

TMX MT01

SAW Filter datasheet

1.1 x 0.9 mm, SMD

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SAW Bandpass Filters | GNSS Receivers



Features

Features

- 1580 MHz center frequency
- Narrow and sharp passband characteristics
- Low Insertion Loss and deep stopband attenuation for interference
- High stability and reliability. No adjustment
- Unbalanced to unbalanced operation
- No matching network required for operation at 50 Ω

Applications

- GNSS Receivers
 - Beidou
 - GPS
 - Glonass

1.1 x 0.9 mm



Maximum Ratings

Parameter	Min.	Typ.	Max.	Unit
Storage temperature range (T_{stg})	-40		85	°C
Operating temperature range (T_A)	-30		85	°C
DC voltage (between any terminals)			10	V
RF Power (in BandWidth)			13	dBm

Frequency and Electrical Characteristics (Reference temperature @ 25°C)

Parameter	Min.	Typ. ¹	Max.	Unit
Center frequency (fc)		1580		MHz
Insertion Loss				
From 1559.09 to 1563.09 MHz		1.8	2.1	dB
From 1574.42 to 1576.42 MHz		1.3	1.6	dB
From 1597.55 to 1605.89 MHz		1.8	2.1	dB
Passband Ripple				
From 1559.09 to 1563.09 MHz		0.2	0.5	dB
From 1574.42 to 1576.42 MHz		0.2	0.4	dB
From 1597.55 to 1605.89 MHz		0.3	0.6	dB
VSWR Input				
From 1559.09 to 1563.09 MHz		1.5	1.9	
From 1574.42 to 1576.42 MHz		1.25	1.8	
From 1597.55 to 1605.89 MHz		1.55	1.9	
VSWR Output				
From 1559.09 to 1563.09 MHz		1.	1.9	
From 1574.42 to 1576.42 MHz		1.25	1.8	
From 1597.55 to 1605.89 MHz		1.555	1.9	
Group delay Ripple				
From 1597.55 to 1605.89 MHz		3	12	ns

¹ Typical values are nominal performances at room temperature

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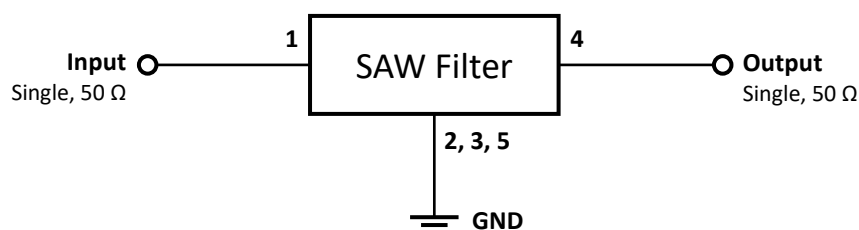
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Parameter	Min.	Typ. ²	Max.	Unit
Absolute Attenuation				
From 10 to 960 MHz	47	50		dB
From 960 to 1463 MHz	36	40		dB
From 1710 to 1785 MHz	37	39		dB
From 1785 to 1990 MHz	37	39		dB
From 1990 to 2280 MHz	35	39		dB
From 2280 to 2400 MHz	35	39		dB
From 2400 to 2500 MHz	33	38		dB
From 2500 to 2700 MHz	32	36		dB
From 2700 to 3000 MHz	28	33		dB
From 3000 to 6000 MHz	15	22		dB
Input / Output impedance (Nominal)		50		Ω

Test Circuit

50 Ω / 50 Ω Configuration

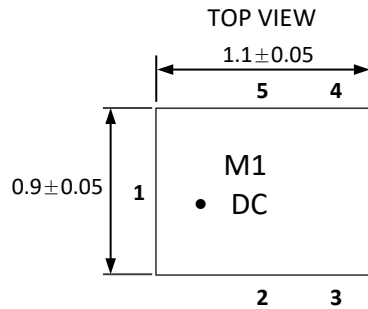


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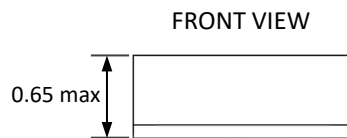
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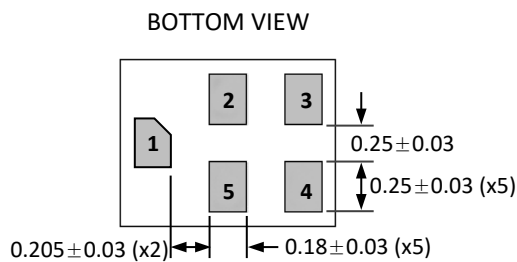
Model Outline, Pin Connection and Marking



