

## TMX JT04

### SAW Filter datasheet

3.0 x 3.0 x 1.1 mm, SMD

#### Table of Contents

<b>Features</b> .....	1
<b>Maximum Ratings</b> .....	1
<b>Frequency and Electrical Characteristics (Reference temperature @ 25°C)</b> .....	1
<b>Model Outline, Pin Connection and Marking</b> .....	2
<b>Test Circuit</b> .....	2
<b>Frequency Characteristics</b> .....	3
<b>Recommended Reflow Soldering Profile</b> .....	4
<b>Tape and Reel Specifications</b> .....	5
<b>Reliability Test</b> .....	6

# TMX JT04

SAW Bandpass Filters | Wireless Communications

## Features

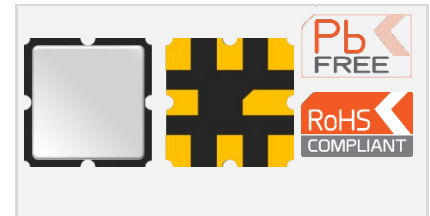
### Features

- 1395 MHz center frequency
- Ceramic package for Surface Mounted Technology
- Typical Passband width: 20 MHz
- Low loss RF filter and low amplitude ripple
- No matching network required for operation at 50 Ω

### Applications

- Wireless applications

3.0 x 3.0 x 1.1 mm



## Maximum Ratings

Parameter	Min.	Typ.	Max.	Unit
Storage temperature range ( $T_{stg}$ )	-40		85	°C
Operating temperature range ( $T_A$ )	-40		85	°C
DC Voltage ( $V_{DC}$ )			0	V
RF Power (in Band Width)			10	dBm

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

Parameter	Min.	Typ. <sup>1</sup>	Max.	Unit
Center frequency ( $f_c$ )		1395		MHz
Bandwidth (BW, passband width)	20.00			MHz
Insertion loss (IL, 1385.00 to 1405.00 MHz)		2.3	3.5	dB
Passband ripple (pk-pk) (1385.00 to 1405.00 MHz)		0.7	1.2	dB
Group Delay (pk-pk) (1385.00 to 1405.00 MHz)		11	40	ns
Absolute Attenuation				
From DC to 960 MHz	40	50		dB
From 960 to 1050 MHz	35	51		
From 1050 to 1120 MHz	35	54		
From 1120 to 1360 MHz	32	44		
From 1248 to 1268 MHz	35	63		
From 1430 to 1700 MHz	38	55		
From 1700 to 2500 MHz	33	47		
From 2500 to 4000 MHz	10	14		
VSWR (1385 to 1405 MHz)		1.5	2.0	
Source impedance <sup>2</sup> (Single ended)		50		Ω
Load impedance <sup>2</sup> (Single ended)		50		Ω

<sup>1</sup> Typical values are nominal performances at room temperature

<sup>2</sup> No external matching is required

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## Model Outline, Pin Connection and Marking

**TOP VIEW**

**FRONT VIEW**

**BOTTOM VIEW**

Marking	Note
Line 1	JT04 RakonXpress designation
Line 2	S911 S = Production Code 9 = Year 2019 11 = Week 11
Line 3	•AA • = Identify black dot AA = Internal Code (Wafer Batch)

