

SAW Components

SAW Duplexer

Cellular / LTE / Band 7

Series/type: QGSA2G53BASP3

Ordering code: QGSA2G53BASP3

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Version: 2.0



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Contents

1 Applications	3
2 Features	3
3 Package	4
4 Pin configuration	4
5 Matching circuit	5
6 Absolute Maximum Ratings	5
7 Characteristics	6
7.1 TX-ANT	6
7.2 ANT-RX	7
7.3 TX-RX	7
8 Transmission coefficients	8
9 Soldering profile	10
10 Tape and Reel	11
10.1 Tape	11
10.2 Reel with diameter of 178 mm	11

1 Applications

- Multimode SAW duplexer for mobile telephone Cellular / LTE Band 7 systems
- Low Insertion Loss
- High WiFi Attenuation

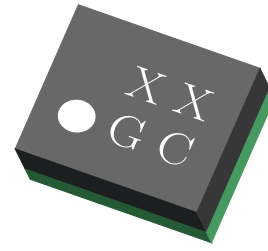
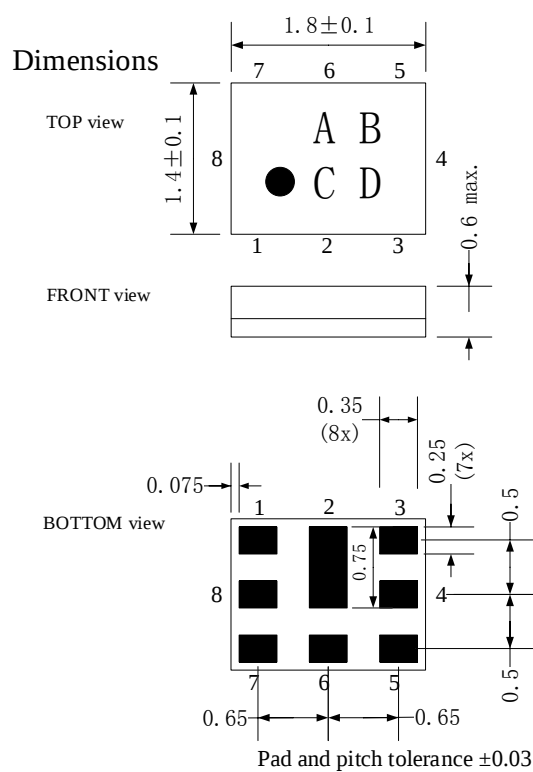


Figure 1: Picture of component with example of product marking.

2 Features

- Package size 1.8 mm x 1.4 mm
- Package height 0.6 mm (max.)
- RoHS compatible
- Package for Surface Mount Technology (SMT)
- Ni/Au-plated terminals
- Electrostatic Sensitive Device (ESD)
- Moisture Sensitivity Level 3 (MSL3)

3 Package



Land Pattern

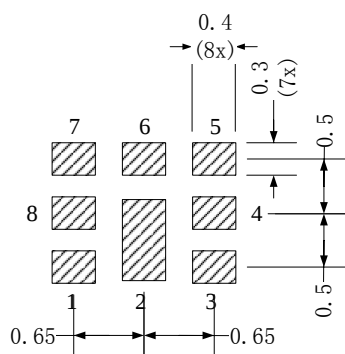


Figure 2: Drawing of package with package height A = 0.6 mm (max.)

4 Pin configuration

- 1 Rx
- 3 Tx
- 6 ANT
- 2,4,5,7,8 Ground

5 Matching circuit

- $R_1 : 50\Omega$ $R_2 : 50\Omega$ $R_3 : 50\Omega$
- $L_{p1} : 2.7nH$ $L_{p2} : 3.9nH$ $L_{p3} : 9nH$

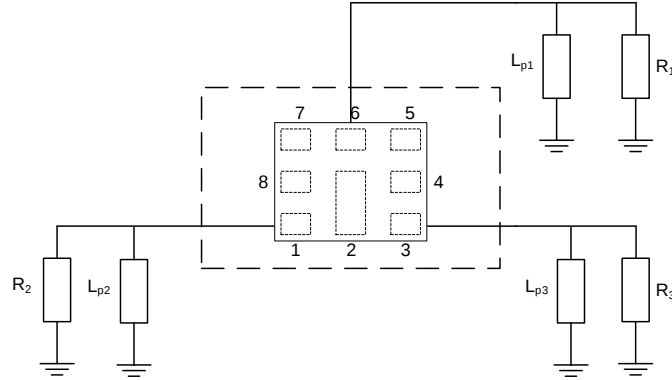


Figure 3: Schematic of matching circuit.

