

SAW Components

SAW Duplexer

Cellular / LTE / Band 5

Series/type: QGSA836MBASP5

Ordering code: QGSA836MBASP5

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Version: 1.0



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1 Applications

- Multimode SAW duplexer for mobile telephone Cellular / LTE / WCDMA Band 5 systems
- Low Insertion Attenuation
- Low Amplitude Ripple

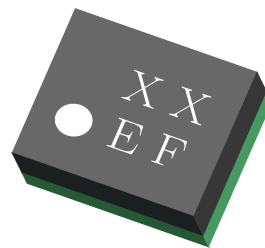


Figure 1: Picture of component with example of product marking.

2 Features

- Package size 1.6 mm x 1.2 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

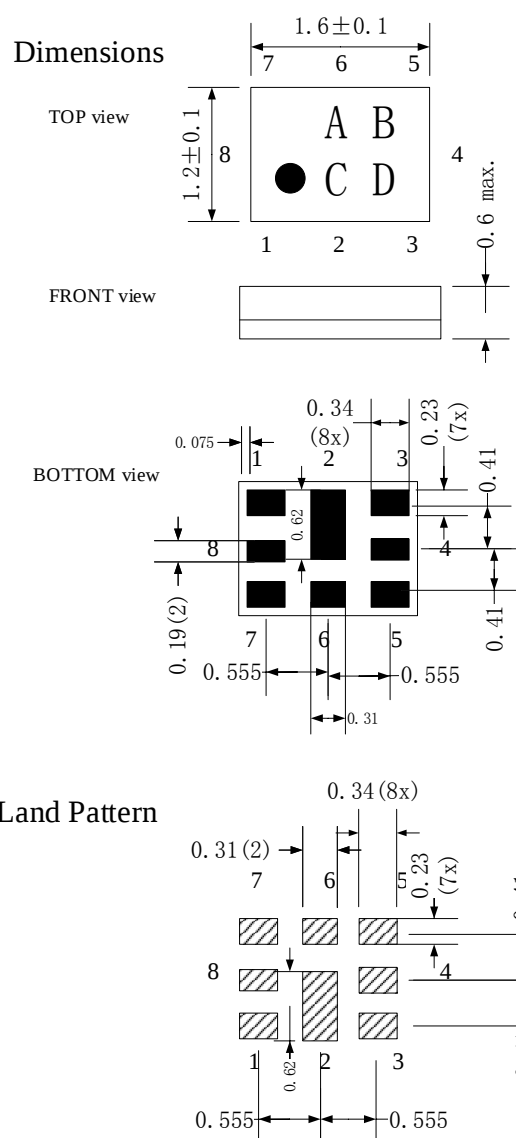


Figure 2: Drawing of package with package height A = 0.6 mm (max.)

4 Pin configuration

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

5 Matching circuit

- $R_1 : 50\Omega$ $R_2 : 50\Omega$ $R_3 : 50\Omega$
- $L_{p1} : 7.5nH$ $L_{p2} : NC$ $L_{p3} : 11nH$

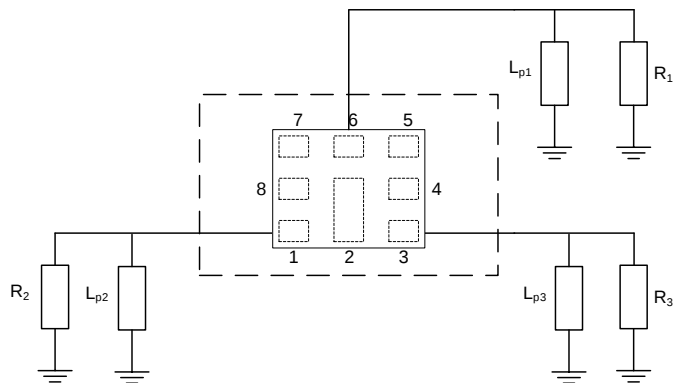


Figure 3: Schematic of matching circuit.

