

Product Overview

The RFSW6222 is a Dual-Pole Double-Throw (DPDT) switch designed for general purpose switching applications. The low insertion loss along with excellent linearity performance makes the RFSW6222 ideal for filter or amplifier bypass switching. The operational supply voltage is from 2.4V to 3.5V. And the control logic is compatible with 1.3V and 2.7V systems. The standard 12-pin QFN package in 2.0mm x 2.0mm size is a compact, easy-to-use, switch component for quick integration into multi-mode, multi-band systems.

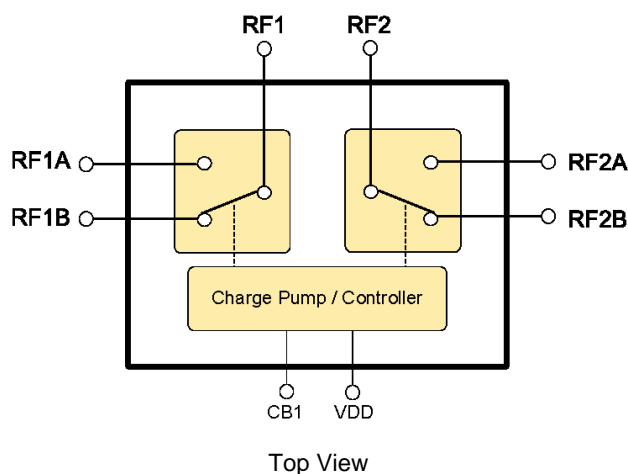


12-Pin, 2 x 2 mm QFN Package

Key Features

- 50 – 3700 MHz Operation
- Low Insertion Loss: 0.29dB at 2700MHz Typical
- High Port-to-Port Isolation: 29dB at 2700MHz Typical
- Power Handling \leq +35dBm
- Very Low Current Consumption
- 1.3V to 2.7V GPIO Compatible

Functional Block Diagram



Applications

- Filter Switching
- LNA Bypass Switching
- Antenna Switching
- Dual Single-Ended Configuration
- Differential Pair Configuration

Ordering Information

Part No.	Description
RFSW6222TR7	2,500 pieces on a 7" reel
RFSW6222 PCBA-410	50 MHz – 3700MHz Evaluation Board

Absolute Maximum Ratings

Parameter		Rating
Storage Temperature		-65 to +150 °C
RF Input Power, Momentary Infrequent	50 Ω Load	+38 dBm
	6:1 VSWR	+36dBm
RF Input Power, Continuous	50 Ω Load	+36 dBm
	6:1 VSWR	+35dBm
DC Supply Voltage (VDD)		+3.9 V
Control Voltage to Digital Input (CB1)		+3.0 V

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.

Electrical Specifications

Parameter		Conditions ⁽¹⁾	Min	Typ	Max	Units
Operational Frequency Range			50		2700	MHz
Insertion Loss ⁽²⁾ (RFx to RFxA/RFxB)		700 MHz to 960 MHz		0.26	0.40	dB
		961 MHz to 1710 MHz		0.26	0.45	dB
		1711 MHz to 2170 MHz		0.27	0.45	dB
		2171 MHz to 2700 MHz		0.29	0.50	dB
Isolation (RF1 to RF1A/RF1B)		700 MHz to 960 MHz	31	40		dB
		961 MHz to 1710 MHz	25	36		dB
		1711 MHz to 2170 MHz	25	30		dB
		2171 MHz to 2700 MHz	25	30		dB
Isolation (RF2 to RF2A/RF2B)		700 MHz to 960 MHz	31	40		dB
		961 MHz to 1710 MHz	25	35		dB
		1711 MHz to 2170 MHz	25	32		dB
		2171 MHz to 2700 MHz	25	29		dB
Phase Balance				± 5		°
IP3		700 MHz to 2700MHz, +35dBm		70		dBm
Harmonics	2 x f ₀	f ₀ 787 MHz, Pin 26 dBm		-79		dBc
	3 x f ₀	f ₀ 710 MHz, Pin 26 dBm		-84		dBc
	2 x f ₀	f ₀ 915 MHz, Pin 26 dBm		-107	-84	dBc
	3 x f ₀			-106	-84	dBc
	2 x f ₀	f ₀ 915 MHz, Pin 35 dBm		-103	-76	dBc
	3 x f ₀			-90	-76	dBc
	2 x f ₀	f ₀ 1980 MHz, Pin 26 dBm		-105	-86	dBc
	3 x f ₀			-105	-86	dBc
	2 x f ₀	f ₀ 1980 MHz, Pin 32 dBm		-99	-76	dBc
	3 x f ₀			-94	-76	dBc
	2 x f ₀	f ₀ 2570 MHz, Pin 26 dBm		-108	-86	dBc
	3 x f ₀			-109	-86	dBc
	2 x f ₀	f ₀ 2690 MHz, Pin 26 dBm		-109	-86	dBc
	3 x f ₀			-105	-86	dBc

