

■ Features

- Molding Inductor, low noise.
- Low Profile, Low Temp.
- Large Current (Over 15A).
- Customize For Different Need.
- Operating temperature: $-40^{\circ}\text{C} \sim +125^{\circ}\text{C}$ (Including self-temperature rise) .

■ Applications

- General Electronic.
- Video Device, TV, TFT.
- Power Module for PC.
- NB/Lap Top Computer.
- Server, VGA Card/Module.
- DC/DC converter.

■ Product Identification

YSPI □□□□□ — □□□ □
 (1) (2) (3) (4)

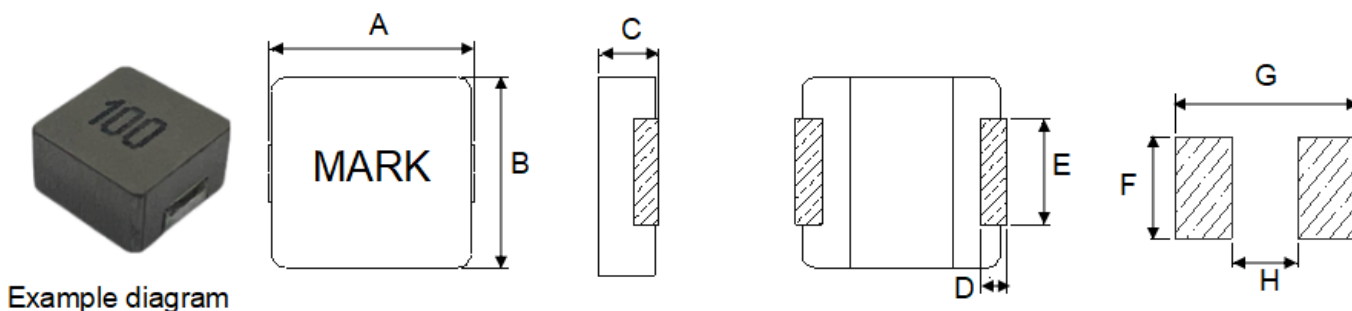
(1) : Type

(2) : Dimensions

(3) : Inductance value

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

■ Shapes and Dimensions (Unit: mm)



TYPE	A	B	C	D	E	F Typ.	G Typ.	H Typ.
YSPI0650A	7.3±0.3	6.6±0.3	4.8±0.2	1.6±0.3	3.0±0.2	3.4	8.0	3.5

■ YSPI0650A Series

Part Number	Inductance (uH) @100KHz/1V	DCR (mΩ)		Isat(A)		Irms(A)	
		Typ.	Max.	Typ.	Max.	Typ.	Max.
YSPI0650A-R15M	0.15±20%	1.3	1.7	45.0	40.0	35.0	32.0
YSPI0650A-R22M	0.22±20%	1.7	2.2	40.0	35.0	30.0	26.0
YSPI0650A-R33M	0.33±20%	1.9	2.4	25.0	23.0	26.0	24.0
YSPI0650A-R47M	0.47±20%	2.9	3.3	22.0	20.0	22.0	20.0
YSPI0650A-R56M	0.56±20%	3.4	3.9	21.0	18.0	21.0	19.0
YSPI0650A-R68M	0.68±20%	3.6	4.1	20.0	17.0	20.0	18.0
YSPI0650A-1R0M	1.0±20%	5.6	6.2	16.0	13.0	17.0	15.0
YSPI0650A-1R5M	1.5±20%	6.6	7.3	13.0	10.5	15.0	13.0
YSPI0650A-2R2M	2.2±20%	10.0	11.5	10.0	8.5	14.0	12.0
YSPI0650A-3R3M	3.3±20%	14.0	16.2	9.5	8.0	13.0	11.0
YSPI0650A-4R7M	4.7±20%	20.8	24.0	8.8	7.5	11.0	9.5
YSPI0650A-5R6M	5.6±20%	28.0	33.0	8.0	7.2	10.0	8.5
YSPI0650A-6R8M	6.8±20%	30.0	36.0	7.6	7.0	9.0	8.0
YSPI0650A-8R2M	8.2±20%	38.5	45.0	6.5	6.0	7.5	6.5
YSPI0650A-100M	10±20%	44.0	53.0	6.0	5.7	7.0	6.0
YSPI0650A-150M	15±20%	73.0	85.0	4.0	3.2	5.0	4.0
YSPI0650A-220M	22±20%	122	142	3.6	3.1	4.2	3.6
YSPI0650A-330M	33±20%	142	170	2.3	1.8	3.0	2.5
YSPI0650A-470M	47±20%	275	320	1.8	1.5	2.6	2.0
YSPI0650A-680M	68±20%	260	312	2.7	2.4	2.5	2.3
YSPI0650A-101M	100±20%	432	520	1.2	1.0	1.8	1.4

