

■ Features

- Molding Inductor.
- High reliability.
- High current, low DCR, high efficiency.
- Very low acoustic noise and very low leakage flux noise.
- 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

YSPIT □□□□□□ — □□□ □ □□□
 (1) (2) (3) (4) (5)

(1) : Type

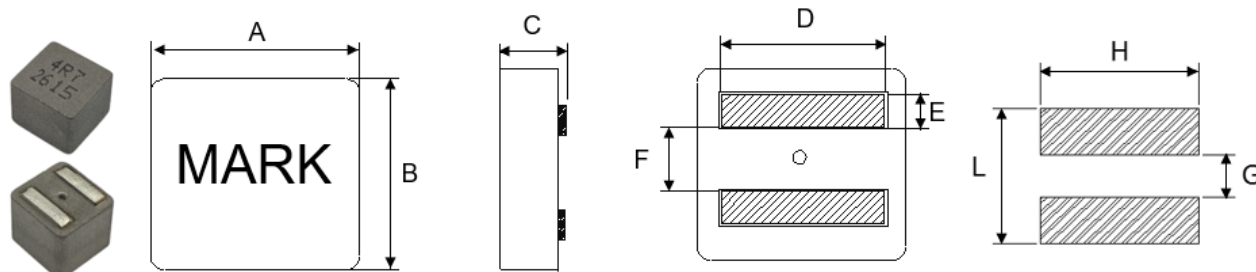
(2) : Dimensions

(3) : Inductance value

(4) : Inductance Tolerance: $N=\pm 30\%$, $M=\pm 20\%$

(5) : Internal code

■ Shapes and Dimensions (Unit: mm)



Example diagram

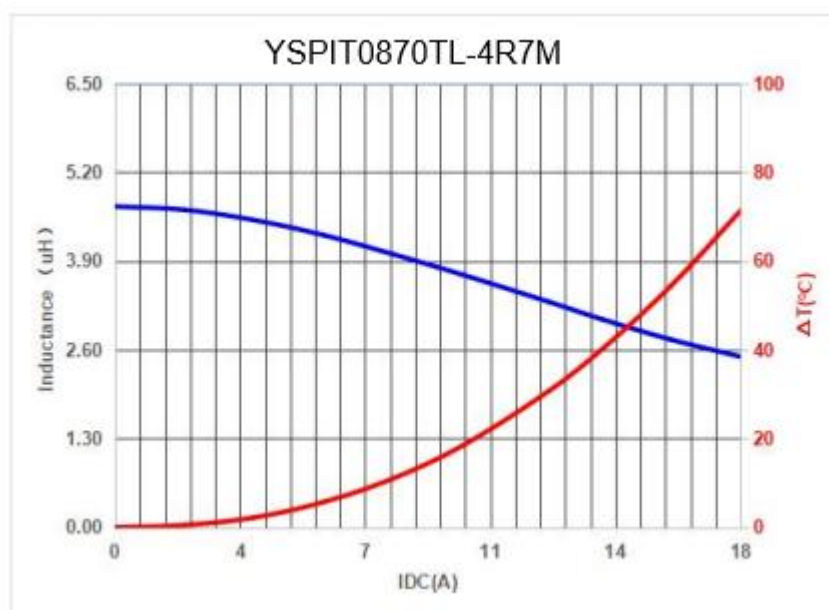
TYPE	A	B	C	D	E	F	G Ref.	H Ref.	L Ref.
YSPIT0870TL	8.4 ± 0.3	8.0 ± 0.3	6.7 ± 0.3	6.7 ± 0.3	1.75 ± 0.2	3.15 ± 0.25	2.8	6.7	7.8

■ Electrical Characteristics

Part Number	Inductance (μ H) @100KHz/0.1V	DCR Max. (m Ω)		Heat Rating Current (A)		Saturation Current (A)	
		Typ.	Max.	Typ.	Max.	Typ.	Max.
YSPIT0870TL-4R7M	4.7 $\pm$ 20%	7.5	8.5	14.0	11.5	12.5	11.0

- ※ All test data referenced to 25°C ambient.
- ※ Current that causes the specified temperature rise from 25°C ambient.
- ※ Saturation Current (Isat) will cause L0 to drop approximately 30%.
- ※ The part temperature (ambient + temp rise) should not exceed 125°C 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.
- ※ Special inquiries besides the above common used types can be met on your requirement.
- ※ Rated DC current: The lower value of Irms and Isat.

