QuantGrav Technology Co., Ltd.

SAW Components

SAW Duplexer

Cellular / LTE / Band 8

Series/type: QGSA898MBBSP3

Ordering code: QGSA898MBBSP3

Date: May 2023

Version: 1.0

Contents

1 Applications

- Multimode SAW duplexer for mobile telephone Cellular / LTE Band 8 systems
- Low Insertion Attenuation
- Low Amplitude Ripple

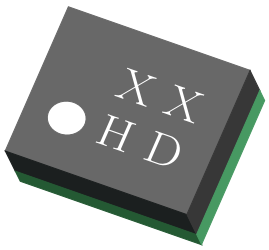
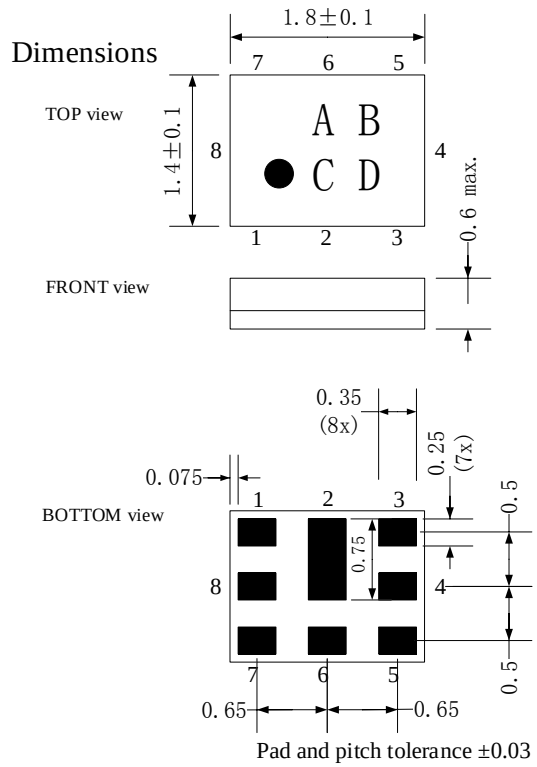


Figure 1: Picture of component with example of product marking.

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



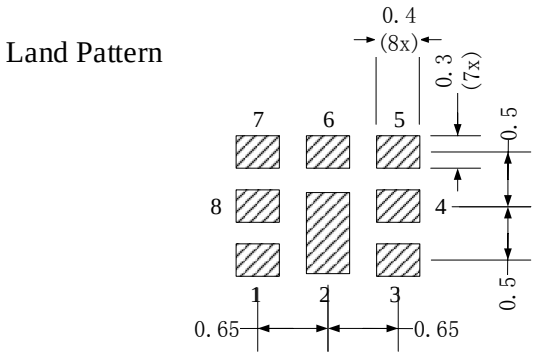


Figure 2: Drawing of package with package height A = 0.6 mm (max.)

4 Pin configuration

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

5 Matching circuit

- $R_1 : 50\Omega$ $R_2 : 50\Omega$ $R_3 : 50\Omega$
- $L_{p1} : 6.1nH$ $L_{p2} : NC$ $L_{p3} : 45nH$

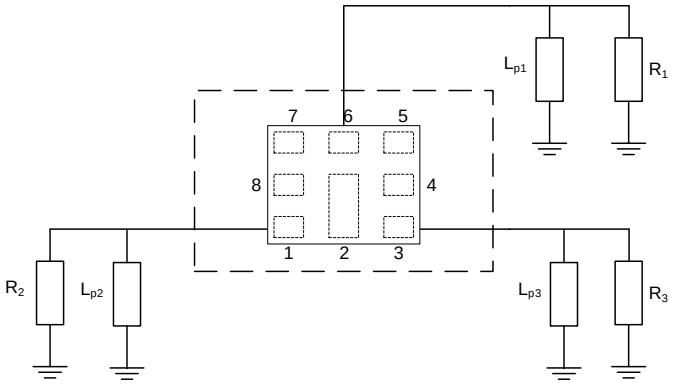


Figure 3: Schematic of matching circuit.