Marking	Note
Line 1 M1	RakonXpress designation (TMX MT01)
Line 2 • DC	• = Identify black dot DC = Date code (See the tables below)



Pin	Connections
1	Input unbalanced
4	Output unbalanced
2, 3, 5	To be grounded



Unit: mm

Year Code (1 st digit)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2016 & 2020	n	p	q	r	s	t	u	v	w	X	y	z
2017 & 2021	A	B	C	D	E	F	G	H	I	K	L	M
2018 & 2022	N	P	Q	R	S	T	U	V	W	X	Y	Z
2019 & 2023	a	b	c	d	e	f	g	h	i	j	k	m

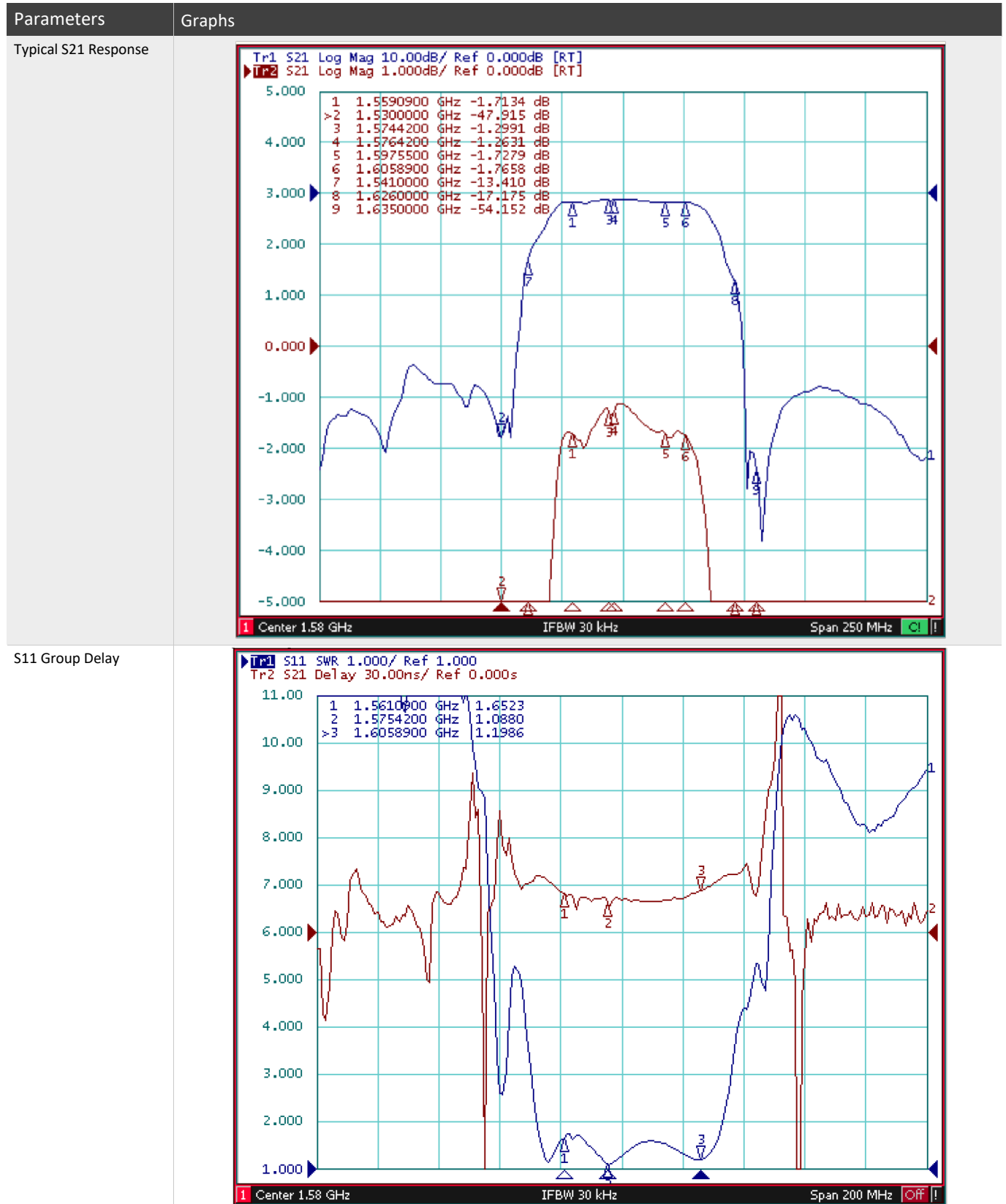
Date Code (2 nd digit)															
1 st	2 nd	3 rd	4 th	5 th	6 th	7 th	8 th	9 th	10 th	11 th	12 th	13 th	14 th	15 th	16 th
A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R
17 th	18 th	19 th	20 th	21 st	22 nd	23 rd	24 th	25 th	26 th	27 th	28 th	29 th	30 th	31 st	
S	T	U	V	W	X	Y	Z	a	b	d	e	f	g	h	