6 Absolute Maximum Ratings

Table 1: Absolute Maximum Ratings of Example Data Sheet

Parameter	Rating
Storage temperature	$T_{STG} = -40^{\circ}C$ to $+85^{\circ}C$
Operating temperature	$T_{opt} = -20^{\circ}C$ to $+85^{\circ}C$
DC voltage	$V_{DC} = 3.0V(max)$
Input power(TX)	$P_{IN} = +29dBm$ 5000h $+55^{\circ}C$
Input power(RX)	$P_{IN} = +28dBm$ 5000h $+55^{\circ}C$

7 Characteristics

Temperature range for specification $T_{SPEC} = -20^{\circ}C \dots +85^{\circ}C$

ANT terminating impedance $Z_{ANT} = 50\Omega$ with par. L_{p1}

RX terminating impedance $Z_{RX} = 50\Omega$ with par. L_{p3}

TX terminating impedance $Z_{TX} = 50\Omega$ with par. L_{p2}

7.1 TX-ANT

Item		min.	typ.	max.	Unit	Note
Center Frequency		2535			MHz	
Insertion Loss	2500 to 2570 MHz		2.3	2.9	dB	
Ripple Deviation	2500 to 2570 MHz		0.7	2	dB	
VSWR	2500 to 2570 MHz		1.5	2.2		ANT
	2500 to 2570 MHz		1.5	2.2		TX
Absolute Attenuation	450 to 1559 MHz	35	42		dB	B3
	791 to 821 MHz	38	44		dB	
	1166.22 to 1605.89 MHz	35	40		dB	
	1805 to 1880 MHz	32	42		dB	
	1900 to 1920 MHz	32	42		dB	
	2010 to 2050 MHz	32	40		dB	B34
	2110 to 2170 MHz	32	42		dB	B1
	2401 to 2468 MHz	32	35		dB	CH1-10Average for any 18M over frequency
	2451 to 2473 MHz	36	45		dB	
	2456 to 2478 MHz	21	44		dB	
	2461 to 2483 MHz	12	28		dB	
	2620 to 2690 MHz	45	54		dB	
	3300 to 4200 MHz	30	44		dB	B7
	4400 to 5140 MHz	27	32		dB	
	5150 to 5950 MHz	20	42		dB	

7.2 ANT-RX

Item		min.	typ.	max.	Unit	Note
Center Frequency		2655			MHz	
Insertion Loss	2620 to 2690 MHz		2.1	2.9	dB	
Ripple Deviation	2620 to 2690 MHz		0.5	1.7	dB	
VSWR	2620 to 2690 MHz		1.8	2.3		ANT
	2620 to 2690 MHz		2.0	2.4		RX
Absolute Attenuation	450 to 2500 MHz	33	35		dB	
	718 to 748 MHz	40	63		dB	B28 Tx
	832 to 862 MHz	40	63		dB	B20 Tx
	880 to 915 MHz	40	63		dB	B8 Tx
	1710 to 1785 MHz	35	38		dB	B3 Tx
	1920 to 1980 MHz	33	36		dB	B1 Tx
	2500 to 2570 MHz	45	52		dB	Tx
	2570 to 2600 MHz	2.5	10		dB	(Rx+Tx)/2
	2775 to 6000 MHz	35	38		dB	
	2400 to 2500 MHz	33	35		dB	ISM 2.4G
	4900 to 5950 MHz	40	50		dB	ISM 5G

7.3 TX-RX

Item	Tx to Rx	min.	typ.	max.	Unit	Note
Isolation	2500 to 2570 MHz	52	55		dB	Tx
	2620 to 2690 MHz	52	55		dB	Rx

