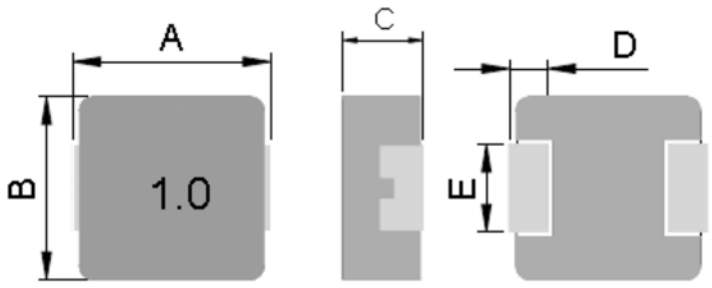
FEATRLRES

- Carbonyl Powder.
- Compact design.
- High current , low DCR , high efficiency.
- Very low acoustic noise and very low leakage flux noise.
- High reliability.
- 100% Lead(Pb)-Free and RoHS compliant.

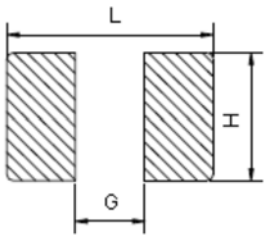
APPLICATIONS

- Note PC power system , incl. IMVP-6
- DC/DC converter .

CONFIGRLRATIONS & DIMENSIONS (unit in mm)



Recommended Land pattern



Type	A	B	C	D	E	L	G	H
HMPL0412HP	4.45±0.25	4.06±0.25	1.0±0.2	0.76±0.3	2.0±0.2	5.2	2.2	2.3

Note:
1. The above PCB layout reference only.
2. Recommend solder paste thickness at 0.12mm and above.

ELECTRICAL CHARACTERISTICS

Part Number	Inductance L0 (uH)±20% @ 0 A	I rms (A) Typ.	I sat (A) Typ.	DCR(mΩ) Typ.@25℃	DCR(mΩ) Max.@25℃
HMPL0412HP-R10YG-Z02	0.10±30%	11.5	25	4.3	5.5
HMPL0412HP-R15YG-Z02	0.15±30%	10	21.5	5.5	6.8
HMPL0412HP-R22MG-Z02	0.22±20%	8.5	20	6.6	8.0
HMPL0412HP-R33MG-Z02	0.33±20%	7.0	11	13.6	16
HMPL0412HP-R36MG-Z02	0.36±20%	6.5	8.5	15.5	18
HMPL0412HP-R47MG-Z02	0.47±20%	6.0	6.5	18	20
HMPL0412HP-R60MG-Z02	0.60±20%	5.3	6.0	22.5	26
HMPL0412HP-R68MG-Z02	0.68±20%	5.0	6.0	32	37
HMPL0412HP-1R0MG-Z02	1.00±20%	4.0	6.0	41	47
HMPL0412HP-1R2MG-Z02	1.20±20%	3.5	5.0	48	56
HMPL0412HP-1R5MG-Z02	1.50±20%	3.0	4.0	55	63.3
HMPL0412HP-2R2MG-Z02	2.20±20%	2.8	3.5	69.2	80
HMPL0412HP-3R3MG-Z02	3.30±20%	2.3	3.0	84	97
HMPL0412HP-4R7MG-Z02	4.70±20%	2.0	2.5	128	145
HMPL0412HP-5R6MG-Z02	5.60±20%	1.7	2.3	180	208
HMPL0412HP-6R8MG-Z02	6.80±20%	1.5	1.7	300	360
HMPL0412HP-8R2MG-Z02	8.20±20%	1.4	1.6	313	376
HMPL0412HP-100MG-Z02	10.0±20%	1.3	1.4	410	463
HMPL0412HP-220MG-Z02	22.0±20%	0.8	1.0	950	1050

Note:

1.Test frequency : Ls : 100KHz /1.0V.

2.All test data referenced to 25℃ ambient.

3.Testing Instrument(or equ) : L: HP4284A,CH11025,CH3302,CH1320,CH1320S LCR METER / Rdc:CH16502,Agilent33420A MICRO OHMMETER.

