

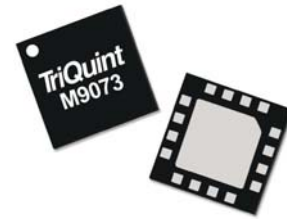
# TQM4M9073

## Through Line



### Applications

- General Purpose Wireless
- RF bypass paths
- Microwave Radio
- Test & Measurement
- Scientific Instruments

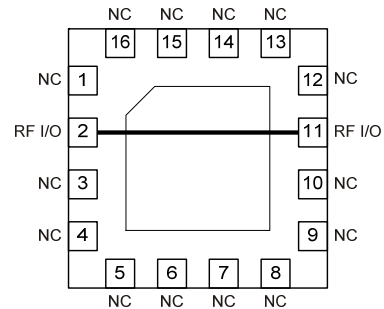


16-pin 3x3mm leadless SMT package

### Product Features

- DC – 6 GHz
- 50 ohm port impedance
- Low insertion loss, <0.1dB at 2.14GHz
- 1.2:1 VSWR at 2.14 GHz
- Surface Mountable

### Functional Block Diagram



### General Description

The TQM4M9073 is a passive low-loss through line that operates from 0 to 6.0 GHz. At 2.14 GHz, input and output return loss is greater than 22 dB and typical insertion loss is 0.1 dB. The product is housed in an industry standard Pb-free / RoHS-compliant surface-mount leadless package.

### Pin Configuration

Pin #	Symbol
2, 11	RF I/O
1, 3, 4, 5, 6, 7, 8, 9, 10, 12, 13, 14, 15, 16	No Connect
Backside Paddle	No Connect

### Typical Performance

Parameter	Units	Typical Value			
Frequency	MHz	960	2140	2500	3000
Insertion Loss	dB	<0.1	0.1	0.13	0.17
Input/ Output Return Loss	dB	32	25	23	20

### Ordering Information

Part No.	Description
TQM4M9073	Through Line

Standard T/R size = 2500 pcs. on a 7" reel

# TQM4M9073

Through Line

## Specifications

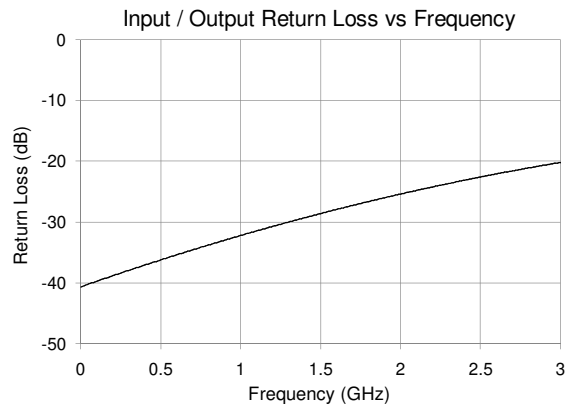
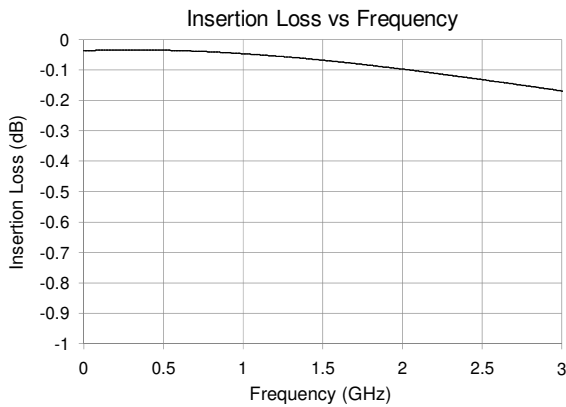
### Electrical Specifications

Parameter	Conditions	Min	Typical	Max	Units
Operational Frequency Range	$T_{LEAD} = +25^{\circ}C$	0		6	GHz
Port Impedance (0 to 6 GHz)			50		$\Omega$
Insertion Loss	$f = 2140$ MHz		0.1	0.3	dB
Return Loss			25		dB

### Absolute Maximum Ratings

Parameter	Rating
Storage Temperature	-55 to +150 °C
Recommended Operating Temperature Range	-40 to +150 °C

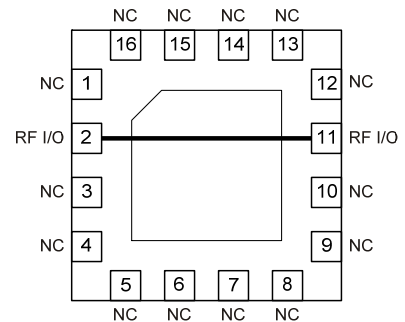
Operation of this device outside the parameter ranges given above may cause permanent damage



Note: Insertion loss data represents TQM4M9073 performance with PCB losses de-embedded. Insertion loss measured on a PCB will exhibit the loss contributions of the PCB material.