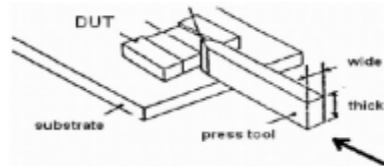
■ Typical Performance Curves



■ 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, KEYSIGTE4980A/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 $\Delta T 40^{\circ}\text{C}$	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 $\pm$ 5min Step2: $125 \pm 2^{\circ}\text{C}$ $\leq$ 20S Step3 : $125 \pm 2^{\circ}\text{C}$ 30 $\pm$ 5min Step4: $-40 \pm 2^{\circ}\text{C}$ $\leq$ 20S 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	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	RDC:within ±15% of Initial value and shall not exceed the specification value	<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	11.3
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		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	Appearance: No damage. Inductance: within±10% of initial 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 With the component mounted on a PCB with the device to be tested,applyaforce(>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 $\pm$ 2 hours of recovery under the standard condition.

Soldering Specifications

Soldering

Mildly activated rosin fluxes are preferred. YJYCOIN 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°C
- ※ Never contact the ceramic with the iron tip
- ※ Use a 20 watt soldering iron with tip diameter of 1.0mm
- ※ 355°C tip temperature(max)
- ※ 1.0mm tip diameter(max)
- ※ Limit soldering time to 4~5sec.

