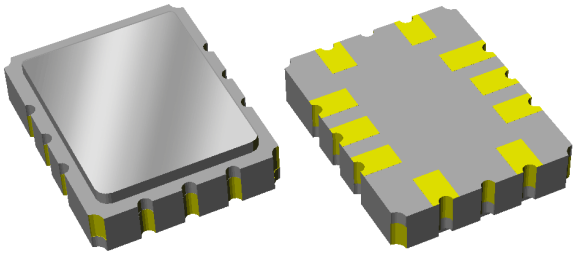
# 857073

## *397.5 MHz SAW Filter*

## Applications

- General purpose wireless
- Wireless infrastructure
- 3G, 4G, Multistandard
- Distributed Antenna Systems (DAS)

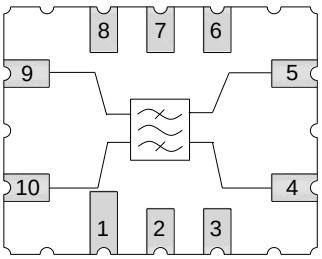


## Product Features

- Usable bandwidth 66.7 MHz
- High attenuation
- Low EVM
- Balanced operation
- Ceramic Surface Mount Package (SMP-28C)
- Small Size: 7.00 x 5.50 x 1.24 mm
- Hermetic **RoHS** compliant, **Pb**-free

## Functional Block Diagram

Top view




## General Description

The 857073 is a high-performance IF SAW filter with a center frequency of 397.5MHz and 1.5 dB bandwidth of 66.7 MHz

It features excellent attenuation and pass band ripple, leading to outstanding EVM performance. 857073 is designed to be used in a balanced configuration, thereby eliminating the need for Baluns on the input and output. The high performance coupled with the small size of this surface mount filter makes it a natural choice for our customers filtering needs in demanding high data rate communications standards.

This device is RoHS compliant and Pb-free.

## Pin Configuration

| Pin # Bal/Bal | Description |
|---|---|
| 10 | Input + |
| 9 | Input - |
| 5 | Output + |
| 4 | Output - |
| 1,2,3 | Case Ground |
| 6,7,8 | Case Ground |

## Ordering Information

| Part No. | Description |
|---|---|
| 857073 | packaged part |
| 857073-EVB | evaluation board |

Standard T/R size = 3000 units/reel.

## Specifications

### Electrical Specifications [1, 2]

Specified Temperature Range: [3] +10 to +75 ºC

| Parameter [4] | Conditions | Min | Typical [5] | Max | Units |
|---|---|---|---|---|---|
| Center Frequency | $f_o$ | - | 398.1 | - | MHz |
| Insertion Loss | at 397.5 MHz | - | 16.6 | 19 | dB |
| 1.5 dB Bandwidth [10] | | 65 | 67.8 | - | MHz |
| 2.8 dB Band edge [9] | | - | 363.9 | 365 | MHz |
| 2.8 dB Band edge [9] | | 430 | 432.5 | - | MHz |
| 35 dB Bandwidth [10] | | - | 71.7 | 76 | MHz |
| Passband Flatness[7] | 365 – 430 MHz | - | 0.7 | 2.8 | dB p-p |
| Absolute Delay | over $f_o$ +/- 32.5 MHz | - | 0.66 | 0.70 | µs |
| Group Delay Ripple [6] | over $f_o$ +/- 32.5 MHz | - | 36 | 100 | ns p-p |
| Group Delay Ripple [6] | Any 3.84 MHz channel over $f_o$ +/- 32.5 MHz | - | 33 | 70 | ns p-p |
| EVM [8] | Any 3.84 MHz channel over $f_o$+/- 32.5 MHz | - | 2.3 | 3 | % |
| Temperature Coeffient | | - | -94 | - | ppm/ ºC |
| Input /Output Return Loss | over $f_o$ +/- 32.5 MHz | 8.5 | 14 | - | dB |
| Stopband Attenuation [10] | 5 – 100 MHz | 45 | 60 | - | dB |
| | 150 – 310 MHz | 40 | 58 | - | dB |
| | 310 – 359.5 MHz | 35 | 44 | - | dB |
| | 359.5 – 360 MHz | 28 | 44 | - | dB |
| | 435 – 435.5 MHz [11] | 25 | 31 | - | dB |
| | 435.5 – 437 MHz | 22 | 41 | - | dB |
| | 437 – 460 MHz | 35 | 41 | - | dB |
| | 460 – 860 MHz | 40 | 46 | - | dB |
| Source/Load Impedance (balanced) [12] | | - | 100 | - | Ω |

