

SAW Components

SAW Duplexer

Cellular / LTE / Band 28A

Series/type: QGSA718MAASP3

Ordering code: QGSA718MAASP3

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Version: 1.0



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1 Applications

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

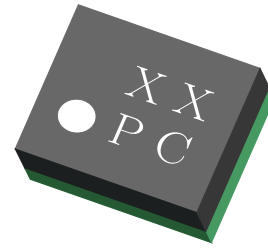


Figure 1: Picture of component with example of product marking.

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

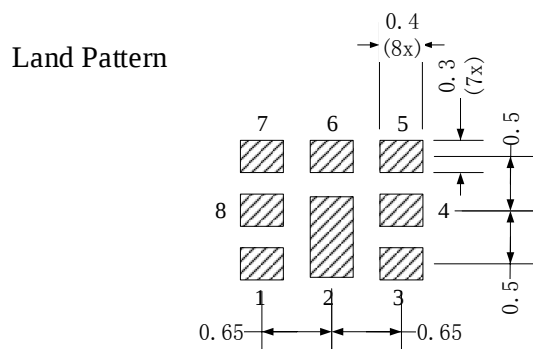
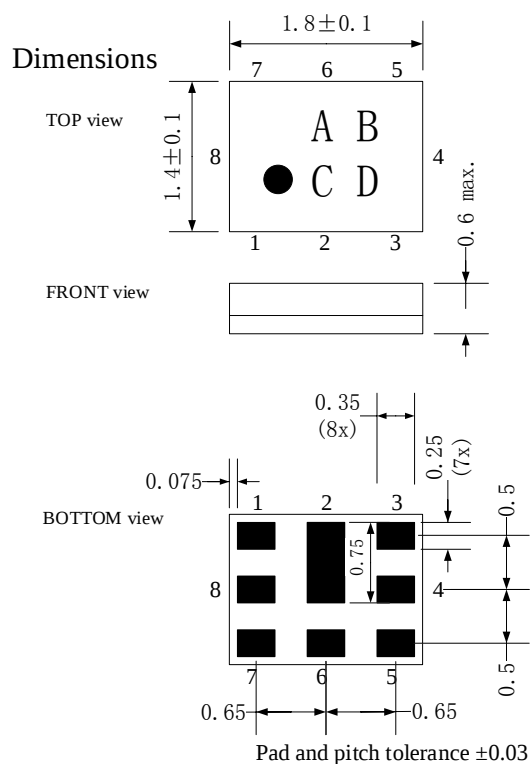


Figure 2: Drawing of package with package height $A = 0.6$ mm (max.)

4 Pin configuration

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

5 Matching circuit

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

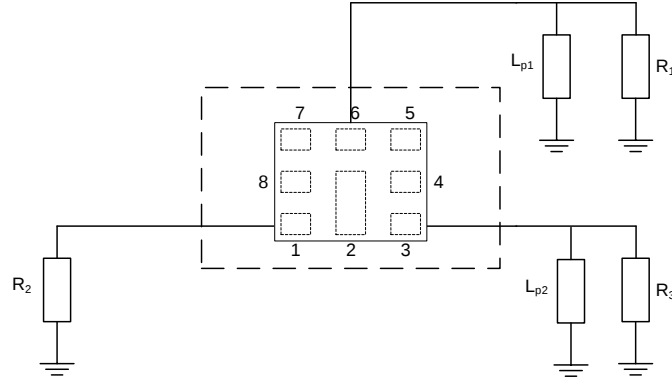


Figure 3: Schematic of matching circuit.