8 Transmission coefficients

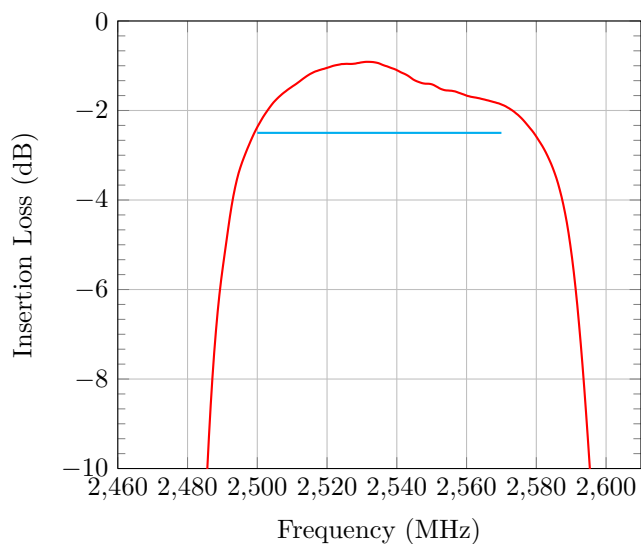


Figure 4: Tx-Ant Insertion Loss

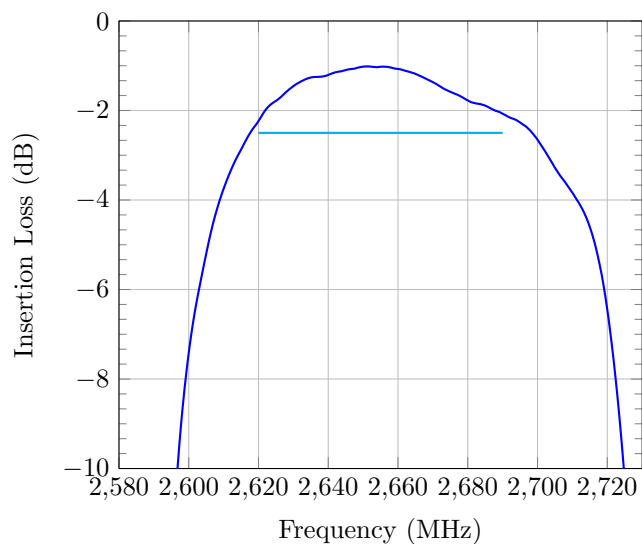


Figure 5: Ant-Rx Insertion Loss

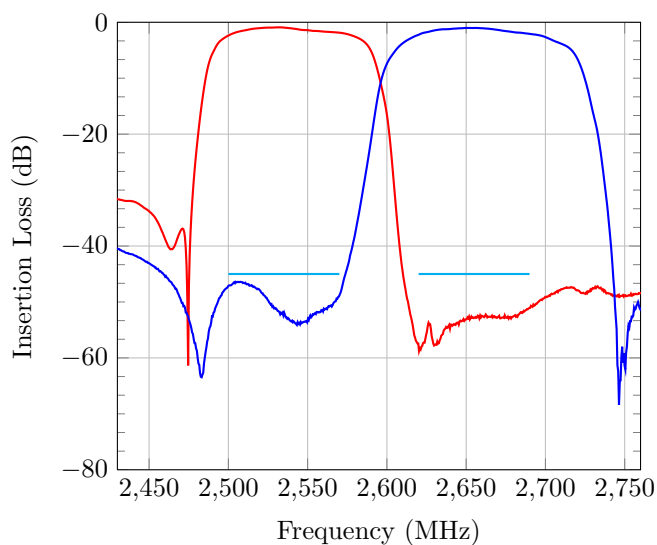


Figure 6: Tx Rejection in Rx Band and Rx Rejection in Tx Band

