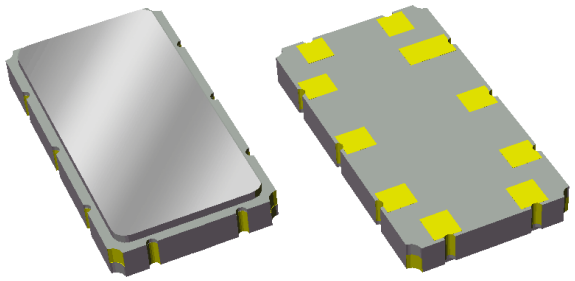
856691

140 *MHz SAW Filter*

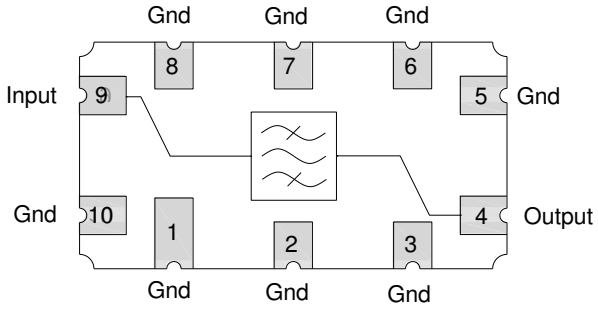
Applications

- Wireless infrastructure
- Microwave communications IF filtering
- General purpose IF



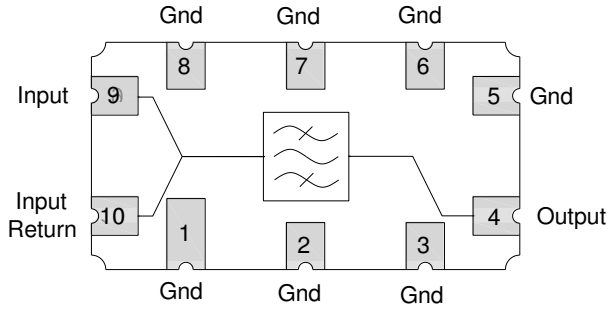
Functional Block Diagram SE/SE

Top View



Functional Block Diagram Bal/SE

Top view



Product Features

- Usable bandwidth 1.5 MHz
- High attenuation
- Balanced or Single-ended operation
- Ceramic Surface Mount Package (SMP)
- Dimensions: 9.1 x 4.8 x 1.24 mm
- Hermetic **RoHS** compliant, **Pb**-free

General Description

856691 is a 1.5MHz bandwidth filter which is part of TriQuint's 140MHz center frequency family for use in IF filtering for various channelized communication systems.

Housed in a hermetic surface mount package, 856691 offers low insertion loss, constant group delay, and good input power handling capability.

856691 offers an excellent choice for narrowband selection for communication systems.

Pin Configuration

Pin # SE/SE	Description
9	Input
10	Ground
4	Output
5	Ground
1,2,3,6,7,8	Case Ground

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

Ordering Information

Part No.	Description
856691	packaged part
856691-EVB	evaluation board

Standard T/R size = 4000 units/reel.

Specifications

Electrical Specifications [1]

Specified Temperature Range: [2] -40 to +85 ºC

Parameter [3]	Conditions	Min	Typical [4]	Max	Units
Center Frequency		-	140	-	MHz
Minimum Insertion Loss	139.25 – 140.75 MHz	-	12.1	14	dB
Amplitude Variation	139.25 – 140.75 MHz	-	0.6	1.2	dB p-p
Phase Linearity	139.25 – 140.75 MHz	-	3.2	10	° p-p
Group Delay Variation	139.25 – 140.75 MHz	-	74	180	ns p-p
Relative Attenuation [5]	10 – 137 MHz 143 – 280 MHz	40 40	47 48	- -	dB dB
Source Impedance (single-ended or balanced) [6]		-	50	-	Ω
Load Impedance (single-ended) [6]		-	50	-	Ω

Notes:
1. All specifications are based on the TriQuint schematic for the main reference design shown on pages 3 and 5
2. In production, devices will be tested at room temperature to a guardbanded specification to ensure electrical compliance over temperature
3. Electrical margin has been built into the design to account for the variations due to temperature drift and manufacturing tolerances
4. Typical values are based on average measurements at room temperature
5. Relative to minimum insertion loss
6. This is the optimum impedance in order to achieve the performance shown

