



QM25032

Band 1/3 Multiplexer

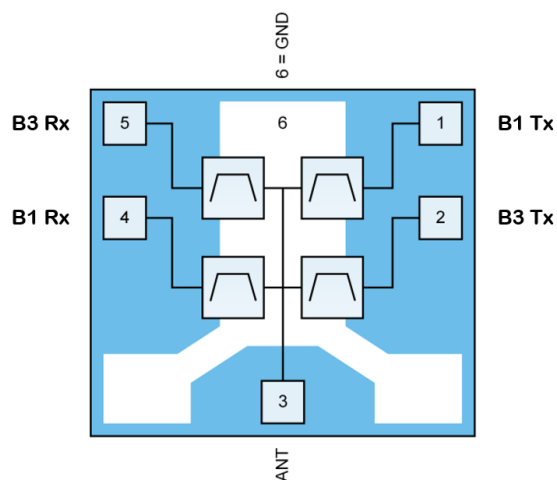
Product Overview

The QM25032 is the latest band 1 + band 3 multiplexer using Qorvo's patented technology to optimize performance required in today's handsets.

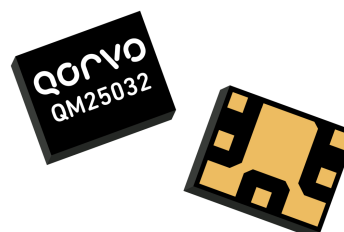
The QM25032 is designed to ensure minimal transmit insertion loss in all bands being multiplexed without loading each other while providing high cross-isolation which is critical to ensure good receive performance. Additionally, the QM25032 is capable of supporting higher power levels to overcome additional front-end losses in today's handsets.

The QM25032 uses common module packaging techniques to enable a compact 2.5 mm x 2.0 mm footprint.

Functional Block Diagram



Bottom View



6 Pin 2.5 x 2.0 x 0.54mm leadless SMT package

Key Features

- Compact Form-Factor: 2.5mm x 2.0mm x 0.6mm
- Minimizes PA current drain with excellent TX IL
- Improved RX sensitivity with low RX IL
- Single-Ended
- RoHS Compliant, Pb-Free Module Package

Applications

- LTE/NR Mobile Products
 - Handsets
 - Datacards
- Carrier Aggregation

Ordering Information

Part Number	Description
QM25032EVB	Evaluation Board
QM25032SB	5pc sample bag
QM25032SR	100pcs on 7" reel
QM25032TR13	10,000pcs on 13" reel

Absolute Maximum Ratings

Parameter	Conditions		Rating
Storage Temperature			-40 to +85°C
RF Input Power (Pin1, Pin2)	CW	+55°C for 5k hours	+31 dBm
	FDD_UL_CP-OFDM_QPSK_5M_1RB@23		+29.5 dBm
	FDD_UL_CP-OFDM_QPSK_5M_1RB@24		+28 dBm
Peak RF Input Power (Pin 1, Pin2)	CW, Max duration 500 ms		+34.5 dBm

Operation of this device outside the parameter ranges given above may cause permanent damage.

Recommended Operating Conditions

Parameter	Min.	Typ.	Max.	Units
T _{CASE}	-30		85	°C

Electrical specifications are measured at specified test conditions. Specifications are not guaranteed over all recommended operating conditions.

Electrical Specifications⁽¹⁾ Band 1 Transmit - Antenna

Unless Otherwise Noted: Operating Temp = -30 °C to +85 °C

Parameter	Conditions	Min.	Typ.	Max.	Units
Insertion Loss	1920 – 1980 MHz	-	1.3 ⁽²⁾	2.3	dB
VSWR (TX Port)	1920 – 1980 MHz	-	1.6:1	2:1	-
VSWR (ANT Port)			1.5:1	2:1	
Attenuation	1495.9 – 1510.9 MHz	45	58	-	dB
	1559 – 1680 MHz	45	58	-	
	1805 – 1880 MHz	48	60	-	
	2010 – 2025 MHz	15 ⁽³⁾	20	-	
	2110 – 2170 MHz	50	69	-	
	2400 – 2500 MHz	45	61	-	
	3640 – 3960 MHz	40	59	-	
	4900 – 5180 MHz	30	53	-	
	5180 – 5900 MHz	12	22	-	

Notes:

1. All specifications include expected temperature, process guardbands, and are based on application circuit schematic
2. Typical specified as mathematical average over frequency range at room temp
3. Operating Temp = +15 °C to +85 °C

Electrical Specifications⁽¹⁾ Band 1 Antenna - Receive

Unless Otherwise Noted: Operating Temp = -30 °C to +85 °C

Parameter	Conditions	Min.	Typ.	Max.	Units
Insertion Loss	2110 – 2170 MHz	-	1.2 ⁽²⁾	2.2	dB
VSWR (RX Port)	2110 – 2170 MHz	-	1.6:1	2:1	-
VSWR (ANT Port)			1.5:1	2:1	
Attenuation	1447 – 1463 MHz	40	48	-	dB
	1710 – 1785 MHz	48	54	-	
	1920 – 1980 MHz	49	56	-	
	2400 – 2500 MHz	50	62	-	
	4900 – 5180 MHz	30	53	-	
	5180 – 5900 MHz	25	53	-	

Notes:

1. All specifications include expected temperature, process guardbands, and are based on application circuit schematic
2. Typical specified as mathematical average over frequency range at room temp

Electrical Specifications⁽¹⁾ Band 3 Transmit - Antenna

Unless Otherwise Noted: Operating Temp = -30 °C to +85 °C

Parameter	Conditions	Min.	Typ.	Max.	Units
Insertion Loss	1710 – 1785 MHz	-	1.3 ⁽²⁾	3 ⁽³⁾	dB
VSWR (TX Port)	1710 – 1785 MHz	-	1.5:1	2:1 ⁽⁴⁾	-
VSWR (ANT Port)			1.3:1	2:1 ⁽⁴⁾	
Attenuation	1559 – 1605 MHz	40	49	-	dB
	1805 – 1880 MHz	47 ⁽⁴⁾	60	-	
	2110 – 2170 MHz	50	62	-	
	2400 – 2500 MHz	42	46	-	
	3420 – 3570 MHz	25	39	-	
	4900 – 5180 MHz	18	31	-	
	5180 – 5900 MHz	18	25	-	

