

SAW Components

SAW Duplexer

Cellular / LTE / WCDMA Band 1

Series/type: QGSA1G95BASP5
Ordering code: QGSA1G95BASP5

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Version: 1.0



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1 Application

- Multimode SAW duplexer for mobile telephone
Cellular / LTE / WCDMA Band 1 systems
- Low insertion attenuation
- Low amplitude ripple

2 Features

- Package size 1.6 ± 0.1 mm x 1.2 ± 0.1 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)

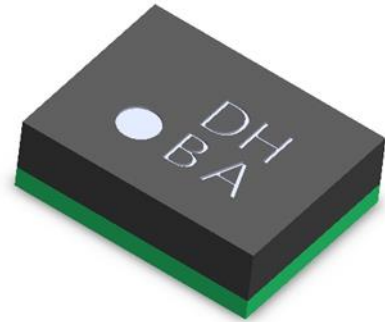
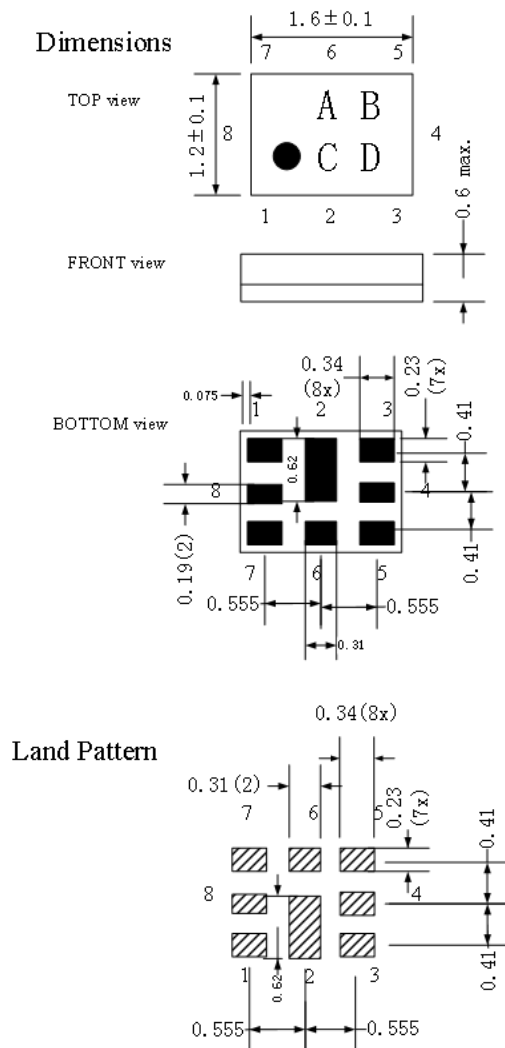


Figure 1: Picture of component with example of product marking.

3 Package



4 Pin configuration

- 1 RX
- 3 TX
- 6 ANT
- 2,4,5,7,8 Ground

5 Matching circuit

■ $L_{p1}=2.9\text{nH}$ $L_{p2}=1.8\text{nH}$ $C=0.8\text{pF}$

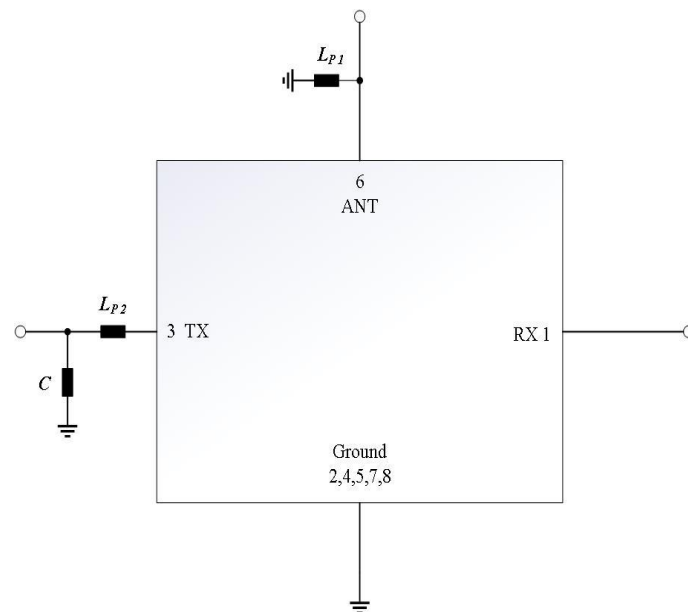


Figure 3: Schematic of matching circuit.