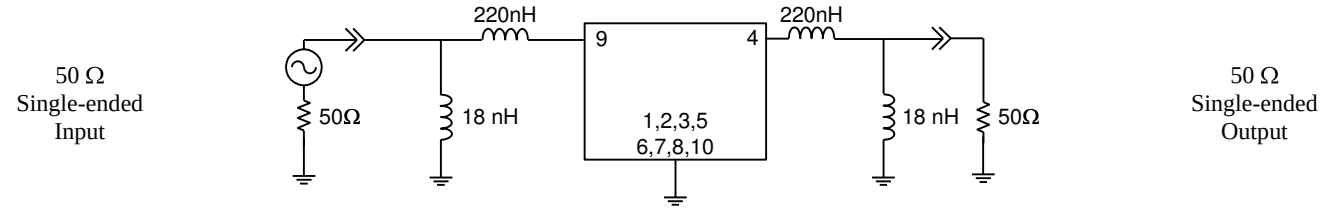
Absolute Maximum Ratings

Parameter	Rating
Operating Temperature	-40 to +85 °C
Storage Temperature	-55 to +125 °C
Pyroelectric Voltage	50 mV p-p
Input Power	+20 dBm

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

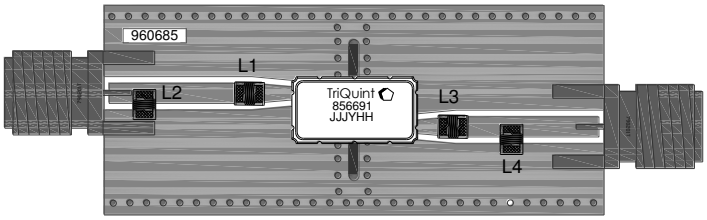
Reference Design 1 – 50Ω SE Input, 50Ω SE Output

Schematic



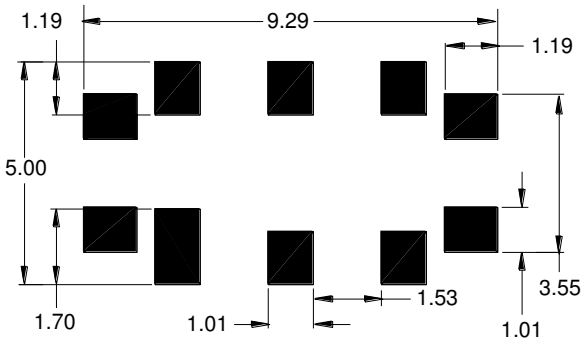
Notes:
1. Actual matching values may vary due to PCB layout and parasitic

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



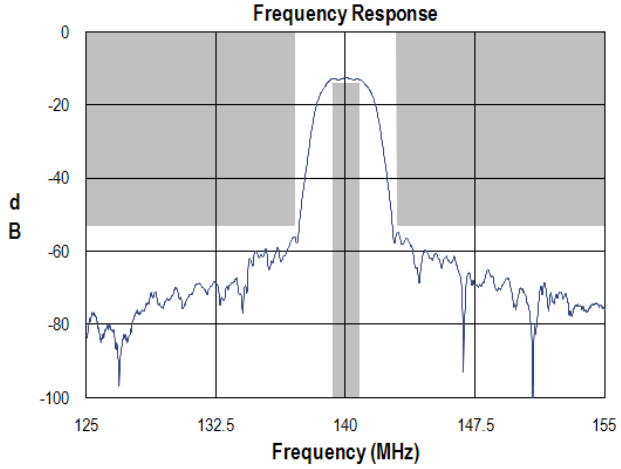
Notes:
1. All dimensions are in millimeters.
2. This footprint represents a recommendation only.