Notes:

1. All specifications include expected temperature, process guardbands, and are based on application circuit schematic
2. Typical specified as mathematical average over frequency range at room temp
3. Operating Temp = -30 °C to +25 °C
4. Operating Temp = +25 °C to +85 °C

Electrical Specifications⁽¹⁾ Band 3 Antenna - Receive

Unless Otherwise Noted: Operating Temp = -30 °C to +85 °C

Parameter	Conditions	Min.	Typ.	Max.	Units
Insertion Loss	1805 – 1880 MHz	-	1.3 ⁽²⁾	3.2 ⁽³⁾	dB
VSWR (RX Port)	1805 – 1880 MHz	-	1.5:1	2:1	-
VSWR (ANT Port)			1.4:1	2:1	
Attenuation	1710 – 1785 MHz	40	57	-	dB
	1920 – 1980 MHz	48	53	-	
	2400 – 2500 MHz	40	52	-	
	4900 – 5180 MHz	40	51	-	
	5180 – 5900 MHz	30	54	-	

Notes:

1. All specifications include expected temperature, process guardbands, and are based on application circuit schematic
2. Typical specified as mathematical average over frequency range at room temp
3. Operating Temp = +25 °C to +85 °C

Electrical Specifications⁽¹⁾ Isolation

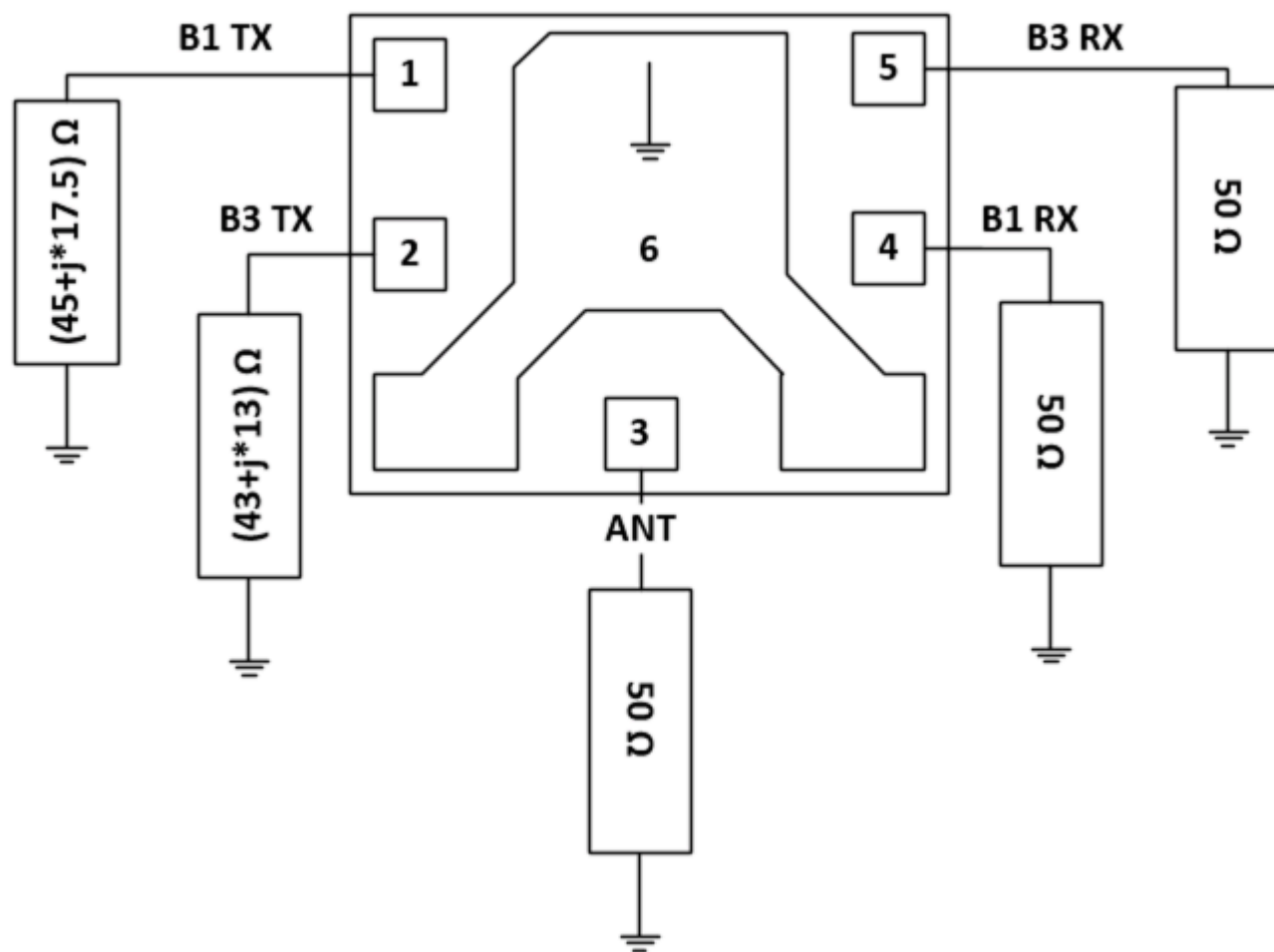
Unless Otherwise Noted: Operating Temp = -30 °C to +85 °C

Parameter	Conditions	Min.	Typ.	Max.	Units
B3 TX-RX Isolation in B3 RX	1805 – 1880 MHz	55 ⁽²⁾	62	-	dB
B3 TX-RX Isolation in B3 TX	1710 – 1785 MHz	55	59	-	
B1 TX-RX Isolation in B1 RX	2110 – 2170 MHz	55	69	-	
B1 TX-RX Isolation in B1 TX	1920 – 1980 MHz	50	59	-	
B1 TX to B3 RX Isolation in B3 RX	1805 – 1880 MHz	55	61	-	
B1 TX to B3 RX Isolation in B1 TX	1920 – 1980 MHz	52	55	-	
B3 TX to B1 RX Isolation in B3 TX	1710 – 1785 MHz	53	57	-	
B3 TX to B1 RX Isolation in B1 RX	2110 – 2170 MHz	55	64	-	