※ All test data is referenced to 25 °C ambient

※ Irms (A):DC current (A) that will cause an approximate ΔT of 40 °C(reference ambient temperature is 25 °C)

※ Isat(A):DC current (A) that will cause L0 to drop approximately 30 %.(Internal control standards at 40% MAX)

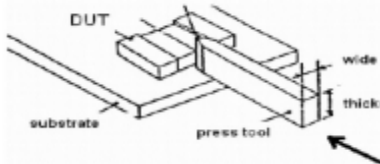
※ The part temperature (ambient + temp rise) should not exceed 125 °C under worst case operating conditions.
Circuit design, component placement, PWB trace size and thickness, airflow and other cooling provisions all affect the part temperature. Part temperature should be verified in the end application.

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

■ Reliability and Test Condition

Item	Performance	Test Condition
Operating temperature	-40~+125°C (Including self - temperature rise)	N/A
Storage temperature	1. -10~+40°C, 50~60%RH (Product with taping) 2. -40~+125°C(on board)	N/A
Electrical Performance Test		
Inductance	Refer to standard electrical characteristics list.	Agilent4284A,E4991A,KEYSIGHT4980A/AL,chroma3302,3205
DCR		Agilent 4339B,chrom16502
Saturation Current (Isat)	Approximately $\Delta 30\%$	Saturation DC Current (Isat) will cause L0 to drop $\Delta L(\%)$
Heat Rated Current (Irms)	Approximately $\Delta T40^{\circ}\text{C}$	Heat Rated Current (Irms) will cause the coil temperature rise $\Delta T(^{\circ}\text{C})$. 1.Applied the allowed DC current 2.Temperature measured by digital surface thermometer
Reliability Test		
Life Test	Appearance: No damage. Inductance: within $\pm 10\%$ of initial value RDC: within $\pm 15\%$ of initial value and shall not exceed the specification value	Preconditioning: Run through IR reflow for 3 times. times.(IPC/JEDECJ-STD-020E Classification Reflow Profiles) Temperature: $125\pm 2^{\circ}\text{C}$ (Inductor, ambient + temp rise) Applied current: rated current Duration: 1000 ± 12 hrs Measured at room temperature after placing for 24 ± 2 hrs.
Load Humidity		Preconditioning: Run through IR reflow for 3 times times.(IPC/JEDECJ-STD-020E Classification Reflow Profiles) Humidity: $85\pm 2\%$ R.H, Temperature: $85^{\circ}\text{C}\pm 2^{\circ}\text{C}$ Duration: 1000hrs Min.(No load current) Measured at room temperature after placing for 24 ± 2 hrs.
Moisture Resistance		Preconditioning: Run through IR reflow for 3 times. times.(IPC/JEDECJ-STD-020E Classification Reflow Profiles) 1. Baked at 50°C for 25hrs, measured at room temperature after placing for 4 hrs. 2. Raise temperature to $65\pm 2^{\circ}\text{C}$ 90-100%RH in 2.5hrs, and keep 3 hours, cool down to 25°C in 2.5hrs. 3. Raise temperature to $65\pm 2^{\circ}\text{C}$ 90-100%RH in 2.5hrs, and keep 3 hours, cool down to 25°C in 2.5hrs,keep at 25°C for 2 hrs then keep at -10°C for 3 hrs 4. Keep at 25°C 80-100%RH for 15min and vibrate at the frequency of 10 to 55 Hz to 10 Hz, measure at room temperature after placing for 1~2 hrs.
Thermal shock		Preconditioning: Run through IR reflow for 3 times. (IPC/JEDECJ-STD-020E Classification Reflow Profiles) Condition for 1 cycle Step1: $-40\pm 2^{\circ}\text{C}$ 30 ± 5 min Step2: $125\pm 2^{\circ}\text{C} \leq 20\text{S}$ Step3 : $125\pm 2^{\circ}\text{C}$ 30 ± 5 min Step4: $-40\pm 2^{\circ}\text{C} \leq 20\text{S}$ Number of cycles: 500 Measured at room fempraturc after placing for 24 ± 2 hrs.
Vibration		Preconditioning: Run through IR reflow for 3 times. times.(IPC/JEDECJ-STD-020E Classification Reflow Profiles) Oscillation Frequency: 10Hz~2KHz~10Hz for 20 minutes Equipment: Vibration checker Total Amplitude: 10g Testing Time : 12 hours(20 minutes, 12 cycles each of 3 orientations).

