

## Features

- Small footprint and integrated loopback circuit with 4 inductors & 4 capacitors
  - > Inductor is manufactured by MEMS (Micro Electro Mechanical Systems)
  - > Inductor is designed specifically for broadband applications : up to 6.2GHz
- Surface mounted component with high reliability
- Package size : 4.26 x 4.47 x 2.30mm (W x L x H mm)
- Package cap is hermetically sealed and protects MEMS inductors
- The capacitance of 4 capacitors can be determined by user requirement
- Improved isolation compared with TL4C4-100

Electrical Specification		Environmental Specification	
<b>Inductance*1</b> (Tolerance : ±5%)	60.7nH @ 5MHz 59.8nH @ 100MHz	<b>Thermal Shock</b>	200 cycles, -65°C ~ +150°C
<b>SRF*2 (Typ.)</b>	6.6GHz	<b>Pressure Cooker Test</b>	+130°C, 85% RH, 96Hrs
<b>Idc*3 (Max)</b>	300mA	<b>Operating Temperature Range</b>	-55°C ~ +85°C
<b>DCR *4</b>	1.97±0.1Ω		

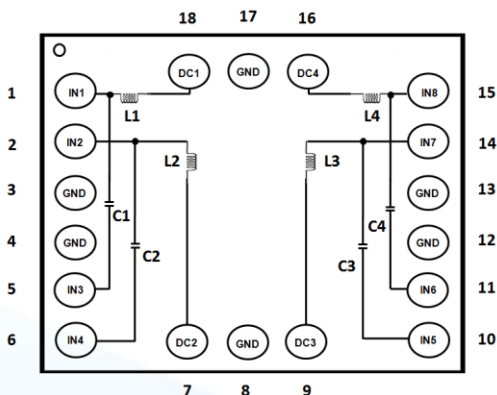
\*1. Measurement Instrument : Impedance Analyzer Agilent 4294 & 42941A(Probe Kit)

\*2. Measurement Instrument : VNA Keysight N5224A

\*3. Idc Measurement Condition : The DC resistance changes were observed by supplying 5V and maintaining 300mA current for 30 minutes at room temperature

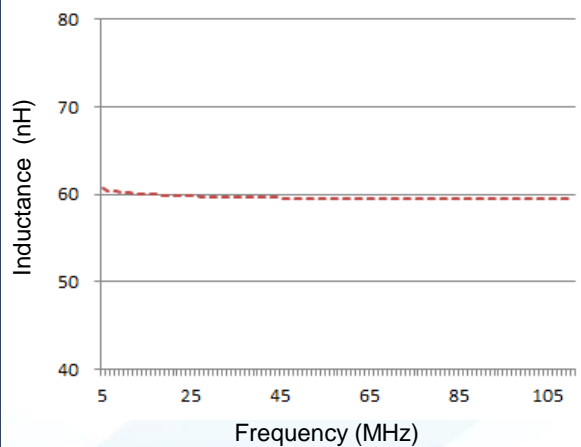
\*4. Measurement Instrument : Keithley 2000

## Pin Assignment



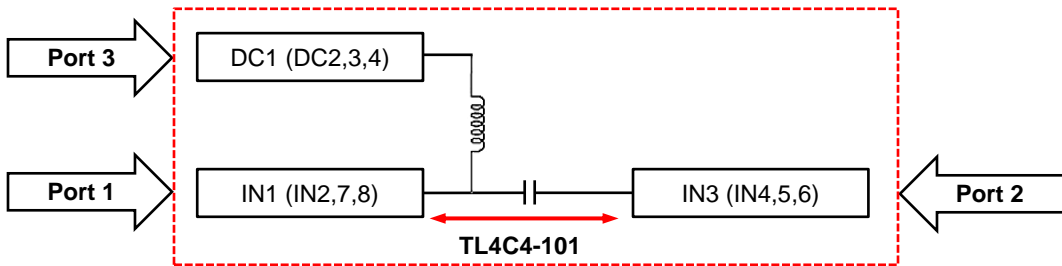
- L1~L4 : MEMS Inductor
- C1~C4 : AC Coupling Capacitor
- AC Coupling Capacitor Specification : 100nF (±10%), 6.3V rated voltage