Pin	Connections
2	Input
6	Output
1, 3, 5, 7	To be Grounded
4, 8	Case Ground

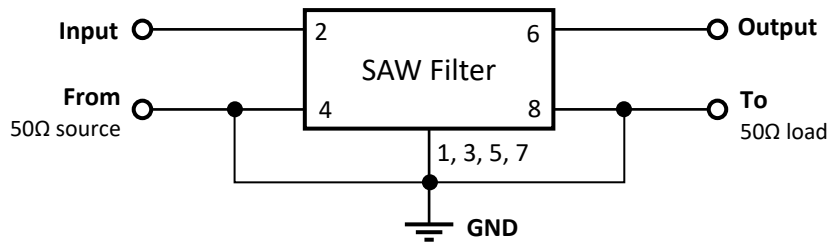
**RECOMMENDED PAD LAYOUT**

**TOP VIEW**

Unit: mm

## Test Circuit

### 50 Ω / 50 Ω Configuration



# TMX JT04

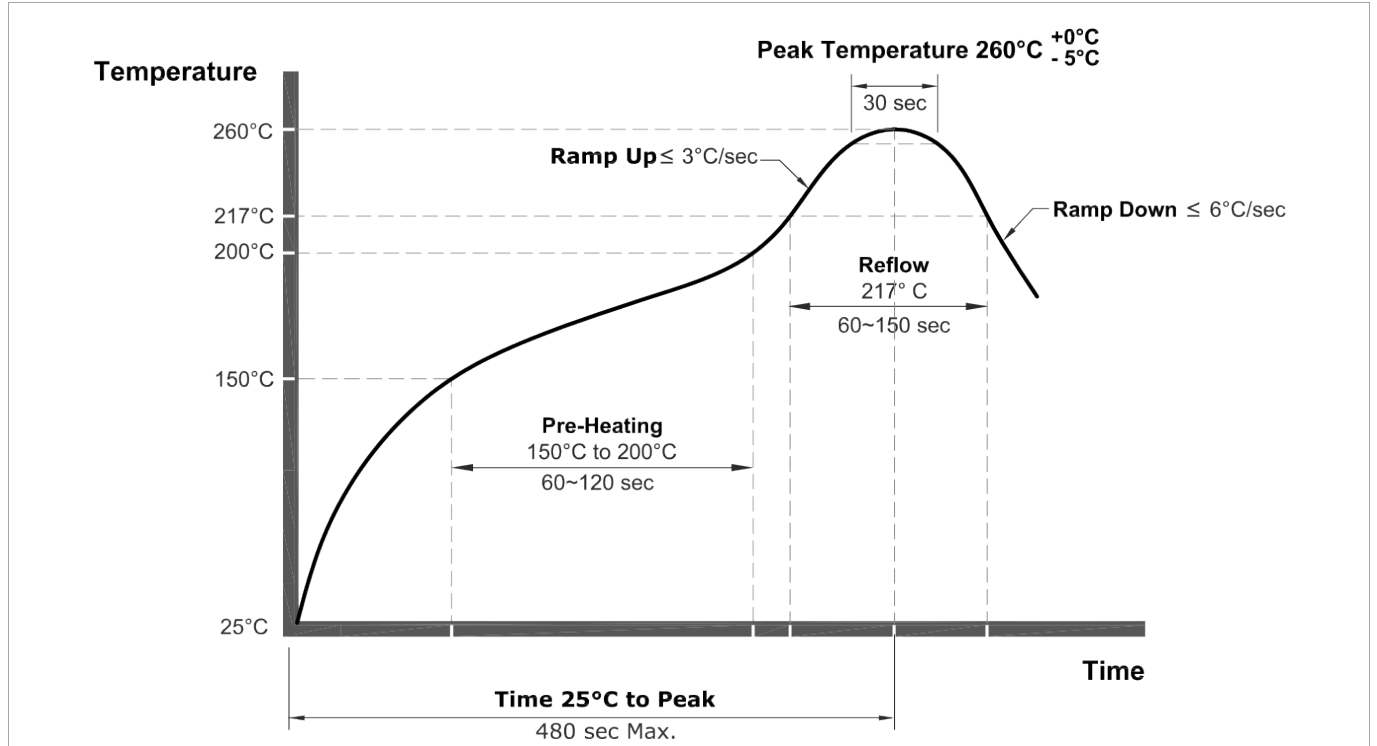
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## Frequency Characteristics

