

# 978 MHz SMD TC-SAW Filter



**AFII-TC-0015**

Request Samples



Check Inventory



**3 x 3 x 1.4 mm**

**RoHS Compliant**

**MSL Level=1**

## Features

- Temperature-Compensated SAW (TC-SAW) Filter
- Compact Size: 3 x 3 x 1.4 mm
- Frequency Range: 975.5~980.5 MHz
- Insertion Loss: 2.2 dB (Typ.)
- High Out-of-Band Rejection: > 38dB
- +85°C maximum Operating Temperature
- Max Input Power: +20 dBm
- 50 Ohms Single-Ended Input & Output

## Applications

- Aviation & ADS-B / UAT Systems
- IoT & Smart Metering
- Private LTE & 5G Sub-1 GHz Bands
- Industrial, Scientific, and Medical (ISM) Applications
- Defense, Drones, and Secure Communications

## Product Image



# 978 MHz SMD TC-SAW Filter



AFII-TC-0015

Request Samples



Check Inventory



3 x 3 x 1.4 mm

RoHS Compliant

MSL Level=1

## Electrical Specification

| Parameters                                                | Minimum | Typical | Maximum | Units             | Notes           |
|-----------------------------------------------------------|---------|---------|---------|-------------------|-----------------|
| Center Frequency (fc)                                     | -       | 978     | -       | MHz               |                 |
| Bandwidth                                                 | -       | 5       | -       | MHz               |                 |
| VSWR <sup>(1)</sup>                                       | -       | 1.3     | 1.5     | :1                | 975.5~980.5MHz  |
| Insertion Loss <sup>(1)</sup>                             | -       | 2.2     | 2.7     | dB                | 975.5~980.5 MHz |
| Group Delay <sup>(1)</sup>                                | -       | 55.5    | 57.9    | ns                | 975.5~980.5MHz  |
| Group Delay Ripple <sup>(1)</sup>                         | -       | 1.26    | 3.85    | ns                | 975.5~980.5MHz  |
| Amplitude Ripple <sup>(1)</sup>                           | -       | 0.5     | 0.8     | dB <sub>p-p</sub> | 975.5~980.5MHz  |
| Attenuation <sup>(2)</sup><br>(Reference level from 0 dB) | 45      | 48      | -       | dB                | 953~958MHz      |
|                                                           | 38      | 42      | -       |                   | 958~963MHz      |
|                                                           | 35      | 38      | -       |                   | 993~998MHz      |
|                                                           | 55      | 65      | -       |                   | 998~1003MHz     |
| Terminating Source Impedance                              | -       | 50      | -       | Ω                 |                 |
| Terminating Load Impedance                                | -       | 50      | -       | Ω                 |                 |
| DC Voltage                                                | -       | -       | 3       | V                 |                 |
| Input Power                                               | -       | -       | 20      | dBm               |                 |
| Temperature Coefficient                                   | -       | -20     | -       | ppm/°C            |                 |

Notes: (1) Averaged values of linear S-Parameters at +25°C

(2) Averaged values of linear S-Parameters at +25°C

(3) A matching network is unnecessary (refer to the Measurement Circuits section).

# 978 MHz SMD TC-SAW Filter



**AFII-TC-0015**

Request Samples



Check Inventory



**3 x 3 x 1.4 mm**

**RoHS Compliant**

**MSL Level=1**

## Mechanical Specification

| Parameters    | Specifications |
|---------------|----------------|
| Dimension     | 3 x 3 x 1.4 mm |
| Mounting Type | Surface Mount  |

## Environmental Specification

| Parameters                  | Specifications |
|-----------------------------|----------------|
| Operating Temperature Range | -54°C ~ +85°C  |
| Storage Temperature Range   | -60°C ~ +95°C  |
| MSL level                   | 1              |
| ESD Machine Mode            | 100V           |
| ESD Human Body Mode         | 200V           |
| RoHS Compliant              | Yes            |

# 978 MHz SMD TC-SAW Filter



**AFII-TC-0015**

Request Samples



Check Inventory



**3 x 3 x 1.4 mm**  
**RoHS Compliant**  
**MSL Level=1**

## Ordering Information

| Part Number      | Description                                |
|------------------|--------------------------------------------|
| AFII-TC-0015     | 978 MHz SMD TC-SAW Filter on Cut Tape      |
| AFII-TC-0015-T   | 978 MHz SMD TC-SAW Filter on Tape & Reel   |
| AFII-TC-0015-EVB | 978 MHz SMD TC-SAW Filter Evaluation Board |