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		718			MHz	
Insertion Loss	703 to 733 MHz		1.9	2.7	dB	Any 4.5MHz
Ripple Deviation	703 to 733 MHz		0.8	1.7	dB	Any 5MHz
VSWR	703 to 733 MHz		1.5	2.0		Ant
	703 to 733 MHz		1.5	2.0		Tx
Absolute Attenuation	10 to 670 MHz	29	34		dB	
	670 to 694 MHz	30	35		dB	DTV rejection
	694 to 695 MHz	25	32		dB	DTV rejection
	695 to 698 MHz	5	11		dB	DTV rejection
	758 to 788 MHz	42	48		dB	RX
	788 to 803 MHz	20	25		dB	
	859 to 894 MHz	25	32		dB	
	1225 to 1250 MHz	33	37		dB	GPS L2
	1406 to 1466 MHz	30	33		dB	2f
	1559 to 1563 MHz	30	32		dB	Compass
	1565.42 to 1585.42 MHz	30	32		dB	GPS L5
	1597.6 to 1605.9 MHz	27	29		dB	GLONASS
	1805 to 1880 MHz	25	28		dB	B3
	1930 to 1995 MHz	25	28		dB	B2/B25
	2010 to 2025 MHz	23	26		dB	B34
	2109 to 2199 MHz	20	25		dB	3f
	2400 to 2484 MHz	22	25		dB	ISM 2.4G
	2570 to 2620 MHz	19	24		dB	B38
	2812 to 2932 MHz	20	25		dB	4f
	4900 to 5950 MHz	10	15		dB	ISM 5G

7.2 ANT-RX

Item		min.	typ.	max.	Unit	Note
Center Frequency		773			MHz	
Insertion Loss	758 to 788 MHz		2.2	2.8	dB	
Ripple Deviation	758 to 788 MHz		0.5	1.6	dB	Any 5MHz
VSWR	758 to 788 MHz		1.8	2.1		Ant
	758 to 788 MHz		1.7	2.0		Rx
Absolute Attenuation	10 - 699 MHz	40	54		dB	DTV rejection
	703 to 733 MHz	52	58		dB	TX
	733 to 748 MHz	25	38		dB	Block-B TX
	814 to 6000 MHz	30	40		dB	
	2400 to 2484 MHz	30	48		dB	ISM 2.4G

7.3 TX-RX

Item	Tx to Rx	min.	typ.	max.	Unit	Note
Isolation	703 to 733 MHz	56	61		dB	TX
	758 to 788 MHz	50	55		dB	RX
	1406 to 1466 MHz	40	62		dB	2f TX
	2109 to 2199 MHz	40	54		dB	3f TX
	2812 to 2932 MHz	40	50		dB	4f TX

