

# Chip Multilayer Ferrite Inductors

## New options in chip multilayer ferrite inductor (TRMI)

### ► Preview

Token TRMI series is a multilayer ferrite technology with good overall characteristics in a cost effective package. The TRMI multilayer inductor series is available in 0603, 0805, and 1206 sizes. Inductance values range from 10 to 33000nH, and tolerances are as tight as  $\pm 10\%$ . This product provides a good blend of electrical performance and low cost.

The TRMI devices utilize closed magnetic circuit construction to avoid crosstalk. These are suitable for EMI reduction on DC power lines and low speed signal lines where the smaller packaging reduces board space. Conform to the RoHS directive and Lead-free. Package of multilayer Ferrite TRMI chip is suitable for automatic pick and place equipment and is mounted in a surface mount package which assures mechanical stability and excellent lead coplanarity.

Multilayer Chip Ferrite Inductor can be customized designs and tighter tolerances available on request. Application of specific designs also available including different inductance values and Q specifications adjusted to frequency requirements.

Custom parts are available on request. Token will also produce devices outside these specifications to meet specific customer requirements, please contact our sales for more information.

### Features :

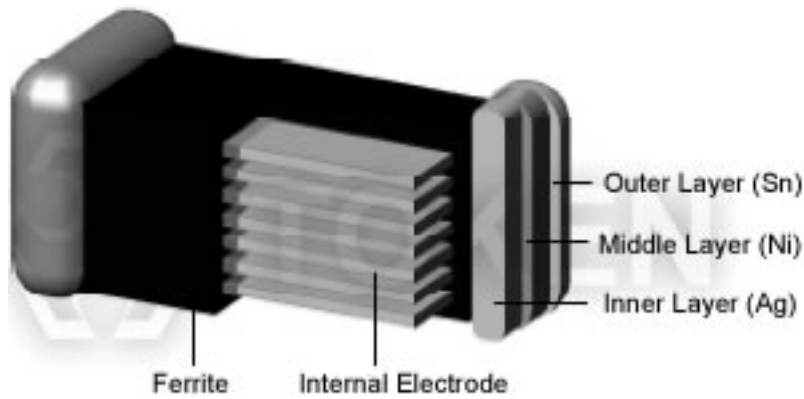
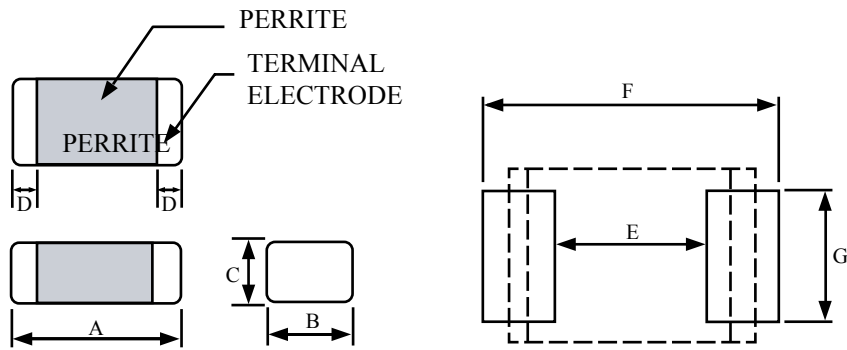
- Sizes EIA 0603 / EIA 0805 / EIA 1206.
- Closed magnetic circuit avoids crosstalk.
- Suitable for high density installation, re-flow soldering.

### Applications :

- Portable Equipment.
- Personal Computers.
- CD-ROM, Hard Disk, Modem, Printers.



