QuantGrav Technology Co., Ltd.

SAW Components

SAW Duplexer

Cellular / LTE / Band 20

Series/type: QGSA806MBASP3

Ordering code: QGSA806MBASP3

Date: May 2023

Version: 1.0

Contents

1 Applications

- Multimode SAW duplexer for mobile telephone Cellular / LTE / WCDMA Band 20 systems
- Low Insertion Attenuation
- Low Amplitude Ripple

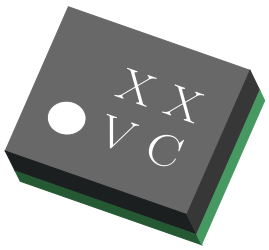
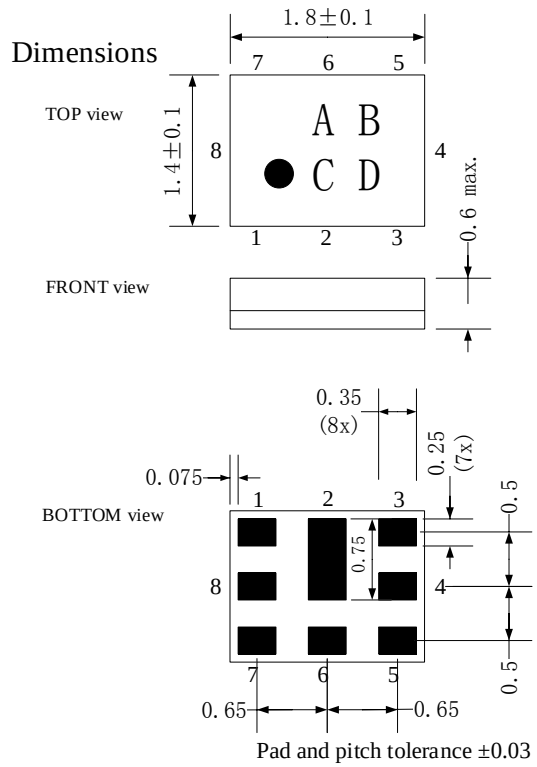


Figure 1: Picture of component with example of product marking.

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



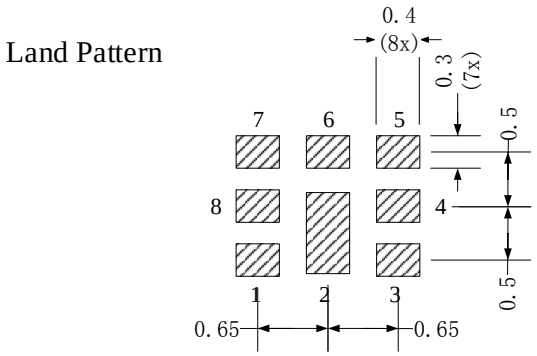


Figure 2: Drawing of package with package height A = 0.6 mm (max.)

4 Pin configuration

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

5 Matching circuit

- R_1 : 50Ω R_2 : 50Ω R_3 : 50Ω
- L_{p1} : 9nH L_{p2} : 35nH L_{p3} : 20nH

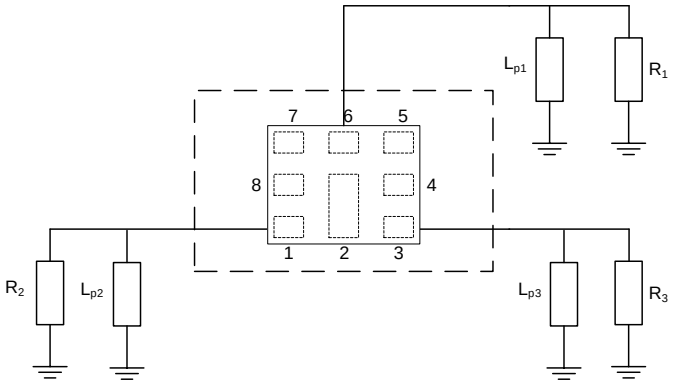


Figure 3: Schematic of matching circuit.