8 Transmission coefficients

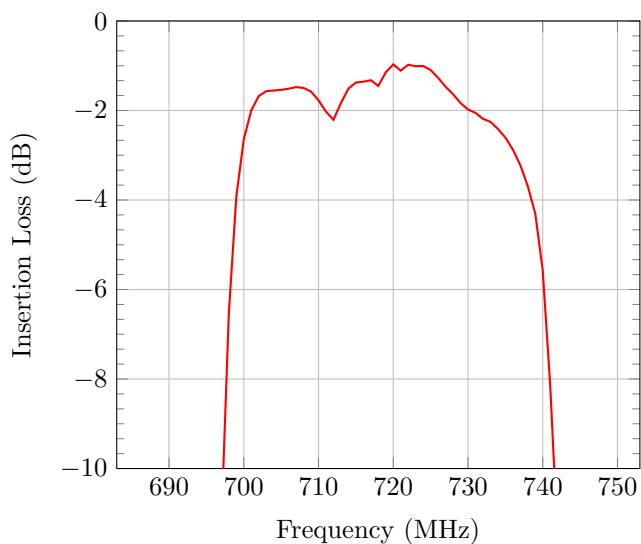


Figure 4: Tx-Ant Insertion Loss

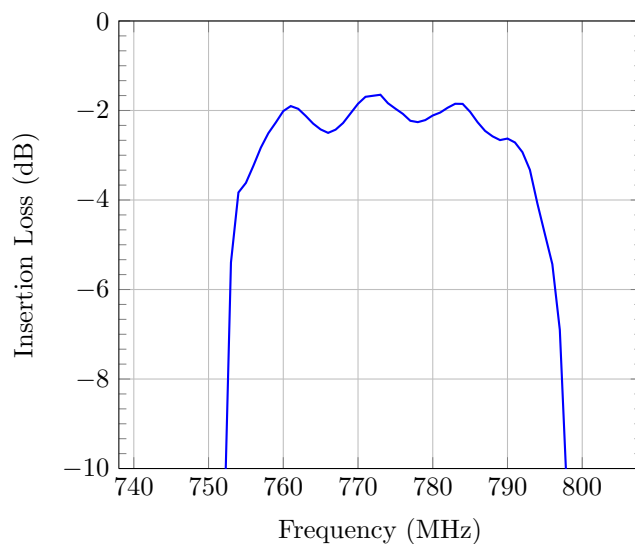


Figure 5: Ant-Rx Insertion Loss

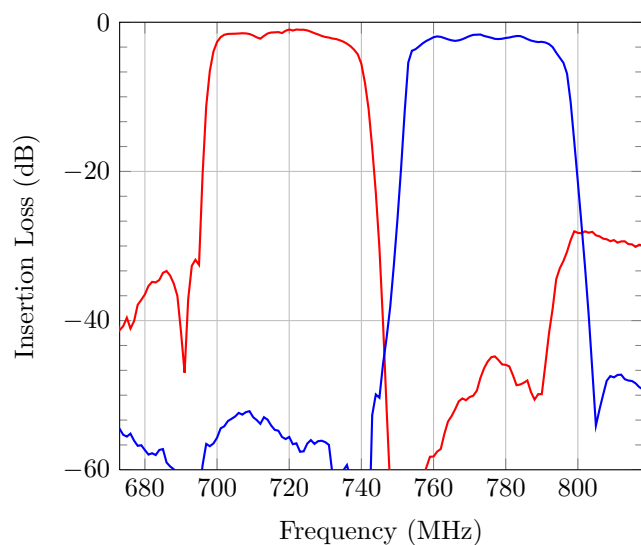


Figure 6: Tx Rejection in Rx Band and Rx Rejection in Tx Band

