

APPLICATION

GMPI series is suitable for power line choke because of its excellent direct current characteristics

- PC/ Notebook
- PDA
- Digital camera
- DVD

FEATURES

- The GMPI series is magnetically shielded chip based on multilayer process.
- New magnetic material is developed to get excellent direct current characteristics. This series has larger rated current than conventional GMLI series.
- Low DC resistance is realized.
- The cross talk characteristics are excellent because of the magnetically shielded structure.

PRODUCT IDENTIFICATION

G M P I - 2 5 2 0 1 0 - 1 R 5 N T

①

②

③

④

⑤

① Product Code

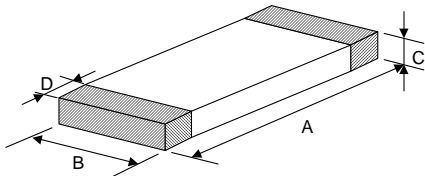
② Dimension Code

③ Inductance

④ Tolerance Code : N = ±30%,M = ±20%

⑤ Code for Special Specification

PRODUCT DIMENSION



NOTE : Dimensions in mm

PRODUCT NO.	A	B	C	D
GMPI-252010	2.5±0.20	2.0±0.20	1.0(MAX.)	0.5±0.30
GMPI-252012	2.5±0.20	2.0±0.20	1.2(MAX)	0.5±0.30
GMPI-201610	2.0±0.20	1.6±0.20	1.0(MAX.)	0.5±0.30
GMPI-201209	2.0±0.20	1.2±0.20	1.0(MAX.)	0.5±0.30

ELECTRICAL REQUIREMENTS

Part Number	Inductance (μ H)	Test Freq. (MHz)	R_{DC} (Ω) $\pm 30\%$	Rated Current (mA) Max.	
				IDC*1	IDC*2
GMPI-201610-1R5MF1	1.5 \pm 20%	5	0.11	400	1100
GMPI-201610-2R2MF1	2.2 \pm 20%	5	0.11	300	1100
GMPI-201610-3R3MF1	3.3 \pm 20%	5	0.13	250	1000
GMPI-201610-4R7MF1	4.7 \pm 20%	5	0.16	150	900

● **IDC*1** Inductance change should be less than $\pm 30\%$ when rated current is applied.

● **IDC*2** Temperature rise should be less than 40°C

MEASURING METHOD / CONDITION

● **Test Instrument:**

L/SRF: Agilent 4291B Impedance Analyzer, Test Fixture: Agilent 16192
Osc. Level: 100mV

R_{DC} : Agilent 34401A

● **Test Condition:**

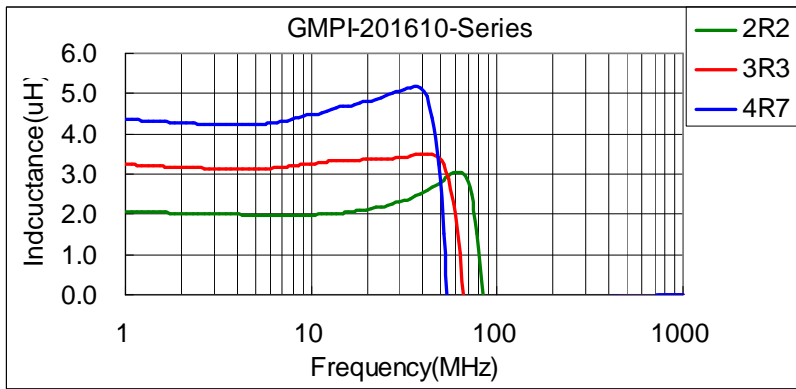
< Unless otherwise specified >

Temperature: 15°C to 35°C Humidity: 25% to 85% RH

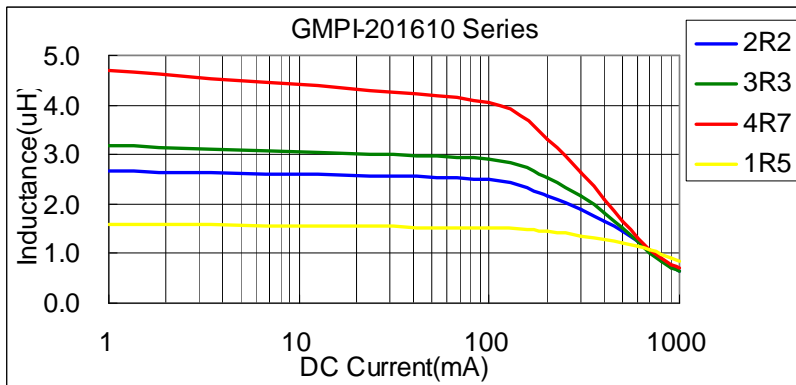
< In case of doubt >

Temperature: 25°C \pm 2°C Humidity: 60% to 70% RH

TYPICAL ELECTRICAL CHARACTERISTICS (T=25°C)