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_{p3}

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

7.1 TX-ANT

Item		min.	typ.	max.	Unit	Note
Center Frequency			847		MHz	
Insertion Loss	834.5 to 859.5 MHz		1.5	2.0	dB	
Ripple Deviation	832 to 862 MHz		0.7	1.8	dB	
VSWR	832 to 862 MHz		1.7	2.0		Ant
	832 to 862 MHz		1.6	2.0		Tx
Absolute Attenuation	450 to 790 MHz	30	35		dB	
	791 to 821 MHz	50	55		dB	
	821 to 827 MHz	2.4	7.2		dB	RX
	925 to 960 MHz	38	41		dBINT	B8 RX
	1559 to 1563 MHz	43	46		dB	Compass
	1565.42 to 1605.89 MHz	43	46		dB	
	1664 to 1724 MHz	25	47		dB	2f
	1805 to 1880 MHz	30	50		dB	B3 TX
	1884.5 to 1919.6 MHz	30	51		dB	
	2110 to 2170 MHz	30	56		dB	B1 RX
	2400 to 2500 MHz	45	56		dB	ISM2.4
	2496 to 2690 MHz	40	51		dB	3f
	3328 to 3448 MHz	20	47		dB	4f
	4160 to 4310 MHz	20	43		dB	5f
	4900 to 5950 MHz	20	40		dB	ISM,5G,6f

7.2 ANT-RX

Item		min.	typ.	max.	Unit	Note
Center Frequency			806		MHz	
Insertion Loss	791.25 to 820.75 MHz		2.5	3.0	dB	
Ripple Deviation	791 to 821 MHz		1.5	2.5	dB	
VSWR	791 to 821 MHz		1.7	2.0		Ant
	791 to 821 MHz		1.7	2.0		Rx
Absolute Attenuation	450 to 760 MHz	24	35		dB	
	832.25 to 861.75 MHz	45	57		dB	Tx
	880 to 915 MHz	40	50		dB	B8 TX
	1710 to 1785 MHz	40	56		dB	B3 TX
	2373 to 2463 MHz	45	52		dB	3f
	2400 to 2500 MHz	45	50		dB	ISM2.4
	2500 to 2570 MHz	40	65		dB	R7 TX
	4900 to 5950 MHz	40	48		dB	ISM 5G

7.3 TX-RX

Item	Tx to Rx	min.	typ.	max.	Unit	Note
Isolation	832.25 to 861.75 MHz	53	57		dB	TX
	791 to 821 MHz	53	57		dB	RX
	1574 to 1577 MHz	40	58		dB	Any 4.5MHz
	1664 to 1724 MHz	20	57		dB	Any 4.5MHz
	2496 to 2586 MHz	20	54		dB	

