QuantGrav Technology Co., Ltd.

SAW Components

SAW Duplexer

Cellular / LTE / Band 8 DPX-15MHz

Series/type: QGSA919MAASP3

Ordering code: QGSA919MAASP3

Date: December 2023

Version: 1.1

Contents

1 Applications

- Multimode SAW duplexer for In-building Distribution System / LTE Band 8 systems
- Low insertion attenuation
- Low amplitude ripple

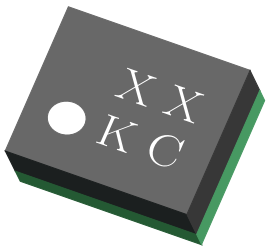
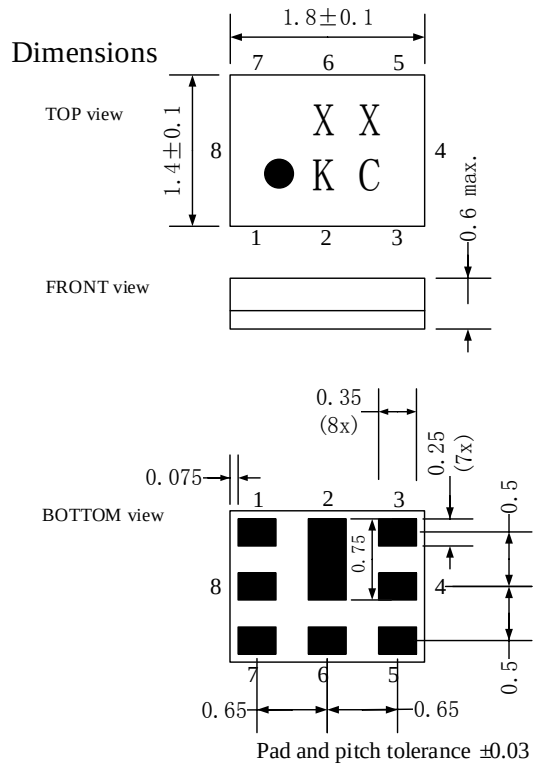


Figure 1: Picture of component with example of product marking.

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



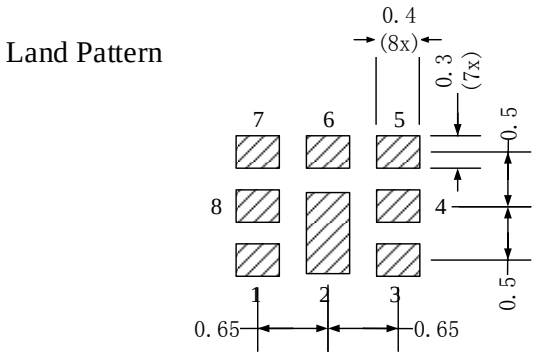


Figure 2: Drawing of package with package height A = 0.6 mm (max.)

4 Pin configuration

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

5 Matching circuit

- $R_1 : 50\Omega$ $R_2 : 50\Omega$ $R_3 : 50\Omega$
- $L_{p1} : 8.1nH$ $L_{p2} : NC$ $L_{p3} : 45nH$

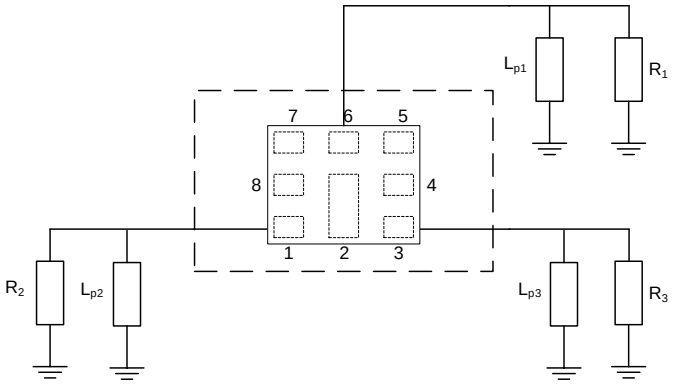


Figure 3: Schematic of matching circuit.