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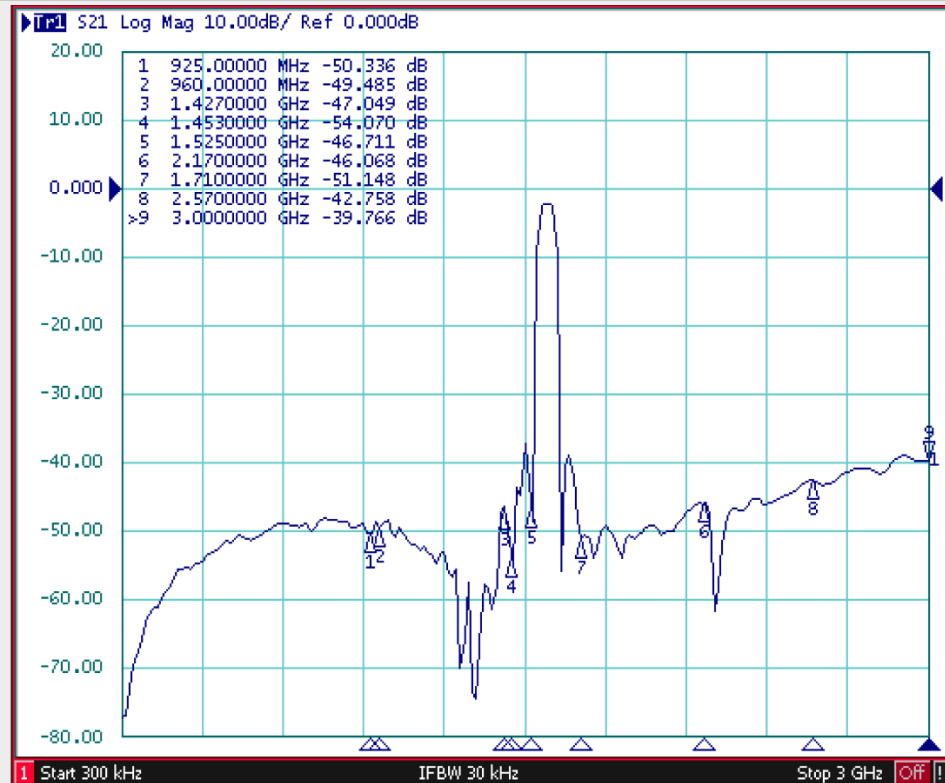
Frequency Characteristics