8 Transmission coefficients

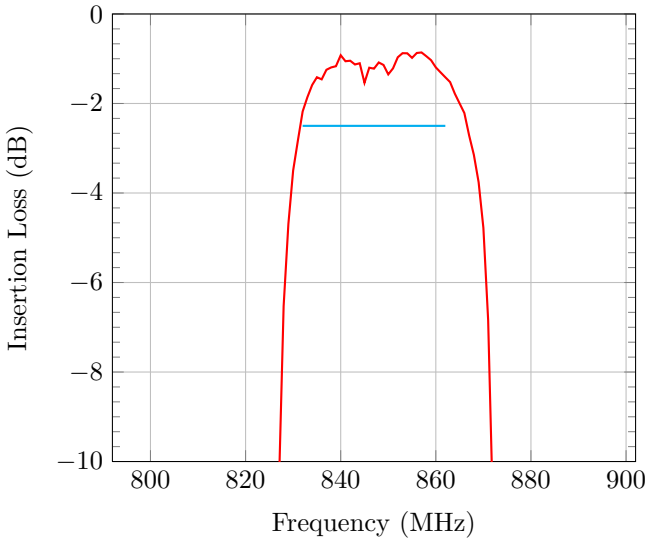


Figure 4: Tx–Ant Insertion Loss

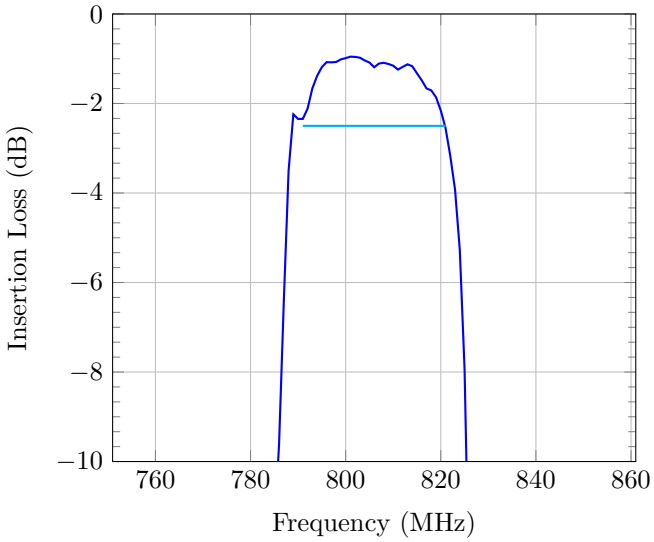


Figure 5: Ant–Rx Insertion Loss

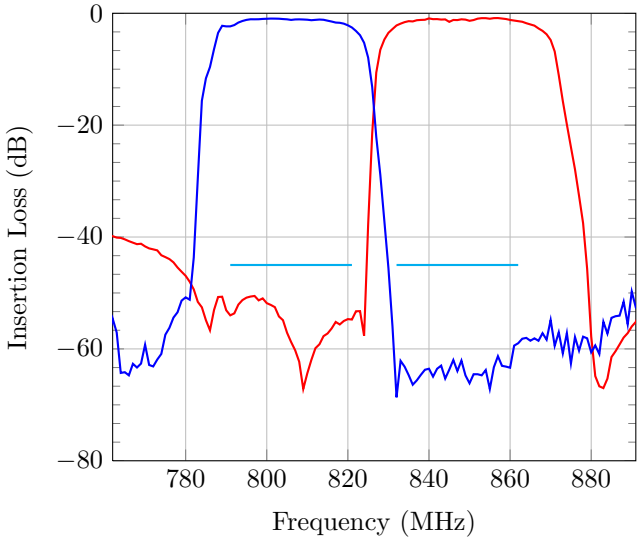


Figure 6: Tx Rejection in Rx Band and Rx Rejection in Tx Band