Note: Other options not listed may be available upon request via [Abracon online support](#)



5101 Hidden Creek Ln Spicewood TX 78669  
Phone: 512-371-6159 | Fax: 512-351-8858  
For terms and conditions of sales, please visit:  
[www.abracon.com](http://www.abracon.com)

**REVISED: 08-28-25**

ABRACON IS  
ISO9001-2015  
CERTIFIED

# 978 MHz SMD TC-SAW Filter



AFII-TC-0015

Request Samples

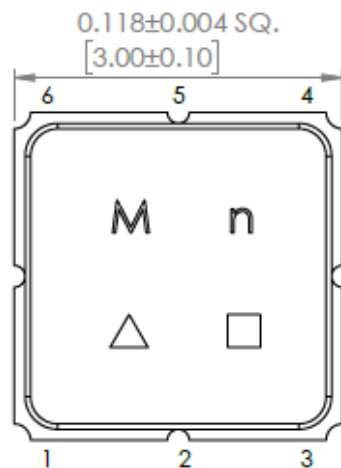


Check Inventory

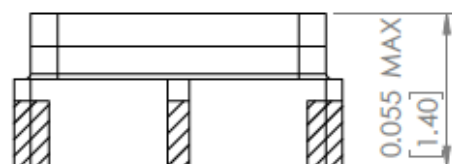


3 x 3 x 1.4 mm  
RoHS Compliant  
MSL Level=1

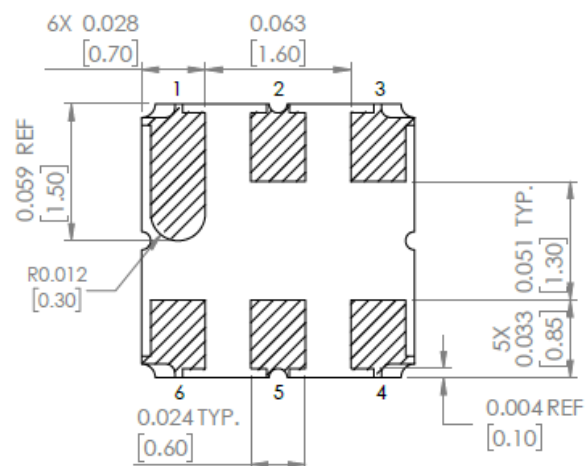
## Product Dimensions



TOP VIEW



FRONT VIEW



BOTTOM VIEW

NOT SPECIFIED TOLERANCE: ±0.005[0.15]

Unit: Inches[mm]

| Pin No. | Function |
|---------|----------|
| 1       | GND      |
| 2       | Input    |
| 3       | GND      |
| 4       | GND      |
| 5       | Out      |
| 6       | GND      |

