

SAW Components

SAW Duplexer

Cellular / LTE / Band 28B

Series/type: QGSA733MAASP3

Ordering code: QGSA733MAASP3

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Version: 1.0



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1 Applications

- Multimode SAW duplexer for mobile telephone Cellular / LTE Band 28B systems
- Low insertion attenuation
- Low amplitude ripple

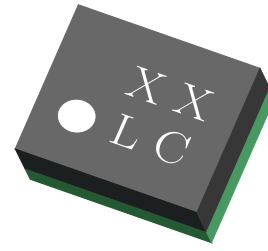
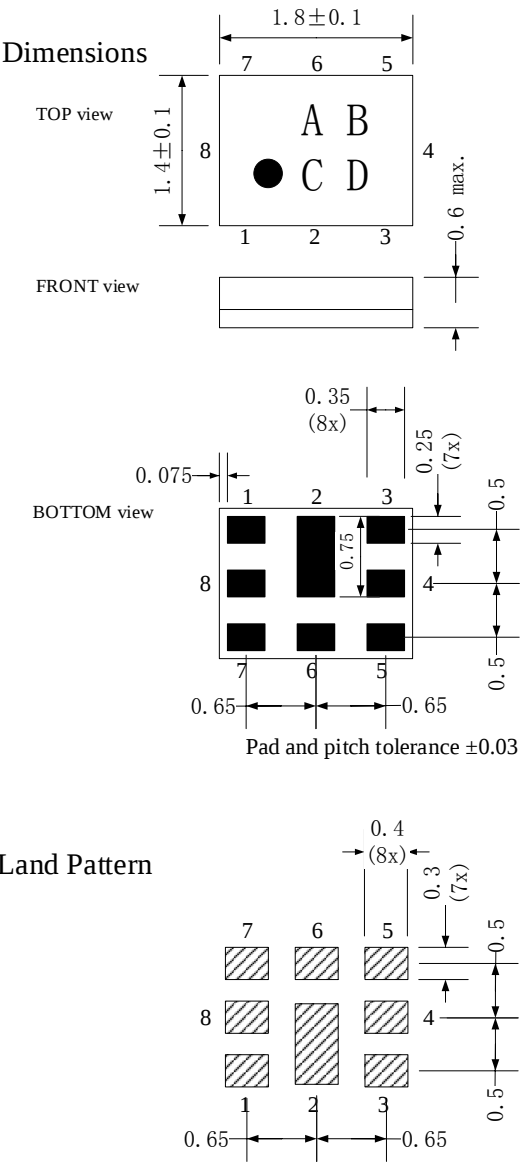


Figure 1: Picture of component with example of product marking.

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



4 Pin configuration

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

5 Matching circuit

- $R_1 : 50\Omega$ $R_2 : 50\Omega$ $R_3 : 50\Omega$
- $L_{p1} : 10.1nH$ $L_{p2} : 12nH$

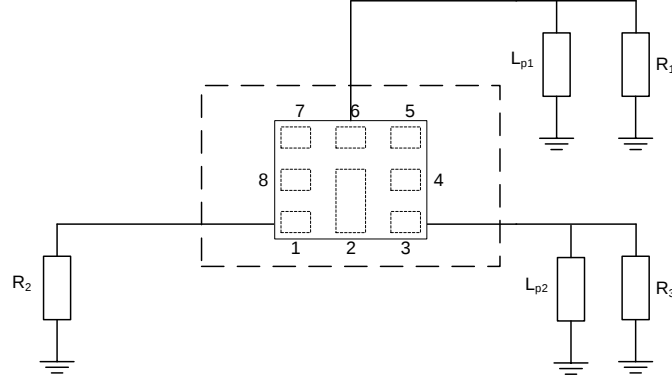


Figure 3: Schematic of matching circuit.

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 ¹	$P_{IN} = +29dBm$ 5000h $+55^{\circ}C$

¹Input signal shall be applied to TX port.

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.