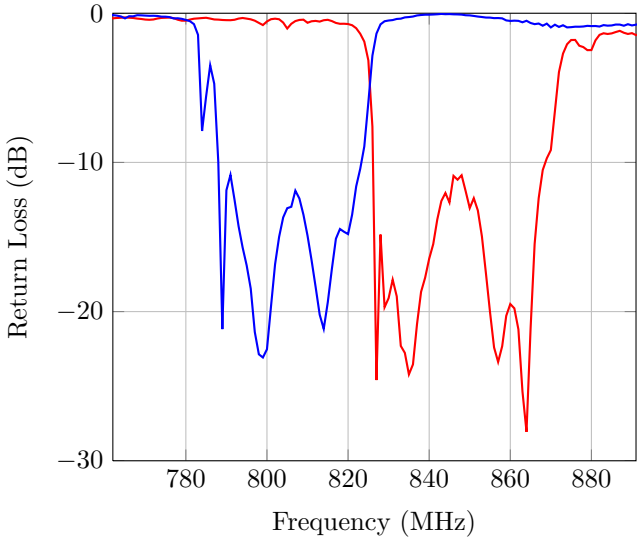


Figure 7: Tx and Rx Port Return Loss

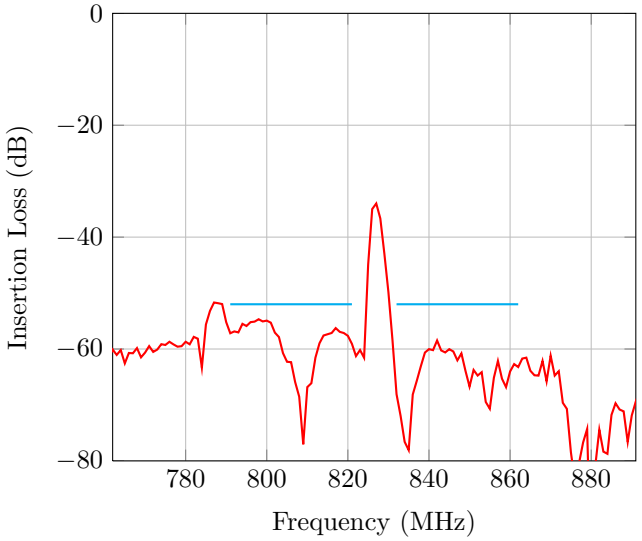


Figure 8: Tx–Rx Isolation

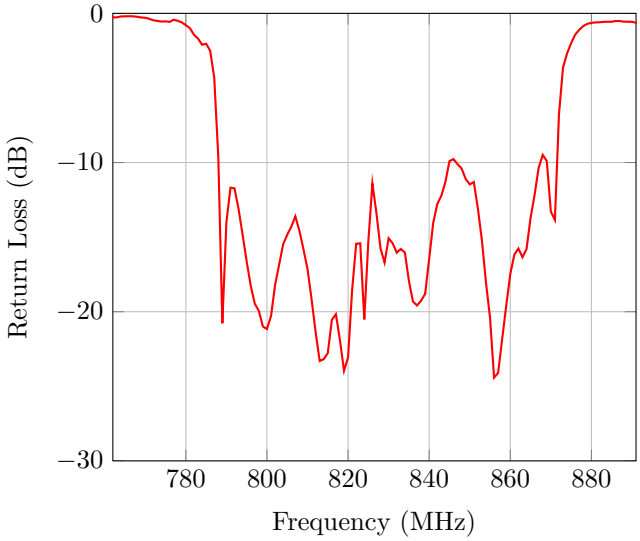


Figure 9: Antenna Port Return Loss

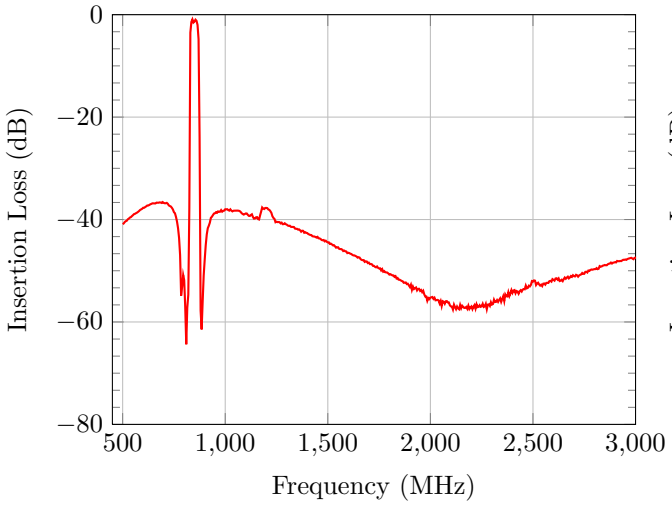


Figure 10: Tx–Ant Wideband Insertion Loss