# 978 MHz SMD TC-SAW Filter



AFII-TC-0015

Request Samples

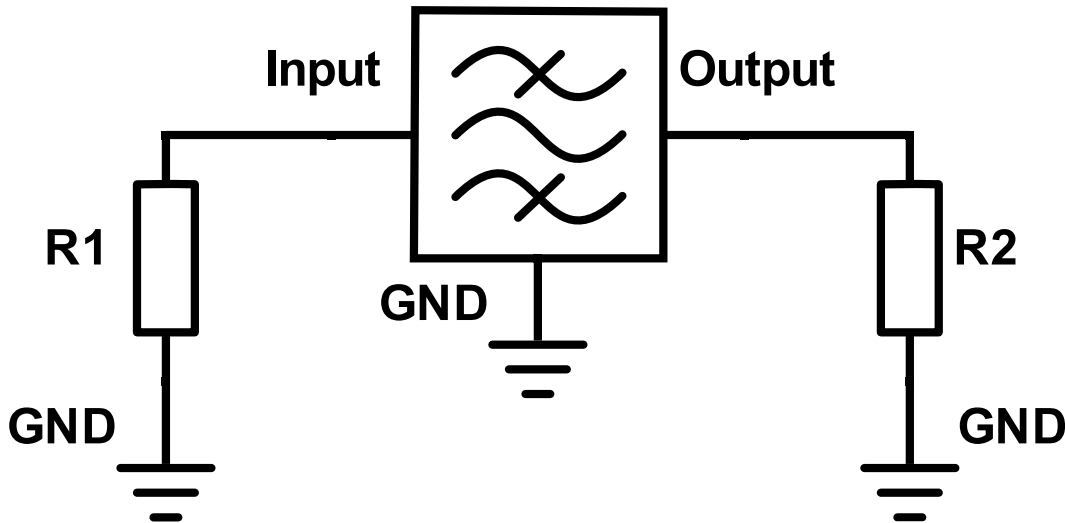


Check Inventory



3 x 3 x 1.4 mm  
RoHS Compliant  
MSL Level=1

## Measurement Circuit



| Pin No.    | Description              |
|------------|--------------------------|
| 2          | Input (R1): 50 $\Omega$  |
| 5          | Output (R2): 50 $\Omega$ |
| 1, 3, 4, 6 | Ground                   |

# 978 MHz SMD TC-SAW Filter



AFII-TC-0015

Request Samples

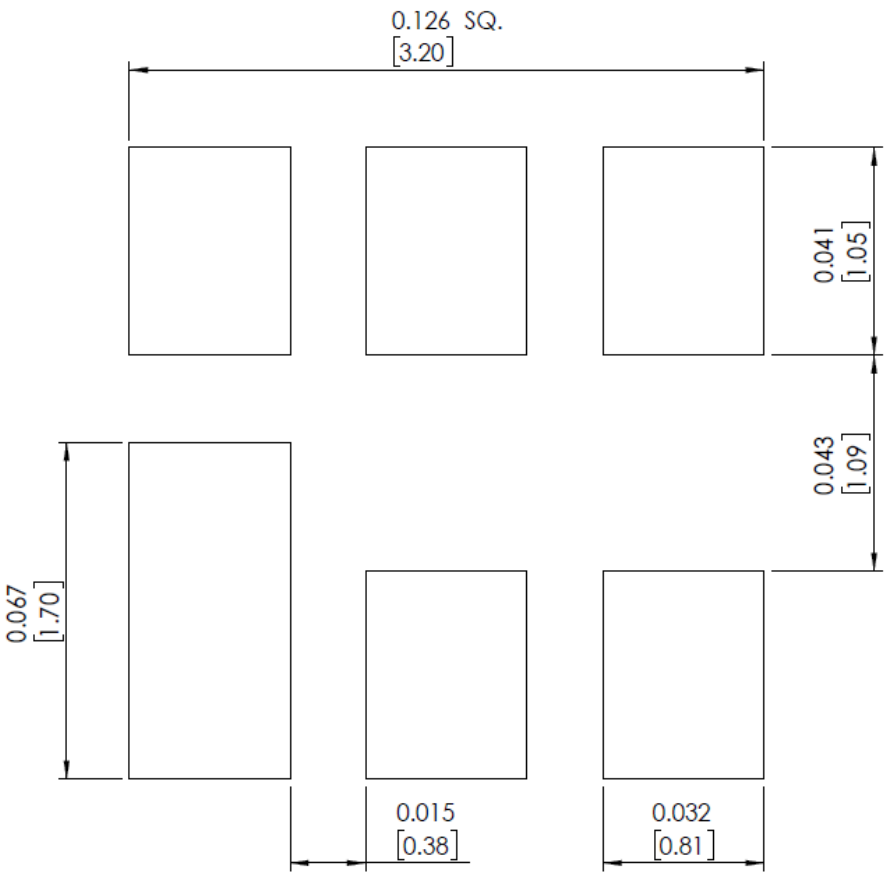


Check Inventory



3 x 3 x 1.4 mm  
RoHS Compliant  
MSL Level=1

## Land Pattern



Unit: Inches[mm]