Notes:
1. All specifications are based on the TriQuint schematic for the main reference design shown on page 3
2. An external impedance matching network with ±2% tolerance will be necessary to achieve the proposed specifications
3. In production, devices will be tested at room temperature to a guardbanded specification to ensure electrical compliance over temperature
4. Electrical margin has been built into the design to account for the variations due to temperature drift and manufacturing tolerances
5. Typical values are based on average measurements of 10 devices at room temperature
6. This ripple is defined as the worst peak to adjacent valley within specified frequency range
7. Passband Flatness is defined as the difference between maximum and minimum loss over the specified band
8. The EVM specification is guaranteed by design and measured approximately in production
9. 2.8 db Band edges are relative to Minimum Loss
10. All Bandwidth and Attenuation measurements are relative to loss at 1.5dB Center Frequency
11. 435 to 435.5 MHz Stopband Attenuation applies only for this temperature range : +25 °C to +75 °C
12. This is the optimum impedance in order to achieve the performance shown

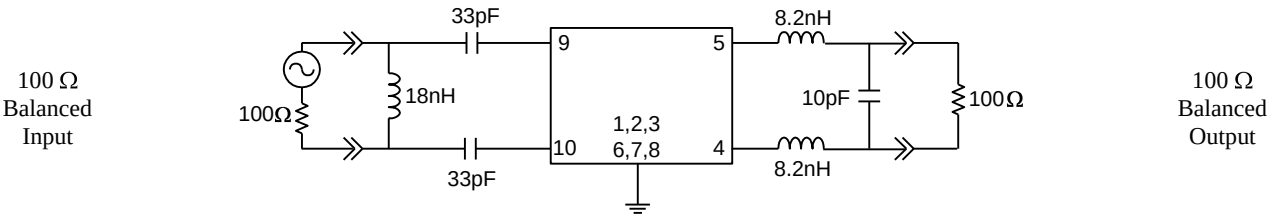
### Absolute Maximum Ratings

(Operation of this device outside the parameter ranges given above may cause permanent damage.)

| Parameter | Rating |
|---|---|
| Operable /Storage Temperature | -40 to +85 °C |
| Input Power | +10dBm (Measured with continuous sine wave signal. Expected Lifetime of greater than or equal to 10K Hrs at 55 °C) |

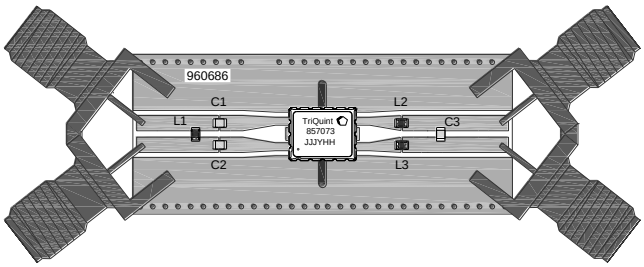
## Reference Design – 100Ω Bal Input, 100Ω Bal Output