Bill of Material

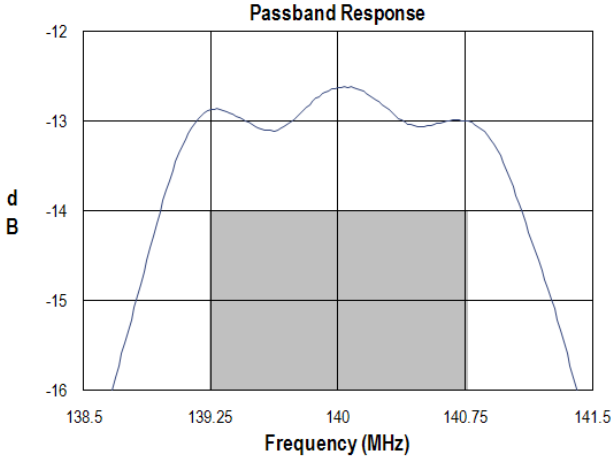
Reference Desg.	Value	Description	Manufacturer	Part Number
L1	18 nH	Coil Wire-wound, 0805, 5%	Coilcraft	0805CS-180XJBC
L2	220 nH	Coil Wire-wound, 0805, 5%	Coilcraft	0805CS-221XJBC
L3	220 nH	Coil Wire-wound, 0805, 5%	Coilcraft	0805CS-221XJBC
L4	18 nH	Coil Wire-wound, 0805, 5%	Coilcraft	0805CS-180XJBC
SMA	N/A	SMA connector	Radiall USA Inc.	9602-1111-018
PCB	N/A	3-layer	multiple	960685

Typical Performance 1- 50Ω SE Input, 50Ω SE Output (at room temperature)