# 978 MHz SMD TC-SAW Filter



AFII-TC-0015

Request Samples



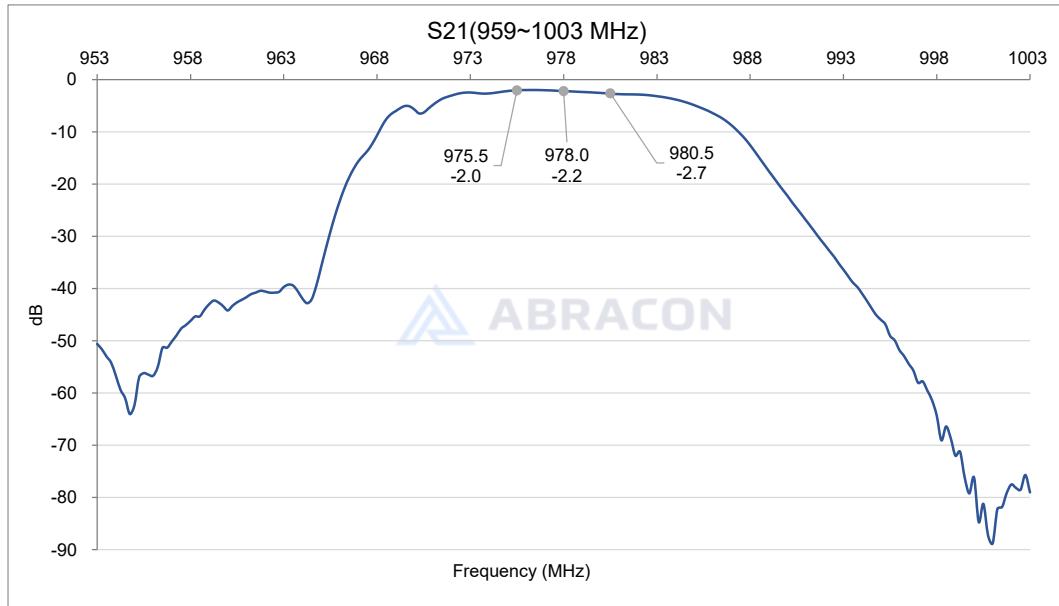
Check Inventory



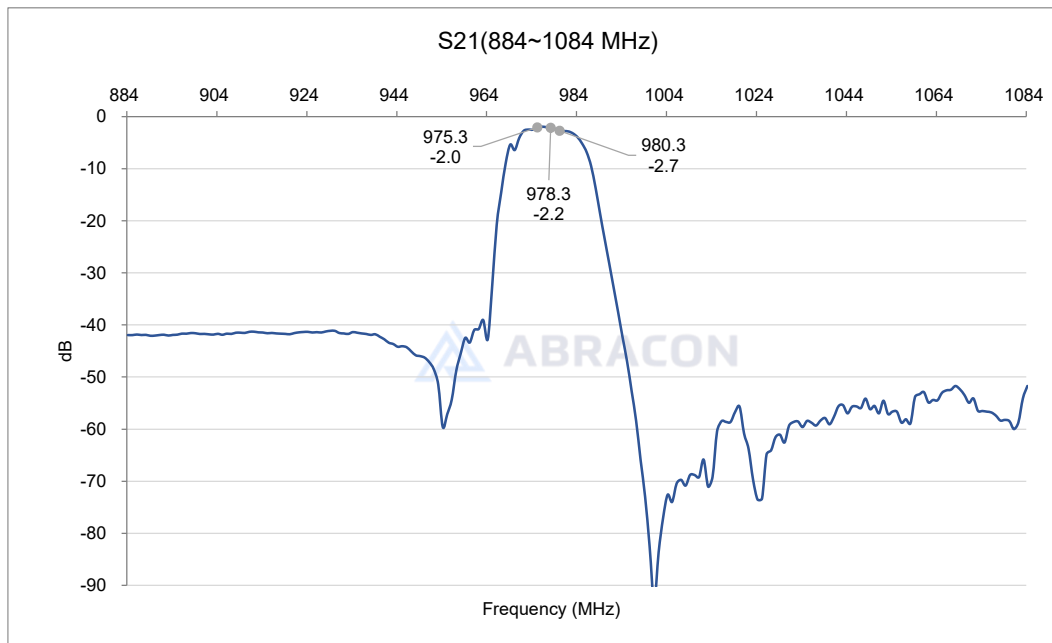
3 x 3 x 1.4 mm  
RoHS Compliant  
MSL Level=1

