EQM08-4KC-D3SX493

Messrs. Digi-Key Corporation

# APPROVAL SHEET

(KYOCERA CORPORATION SAW FILTER SPECIFICATION)

Kindly send us back a copy of this specification sheet with your signature.
The specification shall be regarded as "APPROVED" unless we receive your disagreement or counterproposal before your placement of initial order for the part number specified.

Part No.:SF16-0953M4UU01

Jan,17,2011

**RoHS Compliant (Pb-Free)**

KYOCERA CORPORATION

## 0.History

| No | Date | Notes | Approved | Approved | Approved | Prepared |
|---|---|---|---|---|---|---|
| 00 | Jan.06 ,2011 | First Edition | | | | |
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| Approved | Approved |
|---|---|
| QA | Engineering |
| Approved | Prepared |
| Production | Engineering |

## 1.Scope

This specification shall cover the characteristics of the RF SAW filter.

## 2.Customer's Part No.

## 3.KYOCERA's Part No.

SF16-0953M4UU01

SF 16 – 0953 M 4 UU 01
① ② ③ ④ ⑤ ⑥ ⑦

①Series ②Package Size ③Frequency ④Application ⑤Terminals ⑥In/Out Condition ⑦Custom Specification

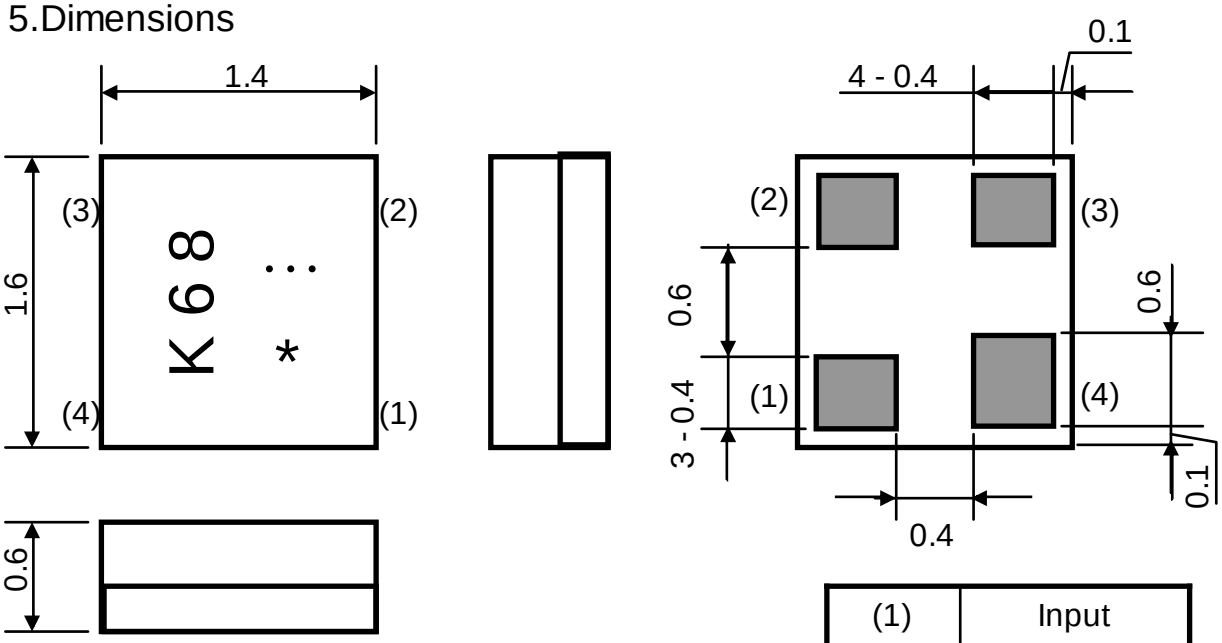
## 4.Electrical Characteristics

Terminating Source Impedance : 50 ohms , Single-ended
Terminating Load Impedance : 50 ohms , Single-ended
Table.1