6 Absolute Maximum Ratings

Table 1: Absolute Maximum Ratings of Example Data Sheet

Parameter	**Rating**
Storage temperature	$T_{STG} = -40°C$ to $+95°C$
Operating temperature	$T_{opt} = -40°C$ to $+95°C$
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 $T_{SPEC} = -40°C \ldots +95°C$

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			941.5		MHz	
Insertion Loss	934 to 949 MHz		1.3	1.7	dB	
Ripple Deviation	934 to 949 MHz		0.5	1.2	dB	
VSWR	934 to 949 MHz		1.5	2.1		
	934 to 949 MHz		1.5	2.1		
Absolute Attenuation	450 to 880 MHz	35	40		dB	
	835 to 870 MHz	35	40		dB	
	882.5 to 912.5 MHz	45	56		dB	
	902.5 to 910 MHz	45	58		dB	
	980 to 1045 MHz	35	40		dB	
	1045 to 6000 MHz	30	35		dB	
	1427 to 1448 MHz	35	42		dB	
	1710 to 1785 MHz	40	45		dB	
	1805 to 1980 MHz	40	45		dB	
	2400 to 3840 MHz	45	50		dB	
	4625 to 4800 MHz	35	40		dB	
	4900 to 5950 MHz	30	37		dB	

7.2 ANT-RX

Item		min.	typ.	max.	Unit	Note
Center Frequency			896.5		MHz	
Insertion Loss	889 to 904 MHz		1.4	1.8		
Ripple Deviation	889 to 904 MHz		0.5	1.2	dB	
VSWR	889 to 904 MHz		1.5	2.1		
	889 to 904 MHz		1.5	2.1		
Absolute Attenuation	450 to 793 MHz	40	48		dB	
	832 to 862 MHz	42	52		dB	
	927.5 to 957.5 MHz	50	60		dB	
	1559 to 1563 MHz	42	52		dB	
	1565.42 to 1605.89 MHz	42	52		dB	
	1710 to 1785 MHz	48	54		dB	
	1760 to 1880 MHz	48	54		dB	
	1920 to 1980 MHz	50	57		dB	
	2110 to 2170 MHz	50	55		dB	
	2400 to 2500 MHz	50	58		dB	
	2620 to 2745 MHz	52	60		dB	
	3520 to 3660 MHz	50	57		dB	
	4400 to 4575 MHz	40	48		dB	
	4900 to 5950 MHz	30	40		dB	

7.3 TX-RX

Item	Tx to Rx	min.	typ.	max.	Unit	Note
Isolation	889 to 904 MHz	50	56			
	934 to 949 MHz	56	61		dB	

