



TAI-SAW TECHNOLOGY CO., LTD.

No. 3, Industrial 2nd Rd., Ping-Chen Industrial District,
Taoyuan, 324, Taiwan, R.O.C.

TEL: 886-3-4690038 FAX: 886-3-4697532

E-mail: tstsales@mail.taisaw.com Web: www.taisaw.com

Product Specifications Approval Sheet

Product Description: 409.641 MHz SMD 3.0 x 3.0 mm SAW Resonator

TST Parts No.: TC0657A

Customer Parts No.: _____

| |
|-----------------------------|
| Customer signature required |
| Company: _____ |
| Division: _____ |
| Approved by : _____ |
| Date: _____ |

Checked by: _____ Sam Lin *Sam Lin*

Approval by: _____ Andy Yu *Andy Yu*

Date: _____ 2019/04/25

1. Customer signed back is required before TST can proceed with sample build and receive orders.
2. Orders received without customer signed back will be regarded as agreement on the specifications.
3. Any specifications changes must be approved upon by both parties and a new revision of specifications shall be released to reflect the changes.



TAI-SAW TECHNOLOGY CO., LTD.

No.3, Industrial 2nd Rd., Ping-Chen Industrial District,
Taoyuan, 324, Taiwan, R.O.C.

TEL: 886-3-4690038 FAX: 886-3-4697532

E-mail: tstsales3@mail.taisaw.com Web: www.taisaw.com

SAW Resonator 409.641 MHz (SMD 3.0x3.0mm)

MODEL NO.: TC0657A

REV. NO.2.0

A. FEATURES:

1. 1-port Resonator.

RoHS Compliant
Lead free
Lead-free soldering

B. MAXIMUM RATING:

1. Input Power Level : 0 dBm
2. DC Voltage : 5V
3. Operating temperature range: -45 °C to +105 °C
4. Storage temperature range: -45 °C to +105 °C
5. Moisture Sensitivity Level: Level 1 (MSL1)

Electrostatic Sensitive Device

C. ELECTRICAL CHARACTERISTICS:

Reference Temperature $T_A=25^{\circ}\text{C}$

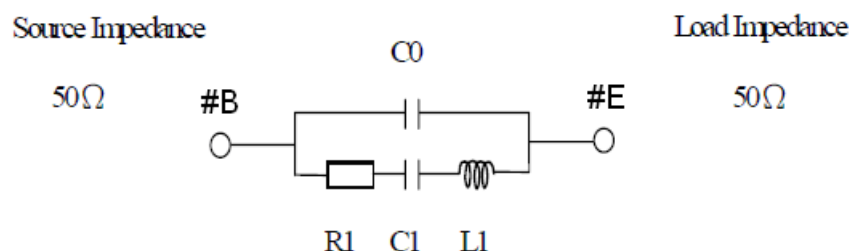
| Item | Unit | Min. | Type. | Max. |
|-------------------------------------|---------------------------|--------------------|---------|---------|
| Center Frequency*, Fc | MHz | 409.600 | 409.641 | 409.682 |
| Insertion Loss IL | dB | - | 1.7 | 2.0 |
| Equivalent Elements | | | | |
| Unload Q Factor | - | 8000 | 9000 | - |
| Motional Capacitance C1 | fF | - | 1.7 | - |
| Motional Inductance L1 | μH | - | 89.2 | - |
| Motional Resistance R1 | Ohm | - | 23.2 | 25.0 |
| Parallel Capacitance Co | pF | - | 2.7 | - |
| Frequency Temperature Coefficient** | ppm/°C² | - | -0.032 | - |
| Turnover To | Deg.C | 30 | 40 | 50 |
| Package Size | | SMD 3.0x3.0x1.4 mm | | |