6 Absolute Maximum Ratings

Table 1: Absolute Maximum Ratings of Example Data Sheet

Parameter	**Rating**
Storage temperature	$T_{STG} = -40°C$ to $+85°C$
Operating temperature	$T_{opt} = -20°C$ to $+85°C$
DC voltage	$V_{DC} = 3.0V(max)$
Input power[1]	$P_{IN} = +29dBm$ 5000h $+55°C$

[1]Input signal shall be applied to TX port.

7 Characteristics

Temperature range for specification $T_{SPEC} = -20°C \ldots +85°C$

ANT terminating impedance Z_{ANT}= 50Ω *with par.* L_{p1}

RX terminating impedance Z_{RX} = 50Ω *with par.* L_{p2}

TX terminating impedance Z_{TX} = 50Ω *with par.* L_{p3}

7.1 TX-ANT

Item		min.	typ.	max.	Unit	Note
Center Frequency			897.5		MHz	
Insertion Loss	882.5 to 912.5 MHz		1.7	2.5	dBINT	Any 4.5MHz
Ripple Deviation	880 to 915 MHz		0.7	2	dB	Any 5MHz
VSWR	880 to 915 MHz		1.5	2.2		Ant
	880 to 915 MHz		1.5	2.2		Tx
Absolute Attenuation	450 to 793 MHz	30	35		dB	
	832 to 862 MHz	30	40		dB	B20 Tx
	927.5 to 957.5 MHz	35	53		dBINT	Any 4.5MHz
	1559 to 1563 MHz	32	36		dB	Compass
	1565.42 to 1605.89 MHz	32	36		dB	
	1710 to 1785 MHz	30	34		dB	B3Tx
	1760 to 1880 MHz	27	32		dB	2f
	1920 to 1980 MHz	26	31		dB	B1 Tx
	2110 to 2170 MHz	25	30		dB	
	2400 to 2500 MHz	23	27		dB	2.4GHz ISM
	2620 to 2745 MHz	23	27		dB	3f
	3520 to 3660 MHz	10	20		dB	4f
	4400 to 4575 MHz	3	8.9		dB	5f
	4900 to 5950 MHz	3	10		dB	5GHz ISM,6f

7.2 ANT-RX

Item		min.	typ.	max.	Unit	Note
Center Frequency			942.5		MHz	
Insertion Loss	927.5 to 957.5 MHz		2.0	2.7	dBINT	Any 4.5MHz
Ripple Deviation	925 to 960 MHz		0.5	2.3	dB	Any 5MHz
VSWR	925 to 960 MHz		1.8	2.1		Ant
	925 to 960 MHz		1.5	2.1		Rx
Absolute Attenuation	450 to 880 MHz	45	54		dB	
	835 to 870 MHz	40	55		dB	2Tx-Rx
	882.5 to 912.5 MHz	45	53		dBINT	Any 4.5MHz
	902.5 to 910 MHz	30	58		dB	(Rx+Tx)/2
	980 to 1045 MHz	12	17		dB	
	1045 to 6000 MHz	24	34		dB	
	1427 to 1448 MHz	40	59		dB	B11Tx
	1710 to 1785 MHz	40	56		dB	B3Tx
	1805 to 1980 MHz	40	56		dB	Rx+2Tx and 2x
	2400 to 3840 MHz	39	45		dB	2.4Ghz ISM
	4625 to 4800 MHz	28	36		dB	5f
	4900 to 5950 MHz	25	34		dB	5GHz ISM,6f

7.3 TX-RX

Item	Tx to Rx	min.	typ.	max.	Unit	Note
Isolation	882.5 to 912.5 MHz	53	61		dBINT	Any 4.5MHz
	927.5 to 957.5 MHz	53	56		dBINT	-10 to+85deg.C Any 4.5MHz