Notes:

1. All specifications include expected temperature, process guardbands, and are based on application circuit schematic
2. Integrated over 5MHz Bandwidth

Application Circuit Schematic



Note:

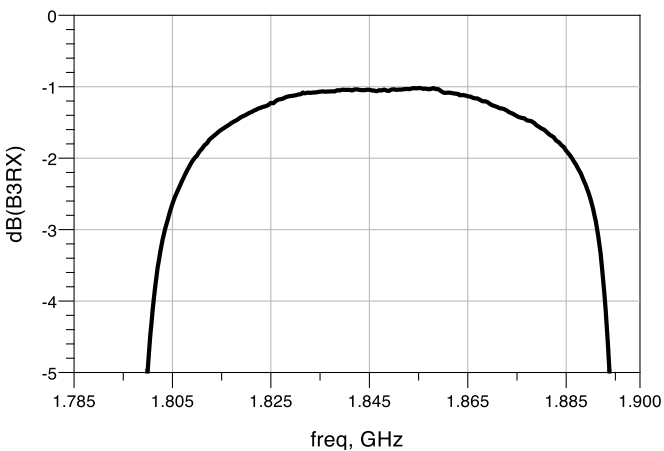
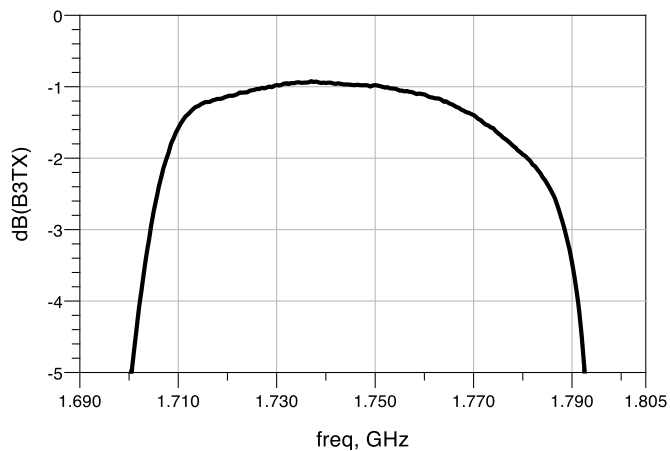
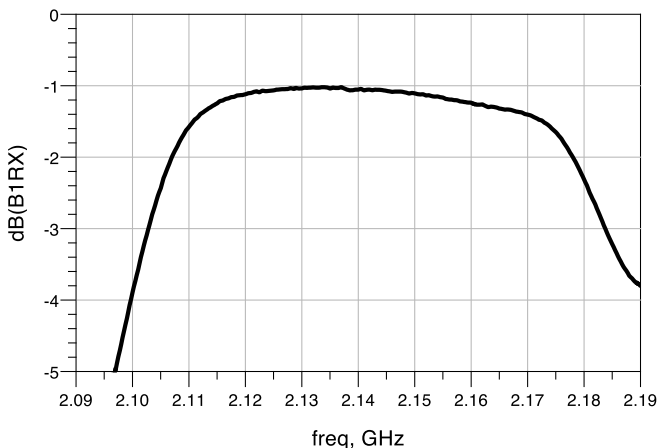
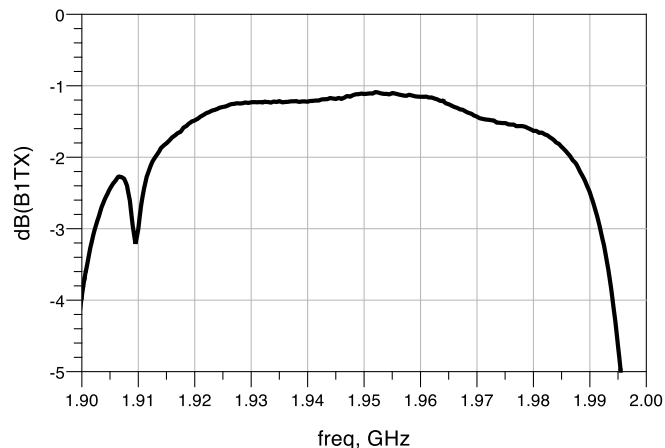
B1 TX (pin 1) and B3 TX (pin 2) are terminated with complex impedance to provide flexible matching options for optimizing TX performance between PA and QM25032. All other ports are matched to 50 ohm impedance

Bill of Materials

Ref. Des.	Value	Description	Manuf.	Part number
U1	N/A	Band 1/3 Multiplexer	Qorvo	QM25032
PCB	N/A	4-layer Printed Circuit Board		