| Items | | Frequency Range | Unit | Spec. | | |
|---|---|---|---|---|---|---|
| | | | | min. | typ. | max. |
| 4-1 | Norminal Frequency | ------ | MHz | - | 953 | - |
| 4-2 | Maximum Insertion Loss | 950 to 956 MHz | dB | - | 2.5 | 3.0 |
| 4-3 | Amplitude Ripple(P-P) | 950 to 956 MHz | dB | - | 0.1 | 2.0 |
| 4-4 | Input VSWR | 950 to 956 MHz | | - | 1.4 | 2.5 |
| | Output VSWR | 950 to 956 MHz | | - | 1.4 | 2.5 |
| 4-5 | Absolute Attenuation | 0.3 to 911 MHz | dB | 30 | 43 | - |
| | | 911 to 931 MHz | dB | 20 | 38 | - |
| | | 931 to 936 MHz | dB | 15 | 45 | - |
| | | 936 to 943 MHz | dB | 3 | 12 | - |
| | | 964 to 971 MHz | dB | 3 | 10 | - |
| | | 971 to 976 MHz | dB | 10 | 28 | - |
| | | 976 to 1025 MHz | dB | 27 | 36 | - |
| | | 1025 to 3000 MHz | dB | 27 | 57 | - |
| 4-6 | Maximum Input Power | | dBm | +12 | | |
| 4-7 | Operating Temperature | | deg.C | -30 to +85 | | |
| 4-8 | Storage Temperature | | deg.C | -40 to +95 | | |

Specifications can change owing to product and/or technical improvements.

## 5.Dimensions



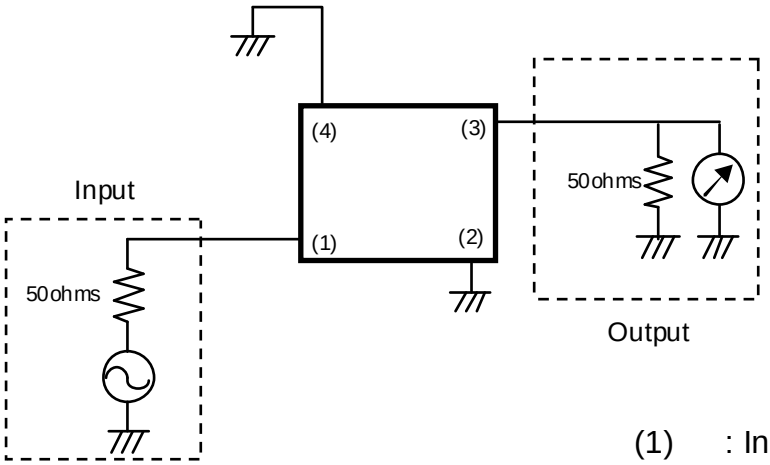

| | |
|---|---|
| (1) | Input |
| (2) | GND |
| (3) | Output |
| (4) | GND |

Unit:mm
Tol:+/-0.1mm
The degree of terminal flat : 0.10mm Max.
Terminal quality of the material : Ni Plating + Au Plating
K:Kyocera
68:Part Number
*:Monthly Code
⋮Weekly Code(⋮1st-10th, :11th-20th, .21th-31th)