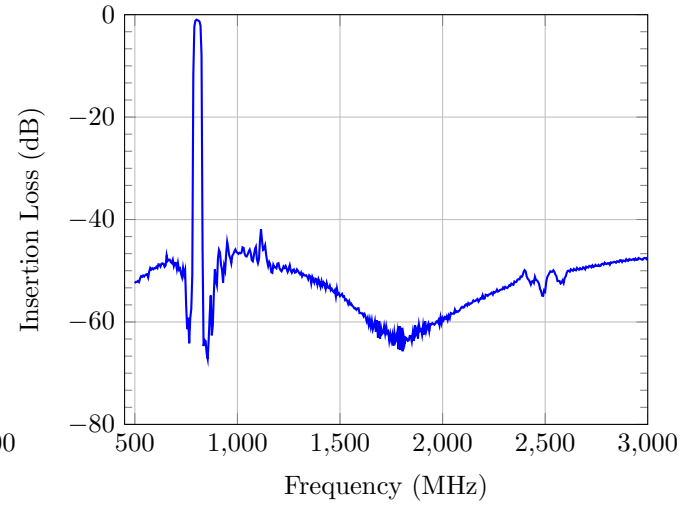


Figure 11: Ant–Rx Wideband Insertion Loss

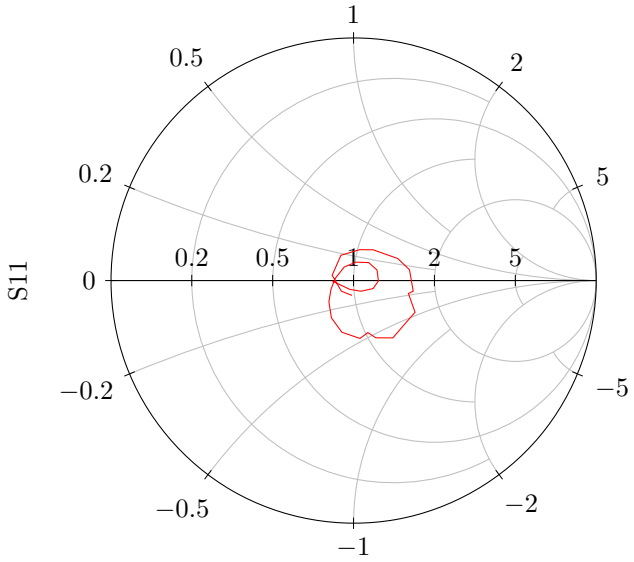


Figure 12: Tx Port Impedance in Tx Band ($Z0 = 50\Omega$)

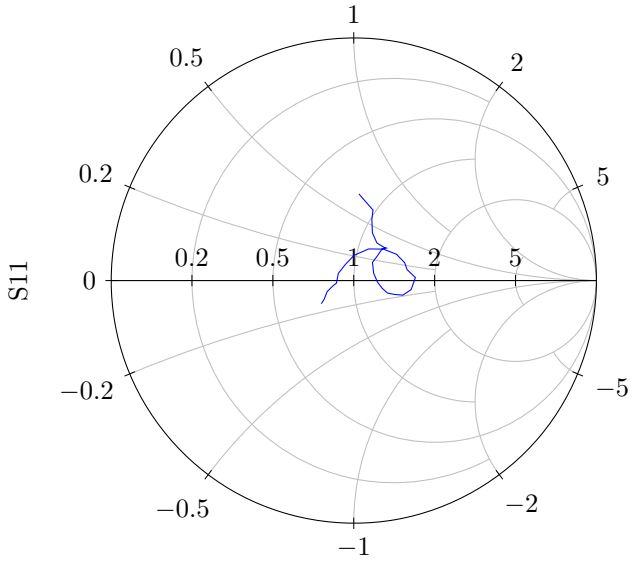


Figure 13: Rx Port Impedance in Rx Band ($Z0 = 50\Omega$)