8 Transmission coefficients

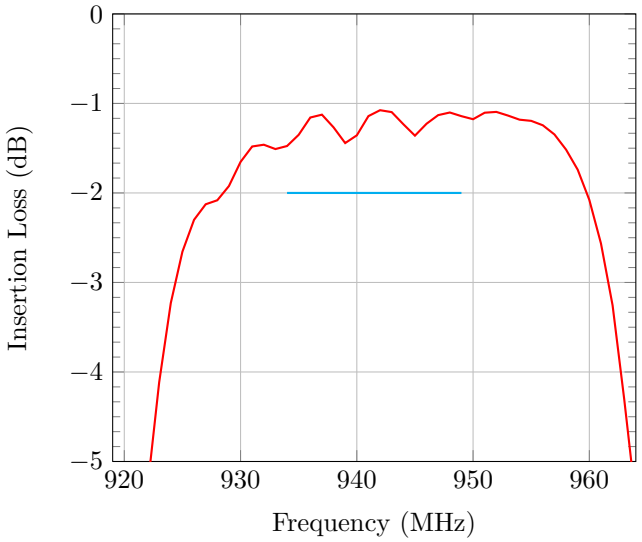


Figure 4: Tx–Ant Insertion Loss

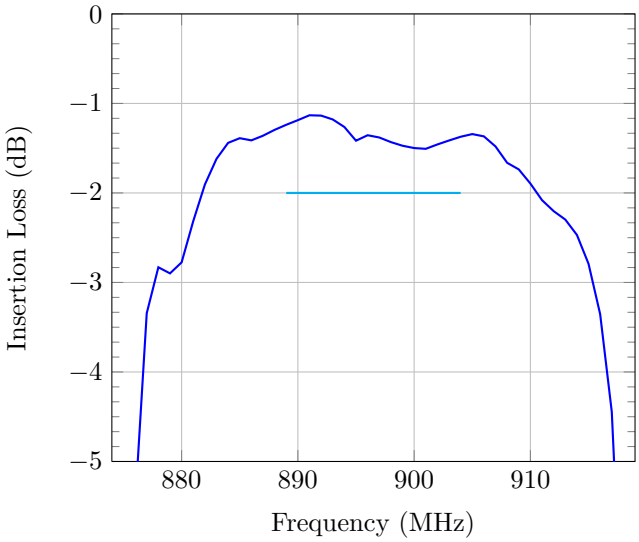


Figure 5: Ant–Rx Insertion Loss

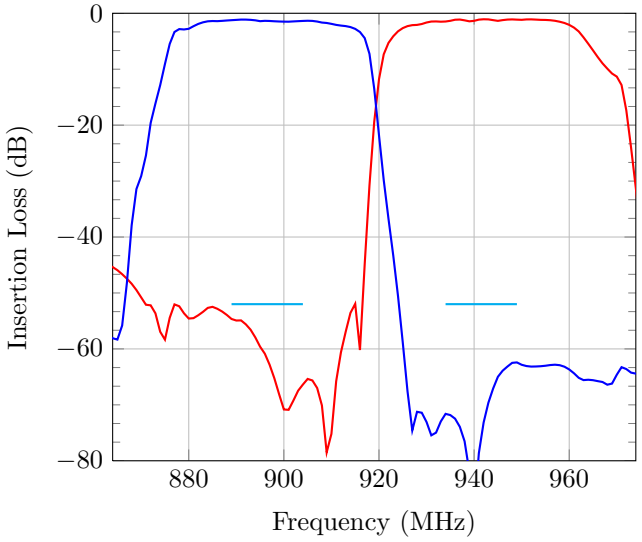


Figure 6: Tx Rejection in Rx Band and Rx Rejection in Tx Band

