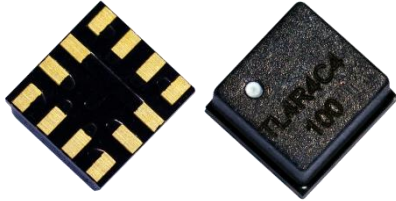


## Applications

- Gigabit Display High Speed I/O Test in ATE

## Features

- Small footprint and integrated high speed I/O test circuit with 4 inductors, 4 capacitors & 4 resistors
  - > Inductor is manufactured by MEMS (Micro Electro Mechanical Systems)
  - > Inductor is designed specifically for broadband applications : up to 6.5GHz
- 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



| Electrical Specification                 |                                  | Environmental Specification        |                              |
|--|----------------------------------|------------------------------------|------------------------------|
| <b>Inductance*1</b><br>(Tolerance : ±5%) | 60.4nH @ 5MHz<br>59.4nH @ 100MHz | <b>Thermal Shock</b>               | 200 cycles, -65 °C ~ +150 °C |
| <b>SRF*2 (Typ.)</b>                      | 6.60GHz                          | <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                        |                                    |                              |

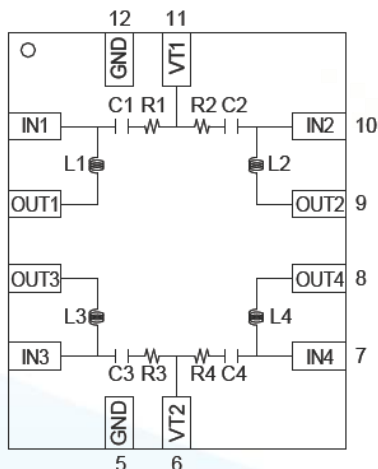
\*1. Measurement Instrument : Impedance Analyzer Agilent 4294 & 42941A(Probe Kit)

\*2. Measurement Instrument : VNA Agilent 8720ES

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

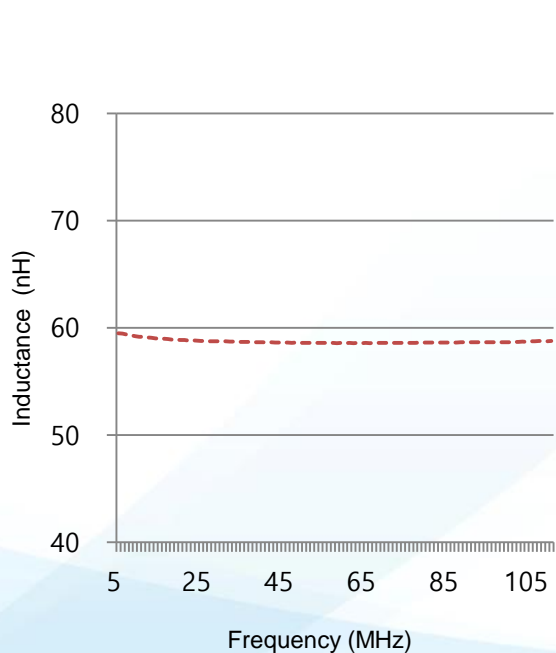
\*4. Measurement Instrument : Keithley 2000

## Pin Assignment



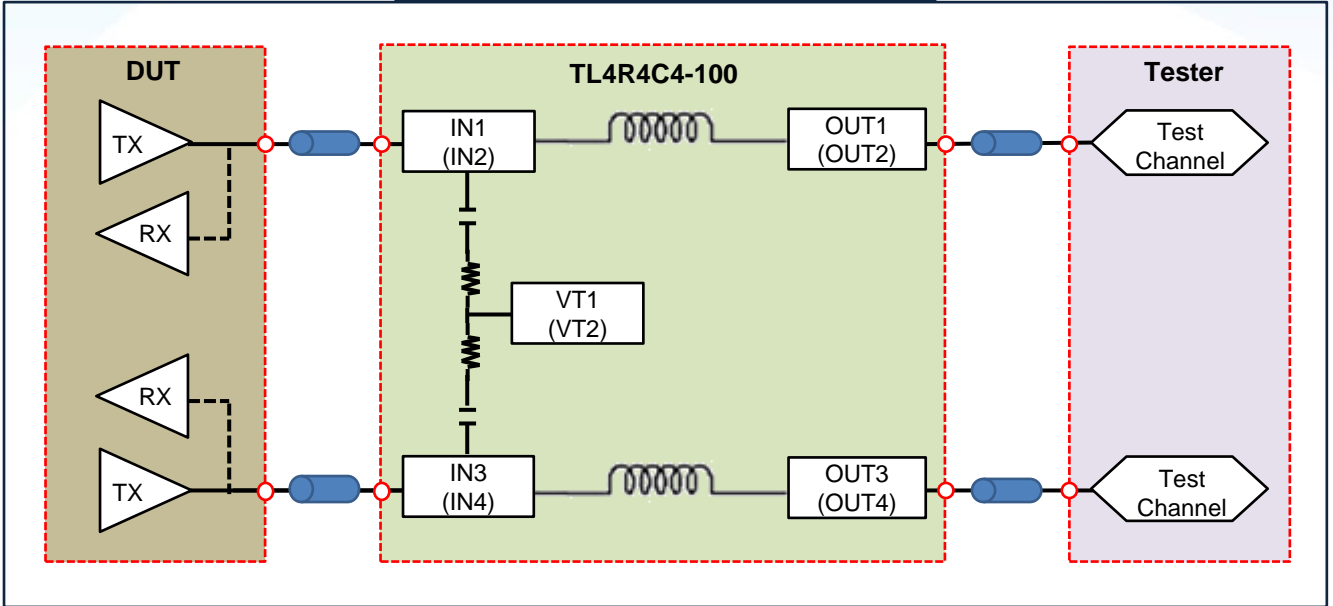
- L1~L4 : MEMS Inductor, C1~C4 : Capacitor
- R1~R4 : Resistor
  - > Capacitor Specification : 100nF (±10%), 6.3V rated voltage
  - > Resistor Specification : 49.9ohm(±1%), 15V rated voltage