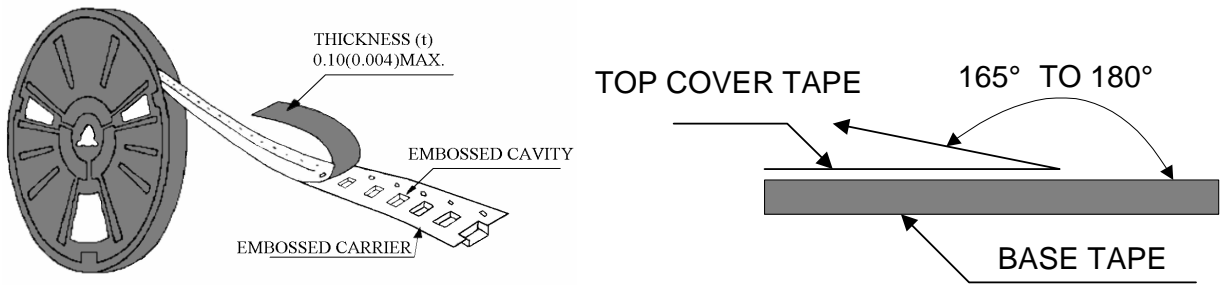


TYPICAL DC BIAS CHARACTERISTICS



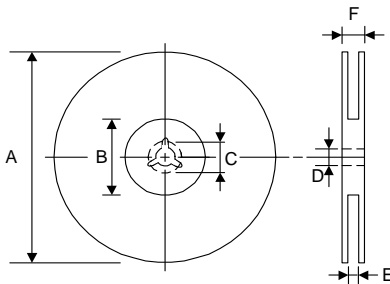
PACKAGING

● Peel-off Force

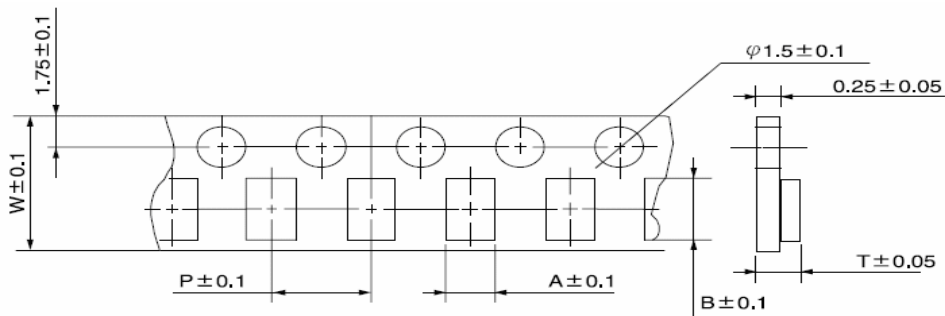


The force for peeling off cover tape is 10 grams in the arrow direction.

● Dimension (Unit: mm)

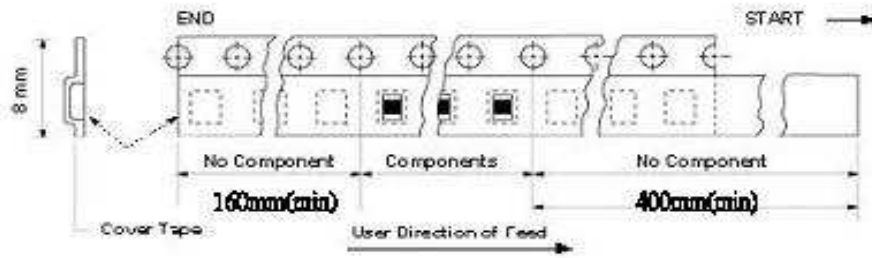


TYPE	A	B	C	D	E	F
8 mm	178±1	60 +0.5 -0	-	13 ±0.2	9 ±0.5	12 ±0.5
12 mm	178±0.3	60 ±0.2	19.3 ±0.1	13.5 ±0.1	13.6 ±0.1	-



TYPE	SIZE	A	B	W	P	T	CHIPS/REEL
GMPI	252012	2.27	2.74	8	4	1.40	3000
GMPI	252010	2.20	2.90	8	4	1.20	3000
GMPI	201610	1.90	2.30	8	4	1.20	3000
GMPI	201209	1.42	2.25	8	4	1.00,	4000