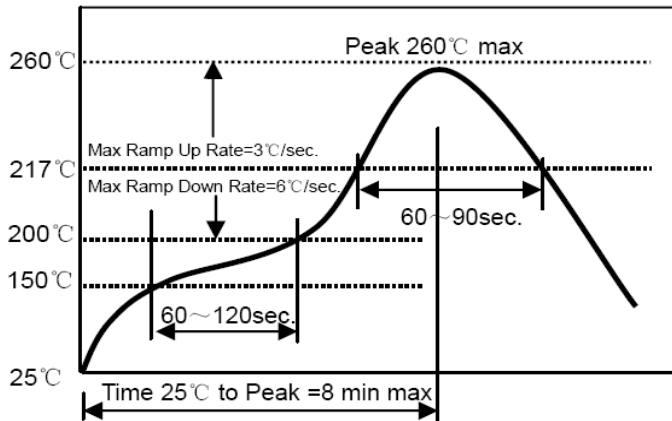
■ Reliability and Test Condition

Item	Performance	Test Condition														
Bending	Appearance: No damage. Inductance: within±10% of initial value RDC: within ±15% of initial value and shall not exceed the specification value	Shall be mounted on a FR4 substrate of the following dimensions: ≥0805 inch(2012mm):40x100x1.2mm <0805 inch(2012mm):40x100x0.8mm Bending depth: ≥0805 inch(2012mm):1.2mm <0805 inch(2012mm):0.8mm duration of 10 sec.														
Shock		<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>50</td><td>11</td><td>Half-sine</td><td>11.3</td></tr><tr><td>Lead</td><td>50</td><td>11</td><td>Half-sine</td><td>11.3</td></tr></table> 3 shocks in each direction along 3 perpendicular axes(18 shocks).	Type	Peak value (g's)	Normal duration (D) (ms)	Wave form	Velocity change (Vi)ft/sec	SMD	50	11	Half-sine	11.3	Lead	50	11	Half-sine
Type	Peak value (g's)	Normal duration (D) (ms)	Wave form	Velocity change (Vi)ft/sec												
SMD	50	11	Half-sine	11.3												
Lead	50	11	Half-sine	11.3												
Solderability	More than 95% of the terminal electrode should be covered with solder.	Solder: Sn96.5% Ag3% Cu0.5% Method B, 4 hrs @ 155°C dry heat Temperature: 245±5°C Dip time: 5+0/-0.5s.														
Resistance to Soldering Heat	Appearance: No damage. Inductance: within±10% of initial value RDC: within ±15% of initial value and shall not exceed the specification value	Depth: completely cover the termination <table><tr><th>Temperature(°C)</th><th>Time(s)</th><th>Temperature ramp/immersion and emersion rate</th><th>Number of heat cycles</th></tr><tr><td>260 ±5 (solder temp)</td><td>10 ±1</td><td>25mm/s ±6 mm/s</td><td>1</td></tr></table>	Temperature(°C)	Time(s)	Temperature ramp/immersion and emersion rate	Number of heat cycles	260 ±5 (solder temp)	10 ±1	25mm/s ±6 mm/s	1						
Temperature(°C)		Time(s)	Temperature ramp/immersion and emersion rate	Number of heat cycles												
260 ±5 (solder temp)	10 ±1	25mm/s ±6 mm/s	1													
Terminal Strength		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 force (>0805inch(2012mm):1kg, ≤0805inch(2012mm):0.5kg) 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.