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

7.1 TX-ANT

Item		min.	typ.	max.	Unit	Note
Center Frequency		733			MHz	
Insertion Loss	718 to 748 MHz		1.8	2.6	dB	Any 4.5MHz
Ripple Deviation	718 to 748 MHz		0.9	1.5	dB	Any 5MHz
VSWR	718 to 748 MHz		1.8	2.0		Ant
	718 to 748 MHz		1.6	2.0		Tx
Absolute Attenuation	10 – 698 MHz	30	35		dB	DTV rejection RX
	698 to 710 MHz	30	40		dB	
	758 to 773 MHz	9	39		dB	
	773 to 803 MHz	44	49		dB	
	859 to 894 MHz	30	32		dB	GPS L2 2f
	1225 to 1250 MHz	37	38		dB	
	1436 to 1510 MHz	31	32		dB	
	1559 to 1563 MHz	30	31		dB	
	1565.42 to 1585.42 MHz	30	30		dB	GPS L1
	1597.55 to 1605.89 MHz	29	29		dB	GLONASS
	1805 to 1880 MHz	26	26		dB	B3
	1930 to 1995 MHz	25	26		dB	B2/B25
	2010 to 2025 MHz	25	25		dB	B34
	2154 to 2244 MHz	24	24		dB	3f
	2400 to 2484 MHz	23	23		dB	ISM 2.4G
	2570 to 2620 MHz	23	24		dB	B38
	2870 to 2992 MHz	23	25		dB	4f
	4900 to 5950 MHz	9	11		dB	ISM 5G

7.2 ANT-RX

Item		min.	typ.	max.	Unit	Note
Center Frequency		788			MHz	
Insertion Loss	773 to 803 MHz		2.2	2.8	dB	
Ripple Deviation	773 to 803 MHz		0.3	1.5	dB	Any 5MHz
VSWR	773 to 803 MHz		1.8	2.1		Ant
	773 to 803 MHz		1.7	2.0		Rx
Absolute Attenuation	10 - 699 MHz	51	60		dB	DTV rejection
	45 to 65 MHz	48	100		dB	TX
	703 to 718 MHz	54	58		dB	Block-B TX
	718 to 748 MHz	51	56		dB	
	814 to 6000 MHz	12	50		dB	ISM 2.4G

7.3 TX-RX

Item	Tx to Rx	min.	typ.	max.	Unit	Note
Isolation	718.25 to 747.75 MHz	54	61		dB	TX
	720.5 to 745.5 MHz	54	60		dB	Any 4.5M,TX
	773.25 to 802.75 MHz	53	60		dB	RX
	775.5 to 800.5 MHz	53	61		dB	Any 4.5M,RX
	1436 to 1496 MHz	59	60		dB	2f TX
	2154 to 2244 MHz	51	51		dB	3f TX
	2872 to 2992 MHz	48	48		dB	4f TX

