SMD Molding Power Inductors
-YASPI0754A Series

■ Features

- Molding Inductor,low loss realized with low DCR.
- High Performance realized by metal dust core.
- Ultra low buzz noise,due to composite construction.
- 100% Lead(Pb)-Free and RoHS compliant.
- High reliability-Reliability test complied to AEC-Q200.
- Operating temperature:-55℃ ~ +165℃（Including self-temperature rise）.

■ Applications

- Automotive applications.

■ Product Identification

YASPI □□□□□ – □□□ □

(1) (2) (3) (4)

(1)： Series

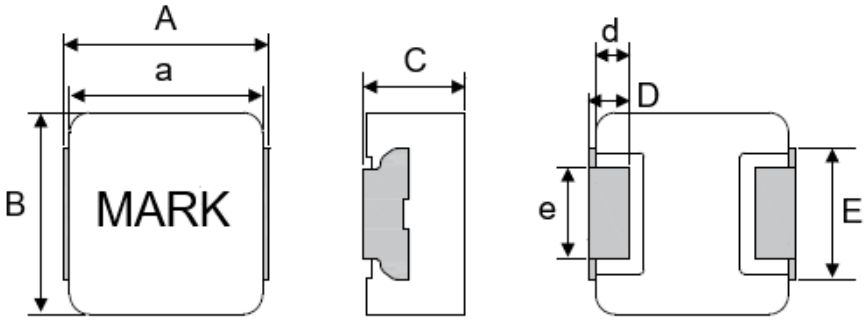
(2)： Dimensions

(3)： Inductance value

(4)： Inductance Tolerance：N=±30%，M=±20%

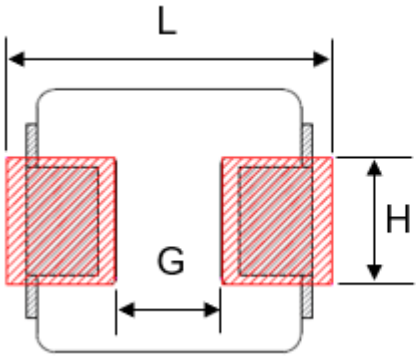
■ Shapes and Dimensions (Unit：mm)

Example diagram



TYPE	A	a	B	C	D	d	E	e
YASPI0754A	7.9±0.3	7.3±0.2	7.3±0.2	5.2±0.2	2.0±0.3	1.7±0.3	5.4±0.2	3.0±0.2

■ Recommend PC Board Pattern



Unit:mm

G	H	L
9.0	3.0	3.5

※ PCB layout is referred to standard IPC-7351B;

※ The above PCB layout reference only.

※ Recommend solder paste thickness at 0.15mm and above.

■ YASPI0754A Series

Part Number	Inductance (uH) @100KHz/1V	DCR (mΩ)		Irms (A)		Isat (A)	
		Typ.	Max.	Typ.	Max.	Typ.	Max.
YASPI0754A-1R0M	1.0±20%	5.0	6.0	20.0	17.0	23.0	20.0
YASPI0754A-1R5M	1.5±20%	6.3	7.3	17.0	15.0	19.0	17.0
YASPI0754A-2R2M	2.2±20%	9.7	11.2	14.5	13.0	16.5	14.5
YASPI0754A-3R3M	3.3±20%	13.0	15.0	11.5	10.5	14.0	12.3
YASPI0754A-4R7M	4.7±20%	17.8	20.5	10.5	9.0	13.3	11.3
YASPI0754A-5R6M	5.6±20%	19.2	22.1	9.3	8.5	11.0	9.5
YASPI0754A-6R8M	6.8±20%	23.0	26.5	8.7	8.0	10.2	9.0
YASPI0754A-8R2M	8.2±20%	27.3	31.4	8.0	7.5	9.2	8.1
YASPI0754A-100M	10±20%	33.0	38.0	7.2	6.7	8.0	7.0
YASPI0754A-120M	12±20%	43.0	52.0	6.3	5.8	7.7	6.7
YASPI0754A-150M	15±20%	60.0	66.0	5.5	5.0	7.2	6.2
YASPI0754A-220M	22±20%	85.0	93.5	5.0	4.5	6.3	5.4
YASPI0754A-330M	33±20%	111.0	127.6	4.0	3.5	4.9	4.2
YASPI0754A-470M	47±20%	156.0	171.6	3.2	2.7	4.1	3.5
YASPI0754A-560M	56±20%	188.0	206.8	3.0	2.6	3.4	2.9
YASPI0754A-680M	68±20%	218.0	251.0	2.7	2.4	3.0	2.6
YASPI0754A-101M	100±20%	310.0	357.0	2.2	2.0	2.0	1.6

※ Test frequency:Ls 100KHz /1.0V.