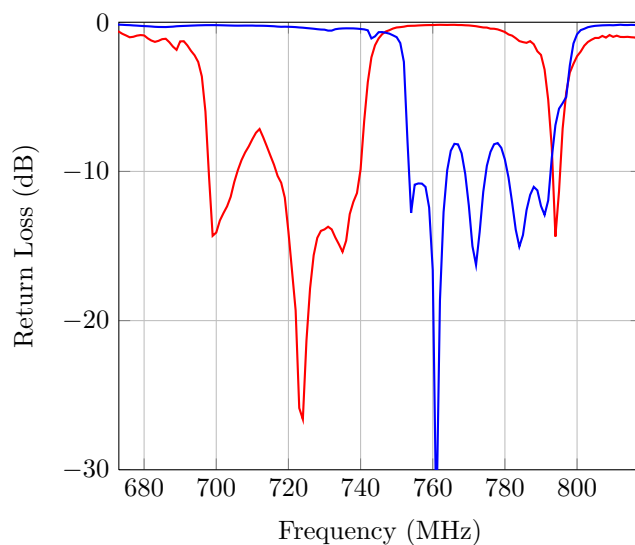


Figure 7: Tx and Rx Port Return Loss

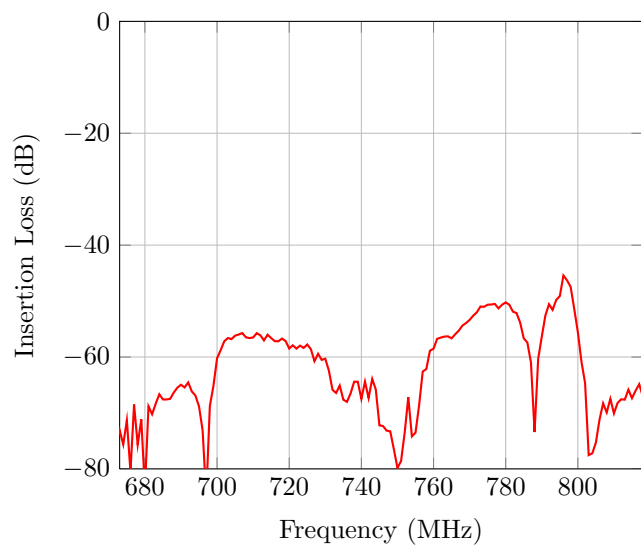


Figure 8: Tx-Rx Isolation

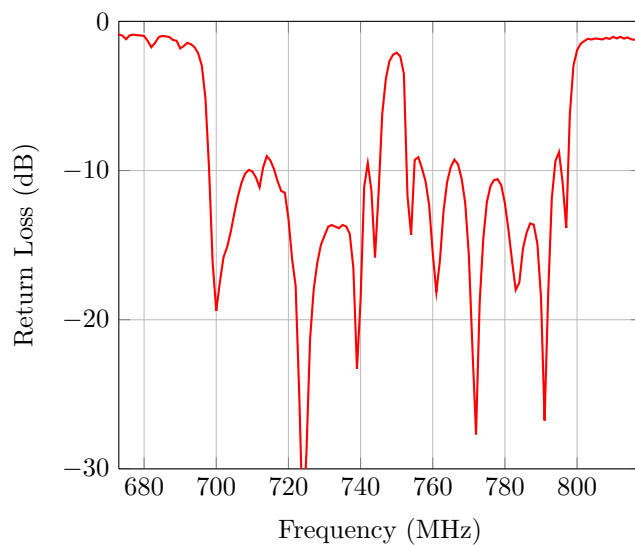


Figure 9: Antenna Port Return Loss

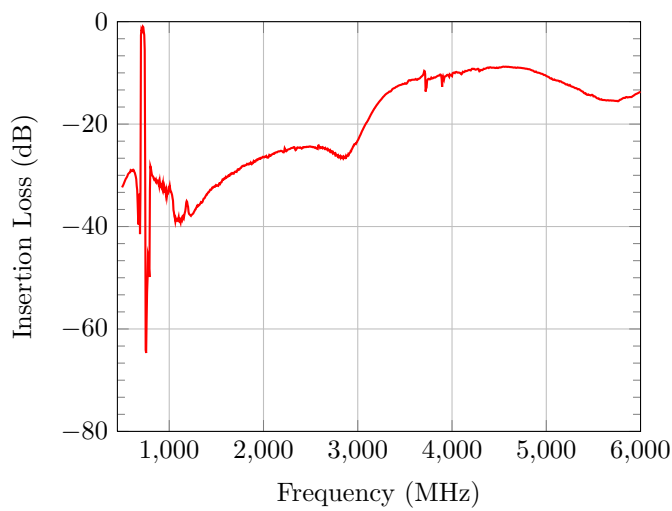