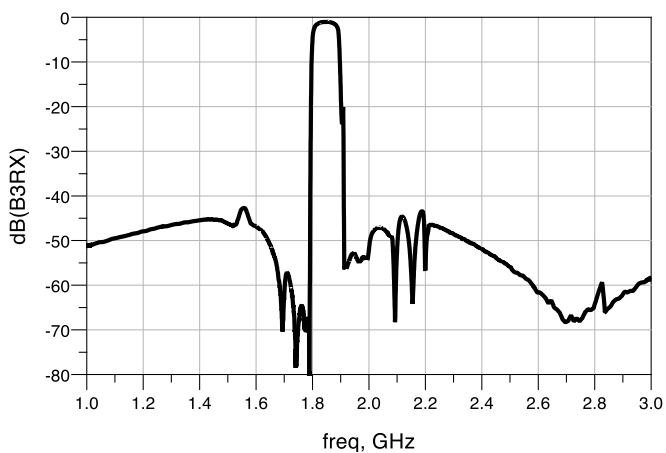
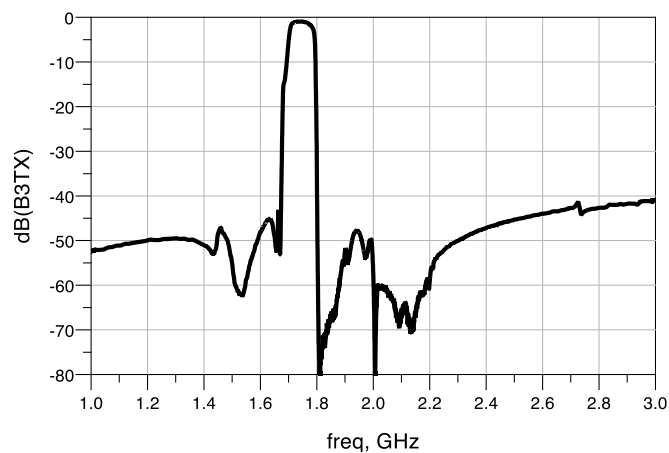
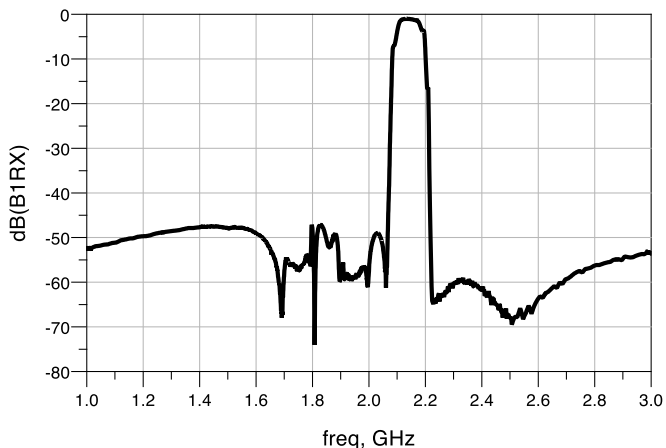
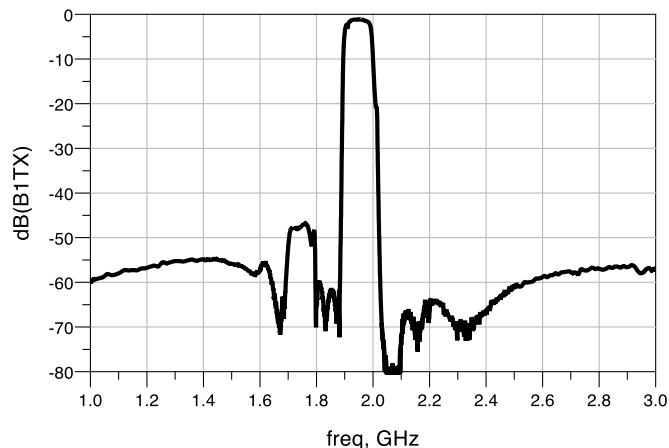
Performance Plots – Passband

Test conditions unless otherwise noted: Temp. = +25 °C



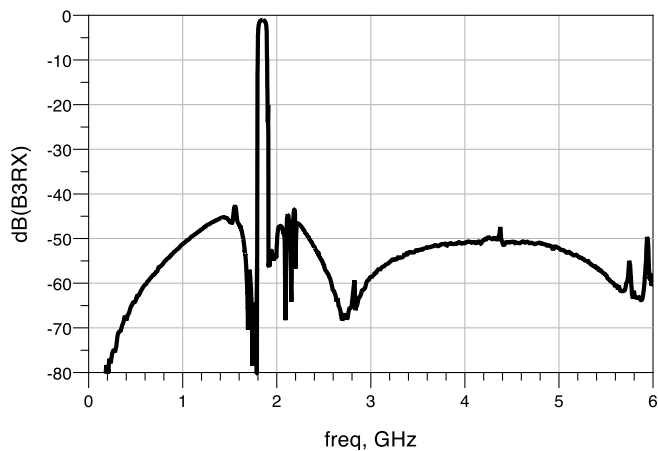
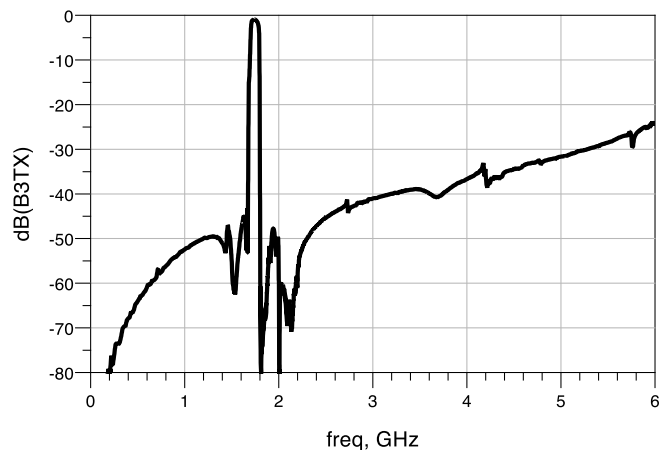
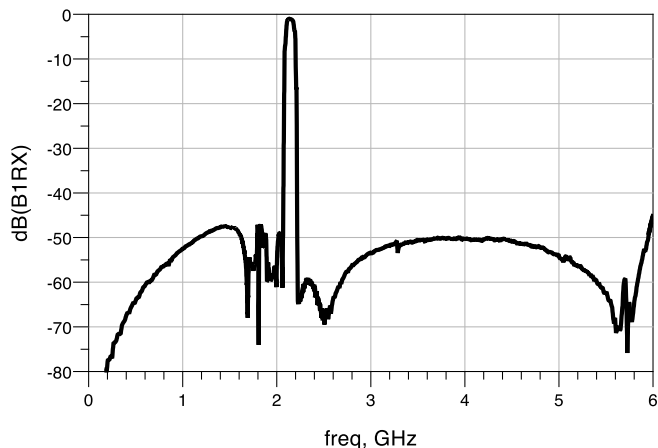
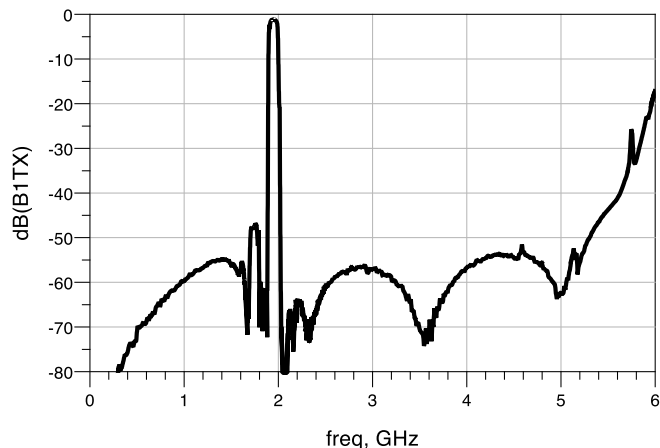
Performance Plots – Narrowband