## Frequency Characteristics

### S21 Narrow Band



### S21 Wide Band





# 978 MHz SMD TC-SAW Filter



**AFII-TC-0015**

Request Samples

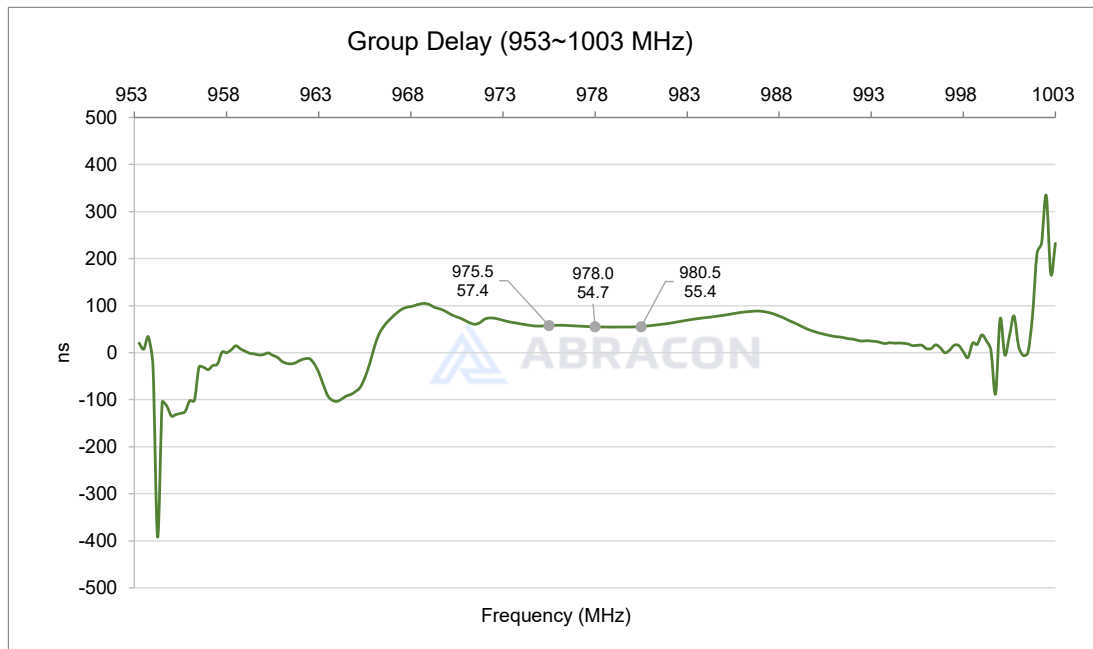


Check Inventory



**3 x 3 x 1.4 mm**  
**RoHS Compliant**  
**MSL Level=1**

## Group Delay



# 978 MHz SMD TC-SAW Filter



AFII-TC-0015

Request Samples

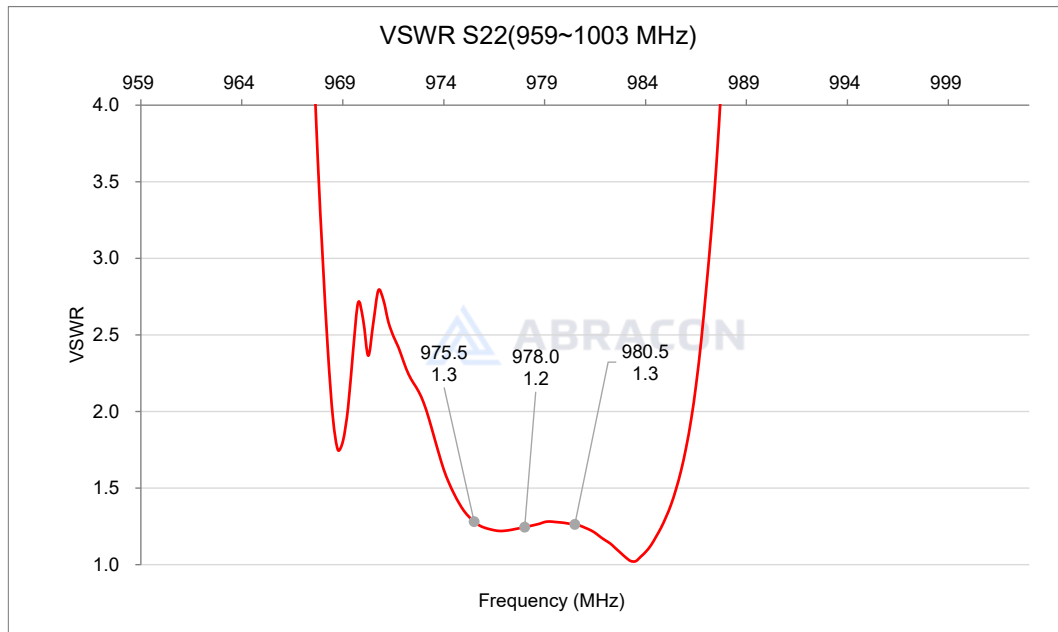
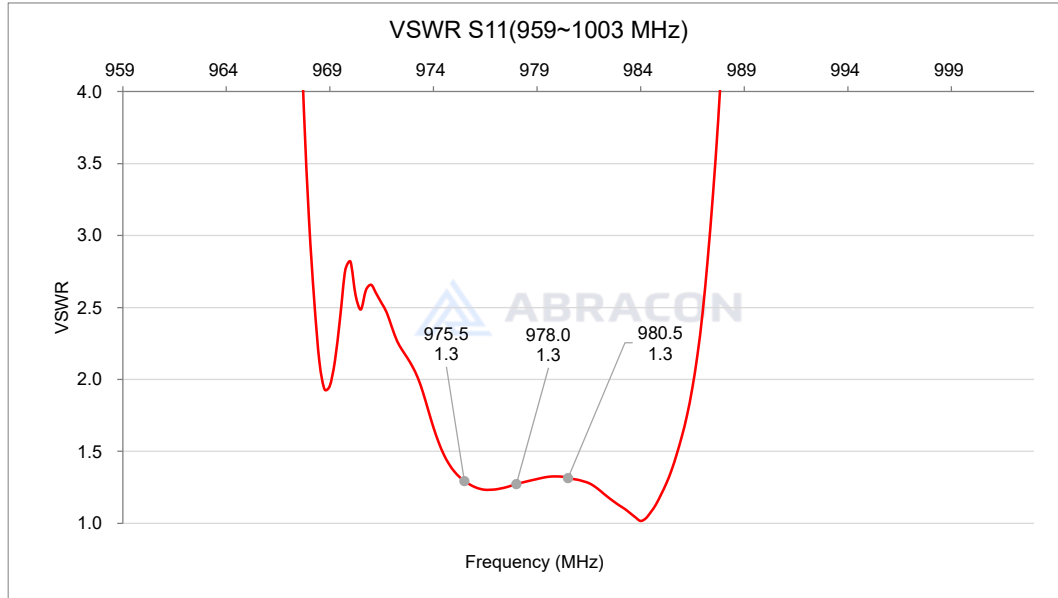