※ All test data referenced to 25℃ ambient.

※ Testing Instrument(or equ): Agilent 4284A,E4991A,4339B,KEYSIGHT E4980A/AL,chroma3302,3250, 16502.

※ Heat Rated Current (Irms) will cause the coil temperature rise approximately ΔT of 40℃

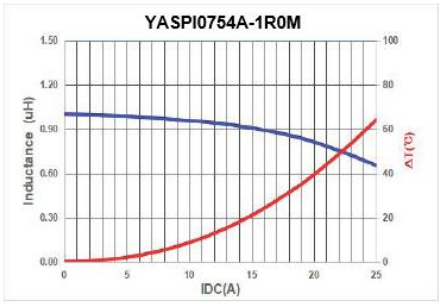
※ Saturation Current (Isat) will cause L0 to drop approximately 30%.

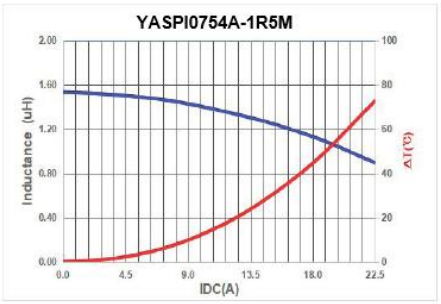
※ The part temperature (ambient + temp rise) should not exceed 165℃ under worst case operating conditions. Circuit design,component,PCB trace size and thickness,airflow and other cooling provisions all affect the part temperature. Part temperature should be verified in the end application.

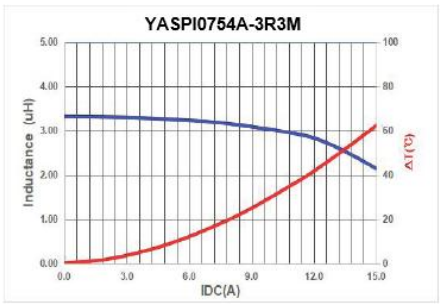
※ Irms Testing:Temperature rise is highly dependent on many factors including pcb land pattern, trace size, and proximity to other components. Therefore temperature rise should be verified in application conditions.

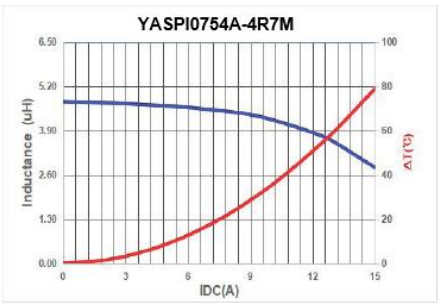
※ Rated DC current: The lower value of Irms and Isat.