Parameters	Graphs																								
<p><b>Typical S21 Frequency Response</b></p>	<p>Graph showing S21 Log Mag (dB) vs Frequency (GHz). The plot displays the passband response with markers for center, low, and high frequencies, and insertion loss. The passband is centered around 1.395 GHz.</p> <table border="1"> <thead> <tr> <th>Frequency (GHz)</th> <th>Loss (dB)</th> </tr> </thead> <tbody> <tr> <td>1.3850000</td> <td>-2.4985</td> </tr> <tr> <td>1.4050000</td> <td>-2.2509</td> </tr> <tr> <td>1.3945000</td> <td>-1.8791</td> </tr> </tbody> </table> <p>Additional parameters: BW: 29.52732900 MHz, cent: 1.395343379 GHz, low: 1.380579714 GHz, high: 1.410107043 GHz, Q: 47.256, loss: -1.8791 dB. Rip12: Pass B1 619.39 mdB, Rip13: Pass B1 10.324 ns.</p>	Frequency (GHz)	Loss (dB)	1.3850000	-2.4985	1.4050000	-2.2509	1.3945000	-1.8791																
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<p><b>VSWR</b></p>	<p>Graph showing VSWR vs Frequency (GHz). The plot shows the Standing Wave Ratio across the passband, indicating a very low VSWR (near 1.000) within the passband.</p> <table border="1"> <thead> <tr> <th>Frequency (GHz)</th> <th>VSWR</th> </tr> </thead> <tbody> <tr> <td>1.3850000</td> <td>1.4810</td> </tr> <tr> <td>1.4050000</td> <td>1.4679</td> </tr> <tr> <td>1.3850000</td> <td>1.4699</td> </tr> <tr> <td>1.4050000</td> <td>1.4900</td> </tr> </tbody> </table>	Frequency (GHz)	VSWR	1.3850000	1.4810	1.4050000	1.4679	1.3850000	1.4699	1.4050000	1.4900														
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<p><b>Typical S21 FAR SIDELobe</b></p>	<p>Graph showing S21 Log Mag (dB) vs Frequency (GHz) for side lobes. The plot displays the magnitude of side lobes across the frequency range from 1.0 GHz to 5.0 GHz.</p> <table border="1"> <thead> <tr> <th>Frequency (GHz)</th> <th>Loss (dB)</th> </tr> </thead> <tbody> <tr> <td>10.0000000</td> <td>-79.534</td> </tr> <tr> <td>960.0000000</td> <td>-51.820</td> </tr> <tr> <td>1.0500000</td> <td>-54.439</td> </tr> <tr> <td>1.1200000</td> <td>-55.996</td> </tr> <tr> <td>1.3600000</td> <td>-44.388</td> </tr> <tr> <td>1.2480000</td> <td>-63.530</td> </tr> <tr> <td>1.2680000</td> <td>-66.291</td> </tr> <tr> <td>1.4300000</td> <td>-61.367</td> </tr> <tr> <td>1.7000000</td> <td>-58.679</td> </tr> <tr> <td>2.5000000</td> <td>-48.541</td> </tr> <tr> <td>4.0000000</td> <td>-14.504</td> </tr> </tbody> </table>	Frequency (GHz)	Loss (dB)	10.0000000	-79.534	960.0000000	-51.820	1.0500000	-54.439	1.1200000	-55.996	1.3600000	-44.388	1.2480000	-63.530	1.2680000	-66.291	1.4300000	-61.367	1.7000000	-58.679	2.5000000	-48.541	4.0000000	-14.504
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**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  $10 \pm 1$  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:  $2 \pm 0.5$  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.