8 Transmission coefficients

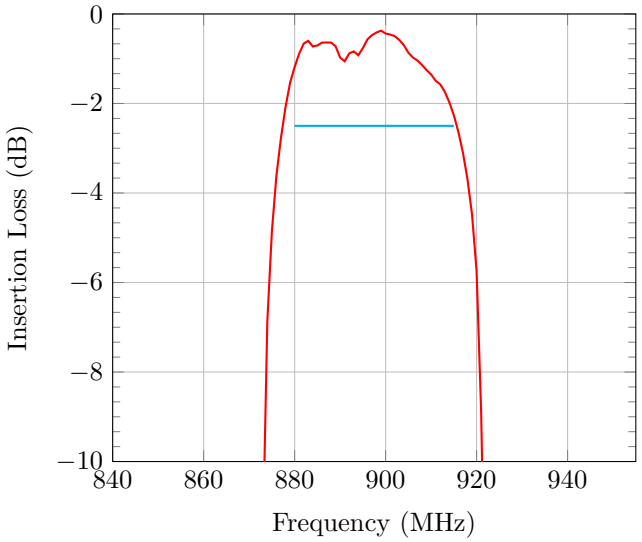


Figure 4: Tx–Ant Insertion Loss

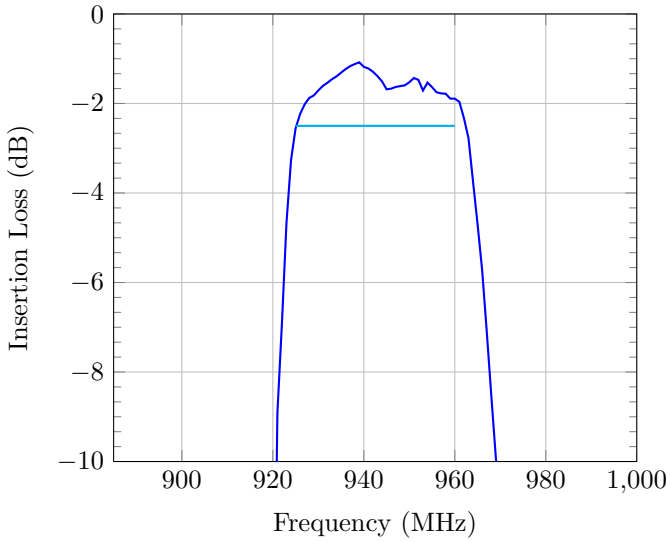


Figure 5: Ant–Rx Insertion Loss

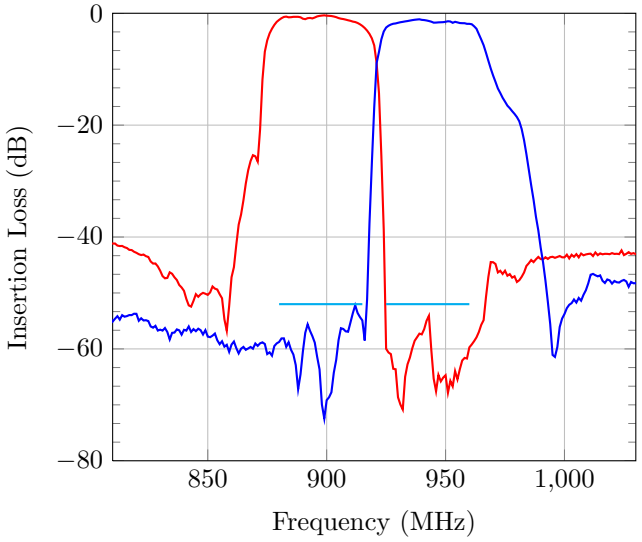


Figure 6: Tx Rejection in Rx Band and Rx Rejection in Tx Band