## Inductance vs Frequency

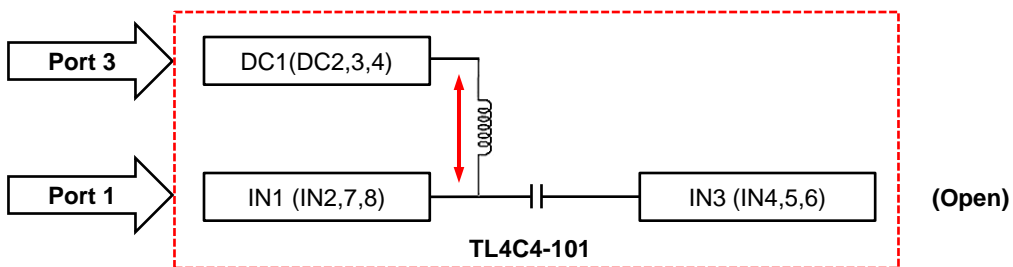


## S-Parameter Measurement Set up

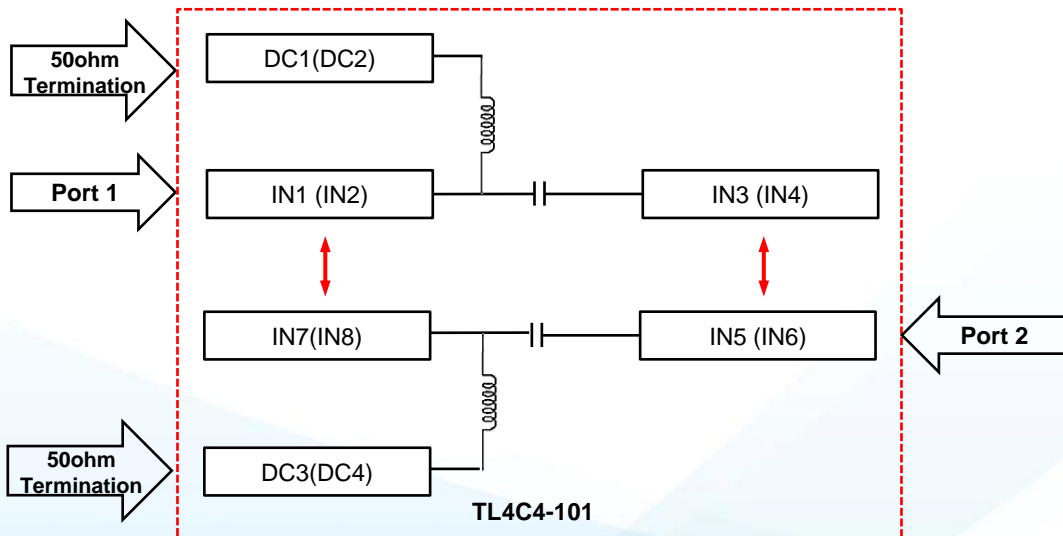
- Loopback Path



- Inductor Path (Test Channel Connection)



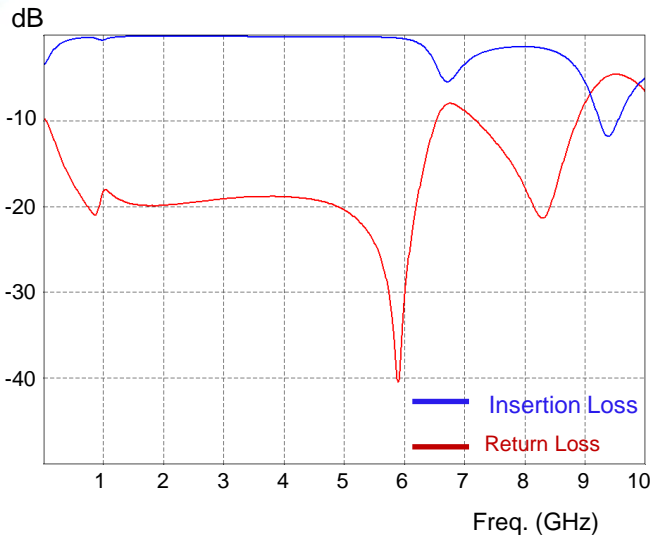
- Isolation



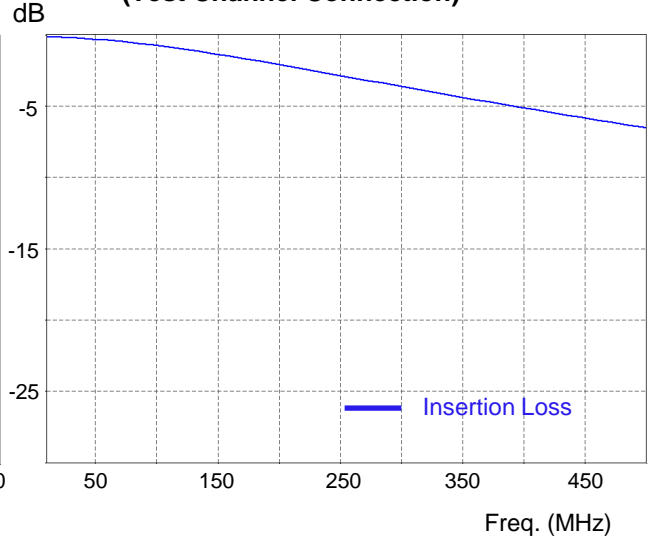
[Note] Other pads are open except probing pads