6 Characteristics

6.1 TX-ANT

Temperature range for specification

$T_{SPEC} = -20^{\circ}\text{C} \dots +85^{\circ}\text{C}$

TX terminating impedance

$Z_{TX} = 50 \Omega$ with par. Lp2¹⁾

ANT terminating impedance

$Z_{ANT} = 50 \Omega$ with par. Lp1¹⁾

RX terminating impedance

$Z_{RX} = 50 \Omega$

Item					min.	typ. ⁽¹⁾	max.	Unit	Note
Center Frequency						1950		MHz	
Insertion Loss	1920	to	1980	MHz		1.7	1.9	dB	
	1920.25	to	1979.75	MHz		1.7	1.9	dB	
	1922.5	to	1977.5	MHz		1.7	1.9	dB _{INT}	
Ripple Deviation	1920	to	1980	MHz		0.2	0.5	dB	
VSWR	1920	to	1980	MHz		1.1	2.0		TX
	1920	to	1980	MHz		1.2	2.0		ANT
Absolute Attenuation	450	to	1574	MHz	29	34		dB	
	450	to	494	MHz	29	39		dB	
	814	to	849	MHz	29	37		dB	
	880	to	915	MHz	29	36		dB	
	925	to	1250	MHz	29	35		dB	
	1428	to	1563	MHz	29	34		dB	
	1565.42	to	1577.47	MHz	29	33		dB	
	1577.47	to	1605.89	MHz	28	32		dB	
	1605.88	to	1805	MHz	25	33		dB	
	1805	to	1865	MHz	20	24		dB	
	1865	to	1880	MHz	10	23		dB	
	1880	to	1895	MHz	8.0	16.5		dB	
	2010	to	2025	MHz	15	24		dB	
	2110	to	2170	MHz	30	35		dB	
	2300	to	2400	MHz	37	43		dB	
	2400	to	2500	MHz	34	39		dB	
	2620	to	2690	MHz	29	33		dB	
	3840	to	3960	MHz	20	26		dB	
	4900	to	5950	MHz	17	27		dB	
	4905	to	5845	MHz	17	27		dB	

¹⁾ See Sec. Matching circuit (p. 5).

6.2 ANT-RX

Temperature range for specification

$T_{SPEC} = -20^{\circ}C...+85^{\circ}C$

TX terminating impedance

$Z_{TX} = 50 \Omega$ with par. Lp2¹⁾

ANT terminating impedance

$Z_{ANT} = 50 \Omega$ with par. Lp1¹⁾

RX terminating impedance

$Z_{RX} = 50 \Omega$

Item					min.	typ. ⁽¹⁾	max.	Unit	Note
Center Frequency					2140			MHz	
Insertion Loss	2110	to	2170	MHz		1.8	2.3	dB	
	2110.25	to	2169.75	MHz		1.8	2.3	dB	
	2112.5	to	2167.5	MHz		1.8	2.3	dB _{INT}	
Ripple Deviation	2110	to	2170	MHz		0.5	1.2	dB	
VSWR	2110	to	2170	MHz		1.7	2.1		RX
	2110	to	2170	MHz		1.6	2.1		ANT
Absolute Attenuation	450	to	1920	MHz	33	39		dB	
	718	to	748	MHz	40	57		dB	
	814	to	849	MHz	40	55		dB	
	880	to	915	MHz	40	54		dB	
	1427	to	1463	MHz	39	47		dB	
	1730	to	1790	MHz	35	41		dB	
	1710	to	1785	MHz	33	39		dB	
	1920	to	1980	MHz	45	49		dB	
	1980	to	2015	MHz	15	51		dB	
	2015	to	2075	MHz	5.0	11.1		dB	
	2255	to	6130	MHz	24	30		dB	
	2300	to	2400	MHz	26	31		dB	
	2400	to	2500	MHz	30	35		dB	
	2500	to	2570	MHz	38	45		dB	
	4030	to	4150	MHz	33	40		dB	
	4220	to	4340	MHz	32	39		dB	
	4900	to	5950	MHz	27	35		dB	

¹⁾ See Sec. Matching circuit (p. 5).