Table2 Monthly Code Production

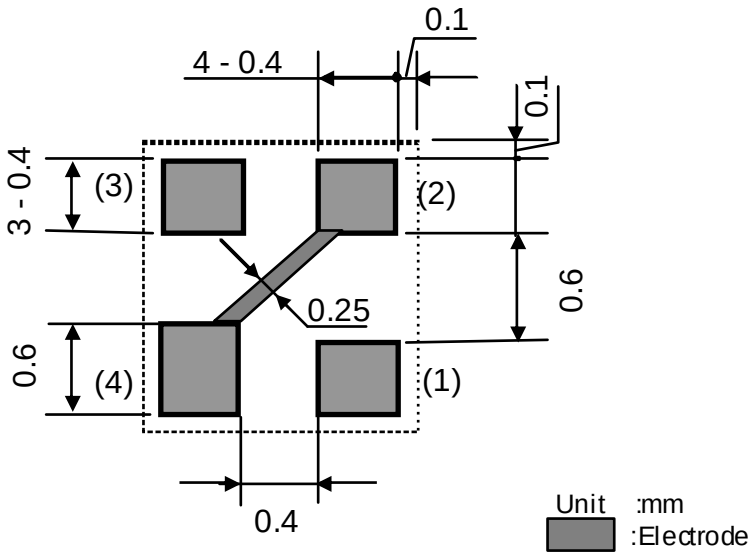
| Year | Month | Code | Year | Month | Code |
|---|---|---|---|---|---|
| 2011 | 1 | a | 2009 | 1 | A |
| 2015 | 2 | b | 2013 | 2 | B |
| | 3 | c | | 3 | C |
| | 4 | d | | 4 | D |
| | 5 | e | | 5 | E |
| | 6 | f | | 6 | F |
| | 7 | g | | 7 | G |
| | 8 | h | | 8 | H |
| | 9 | j | | 9 | J |
| | 10 | k | | 10 | K |
| | 11 | l | | 11 | L |
| | 12 | m | | 12 | M |
| 2012 | 1 | n | 2010 | 1 | N |
| 2016 | 2 | p | 2014 | 2 | P |
| | 3 | q | | 3 | Q |
| | 4 | r | | 4 | R |
| | 5 | s | | 5 | S |
| | 6 | t | | 6 | T |
| | 7 | u | | 7 | U |
| | 8 | v | | 8 | V |
| | 9 | w | | 9 | W |
| | 10 | x | | 10 | X |
| | 11 | y | | 11 | Y |
| | 12 | z | | 12 | Z |

## 6.Measurement Circuit

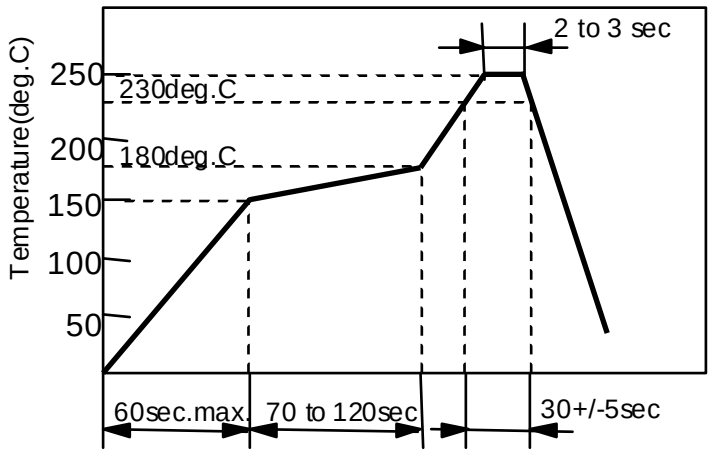



(1) : Input
(3) : Output
(2),(4) : Ground

## 7.Recommendable Land Pattern




## 8.Recommendable Reflow Soldering Profile

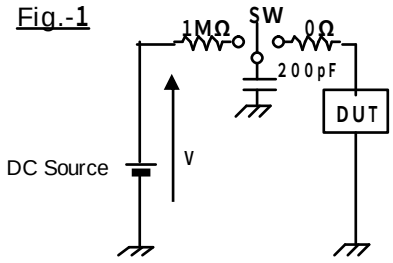



IR REFLOW SOLDERING
Temperature measurement point is surface of glass epoxy circuit board of 0.8mm thickness.