### Schematic



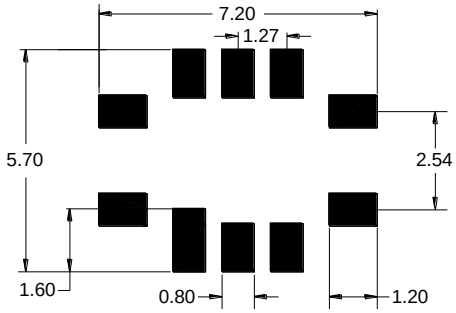

Notes:
1. Actual matching values may vary due to PCB layout and parasitic

### PC Board




Notes:
Top, middle & bottom layers: 1 oz copper
Substrates: FR4 dielectric, .031" thick
Finish plating: Nickel: 3-8µm thick, Gold: .03-.2µm thick
Hole plating: Copper min .0008µm thick

### Mounting Configuration



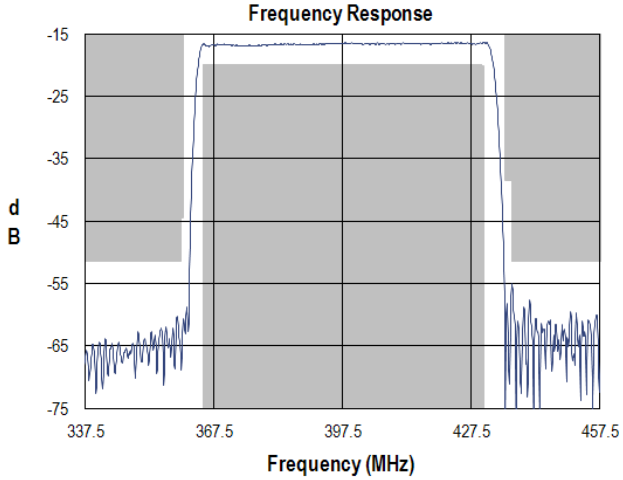

Notes:
1. All dimensions are in millimeters.
2. This footprint represents a recommendation only.

### Bill of Material

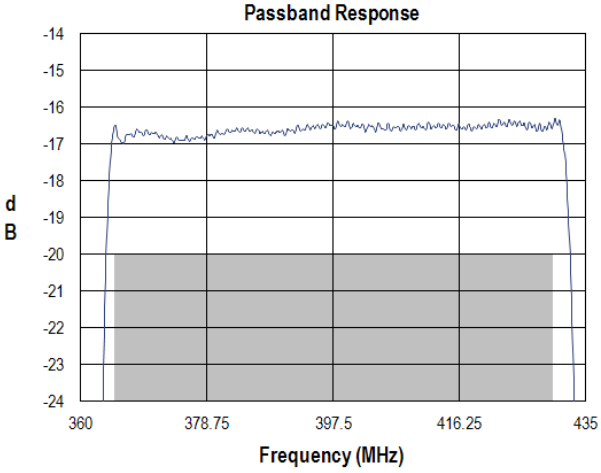
| Reference Desg. | Value | Description | Manufacturer | Part Number |
|---|---|---|---|---|
| L1 | 18nH | Coil Wire-wound, 0603 5% | MuRata | LQW18AN18NJ00 |
| L2 | 8.2nH | Coil Wire-wound, 0603, 5% | MuRata | LQW18AN8N2J00 |
| L3 | 8.2nH | Coil Wire-wound, 0603, 5% | MuRata | LQW18AN8N2J00 |
| C1 | 33pF | Chip Ceramic, 0603, 5% | MuRata | GRM1885C1H330JA01 |
| C2 | 33pF | Chip Ceramic, 0603, 5% | MuRata | GRM1885C1H330JA01 |
| C3 | 10pF | Chip Ceramic, 0603, 5% | MuRata | GRM1885C1H100JA01 |
| SMA | N/A | SMA connector | Johnson Components | 142-0701-801 |
| PCB | N/A | 3-layer | multiple | 960686 |