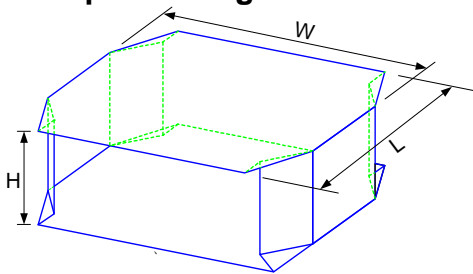




● Taping Quantity

SERIES	PCS/Reel
252012	3000
252010	3000
201209	4000
201610	3000

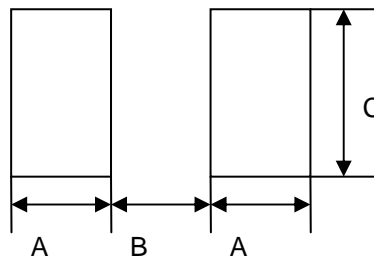
● Tape Packing Case



No. of Reels	W	L	H
2	18±0.5	18±0.5	2.4±0.2
3	18±0.5	18±0.5	3.6±0.2
4	18±0.5	18±0.5	4.8±0.2
5	18±0.5	18±0.5	6.0±0.2

Unit: cm

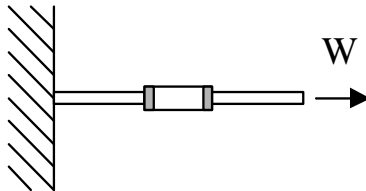
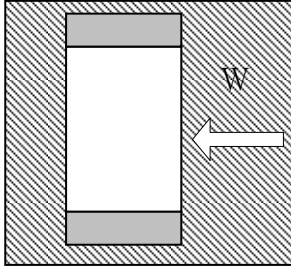
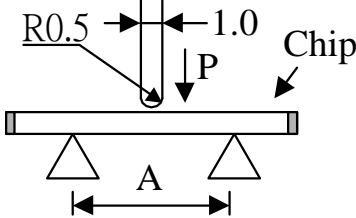
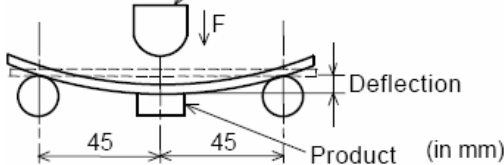
■ RECOMMENDED LAND PATTERNS



Unit: mm

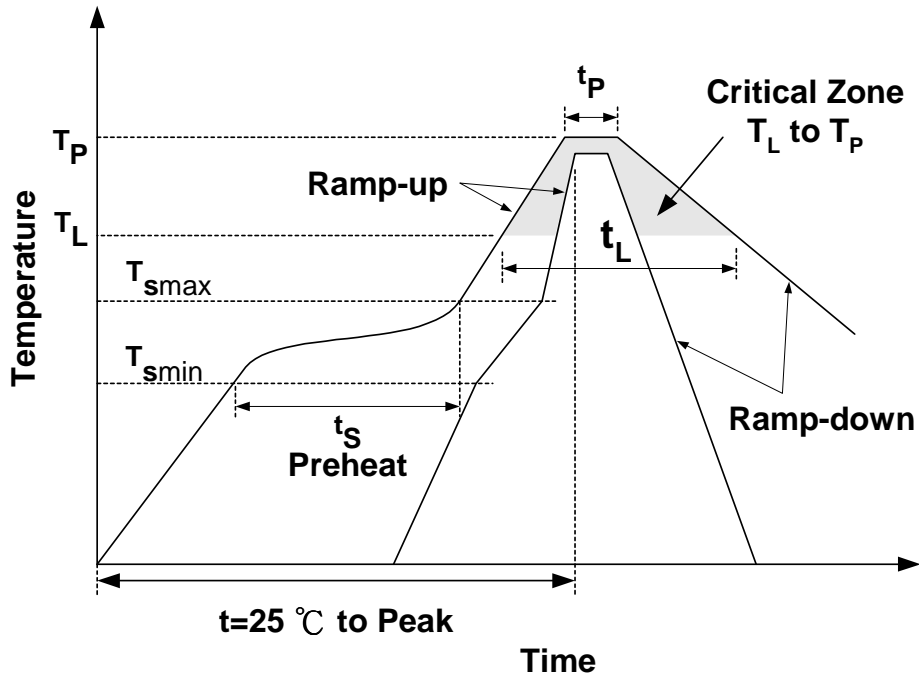
Type	2520	2016	2012
A	0.8	0.7	0.7
B	1.2	0.8	0.8
C	2.2	1.8	1.45

