

CUSTOMER: \_\_\_\_\_

DATE: \_\_\_\_\_

## APPROVAL SPECIFICATION

PRODUCT NAME: SMD power inductor

YOUR PART NO. :

OUR PART NO. : MPIT6028-series

<b>RECEPTION</b> <b>THE SPECIFICATION HAS BEEN ACCEPTED.</b>		
<b>COMPANY:</b>		<b>DATE:</b>
<b>CFMD</b>	<b>CHKD</b>	<b>RCVD</b>

### MANUFACTURING NAME

深圳市麦捷微电子科技股份有限公司

SHENZHEN MICROGATE TECHNOLOGY CO., LTD

Address: Yuxing road, Golf Street, Guanlan Town  
Bao'an District Shenzhen P. R. C

Postcode :518110

TEL: 86-755-28085000

FAX: 86-755-28085605

CFMD.	CHKD.	DSGD.
胡潞乐	王玉生	刘维

SHENZHEN MICROGATE TECHNOLOGY CO.,LTD.

Add: Yuxing Road,Golf Street,Guanlan Town,Bao'an District,Shenzhen

Tel: +86-755-28085000

Fax: +86-755-28085605

Postcode: 518110

## 1. Scope

This specification applies to the MPIT series of SMD power inductors.

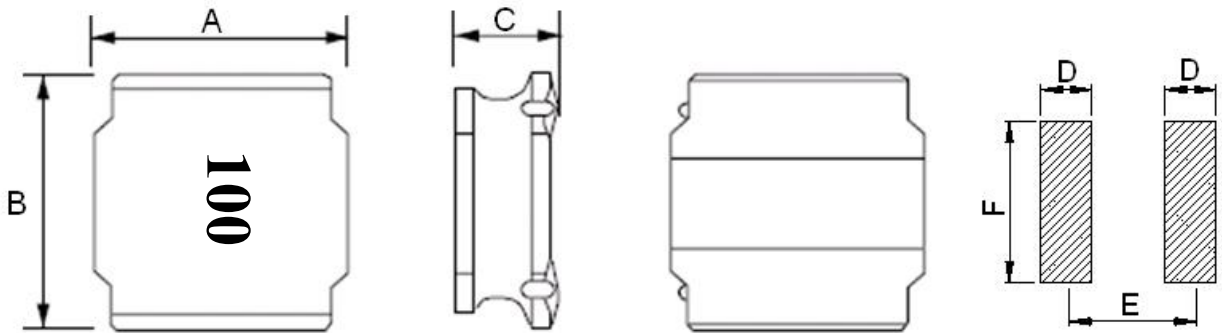
## 2. Product Identification

MPIT      6028 –    100   M   -   LF  
 ①            ②            ③       ④       ⑤

- ① Series name
- ② Product dimensions
- ③ Inductance Value: (6R3:6.3uH 100: 10uH; 101:100uH)
- ④ Inductance Tolerance: (K:10% ; M:20% ; N:30%)
- ⑤ Lead free products

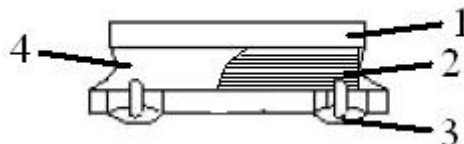
## 3. Construction

### 3.1 Shape and dimensions



Dimensions in mm						
Model	A	B	C	D	E	F
MPIT6028	6.0±0.3	6.0±0.3	3.0 Max.	1.6 ref.	4.7 ref.	5.7 ref.

### 3.2 Material List



No.	Item	Material
1	DR Core	Ferrite
2	Wire	Enameled Copper Wire
3	Solder	Sn99.7-Cu0.3
4	Epoxy	Epoxy Adhesive

#### 4. Testing Conditions

Unless otherwise specified

Temperature : Ordinary Temperature ( 5 to 35°C)

Humidity : Ordinary Humidity (25 to 85% RH)