Recommended Operating Conditions

Parameter	Min	Typ	Max	Units
Device Voltage (VDD)	+2.4	+2.8	+3.5	V
T _{CASE}	-30	+25	+90	°C

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

Electrical Specifications (Continued)

Parameter	Conditions ⁽¹⁾	Min	Typ	Max	Units
VSWR	700 MHz to 2700 MHz		1.1:1	1.3:1	Ratio
Device Current, I_{VDD}			90	110	μA
Control Current, I_{CB1}				1	μA
Control Voltage High, V_{CB1}		1.3	1.8	2.7	V
Control Voltage Low, V_{CB1}		0		0.45	V
Switching Time	50% control to 10/90% RF			5	μs

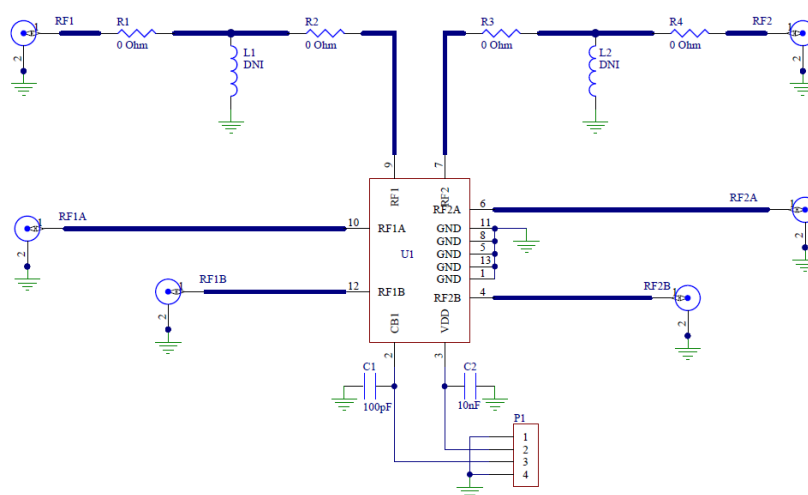
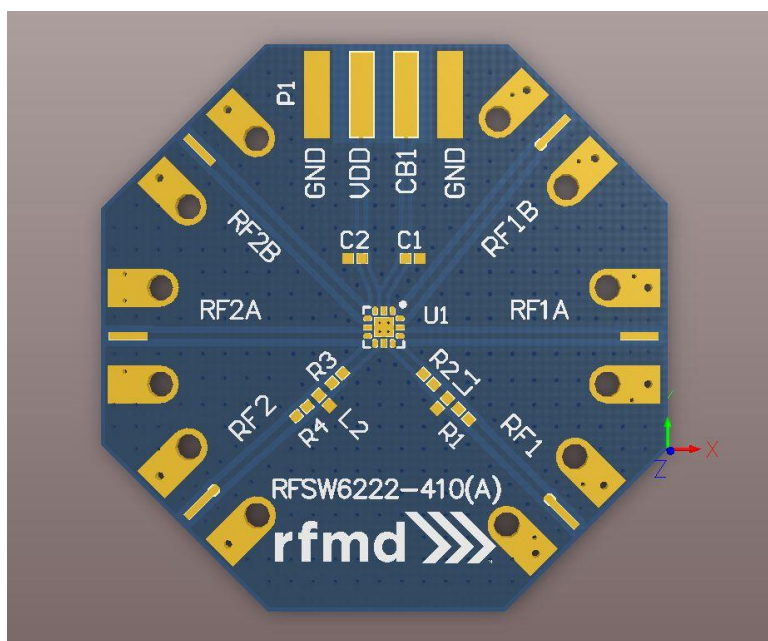
Notes:

