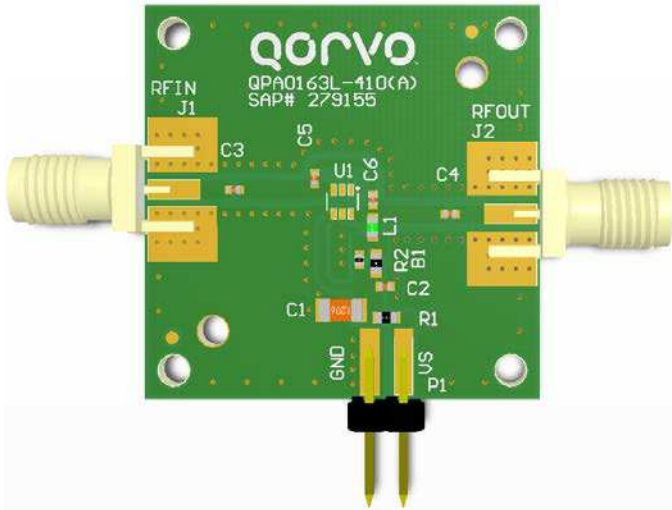
QPA0163L

Typical Performance Using 800MHz–1300MHz Application Circuit At +4V



QPA0163L

Evaluation Board and Schematic



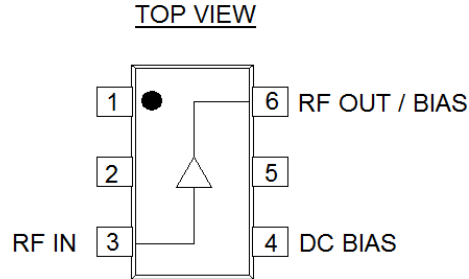
Evaluation Board Bill of Materials For 800MHz-1300MHz Application Circuit

Description	Reference Designator	Manufacturer	Manufacturer's P/N
Gain Block	U1	Qorvo	QPA0163L
PCB, QPA0163L		Viasystems Technologies	QPA0163L-410(A)
CAP, 0.1uF, 5%, 25V, C0G, 1206	C1	Murata Electronics	GRM31C5C1E104JA01L
CAP, 100pF, 5%, 50V, C0G, 0402	C2	Murata Electronics	GRM1555C1H101JA01D
CAP, 0.1uF, 10%, 16V, X7R, 0402	C3, C4	Murata Electronics	GRM155R71C104KA88D
FER, BEAD, 1500 Ohm, 500mA, 0603	B1*	Murata Electronics	BLM18HE152SN1D
JMPR, 0 Ohm, 0603	R1	Panasonic Industrial Devices	ERJ-3GEY0R00
RES, 47 Ohm, 5%, 1/16W, 0402	R2*	Panasonic Industrial Devices	ERJ-2GEJ470
IND, 33nH, 5%, M/L, 0603	L1	Murata Electronics	LL1608-FSL33NJ
CONN, SMA, EL, FLT, 0.068" SPE-000318	J1, J2	Amphenol RF Asia Corp	901-10426
CONN, HDR, ST, 1x2, 0.100", HI-TEMP, T/H	P1	Samtec Inc.	HTSW-102-07-G-S

* NOTE: B1 and R2 provide improved K-factor and are optional. R1 may be used as a dropping resistor for use with supply voltages greater than the desired bias voltage. C5 and C6 are shown on PCB as options for the feedback loop in 100MHz to 800MHz applications