Check Inventory



3 x 3 x 1.4 mm  
RoHS Compliant  
MSL Level=1

## VSWR (S11 & S22)



# 978 MHz SMD TC-SAW Filter



AFII-TC-0015

Request Samples



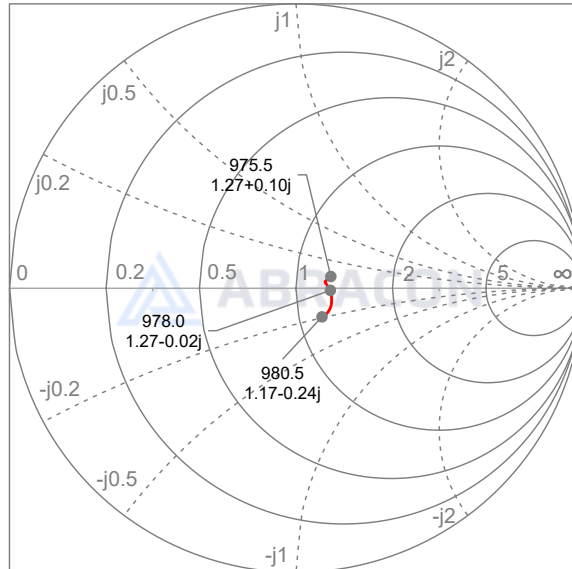
Check Inventory



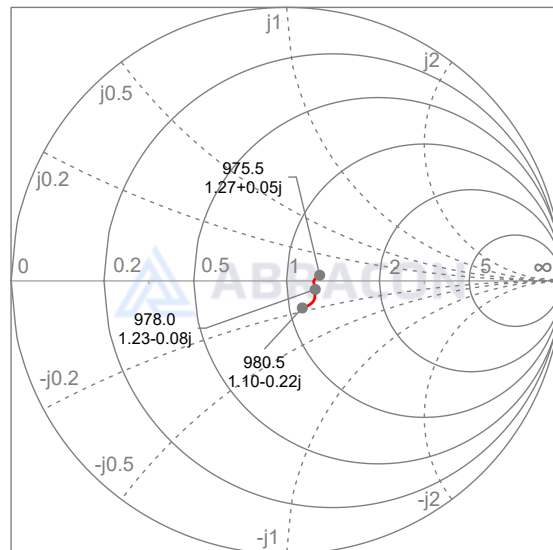
3 x 3 x 1.4 mm  
RoHS Compliant  
MSL Level=1

Smith Chart (S11 & S22)

Smith chart S11 (975.5~980.5MHz)