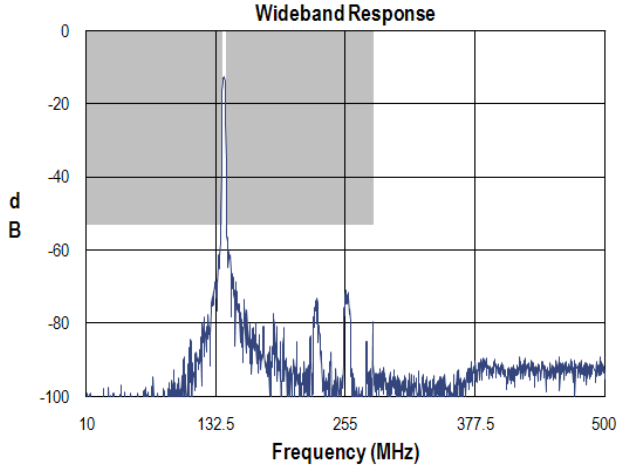
Frequency Response



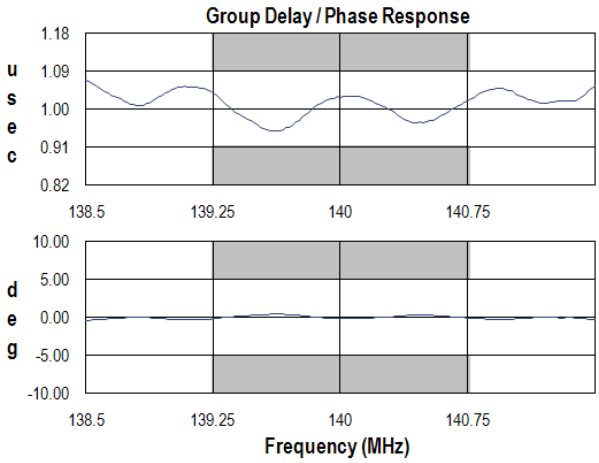
Passband Response



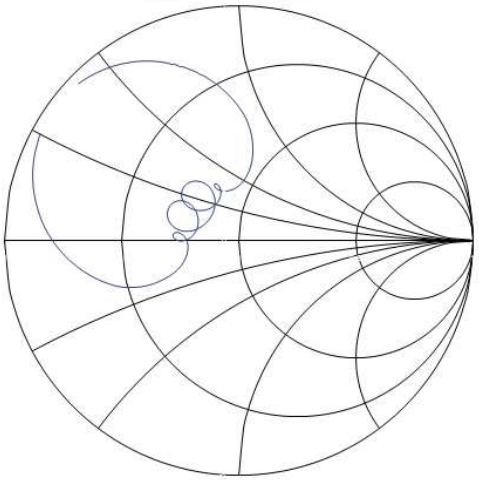
Wideband Response



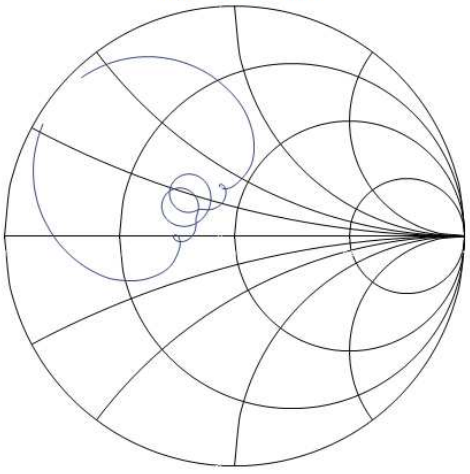
Group Delay / Phase Response



Input Smith Chart

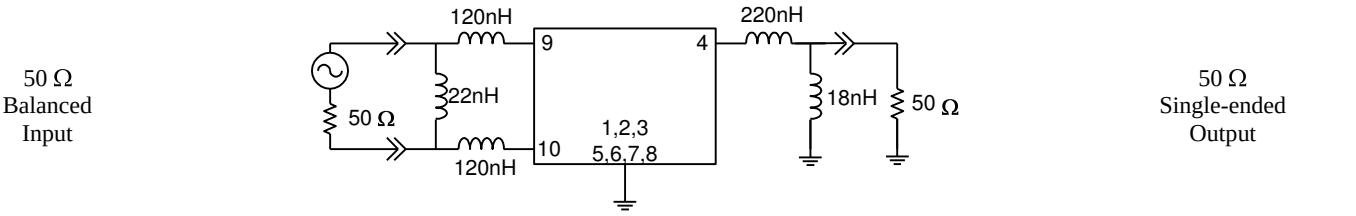


Output Smith Chart



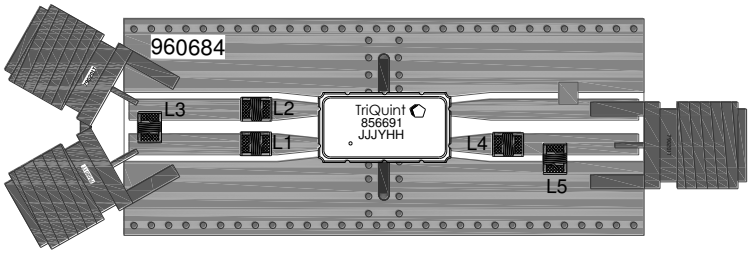
Reference Design 2 – 50Ω Balanced Input, 50Ω Single-ended output

Schematic



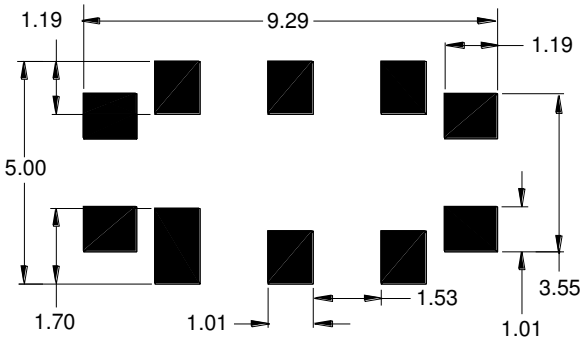
Notes:
1. Actual matching values may vary due to PCB layout and parasitic

PC Board



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

Mounting Configuration



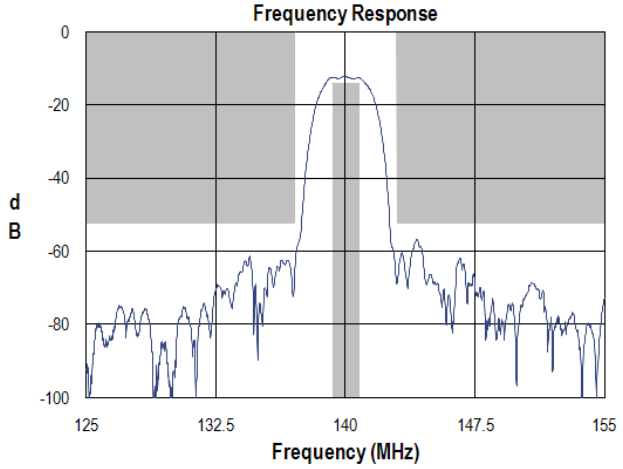
Notes:
1. All dimensions are in millimeters.
2. This footprint represents a recommendation only.

