# TMX U386

## SAW Filter datasheet

3.8 x 3.8 x 1.5 mm, SMD

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Issue: Rev 3, 9 November 2022

# TMX U386

SAW Bandpass Filters | Wireless Communications

## Features

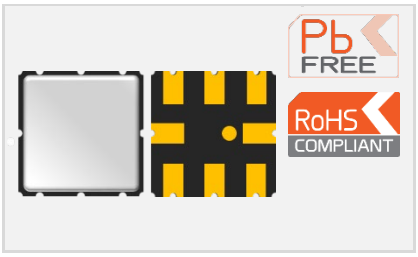
Features

- 433.92 MHz center frequency
- Ceramic package for Surface Mounted Technology
- Low Loss: 2.8 dB typical value within PassBand Width 433.13 to 434.71 MHz
- Maximum pulse power: 15 dBm
- No matching network required for operation at 50 Ω

Applications

- Remote control - RF
- Wireless applications:
  - Home appliances
  - Security systems

3.8 x 3.8 x 1.5 mm




## Maximum Ratings

| Parameter | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|
| Storage temperature range ($T_{stg}$) | -45 | | 90 | °C |
| Operating temperature range ($T_A$) | -40 | | 85 | °C |
| DC permissive voltage | | | 0 | V |
| Maximum pulse input power | | | 15 | dBm |

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

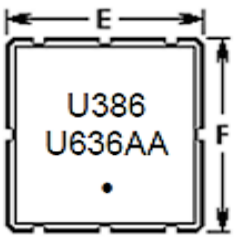
| Parameter | Min. | Typ.[1] | Max. | Unit |
|---|---|---|---|---|
| Center frequency ($f_C$) | | 433.92 | | MHz |
| Bandwidth (BW, passband width) | 1.58 | | | MHz |
| Insertion loss (IL, 433.13 – 434.71 MHz) | | 2.8 | 3.9 | dB |
| Amplitude ripple (433.13 – 434.71 MHz) | | 0.3 | 1.0 | dB |
| Relative attenuation (relative to IL) | | | | |
| From 10.00 to 350.0 MHz | 60 | 65 | | dB |
| From 350.0 to 393.0 MHz | 52 | 57 | | dB |
| From 393.0 to 408.0 MHz | 45 | 50 | | dB |
| From 408.0 to 415.0 MHz | 52 | 57 | | dB |
| From 415.0 to 425.0 MHz | 40 | 48 | | dB |
| From 443.5 to 454.0 MHz | 12 | 16 | | dB |
| From 454.0 to 475.0 MHz | 34 | 39 | | dB |
| From 475.0 to 650.0 MHz | 48 | 53 | | dB |
| From 650.0 to 1000.0 MHz | 45 | 49 | | dB |
| Temperature coefficient of frequency | | -30.0 | | ppm/K |
| Source impedance[2] (Single ended) | | 50 | | Ω |
| Load impedance[2] (Single ended) | | 50 | | Ω |

[1] Typical values are nominal performances at room temperature

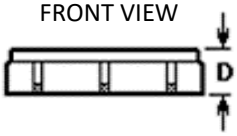
[2] No external matching is required

## Model Outline, Pin Connection and Marking

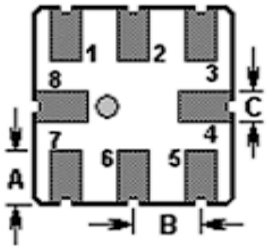
TOP VIEW




FRONT VIEW




BOTTOM VIEW




| Marking | | Note |
|---|---|---|
| Line 1 | U386 | RakonXpress designation |
| Line 2 | U63601 | U = Production code<br>6 = The last digit of year 2016<br>36 = Week 36 of the year<br>01= Internal code (Wafer batch) |
| Line 3 | • | • = Identify black dot |

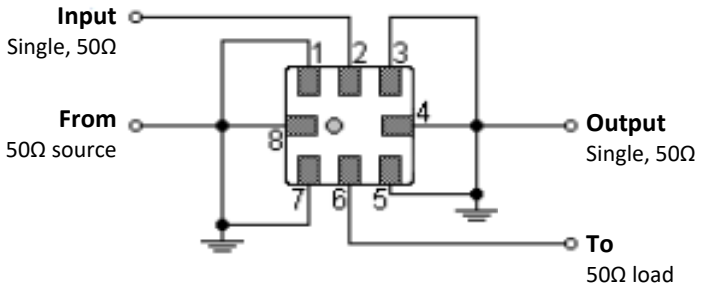
| Pin | Connections |
|---|---|
| **2** | Input |
| **1, 3** | Input Ground |
| **6** | Output |
| **5,7** | Output Ground |
| **4, 8** | To be grounded |

| Code | Dimensions (mm) |
|---|---|
| **A** | 1.0 |
| **B** | 1.27 |
| **C** | 0.6 |
| **D** | 1.3 (1.5 max.) |
| **E** | 3.8 |
| **F** | 3.8 |