Test conditions unless otherwise noted: Temp. = +25 °C



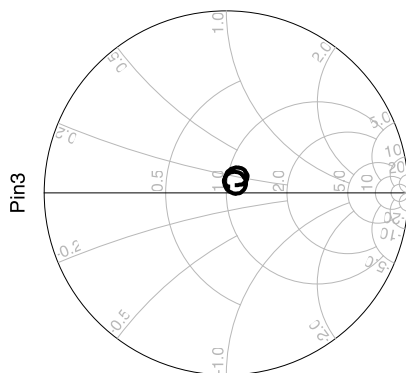
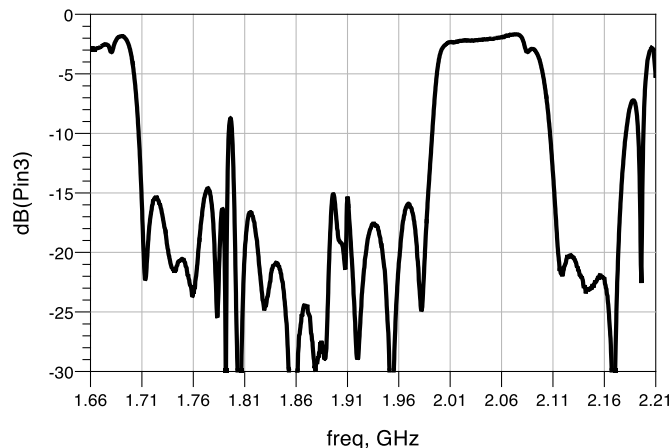
Performance Plots – Wideband

Test conditions unless otherwise noted: Temp. = +25 °C

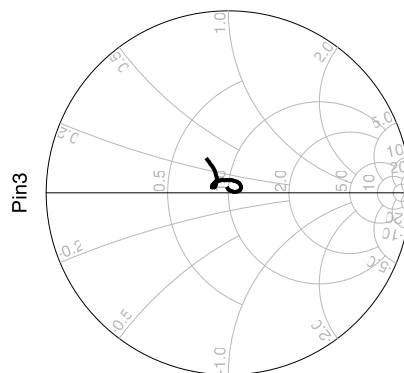


Performance Plots – ANT Port Return Loss/Impedance

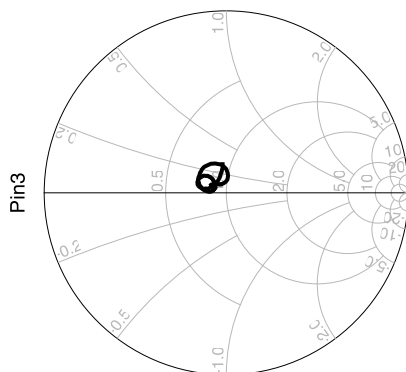
Test conditions unless otherwise noted: Temp. = +25 °C



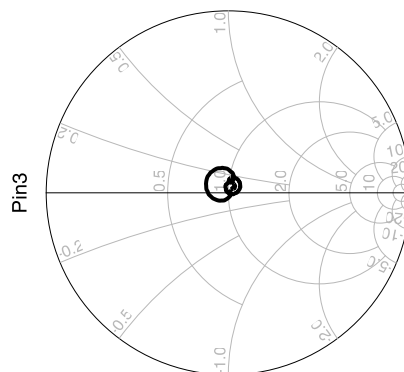
freq (1.920GHz to 1.980GHz)



freq (2.110GHz to 2.170GHz)



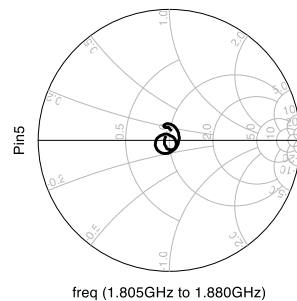
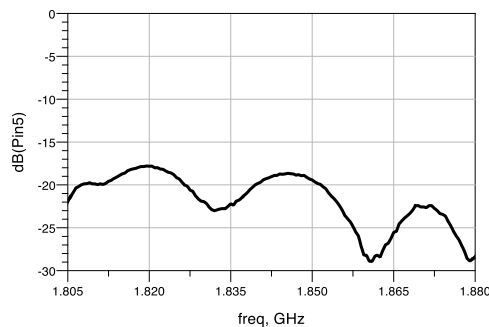
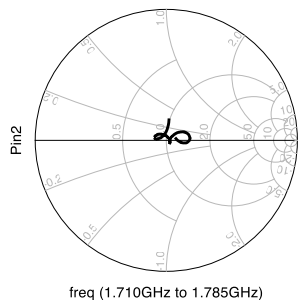
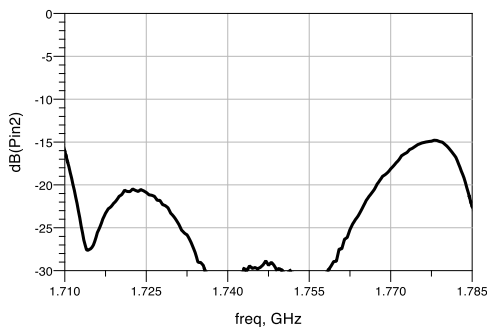
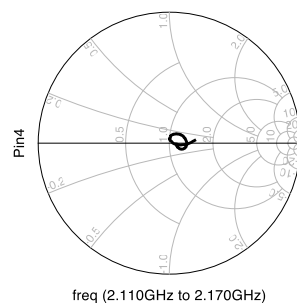
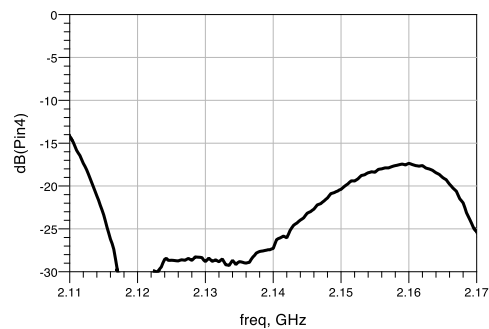
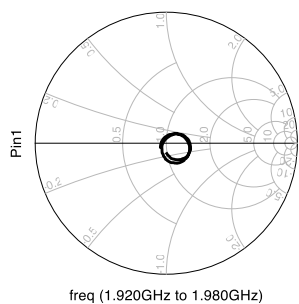
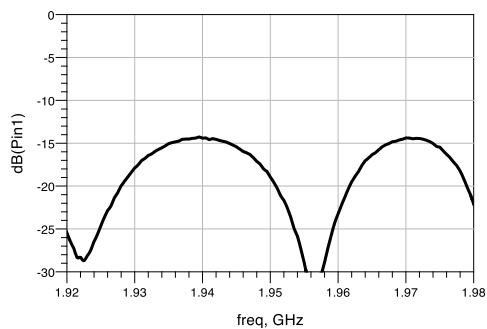
freq (1.710GHz to 1.785GHz)