6 Absolute Maximum Ratings

Table 1: Absolute Maximum Ratings of Example Data Sheet

Parameter	Rating
Storage temperature	$T_{STG} = -40^{\circ}C$ to $+85^{\circ}C$
DC voltage	$V_{DC} = 3.0V(max)$
Input power ¹	$P_{IN} = +30dBm$ 5000h $+55^{\circ}C$

¹Input signal shall be applied to Terminal number(1).

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_{p2}

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

7.1 TX-ANT

Item		min.	typ.	max.	Unit	Note
Center Frequency		836.5			MHz	
Insertion Loss	824 to 849 MHz		1.6	2.0	dB	
	826.5 to 846.5 MHz		1.3	1.7		
Ripple Deviation	824 to 849 MHz		0.5	1.4	dB	
	824 to 849 MHz		0.3	1.2	dB	
VSWR	824 to 849 MHz		1.3	2.0		TX
	824 to 849 MHz		1.3	2.0		ANT
Absolute Attenuation	450 to 764 MHz	27	31		dB	
	764 to 804 MHz	28	31		dB	
	860 to 869 MHz	3.0	8.0		dB	
	869 to 894 MHz	45	57		dB	
	1559 to 1605 MHz	27	35		dB	
	1638 to 1708 MHz	24	30		dB	
	1710 to 1785 MHz	24	30		dB	
	1884.5 to 1919.6 MHz	23	31		dB	
	1920 to 1980 MHz	23	30		dB	
	2110 to 2170 MHz	23	28		dB	
	2400 to 2494 MHz	22	28		dB	
	2472 to 2547 MHz	22	28		dB	
	3286 to 3406 MHz	15	24		dB	
	4110 to 4255 MHz	12	19		dB	
	4900 to 5950 MHz	10	18		dB	

7.2 ANT-RX

Item		min.	typ.	max.	Unit	Note
Center Frequency		881.5			MHz	
Insertion Loss	869 to 894 MHz		1.8	2.2	dB	
	871.5 to 891.5 MHz		1.6	1.9	dB	
Ripple Deviation	869 to 894 MHz		0.5	1.2	dB	
	869 to 894 MHz		0.3	0.8	dB	
VSWR	869 to 894 MHz		1.6	2.0		RX
	869 to 894 MHz		1.6	2.0		ANT
Absolute Attenuation	450 to 824 MHz	43	49		dB	
	779 to 804 MHz	44	50		dB	
	824 to 849 MHz	45	58		dB	
	849 to 854 MHz	33	58		dB	
	909 to 979 MHz	12	21		dB	
	1693 to 1743 MHz	45	53		dB	
	1710 to 1785 MHz	45	54		dB	
	1850 to 1920 MHz	40	54		dB	
	1920 to 1980 MHz	40	55		dB	
	1980 to 2400 MHz	40	55		dB	
	2305 to 2315 MHz	33	57		dB	
	2400 to 2500 MHz	30	57		dB	
	2517 to 2592 MHz	30	57		dB	
	2607 to 2682 MHz	30	57		dB	
	3476 to 3576 MHz	32	52		dB	
	4345 to 4470 MHz	35	44		dB	
	4900 to 5950 MHz	25	32		dB	
	5214 to 5364 MHz	25	35		dB	

7.3 TX-RX

Item	Tx to Rx	min.	typ.	max.	Unit	Note
Isolation	824 to 849 MHz	55	59		dB	
	826.5 to 846.5 MHz	55	59		dB	
	869 to 894 MHz	52	55		dB	
	871.5 to 891.5 MHz	52	55		dB	