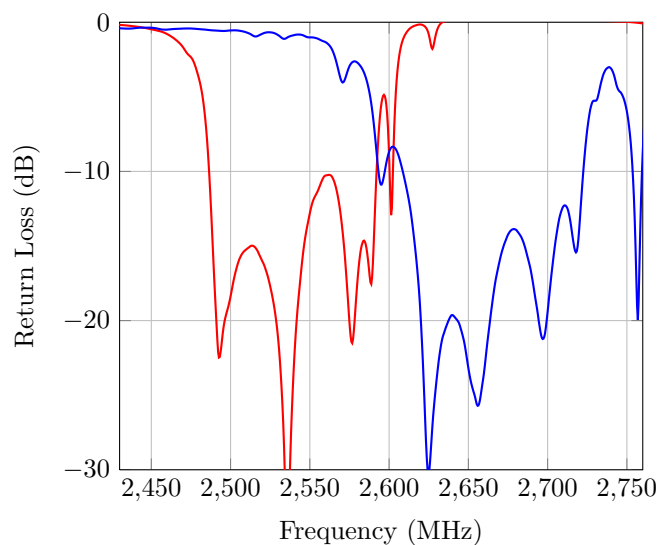


Figure 7: Tx and Rx Port Return Loss

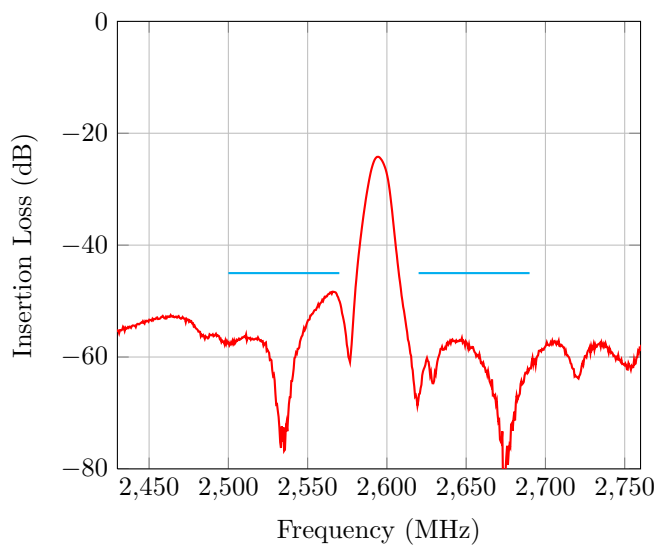


Figure 8: Tx-Rx Isolation

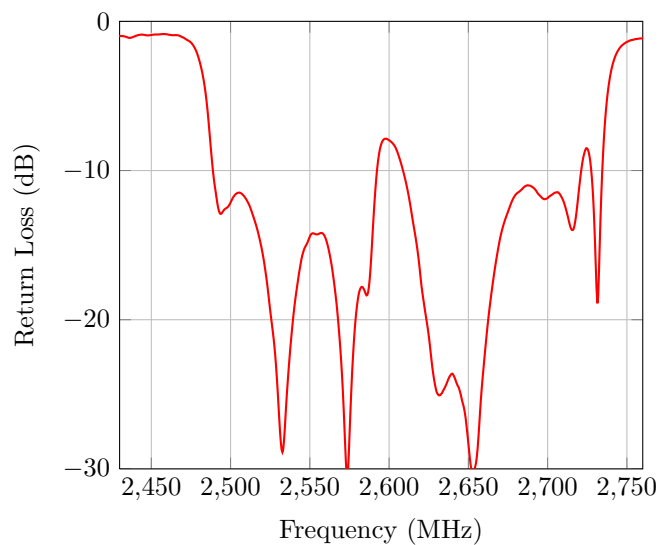


Figure 9: Antenna Port Return Loss

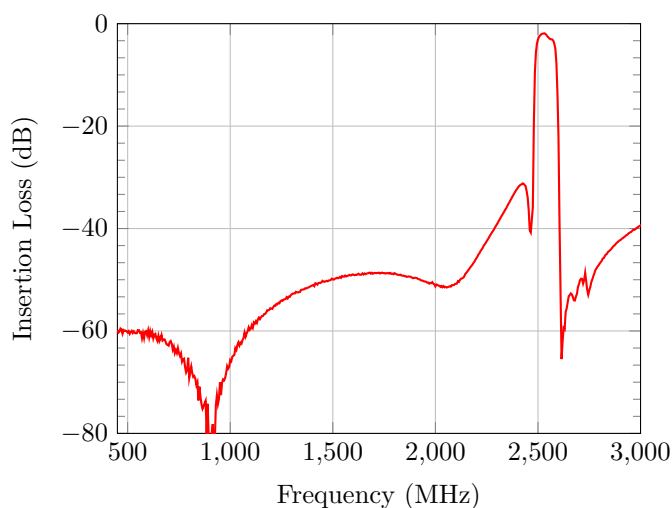