## 9.Environmental Characteristics

| Item | Condition |
|---|---|
| Humidity | Subject the filter to 60+/-2 deg.C and 90%RH to 95%RH for 100 hours. Then, release the filter into the room conditions for 2 hours minimum to the measurement. It shall fulfill the specifications in Table 1. |
| High Temperature Storage | Subject the filter to 85+/-2 deg.C for 100 Hours. Then, release the filter into the room conditions for 2 hours minimum to the measurement. It shall fulfill the specifications in Table 1. |
| Low Temperature Storage | Subject the filter to –40+/-2 deg.C for 100Hours. Then, release the filter into the room conditions for 2 hours minimum to the measurement. It shall fulfill the specifications in Table 1. |
| Resistance to Reflow Solder Heat | Expose filter to increasing temperature with a minimum total exposure above 230 deg.C of 30+/-5 seconds and must include 2-3 seconds at peak temperature of 250 deg.C, twice. Then, release the filter into the room conditions for 2 hours minimum to the measurement. It shall fulfill the specifications in Table 1. |
| Temperature Cycle | 10 Cycles (1 cycles:-40 deg.C for 30minutes then 25 deg.C for 15minutes then 85 deg.C for 30minutes.) An examination is done under the evaluation circuit board mounting condition. Then, release the filter into the room conditions for 2 hours minimum to the measurement. It shall fulfill the specifications in Table 1. |
| Vibration | Subject the filter to vibration for 2hour each In the X,Y and Z axes with the amplitude of 1.5mm, 10 to 55 Hz/min. It shall fulfill the specifications in Table 1. |
| Mechanical Shock1 | Subject the filter to 3 shocks in each direction of six mutually perpendicular planes (a total of 18 shocks). Each shock shall be a sine wave shaped with a magnitude of 100 G and a duration of 6 mseconds. It shall fulfill the specifications in Table 1. |
| Mechanical Shock2 | Drop the filter randomly onto a concrete floor from the Height of 1m, 3 times. It shall fulfill the specifications in Table 1. |
| ESD | A direct current voltage is increased to DEVICE mounted on the evaluation circuit board. The failure rate which occurred by the direct current voltage is investigated.A direct current voltage begins from 39V. As for the voltage,it increses with step of E12 series.A failure voltage is prescribed in the direct current voltage that an accumulate trouble rate is 0.1%.It is judged with the trouble when increase in the insertion loss occurs beyond 0.3dB before and after the examination.A failure voltage is more than 50V. ( Fig.-1 ) |

Fig.-1




ESD TEST Circuit( Machine Model)

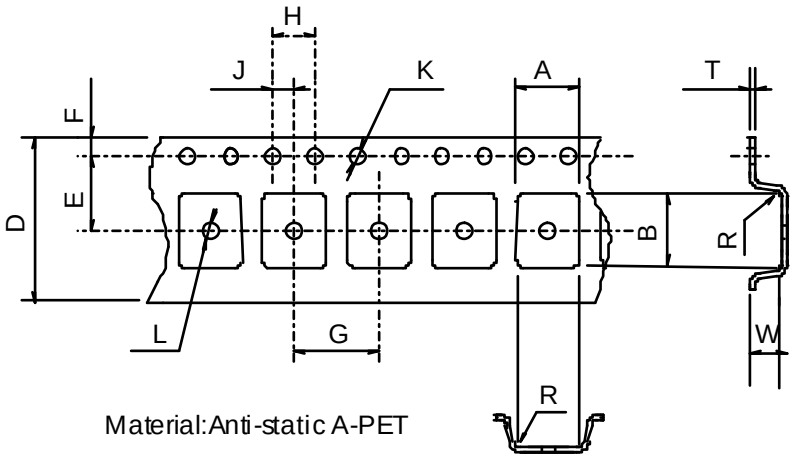
# 10.Taping Specification

## 10-1.Tape

### 10-1-1. Tape Material

Polycarbonate(EC-AP), or PS materials ( conductivity type ).

### 10-1-2. Tape Dimensions




Material:Anti-static A-PET

| Part | A | B | D | E | F |
|---|---|---|---|---|---|
| Dimension | 1.85+/-0.1 | 1.90+/-0.1 | 8.0+/-0.2 | 3.5+/-0.05 | 1.75+/-0.1 |
| Part | G | H | J | K | L |
| Dimension | 4.0+/-0.1 | 4.0+/-0.1 | 2.0+/-0.05 | 1.5+/-0.1 | 1.1+/-0.1 |
| Part | R | W | T | | |
| Dimension | 0.3 MAX | 0.95+/-0.2 | 0.25+/-0.05 | | |

Unit[mm]

* W Dimension is depth of pockets.