## Typical Performance (at room temperature)

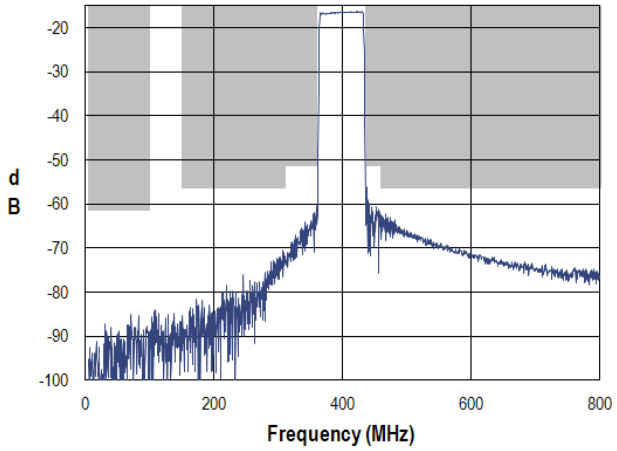
Frequency Response



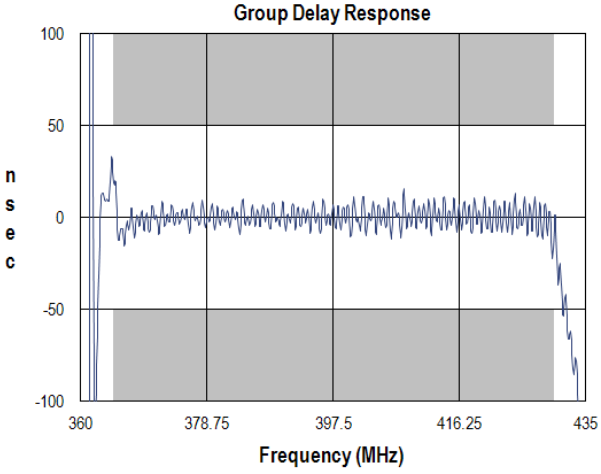

Passband Response



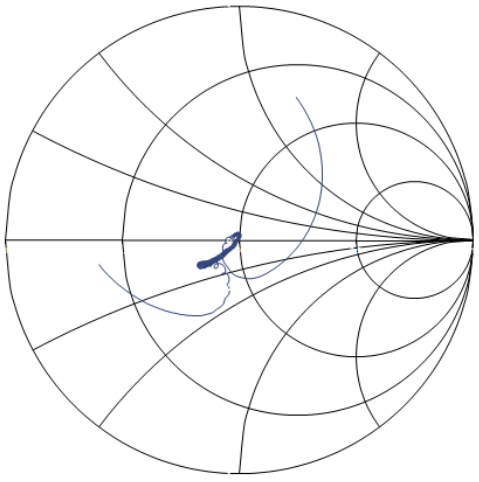

Wideband Response



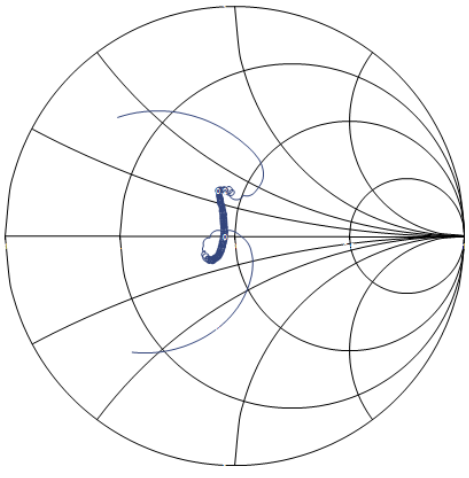

Group Delay Response




Input Smith Chart

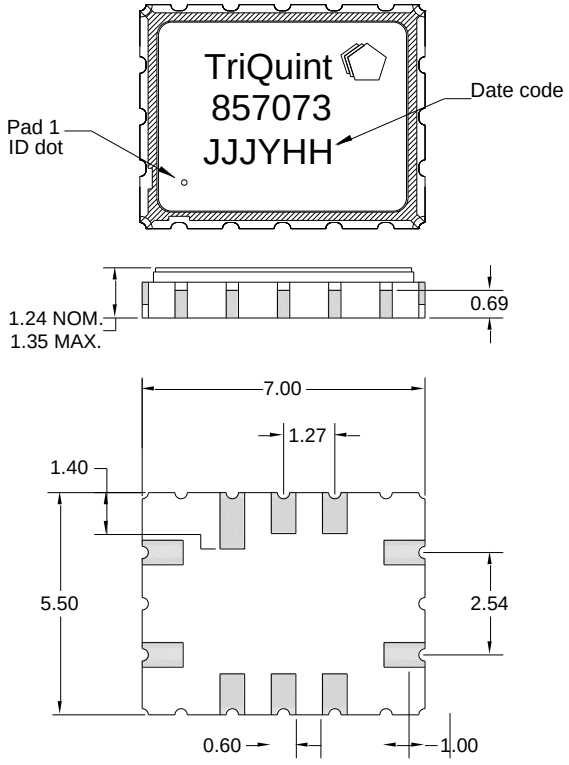


Output Smith Chart



## Mechanical Information

### Package Information, Dimensions and Marking




Package Style: SMP-28C
Dimensions: 7.00 x 5.50 x 1.24 mm

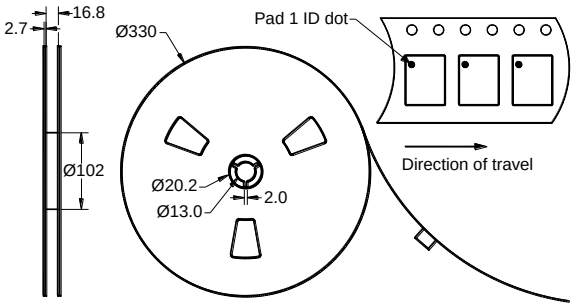
Body: $Al_2O_3$ ceramic
Lid: *Kovar, Ni* plated
Terminations: *Au* plating 0.5 - 1.0µm, over a 2-6µm *Ni* plating

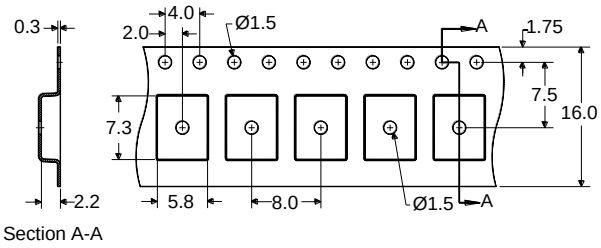
All dimensions shown are nominal in millimeters
All tolerances are ±0.15mm except overall length and width ±0.10mm

The date code consists of: day of the current year (Julian, 3 digits), Y = last digit of the year (1 digit), and HH = hour (2 digits)

## Tape and Reel Information

Standard T/R size = 3000 units/reel. All dimensions are in millimeters




Section A-A

## Product Compliance Information

### ESD Information

**Caution! ESD-Sensitive Device**

ESD Rating: 0
Value: Passes ≥ 200 V min.
Test: Human Body Model (HBM)
Standard: JEDEC Standard JESD22-A114

ESD Rating: B
Value: Passes ≥ 200 V min.
Test: Machine Model (MM)
Standard: JEDEC Standard JESD22-A115

### MSL Rating

Devices are Hermetic, therefore MSL is not applicable

### Solderability

Compatible with the latest version of J-STD-020, lead free solder, 260°C

Refer to **Soldering Profile** for recommended guidelines.

This part is compliant with EU 2002/95/EC RoHS directive (Restrictions on the Use of Certain Hazardous Substances in Electrical and Electronic Equipment).

This product also has the following attributes:

- Halogen Free (Chlorine, Bromine)
- Antimony Free
- TBBP-A ($C_{15}H_{12}Br_40_2$) Free
- PFOS Free
- SVHC Free

## Contact Information

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