Figure 10: Tx-Ant Wideband Insertion Loss

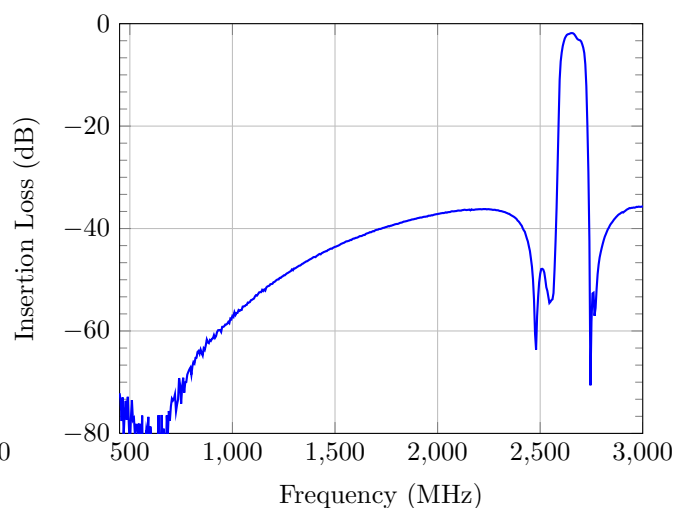
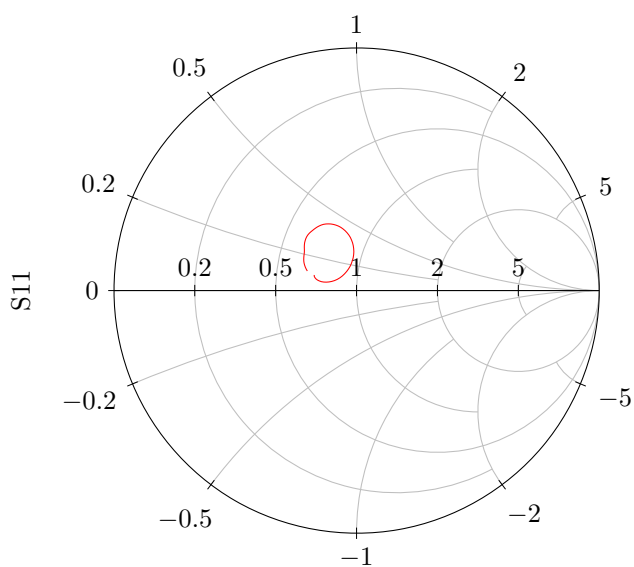
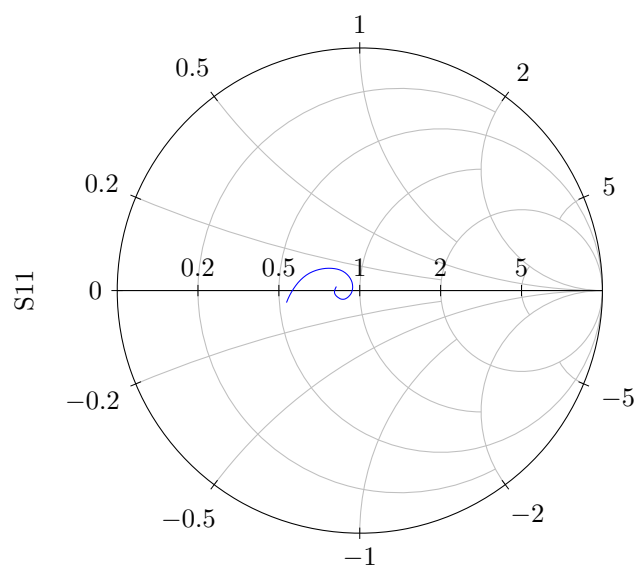
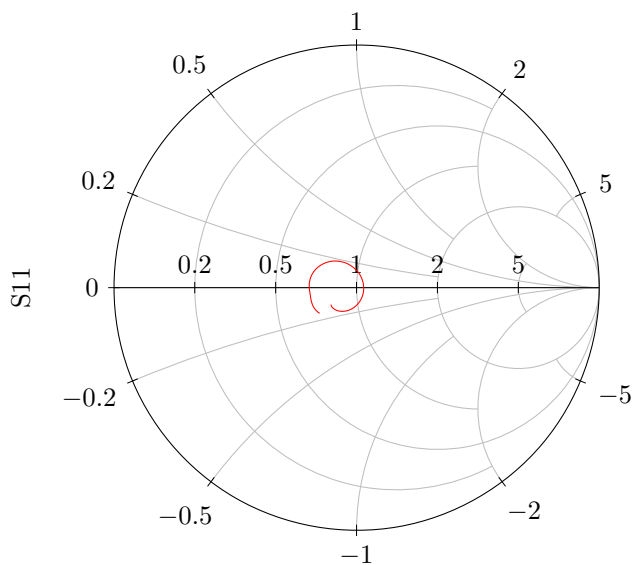
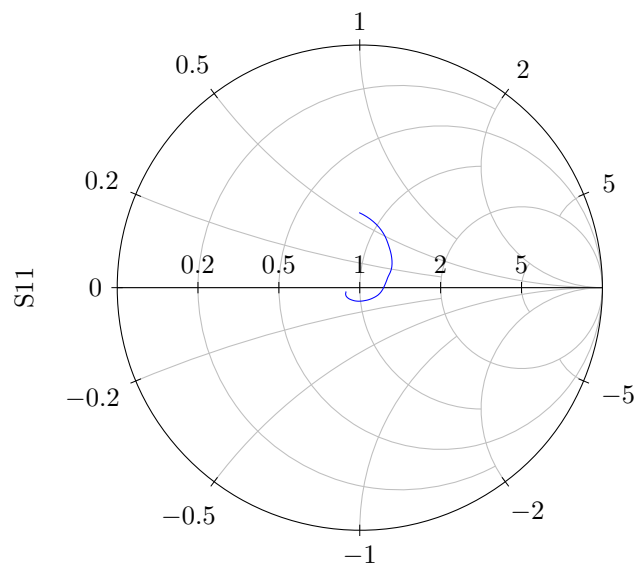