1. Test conditions unless otherwise noted: $V_{DD} = +2.8V$, V_{CB1} High/Low = $+1.8V / 0V$, Temp = $+25^{\circ}C$, Single-ended 50Ω system,
2. PCB trace loss deducted

Truth Table – Control Logic

Control Input CB1	Mode of Signal Path	
	Switch RF1	Switch RF2
0	RF1 \leftrightarrow RF1A	RF2 \leftrightarrow RF2A
1	RF1 \leftrightarrow RF1B	RF2 \leftrightarrow RF2B

50 MHz to 2700 MHz Evaluation Board

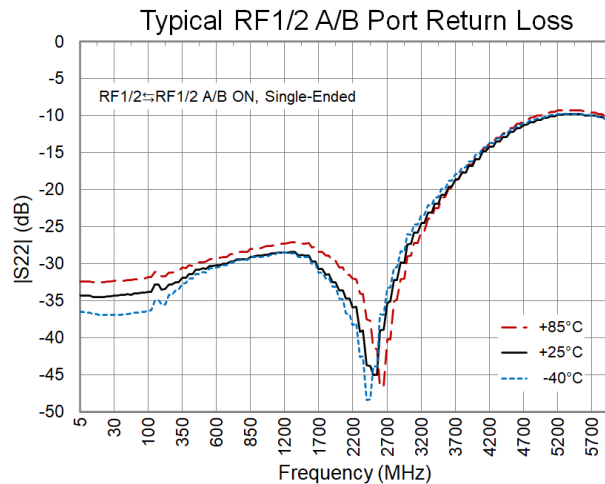
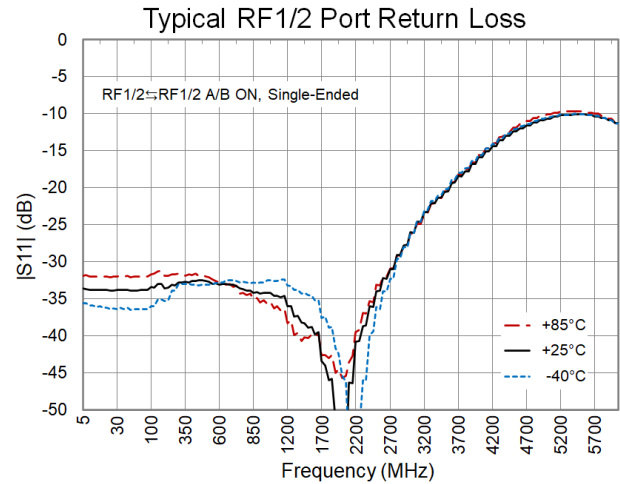
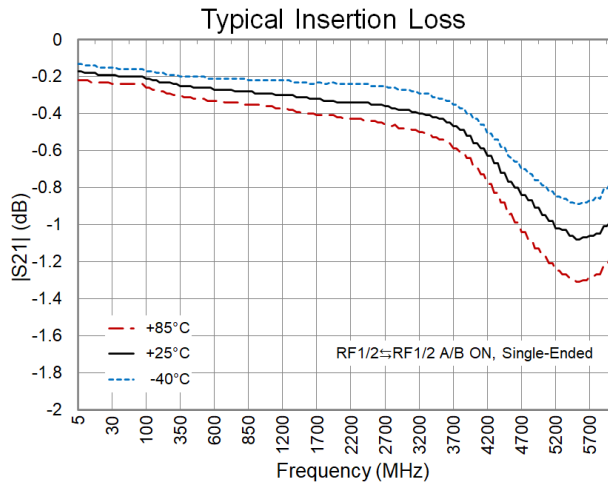