*Center frequency measure by Yr 1-port with impedance analyzer

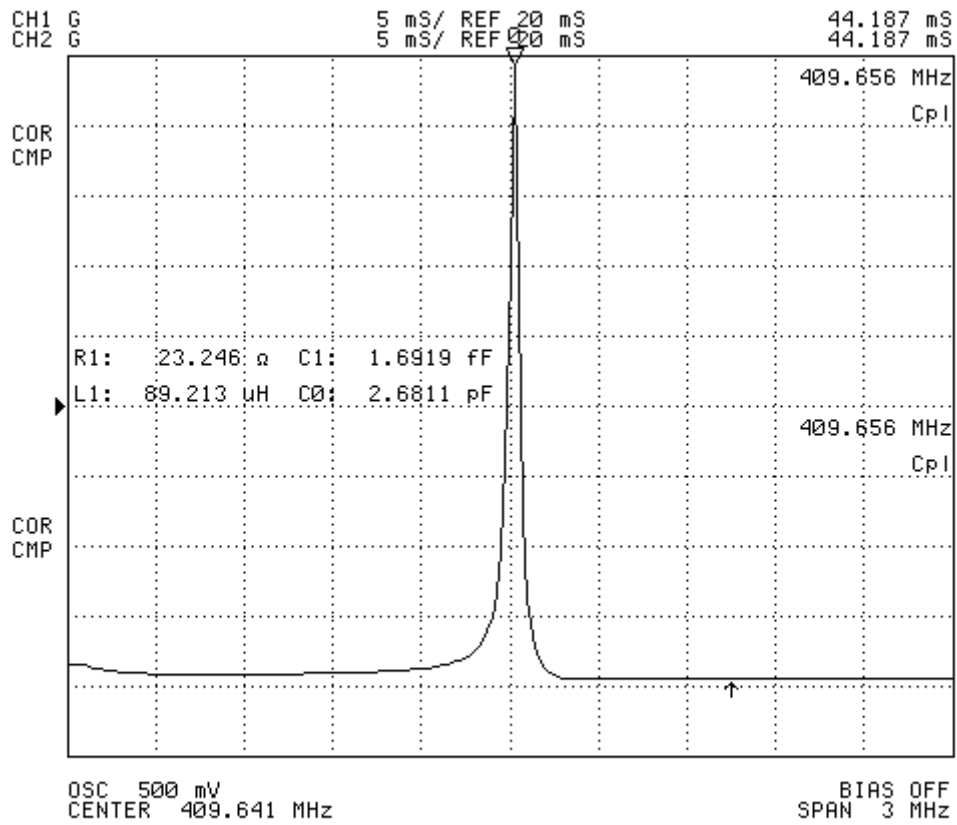
**Temperature dependence of fc: $f_c(T_A)=f_c(T_O)(1-TC_f(T_A-T_O)^2)$

D. EQUIVRENT CIRCUIT:

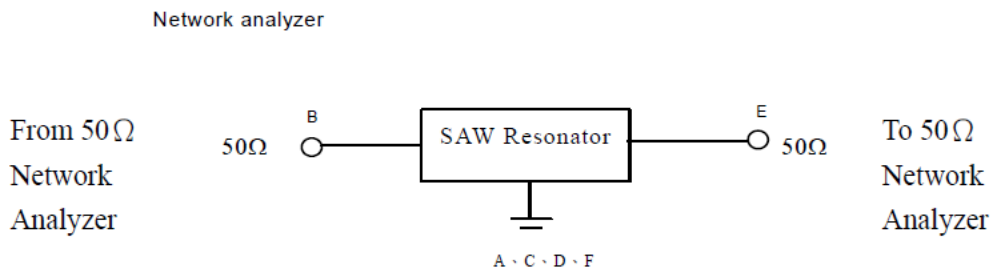
One-Port Resonator:



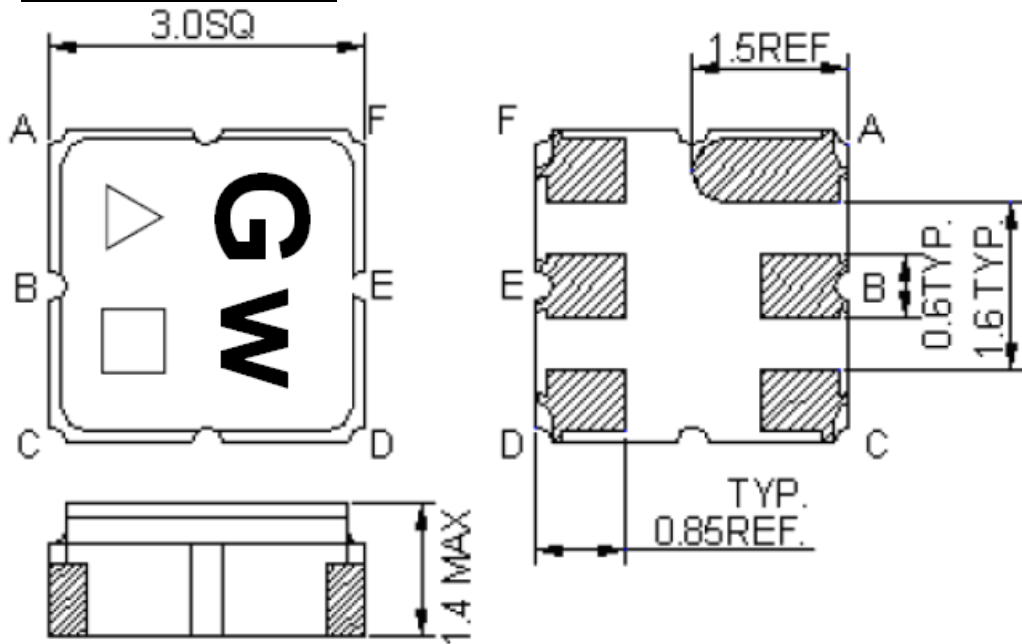
E. FREQUENCY CHARACTERISTICS:



F. TEST CIRCUIT:



E. OUTLINE DRAWING:



B: Input

E: Output

A, C, D, F: Ground

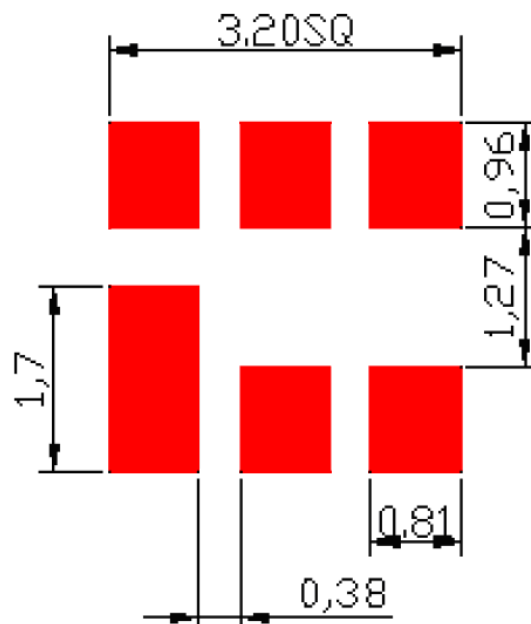
Unit: mm

△ : Year Code (2009->9, 2010->0, ..., 2018->8)

□ : Date Code (Follow the table from planner each year)

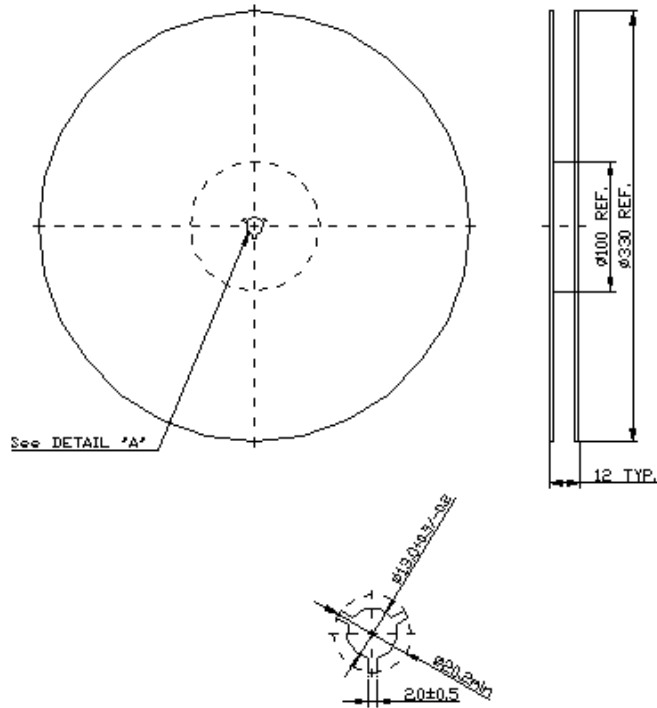
| | | | | | | | | | | | | |
|------|------|------|------|------|------|------|------|------|------|------|------|------|
| WK01 | WK02 | WK03 | WK04 | WK05 | WK06 | WK07 | WK08 | WK09 | WK10 | WK11 | WK12 | WK13 |
| A | B | C | D | E | F | G | H | I | J | K | L | M |
| WK14 | WK15 | WK16 | WK17 | WK18 | WK19 | WK20 | WK21 | WK22 | WK23 | WK24 | WK25 | WK26 |
| N | O | P | Q | R | S | T | U | V | W | X | Y | Z |
| WK27 | WK28 | WK29 | WK30 | WK31 | WK32 | WK33 | WK34 | WK35 | WK36 | WK37 | WK38 | WK39 |
| a | b | c | d | e | f | g | h | i | j | k | l | m |
| WK40 | WK41 | WK42 | WK43 | WK44 | WK45 | WK46 | WK47 | WK48 | WK49 | WK50 | WK51 | WK52 |
| n | o | p | q | r | s | t | u | v | w | x | y | z |