8 Transmission coefficients

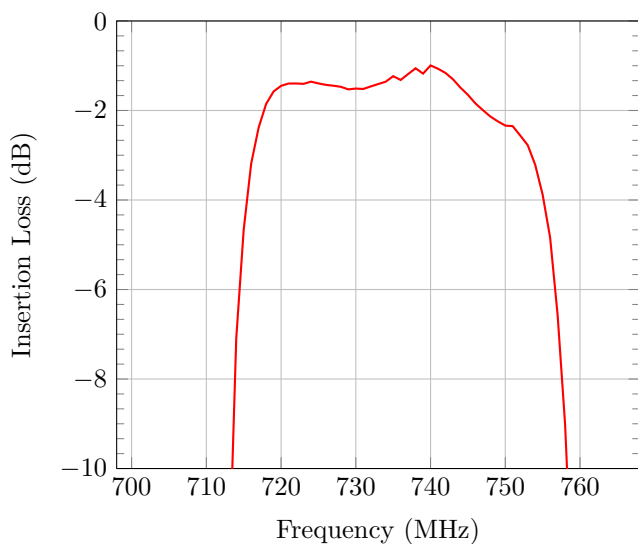


Figure 4: Tx-Ant Insertion Loss

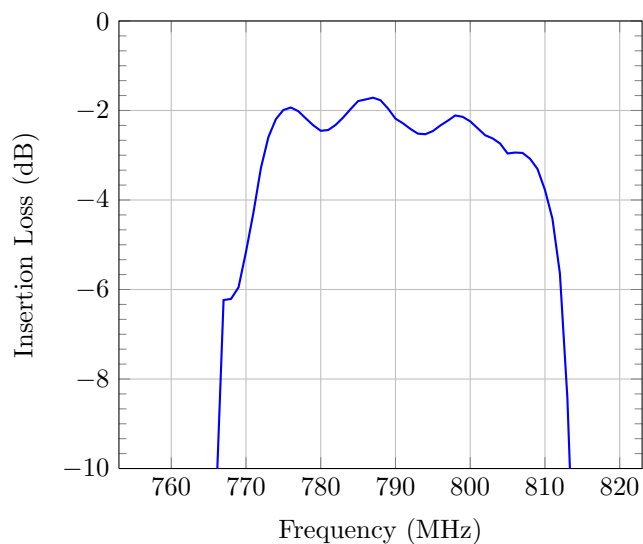


Figure 5: Ant-Rx Insertion Loss

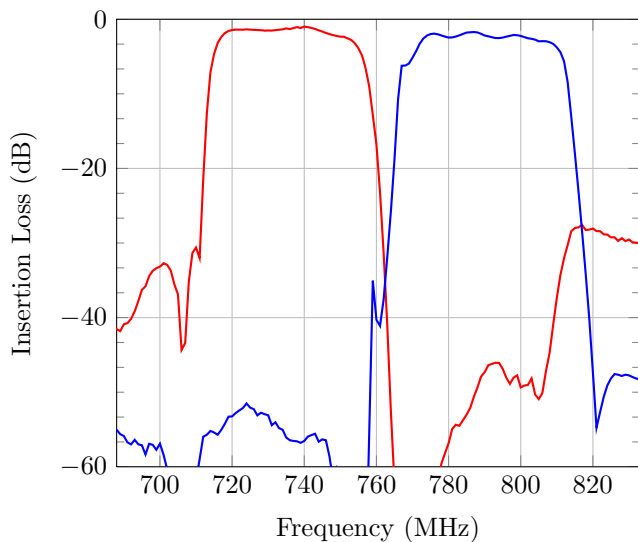


Figure 6: Tx Rejection in Rx Band and Rx Rejection in Tx Band