Evaluation Board Bill of Material – RFSW6222PCBA-410

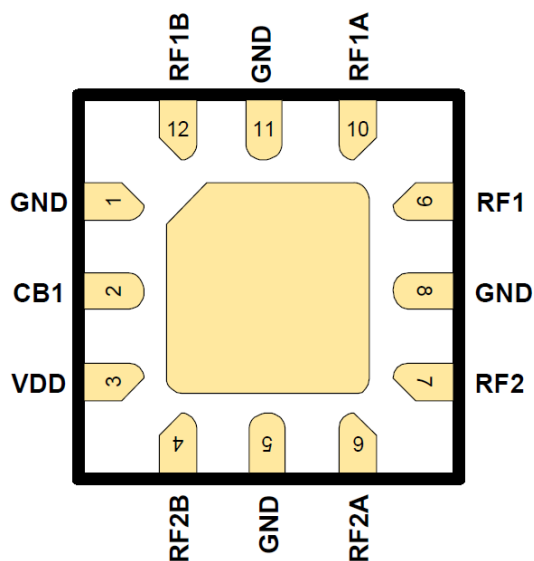
Reference Des.	Value	Description	Manuf.	Part Number
-	-	Printed Circuit Board	Qorvo	RFSW6222-410(A)
U1	-	MOD, General Purpose DPDT RF switch	Qorvo	RFSW6222
C1	100 pF	CAP, 100 pF, 5%, 50V, COG, 0402	Taiyo Yuden	RM UMK105 CG101JV-F
C2	1000 pF	CAP, 1000 pF, 10%, 50V, X7R, 0402	Murata	GRM155R71E103KA01D
R1 – R4	0 Ω	RES, 0 Ω , 0402	Kamaya	RMC1/16SJPTH
RF1, RF2, RF1A, RF1B, RF2A, RF2B	SMA	CONN, SMA, END LUCH, MINI, FLT, 0.068"	Aliner	20-001CF-T
P1	-	CONN, HDR, ST, PLRZD, 4-Pin, 0.100"	ITW Pancon	MPSS100-4-C

Performance Plots – RFSW6222PCK-410

Test conditions unless otherwise noted: VDD = +3.3 V, Single Ended 50 Ω System, Temp. = +25 °C



Pad Configuration and Description

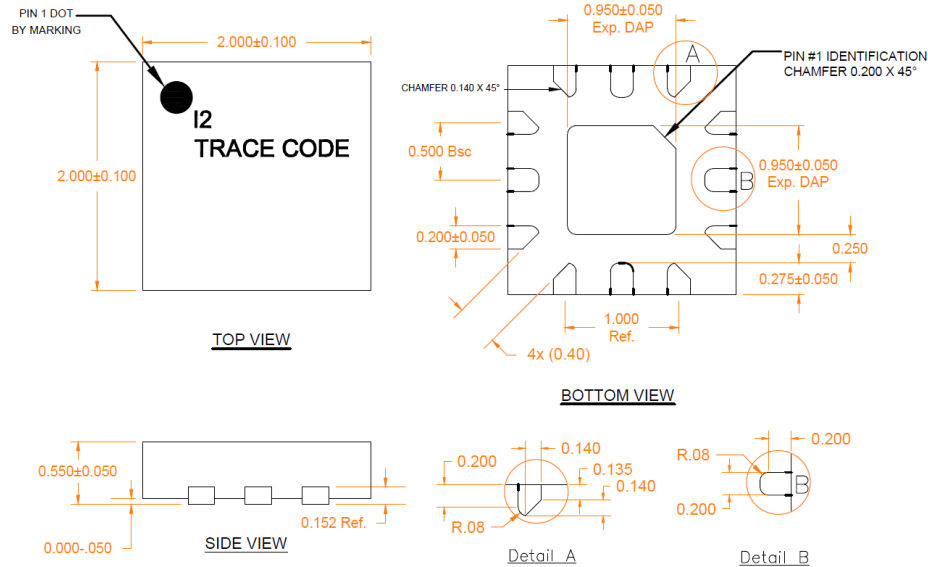


Top View

Pad No.	Label	Description
1	GND	DC and RF Ground
2	CB1	Control Input
3	VDD	DC Supply Voltage Input
4	RF2B	RF2 Output B
5	GND	DC and RF Ground
6	RF2A	RF2 Output A
7	RF2	RF2 Common Input
8	GND	DC and RF Ground
9	RF1	RF1 Common Input
10	RF1A	RF1 Output A
11	GND	DC and RF Ground
12	RF1B	RF1 Output B
Backside Paddle	-	RF and DC Ground. Must be soldered on PCB ground plane over a bed of via holes to minimize inductance and thermal resistance