■ Recommended Soldering Technologies

Re-flowing Profile



Preheat condition: 150 ~200°C/60~120sec.

Allowed time above 217°C: 60~90sec.

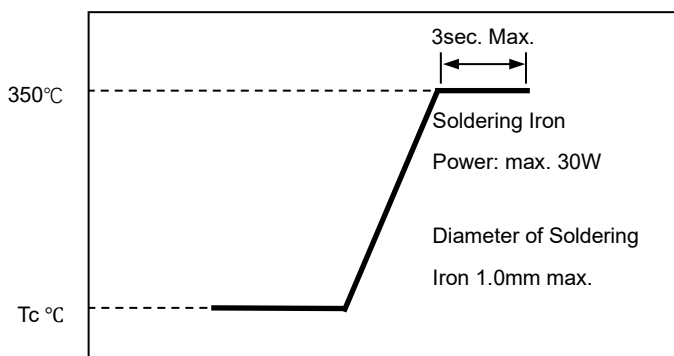
Peak temp: 260°C

Max time at Peak temp: 10 sec.

Solder paste: Sn/3.0Ag/0.5Cu

Allowed Reflow time: 2x max

Iron Soldering Profile



Iron soldering power: Max. 30W

Pre-heating: 150°C/60sec.

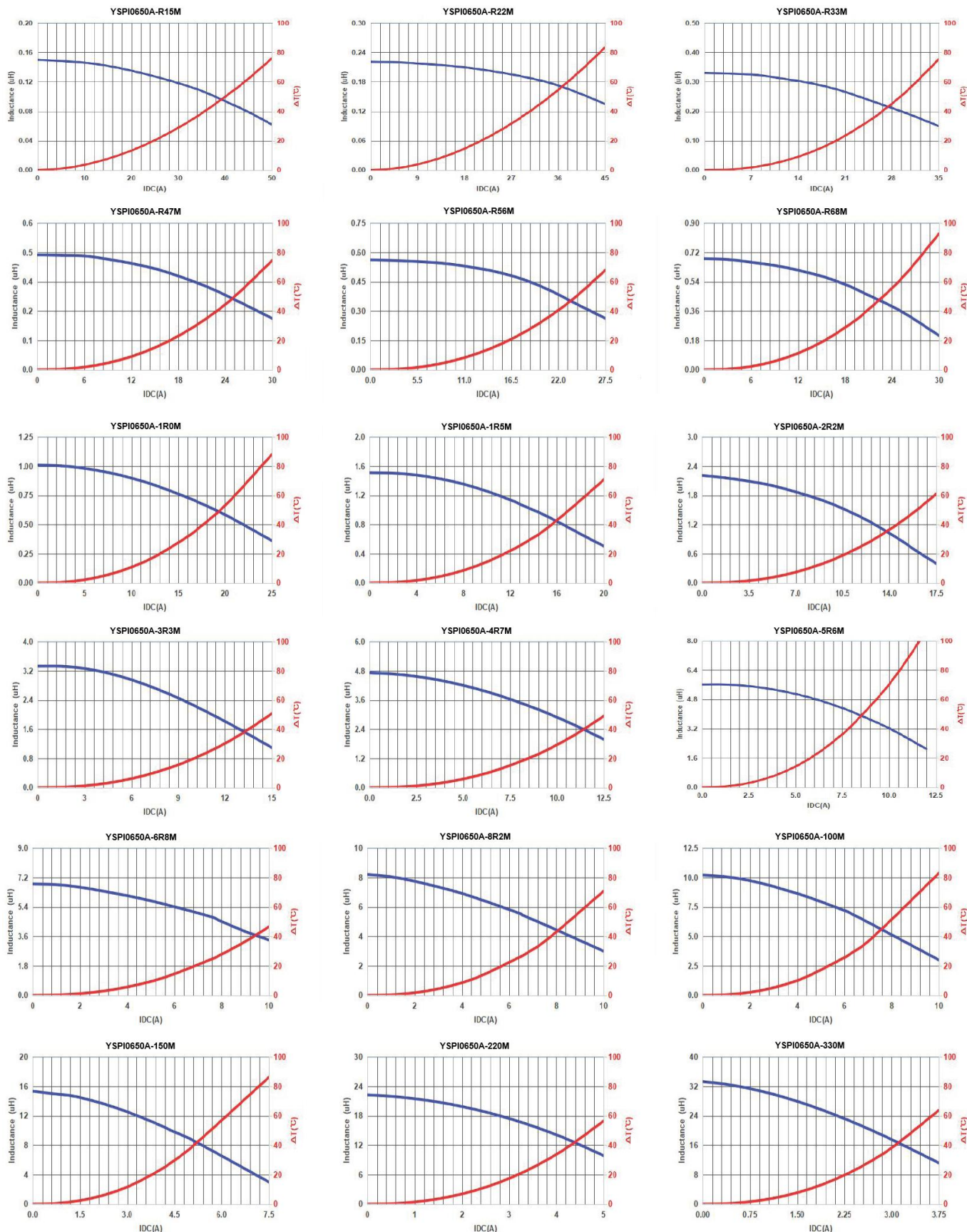
Soldering Tip temperature: 350°C Max.