6.3 TX-RX

Temperature range for specification	T_{SPEC}	= -20°C...+85°C
TX terminating impedance	Z_{TX}	= 50 Ω with par. Lp2 ¹⁾
ANT terminating impedance	Z_{ANT}	= 50 Ω with par. Lp1 ¹⁾
RX terminating impedance	Z_{RX}	= 50 Ω

Item	Tx to Rx				min.	typ. ⁽¹⁾	max.	Unit	Note
Isolation	1920	to	1980	MHz	50	53		dB	
	1920.25	to	1979.75	MHz	50	53		dB	
	1922.5	to	1977.5	MHz	50	53		dB _{INT}	
	2110	to	2170	MHz	53	58		dB	
	2110.25	to	2169.75	MHz	53	58		dB	
	2112.5	to	2167.5	MHz	53	58		dB _{INT}	

1) See Sec. Matching circuit (p. 5).

7 Maximum ratings

Storage temperature	$T_{\text{STG}} = -40\text{ °C to }+85\text{ °C}$	
DC voltage	$V_{\text{DC}} = 3.0\text{ V (max.)}$	
Input power	$P_{\text{IN}} = +30\text{ dBm}$ 5000 h 55 °C	Input signal shall be applied to Terminal number (1)

8 Transmission coefficients

8.1 TX-ANT

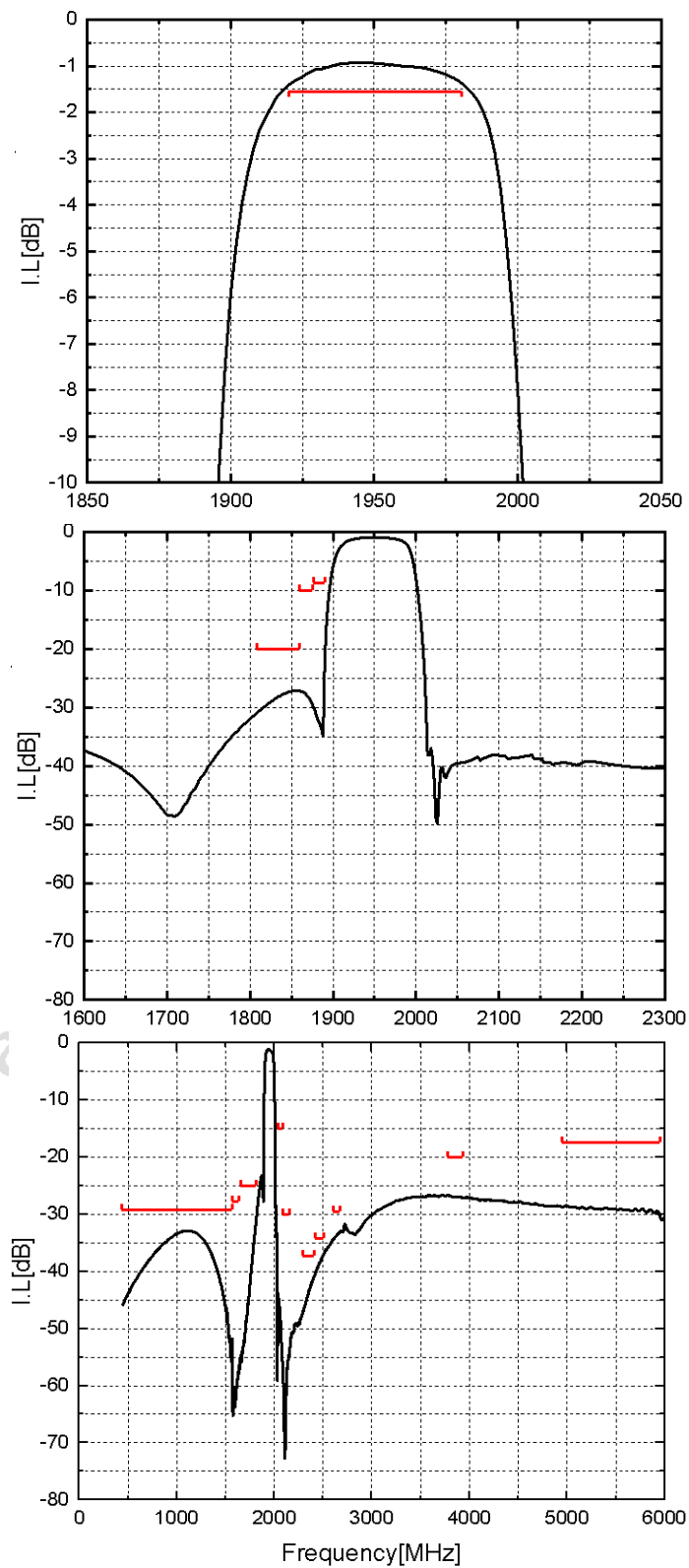


Figure 4: Attenuation TX – ANT.