freq (1.805GHz to 1.880GHz)

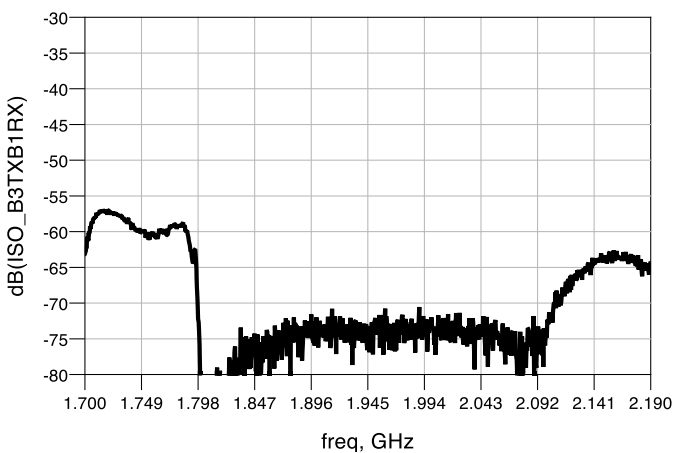
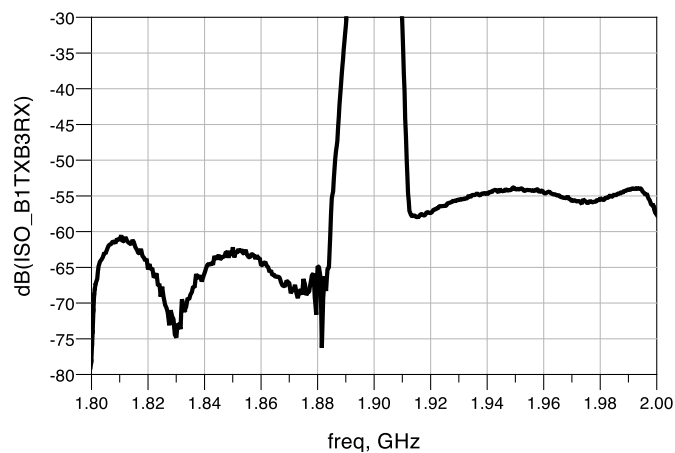
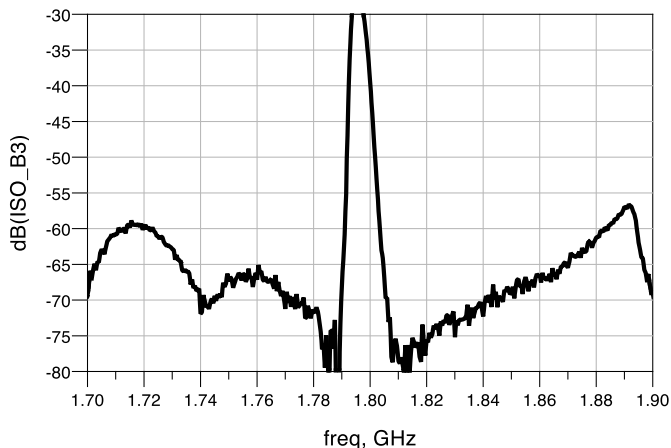
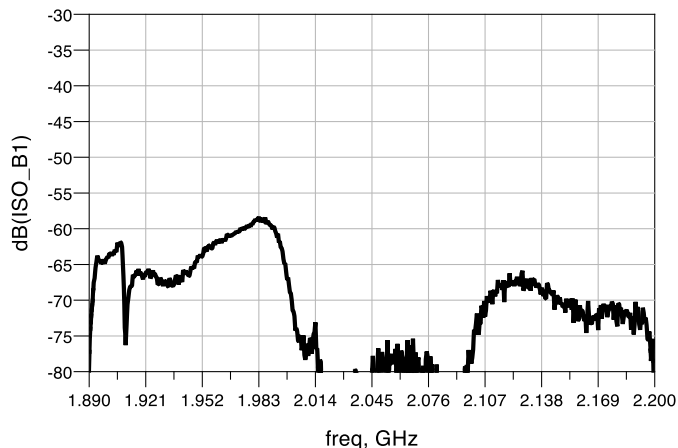
Performance Plots – TX & RX Return Loss/Impedance