Figure 11: Ant-Rx Wideband Insertion Loss

Figure 12: Tx Port Impedance in Tx Band ($Z_0 = 50\Omega$)Figure 13: Rx Port Impedance in Rx Band ($Z_0 = 50\Omega$)Figure 14: Ant Port Impedance in Tx Band ($Z_0 = 50\Omega$)Figure 15: Ant Port Impedance in Rx Band ($Z_0 = 50\Omega$)

9 Soldering profile

The recommended soldering process is in accordance with IEC 60068-2-58-3rd edit and IPC/JEDECJ-STD-020B.

Table 2: Characteristics of recommended soldering profile for lead-free solder (Sn95.5Ag3.8Cu0.7).

Parameter	Rating
Ramp rate	≥ 3 K/s
Preheat	125 °C to 220 °C, 150 s to 210 s, 0.4 K/s to 1.0 K/s
T >220 °C	30 s to 70 s
T >230 °C	Min. 10 s
T >245 °C	Max. 20 s
T $\leq$ 255 °C	-
Peak temperature T_{peak}	220 °C $\pm$ 5°C
Wetting temperature T_{min}	230 °C $\pm$ 5°C for 10s $\pm$ 1s
Cooling rate	≥ 3 K/s
Soldering temperature T	Measured at solder pads

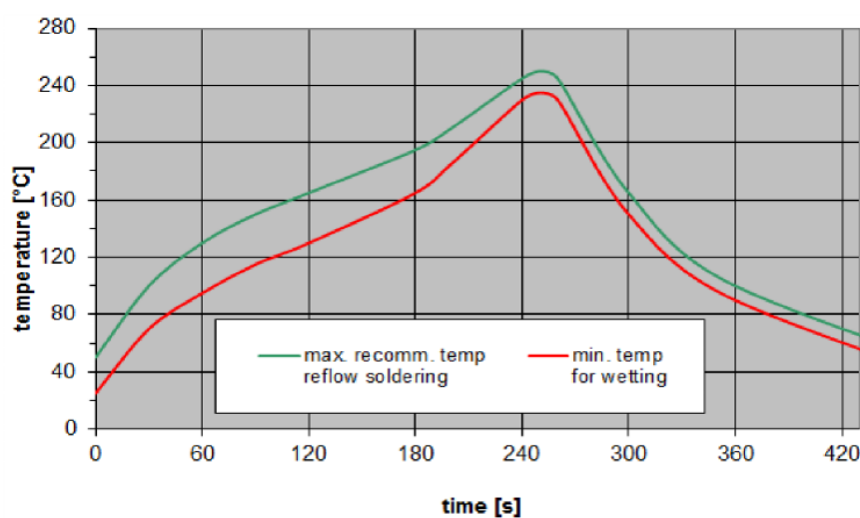


Figure 16: Drawing of reel (Recommended reflow profile for convection and infrared soldering – lead-free solder)