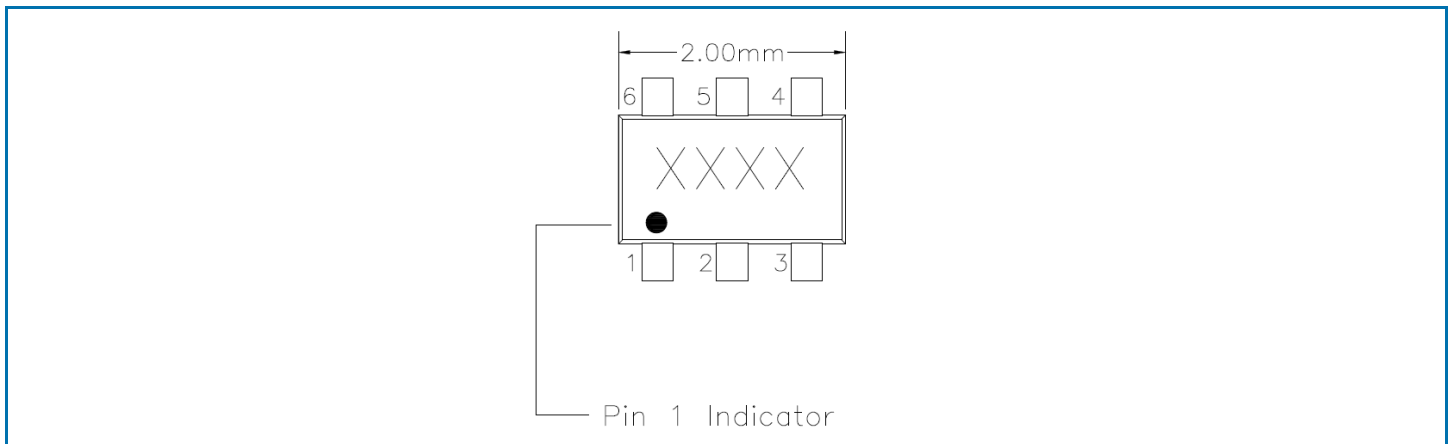
QPA0163L

Pin Configuration and Description



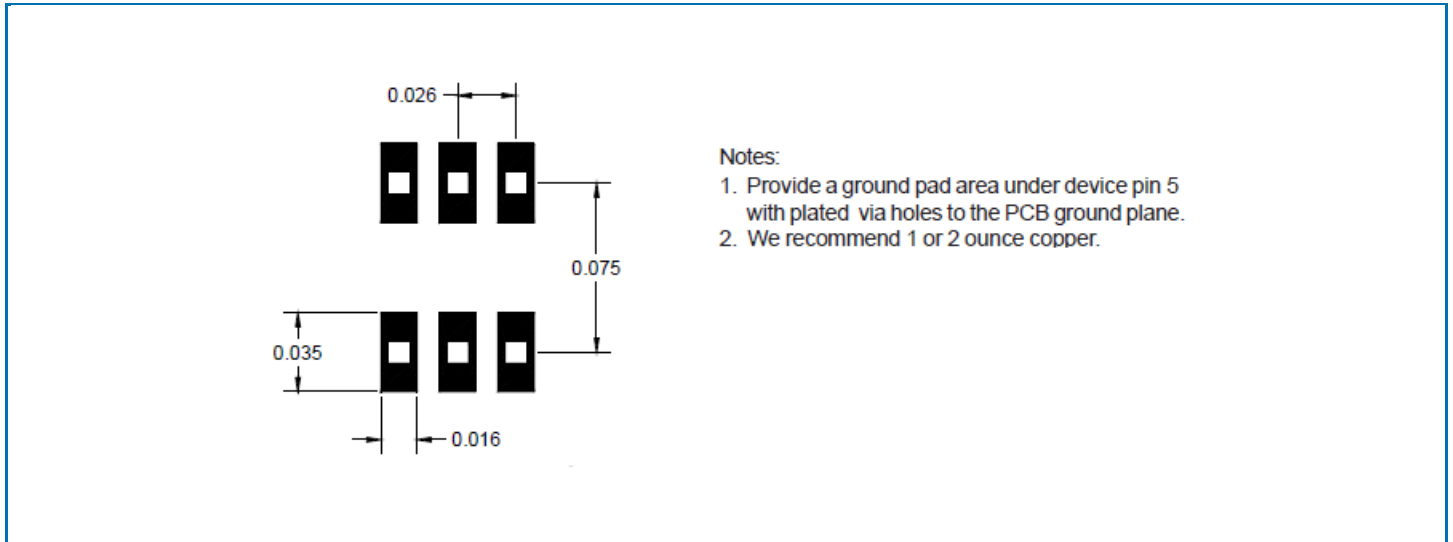
Pin	Label	Description
1, 2	NC	No Connection. Must be left floating and not connected to ground. This pin should be provided with an isolated ungrounded solder pad for mounting and integrity of the circuit.
3	RF IN	RF Input pin. This pin requires the use of an external DC blocking capacitor as shown in the application schematic.
4	DC BIAS	Direct Current Bias and Voltage Supply pin. Bypass with suitable capacitors.
5	GND	Ground. Connect to ground per application circuit drawing. For best performance, vias should be used as shown in the recommended pad layout.
6	RF OUT/BIAS	RF Output and Bias pin. Bias will be supplied to this pin through an external RF choke. A DC blocking capacitor is necessary on the RF output as shown in the application circuit.