Fig.1 IR Soldering Reflow

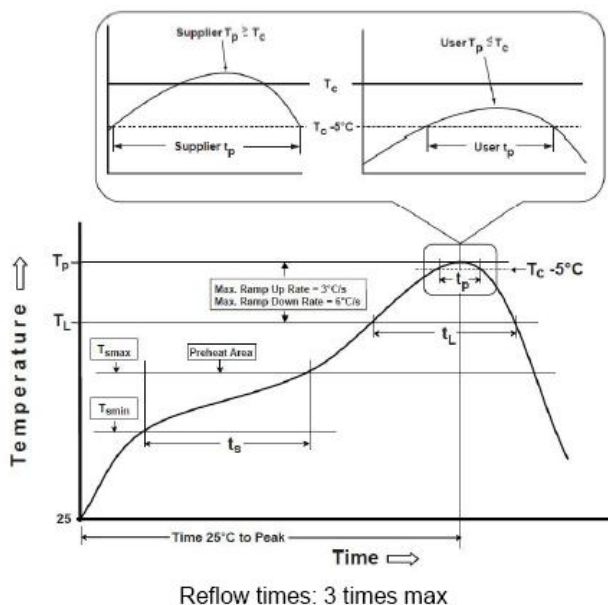


Fig.2 Iron soldering temperature profiles

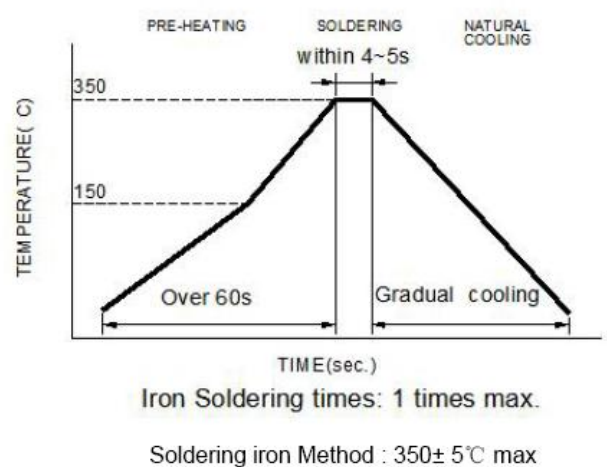


Table (1.1): Reflow Profiles

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

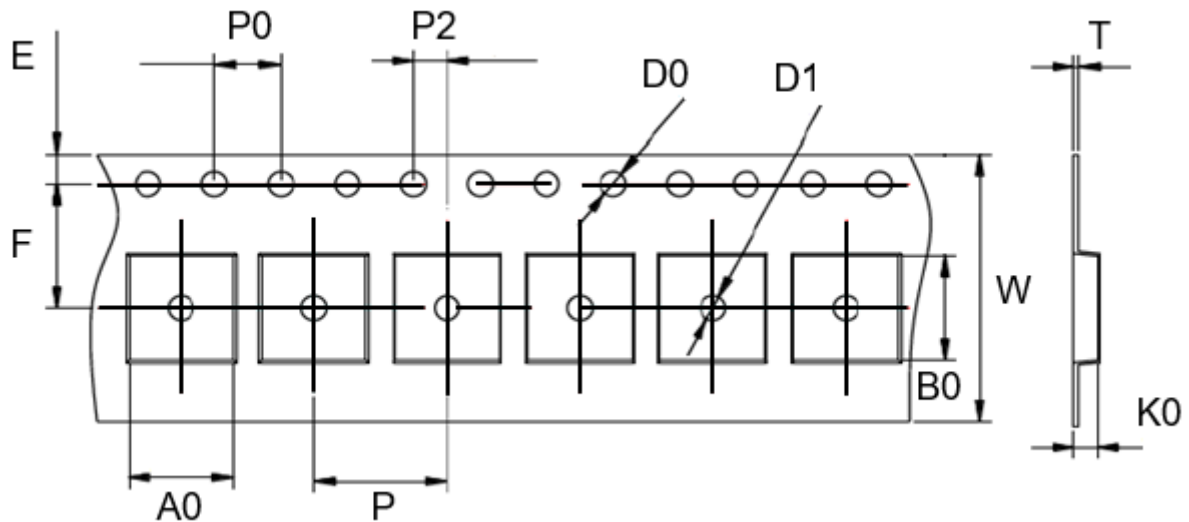
* Tolerance for peak profile temperature (Tp) is defined as a supplier minimum and a user maximum.

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°C	260°C	260°C
	1.6-2.5mm	260°C	250°C	245°C
	≥2.5mm	250°C	245°C	245°C

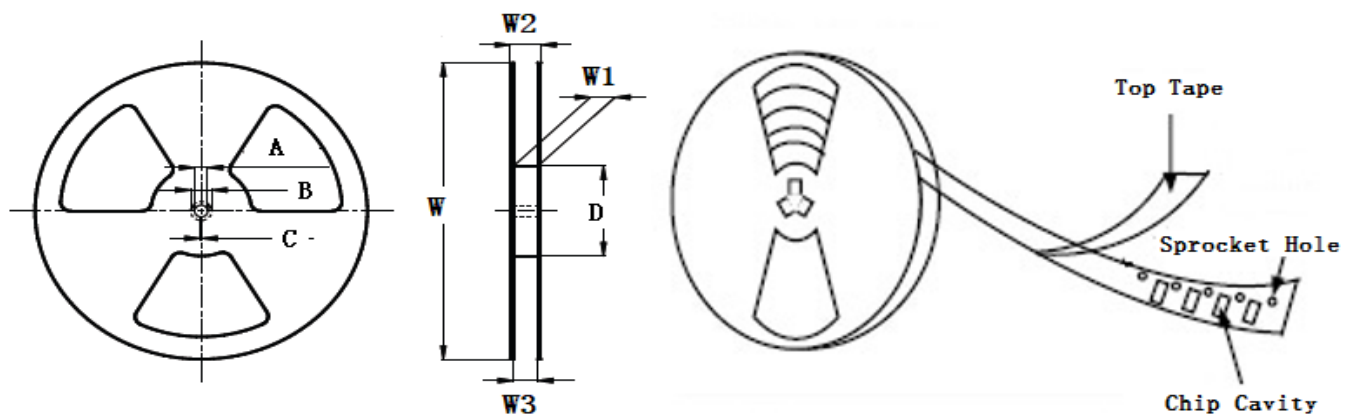
Reflow is referred to standard IPC/JEDEC J-STD-020E

■ Taping Dimensions(Unit:mm)