8 Transmission coefficients

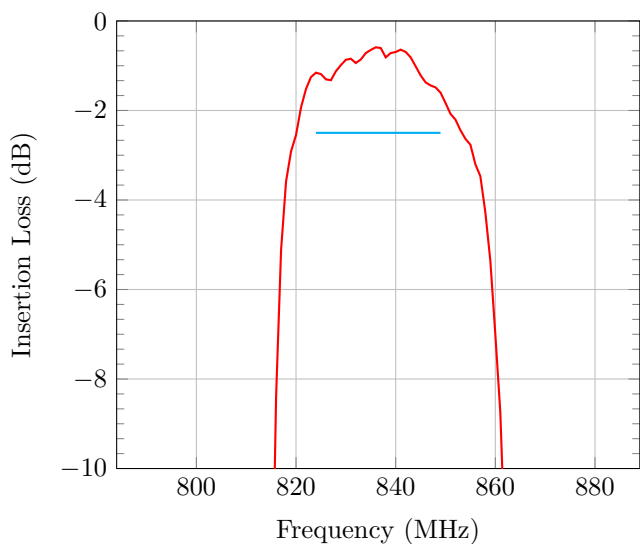


Figure 4: Tx-Ant Insertion Loss

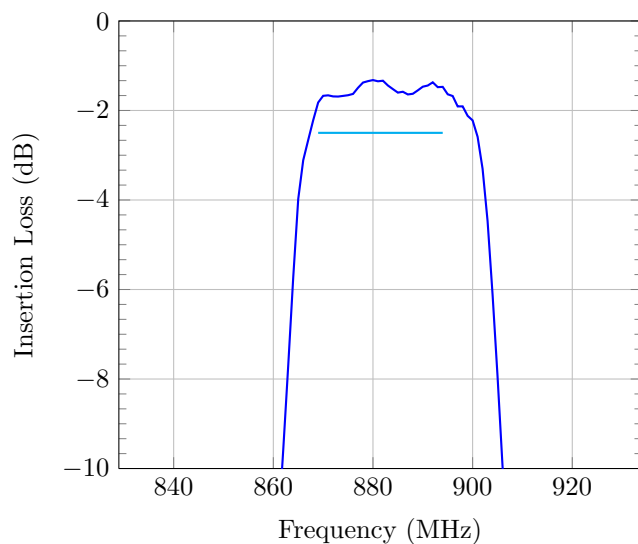


Figure 5: Ant-Rx Insertion Loss

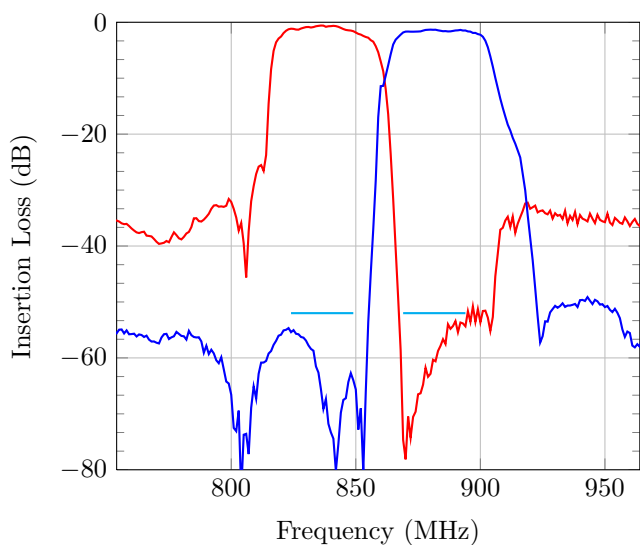


Figure 6: Tx Rejection in Rx Band and Rx Rejection in Tx Band