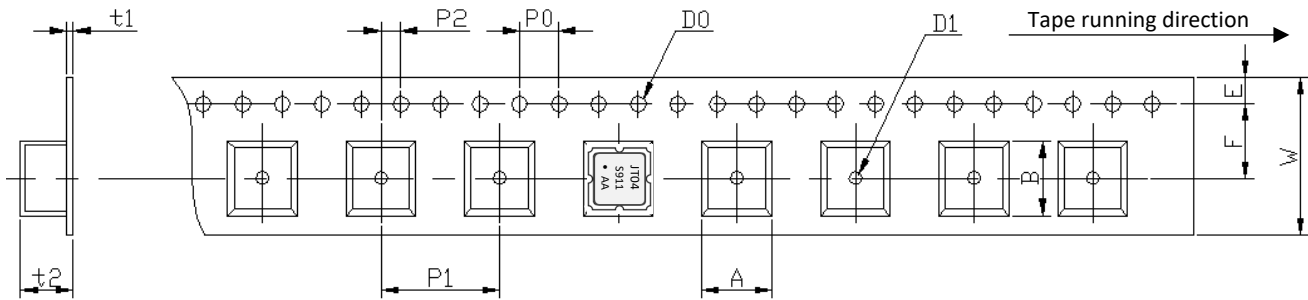
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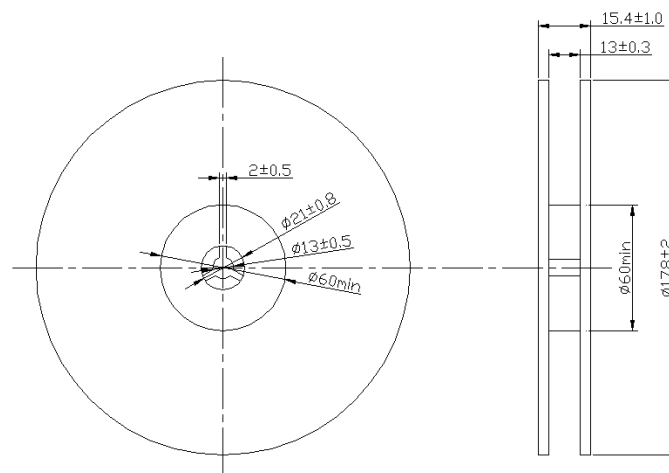
## Tape and Reel Specifications

### TAPE DETAILS:



Parameter	Code	Dimension	Tolerance
Height of component hole	A	3.3 max	
Width of component hole	B	3.3 max	
Diameter of sprocket hole	D <sub>0</sub>	Φ 1.5	± 0.1
Diameter of feed hole	D <sub>1</sub>	Φ 1.5 min	± 0.25
Pitch of sprocket hole	P <sub>0</sub>	4.0	± 0.2
Length from hole center to component center	P <sub>1</sub>	4.0	± 0.1
Length from Pocket hole center to sprocket hole center	P <sub>2</sub>	2.0	± 0.2
Width of carrier tape	W	12.0	± 0.3
Width of adhesive tape	F	5.5	± 0.3
Gap of hold down tape and carrier tape	E	1.75	± 0.1
Thickness of Embossed tape sheet	t <sub>1</sub>	0.31 max	
Thickness of Embossed tape	t <sub>2</sub>	1.7 max	

### REEL DETAILS:



### NOTE:

- Unit: mm
- Standard Packing Quantity (SPQ) is 3000 pieces/reel

**Reliability Test**

Parameter	Test condition / Description
Thermal Shock	The components shall remain within the electrical specifications after being kept at the condition of heat cycle conditions: TA=-40° C ± 3° C, TB=85° C ± 2° C, t1=t2=30min, switch time ≤ 3min & cycle time: 100 times, recovery time: 2h ± 0.5h.
Temperature Storage	High Temperature Storage: The components shall remain within the electrical specifications after being kept at the 85°C ± 2°C for 500 hours, recovery time: 2h ± 0.5h. Low Temperature Storage: The components shall remain within the electrical specifications after being kept at the -40°C ± 3°C for 500 hours, recovery time: 2h ± 0.5h.
Humidity test	The components shall remain within the electrical specifications after being kept at the condition of ambient temperature 60°C ± 2°C, and 90~95% RH for 500 hours.
Drop test	The components shall remain within the electrical specifications after random free drops 10 times from height of 1.0 meter onto concrete floor, and the specimens shall meet the electrical specifications.
Vibration Fatigue	The components shall remain within the electrical specifications after loaded vibration at 10~55Hz, amplitude 1.5mm, X, Y, Z, direction, during 2 hours.
Mechanical Shock	The components shall remain within the electrical specifications after 1000 shocks, acceleration 392 m/s <sup>2</sup> , duration 6ms.
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.