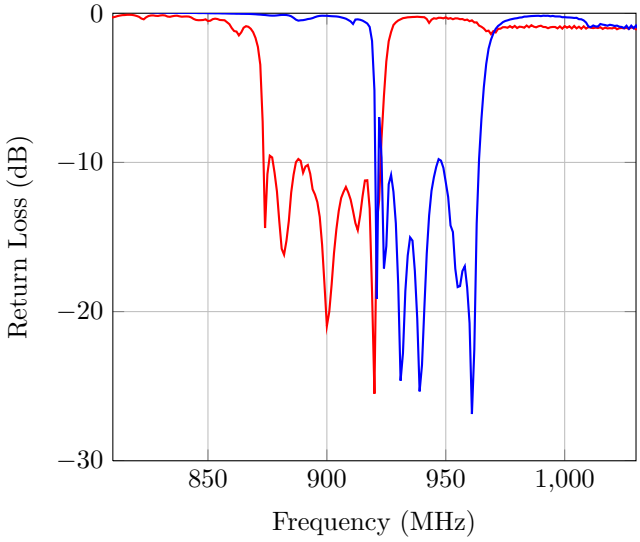


Figure 7: Tx and Rx Port Return Loss

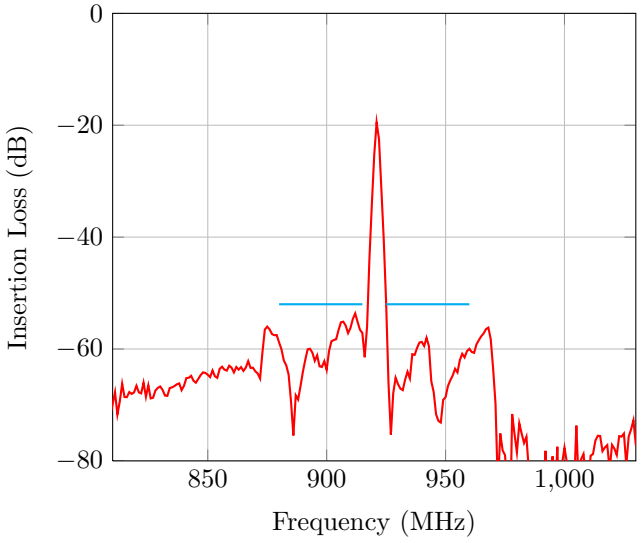


Figure 8: Tx–Rx Isolation

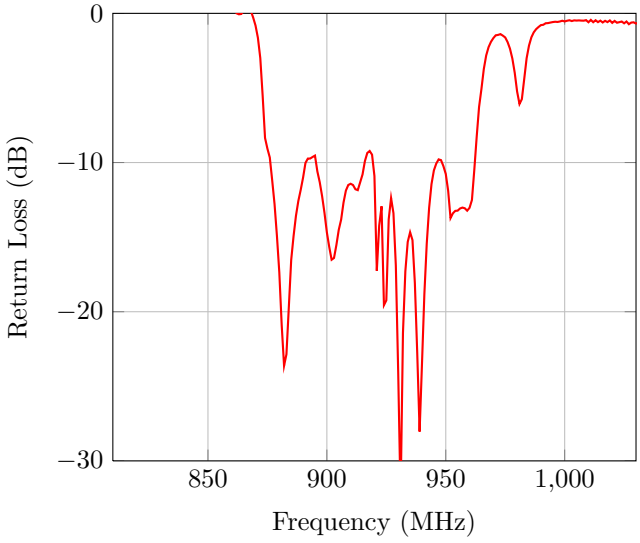


Figure 9: Antenna Port Return Loss

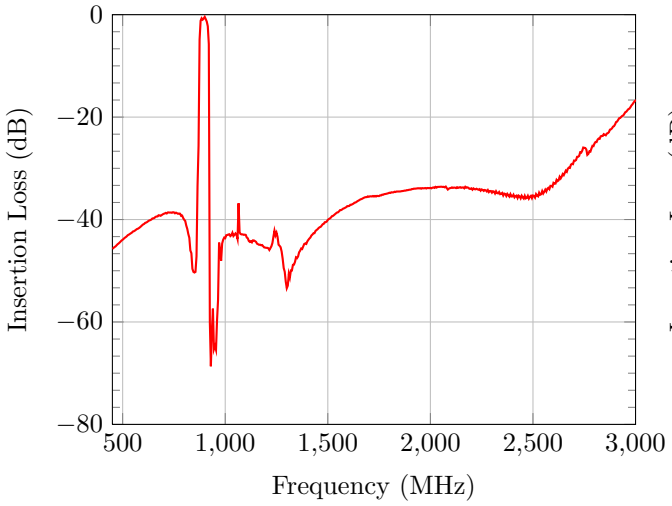


Figure 10: Tx–Ant Wideband Insertion Loss