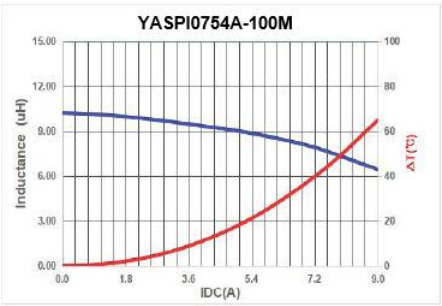
■ Typical Performance Curves

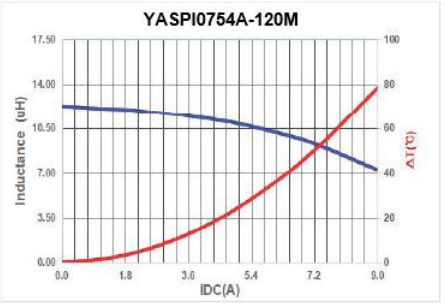


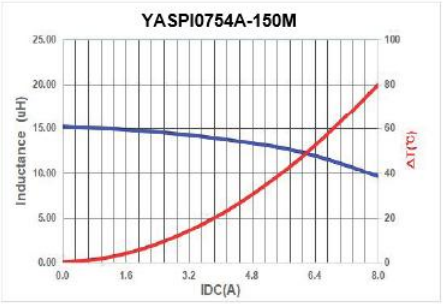


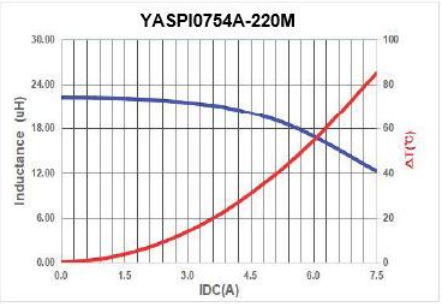




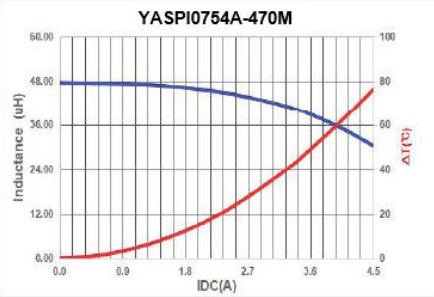


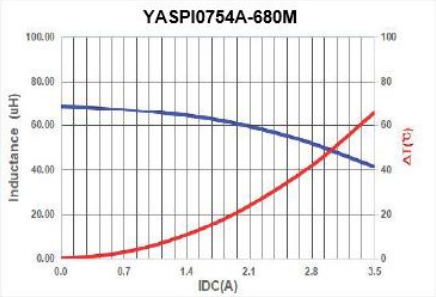




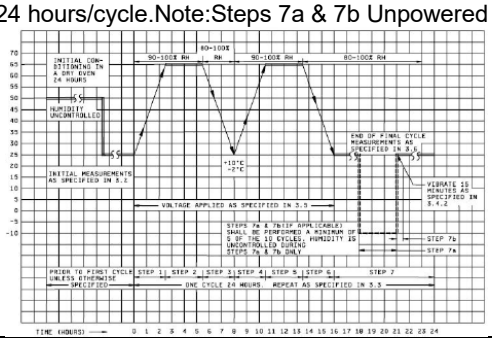


■ Typical Performance Curves

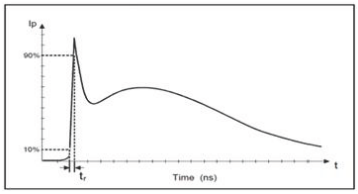




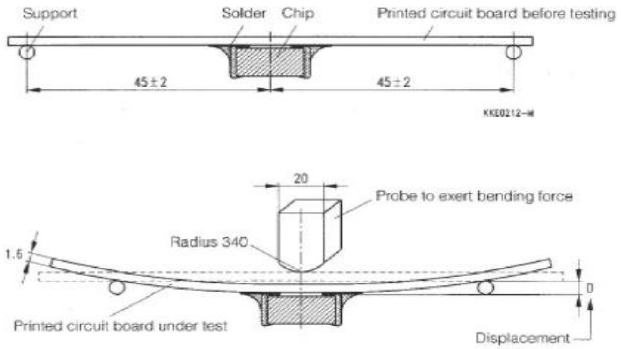
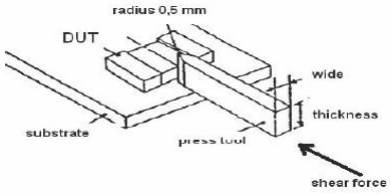
■ Reliability and Test Condition