8.2 ANT-RX

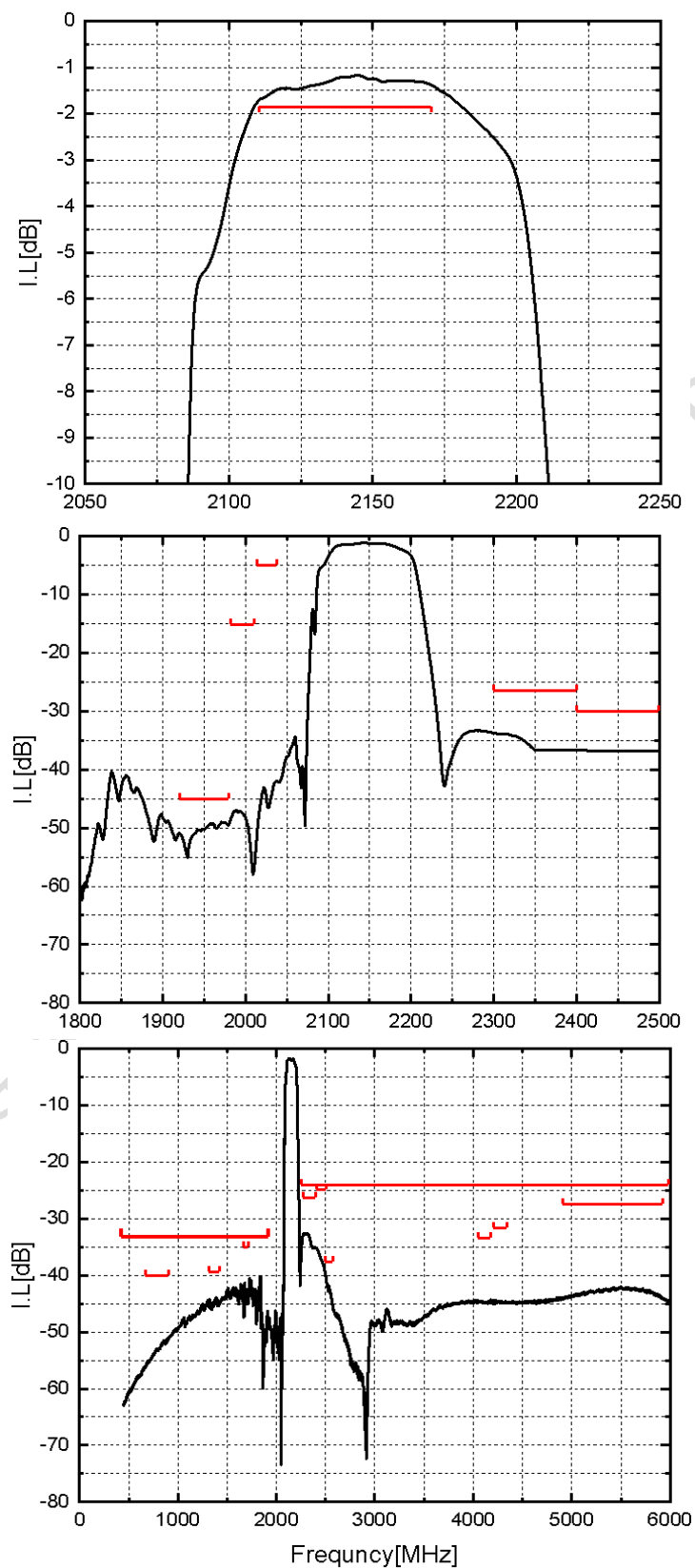


Figure 5: Attenuation ANT - RX.