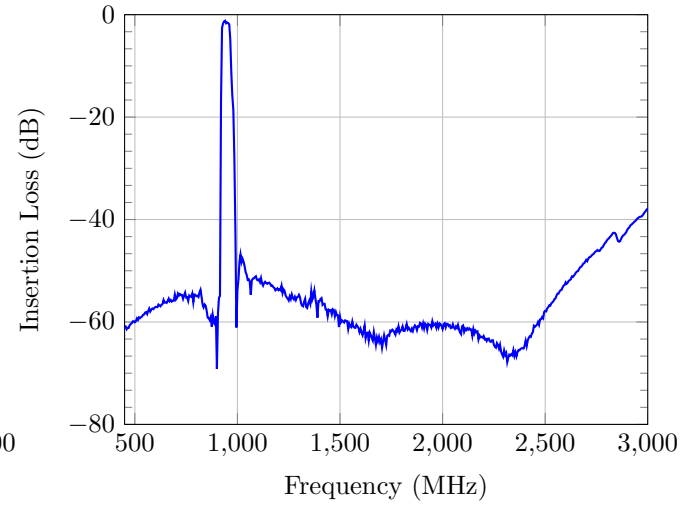


Figure 11: Ant–Rx Wideband Insertion Loss

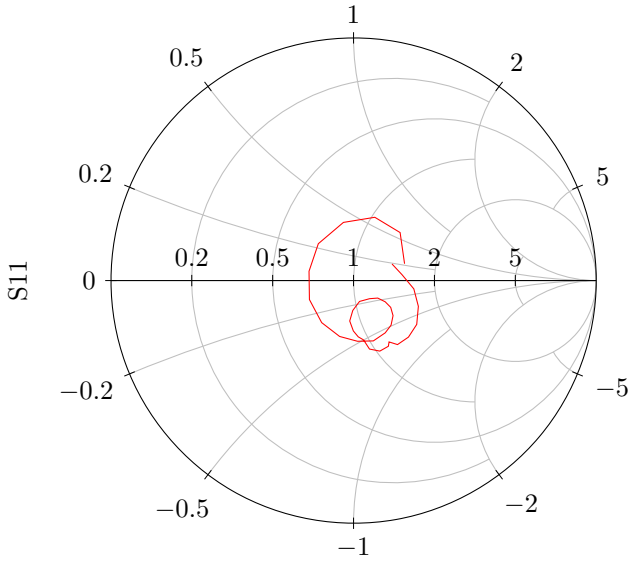


Figure 12: Tx Port Impedance in Tx Band ($Z0 = 50\Omega$)

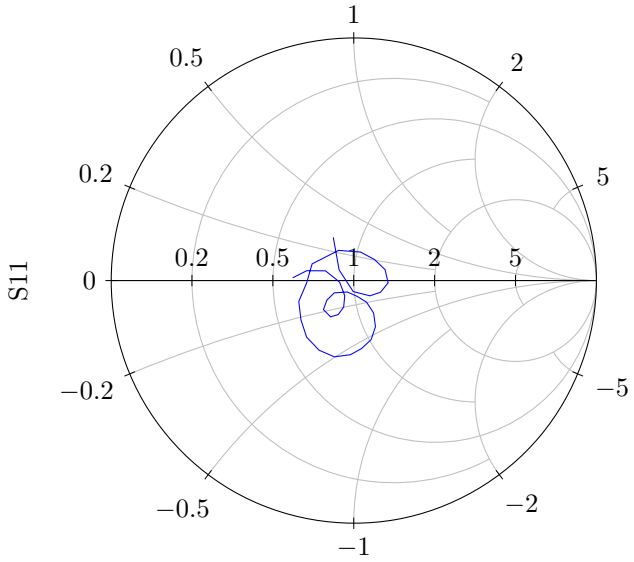


Figure 13: Rx Port Impedance in Rx Band ($Z0 = 50\Omega$)