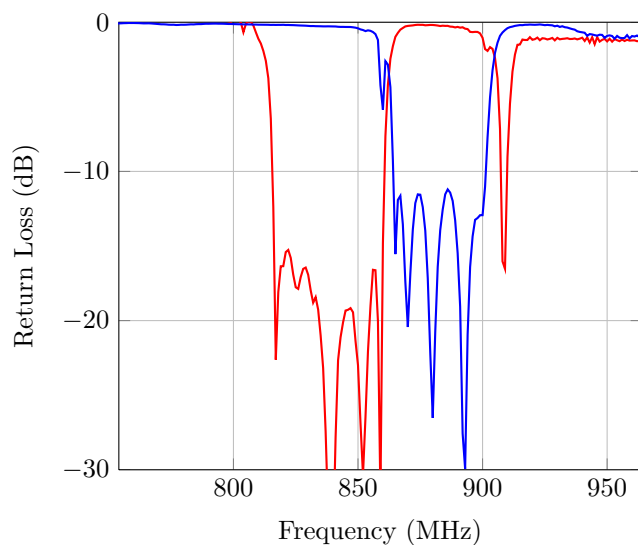


Figure 7: Tx and Rx Port Return Loss

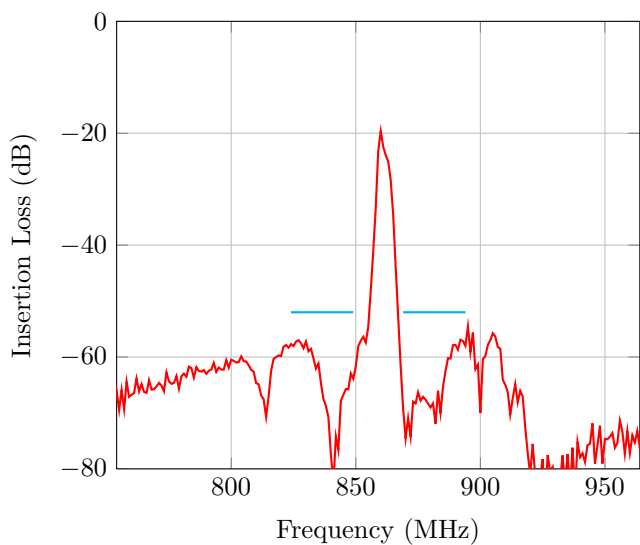


Figure 8: Tx-Rx Isolation

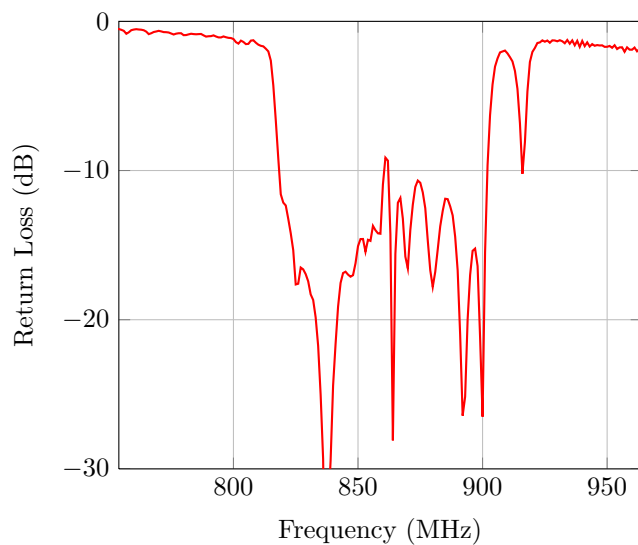


Figure 9: Antenna Port Return Loss

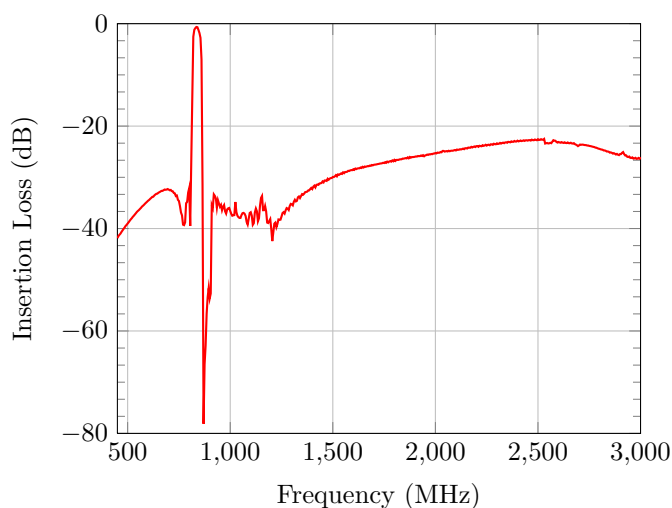