Package Marking and Dimensions

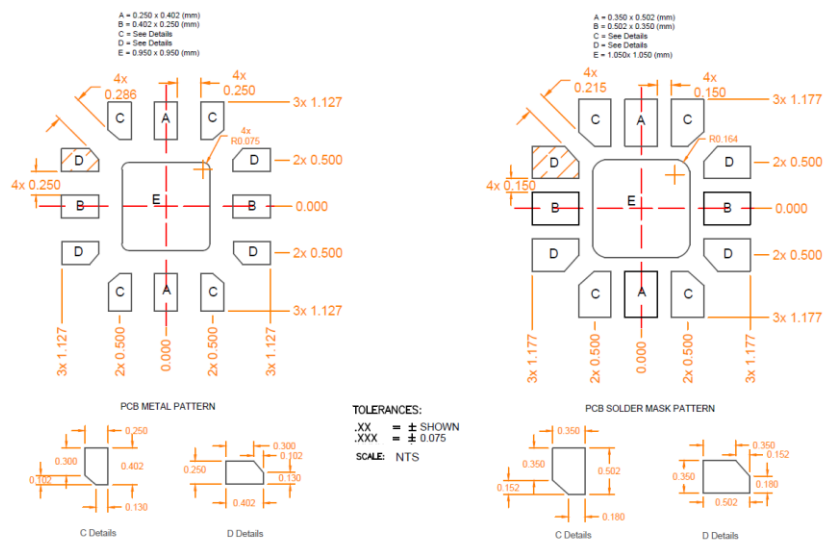
Marking: Part ID – I2
 Trace Code – Assigned by subcontractor



Notes:

1. All dimensions are in millimeters. Angles are in degrees. Interpret dimensions and tolerances per ASME Y14.5 - 2009
2. The terminal #1 identifier and terminal numbering conform to JESD 95-1 SPP-012.
3. Contact plating: Matte Sn

PCB Mounting Pattern



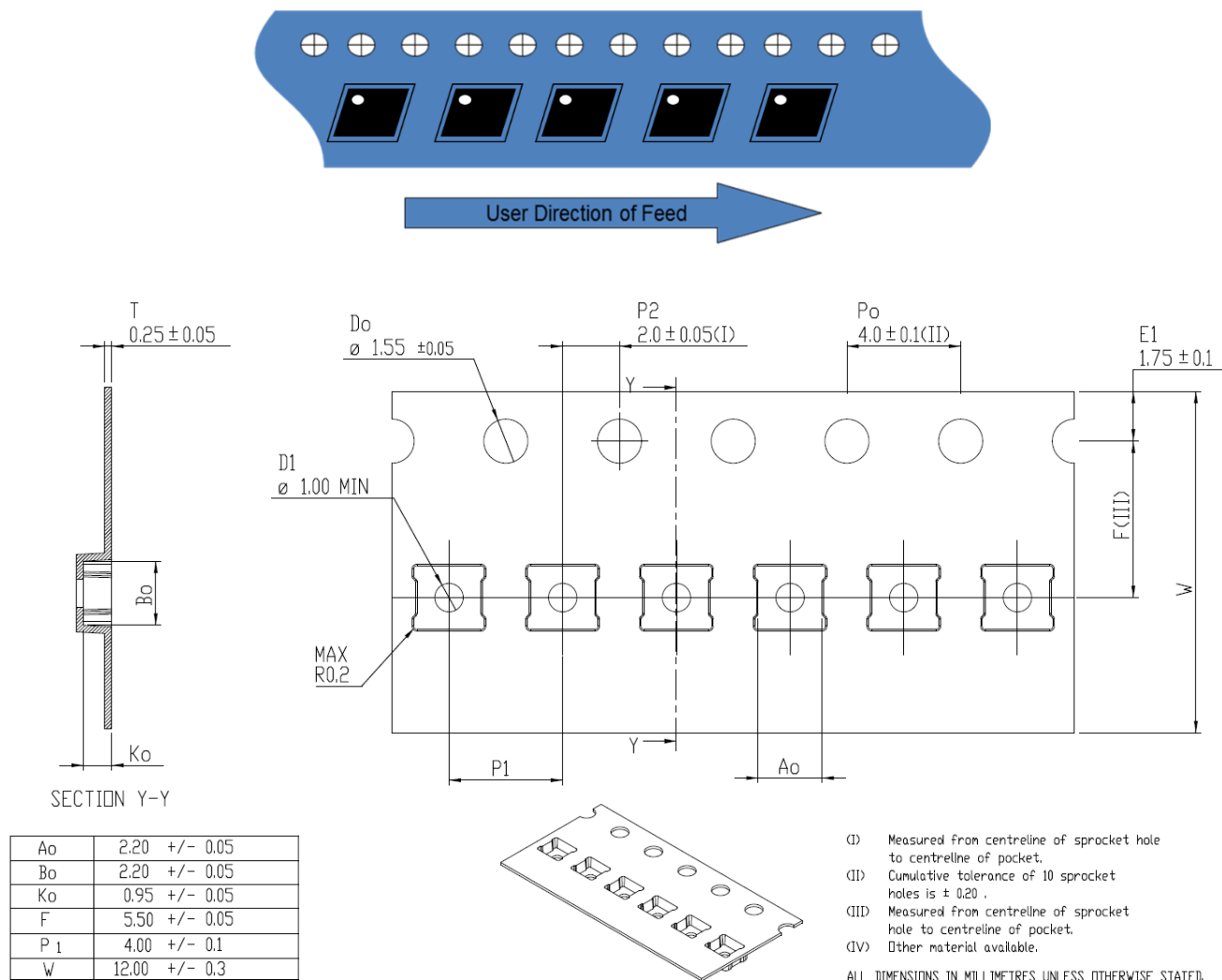
Shaded are represents Pin 1 location.