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

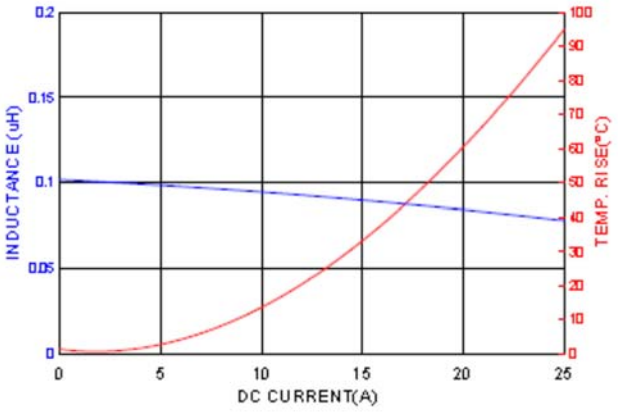
5.Saturation Current (Isat) will cause L0 to drop approximately 20%.

6.The part temperature (ambient + temp rise) should not exceed 125℃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.

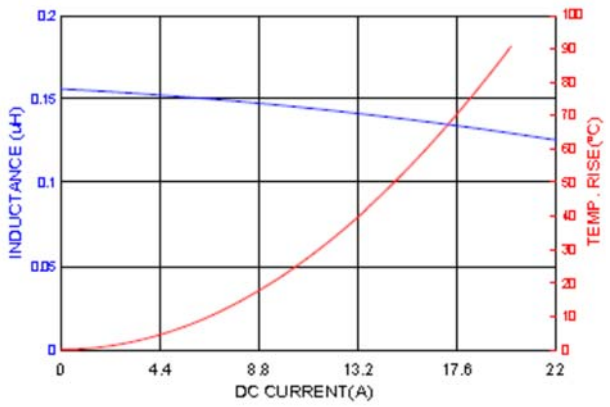
7.Special inquiries besides the above common used types can be met on your requirement.

TYPICALELECTRICALCHARACTERISTICS:

HMPL0412HP-R10



HMPL0412HP-R15



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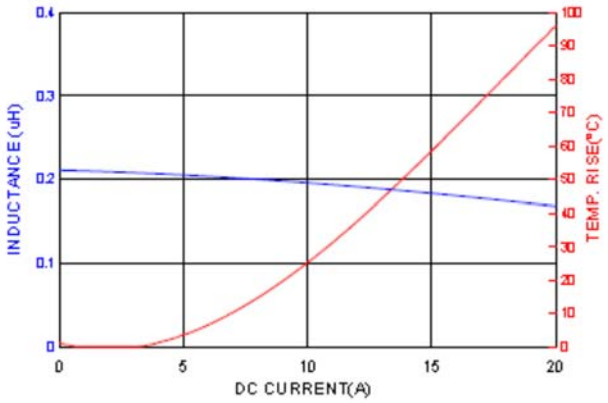
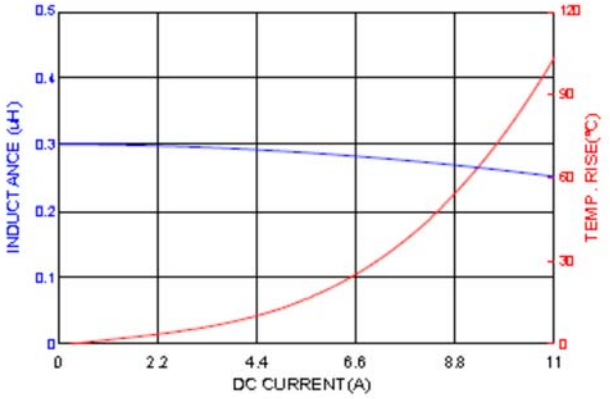
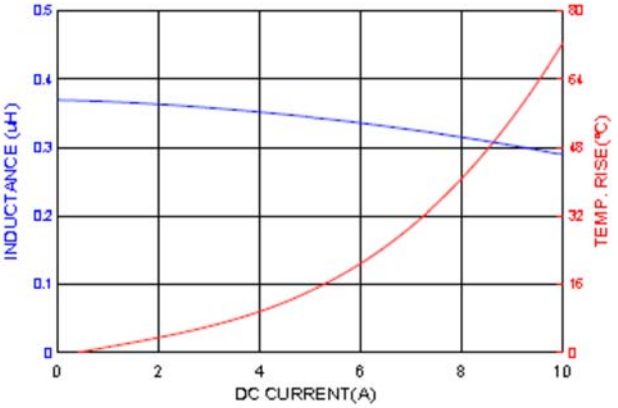