Bill of Material

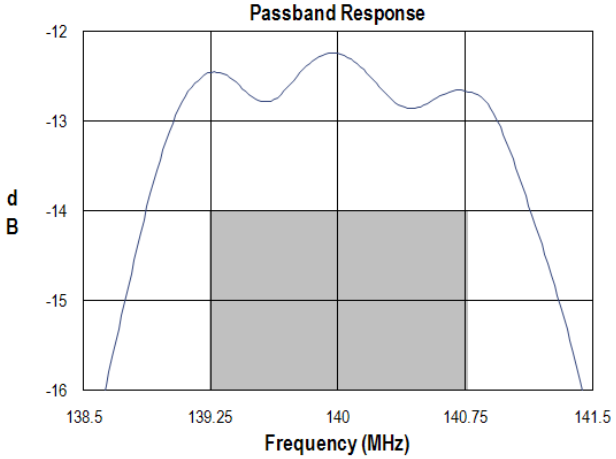
Reference Desg.	Value	Description	Manufacturer	Part Number
L1	22nH	Coil Wire-wound, 0805, 5%	Coilcraft	0805CS-220XJBC
L2	120nH	Coil Wire-wound, 0805, 5%	Coilcraft	0805CS-121XJBC
L3	120nH	Coil Wire-wound, 0805, 5%	Coilcraft	0805CS-121XJBC
L4	220nH	Coil Wire-wound, 0805, 5%	Coilcraft	0805CS-221XJBC
L5	18nH	Coil Wire-wound, 0805, 5%	Coilcraft	0805CS-180XJBC
SMA	N/A	SMA connector	Radiall USA Inc.	9602-1111-018
PCB	N/A	3-layer	multiple	960684

Typical Performance 2- 50Ω Bal Input, 50Ω SE Output (at room temperature)