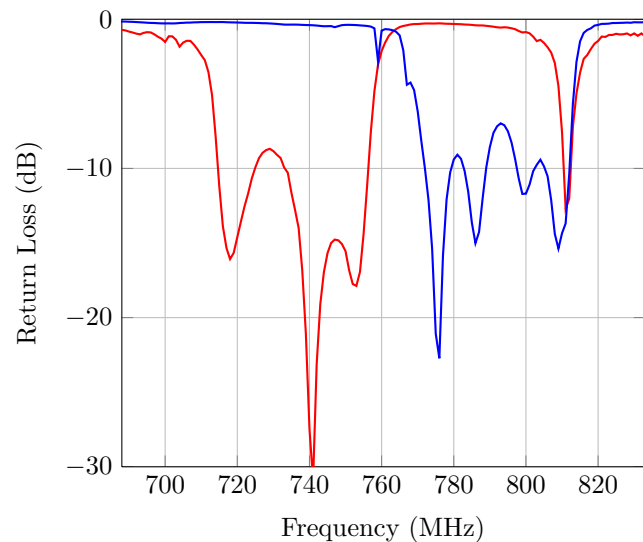


Figure 7: Tx and Rx Port Return Loss

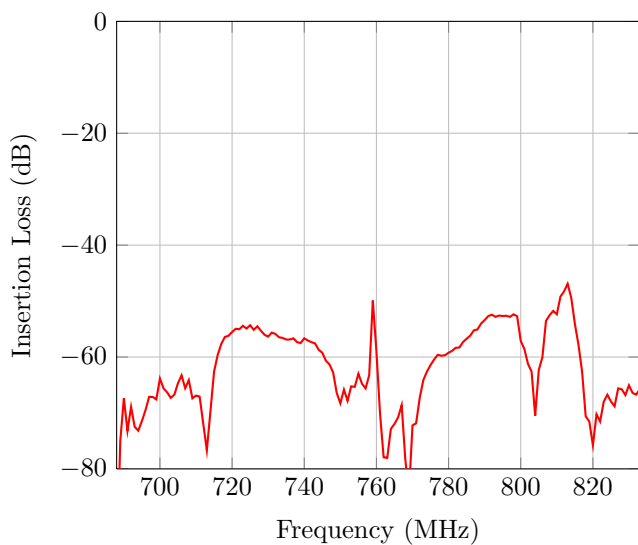


Figure 8: Tx-Rx Isolation

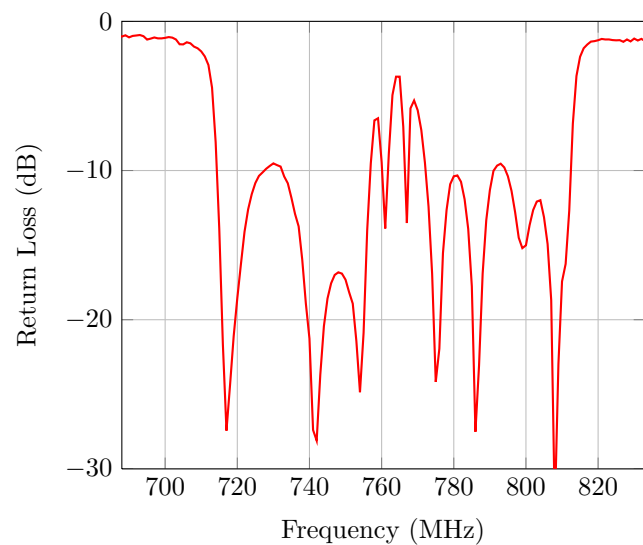


Figure 9: Antenna Port Return Loss

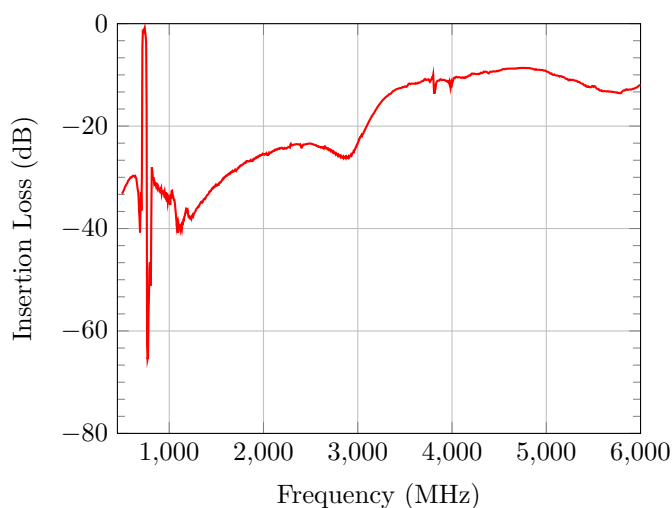