## 10-2.Taping

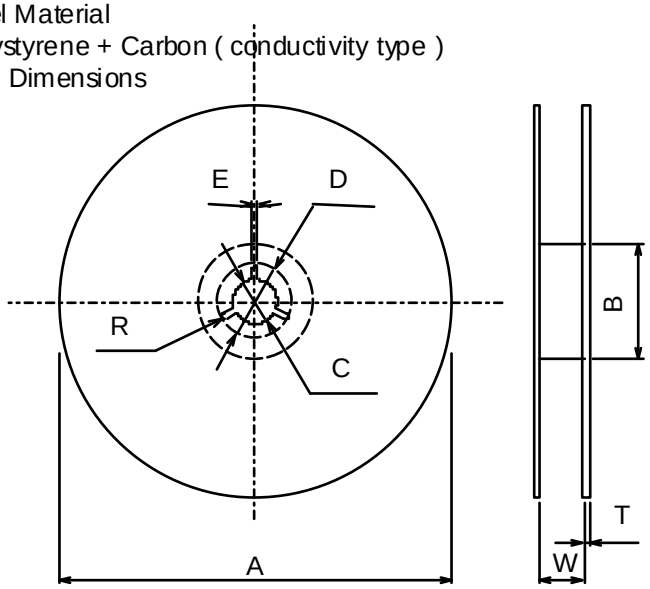
### 10-2-1.Taping Quantity

One reel of tape shall pack 3,000 filters maximum.
No filter shall be missing and contained continuously in pocket.

### 10-2-2. Reel Material

Polystyrene + Carbon ( conductivity type )

### 10-2-3.Reel Dimensions

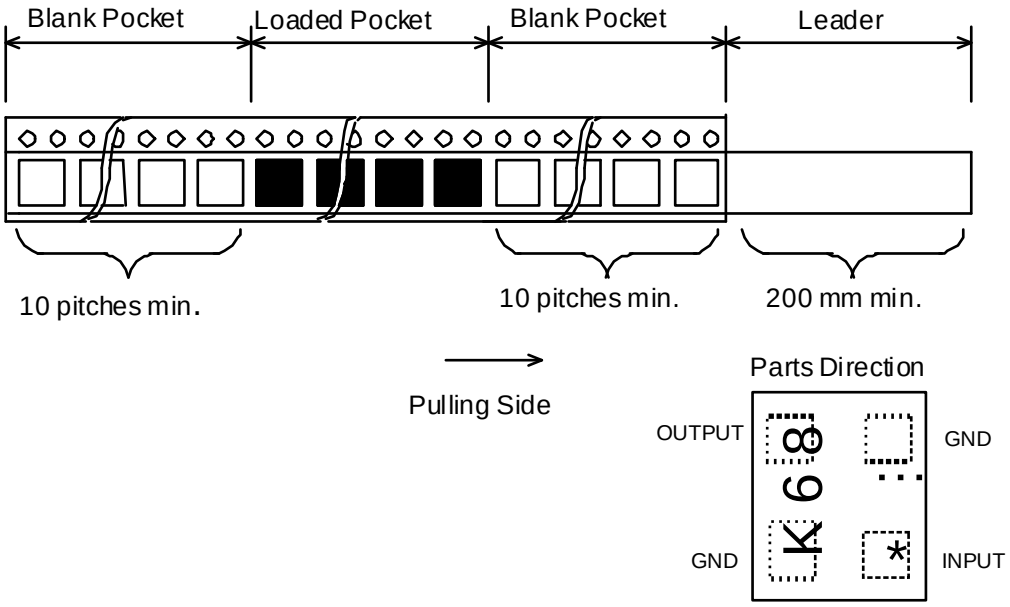



| Part | A | B | C | D |
|---|---|---|---|---|
| Dimension | 178+/-2 | 60+/-2 | 13+/-0.2 | 21+/-0.8 |
| Part | E | R | W | T |
| Dimension | 2+/-0.5 | R 1 | 9.5+/-1 | 2.0+/-0.2 |

Unit[mm]

10-2-4 Leader and blank pocket

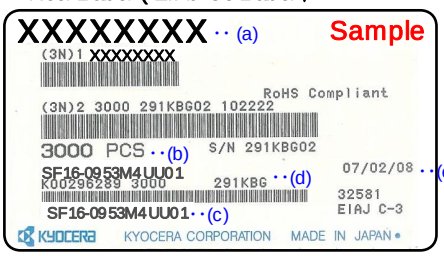
Package shall consist of Leader and Blank Pocket as follows.
The power peeling top from carrier shall be 0.098N to 0.98N.