Item	Performance	Test Condition
Operating temperature	-55~+165℃ (Including self - temperature rise)	N/A
Storage temperature and Humidity range	1. Less than 40℃,85%RH (Product with taping) 2. -55~+165℃(on board)	N/A
Electrical Performance Test		
Inductance	Refer to standard electrical characteristics list.	Agilent4284A,E4991A,KEYSIGHTE4980A/AL,chroma3302,3205
DCR		Agilent 4339B,chrom16502
Saturation Current (Isat)	Approximately △L30%	Saturation DC Current (Isat) will cause L0 to drop △L(%)
Heat Rated Current (Irms)	Approximately △T40℃	Heat Rated Current (Irms) will cause the coil temperature rise △T(℃). 1.Applied the allowed DC current 2.Temperature measured by digital surface thermometer
Reliability Test		
High Temperature Exposure(Storage) AEC-Q200	Appearance:No damage. Inductance:within±10% of initial value Q:Shall not exceed the specification value. RDC:within ±15% of initial value and shall not exceed the specification value	Preconditioning: Run through IR reflow for 3 times.(IPC/JEDEC J-STD-020E Classification Reflow Profiles Temperature:165±2℃(Inductor) Duration:1000hrs Min. Measured at room temperature after placing for 24±2 hrs
Temperature Cycling AEC-Q200		Preconditioning: Run through IR reflow for 3 times.(IPC/JEDEC J-STD-020E Classification Reflow Profiles Condition for 1 cycle Step1:-55±2℃ 30min Min.(Inductor) Step2:165±2℃ transition time 1min MAX. Step3:165±2℃ 30min Min. Step4:Low temp. transition time 1min MAX. Number of cycles:1000 Measured at room temperature after placing for 24±2 hrs
Moisture Resistance (AEC-Q200)		t=24 hours/cycle.Note:Steps 7a & 7b Unpowered 
Biased Humidity (AEC-Q200)		Preconditioning: Run through IR reflow for 3 times. (IPC/JEDEC J-STD-020E Classification Reflow Profiles) Humidity:85±3%R.H, Temperature:85℃±2℃ Duration:1000hrs Min Measured at room temperature after placing for24±2hrs
High Temperature Operational Life (AEC-Q200)		Preconditioning: Run through IR reflow for 3 times. (IPC/JEDECJ-STD-020E Classification Reflow Profiles Temperature：165±2℃(Inductor) Duration:1000hrs Min. With 100% rated current. Measured at room temperature after placing for24±2hrs

■ Reliability and Test Condition

<table>
<tr><th>Item</th><th>Performance</th><th>Test Condition</th></tr>
<tr><td>External Visual</td><td>Appearance:No damage.</td><td>Inspect device construction, marking and workmanship.
Electrical Test not required.</td></tr>
<tr><td>Physical Dimension</td><td>According to the product specification size measurement</td><td>According to the product specification size measurement</td></tr>
<tr><td>Resistance to Solvents</td><td>Appearance:No damage.</td><td>Add aqueous wash chemical - OKEM clean or equivalent.</td></tr>
<tr><td>Mechanical Shock</td><td>Appearance:No damage.
Inductance:within±10% of initial value
Q:Shall not exceed the specification value.
RDC:within ±15% of initial value and shall not exceed the specification value</td><td>Preconditioning: Run through IR reflow for 3 times.(IPC/JEDEC J-STD-020E Classification Reflow Profiles)
Test condition
<table>
<tr><th>Type</th><th>Peak value (g's)</th><th>Normal duration (D) (ms)</th><th>Wave form</th><th>Velocity change (Vi)ft/sec</th></tr>
<tr><td>SMD</td><td>100</td><td>6</td><td>Half-sine</td><td>12.3</td></tr>
<tr><td>Lead</td><td>100</td><td>6</td><td>Half-sine</td><td>12.3</td></tr>
</table>
3 shocks in each direction along 3 perpendicular axes(18 shocks).</td></tr>
<tr><td>Vibration</td><td rowspan="3">Appearance:No damage.
Inductance:within±10% of initial value
RDC:within ±15%
Of initial value and shall not exceed the specification value</td><td>Preconditioning: Run through IR reflow for 3 times.(IPC/JEDEC J-STD-020E Classification Reflow Profiles)
Oscillation Frequency: 10Hz～2KHz～10Hz for 20 minute
Equipment:Vibration checker
Total Amplitude:5g
Testing Time:12 hours(20 minutes,12 cycles each of 3 orientations)</td></tr>
<tr><td>Resistance to Soldering Heat</td><td>Test condition:(MIL-STD-202 Condition B)
Number of heat cycles
<table>
<tr><th>Temperature(℃)</th><th>Time(s)</th><th>Temperature ramp/immersion and emersion rate</th></tr>
<tr><td>260 ±5 (solder temp)</td><td>10±5</td><td>25mm/s ±6 mm/s</td></tr>
</table>
Depth: completely cover the termination</td></tr>
<tr><td>Thermal shock (AEC-Q200)</td><td>Preconditioning:Run through IR reflow for 3 times.(IPC/JEDECJ-STD-020E Classification Reflow Profiles
Condition for 1 cycle
Step1:-55±2℃ 15±1min(Inductor)
Step2:165±2℃ within 20Sec.
Step3:165±2℃ 15±1min
Number of cycles:300
Measured at room fempraturc after placing fo24±2hrs</td></tr>
<tr><td>ESD HBM > =2KV</td><td>Appearance:No damage.</td><td> 
Direct Contact and Air Discharge PASSIVE COMPONENT HBM ESD Discharge Waveform to a Coaxial Target
Test method:AEC-Q200-002
Test mode:Contact Discharge
Discharge level:4 KV (Level: 2)</td></tr>
</table>