Atmospheric Pressure : 86 to 106 kPa

In case of doubt

Temperature : 20±2°C

Humidity : 60 to 75% RH

Atmospheric Pressure : 86 to 106 kPa

#### 5. Electrical Characteristics And Test Instruments

Operating temperature:-40~85°C

Storage temperature and Humidity Range: -40~125°C & 30% to 70%

Microgate Part No.	Customer Part No.	Inductance (uH)	DCR (mΩ)max	Isat (A) max	Irms (A) max
MPIT6028-0R9N-LF		0.9±30%	16.9	6.6	4.6
MPIT6028-1R5N-LF		1.5±30%	20.8	5.0	4.2
MPIT6028-2R2N-LF		2.2±30%	26	4.2	3.7
MPIT6028-3R0N-LF		3.0±30%	29.9	3.6	3.4
MPIT6028-4R7M-LF		4.7±20%	40.3	2.7	3.0
MPIT6028-6R8M-LF		6.8±20%	54.7	2.2	2.5
MPIT6028-100M-LF		10±20%	84.5	1.9	1.9
MPIT6028-150M-LF		15±20%	123.5	1.6	1.8
MPIT6028-220M-LF		22±20%	175.5	1.3	1.4
MPIT6028-330M-LF		33±20%	286	1.1	1.1
MPIT6028-470M-LF		47±20%	390	0.95	0.92
MPIT6028-680M-LF		68±20%	546	0.76	0.77
MPIT6028-101M-LF		100±20%	780	0.62	0.66

\* CHROMA 3302 meter for L and DCR.

\* CHROMA 3302 and 1320 meter for IDC.

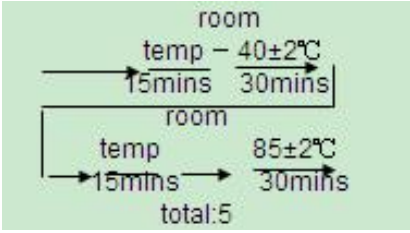
\* L test condition: 100KHz/1V.

\* IDC:  $|L0A-L3.0A|/L0A \leq 30\%$  and temperature rise:  $I_{rms} = 2.5A$   $\Delta T \leq 40^\circ C$

The part must be allowed high temperature : 125°C

## 6. Reliability and Test Condition

Item	Specifications	Test Method/Condition
Operating temperature range	-25°C ~ +85°C	Including temperature rise due to self-generated heat
Terminal strength-pull test	Terminal shall not be loosened or ruptured	A 5N. load shall be applied to both terminals in the axis direction for 60 sec.
Solderability test	The terminal shall be at least 90% covered with solder.	After fluxing, Inductor shall be dipped in a melted solder bath at 230±5 °C for 5 seconds.
Resistance to solvent test	There shall be no case deformation change in appearance obliteration of marking.	MIL-STD-105E II
Vibration test (low frequency)	1. Inductors shall be no evidence of electrical and mechanical damage. 2. Inductance shall not change more than=5%. 3. Q shall not change more than=20%	1. Amplitude: 1.5mm. 2. Frequency: 10~55~10Hz/min. 3. Direction: X.Y.Z. 4. Duration: 2 hrs/X.Y.Z.
Shock test		Inductors shall be dropped 10 from a height of 1m onto 3cm wooden board.
Resistance to soldering heat		Temp: 260±5°C, Time: 10±1sec
High temperature load life test	There shall be no evidence of Short or open circuiting.	1. temp: 85±2°C. 2. time: 1000±12 hours. 3. load: allowed DC current.
Humidity load life		1. temp: 40±2°C. 2. R.H: 90-95%. 3. time: 1000±12 hours. 4. load: allowed DC current.

Item	Required Characteristics	Test Method/Condition
Temperature characteristic		-25°C ~ +85°C
Humidity test		1. Temp:40±2°C. 2. R.H:90-95%. 3. Time:96±2 hours.
Cold test	1. Inductors shall be no evidence of electrical and mechanical damage  2. Inductance shall not change more than±5%.	1. Temp:-40±2°C. 2. Time:96±2 hours.
Thermal shock test	3. Q shall not change more than ±30%.	 <p>The diagram illustrates a thermal shock test cycle. It starts at 'room temp' and goes to -40±2°C for 15 minutes, then returns to 'room temp' for 30 minutes. This cycle is repeated. The next part of the cycle goes to 85±2°C for 15 minutes, then returns to 'room temp' for 30 minutes. The total number of cycles is 5.</p>
Dry heat test		1. temp:85±2°C 2. time: 96±2 hours

## 7. Recommended Soldering Conditions

Product can be applied to flow and reflow soldering.

### (1) Flux, Solder

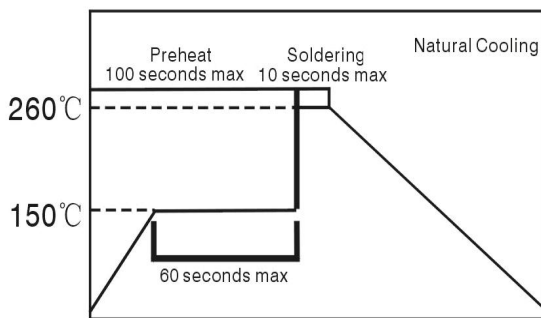
① Use rosin-based flux. Don't use highly acidic flux with halide content exceeding 0.2wt% (chlorine conversion value).

② Use Sn solder.