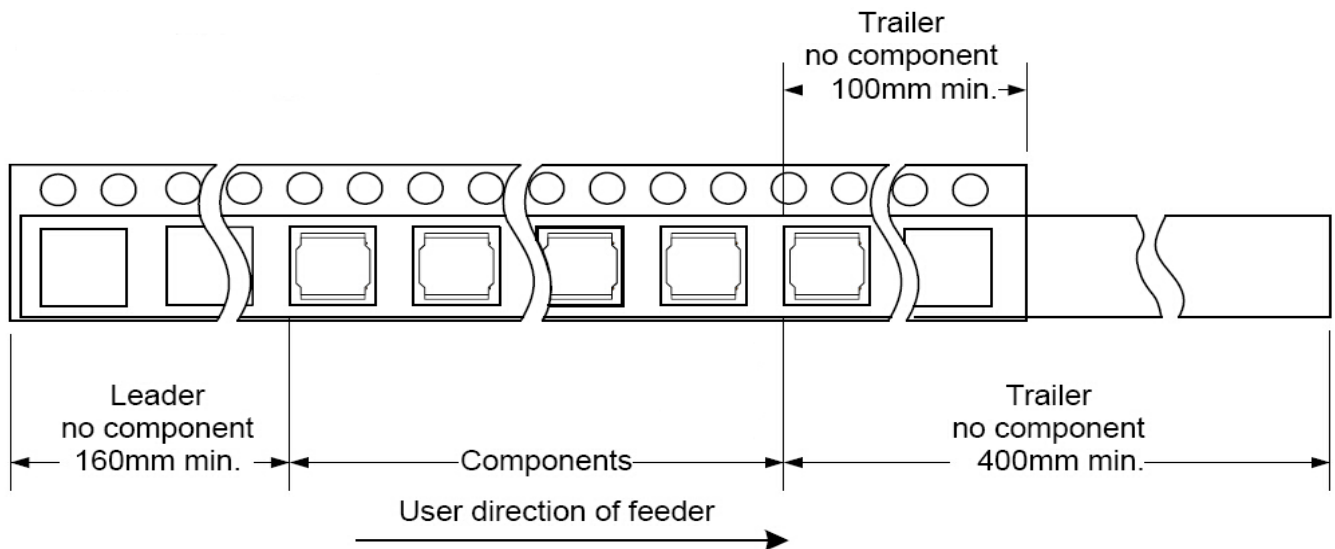
TYPE	W	P	P0	P2	D0	D1	T	A0	B0	K0	E	F	MPQ
YSPIT0870TL	16 ±0.3	12 ±0.1	4 ±0.1	2 ±0.1	1.5 ±0.1	1.5 ±0.1	0.35 ±0.1	8.8 ±0.1	8.4 ±0.1	7.3 ±0.1	1.75 ±0.1	7.5 ±0.1	700

■ Reel Dimensions(Unit:mm)

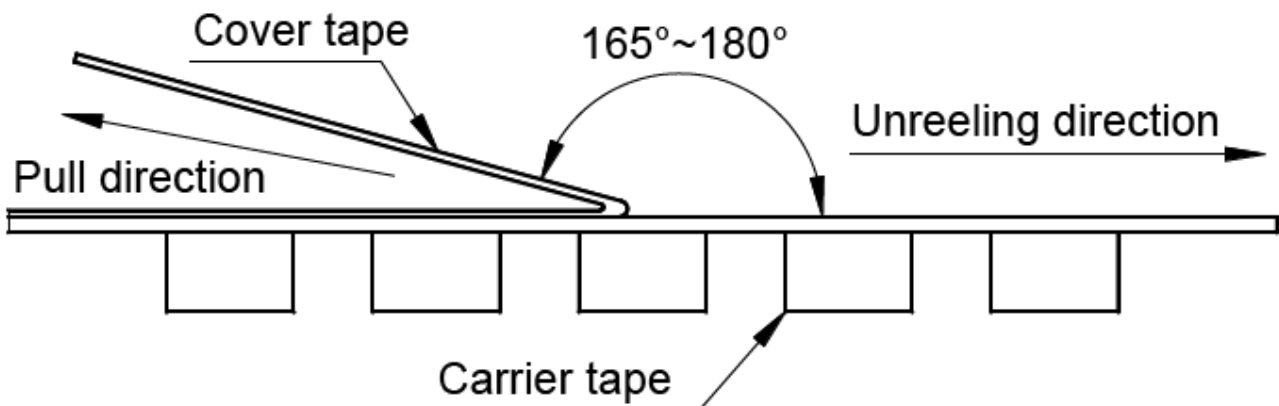


TYPE	W	W1	W2	W3	A	B	C	D
YSPIT0870TL	330±2.0	24.4±2.0	30.4MAX	23.9 Min	13.0±0.5	21.0±0.8	2.0±0.5	97±0.5

■ Direction of rolling



■ Cover tape peel off condition



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

Reference peel speed 300 ± 10 mm/min.