Soldering time: 3sec. Max.

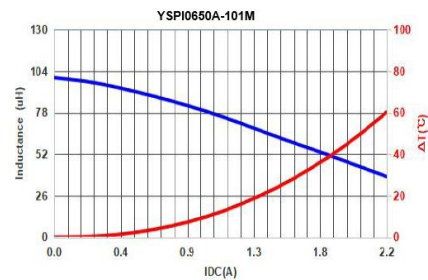
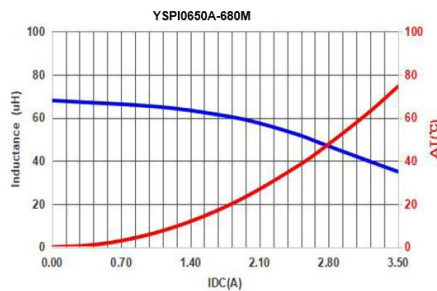
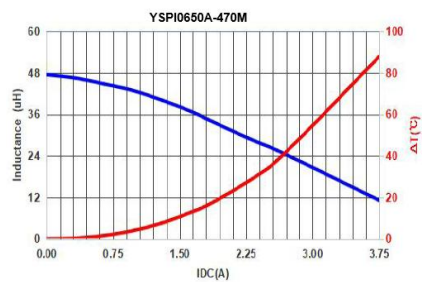
Solder paste: Sn/3.0Ag/0.5Cu