Figure 10: Tx-Ant Wideband Insertion Loss

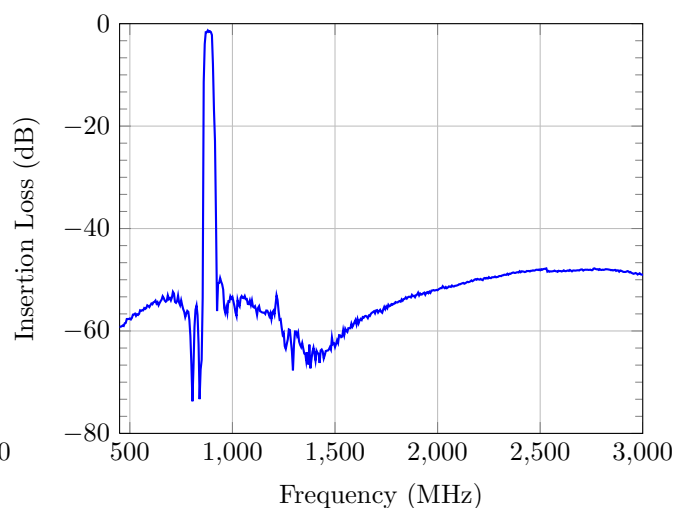
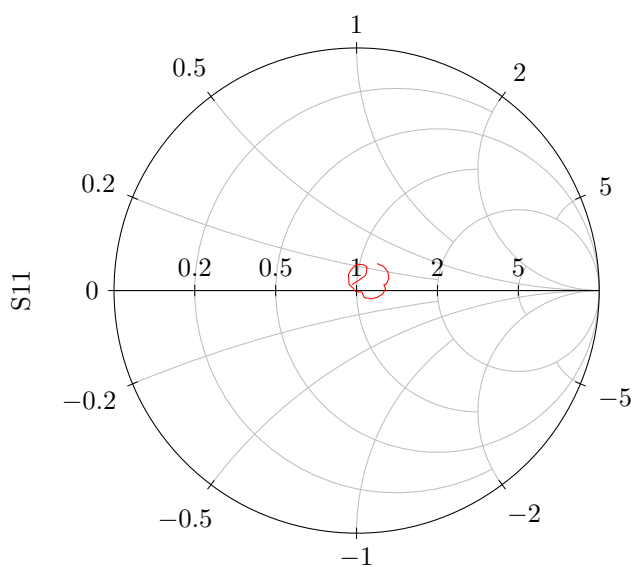
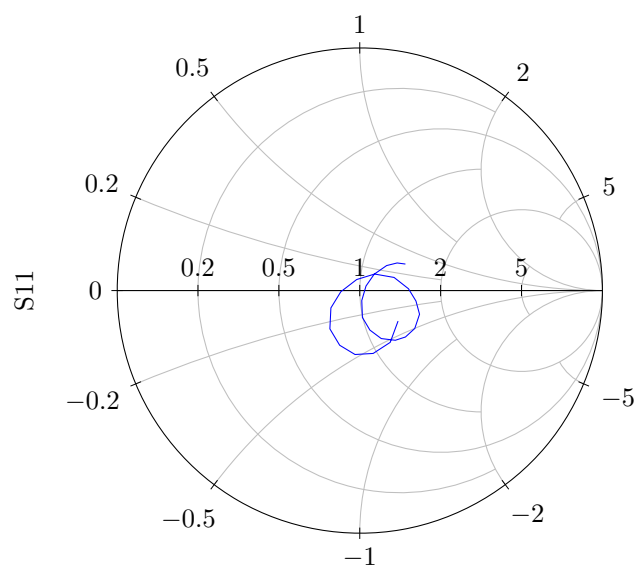
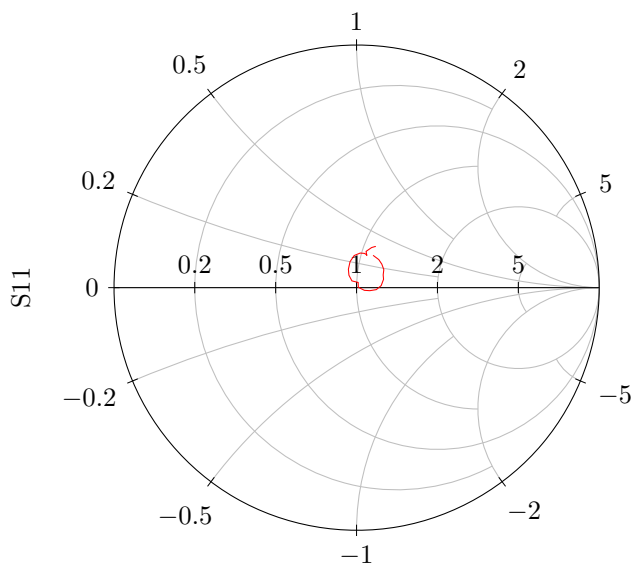
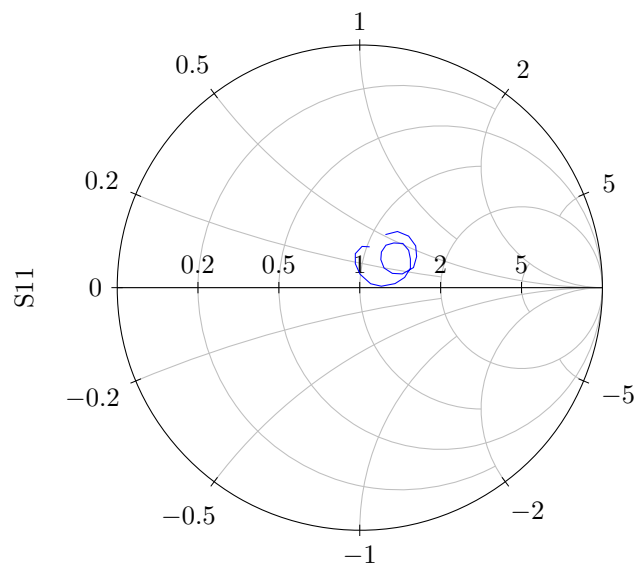