Thermal vias for center slug "E" should be incorporated into the PCB design.

Notes:

1. All dimensions are in millimeters. Angles are in degrees.
2. Use 1 oz. copper minimum for top and bottom layer metal.
3. Via holes are required under the backside paddle of this device for proper RF/DC grounding and thermal dissipation. We recommend a 0.35mm (#80/.0135") diameter bit for drilling via holes and a final plated thru diameter of 0.25 mm (0.01").
4. Ensure good package backside paddle solder attach for reliable operation and best electrical performance.

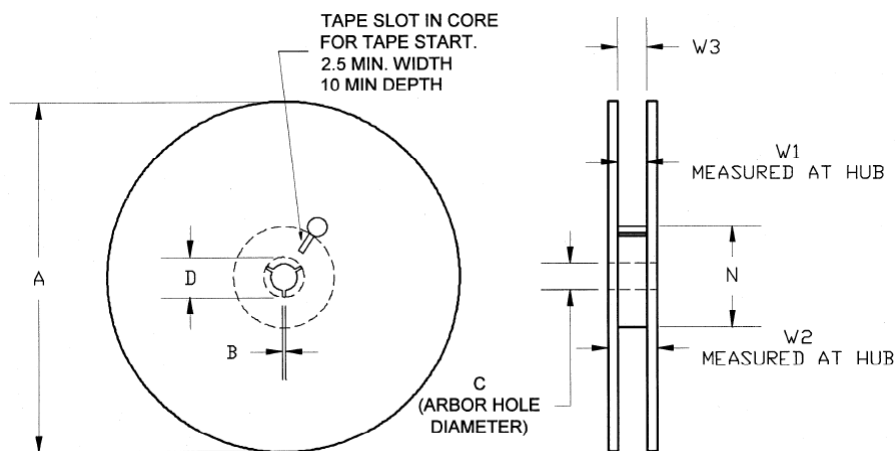
Tape and Reel Information – Carrier and Cover Tape Dimensions



Feature	Measure	Symbol	Size (in)	Size (mm)
Cavity	Length	A0	0.087	2.20
	Width	B0	0.087	2.20
	Depth	K0	0.037	0.95
	Pitch	P1	0.157	4.00
Centerline Distance	Cavity to Perforation - Length Direction	P2	0.079	2.00
	Cavity to Perforation - Width Direction	F	0.217	5.50
Cover Tape	Width	C	0.362	9.20
Carrier Tape	Width	W	0.472	12.0