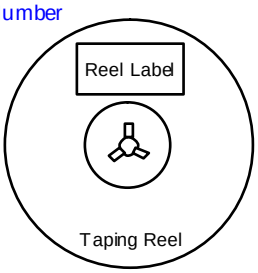

10-2-5 Reel Label

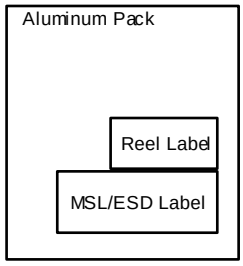
The following contents are indicated in a reel.

Reel Label ( EIAJ-C3 Label )




(a) Customer Parts Number
(b) Quantity
(c) Parts Name
(d) Lot number
(e) Shipping date

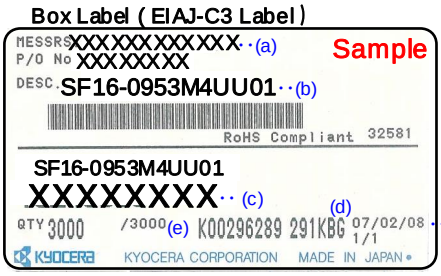



10-2-6 Packing case Label

During transportation, after packing into an aluminum bag for every reel so that a damage and moisture absorption may not be given to a product, it puts into a packing box.
The following contents are indicated in a packing case.

Box Label ( EIAJ-C3 Label )

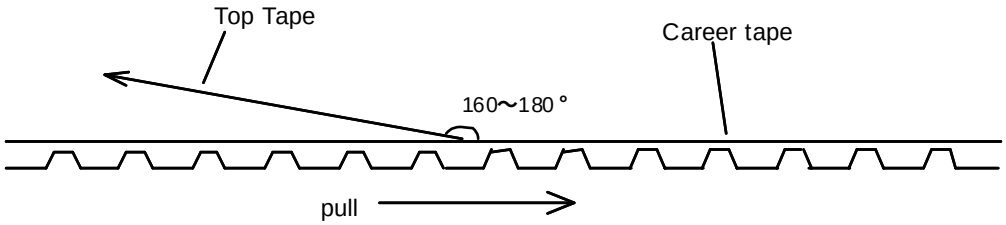



(a) Customer name
(b) Parts name
(c) Customer Parts number
(d) Lot number
(e) Quantity
(f) Shipping date

12-2-7 Taping flaking off strength Test

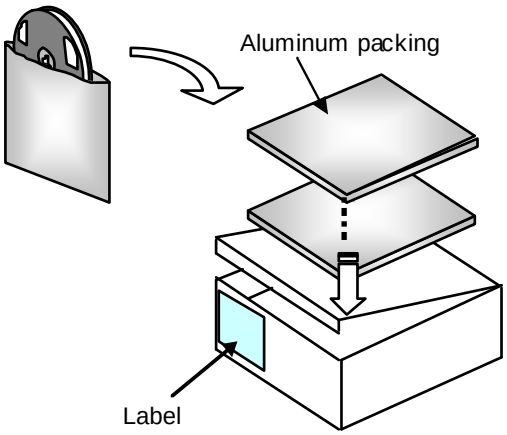
Test Condition : 120mm/min 160-180deg

Range of strength : 0.098 – 0.98 N




12-2-8 Packing form

The reel is packed in aluminum, and it is packed to the box.





**MSL/ESD Label**

## 13.Precaution in handling

Please handle with below condition.

1. Calculated shelf life in sealed bag: 6 months at ≦ 40℃ and ≦ 90% relative humidity (RH) .
2. After bag is opened, devices should be mounted within 168 hours of factory conditions ≦30℃/ 60% RH.
   Exposed over 168 hours parts are recommended to make pre treatment of 60 ℃ 1 hour baking just before
   use. (In case left further longer since unpacked, please check solderability before use.)
3. Expiration date : 6 months form sealing date, which is imprinted on the adjacent bar code label.
4. This components are static sensitivity parts. Please handle with care.
5. On circuit design, it is strongly recommended to put DC cut capacitor for this SAW filter.
7. This component can not be used in resin molding.