F. PCB FOOTPRINT:

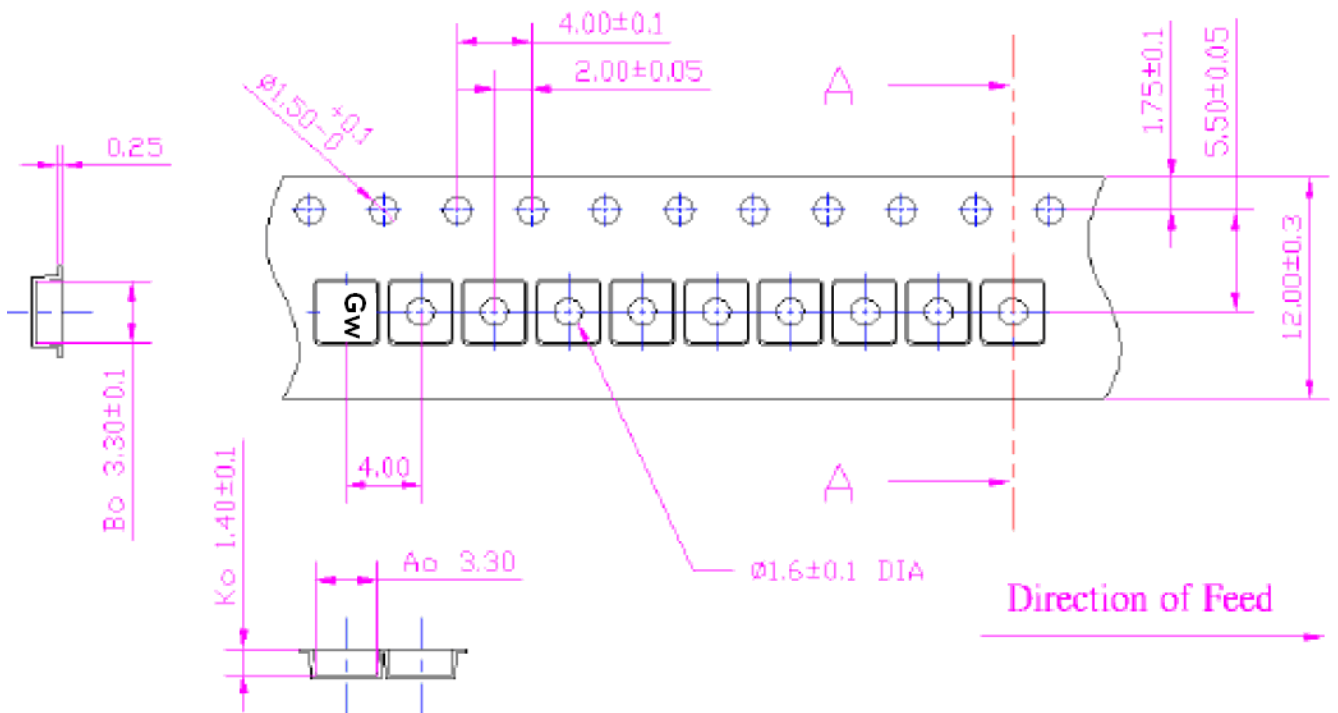


G. PACKING:

1. REEL DIMENSION (Please refer to FR-75D10 for packing quantity)



2. TAPE DIMENSION



H. RECOMMENDED REFLOW PROFILE:

1. Preheating shall be fixed at 150~180°C for 60~90 seconds.
2. Ascending time to preheating temperature 150°C shall be 30 seconds min.
3. Heating shall be fixed at 220°C for 50~80 seconds and at 260°C +0/-5°C peak (20~40sec).
4. Time: 2 times.