■ Reliability and Test Condition

Item	Performance	Test Condition
Solderability	More than 95%of the terminal electrode should be covered with solder 。	a.Method B1, 4 hrs @155°C dry heat @255°C±5°C Test time:5 +0/-0 .5 seconds. b.Method D category 3. (steam aging 8hours ± 15 min) @260°C±5°C Test time: 30 +0/-0 .5 seconds.
Electrical Characterization	Refer Specification for Approval	Summary to show Min, Max, Mean and Standard deviation .
Flammability	Electrical Test not required.	V-0 or V-1 are acceptable.
Board Flex	Appearance:No damage	Preconditioning:Run through IR reflow for 3 times.(IPC/JEDEC J-STD-020E Classification Reflow Profiles Place the 100mm X 40mm board into a fixture similar to the one shown in below Figure with the component facing down.The apparatus shall consist of mechanical means to apply a force which will bend the board (D) x = 2 mm minimum.The duration of the applied forces shall be 60 (+ 5) sec. The force is to be applied only once to the board. 
Terminal Strength(SMD)	Appearance:No damage	Preconditioning: Run through IR reflow for 3 times.(IPC/JEDEC J-STD-020E Classification Reflow Profiles With the component mounted on a PCB with the device to be tested, apply a 17.7 N (1.8 Kg) force to the side of a device being tested. This force shall be applied for 60 +1 seconds. Also the force shall be applied gradually as not to apply a shock to the component being tested. 

Note : When there are questions concerning measurement result : measurement shall be made after 48 ± 2 hours of recovery under the standard condition.

■ Soldering Specifications

Soldering

Mildly activated rosin fluxes are preferred. TAI-TECH terminations are suitable for re-flow soldering systems. If hand soldering cannot be avoided, the preferred technique is the utilization of hot air soldering tools.

IR Soldering Reflow

Recommended temperature profiles for lead free re-flow soldering in Figure 1. Table 1.1& 1.2 (J-STD-020E)

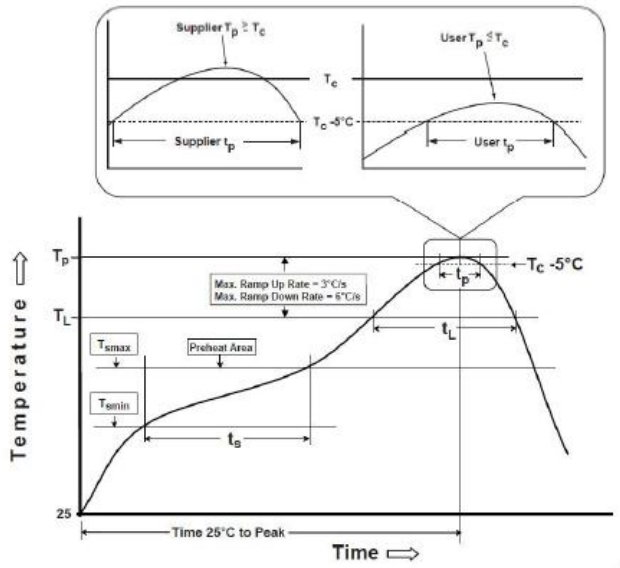
Iron Reflow

Products attachment with a soldering iron is discouraged due to the inherent process control limitations. In the event that a soldering iron must be employed the following precautions are recommended.(Fig. 2)

※ Preheat circuit and products to 150℃ ※ Never contact the ceramic with the iron tip ※ Use a 20 watt soldering iron with tip diameter of 1.0mm