## Pin Description

Pin	Symbol	Description
2, 11	RF I/O	RF through path (bi-directional)
1, 3, 4, 5, 6, 7, 8, 9, 10, 12, 13, 14, 15, 16 Backside paddle	NC	No electrical connection. Land pads should be provided for PCB mounting integrity.



### Mechanical Information

### Package Information and Dimensions

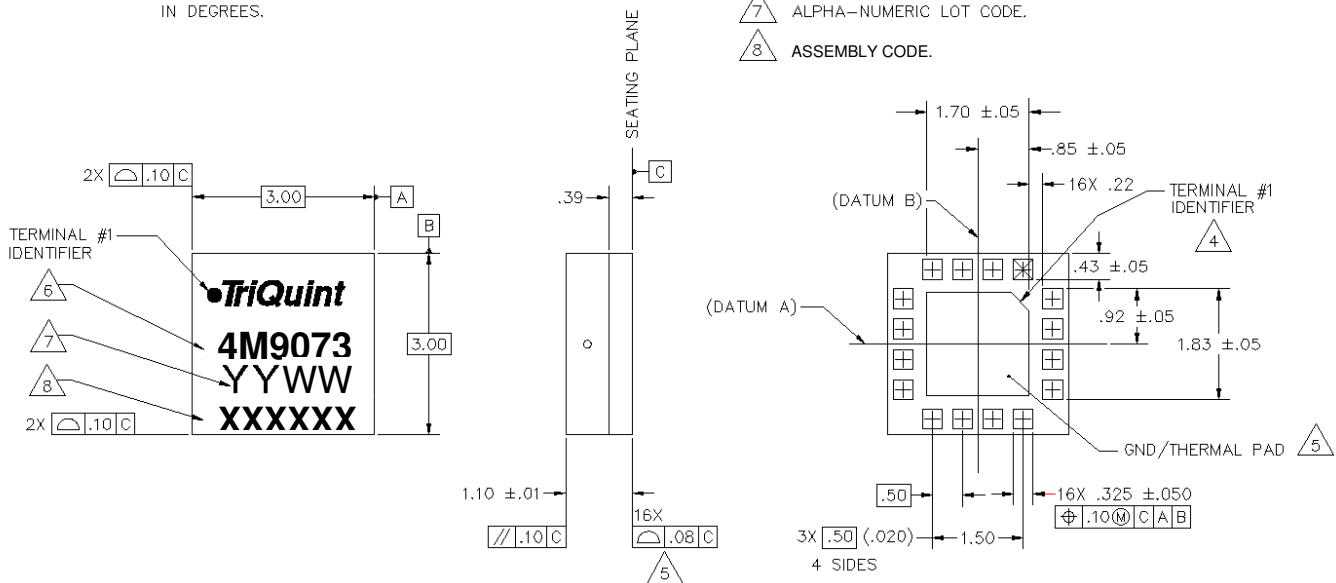
Package Style: 16-pin 3X3 leadless SMT

This package is lead-free/RoHS-compliant. The plating material on the leads is ENIG (Electroless Nickel Immersion Gold). It is compatible with both lead-free (maximum 260 °C reflow temperature) and lead (maximum 245 °C reflow temperature) soldering processes.

**NOTES:**

- EXCEPT WHERE NOTED, THIS PART OUTLINE CONFORMS TO JEDEC STANDARD MO-220, ISSUE E (VARIATION VGGC) FOR THERMALLY ENHANCED PLASTIC VERY THIN FINE PITCH QUAD FLAT NO LEAD PACKAGE (QFN).
- DIMENSIONING & TOLERANCING CONFORM TO ASME Y14.4M-1994.
- ALL DIMENSIONS ARE IN MILLIMETERS. ANGLES ARE IN DEGREES.

- THE TERMINAL #1 IDENTIFIER AND TERMINAL NUMBERING CONVENTION CONFORM TO JESD 95-1 SPP-012.
- COPLANARITY APPLIES TO THE EXPOSED GROUND/THERMAL PAD AS WELL AS THE TERMINALS.
- PRODUCT CODE.
- ALPHA-NUMERIC LOT CODE.
- ASSEMBLY CODE.