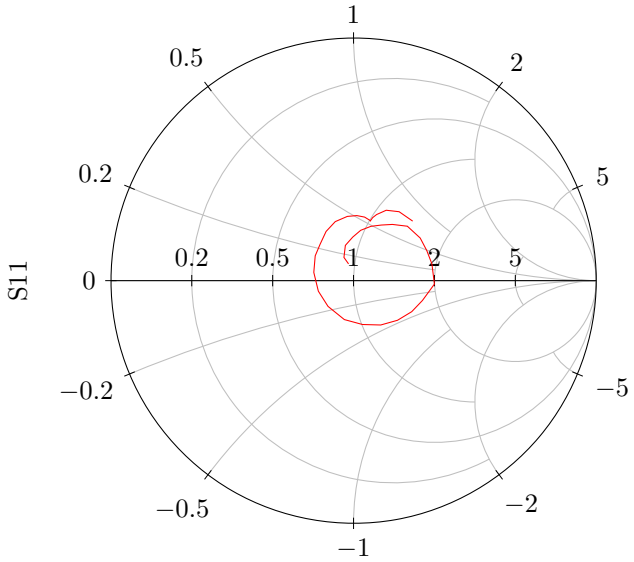


Figure 14: Ant Port Impedance in Tx Band ($Z0 = 50\Omega$)

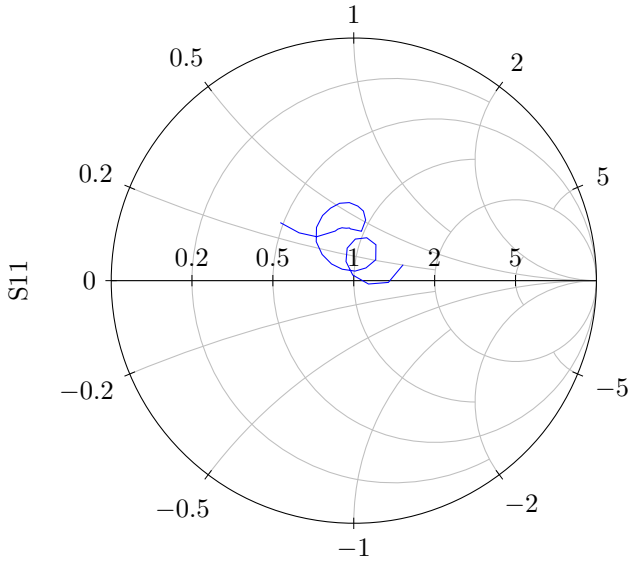


Figure 15: Ant Port Impedance in Rx Band ($Z0 = 50\Omega$)

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	$\geq$ 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	$\geq$ 3 K/s
Soldering temperature T	Measured at solder pads

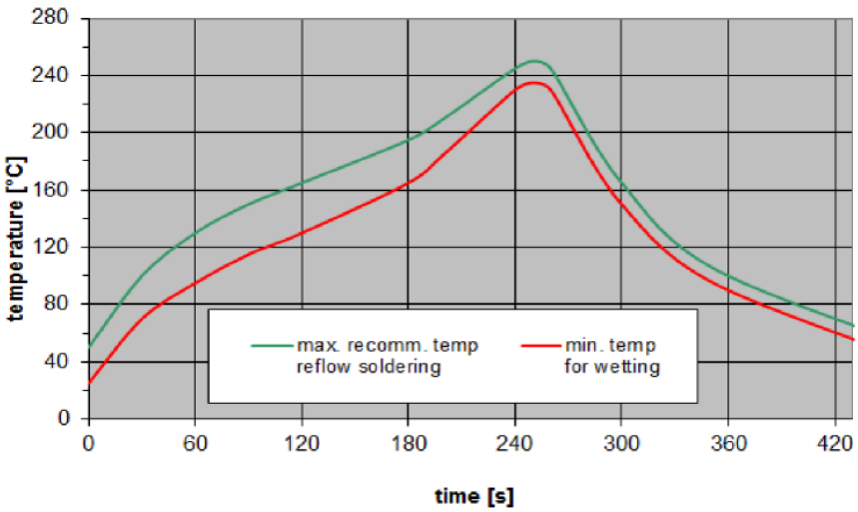
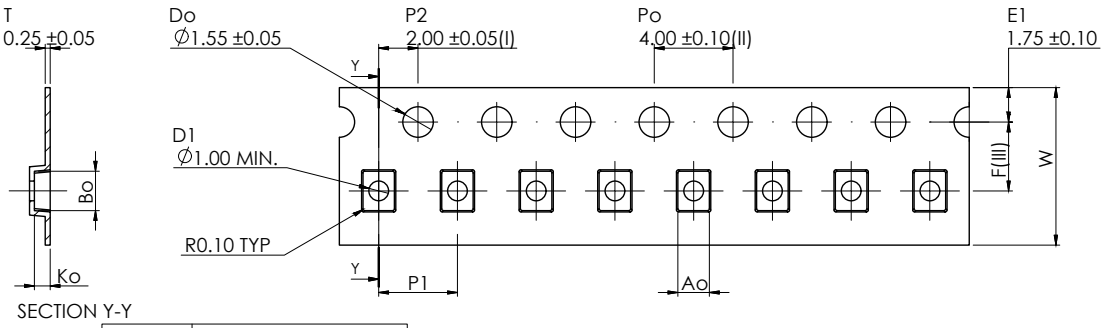