Figure 10: Tx-Ant Wideband Insertion Loss

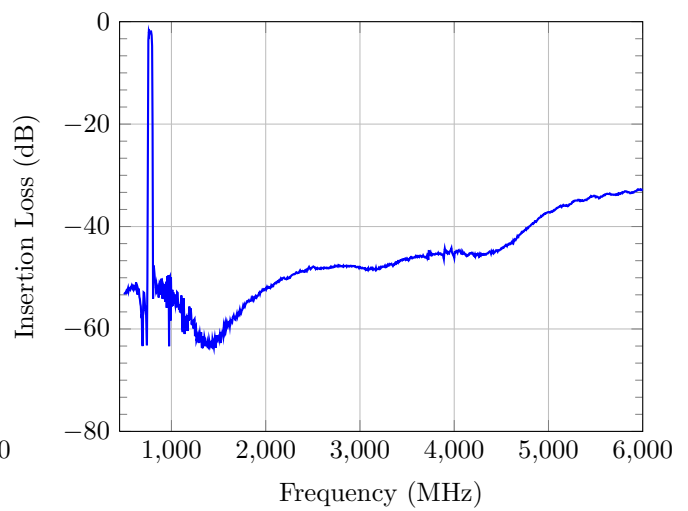
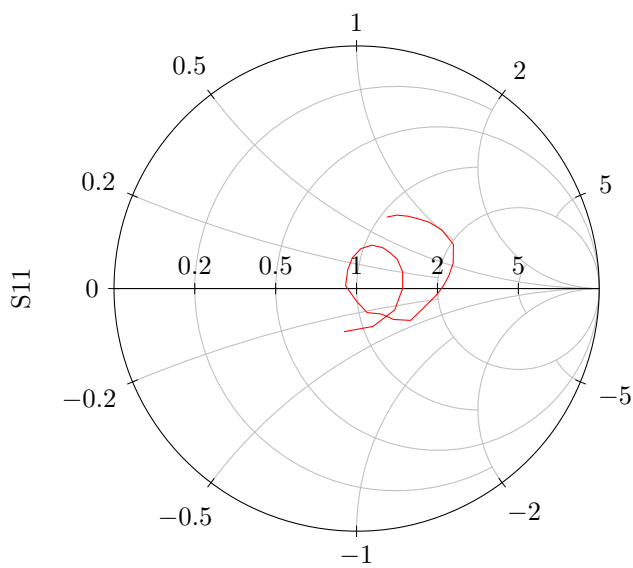
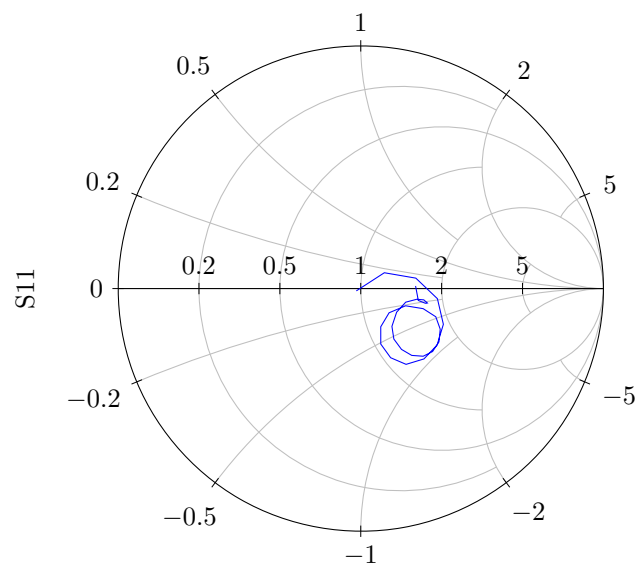
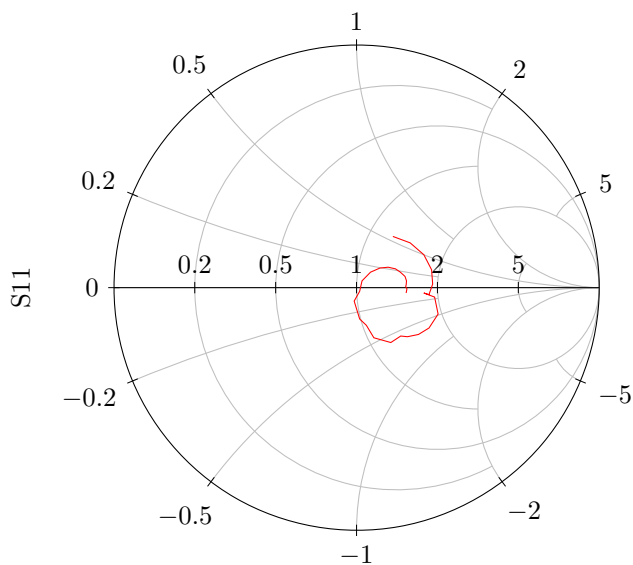
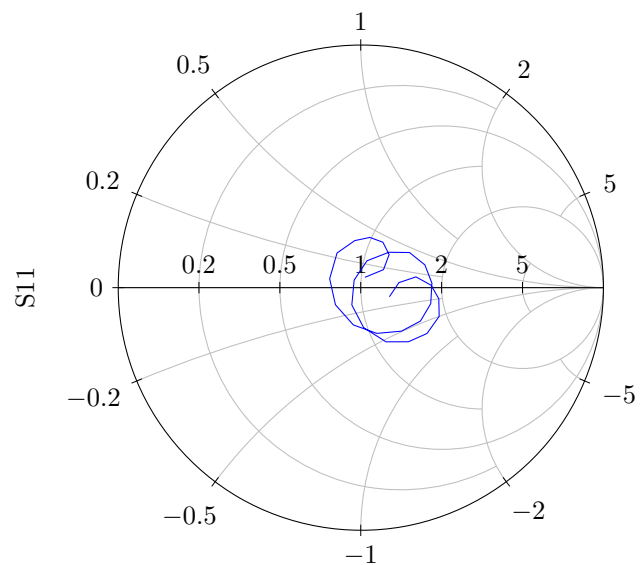