HMPL0412HP-R33



HMPL0412HP-R36



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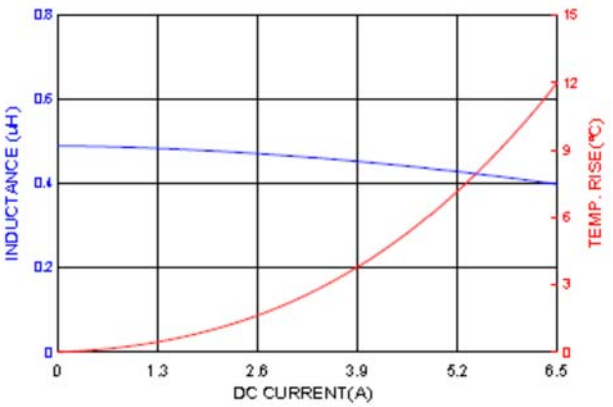

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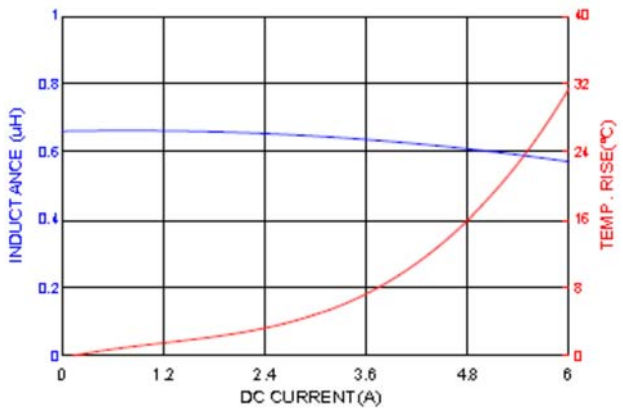
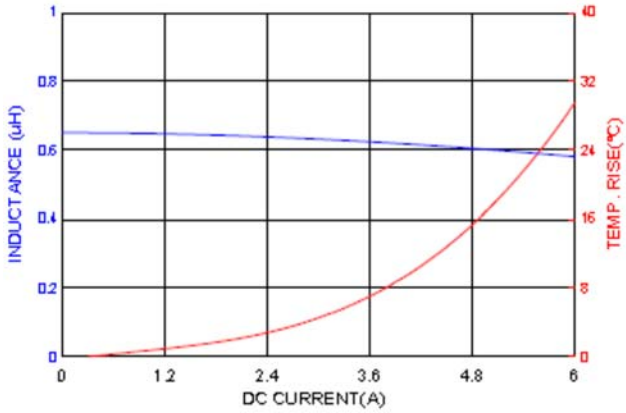
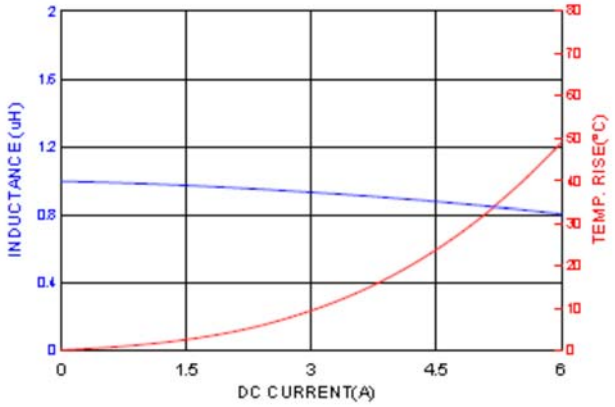