Figure 10: Tx-Ant Wideband Insertion Loss

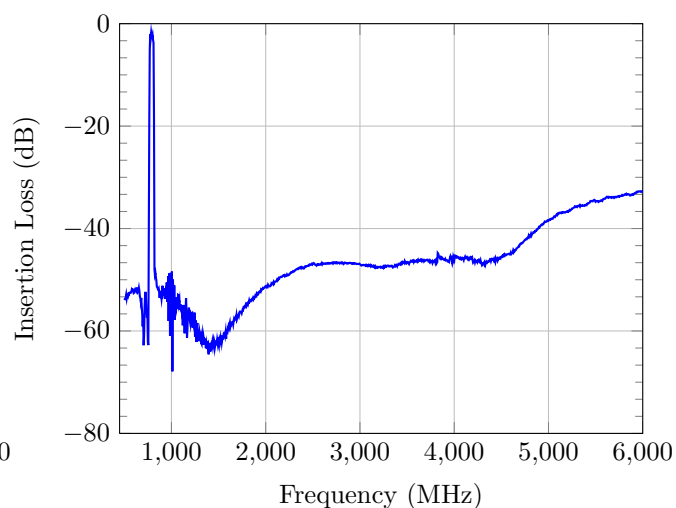
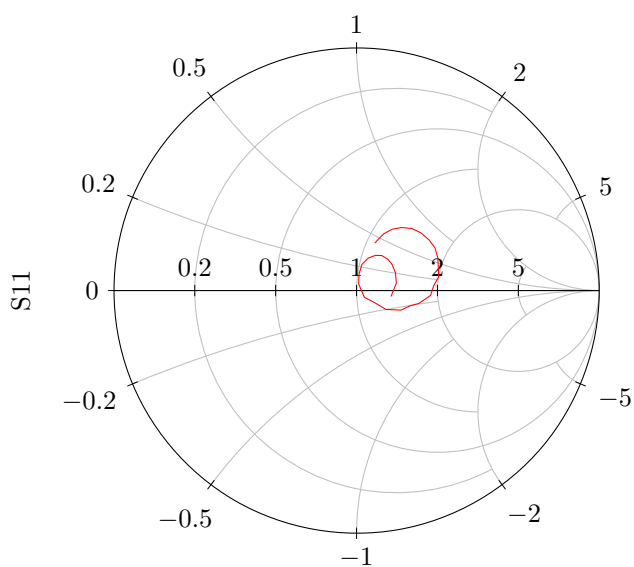
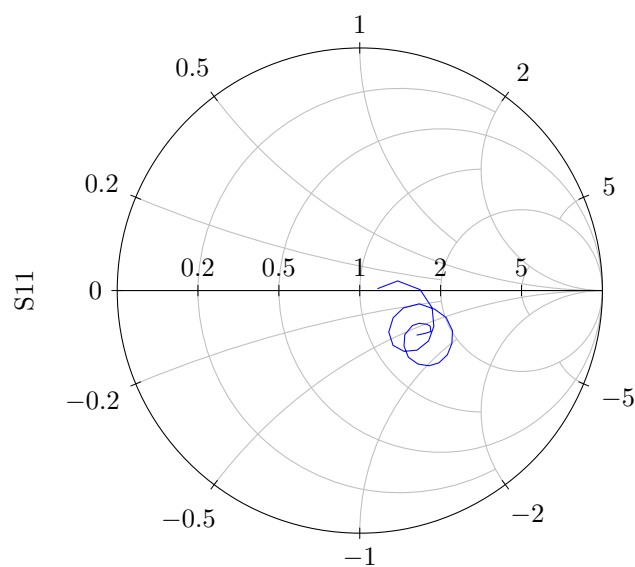
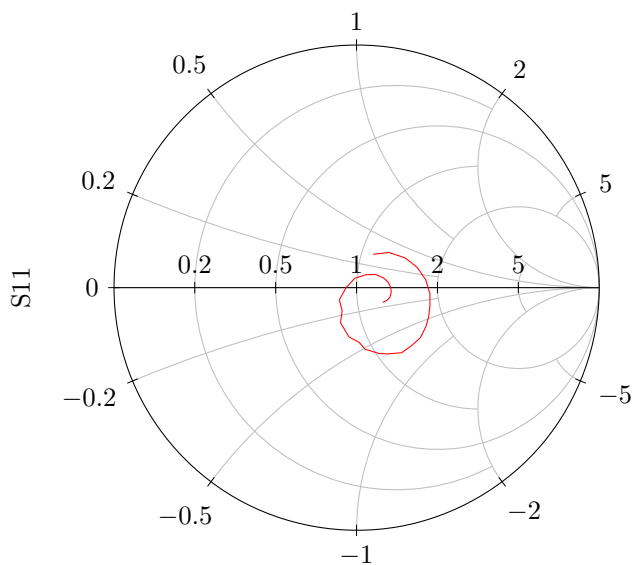
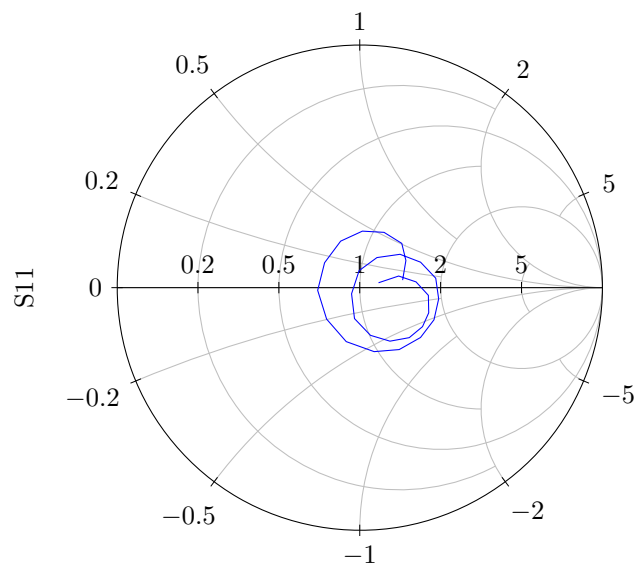