Figure 11: Ant-Rx Wideband Insertion Loss

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 $\pm 5^{\circ}C$
Wetting temperature T_{min}	230 °C $\pm 5^{\circ}C$ for 10s $\pm 1s$
Cooling rate	≥ 3 K/s
Soldering temperature T	Measured at solder pads

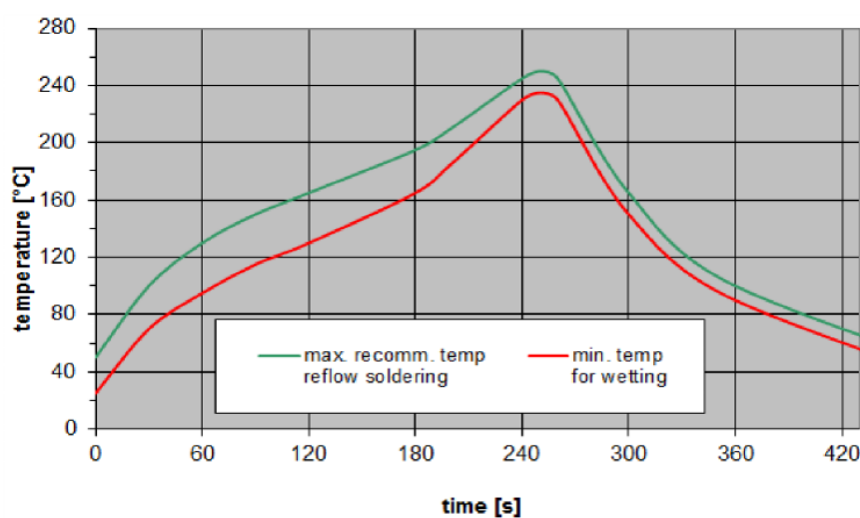


Figure 16: Drawing of reel (Recommended reflow profile for convection and infrared soldering – lead-free solder)