Figure 11: Ant-Rx Wideband Insertion Loss

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

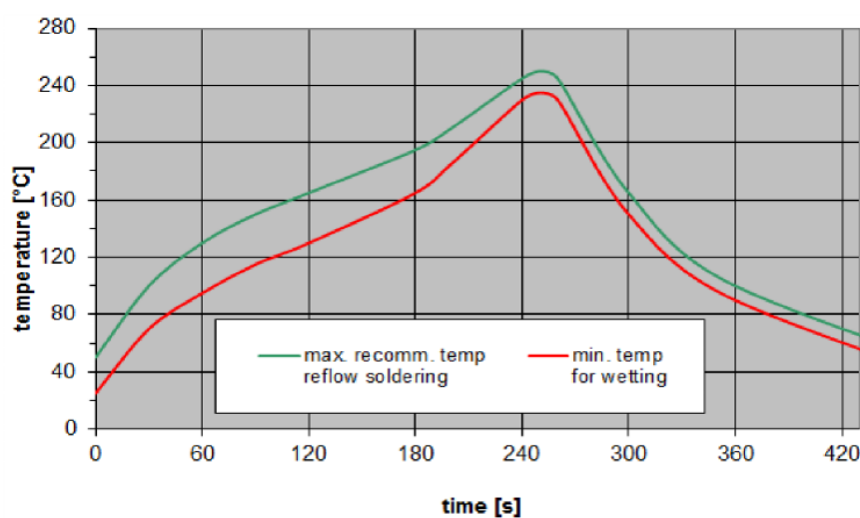


Figure 16: Drawing of reel (Recommended reflow profile for convection and infrared soldering – lead-free solder)

