TQQ1030

Band 30 BAW Duplexer

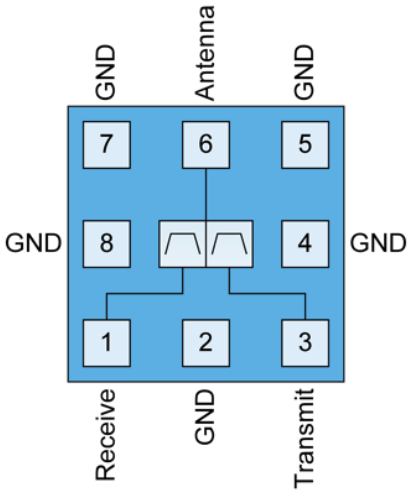
Product Description

The TQQ1030 is a compact, high-performance duplexer module optimized to meet the stringent OOB attenuation requirements along with excellent insertion loss performance, which is a key enabler to co-banding.

The TQQ1030 is built up on Qorvo's high performance NoDrift™ Bulk Acoustic Wave (BAW) technology in order to allow meeting stringent OOB attenuation requirements over temperature extremes.

The TQQ1030 uses Qorvo's unique Wafer-Level-Packaging (WLP) techniques to enable a compact 1.8 mm x 1.4 mm x 0.73 mm Typ footprint.

Functional Block Diagram



Top View

8 Pin: 1.8 mm x 1.4 mm x 0.73 mm Package

Key Features

- Compact form-factor: 1.8 mm x 1.4 mm
- Insertion loss – Enabling true co-banding
  - Tx band, 2305 – 2315 MHz: 1.7 dB Typ
  - Rx band, 2350 – 2360 MHz: 1.9 dB Typ
- Best in class close OOB attenuation across Temp
- High ISM band rejection
- Single-ended (SE) 50 Ohm receive & transmit ports
- RoHS compliant, Pb-free

Applications

- LTE handsets, data cards & mobile routers

Ordering Information

Part Number	Description
TQQ1030	B30 BAW Duplexer
TQQ1030-EVB	Evaluation Board

Standard T/R size = 2500 pieces on a 7" reel.

Absolute Maximum Ratings

Parameter	Rating
Storage Temperature	−40 to +85 °C
RF Input Power applied to pin 3 (CW, 50 Ω, 55 °C, 5000hrs)	+30 dBm
RF Input Power applied to pin 3 (Instantaneous)	+36 dBm

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

Recommended Operating Conditions

Parameter	Min.	Typ.	Max.	Unit
T_{CASE}	-20		+90	°C

The duplexer will function over the recommended range without degradation in reliability or permanent change in performance.

Electrical Specifications[1] Antenna – Transmit

Unless otherwise noted: Operating Temp. = -20 °C to +90 °C.

Parameter	Condition	Min.	Typ.	Max.	Unit
Insertion Loss	2305 – 2315 MHz	–	1.7	2.3	dB
Amplitude Ripple	2305 – 2315 MHz	–	0.2	0.9	dB
Group Delay	2300 – 2315 MHz	–	31	40	ns
VSWR (in/out)	2305 – 2315 MHz	–	1.3:1	2:1	–
ANT Impedance		–	50//5.1 nH[2]	–	Ohms
Tx Impedance		–	50	–	Ohms
Attenuation	1225 –1250 MHz	40	44	–	dB
	1559 –1563 MHz	40	44	–	
	1565.42 –1573.374 MHz	40	44	–	
	1573.3 –1577.466 MHz	40	44	–	
	1577.466 –1585.42 MHz	40	44	–	
	1597.5515 –1605.886 MHz	40	44	–	
	2200 – 2288 MHz	10[3]	18	–	
	2288 – 2292 MHz	7	13	–	
	2292 – 2296 MHz	3	8	–	
	2320 – 2324 MHz	2	3	–	
	2324 – 2328 MHz	3	7	–	
	2328 – 2332 MHz	6.5	10	–	
	2332 – 2350 MHz	10[3]	19	–	
	2350 – 2360 MHz	47	53	–	
	2400 – 2485 MHz	40	48	–	
	4610 – 4630 MHz	35	40	–	
	4900 – 5950 MHz	20	24	–	
	6915 – 6945 MHz	30	35	–	