Figure 11: Ant-Rx Wideband Insertion Loss

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

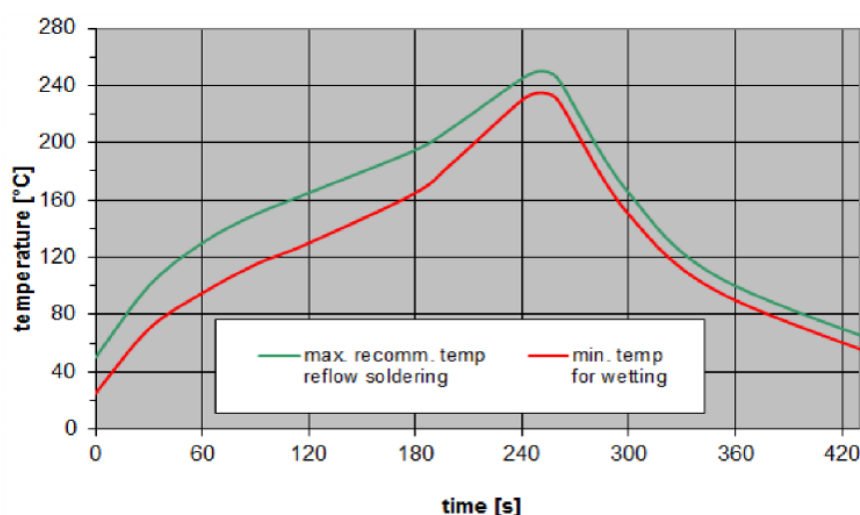


Figure 16: Drawing of reel (Recommended reflow profile for convection and infrared soldering – lead-free solder)