8.3 TX-RX

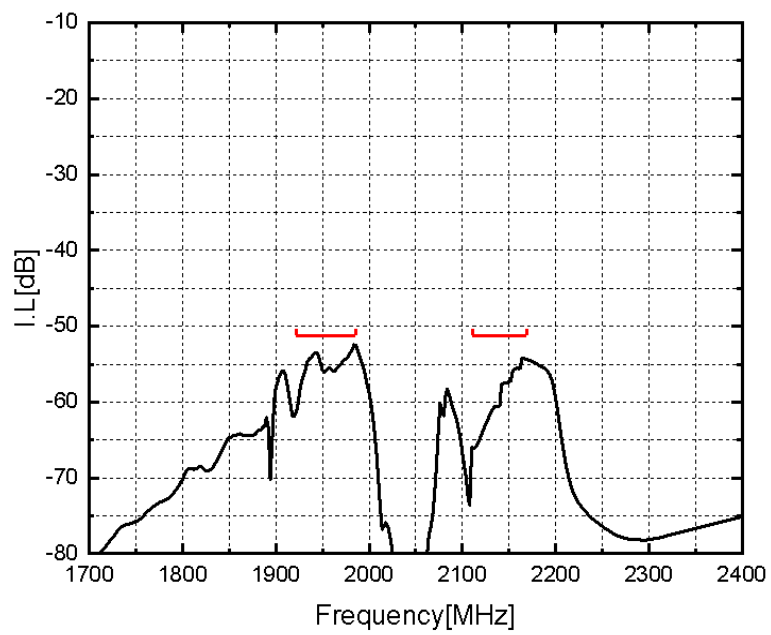


Figure 6: Isolation TX - RX.

9 Soldering profile

The recommended soldering process is in accordance with IEC 60068-2-58-3rd edit and IPC/JEDECJ-STD-020B.

Ramp rate	$\leq 3 \text{ K/s}$
Preheat	125 °C to 220 °C, 150 s to 210 s, 0.4 K/s to 1.0 K/s
$T > 220 \text{ °C}$	30 s to 70 s
$T > 230 \text{ °C}$	Min. 10 s
$T > 245 \text{ °C}$	Max. 20 s
$T \geq 255 \text{ °C}$	–
Peak temperature T_{peak}	220 °C $\pm$ 5 °C
Wetting temperature T_{min}	230 °C $\pm$ 5 °C for 10 s $\pm$ 1 s
Cooling rate	$\leq 3 \text{ K/s}$
Soldering temperature T	Measured at solder pads

Characteristics of recommended soldering profile for lead-free solder (Sn95.5Ag3.8Cu0.7).

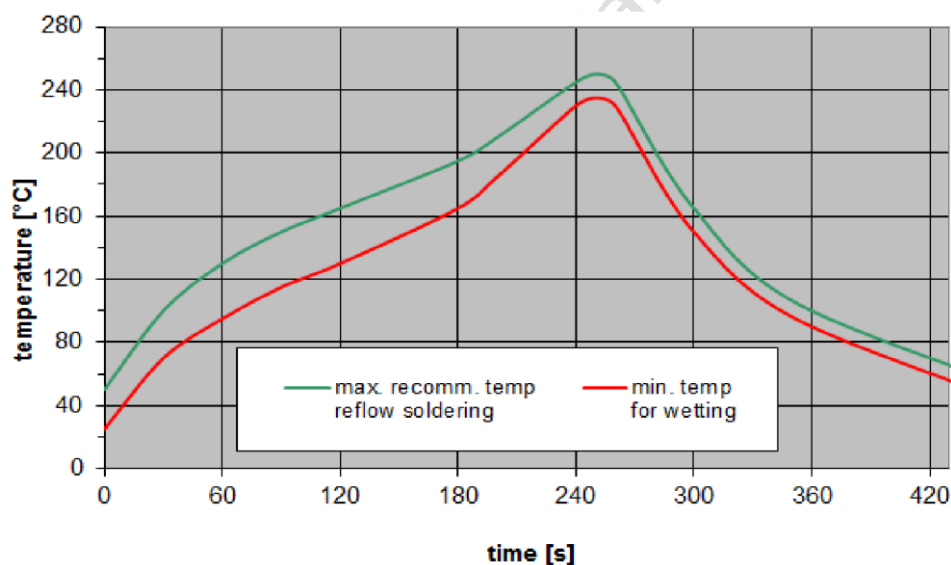


Figure 7: Recommended reflow profile for convection and infrared soldering – lead-free solder