10 Tape and Reel

10.1 Tape

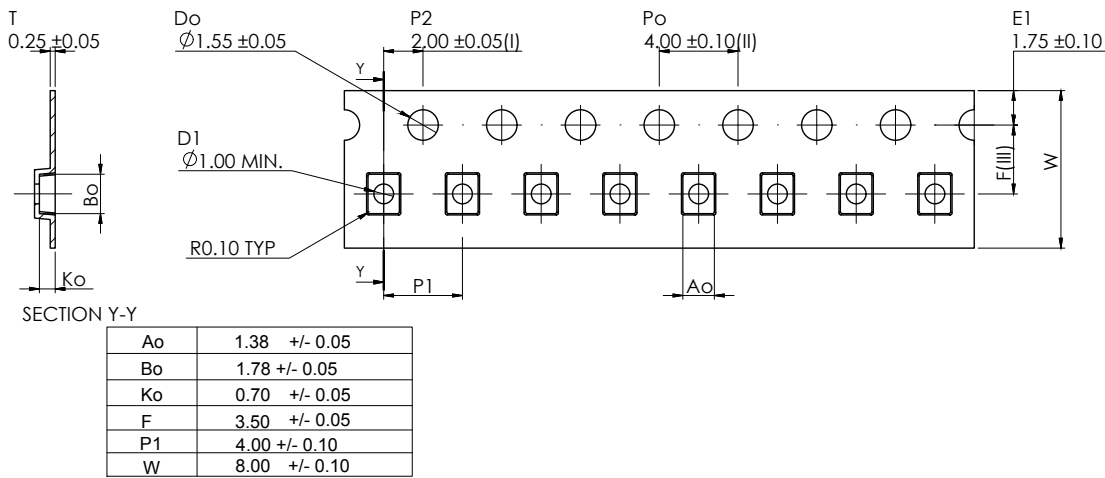


Figure 17: Drawing of tape (first-angle projection) with tape dimensions

10.2 Reel with diameter of 178 mm

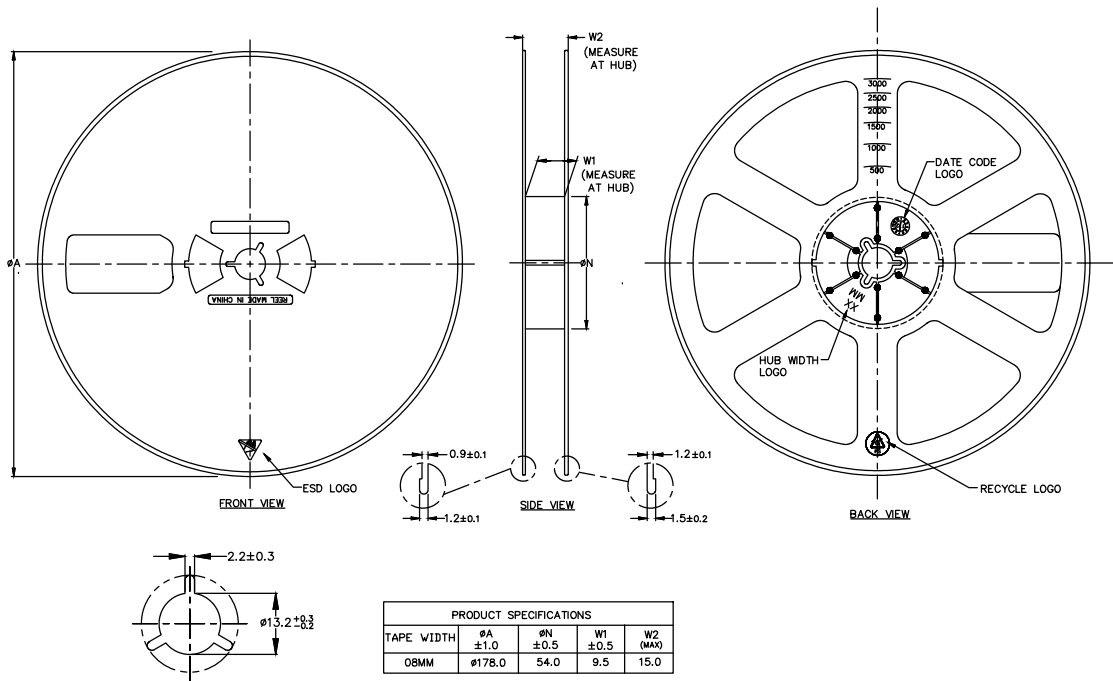


Figure 18: Drawing of reel (first-angle projection) with diameter of 180 mm