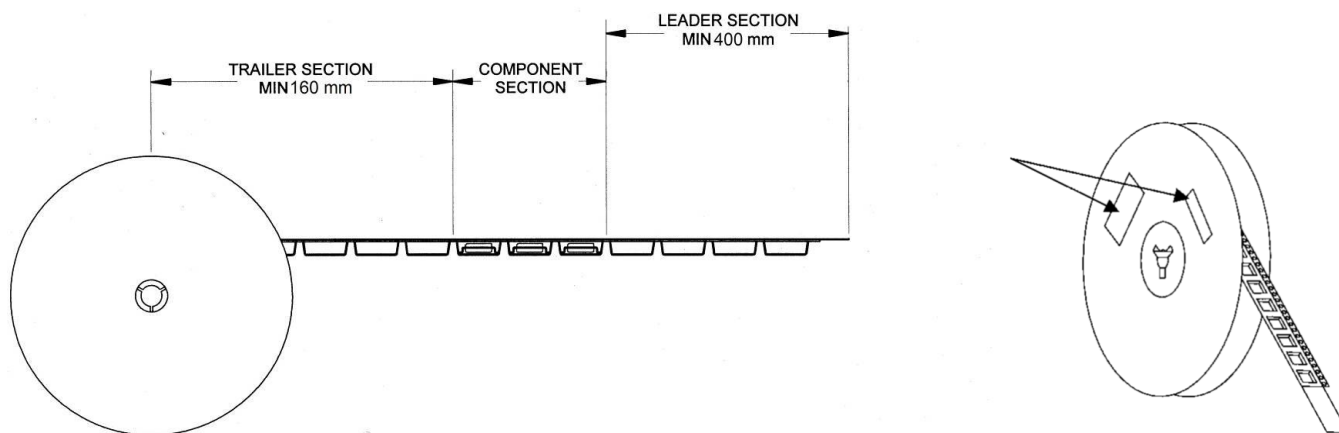
Tape and Reel Information – Reel Dimensions

Standard T/R size = 2,500 pieces on a 7" reel.



Feature	Measure	Symbol	Size (in)	Size (mm)
Flange	Diameter	A	6.969	177.0
	Thickness	W2	0.717	18.2
	Space Between Flange	W1	0.504	12.8
Hub	Outer Diameter	N	2.283	58.0
	Arbor Hole Diameter	C	0.512	13.0
	Key Slit Width	B	0.079	2.0
	Key Slit Diameter	D	0.787	20.0

Tape and Reel Information – Tape Length and Label Placement



Notes:

1. Empty part cavities at the trailing and leading ends are sealed with cover tape. See EIA 481-1-A.
2. Labels are placed on the flange opposite the sprockets in the carrier tape.

Handling Precautions

Parameter	Rating	Standard
ESD – Human Body Model (HBM)	Class 2	ESDA / JEDEC JS-001-2012
ESD – Charged Device Model (CDM)	Class C2a	JEDEC JESD22-C101F
MSL – Moisture Sensitivity Level	Level 1	IPC/JEDEC J-STD-020



Caution!
ESD-Sensitive Device

Solderability

Compatible with both lead-free (260°C max. reflow temp.) and tin/lead (245°C max. reflow temp.) soldering processes.
 Solder profiles available upon request.

Contact plating: Matte Sn (*Plating thickness: 8~ 20 μm*)

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
- Halogen Free (Chlorine, Bromine)
- Antimony Free
- TBBP-A (C₁₅H₁₂Br₄O₂) Free
- SVHC 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 herein is believed to be reliable; however, Qorvo makes no warranties regarding the information contained herein and assumes no responsibility or liability whatsoever for the use of the information contained herein. All information contained herein is subject to change without notice. Customers should obtain and verify the latest relevant information before placing orders for 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. **THIS 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.

Copyright 2021 © Qorvo, Inc. | Qorvo is a registered trademark of Qorvo, Inc.

Mouser Electronics

Authorized Distributor

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

Qorvo:

[RFSW6222SR](#) [RFSW6222TR7](#) [RFSW6222PCBA-410](#) [RFSW6222PCK-410](#)