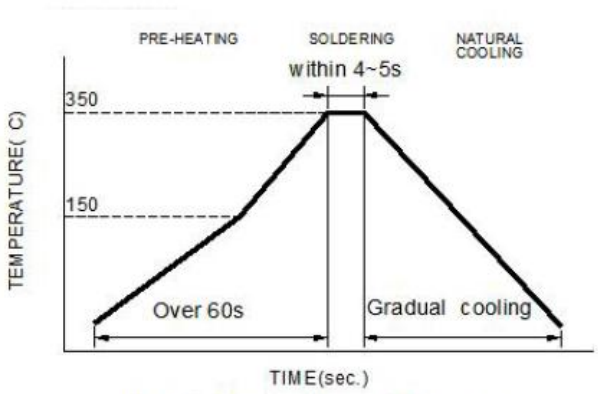
※355℃ tip temperature(max) ※ 1.0mm tip diameter(max) ※ Limit soldering time to 4~5sec.

Fig.1 IR Soldering Reflow



Reflow times: 3 times max

Fig.2 Iron soldering temperature profiles



Iron Soldering times: 1 times max.

Soldering iron Method : 350± 5℃ max

Table (1.1): Reflow Profiles

Profile Type:	Pb-Free Assembly
Preheat -Temperature Min(T smin) -Temperature Max(T smax) -Time(ts) from (T smin to T smax)	150℃ 200℃ 60-120seconds
Ramp-up rate(TL to Tp)	3℃/second max.
Liquidus temperature(TL) Time(tL)maintained above TL	217℃ 60-150 seconds
Classification temperature(Tc)	See Table (1.2)
Time(tp) at Tc- 5℃ (Tp should be equal to or less than Tc.)	*< 30 seconds
Ramp-down rate(Tp to TL)	6℃ /second max.
Time 25℃ to peak temperature	8 minutes max.

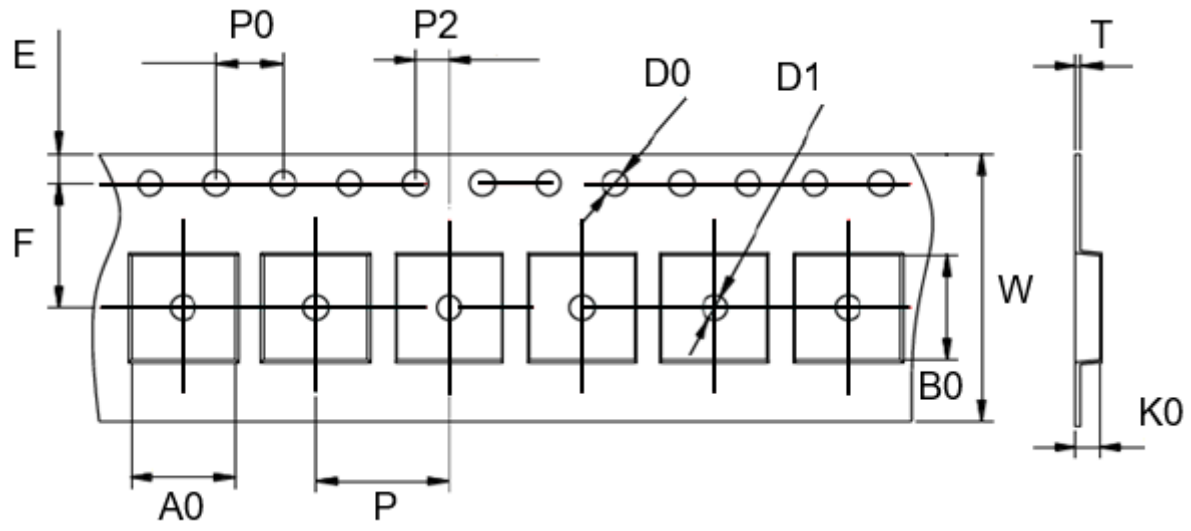
Tp: maximum peak package body temperature, **Tc**: the classification temperature.
For user (customer) **Tp** should be equal to or less than **Tc.**
* Tolerance for peak profile temperature (Tp) is defined as a supplier minimum and a user maximum.