## Configurations & Dimensions



Type	A	B	C	D	E	F	G
TRMI160808 (0603)	1.6 ± 0.2	0.8 ± 0.2	0.8 ± 0.2	0.3 ± 0.2	0.8	2.4~3.4	0.6
TRMI201209 (0805)	2.0 ± 0.2	1.25 ± 0.2	0.9 ± 0.2	0.5 ± 0.3	1.2	3.0~4.0	1.0
TRMI201212 (0805)	2.0 ± 0.2	1.25 ± 0.2	1.25 ± 0.2	0.5 ± 0.3	1.2	3.0~4.0	1.0
TRMI321611 (1206)	3.2 ± 0.2	1.6 ± 0.2	1.1 ± 0.2	0.5 ± 0.3	2.0	4.2~5.2	1.2

## ▶ TRMI160808 Chips (EIA 0603) Electrical Characteristics

Part Number	Inductance (nH)	Tolerance	L/Q Freq. (MHz)	Q (min)	SRF (MHz)(min)	DCR ( $\Omega$ )(max)	IDC (mA)(max)
TRMI160808 - 10N	10	$\pm 20\%$	50MHz, 200mV	10	300	0.20	50
TRMI160808 - 33N	33	$\pm 20\%$	50MHz, 200mV	10	270	0.20	50
TRMI160808 - 47N	47	$\pm 20\%$	50MHz, 200mV	10	260	0.30	50
TRMI160808 - 56N	56	$\pm 20\%$	50MHz, 200mV	10	255	0.30	50
TRMI160808 - 68N	68	$\pm 20\%$	50MHz, 200mV	10	250	0.30	50
TRMI160808 - 82N	82	$\pm 20\%$	50MHz, 200mV	10	245	0.30	50
TRMI160808 - R10	100	$\pm 10, \pm 20\%$	25MHz, 200mV	15	240	0.50	50
TRMI160808 - R12	120	$\pm 10, \pm 20\%$	25MHz, 200mV	15	205	0.50	50
TRMI160808 - R15	150	$\pm 10, \pm 20\%$	25MHz, 200mV	15	180	0.60	50
TRMI160808 - R18	180	$\pm 10, \pm 20\%$	25MHz, 200mV	15	165	0.60	50
TRMI160808 - R22	220	$\pm 10, \pm 20\%$	25MHz, 200mV	15	150	0.80	50
TRMI160808 - R27	270	$\pm 10, \pm 20\%$	25MHz, 200mV	15	136	0.80	50
TRMI160808 - R33	330	$\pm 10, \pm 20\%$	25MHz, 200mV	15	125	0.85	35
TRMI160808 - R39	390	$\pm 10, \pm 20\%$	25MHz, 200mV	15	110	1.00	35
TRMI160808 - R47	470	$\pm 10, \pm 20\%$	25MHz, 200mV	15	105	1.35	35
TRMI160808 - R56	560	$\pm 10, \pm 20\%$	25MHz, 200mV	15	95	1.55	35
TRMI160808 - R68	680	$\pm 10, \pm 20\%$	25MHz, 200mV	15	85	1.70	35
TRMI160808 - R82	820	$\pm 10, \pm 20\%$	25MHz, 200mV	15	75	2.10	35
TRMI160808 - 1R0	1000	$\pm 10, \pm 20\%$	10MHz, 200mV	35	65	0.60	25
TRMI160808 - 1R2	1200	$\pm 10, \pm 20\%$	10MHz, 200mV	35	60	0.80	25
TRMI160808 - 1R5	1500	$\pm 10, \pm 20\%$	10MHz, 200mV	35	55	0.80	25
TRMI160808 - 1R8	1800	$\pm 10, \pm 20\%$	10MHz, 200mV	35	50	0.95	25
TRMI160808 - 2R2	2200	$\pm 10, \pm 20\%$	10MHz, 200mV	35	45	1.55	15
TRMI160808 - 2R7	2700	$\pm 10, \pm 20\%$	10MHz, 200mV	35	40	1.35	15
TRMI160808 - 3R3	3300	$\pm 10, \pm 20\%$	10MHz, 200mV	35	38	1.55	15
TRMI160808 - 3R9	3900	$\pm 10, \pm 20\%$	10MHz, 200mV	35	35	1.70	15
TRMI160808 - 4R7	4700	$\pm 10, \pm 20\%$	10MHz, 200mV	35	33	2.10	15
TRMI160808 - 5R6	5600	$\pm 10, \pm 20\%$	4MHz, 200mV	35	22	1.55	5
TRMI160808 - 6R8	6800	$\pm 10, \pm 20\%$	4MHz, 200mV	35	20	1.70	5
TRMI160808 - 8R2	8200	$\pm 10, \pm 20\%$	4MHz, 60 mV	30	18	2.10	5
TRMI160808 - 100	10000	$\pm 10, \pm 20\%$	2MHz, 60mV	30	17	2.55	5