Notes:
1. All specifications are based on the Qorvo schematic for the main reference design.
2. Matching value based on simulation results.
3. Relative rejection to max insertion loss

Electrical Specifications[1] Receive

Parameter	Condition	Min.	Typ.	Max.	Unit
Insertion Loss	2350 – 2360 MHz	–	1.9	2.8	dB
Amplitude Ripple	2350 – 2360 MHz	–	0.2	0.9	
Group Delay	2350 – 2360 MHz	–	34	40	ns
VSWR (in/out)	2350 – 2360 MHz	–	1.3:1	2:1	–
ANT Impedance		–	50//5.1 nH[2]	–	Ohms
Rx Impedance		–	50	–	Ohms
Attenuation	699 – 716 MHz	40	45	–	dB
	824 – 849 MHz	40	45	–	
	1710 – 1755 MHz	35	40	–	
	1850 – 1910 MHz	35	41	–	
	2305 – 2315 MHz	50	57	–	
	2327 – 2337 MHz	10	18	–	
	2336.2 – 2341.3 MHz	3	7	–	
	2400 – 6000 MHz	32	40	–	
	2400 – 2500 MHz	40	45	–	
	4900 – 5950 MHz	30	35	–	

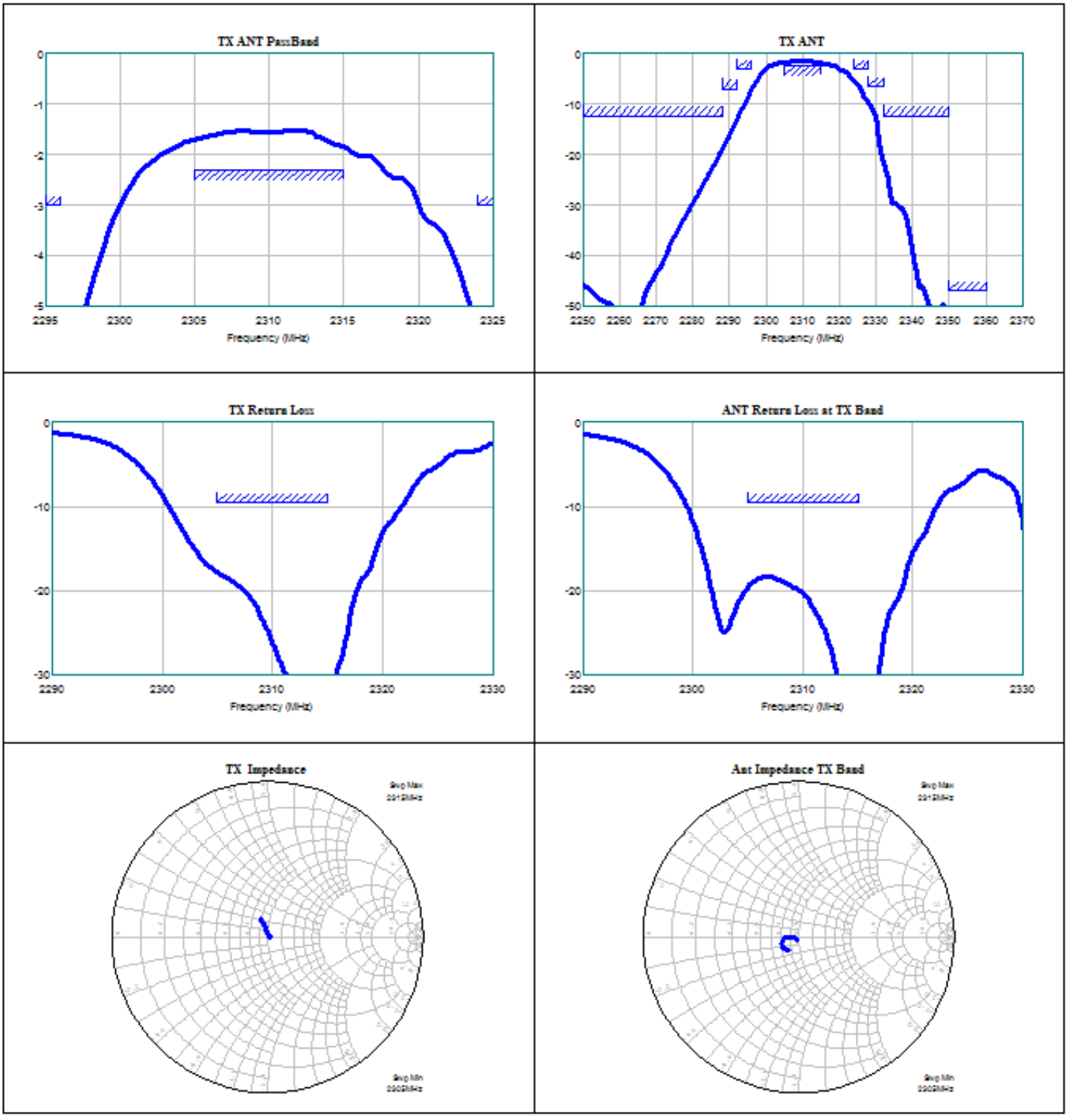
Notes:
1. All specifications are based on the Qorvo schematic for the main reference design.
2. Matching value based on simulation results.