10 Tape and Reel

10.1 Tape

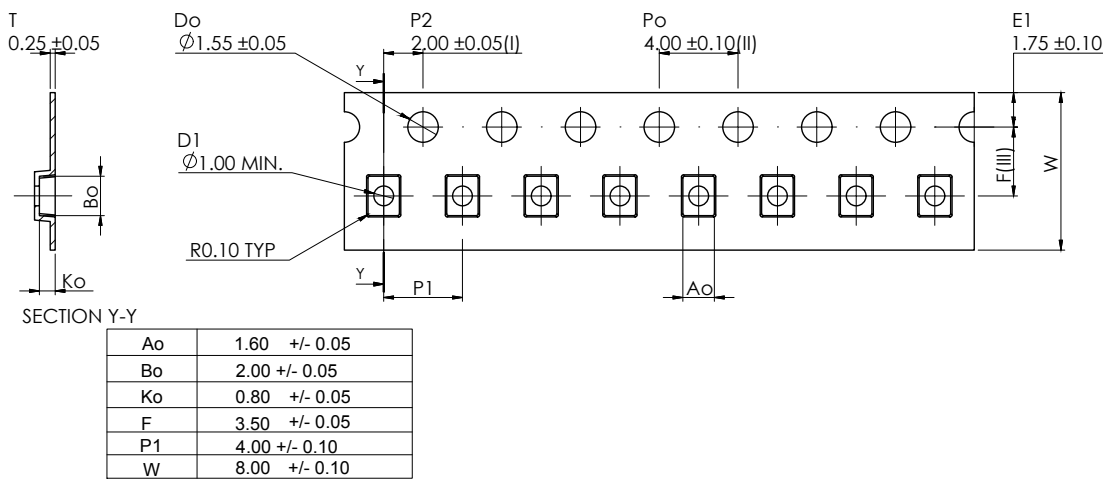


Figure 17: Drawing of tape (first-angle projection) with tape dimensions

10.2 Reel with diameter of 178 mm

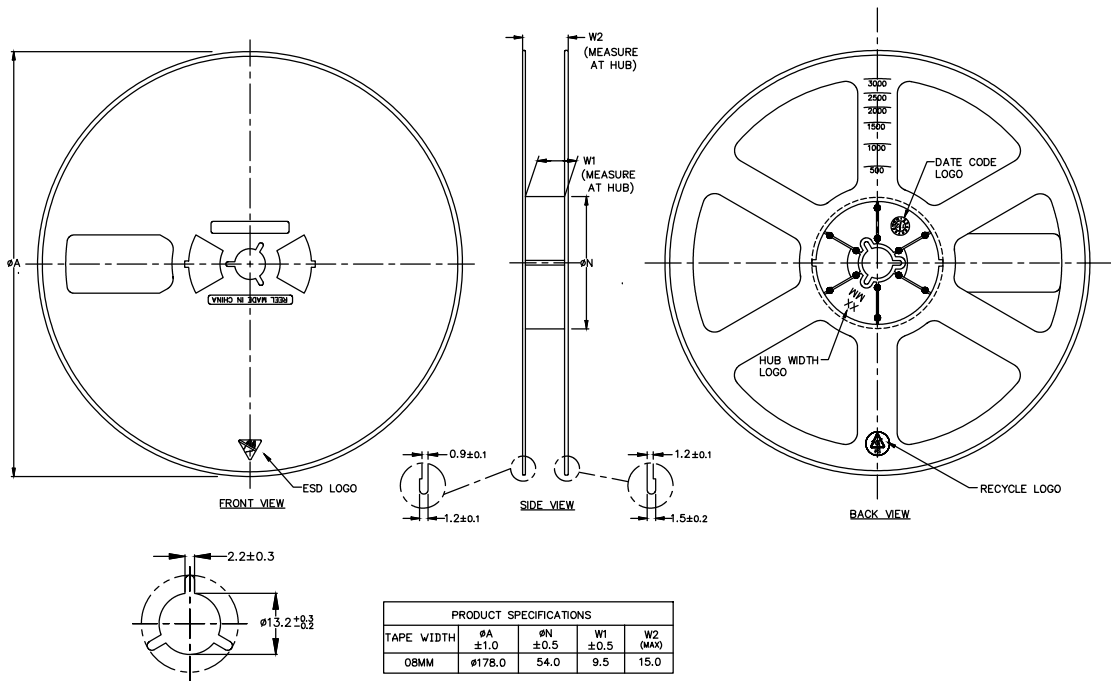


Figure 18: Drawing of reel (first-angle projection) with diameter of 180 mm