Smith chart S22 (975.5~980.5MHz)



# 978 MHz SMD TC-SAW Filter



AFII-TC-0015

Request Samples



Check Inventory



3 x 3 x 1.4 mm  
RoHS Compliant  
MSL Level=1

## Reflow Profile [JEDEC J-STD-020]

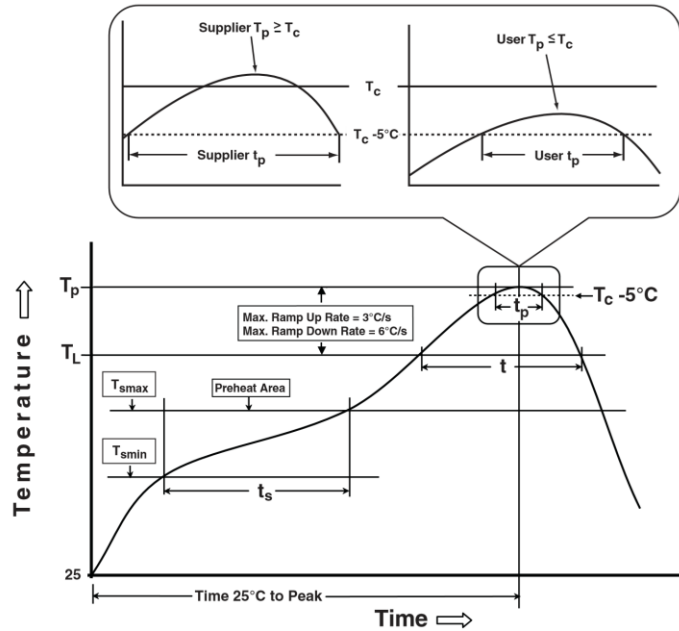


Table 1

SnPb Eutectic Process

Classification Temperatures ( $T_c$ )

| Package Thickness | Volume mm <sup>3</sup> <350 | Volume mm <sup>3</sup> ≥ 350 |
|-------------------|-----------------------------|------------------------------|
| <2.5mm            | 235°C                       | 220°C                        |
| ≥ 2.5mm           | 220°C                       | 220°C                        |

Table 2

Pb-Free Process

Classification Temperatures ( $T_c$ )

| Package Thickness | Volume mm <sup>3</sup> <350 | Volume mm <sup>3</sup> 350-2000 | Volume mm <sup>3</sup> >2000 |
|-------------------|-----------------------------|---------------------------------|------------------------------|
| <1.6mm            | 260°C                       | 260°C                           | 260°C                        |
| 1.6mm - 2.5mm     | 260°C                       | 250°C                           | 245°C                        |
| >2.5mm            | 250°C                       | 245°C                           | 245°C                        |

| Profile Feature                                                                   | Sn-Pb Eutectic Assembly | Pb-Free Assembly |
|-----------------------------------------------------------------------------------|-------------------------|------------------|
| Preheat / soak                                                                    |                         |                  |
| Temperature minimum ( $T_{smin}$ )                                                | 100°C                   | 150°C            |
| Temperature maximum ( $T_{smax}$ )                                                | 150°C                   | 180°C            |
| Time ( $T_{smin}$ to $T_{smax}$ ) ( $t_s$ )                                       | 60 – 120 sec.           | 60 – 90 sec.     |
| Average ramp-up rate ( $T_{smax}$ to $T_p$ )                                      | 3°C/sec. max            | 3°C/sec. max     |
| Liquidous temperature ( $T_L$ )                                                   | 183°C                   | 220°C            |
| Time at Liquidous ( $T_L$ )                                                       | 60 – 150 sec.           | 50 – 80 sec.     |
| Peak package body temperature ( $T_p$ )*                                          | See Table 1             | See Table 2      |
| Time ( $T_p$ )** within 5°C of the specified classification temperature ( $T_c$ ) | 20 sec.                 | 20 ~ 40 sec.     |
| Ramp-down rate ( $T_p$ to $T_{smax}$ )                                            | 6°C/sec. max            | 6°C/sec. max     |
| Time 25°C to peak temperature                                                     | 6 min. max              | 8 min. max       |
| Reflow cycles                                                                     | 2 max                   | 2 max            |

\*Tolerance for peak profile temperature ( $T_p$ ) is defined as a supplier minimum and a user maximum.

\*\*Tolerance for time at peak profile temperature ( $t_p$ ) is defined as a supplier minimum and a user maximum.