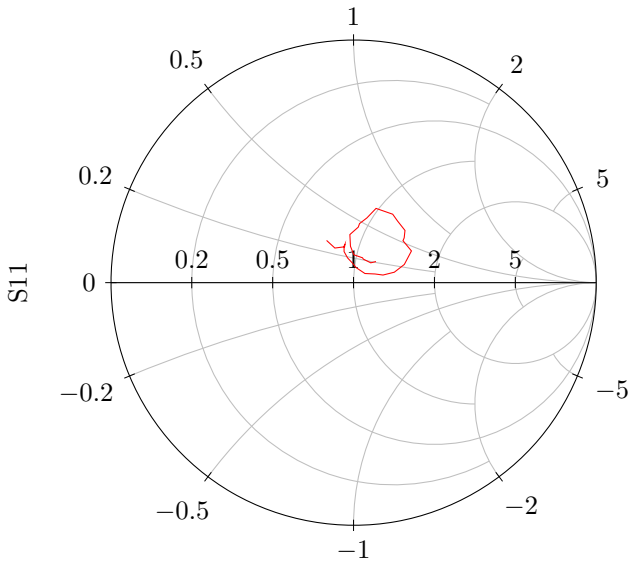


Figure 14: Ant Port Impedance in Tx Band ($Z0 = 50\Omega$)

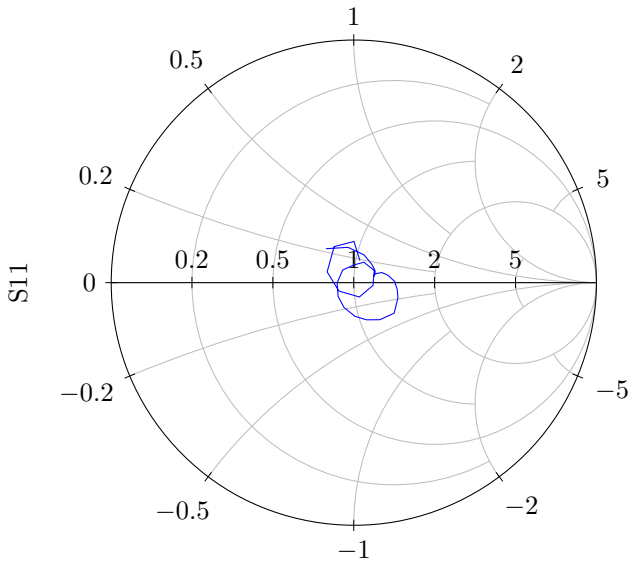


Figure 15: Ant Port Impedance in Rx Band ($Z0 = 50\Omega$)

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

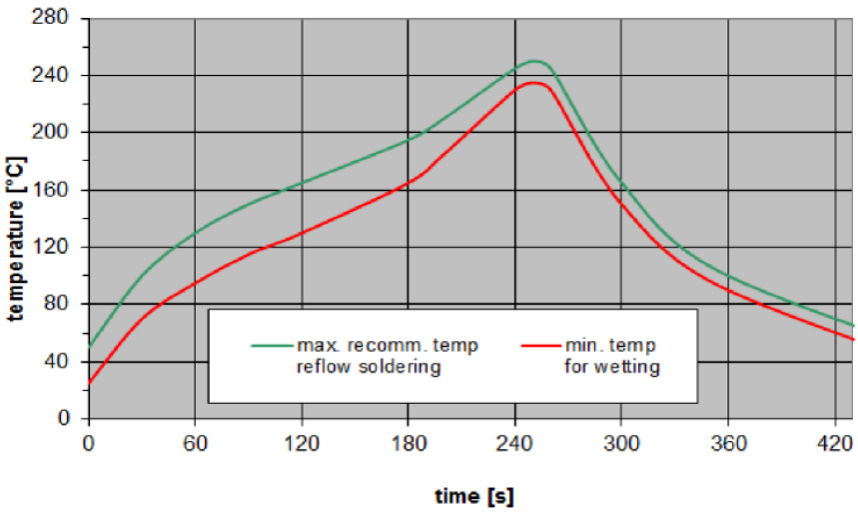
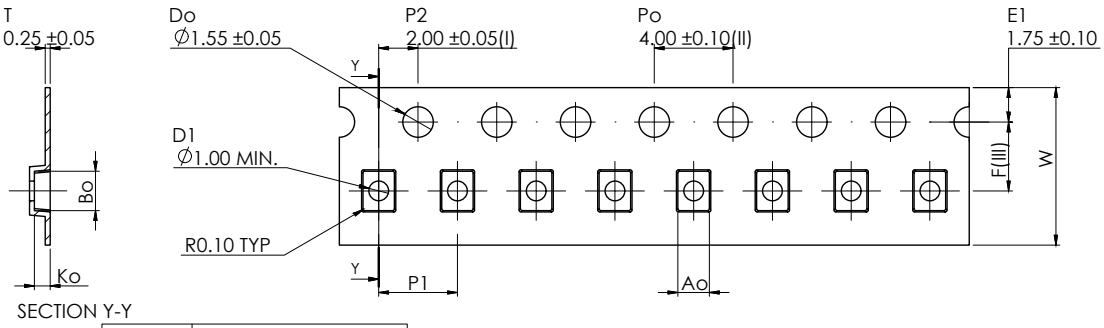