Electrical Specifications[1] - Isolation

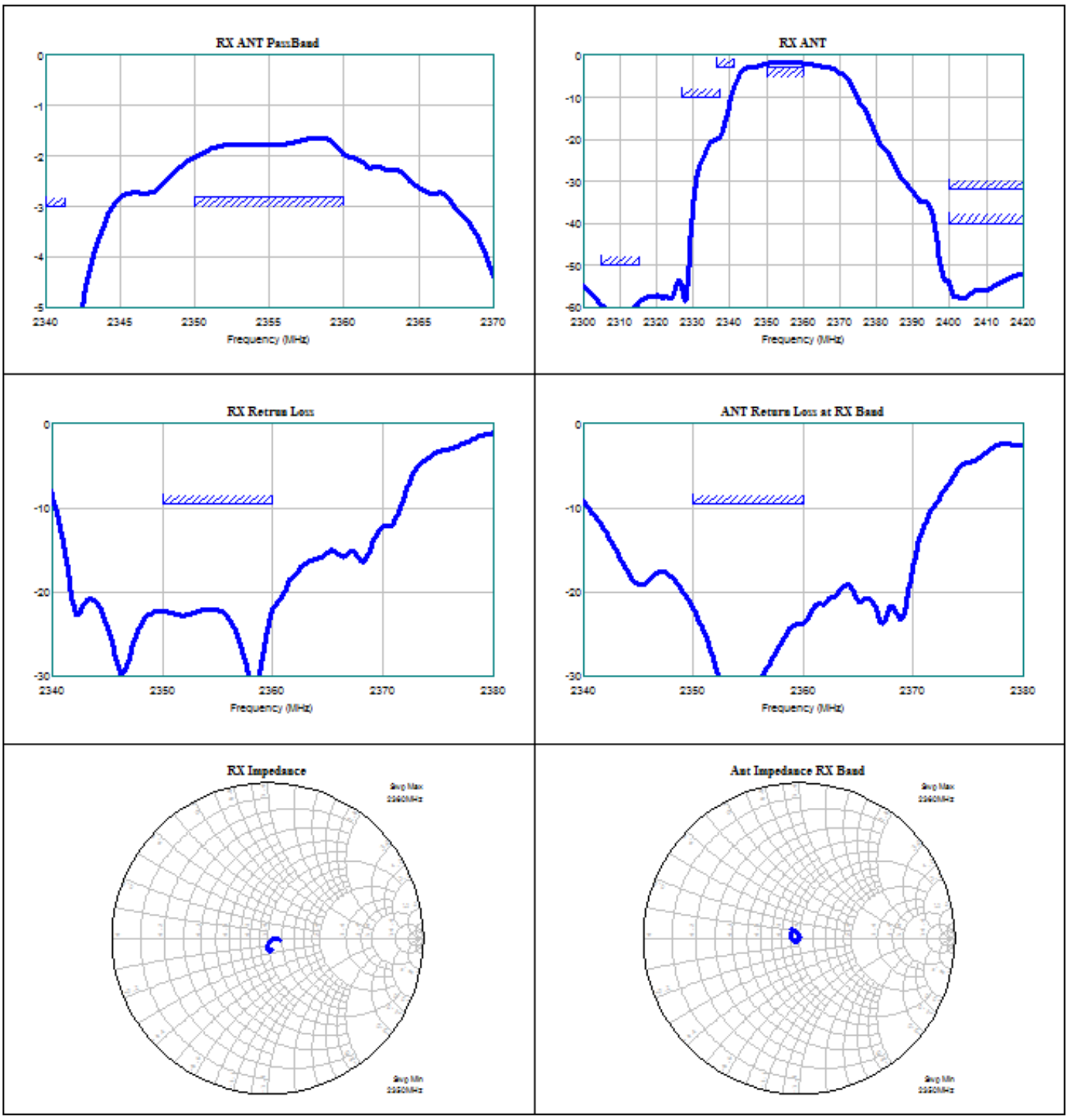
Parameter	Condition	Min.	Typ.	Max.	Unit
Isolation	2305 – 2315 MHz	55	58	–	dB
	2350 – 2360 MHz	52	57	–	dB
	1574 – 1577 MHz	50	54	–	dB