Unit: mm

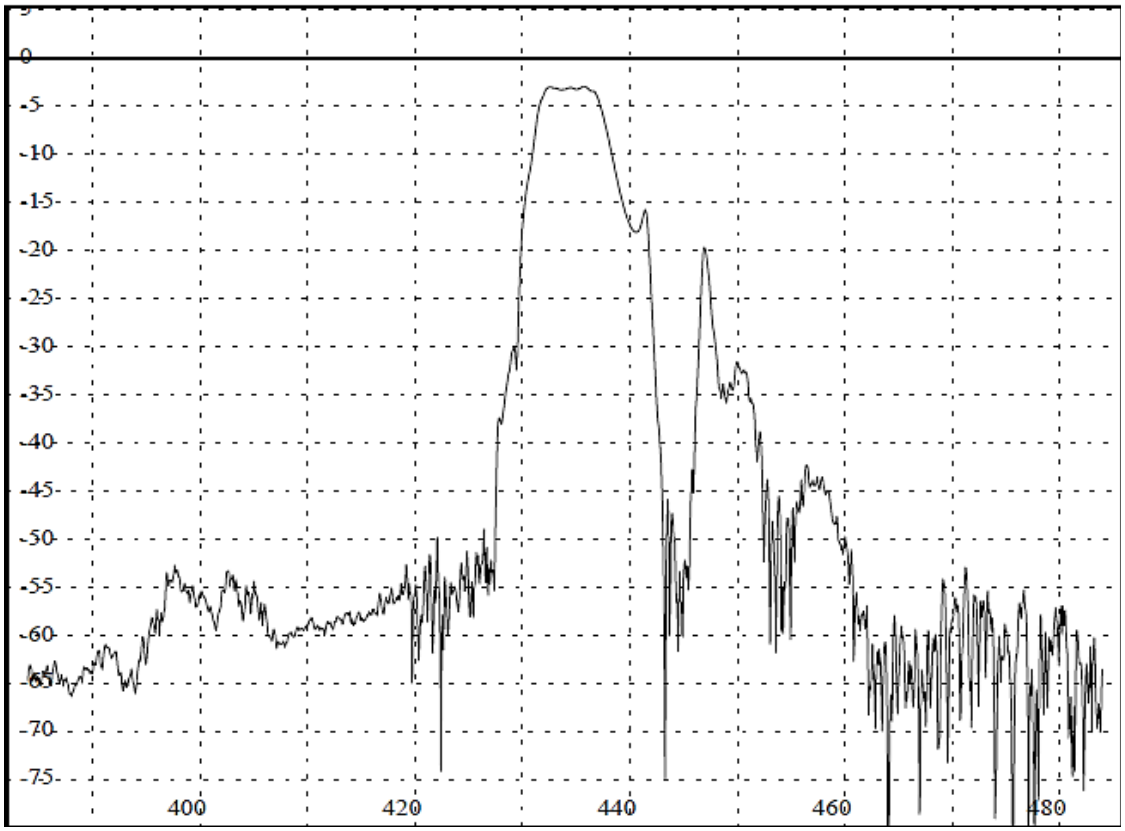
## Test Circuit

50 Ω / 50 Ω Configuration

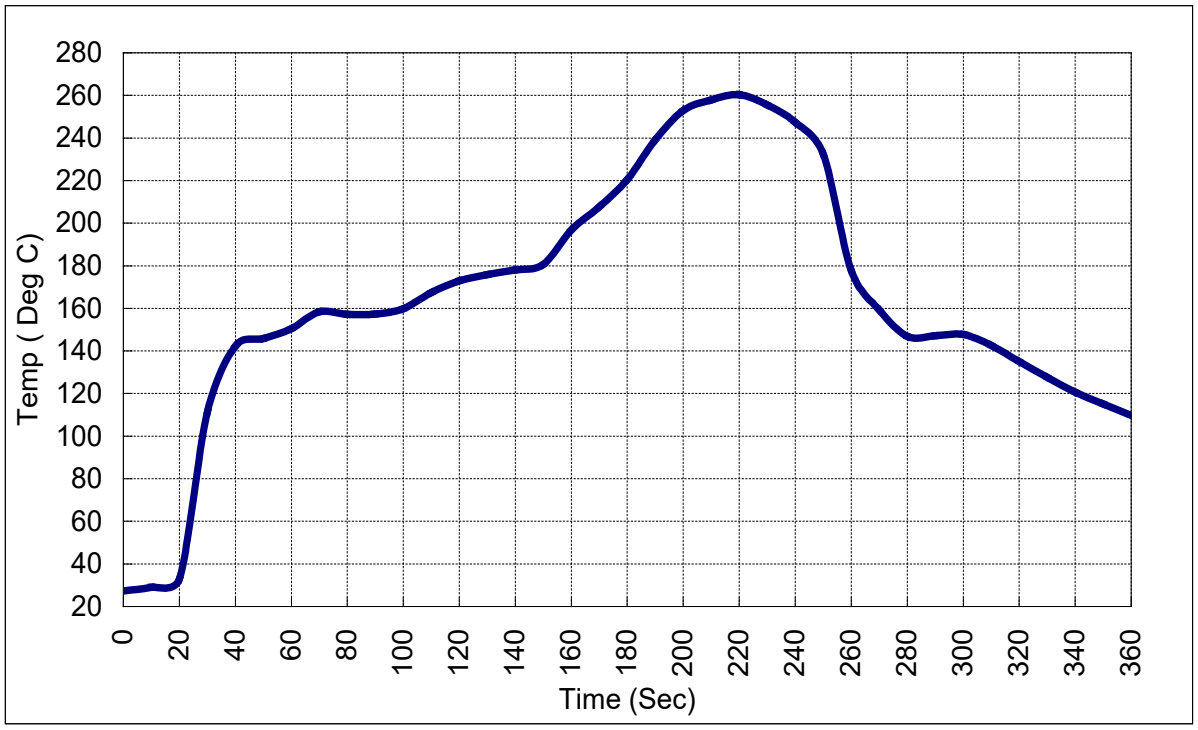


## Frequency Characteristics

TYPICAL S21 RESPONSE



## Recommended Reflow Soldering Profile

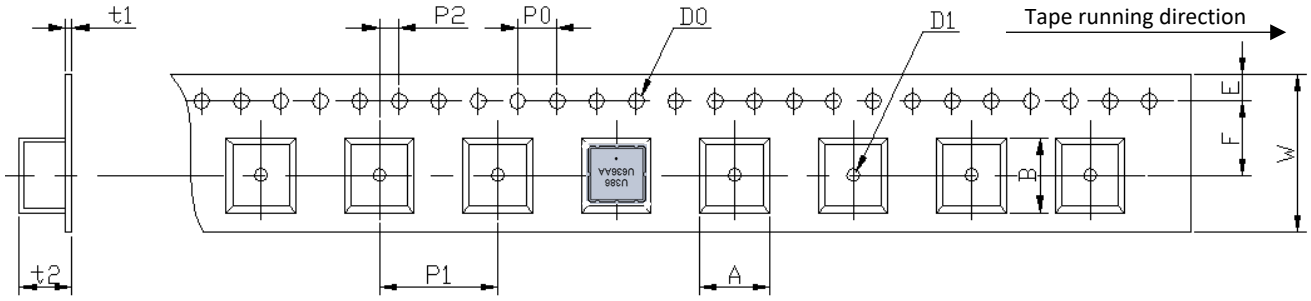



**NOTE:**

- The components shall remain within the electrical specifications after it soldered on the 1mm thickness PCB board and dipped in the solder at 260 ± 5°C during 10 ± 1 seconds.
- The components shall remain within the electrical specifications after it soldered by electric iron, solder at 350 ± 10 °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.

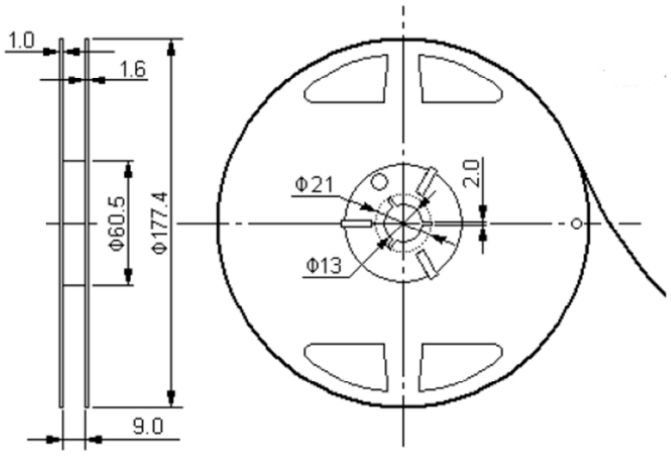
## Tape and Reel Specifications

TAPE DETAILS:




| Parameter | Code | Dimension | Tolerance |
|---|---|---|---|
| Height of component hole | A | 4.1 | ± 0.1 |
| Width of component hole | B | 4.1 | ± 0.1 |
| Diameter of sprocket hole | $D_0$ | Φ 1.5 | ± 0.1 |
| Diameter of feed hole | $D_1$ | Φ 1.5 min | |
| Pitch of sprocket hole | $P_0$ | 4.0 | ± 0.1 |
| Length from hole center to component center | $P_1$ | 8.0 | ± 0.1 |
| Length from Pocket hole center to sprocket hole center | $P_2$ | 4.0 | ± 0.1 |
| 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 Ebossed tape sheet | t1 | 0.31 max | |
| Thickness of Ebossed tape | t2 | 1.7 max | |

REEL DETAILS:




NOTE:
- Unit: mm
- Standard Packing Quantity (SPQ) is 1000 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.<br>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 $m/s^2$ , 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. |