10 Tape and Reel

10.1 Tape

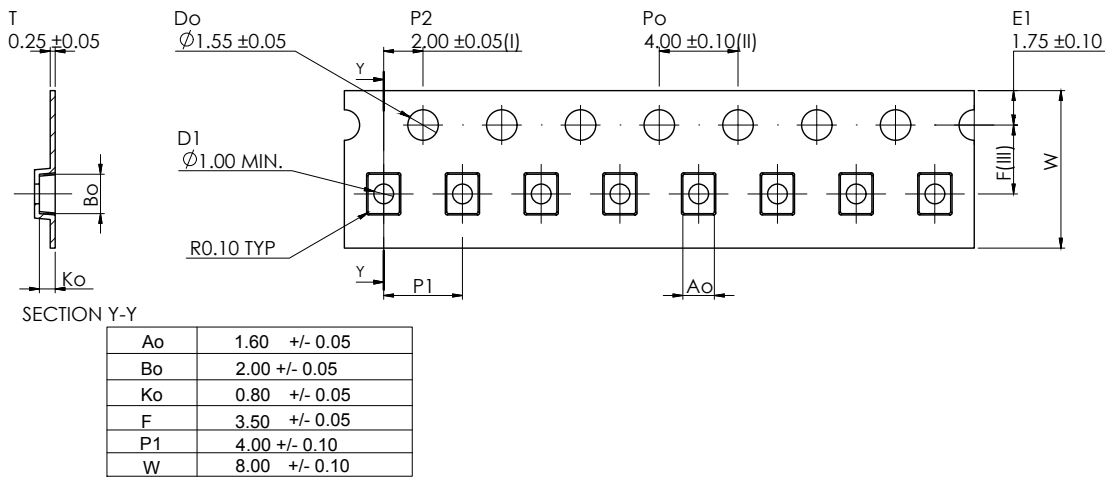


Figure 17: Drawing of tape (first-angle projection) with tape dimensions

10.2 Reel with diameter of 178 mm

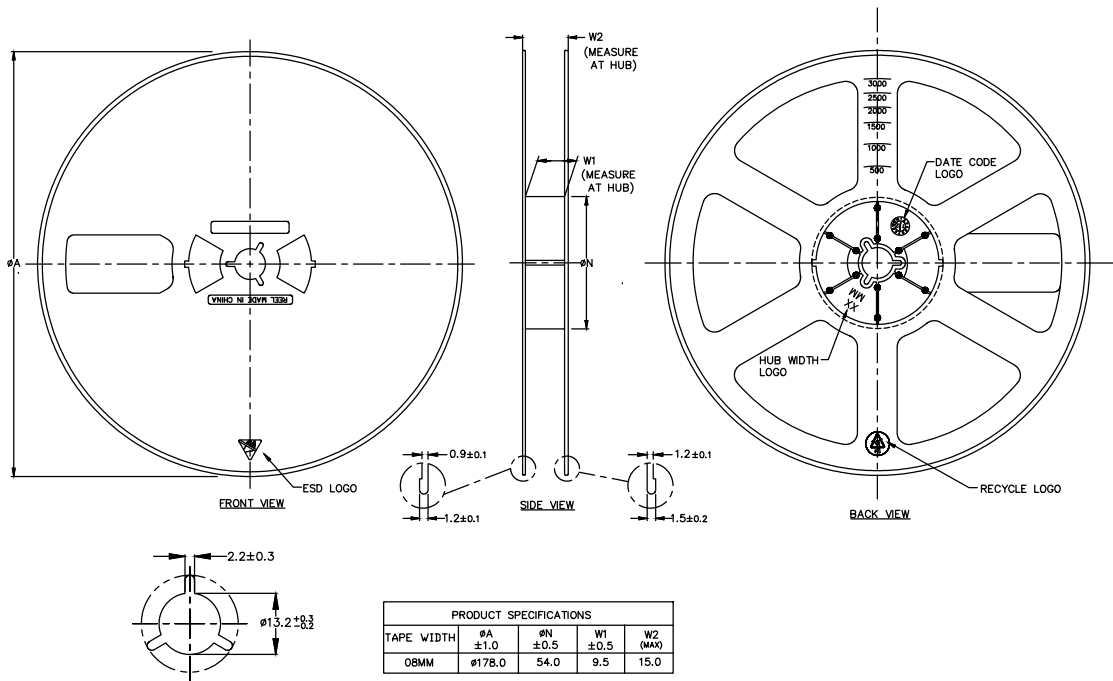


Figure 18: Drawing of reel (first-angle projection) with diameter of 180 mm