Test conditions unless otherwise noted: Temp. = +25 °C

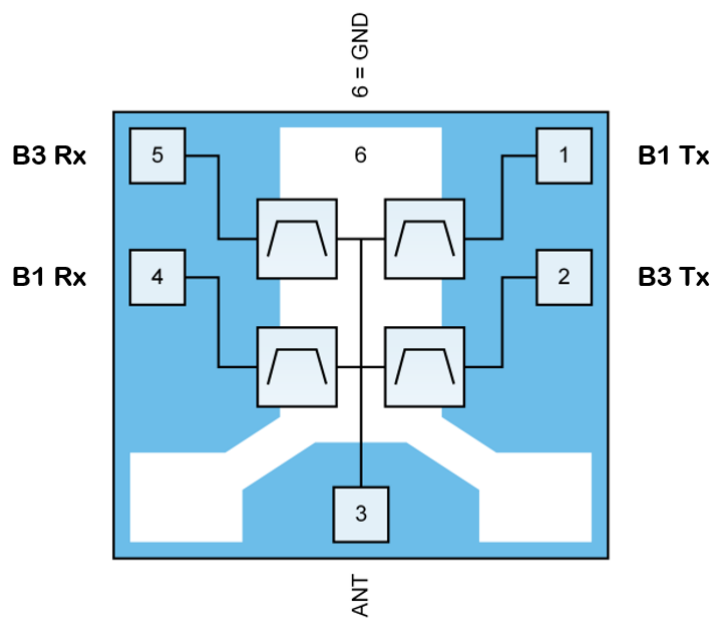


Performance Plots – Isolation

Test conditions unless otherwise noted: Temp. = +25 °C



Pin Configuration and Description

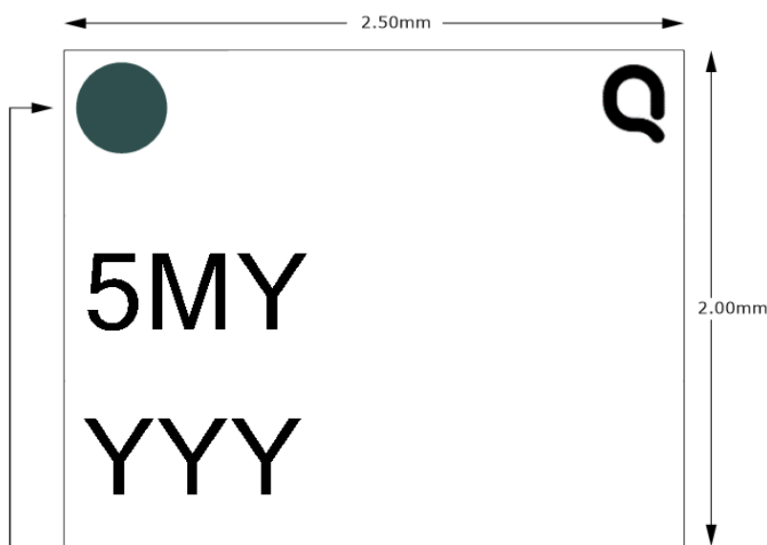


Bottom View

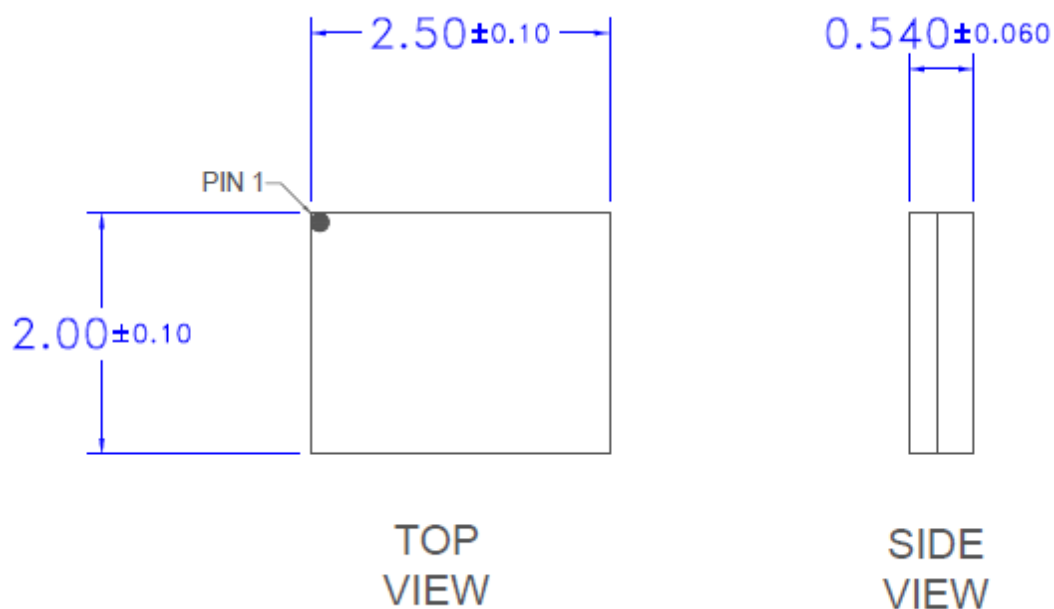
Pin Number	Label	Description
1	B1 TX	Band 1 Transmit Port
2	B3 TX	Band 3 Transmit Port
3	ANT	Band 1/3 Antenna Port
4	B1 RX	Band 1 Receive Port
5	B3 RX	Band 3 Receive Port
6	GND	Package Ground