Figure 16: Drawing of reel (Recommended reflow profile for convection and infrared soldering – lead-free solder

10 Tape and Reel

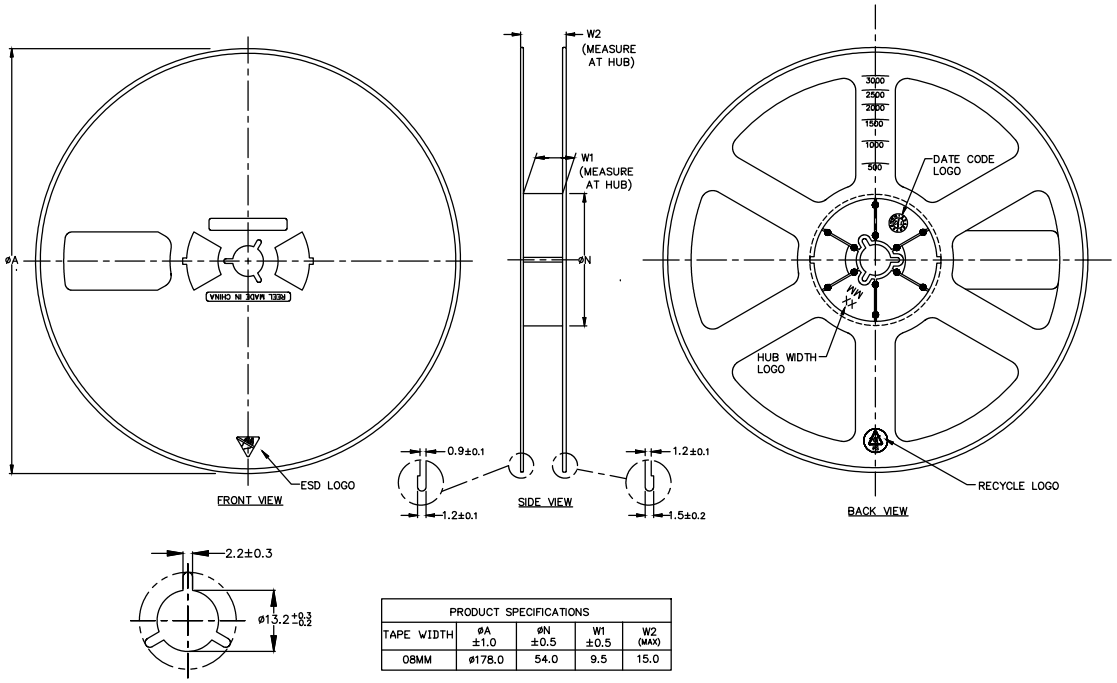
10.1 Tape



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