Table (1.2) Package Thickness/Volume and Classification Temperature (Tc)

	Package Thickness	Volume mm^3 <350	Volume mm^3 350-2000	Volume mm^3 >2000
PB-Free Assembly	<1.6mm	260℃	260℃	260℃
	1.6-2.5mm	260℃	250℃	245℃
	≥2.5mm	250℃	245℃	245℃

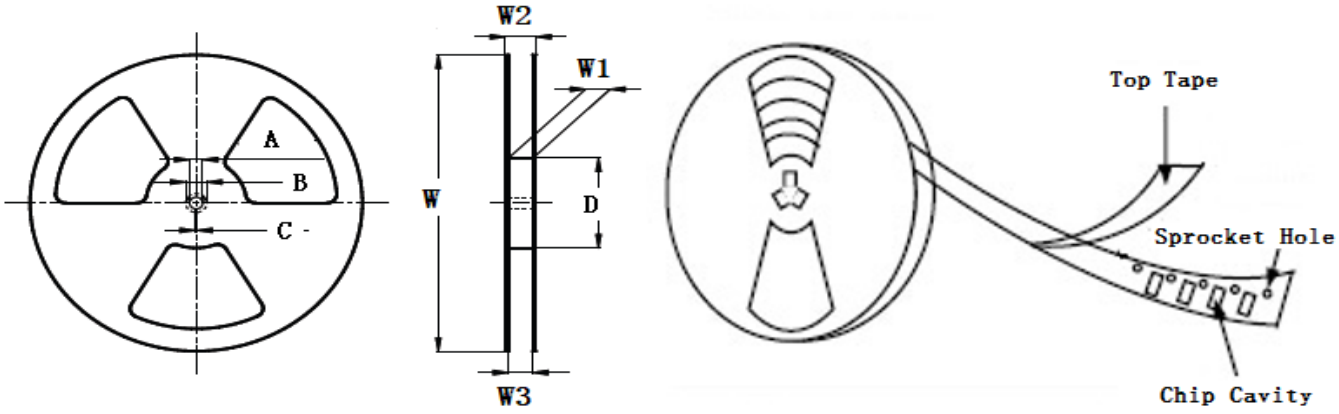
Reflow is referred to standard IPC/JEDEC J-STD-020E

■ Taping Dimensions(Unit:mm)



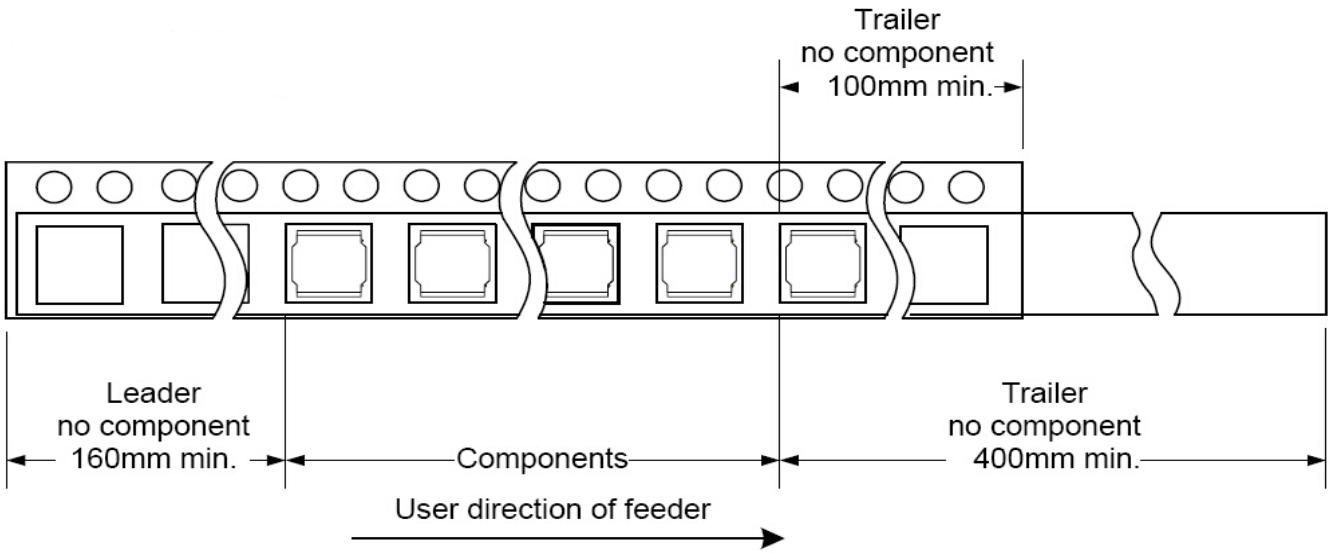
TYPE	W	P	P0	P2	D0	D1	T	A0	B0	K0	E	F	MPQ
YASPI0754A	16.0 ±0.3	12.0 ±0.1	4.0 ±0.1	2.0 ±0.1	1.5 ±0.1	1.5 ±0.1	0.40 ±0.05	7.7 ±0.1	9.0 ±0.1	5.7 ±0.1	1.75 ±0.1	7.5 ±0.1	800