## ▶ TRMI201209 Chips (EIA 0805) Electrical Characteristics

Part Number	Inductance (nH)	Tolerance	L/Q Freq. (MHz)	Q (min)	SRF (MHz)(min)	DCR (Ω)(max)	IDC (mA)(max)
TRMI201209 - 47N	47	± 20%	50MHz, 200mV	20	320	0.20	300
TRMI201209 - 56N	56	± 20%	50MHz, 200mV	20	320	0.20	300
TRMI201209 - 68N	68	± 20%	50MHz, 200mV	20	280	0.20	300
TRMI201209 - 82N	82	± 20%	50MHz, 200mV	20	255	0.20	300
TRMI201209 - R10	100	± 10,± 20%	25MHz, 200mV	20	235	0.30	250
TRMI201209 - R12	120	± 10,± 20%	25MHz, 200mV	20	220	0.30	250
TRMI201209 - R15	150	± 10,± 20%	25MHz, 200mV	20	200	0.40	250
TRMI201209 - R18	180	± 10,± 20%	25MHz, 200mV	20	185	0.40	250
TRMI201209 - R22	220	± 10,± 20%	25MHz, 200mV	20	170	0.50	250
TRMI201209 - R27	270	± 10,± 20%	25MHz, 200mV	20	150	0.50	250
TRMI201209 - R33	330	± 10,± 20%	25MHz, 200mV	20	145	0.55	250
TRMI201209 - R39	390	± 10,± 20%	25MHz, 200mV	25	135	0.65	200
TRMI201209 - R47	470	± 10,± 20%	25MHz, 200mV	25	125	0.65	200
TRMI201209 - R56	560	± 10,± 20%	25MHz, 200mV	25	115	0.75	150
TRMI201209 - R68	680	± 10,± 20%	25MHz, 200mV	25	105	0.80	150
TRMI201209 - R82	820	± 10,± 20%	25MHz, 200mV	25	100	1.00	150
TRMI201209 - 1R0	1000	± 10,± 20%	10MHz, 200mV	45	75	0.40	50
TRMI201209 - 1R2	1200	± 10,± 20%	10MHz, 200mV	45	65	0.50	50
TRMI201209 - 1R5	1500	± 10,± 20%	10MHz, 200mV	45	60	0.50	50
TRMI201209 - 1R8	1800	± 10,± 20%	10MHz, 200mV	45	55	0.60	50
TRMI201209 - 2R2	2200	± 10,± 20%	10MHz, 200mV	45	50	0.65	30

## ▶ TRMI201212 Chips (EIA 0805) Electrical Characteristics

Part Number	Inductance (nH)	Tolerance	L/Q Freq. (MHz)	Q (min)	SRF (MHz)(min)	DCR (Ω)(max)	IDC (mA)(max)
TRMI201212 - 2R7	2700	± 10,± 20%	10MHz, 200mV	45	45	0.75	30
TRMI201212 - 3R3	3300	± 10,± 20%	10MHz, 200mV	45	41	0.80	30
TRMI201212 - 3R9	3900	± 10,± 20%	10MHz, 200mV	45	38	0.90	30
TRMI201212 - 4R7	4700	± 10,± 20%	10MHz, 200mV	45	35	1.00	30
TRMI201212 - 5R6	5600	± 10,± 20%	4MHz, 200mV	45	32	0.90	15
TRMI201212 - 6R8	6800	± 10,± 20%	4MHz, 200mV	45	29	1.00	15
TRMI201212 - 8R2	8200	± 10,± 20%	4MHz, 200mV	45	26	1.10	15
TRMI201212 - 100	10000	± 10,± 20%	2MHz, 60mV	45	24	1.15	15
TRMI201212 - 120	12000	± 10,± 20%	2MHz, 60mV	45	22	1.25	15
TRMI201212 - 150	15000	± 10,± 20%	1MHz, 60mV	30	19	0.80	5
TRMI201212 - 180	18000	± 10,± 20%	1MHz, 60mV	30	18	0.90	5
TRMI201212 - 220	22000	± 10,± 20%	1MHz, 60mV	30	16	1.10	5