## S-Parameter

- Loopback Path S-Parameter



- Inductor Path S-Parameter (Test Channel Connection)



- Loopback Path S-Parameter

Frequency	Insertion Loss(dB)	Return Loss(dB)
0.5 GHz	-0.44	-17.30
1.0 GHz	-0.55	-18.20
2.0 GHz	-0.11	-19.90
3.0 GHz	-0.14	-19.10
4.0 GHz	-0.17	-18.90
5.0 GHz	-0.19	-20.40
6.0 GHz	-0.43	-30.80
7.0 GHz	-3.36	-8.82

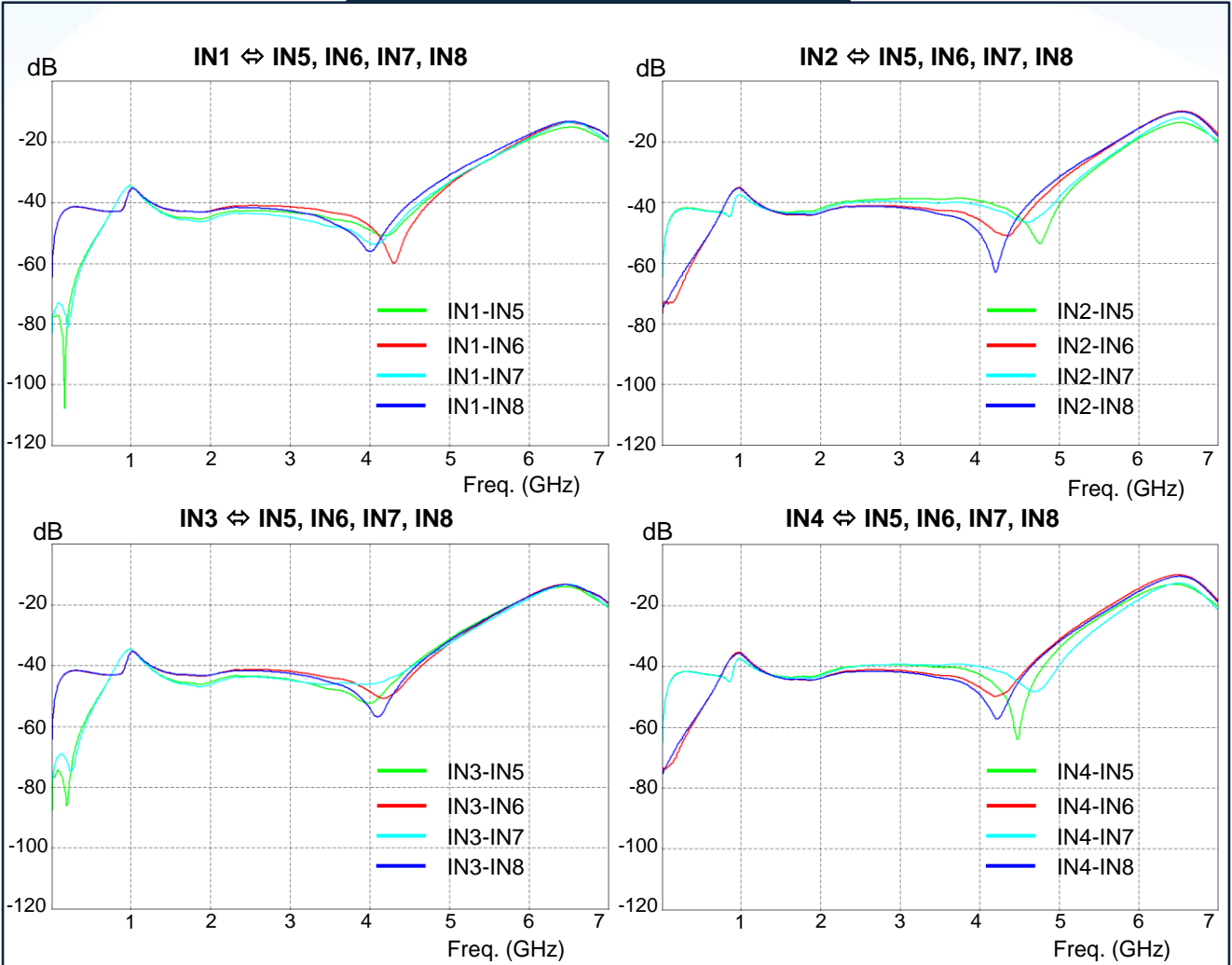
- Inductor Path (Test Channel Connection) S-Parameter

Frequency	Insertion Loss(dB)
100 MHz	-0.77
200 MHz	-2.14
300 MHz	-3.70
400 MHz	-5.21