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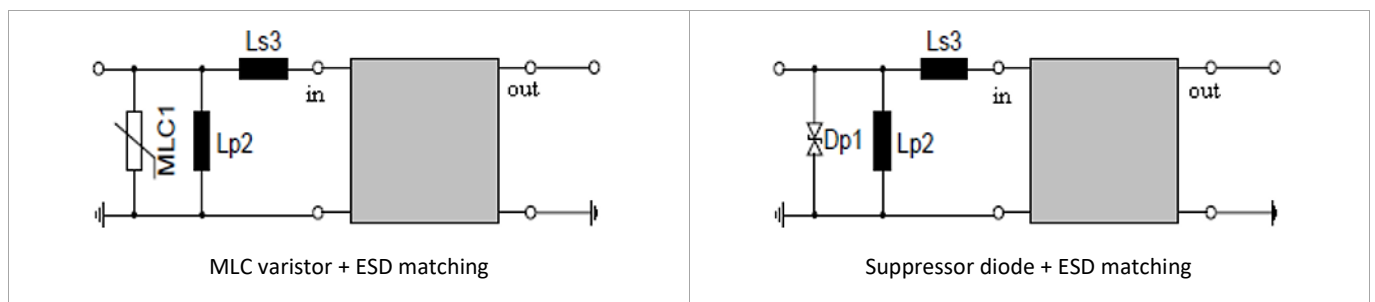
Far Side



ESD Protection

This product is electrostatic sensitive device. When you install or measure it, you should be careful not to add antistatic electricity or high voltage. Please be advised that you had better check anti surge voltage.

To reduce the probability of damages caused by ESD, the following matching topologies should be applied.



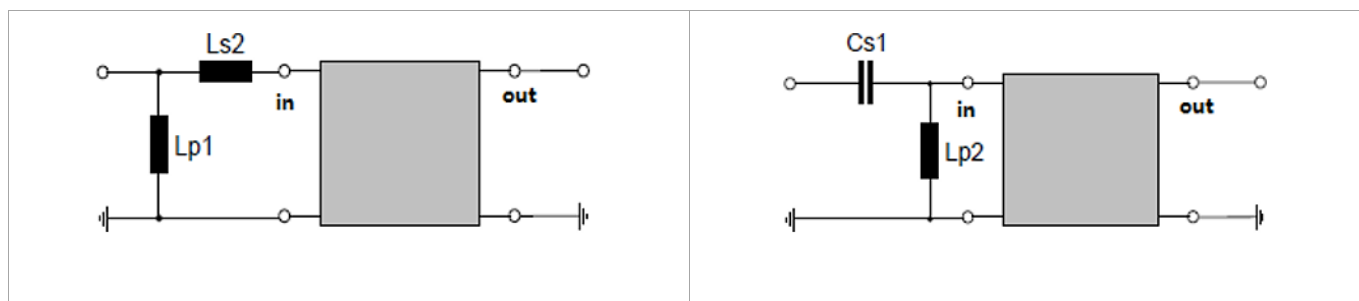
ESD matching" should be added to the filter port, where electrostatic discharge is expected. It predominantly appears at the antenna input of RF receivers. Therefore "ESD matching" should be designed to short circuit or block the ESD pulse.

Depending on the input impedance of the SAW filter and the source impedance, the needed component values have to be determined from case to case.