# 978 MHz SMD TC-SAW Filter



AFII-TC-0015

Request Samples



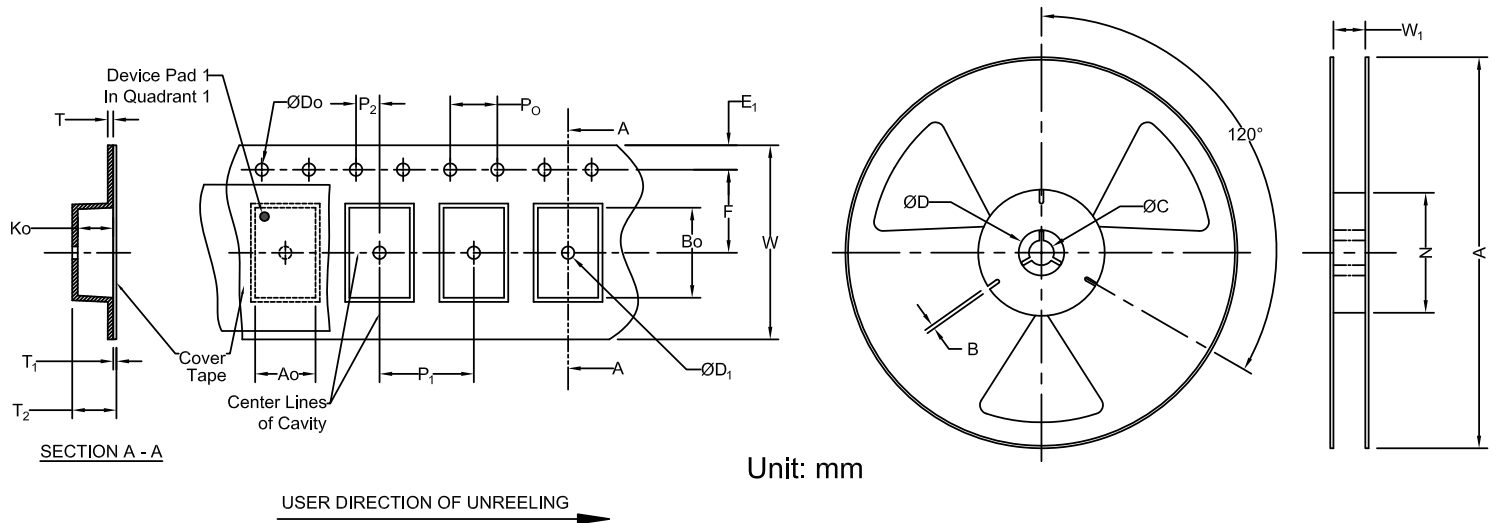
Check Inventory



3 x 3 x 1.4 mm  
RoHS Compliant  
MSL Level=1

## Packaging

### Tape & Reel Dimension



### Carrier Tape Specifications (mm)

| Do        | D1        | E1         | P0        | P2         | T           | F          | P1        | W          | A0        | B0        | K0        | Reel Qty |
|-----------|-----------|------------|-----------|------------|-------------|------------|-----------|------------|-----------|-----------|-----------|----------|
| 1.5 ± 0.1 | 1.6 ± 0.1 | 1.75 ± 0.1 | 4.0 ± 0.1 | 2.0 ± 0.05 | 0.25 ± 0.02 | 5.5 ± 0.05 | 4.0 ± 0.1 | 12.0 ± 0.3 | 3.3 ± 0.1 | 3.3 ± 0.1 | 1.4 ± 0.1 | 3,000    |

### Reel Specifications (mm)

| A           | W1        | N         | C          | D        | B         |
|-------------|-----------|-----------|------------|----------|-----------|
| 330.0 ± 1.0 | 12.0 typ. | 100 ± 0.5 | 13.0 ± 0.5 | 20.2 min | 2.0 ± 0.5 |

**ATTENTION:** Abracon LLC's products are Commercial-Off-The-Shelf ('COTS'), which are designed, intended, and validated for use in commercial, industrial, and automotive applications. The customer is responsible for testing and verifying the performance of an Abracon solution to meet their system-level requirements.



5101 Hidden Creek Ln Spicewood TX 78669  
Phone: 512-371-6159 | Fax: 512-351-8858  
For terms and conditions of sales, please visit:  
[www.abracon.com](http://www.abracon.com)

REVISED: 08-28-25

ABRACON IS  
ISO9001-2015  
CERTIFIED