## Inductance vs Frequency



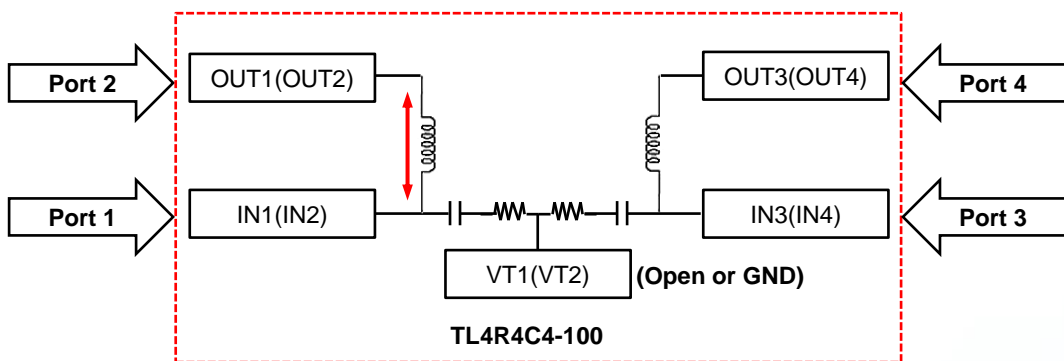
# TL4R4C4-100

## Typical Application



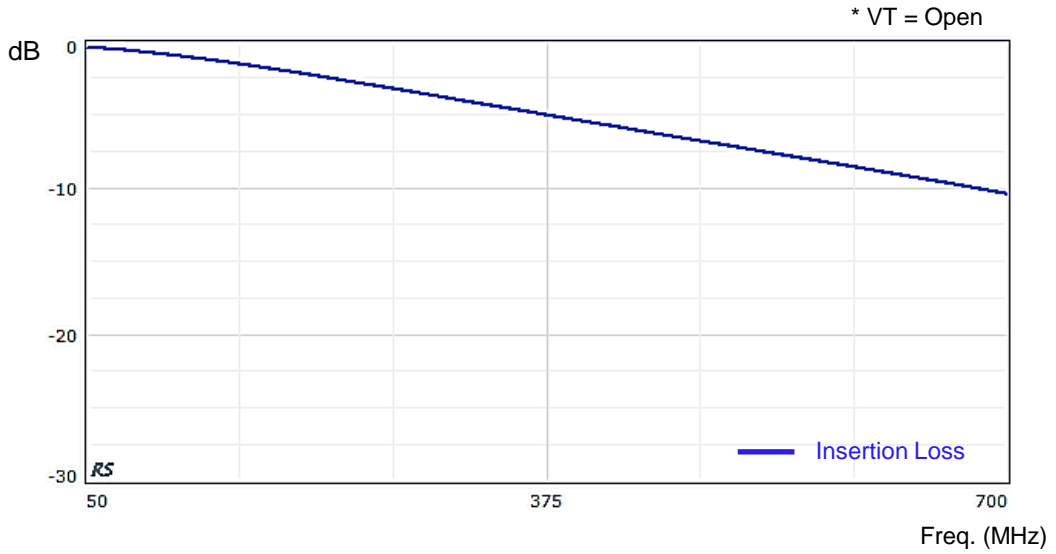
## S-Parameter Measurement Set up

- Inductor DC Path (Test Channel Connection)



## S-Parameter

- Inductor Path S-Parameter (Test Channel Connection)

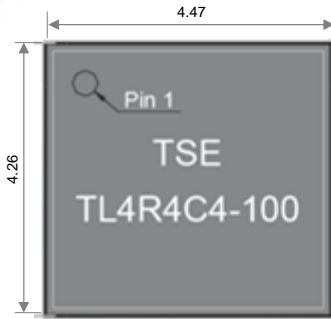


- Inductor Path (Test Channel Connection) S-Parameter

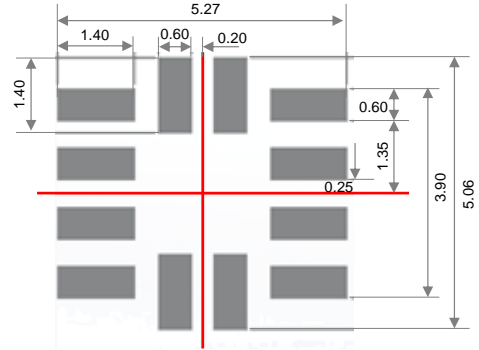
| Frequency | Insertion Loss(dB) |
|-----------|--------------------|
| 100 MHz   | -0.751             |
| 200 MHz   | -2.090             |
| 300 MHz   | -3.710             |
| 400 MHz   | -5.370             |

# TL4R4C4-100

## PKG Dimension & PCB Footprint (Unit : mm)



Package Dimension



PCB Footprint

## SMT Reflow Profile (for Lead Free)

| Parameter   | Specification                      |
|---|------------------------------------|
| Preheat and Soak [ Temperature min (T <sub>smin</sub> )<br>Temperature max (T <sub>smax</sub> )<br>Time (T <sub>smin</sub> to T <sub>smax</sub> ) | 150 °C<br>200 °C<br>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> )<br>Time at liquidous (t <sub>L</sub> )  | 217 °C<br>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 TL4R4C4-100 for 1.5hour at 120 °C if it was stored over 3days at room temperature after unpacking