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## Isolation

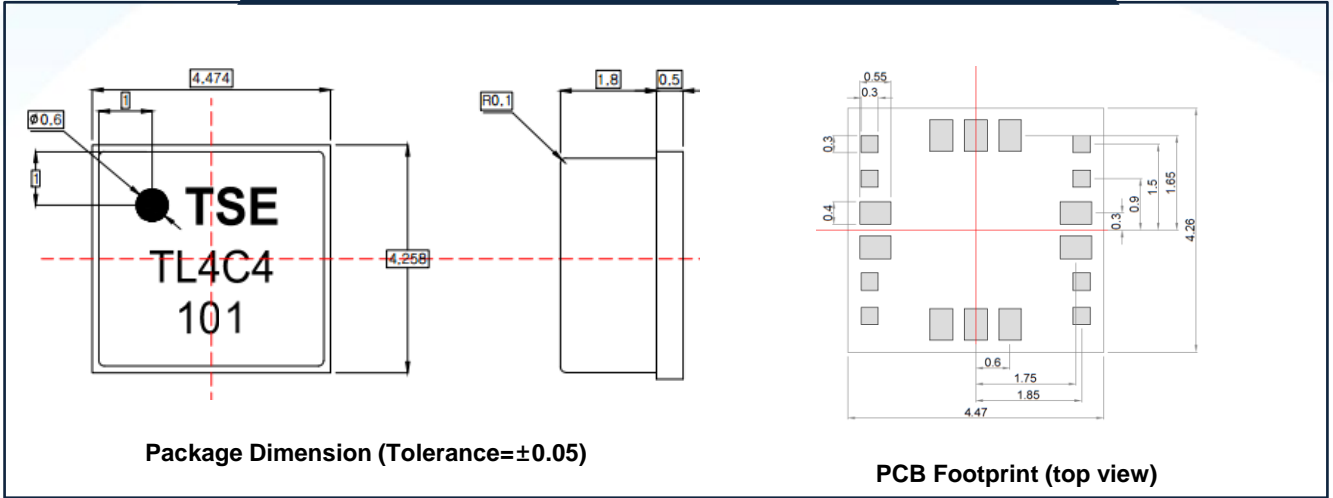


Isolation	1GHz	2GHz	3GHz	4GHz	5GHz
IN1 - IN5	-34.50	-44.60	-43.20	-49.10	-33.30
IN1 - IN6	-35.50	-42.60	-41.40	-47.70	-34.00
IN1 - IN7	-34.60	-45.50	-44.90	-53.20	-33.10
IN1 - IN8	-35.60	-42.80	-42.70	-56.10	-30.90
IN2 - IN5	-37.40	-42.00	-38.80	-39.40	-40.70
IN2 - IN6	-35.30	-43.40	-41.30	-45.70	-33.20
IN2 - IN7	-37.50	-42.60	-39.70	-40.90	-38.20
IN2 - IN8	-35.50	-43.40	-41.70	-50.20	-31.60
IN3 - IN5	-34.60	-45.50	-44.60	-52.30	-31.20
IN3 - IN6	-35.60	-43.10	-41.90	-48.40	-32.70
IN3 - IN7	-34.70	-46.30	-44.80	-46.10	-32.60
IN3 - IN8	-35.70	-43.10	-42.60	-54.00	-31.80
IN4 - IN5	-37.60	-42.60	-39.50	-42.60	-33.90
IN4 - IN6	-35.50	-43.90	-41.40	-46.80	-31.20
IN4 - IN7	-37.70	-43.10	-39.40	-40.20	-39.70
IN4 - IN8	-35.90	-44.00	-41.90	-49.20	-31.80

# TL4C4-101



## PCB Dimension & Footprint (Unit : mm)



## SMT Reflow Profile (for Lead Free)

Parameter	Specification
Preheat and Soak [ Temperature min (T <sub>smin</sub> ) Temperature max (T <sub>smax</sub> ) Time (T <sub>smin</sub> to T <sub>smax</sub> )	150 °C 200 °C 60~120 seconds
Average ramp-up rate (T <sub>smax</sub> to T <sub>p</sub> )	3 °C/second maximum
Liquidous temperature (T <sub>L</sub> ) Time at liquidous (t <sub>L</sub> )	217 °C 60~150 seconds
Peak temperature in reflow (T <sub>p</sub> )	260 °C (+0/-5 °C)
Time(t <sub>p</sub> ) within 5 °C of the specified classification temperature (T <sub>c</sub> )	20 seconds
Average ramp-down rate (T <sub>p</sub> to T <sub>smax</sub> )	6 °C/second max
Time 25 °C to peak temperature	8 minutes max

[Note] Prior to SMT, bake TL4C4-101 for 1.5hour at 120 °C if it was stored over 3days at room temperature after unpacking.  
A one year warranty before opening vacuum pack from the date of delivery of the components & 3 months warranty after opening vacuum pack.