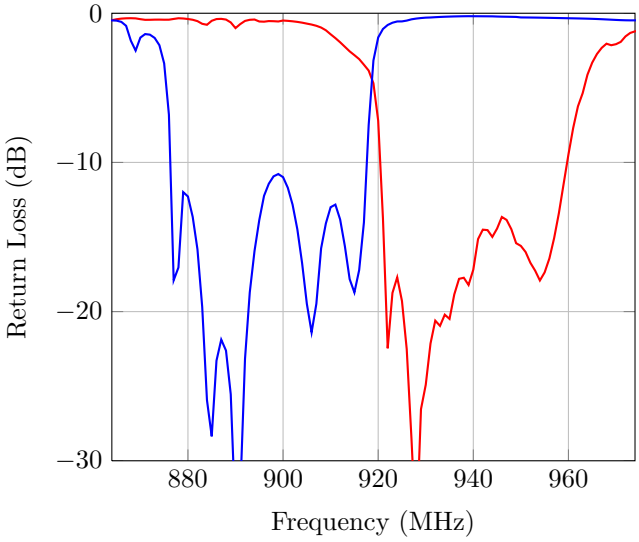


Figure 7: Tx and Rx Port Return Loss

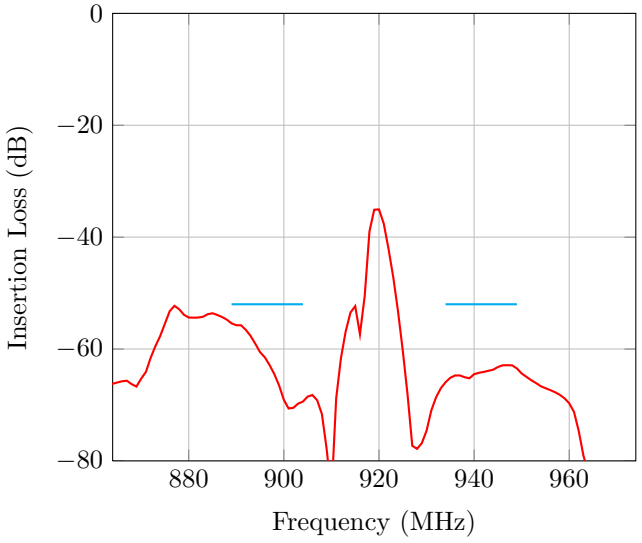


Figure 8: Tx–Rx Isolation

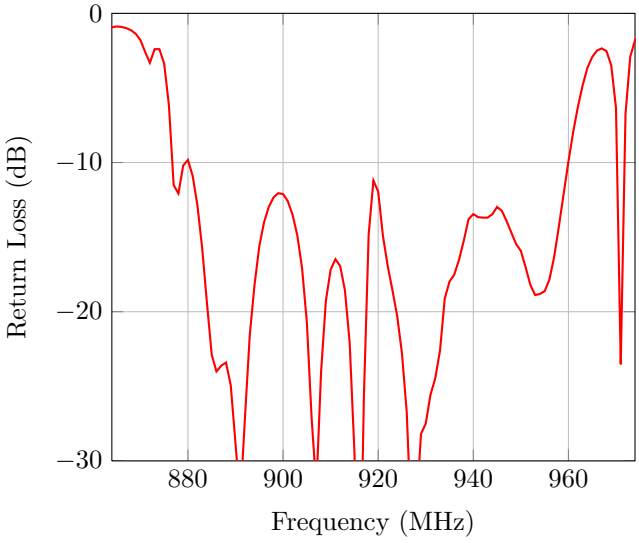


Figure 9: Antenna Port Return Loss

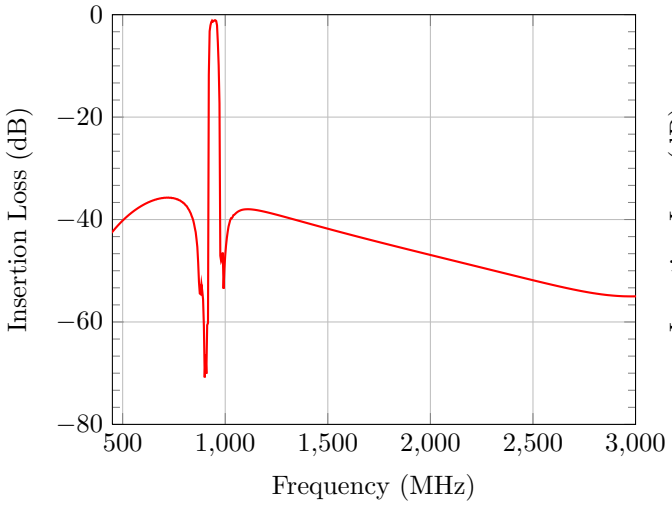


Figure 10: Tx–Ant Wideband Insertion Loss