### (2) Flow soldering conditions

① Pre-heating should be in such a way that the temperature difference between solder and product surface is limited to 150°C max. Cooling into solvent after soldering also should be in such a way that temperature difference is limited to 100°C max. Unwrought pre-heating may cause cracks on the product, resulting in the deterioration of products quality.

② Standard soldering profile.



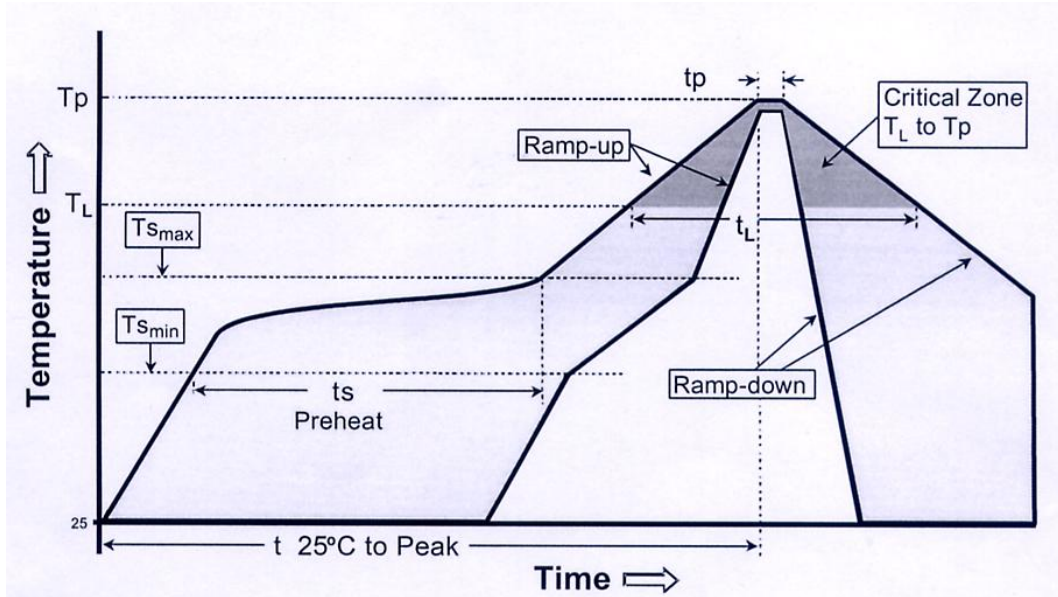
<b>Pre-heating</b>	150°C, 1 minute min
<b>Peak</b>	260°C, 10 seconds max

### (3) Reflow soldering conditions

Profile Feature		Lead-Free Assembly
Average Ramp-Up Rate (Ts max. to Tp)		3°C /second max.
Preheat	- Temperature Min (Ts min.)	150 °C
	- Temperature Max (Ts max.)	200 °C
	- Time (ts min to ts max.)	60-180 seconds
Time maintained above	- Temperature (TL)	217 °C
	- Time (tL)	60-150 seconds
Peak/Classification Temperature (Tp)		260 °C
Peak/Classification Time (Tp)		3-4 seconds
Time within 5 °C of actual Peak Temperature (tp)		20-40 seconds
Ramp-Down Rate		6°C/second max.
Time 25 °C to Peak Temperature		8 minutes max.

Note 1: All temperatures refer to topside of the package, measured on the package body surface.

Reflow curve



(4) The method on Re-work with using the iron:

The following conditions must be strictly followed when using a soldering iron

Pre-heating	150°C, 1 minute
Tip temperature	280°C max
Soldering iron output	20w max
End of soldering iron	Φ 1mm max
Soldering time	3 seconds max

### 8. Cleaning Conditions

Products shall be cleaned on the following conditions.

- (1) Cleaning temperature shall be limited to 60°C max.(40°C max for fluoride and alcohol type cleaner.)
- (2) Ultrasonic cleaning shall comply with the following conditions with avoiding the resonance phenomenon at the mounted products and P.C.B.