10 Tape and Reel

10.1 Tape

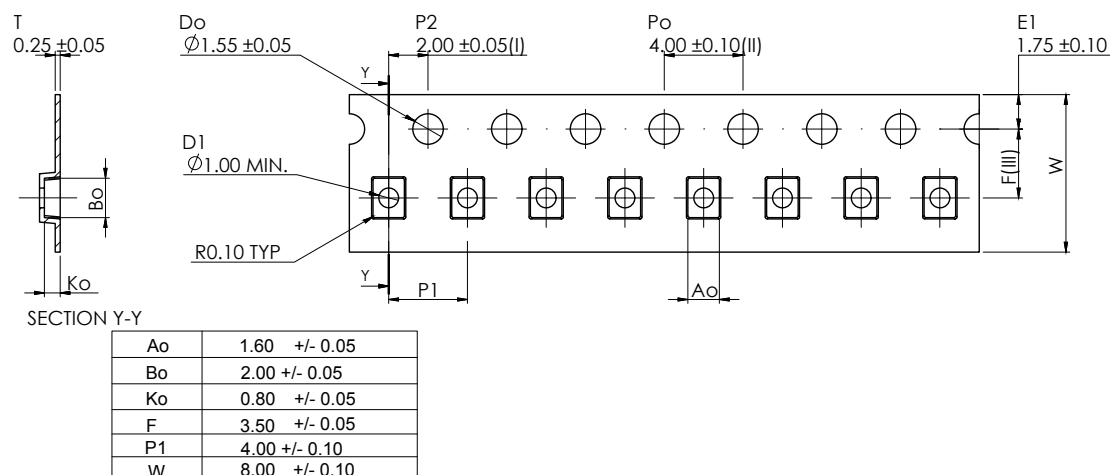


Figure 17: Drawing of tape (first-angle projection) with tape dimensions

10.2 Reel with diameter of 178 mm

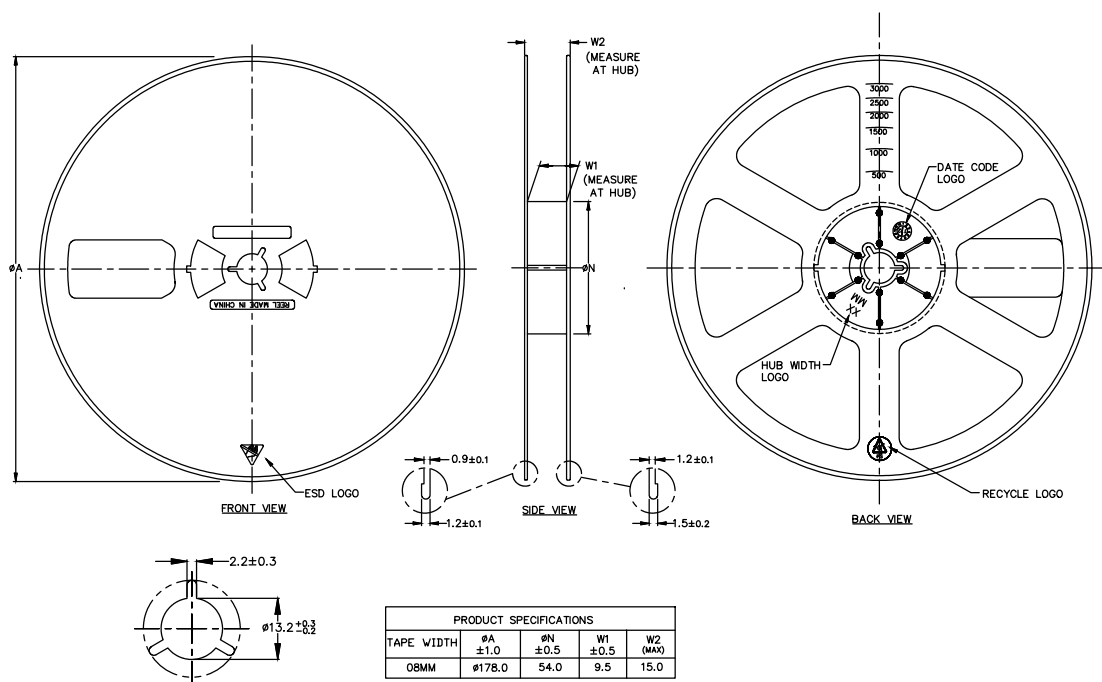


Figure 18: Drawing of reel (first-angle projection) with diameter of 180 mm