### PART MARKING

Pin 1 Location: Upper Left Hand Corner

Line 1 – Pin 1 (orientation) dot & “TriQuint”

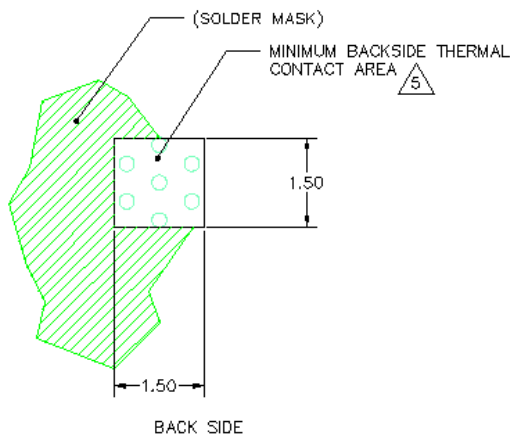
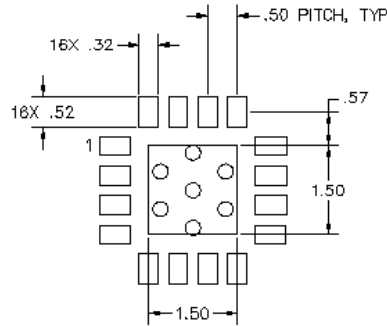
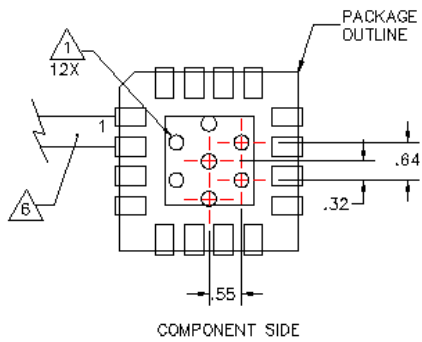
Line 2 – Product Name: “4M9073”

Line 3 – YYWW = Year/Week

Line 4 – Assembly Code

### Mounting Configuration

All dimensions are in millimeters (inches). Angles are in degrees.



#### NOTES:

1. GROUND/THERMAL VIAS ARE CRITICAL FOR THE PROPER PERFORMANCE OF THIS DEVICE. VIAS SHOULD USE A .35mm (#80/.0135") DIAMETER DRILL AND HAVE A FINAL, PLATED THRU DIAMETER OF .25mm (.010").
2. ADD AS MUCH COPPER AS POSSIBLE TO INNER AND OUTER LAYERS NEAR THE PART TO ENSURE OPTIMAL THERMAL PERFORMANCE.
3. TO ENSURE RELIABLE OPERATION, DEVICE GROUND PADDLE-TO-GROUND PAD SOLDER JOINT IS CRITICAL.
4. ADD MOUNTING SCREWS NEAR THE PART TO FASTEN THE BOARD TO A HEATSINK. ENSURE THAT THE GROUND/THERMAL VIA REGION CONTACTS THE HEATSINK.
5. DO NOT PUT SOLDER MASK ON THE BACK SIDE OF THE PC BOARD IN THE REGION WHERE THE BOARD CONTACTS THE HEATSINK.
6. RF TRACE WIDTH DEPENDS UPON THE PC BOARD MATERIAL AND CONSTRUCTION.
7. USE 1 OZ. COPPER MINIMUM.
8. ALL DIMENSIONS ARE IN MILLIMETERS. ANGLES ARE IN DEGREES.

### MANUFACTURING ENVIRONMENTS

#### COMPONENT HANDLING

All necessary special handling techniques shall be adopted in order to avoid contamination of metallization / terminations. Examples include use of finger cots, plastic tweezers, etc.

#### PART PLACEMENT

A placement force of up to 500 grams is applied (using a 2.00 mm or a 0.080 inch diameter rod) to the center of the part while remaining in its tape carrier.

#### COMPONENT SOLDERABILITY

##### Convection or Infrared Reflow

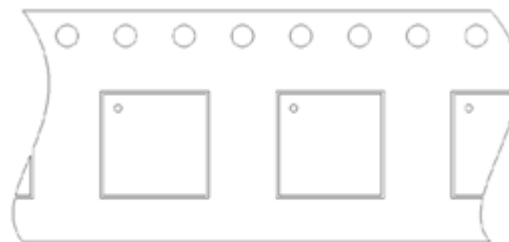
Part will comply with convection or infrared reflow soldering processes consistent with IPC/JEDEC J-STD-020. TriQuint's actual reflow profile for qualification is provided below:

Reflow Parameters	IPC/JEDEC J-STD-020	TriQuint Actual
Average ramp-up rate (217°C to Peak)	3°C/second max.	0.57°C/second
Preheat Time (150°C to 200°C)	60-180 seconds	150 seconds
Time above 217°C	60-150 seconds	126 seconds
Peak Temperature	260 +0/-5°C	259°C
Time within 5°C of actual Peak Temperature	20-40 seconds	30 seconds
Ramp-down Rate	6°C/second max.	0.875°C/second
Time 25°C to Peak Temperature	8 minutes max.	7 minutes max.