■ Reel Dimensions(Unit:mm)

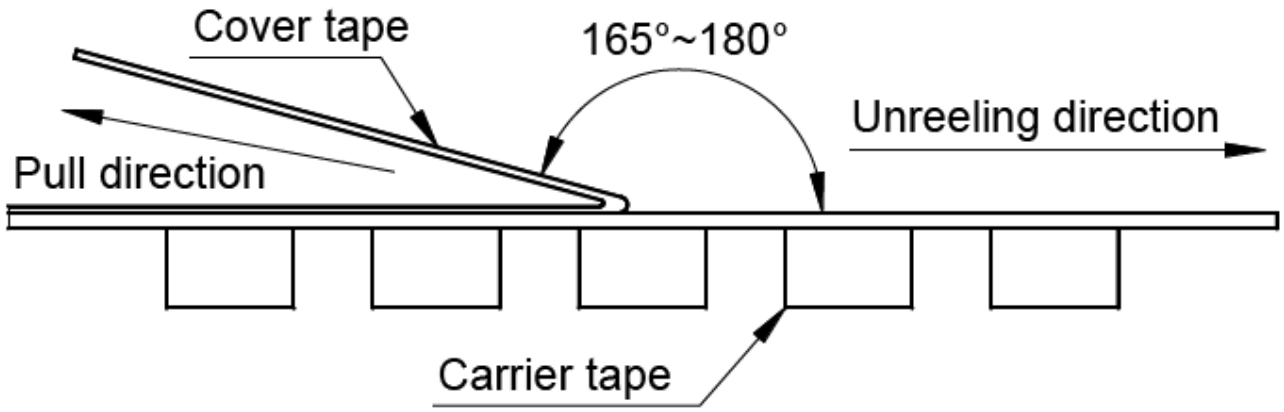


TYPE	W	W1	W2	W3	A	B	C	D
YASPI0754A	330±2.0	16.4±2.0	22.4MAX	15.9 Min	13.0±0.5	21.0±0.8	2.0±0.5	100±2.0

■ Direction of rolling



■ Cover tape peel off condition



Cover tape peel force shall be 0.1N to 1.3N.

Reference peel speed 300±10mm/min.

■ Notes

※ When there are questions concerning measurement result : measurement shall be made after 48±2 hours of recovery under the standard condition

※ This power choke coil itself does not have any protective function in abnormal condition such as overload,short-circuit and open-circuit conditions, etc. Therefore, it shall be confirmed as the end product that there is no risk of smoking, fire, dielectric withstand voltage, insulation resistance, etc. in abnormal conditions to provide protective devices and/or protection circuit in the end product.

※ When this power choke coil was used in a similar or new product to the original one, sometimes it might not be able to satisfy the specifications due to different condition of use.

※ Dielectric withstanding test with higher voltage than specific value will damage insulating material and shorten its life.

※ This power choke coil must not be used in wet condition by water, coffee or any liquid because insulation strength becomes very low in this condition.

※ Please consult our company to confirm the reliability of the process required to wash or use or exposure to a chemical solvent used in this product.PCB washing tested to MIL-STD-202 Method ， and dry it off immediately 。

※ The rated current as listed is either the saturation current or the heating current depending on which value is lower.

※ If this power choke is dipped in the cleaning agent, such as toluene, xylene, ketone, and ether system, there is a possibility that the performance decreases greatly ， and marking disappearnc。

※ The high power ultrasonic washing may damage the choke body。

※ Before use，the user should determine whether this product is suitable for their own design ， Our company only guarantees that the product meets the requirements of this specification。