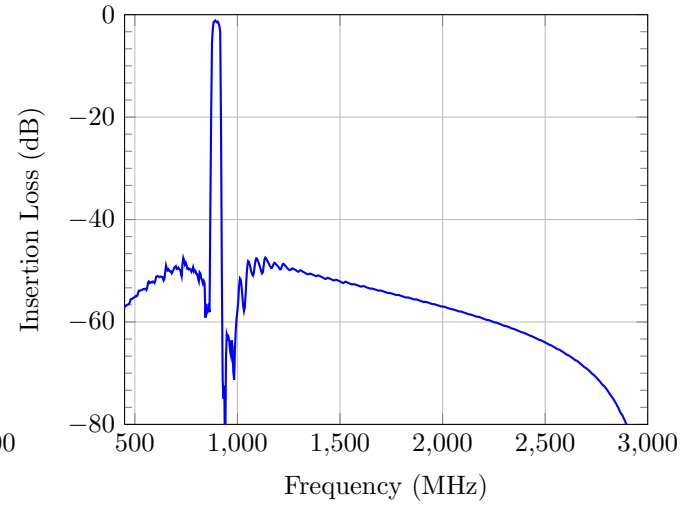


Figure 11: Ant–Rx Wideband Insertion Loss

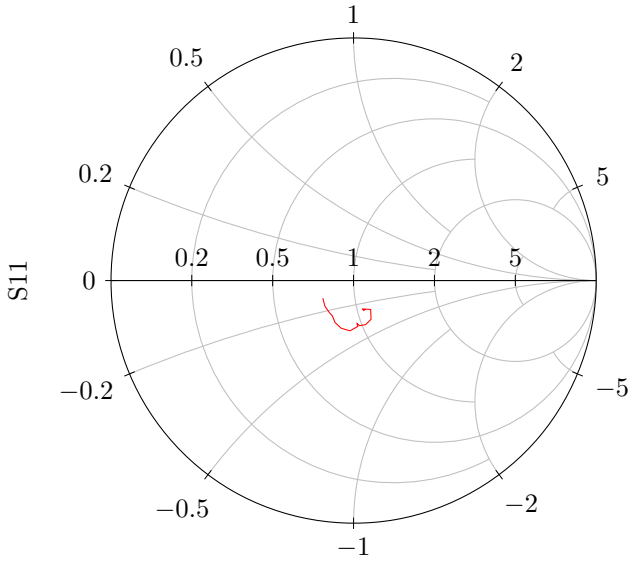


Figure 12: Tx Port Impedance in Tx Band ($Z0 = 50\Omega$)

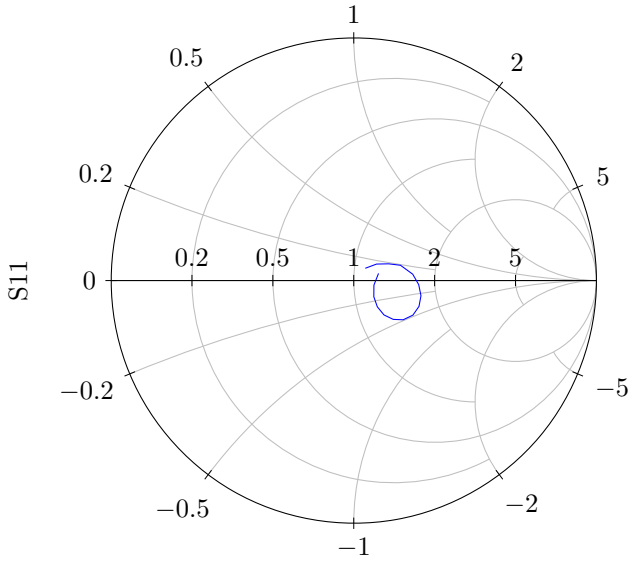


Figure 13: Rx Port Impedance in Rx Band ($Z0 = 50\Omega$)