RELIABILITY TEST

MECHANICAL PERFORMANCE TEST					
ITEM	SPECIFICATION	TEST CONDITION			
Solderability	More than 90% of the terminal electrode shall be covered with fresh solder.	Solder: Sn-3.0Ag-0.5Cu Solder Temperature: 245 ± 5°C Flux: Rosin Dip Time: 3 ± 1 Seconds			
Soldering Heat Resistance	The chip shall not crack. More than 75% of the terminal electrode shall be covered with solder.	Solder temperature : 260 ± 5°C Flux: Rosin Dip time: 10 ± 1 seconds			
Terminal Strength	The terminal electrode shall not be broken off nor the ferrite damaged. 	TYPE	W(KGF)	Time (Sec)	
		GMPI-160808	0.6	30±5	
		GMPI-201205	0.8		
		GMPI-201209	0.6		
		GMPI-201610	1.0		
		GMPI-252005	1.5		
		GMPI-252010	1.0		
		GMPI-252012			
		GMPI-321608			
		GMPI-322510			
GMPI-322512					
Terminal Strength	The terminal electrode shall not be broken off nor the ferrite damaged. 	TYPE	W(KGF)	Time (Sec)	
		GMPI-160808	1.0	10±5	
		GMPI-201205			
		GMPI-201209			
		GMPI-201610			
		GMPI-252005			
		GMPI-252010	2.0		
		GMPI-252012			
		GMPI-321608			
		GMPI-322510			
GMPI-322512					
Bending Strength	No mechanical damage. The ferrite shall not be damaged. 	TYPE	A(MM)	P(KGF)	
		GMPI-160808	1.0	0.6	
		GMPI-201205	1.4	1.0	
		GMPI-201209			
		GMPI-201610	2.0	2.0	
		GMPI-252005			
		GMPI-252010		2.0	2.0
		GMPI-252012			
		GMPI-321608			
		GMPI-322510	2.0		
GMPI-322512					
Bending Test	Appearance: No damage Pressure jig 	Substrate:PCB(100mm×40mm×1.6mm) Solder: Reflow Speed of Applying Force: 0.5mm / s Deflection: 2mm Hold Duration: 30 s			

Vibration	$\Delta L/L_0 \leq \pm 5\%$ There shall be no mechanical damage.	The sample shall be soldered onto the printed circuit board and when a vibration having an amplitude of 1.52mm and a frequency of from 10 to 55Hz/1 minute repeated should be applied to the 3 directions (X,Y,Z) for 2 hours each.
Drop shock	No apparent damage	Dropped onto printed circuit board from 100cm height three times in x, y, z directions. The terminals shall be protected.
• CLIMATIC TEST		
ITEM	SPECIFICATION	TEST CONDITION
Thermal Shock (Temperature Cycle)	No mechanical damage. Inductance shall be within $\pm 5\%$ of the initial value, and Q (shall be) within $\pm 30\%$ of the initial value.	Temperature: $-40^{\circ}\text{C}, 85^{\circ}\text{C}$ for 30 minutes each, 100 cycles.
Humidity Resistance		Temperature : 40°C Humidity: 95% RH Time: 1000 ± 12 HOURS
High Temperature Resistance		Temperature: $85^{\circ}\text{C} \pm 2^{\circ}\text{C}$ Time: 1000 ± 12 hours
Low Temperature Resistance		Temperature : $-40^{\circ}\text{C} \pm 2^{\circ}\text{C}$ Time: 1000 ± 12 hours
1. Operating Temperature Range: -55°C TO $+125^{\circ}\text{C}$ 2. Storage Condition: The temperature should be within $-40^{\circ}\text{C} \sim 85^{\circ}\text{C}$ and humidity should be less than 75% RH. The product should be used within 6 months from the time of delivery.		

RECOMMENDED REFLOW SOLDERING PROFILE



Profile Feature		Sn-Pb	Pb-Free
Preheat	t_s	60~120 seconds	60~180 seconds
	T_{smin}	100°C	150°C
	T_{smax}	150°C	200°C
Average ramp-up rate (T_{smax} to T_P)		3°C/second max.	3°C/second max.
Time main above	Temperature (T_L)	183°C	217°C
	Time (t_L)	60~150 seconds	60~150 seconds
Peak temperature (T_P)		230°C	250~260°C
Time within 5°C of actual peak temperature (t_p)		10 seconds	10 seconds
Ramp-down rate		6°C/sec max.	6°C/sec max.
Time 25°C to peak temperature		6 minutes max.	8 minutes max.

NOTES

The contents of this data sheet are subject to change without notice. Please confirm the specifications and delivery conditions when placing your order.