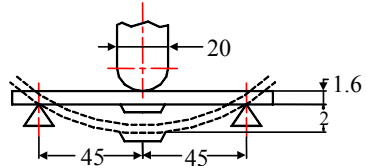
## ▶ TRMI321611 Chips (EIA 1206) Electrical Characteristics

Part Number	Inductance (nH)	Tolerance	L/Q Freq. (MHz)	Q (min)	SRF (MHz)(min)	DCR (Ω)(max)	IDC (mA)(max)
TRMI321611 - 47N	47	± 20%	50MHz, 200mV	20	320	0.15	300
TRMI321611 - 56N	56	± 20%	50MHz, 200mV	20	280	0.25	300
TRMI321611 - 68N	68	± 20%	50MHz, 200mV	20	280	0.25	300
TRMI321611 - 82N	82	± 20%	50MHz, 200mV	20	250	0.25	300
TRMI321611 - R10	100	± 10,± 20%	25MHz, 200mV	20	235	0.25	250
TRMI321611 - R12	120	± 10,± 20%	25MHz, 200mV	20	220	0.30	250
TRMI321611 - R15	150	± 10,± 20%	25MHz, 200mV	20	200	0.30	250
TRMI321611 - R18	180	± 10,± 20%	25MHz, 200mV	20	185	0.40	250
TRMI321611 - R22	220	± 10,± 20%	25MHz, 200mV	20	170	0.40	250
TRMI321611 - R27	270	± 10,± 20%	25MHz, 200mV	20	150	0.50	250
TRMI321611 - R33	330	± 10,± 20%	25MHz, 200mV	20	145	0.60	250
TRMI321611 - R39	390	± 10,± 20%	25MHz, 200mV	25	135	0.50	200
TRMI321611 - R47	470	± 10,± 20%	25MHz, 200mV	25	125	0.60	200
TRMI321611 - R56	560	± 10,± 20%	25MHz, 200mV	25	115	0.70	150
TRMI321611 - R68	680	± 10,± 20%	25MHz, 200mV	25	105	0.80	150
TRMI321611 - R82	820	± 10,± 20%	25MHz, 200mV	25	100	0.90	150
TRMI321611 - 1R0	1000	± 10,± 20%	10MHz, 200mV	45	75	0.40	100
TRMI321611 - 1R2	1200	± 10,± 20%	10MHz, 200mV	45	65	0.50	100
TRMI321611 - 1R5	1500	± 10,± 20%	10MHz, 200mV	45	60	0.50	80
TRMI321611 - 1R8	1800	± 10,± 20%	10MHz, 200mV	45	55	0.50	70
TRMI321611 - 2R2	2200	± 10,± 20%	10MHz, 200mV	45	50	0.60	60
TRMI321611 - 2R7	2700	± 10,± 20%	10MHz, 200mV	45	45	0.60	60
TRMI321611 - 3R3	3300	± 10,± 20%	10MHz, 200mV	45	41	0.70	60
TRMI321611 - 3R9	3900	± 10,± 20%	10MHz, 200mV	45	38	0.80	50
TRMI321611 - 4R7	4700	± 10,± 20%	10MHz, 200mV	45	35	0.90	50
TRMI321611 - 5R6	5600	± 10,± 20%	4MHz, 200mV	45	32	0.70	25
TRMI321611 - 6R8	6800	± 10,± 20%	4MHz, 200mV	45	29	0.80	25
TRMI321611 - 8R2	8200	± 10,± 20%	4MHz, 200mV	45	26	0.90	25
TRMI321611 - 100	10000	± 10,± 20%	2MHz, 60mV	45	24	1.00	25
TRMI321611 - 120	12000	± 10,± 20%	2MHz, 60mV	45	22	1.05	15
TRMI321611 - 150	15000	± 10,± 20%	1MHz, 60mV	35	19	0.70	5
TRMI321611 - 180	18000	± 10,± 20%	1MHz, 60mV	35	18	0.75	5
TRMI321611 - 220	22000	± 10,± 20%	1MHz, 60mV	35	16	0.90	5
TRMI321611 - 270	27000	± 10,± 20%	1MHz, 60mV	35	14	0.90	5
TRMI321611 - 330	33000	± 10,± 20%	1MHz, 60mV	35	13	1.05	5