Power : 20W/t max  
 Frequency: below 40 kHz  
 Time : 5 minutes max

(3) Cleaner

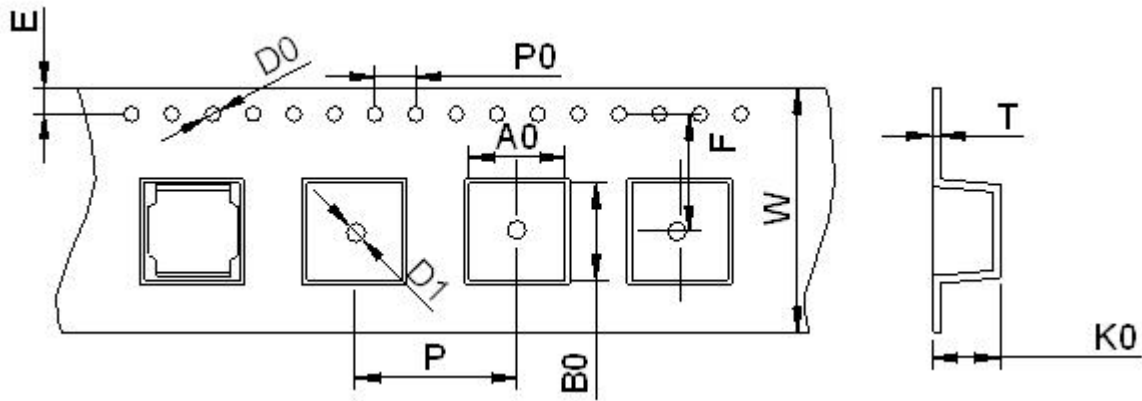
- a) Alternative cleaner  
 Isopropyl alcohol (IPA) HCFC-225
- b) Aqueous agent  
 Surface Active Agent Type (CLEANTHROUGH 750H)  
 Hydrocarbon Type (TECHNOCLEANER 335)  
 Higher Alcohol Type (PINE ALPHA ST-100S)  
 Alkali Saponification Type (\*AQUACLEANER 240)

(4) There shall be no residual flux and residual cleaner after cleaning. In the case of using aqueous agent, products shall be dried completely after rinse with de-ionized water in order to remove the cleaner.

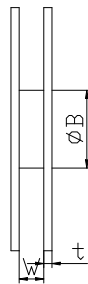
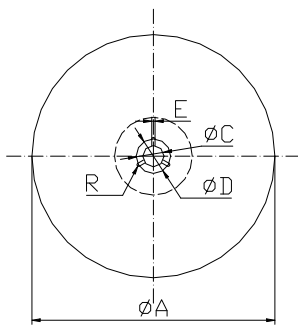
(5) Other cleaning

Please contact us.

**9. Package Information** (Unit: mm)



16.0±0.3	6.4±0.10	6.4±0.10	4.80±0.10	/	1.75±0.10	7.5±0.10	12.0±0.10	4.00±0.10	1.50±0.10	1.50±0.30	0.35±0.05
W	A0	B0	K0	K1	E	F	P	P0	D0	D1	T



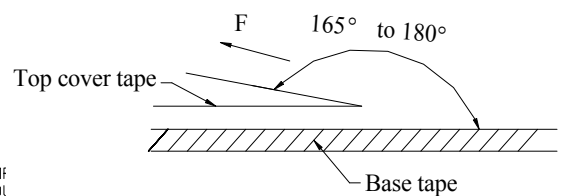
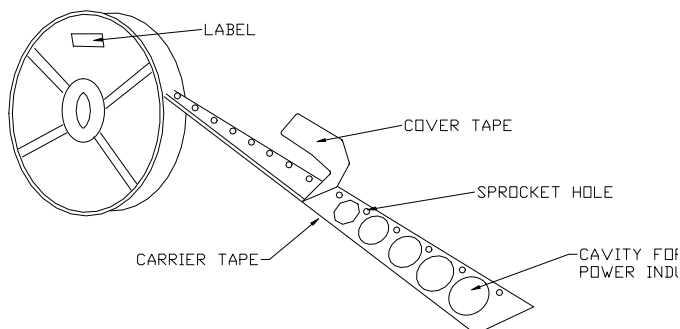
A	330±2.0
B	100±2.0
C	13.5±0.5
D	21±0.5
E	2.2
R	R1.0
W	16.5
t	2.5

Packing quantity: 2000pcs/rell

**9.1 Peeling strength of cover tape:**

The force tearing off cover tape is 30 to60 grams in the arrow direction under the following conditions.

Room Temp. (°C)	Room Humidity (%)	Room aim (hpa)	Peel Speed Mm/min
5-35	45-85	860-1060	300





## 10. Products Storage

### (1) Storage period

Products which inspected in MICROGATE over 6 months ago should be examined and used, which can be confirmed with inspection No. marked on the container. Solderability should be checked if this period is exceeded.

### (2) Storage conditions

Products should be storage in the warehouse on the following conditions:

Temperature: -10 ~+ 40°C

Humidity : Less than 80% relative and humidity

No rapid change on temperature and humidity

- (3) Don't keep products in corrosive gases such as sulfur, chlorine gas or acid, or it may cause oxidization of electrode, resulting in poor solderability.
- (4) Products should be storage on the palette for the prevention of the influence from humidity, dust and so on.
- (5) Products should be storage in the warehouse without heat shock, vibration, direct sunlight and so on.
- (6) Products should be storage under the airtight packaged condition.

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