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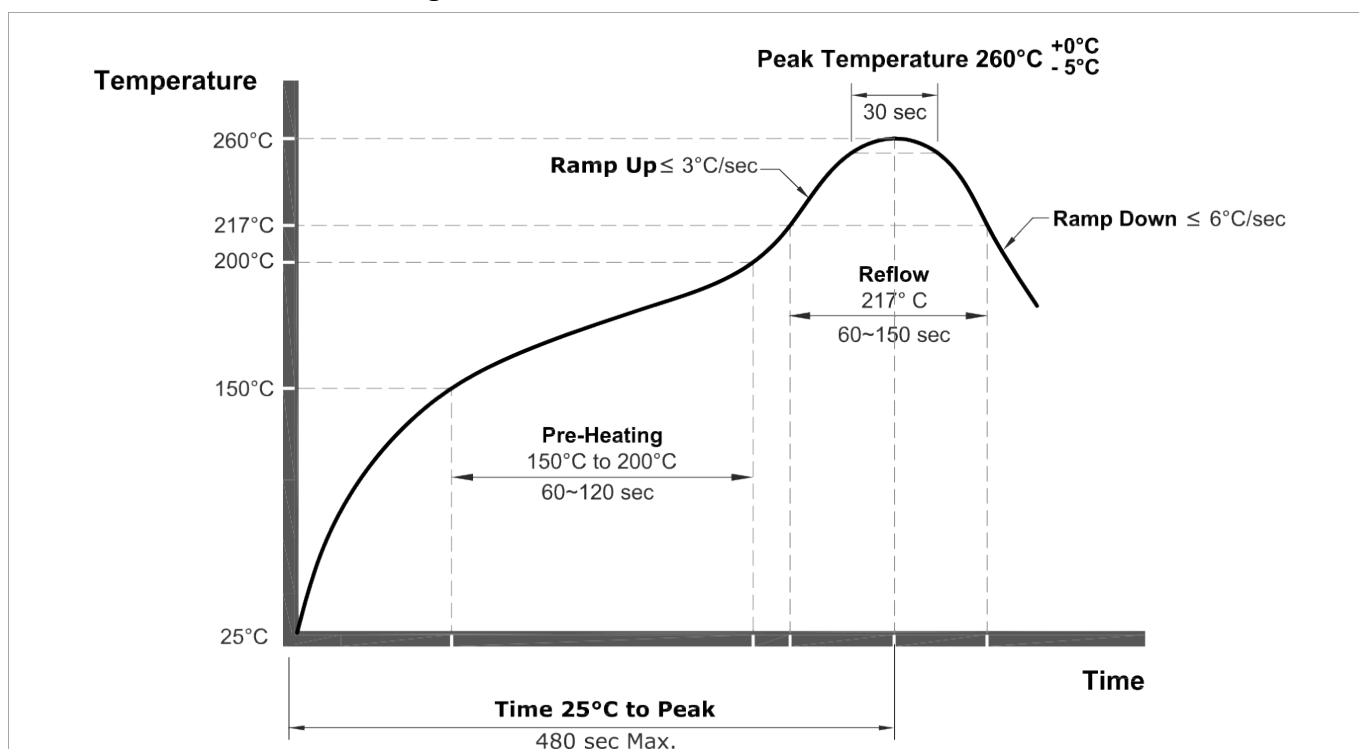
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In cases where ESD is minor, the following simplified “ESD matching” topologies can be used:



Effectiveness of the applied ESD protection has to be checked according to relevant industry standards or customer specific requirements.

Recommended Reflow Soldering Profile



NOTE:

- The components shall remain within the electrical specifications after it soldered on the 1mm thickness PCB board and dipped in the solder at $260 \pm 5^{\circ}\text{C}$ during 10 ± 1 seconds.
- The components shall remain within the electrical specifications after it soldered by electric iron, solder at $350 \pm 10^{\circ}\text{C}$ during 3~4 seconds. Recovery time: 2 ± 0.5 hour.
- Ultrasonic cleaning may cause deterioration and destruction of the component. Please avoid ultrasonic cleaning.
- Only leads of components may be soldered. Please avoid soldering another part of the component.