Notes:
1. All specifications are based on the Qorvo schematic for the main reference design.

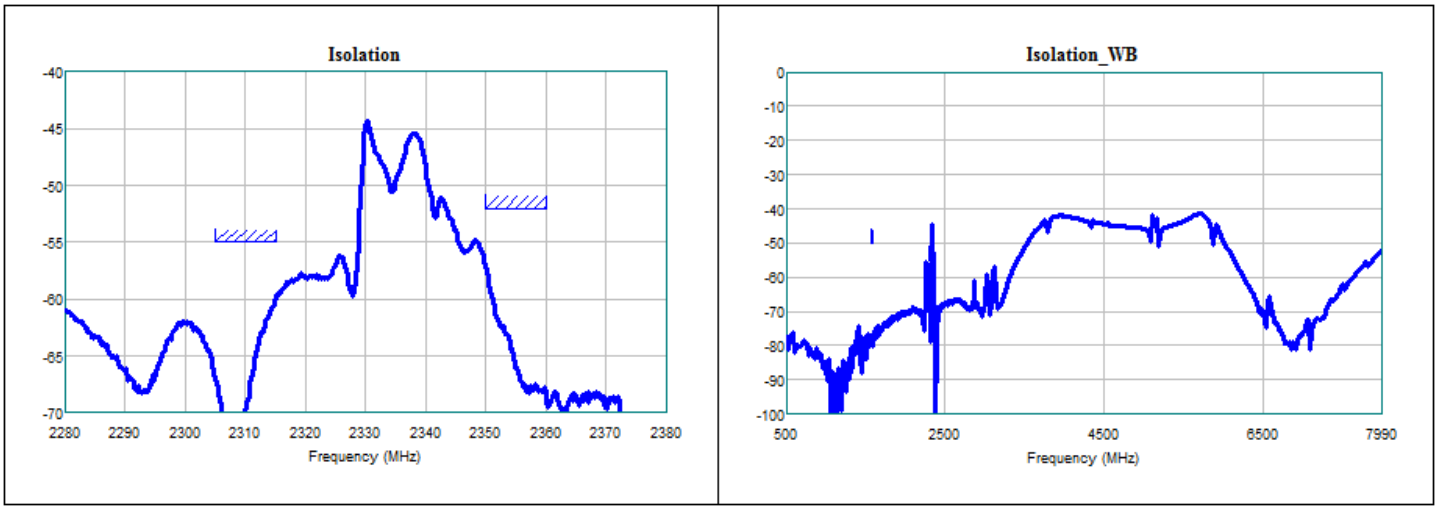
Transmit Performance Plots – Temp = 25 °C