10 Tape&Reel

10.1 Tape

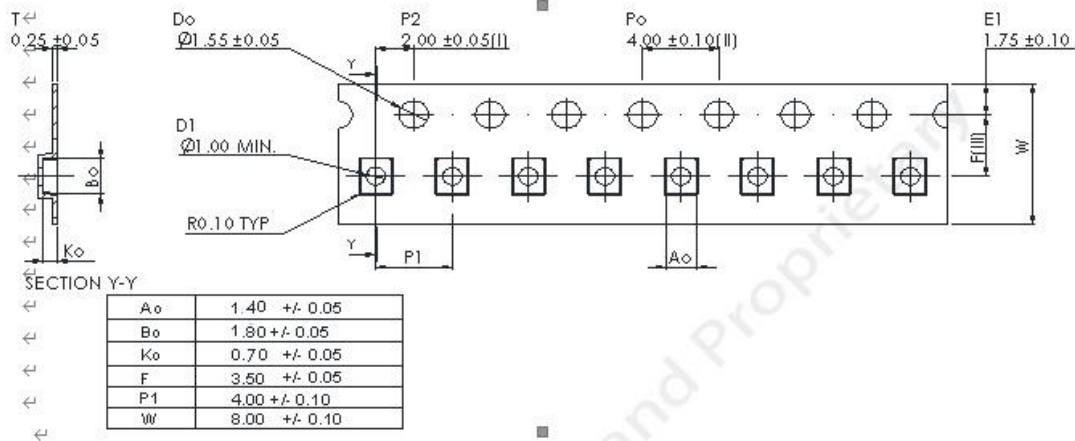


Figure 8: Drawing of tape (first-angle projection) with tape dimensions

10.2 Reel with diameter of 178 mm

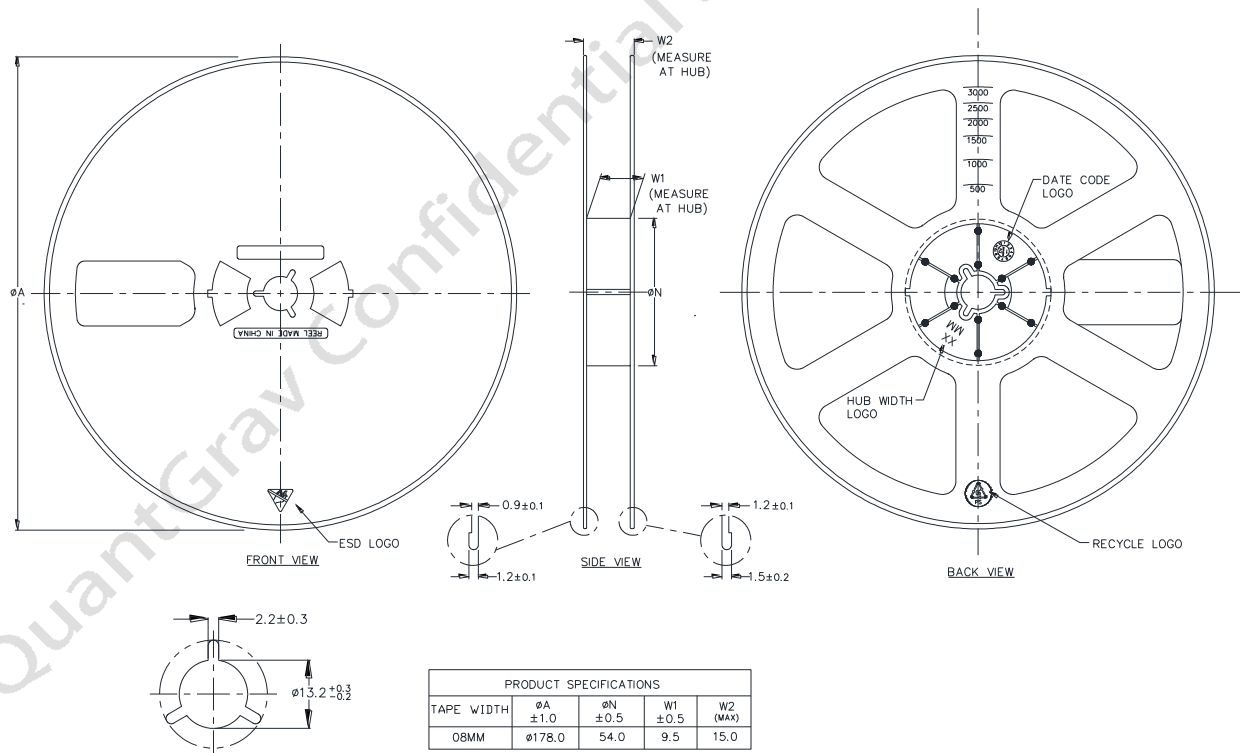


Figure 9: Drawing of reel (first-angle projection) with diameter of 180 mm