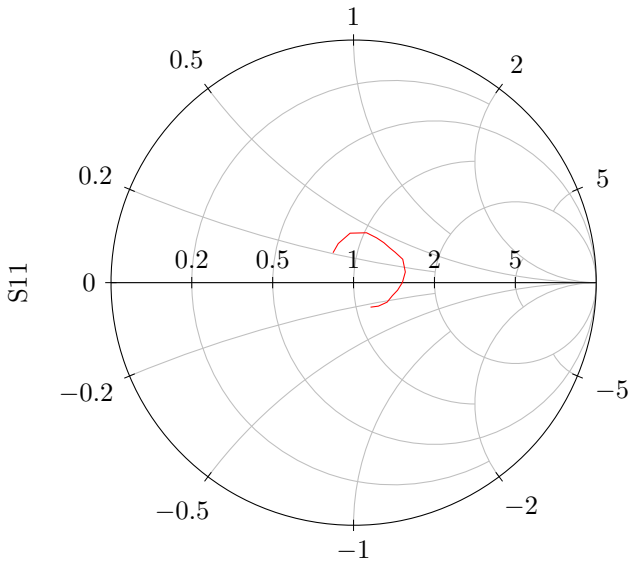


Figure 14: Ant Port Impedance in Tx Band ($Z0 = 50\Omega$)

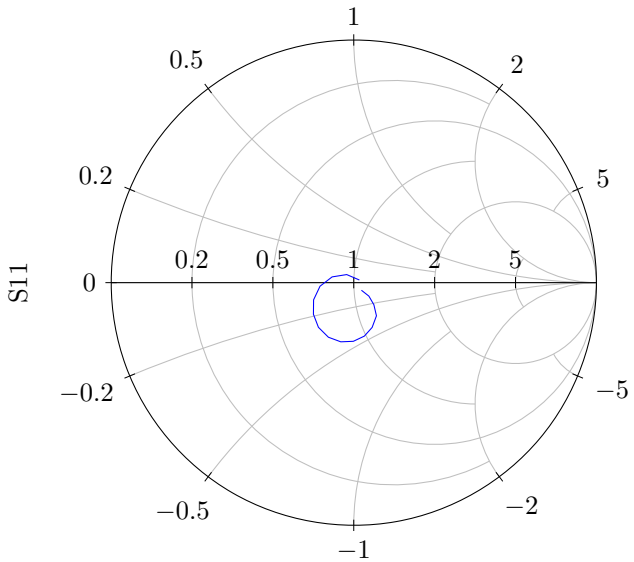


Figure 15: Ant Port Impedance in Rx Band ($Z0 = 50\Omega$)

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

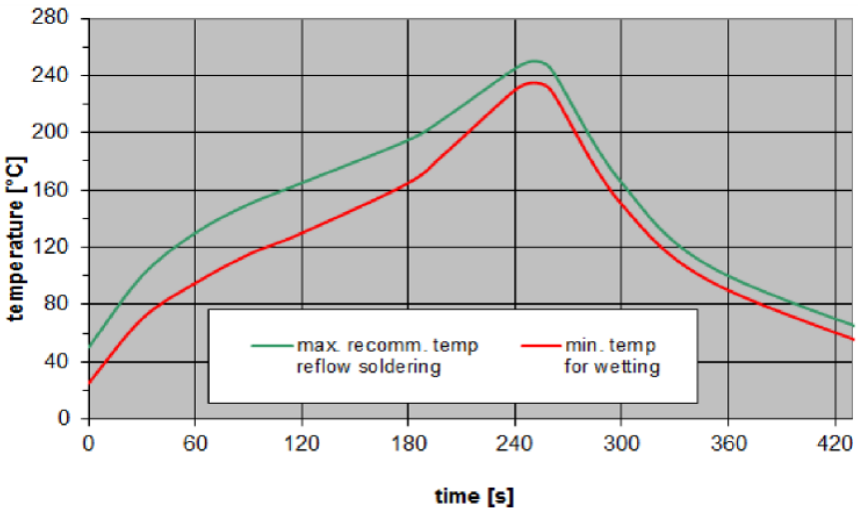
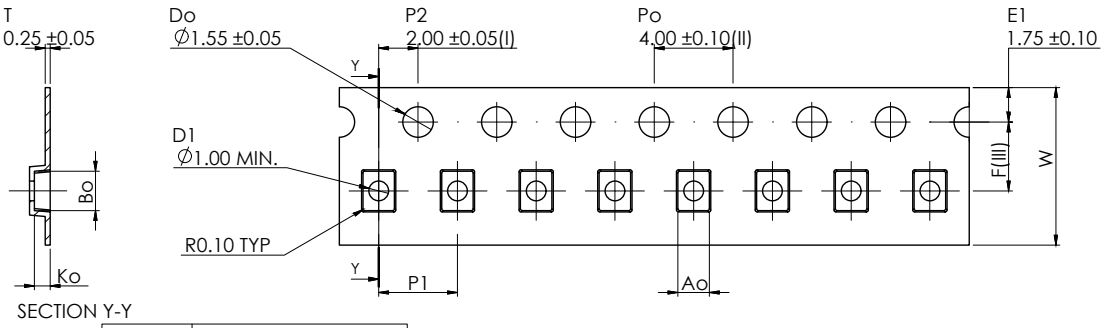