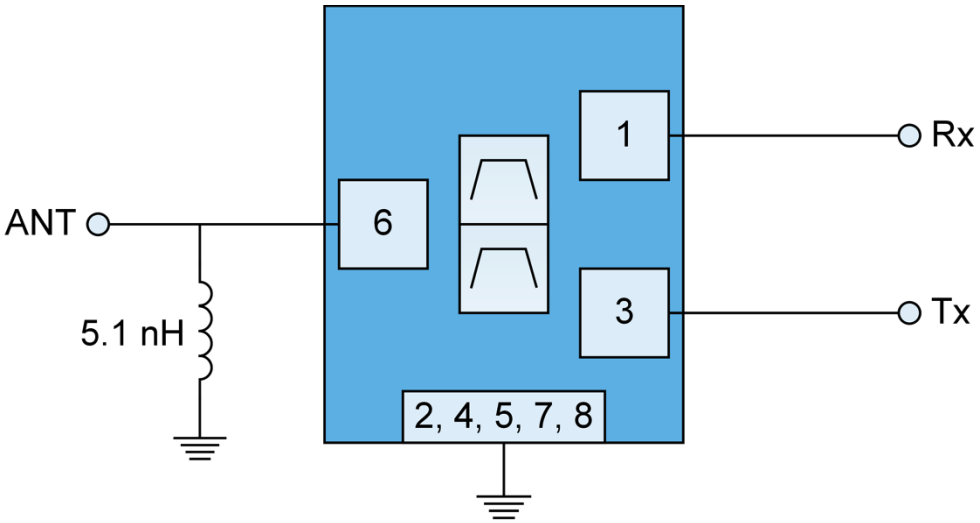
Receive Performance Plots – Temp = 25 ºC



Isolation Plots – Temp = 25 °C



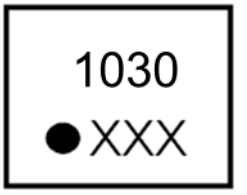
Schematic



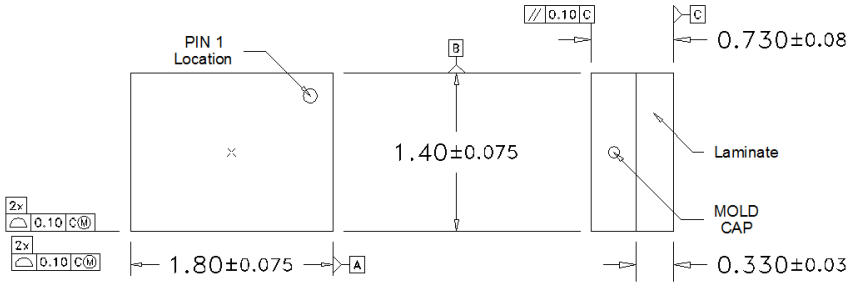
Bill of Materials – EVB

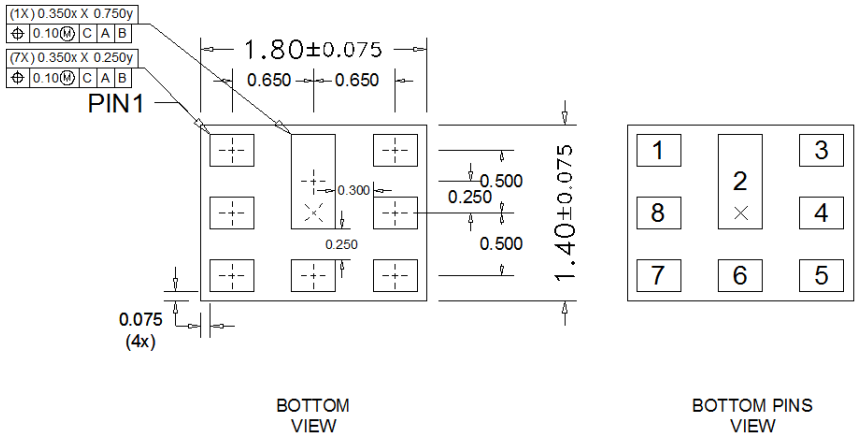
Reference Des.	Value	Description	Manuf.	Part Number
U1	N/A	B30 BAW Duplexer	Qorvo	TQQ1030
U2	5.1 nH	Shunt Inductor at ANT	Murata	LQP03TN5N1H02

Package, Marking, and Dimensions



Line 1: Product name	1030
Line 2: Assembly Lot Code#	XXX = Qorvo assembly number (3 characters only, starting from right side)





UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN MILLIMETERS

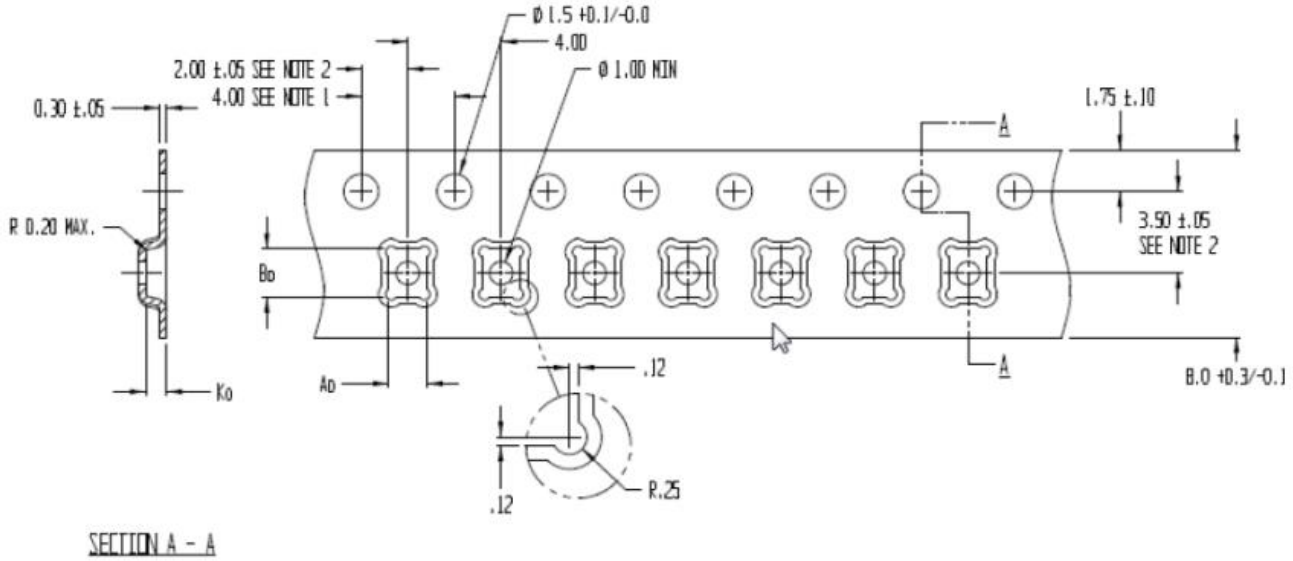
DECIMAL	ANGULAR
X.X ± 0.1	±1°
X.XX ± 0.05	
X.XXX ± 0.025	

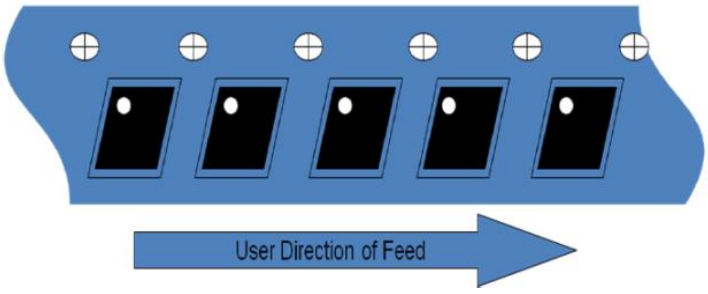
Notes:
1. All dimensions are in millimeters. Angles are in degrees.
2. Except where noted, this part outline conforms to JEDEC standard MO-220, Issue E (Variation VGGC) for thermally enhanced plastic very thin fine pitch quad flat no lead package (QFN).
3. Dimension and tolerance formats conform to ASME Y14.4M-1994

Tape and Reel Information

Standard T/R size = 2,500 units/reel. All dimensions are in millimeters.

Cavity (mm)				Distance Between Centerline (mm)		Carrier Tape (mm)	Cover Tape (mm)
Length (A0) ±0.05	Width (B0) ±0.05	Depth (K0) ±0.05	Pitch (P1)	Length Direction (P2)	Width Direction (F)	Width (W)	Width (W)
1.60	2.0	0.95	4.0	2.00	3.50	8.0	5.4





Handling Precautions

PARAMETER	RATING	STANDARD
ESD – Human Body Model (HBM)	Class 1B	ESDA/JEDEC JS-001
ESD – Charged Device Model (CDM)	Class C3	ESDA/JEDEC JS-002
MSL – Moisture Sensitivity Level	Level 3	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: 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 ($C_{15}H_{12}Br_4O_2$) Free
- SVHC Free

REVISION HISTORY

Revision	Description
Rev J	Updated Power Handling from +29dBm to +30dBm, Converted to Qorvo template

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

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