HMPL0315H-R68



HMPL0412HP-1R0



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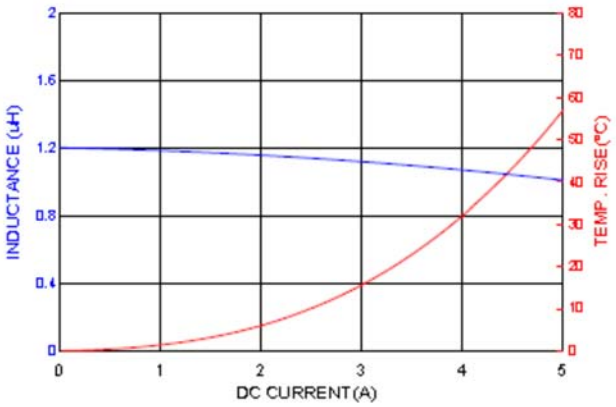
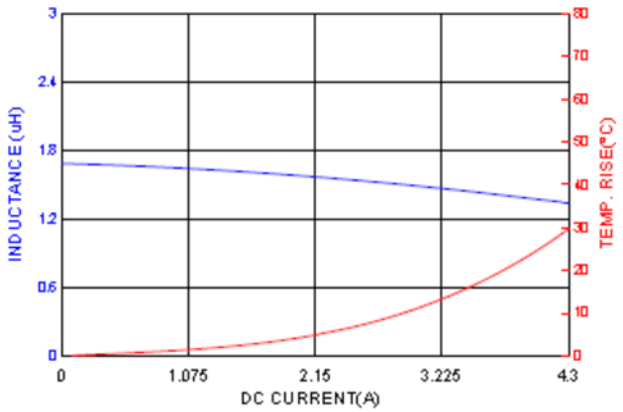
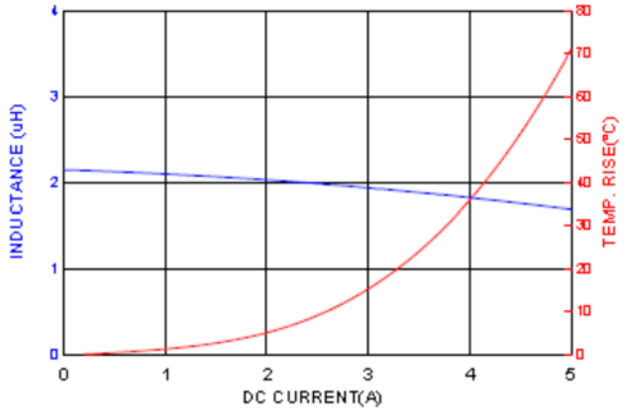


HMPL0412HP-1R5



HMPL0412HP-2R2



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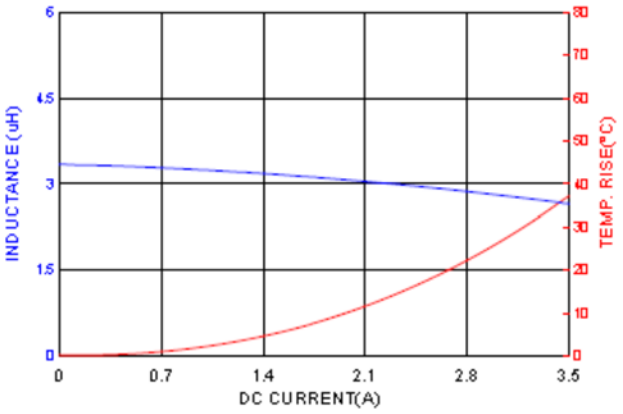