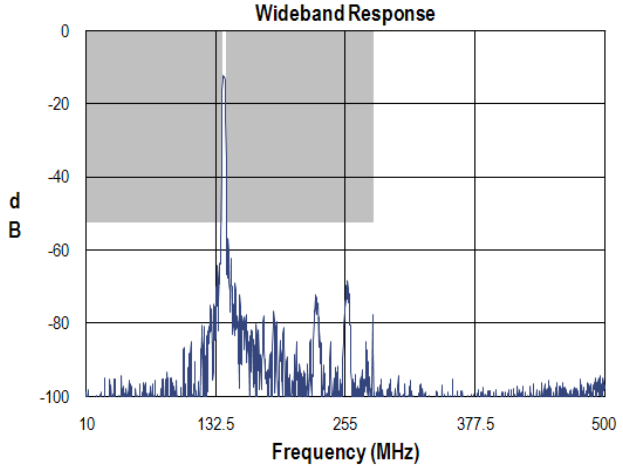
Frequency Response



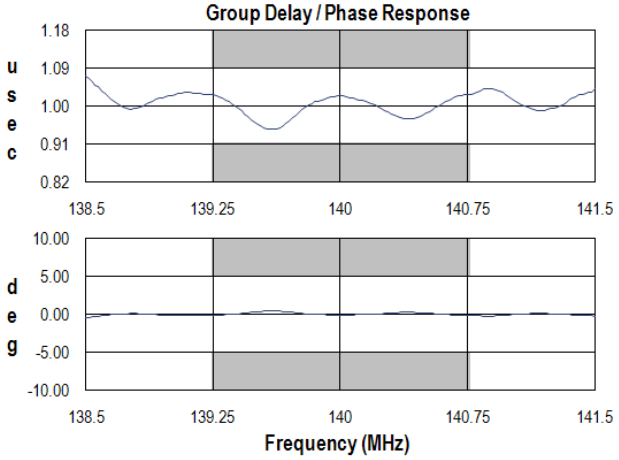
Passband Response



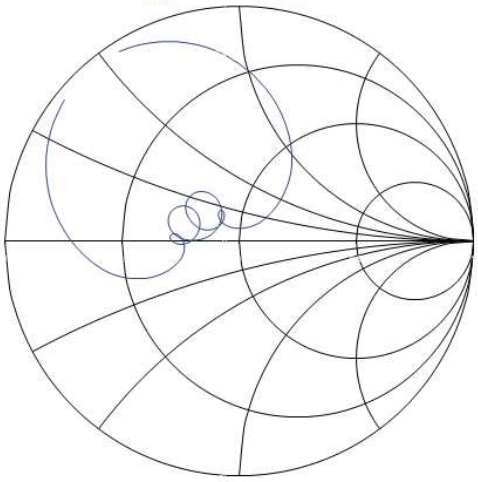
Wideband Response



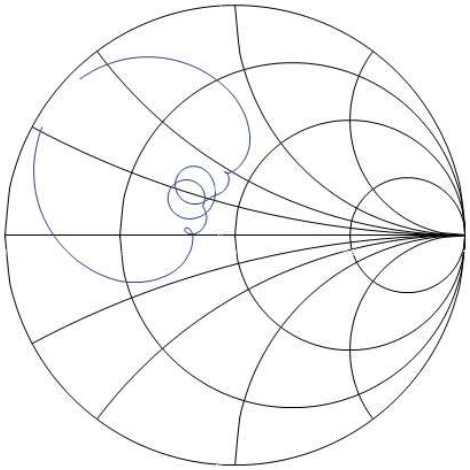
Group Delay / Phase Response



Input Smith Chart

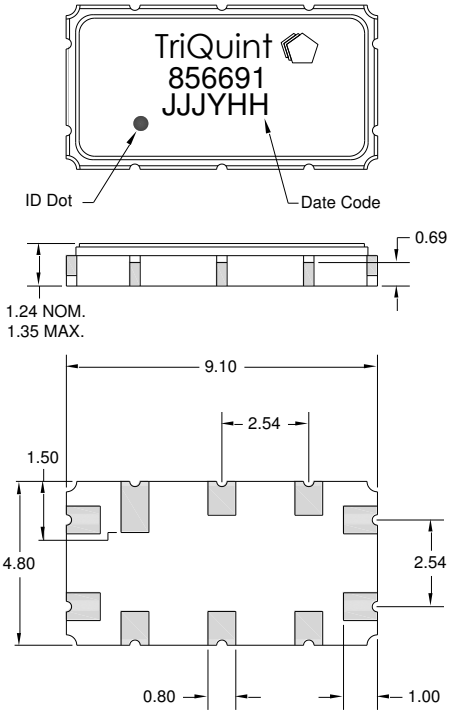


Output Smith Chart



Mechanical Information

Package Information, Dimensions and Marking



Package Style: SMP-35C
Dimensions: 9.1 x 4.8 x 1.24 mm

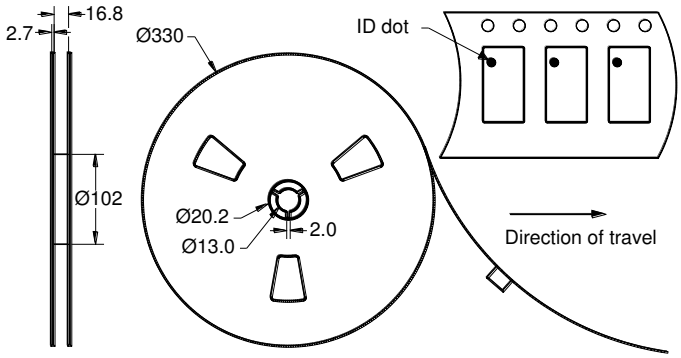
Body: Al_2O_3 ceramic
Lid: Kovar, Ni plated
Terminations: Au plating 0.5 - 1.0µm, over a 2-6µm Ni plating

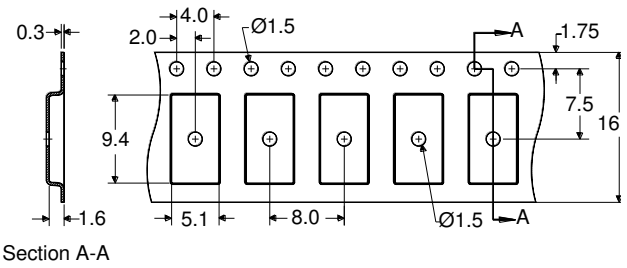
All dimensions shown are nominal in millimeters
All tolerances are ±0.15mm except overall length and width ±0.10mm

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 = 4000 units/reel. All dimensions are in millimeters





Product Compliance Information

ESD Information

Caution! ESD-Sensitive Device

ESD Rating: 1C
Value: Passes ≥ 1000 V min.
Test: Human Body Model (HBM)
Standard: JEDEC Standard JESD22-A114

ESD Rating: C
Value: Passes ≥ 500 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 ($C_{15}H_{12}Br_4O_2$) Free
- PFOS Free
- SVHC Free

Contact Information

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