Max.1 times for iron soldering

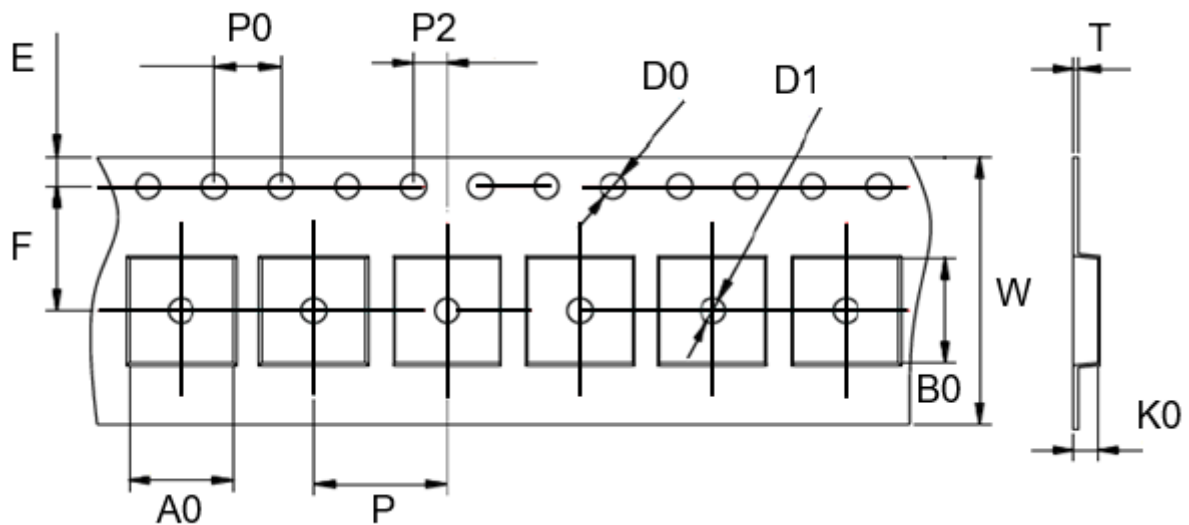
Typical Performance Curves



■ Typical Performance Curves

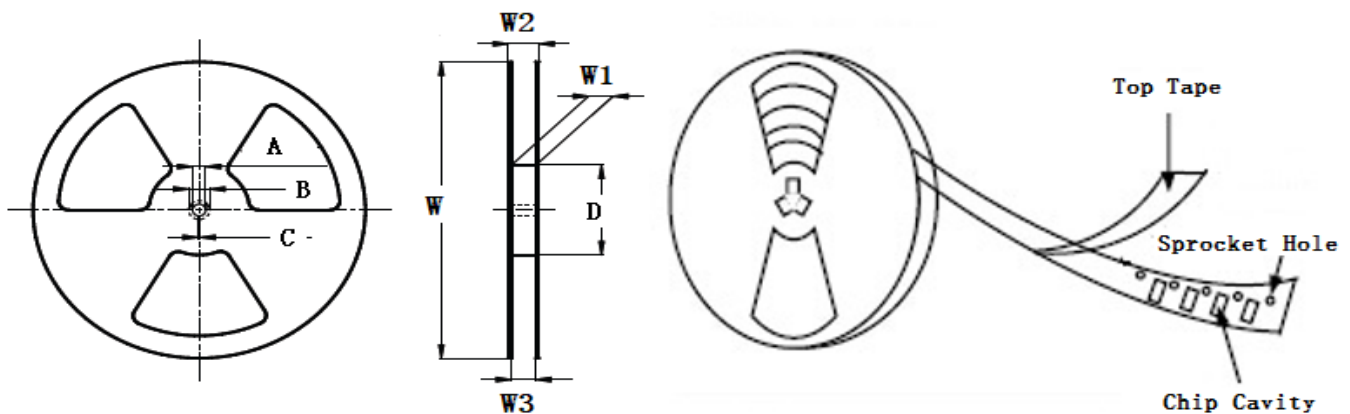


■ Taping Dimensions(Unit:mm)