Package Marking

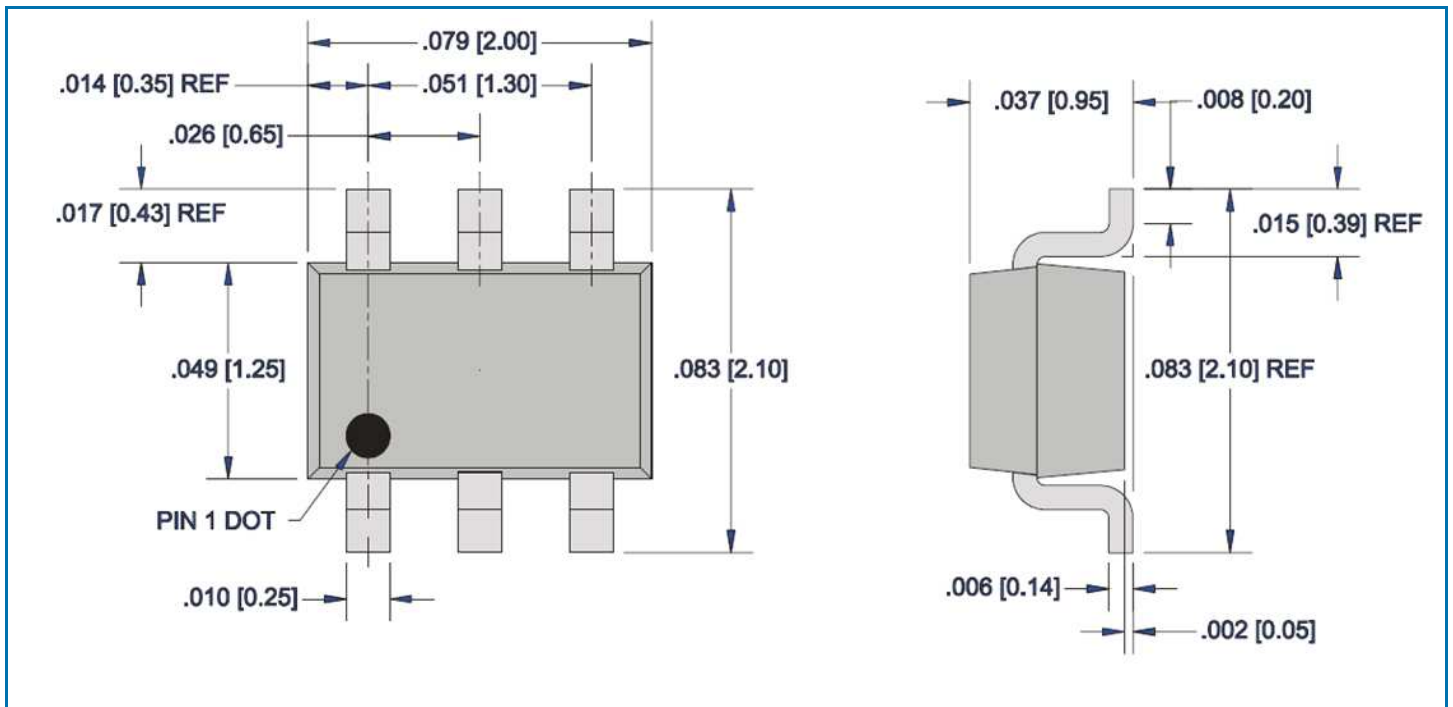


QPA0163L

Suggested Pad Layout (Dimensions in inches)



Package Outline (Dimensions in inches [millimeters])



QPA0163L

Preliminary



Contact Information

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

Web: www.rfmd.com

Tel: 1-844-890-8163

Email: customer.support@qorvo.com

For information about the merger of RFMD and TriQuint as Qorvo:

Web: www.qorvo.com

Important Notice

The information contained herein is believed to be reliable. RFMD and/or Qorvo makes no warranties regarding the information contained herein. RFMD and/or Qorvo assumes no responsibility or liability whatsoever for any of the information contained herein. RFMD and/or Qorvo assumes no responsibility or liability whatsoever for the use of the information contained herein. The information contained herein is provided "AS IS, WHERE IS" and with all faults, and the entire risk associated with such information is entirely with the user. All information contained herein is subject to change without notice. Customers should obtain and verify the latest relevant information before placing orders for RFMD and/or Qorvo products. The information contained herein or any use of such information does not grant, explicitly or implicitly, to any party any patent rights, licenses, or any other intellectual property rights, whether with regard to such information itself or anything described by such information.

RFMD and/or 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.