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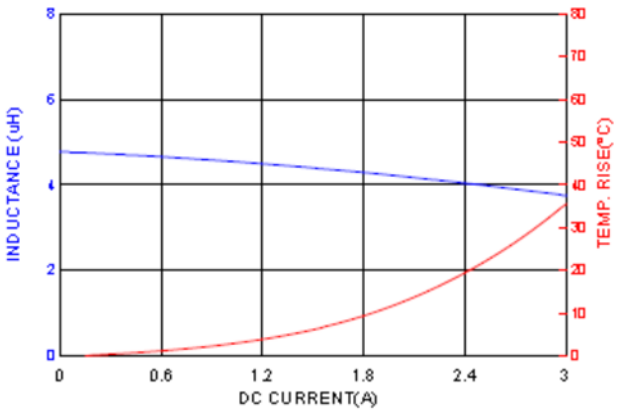
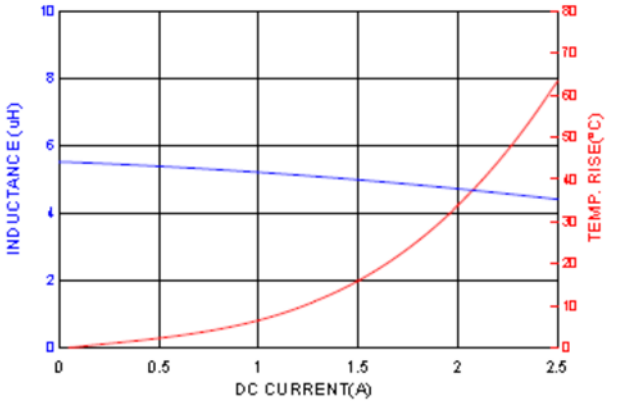
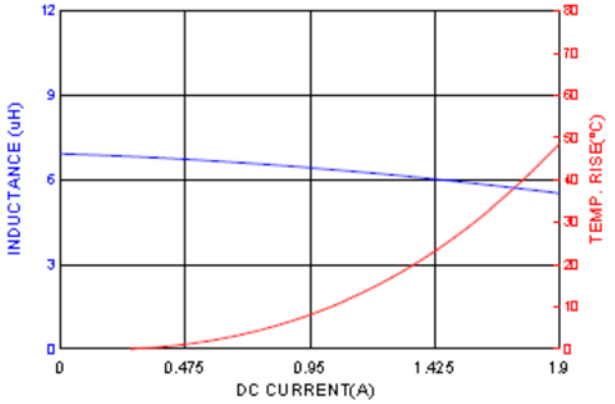


HMPL0412HP-5R6



HMPL0412HP-6R8



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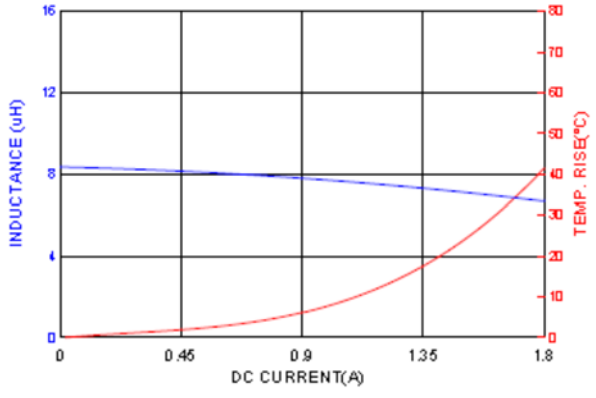
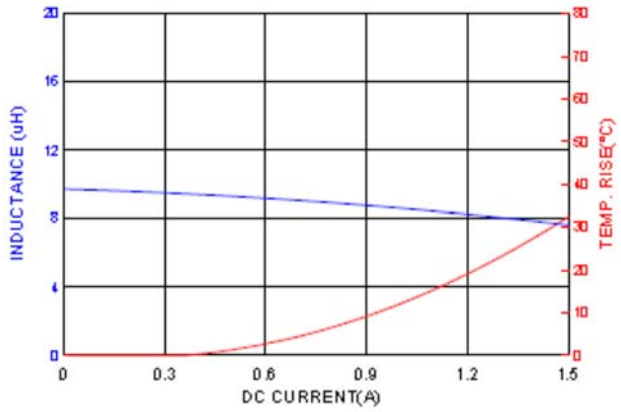
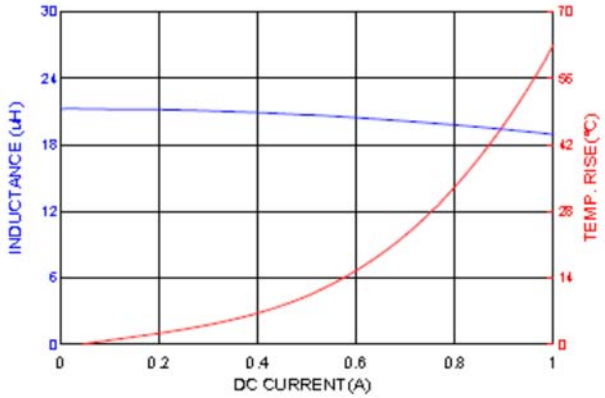