Figure 16: Drawing of reel (Recommended reflow profile for convection and infrared soldering – lead-free solder

10 Tape and Reel

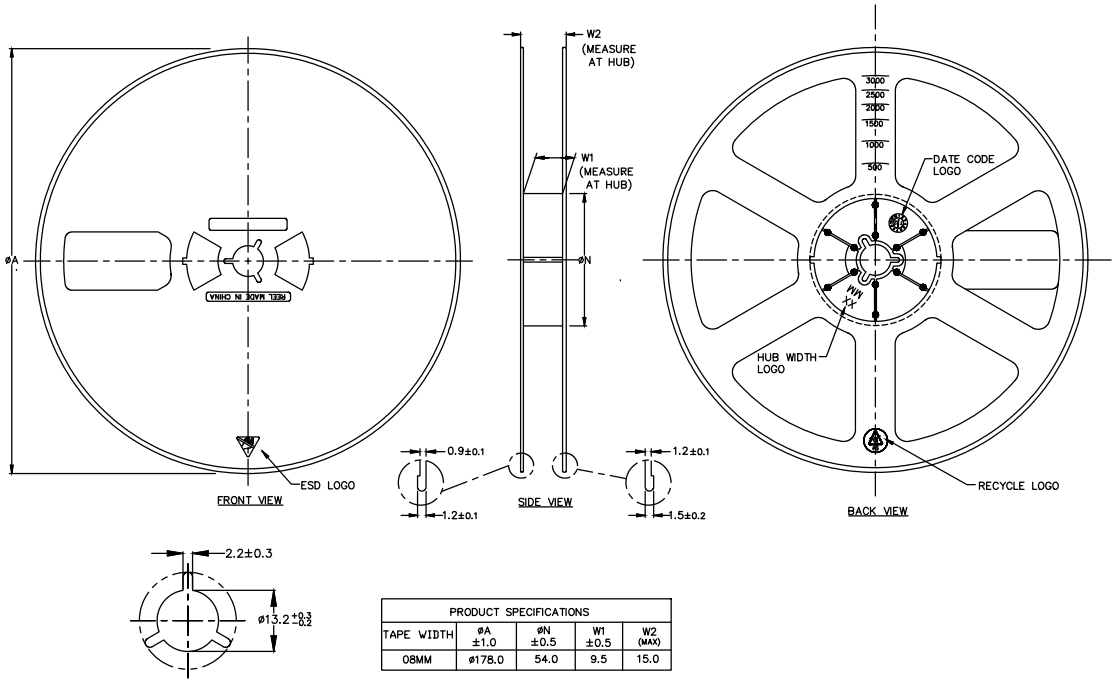
10.1 Tape



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