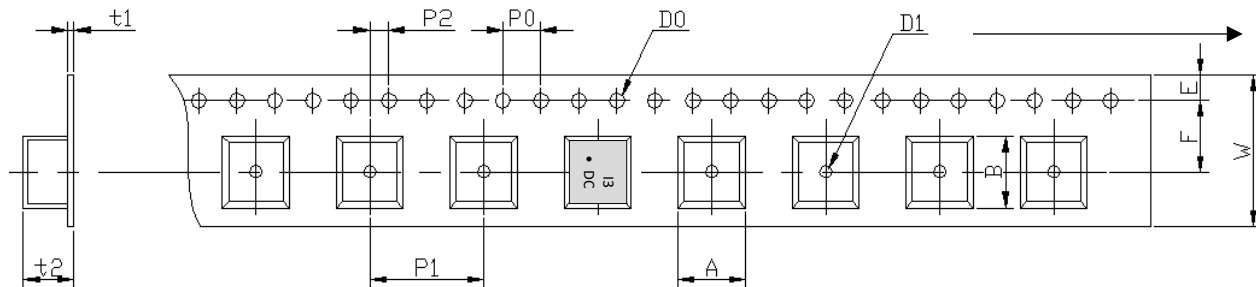
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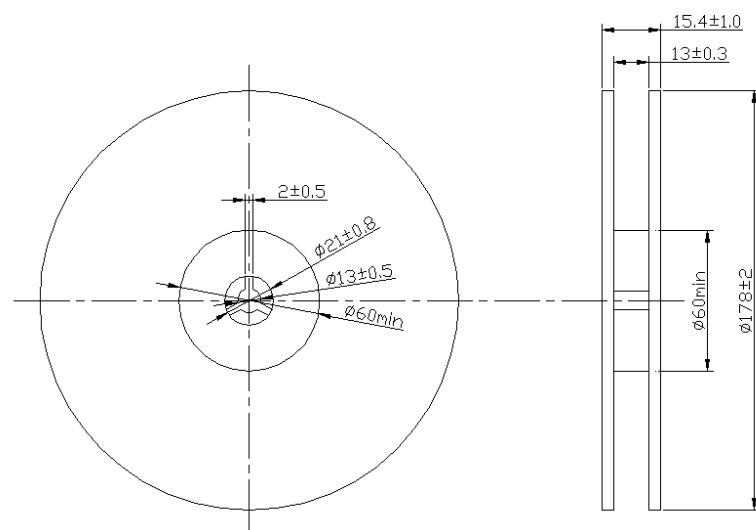
Tape and Reel Specifications

TAPE DETAILS:



Parameter	Code	Dimension	Tolerance
Height of component hole	A	1.02	± 0.05
Width of component hole	B	1.22	± 0.05
Diameter of sprocket hole	D ₀	Φ 1.55	± 0.05
Diameter of feed hole	D ₁	Φ 0.60	± 0.05
Pitch of sprocket hole	P ₀	4.0	± 0.05
Length from hole center to component center	P ₁	2.0	± 0.05
Length from Pocket hole center to sprocket hole center	P ₂	2.0	± 0.05
Width of carrier tape	W	6.0	± 0.1
Width of adhesive tape	F	3.50	± 0.05
Gap of hold down tape and carrier tape	E	1.75	± 0.1
Thickness of Ebossed tape sheet	t ₁	0.20 max	± 0.05
Thickness of Ebossed tape	t ₂	0.72 max	± 0.05

REEL DETAILS:



NOTE:

- Unit: mm
- Standard Packing Quantity (SPQ) is 4000 pieces/ reel

Reliability Test

Parameter	Test condition / Description	
Mechanical shock	(a) Drops: 3 times on concrete floor (b) Height: 1.0 m	
Vibration resistance	(a) Frequency of vibration: 10~55Hz (b) Amplitude: 1.5 mm	(c) Directions: X, Y and Z (d) Duration: 2 hours
Moisture resistance	(a) Condition: 40°C±2°C, 93+2 -3% RH (b) Duration: 96 hours	(c) Wait 4 hours before measurement
Climatic sequence	(a) +70°C for 16 hours (b) +55°C for 24 hours, 90~95% RH (c) -25°C for 2 hours	(d) +40°C for 24 hours, 90~95% RH (e) Wait 4 hours before measurement
High temperature exposure	(a) Temperature: 85°C (b) Duration: 250 hours	(c) Wait 4 hours before measurement
Temperature cycling	(a) +85°C for 30 minutes ↔ -40°C for 30 minutes repeated 120 times (b) Wait 4 hours before measurement	
Note	As a result of the particularity of inner structure of SAW products, the components can easily be breakdown by electrostatic shock; so it's mandatory to pay attention to ESD protect during the tests.	