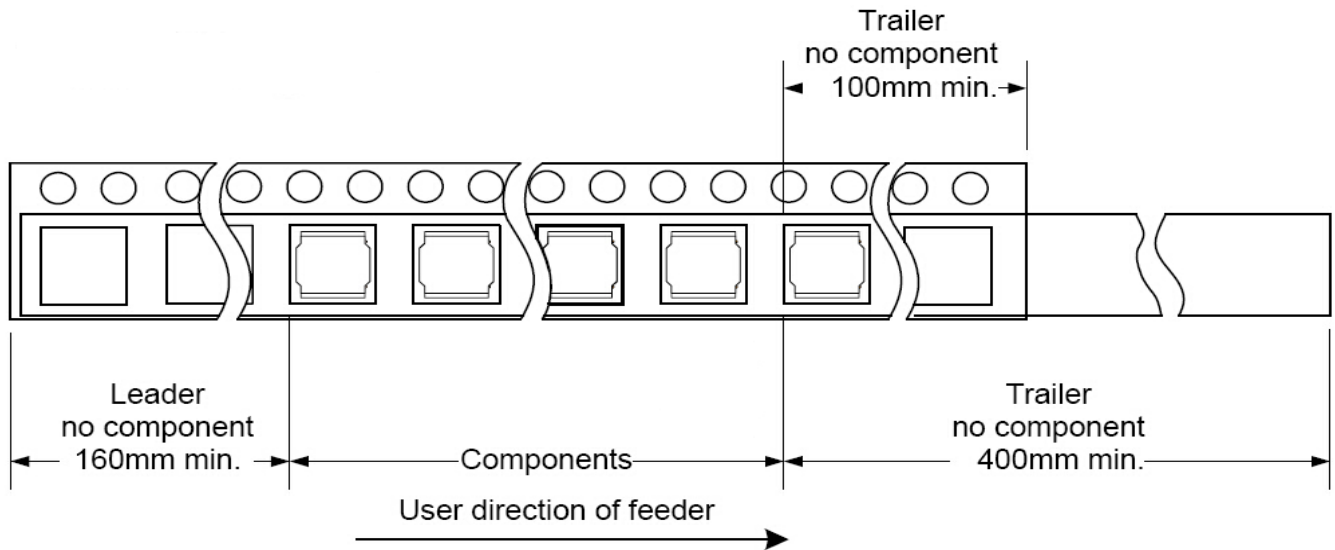
TYPE	W	P	P0	P2	D0	D1	T	A0	B0	K0	E	F	MPQ
YSPI0650A	16.0 ±0.3	12.0 ±0.1	4.0 ±0.1	2.0 ±0.1	1.5 ±0.1	1.5 ±0.1	0.35 ±0.05	7.0 ±0.1	7.7 ±0.1	5.3 ±0.1	1.75 ±0.1	7.5 ±0.1	800

■ Reel Dimensions(Unit:mm)

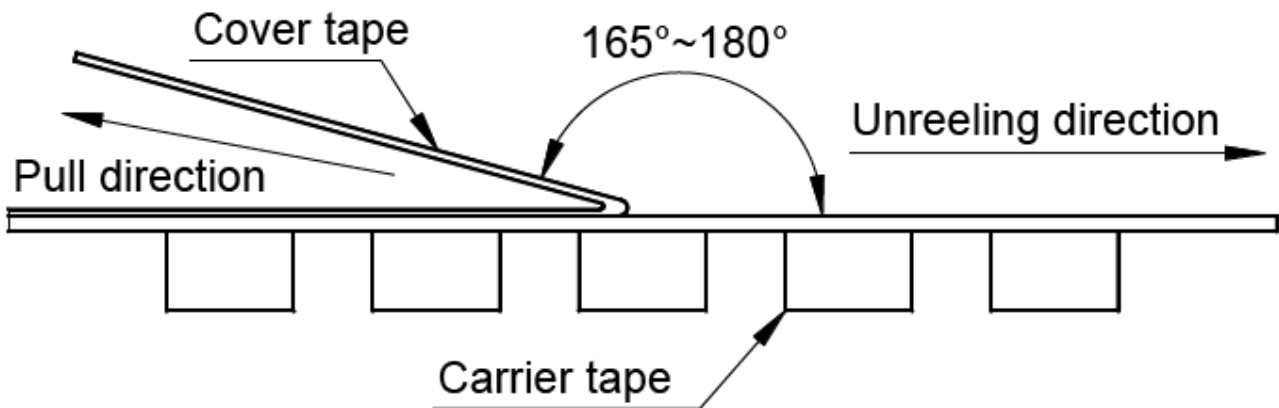


TYPE	W	W1	W2	W3	A	B	C	D
YSPI0650A	330±2.0	16.4±2.0	22.4MAX	15.9 Min	13.0±0.5	21.0±0.8	2.0±0.5	100±2.0

■ 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.