Package Marking and Dimensions

Package Marking Diagram



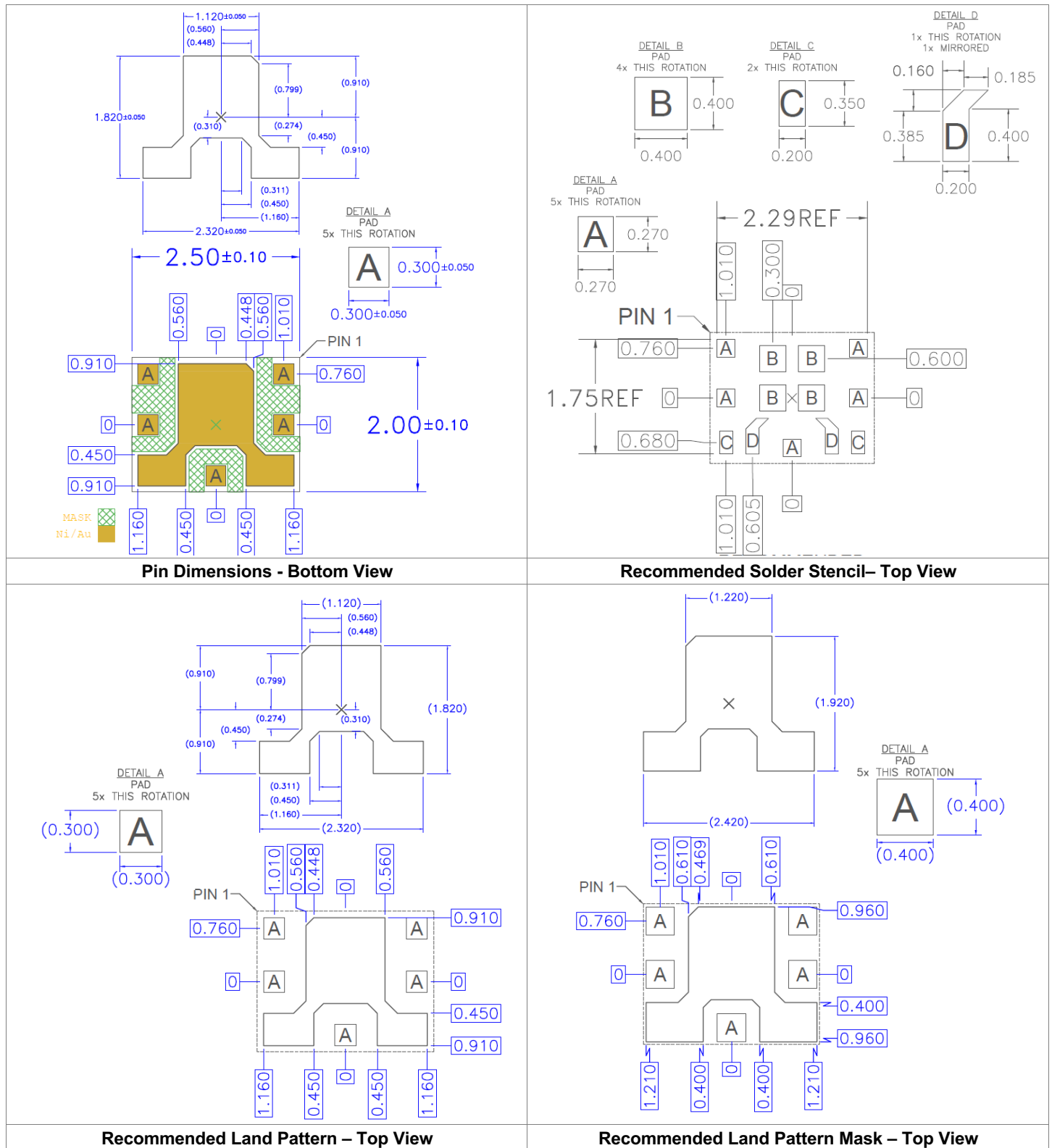
Package Outline Dimension Drawing



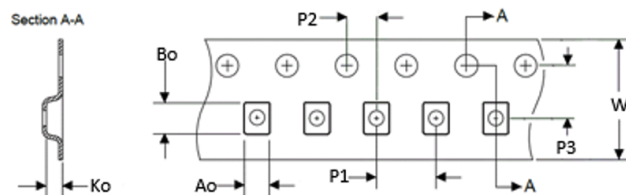
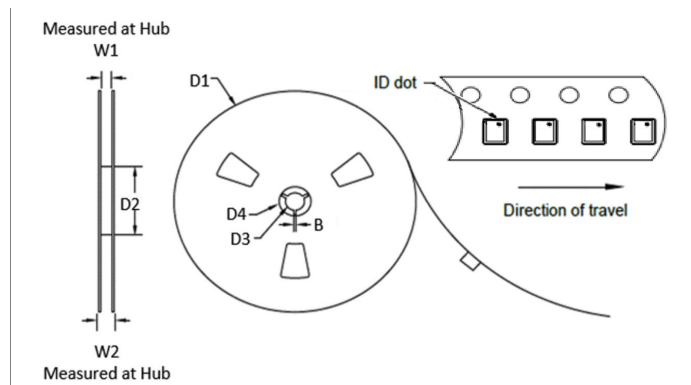
Notes:

1. All dimensions are in millimeters. Angles are in degrees.
2. Dimension and tolerance formats conform to ASME Y14.4M-1994.
3. The terminal #1 identifier and terminal numbering conform to JESD 95-1 SPP-012

Mechanical Information



Tape and Reel Information – Carrier and Cover tape Dimensions



Feature	Measure	Symbol	Size (mm)
Flange	Diameter	D1	330.0
	Thickness	W2	14.2
	Space Between Flange	W1	8.8
Hub	Outer Diameter	D2	102.0
	Arbor Hole Diameter	D3	13.0
	Key Slit Width	B	2.0
	Key Slit Diameter	D4	20.2

Feature	Measure	Symbol	Size (mm)
Cavity	Length	Ao	2.20
	Width	Bo	2.70
	Depth	Ko	1.0
	Pitch	P1	4.0
Centerline Distance	Cavity to Perforation (Length)	P2	2.0
	Cavity to Perforation (Width)	P3	3.5
Carrier Tape	Width	W	8.0

(Unless otherwise specified, all dimension tolerances per EIA-481)

Handling Precautions

PARAMETER	RATING	STANDARD
ESD – Human Body Model (HBM)	1C	ESDA/JEDEC JS-001
ESD – Charged Device Model (CDM)	C3	ESDA/JEDEC JS-002
MSL – Moisture Sensitivity Level	MSL3	IPC/JEDEC J-STD-020



Caution!

ESD sensitive device

Solderability

Compatible with both lead-free (260 °C max. reflow temperature) and tin/lead (245 °C max. reflow temperature) soldering processes.

Package lead plating: Electrolytic plated Au over Ni

RoHS Compliance

This part is compliant with the 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
- Halogen Free (Chlorine, Bromine)
- Antimony Free
- TBBP-A (C₁₅H₁₂Br₄O₂) Free
- SVHC Free



Revision History

REVISION	DATE (YYYYMMDD)	NOTES
E	20200219	Initial Production Release
F	20210222	Updated Power Ratings Specs
G	20210318	Updated Power Ratings Specs

Contact Information

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

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Tel: 1-844-890-8163

Email: customer.support@qorvo.com

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