### MATERIAL PACKAGING AND SHIPMENT

In the absence of customer specific requirements called out in the purchase order, material packaging and shipping requirements shall be defined in the paragraph and in TriQuint's standard procedure for the packaging and shipment of ICs in tape and reel.

#### GENERAL TAPE AND REEL REQUIREMENTS



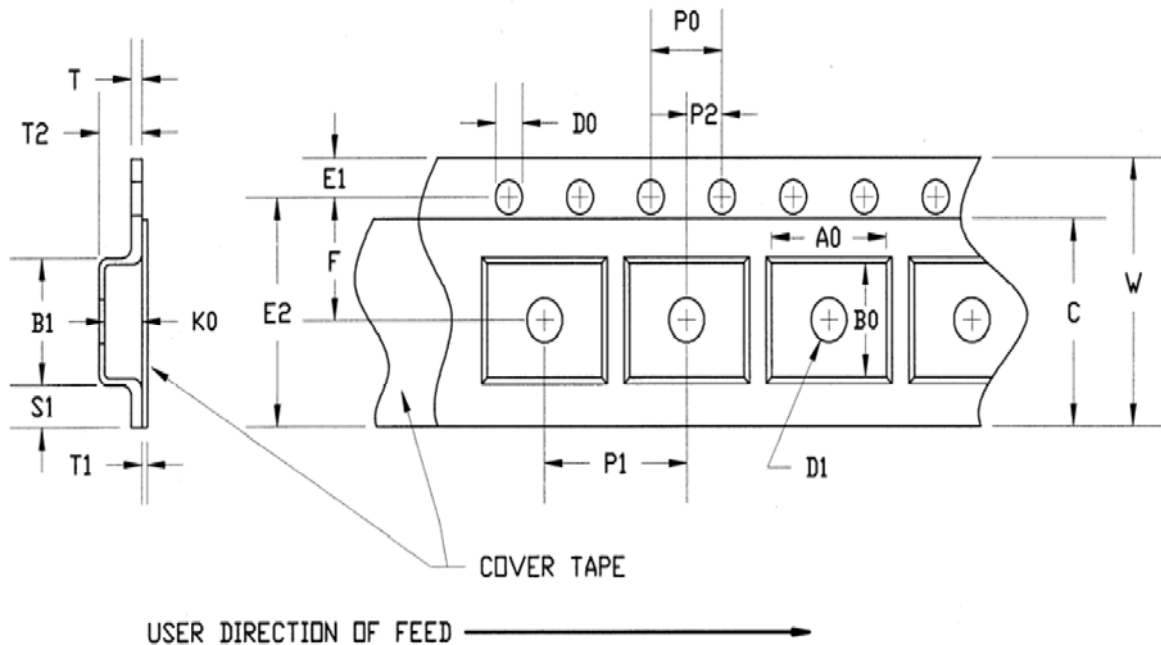
MODULE 3X3

User Direction of Feed →

Carrier and cover tape physical dimensions

# TQM4M9073

Through Line



PART	FEATURE	SYMBOL	SIZE (in)	SIZE (mm)
CAVITY	LENGTH	A0	0.134	3.40
	WIDTH	B0	0.126	3.20
	DEPTH	K0	0.055	1.40
	PITCH	P1	0.157	4.00
DISTANCE BETWEEN CENTERLINE	CAVITY TO PERFORATION LENGTH DIRECTION	P2	0.079	2.00
	CAVITY TO PERFORATION WIDTH DIRECTION	F	0.138	3.50
COVER TAPE	WIDTH	C	0.213	5.40
CARRIER TAPE	WIDTH	W	0.315	8.00

## ESD PROTECTION

To protect the devices and leads from ESD damage, individual parts shall be placed in static protected tape and reels, tubes, bags, trays, or in waffle packages.

## MOISTURE RESISTANT PACKAGING

The product will be shipped in accordance with JEDEC J-STD-033 where applicable.

## Product Compliance Information

### MSL Rating

The part is rated Moisture Sensitivity Level 3 at 260°C per JEDEC standard IPC/JEDEC J-STD-020.

### Solderability

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

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:

- Lead Free
- Halogen Free (Chlorine, Bromine)
- Antimony Free
- TBBP-A (C<sub>15</sub>H<sub>12</sub>Br<sub>4</sub>O<sub>2</sub>) Free
- PFOS Free
- SVHC Free

## Contact Information

For the latest specifications, additional product information, worldwide sales and distribution locations, and information about TriQuint:

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