HMPL0315H-150

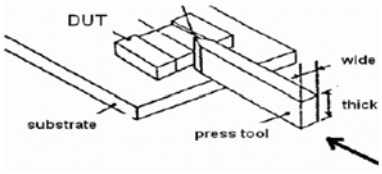


HMPL0412HP-220



Reliability and Test Condition

Item	Performance	Test Condition
Operating temperature	-40~+125℃ (Including self - temperature rise)	
Storage temperature	1. -10~+40℃,50~60%RH (Product with taping) 2. -40~+125℃(on board)	
Electrical Performance Test		
Inductance	Refer to standard electrical characteristics list.	HP4284A,CH11025,CH3302,CH1320,CH1320S LCR Meter.
DCR		CH16502,Agilent33420A Micro-Ohm Meter.
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		
Life Test	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 2 times.(IPC/JEDEC J-STD-020DClassification Reflow Profiles) Temperature： 125±2℃(Inductor) Applied current：rated current Duration：1000±12hrs Measured at room temperature after placing for 24±2 hrs
Load Humidity		Preconditioning: Run through IR reflow for 2 times.(IPC/JEDEC J-STD-020DClassification Reflow Profiles Humidity：85±2 % R.H, Temperature：85℃±2℃ Duration：1000hrs Min. with 100% rated current Measured at room temperature after placing for 24±2 hrs
Moisture Resistance		Preconditioning: Run through IR reflow for 2 times.(IPC/JEDEC J-STD-020DClassification Reflow Profiles 1. Baked at50℃ for 25hrs, measured at room temperature after placing for 4 hrs. 2. Raise temperature to 65±2℃ 90-100%RH in 2.5hrs, and keep 3 hours, cool down to 25℃ in 2.5hrs. 3. Raise temperature to 65±2℃ 90-100%RH in 2.5hrs, and keep 3 hours, cool down to 25℃ in 2.5hrs,keep at 25℃ for 2 hrs then keep at -10℃ for 3 hrs 4. Keep at 25℃ 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.

<table>
<tr><td>Thermal
shock</td><td rowspan="2"></td><td>Preconditioning: Run through IR reflow for 2 times.(IPC/JEDEC J-STD-020DClassification
Reflow Profiles
Condition for 1 cycle
Step1：-40±2℃ 30±5min
Step2：25±2℃ ≦0.5min
Step3：125±2℃ 30±5min
Number of cycles： 500
Measured at room temperature after placing for 24±2 hrs</td></tr>
<tr><td>Vibration</td><td>Oscillation Frequency: 10 ~ 2K ~ 10Hz for 20 minutes
Equipment： Vibration checker
Total Amplitude:1.52mm±10%
Testing Time : 12 hours(20 minutes, 12 cycles each of 3 orientations)。</td></tr>
<tr><td>Bending</td><td rowspan="3">Appearance：No damage.
Impedance：within±15% of initial value
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>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.</td></tr>
<tr><td>Shock</td><td><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></td></tr>
<tr><td>Solder ability</td><td>Preheat: 150℃,60sec.。
Solder: Sn96.5% Ag3% Cu0.5%
Temperature: 245±5℃。
Flux for lead free: Rosin. 9.5%。
Dip time: 4±1sec。
Depth: completely cover the termination</td></tr>
<tr><td>Resistance to Soldering Heat</td><td rowspan="2">More than 95% of the terminal electrode should be covered with solder。</td><td>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></td></tr>
<tr><td>Terminal
Strength</td><td>Preconditioning: Run through IR reflow for 2 times.(IPC/JEDEC J-STD-020DClassification Reflow Profiles
With the component mounted on a PCB with the device to be tested, apply a force(>0805:1kg , <=0805:0.5kg)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.
 
</td></tr>
</table>

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