Figure 16: Drawing of reel (Recommended reflow profile for convection and infrared soldering – lead-free solder

10 Tape and Reel

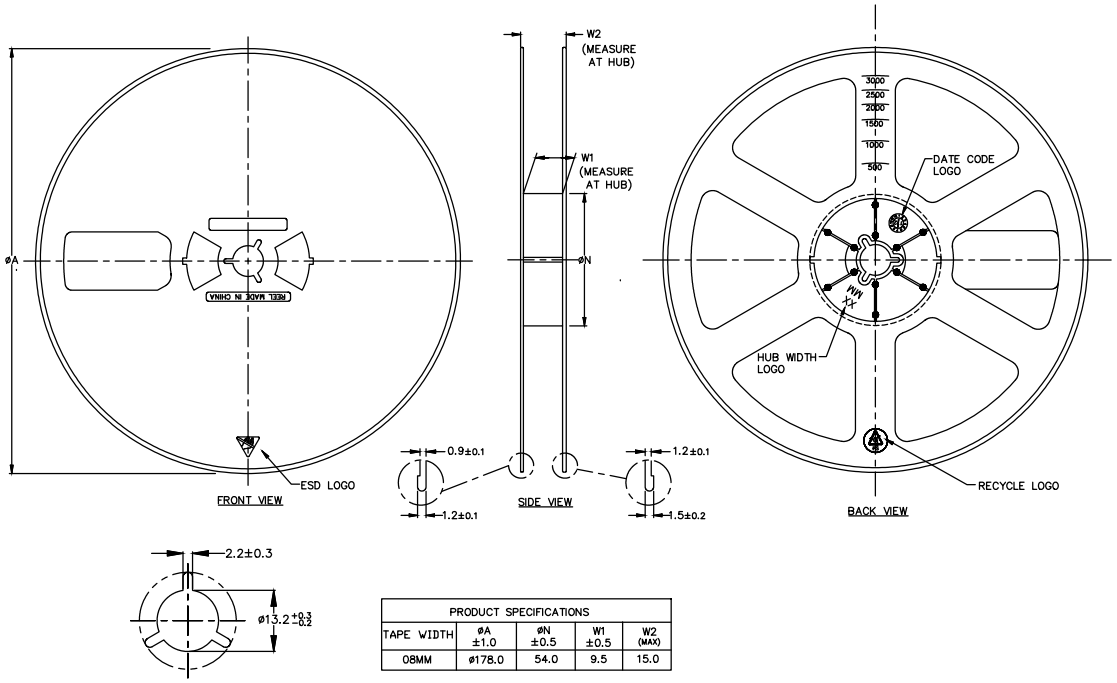
10.1 Tape



Ao	1.60 +/- 0.05
Bo	2.00 +/- 0.05
Ko	0.80 +/- 0.05
F	3.50 +/- 0.05
P1	4.00 +/- 0.10
W	8.00 +/- 0.10

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

10.2 Reel with diameter of 178 mm



PRODUCT SPECIFICATIONS				
TAPE WIDTH	øA ±1.0	øN ±0.5	W1 ±0.5	W2 (MAX)
08MM	ø178.0	54.0	9.5	15.0

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