## ▶ Measurement Equipments

Item	Specification	Test Methods
Inductance	Refer to standard electrical characteristic spec.	HP4291B
Q		HP4291B
SRF		HP4291B
DC Resistance RDC		AX-1152B
Rated Current IDC		Applied the current to coils, The inductance change should be less than 10% to initial value

## ► Environmental Characteristics

Item	Specification	Test Methods
Flexure Strength	The forces applied on the right conditions must not damage the terminal electrode and the ferrite	Test device shall be soldered on the substrate Substrate Dimension: 100×40×1.6mm Deflection: 2.0mm Keeping Time: 30sec For 0402, substrate dimension is 100×40×0.8mm 
Vibration		Test device shall be soldered on the substrate Oscillation Frequency : 10 to 55 to 10Hz for 1min Amplitude : 1.5mm Time : 2hrs for each axis (X,Y&Z), total 6hrs
Resistance to Soldering Heat	Appearance: No damage More than 75% of the terminal. Electrode should be covered with solder. Inductance: within ± 15% of initial value Q: within ± 30% of initial value Inductance: within± 20% of initial value (0603 over 12uH)	Pre-heating: 150°C, 1min Solder Composition: Sn/Ag3.0/Cu0.5 (Pb-Free) Solder Temperature: 260 ± 5°C(Pb-Free) Immersion Time: 10 ± 1sec
Solderability	The electrodes shall be at least 90% covered with new solder coating	Pre-heating: 150°C, 1min Solder Composition: Sn/Ag3.0/Cu0.5 (Pb-Free) Solder Temperature: 245 ± 5°C(Pb-Free) Immersion Time: 4 ± 1sec
Temperature Cycle	Appearance: No damage L change: within± 10% of initial value Q change: within± 30% of initial value	One cycle: step1: -25 ± 3°C for 30min step2: 25 ± 2°C for 3.0min step3: 85 ± 3°C for 30min step4: 25 ± 2°C for 3.0min Total: 100cycles Measured after exposure in the room condition for 24hrs
Humidity Resistance		Temperature: 40 ± 2°C Relative Humidity: 90 ~ 95% Time: 1000hrs Measured after exposure in the room condition for 24hrs
High Temperature Resistance		Temperature: 125 ± 3°C Relative Humidity : 20% Applied Current: Rated Current Time: 1000hrs Measured after exposure in the room condition for 24hrs
Low Temperature Resistance		Temperature: -25 ± 3°C Relative Humidity : 0% Time: 1000hrs Measured after exposure in the room condition for 24hrs

## ▶ How to Order

**TRMI160808**  
❶

**10N**  
❷

**M**  
❸

❶ Part Number: TRMI160808, TRMI201209, TRMI201212, TRMI321611

❷ Inductance

Code	Inductance
10N	10nH
56N	56nH
R68	680nH
180	18000nH

❸ Tolerance

Code	Impedance
S	0.3nH
J	5%
K	10%
M	20%

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