I. SCOPE :

This specification applies to the Pb Free high current type SMD inductors for

MSI-221506HPF-SERIES-

Warn : This product series can't be used in synchronous rectification circuit that is over 24V.

PRODUCT INDENTIFICATION

<u>MSI-221506HPF-R15</u> <u>M</u> -E -

1 2 34 5

① Product Code

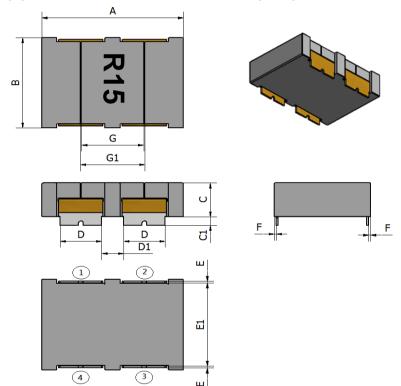
② Dimensions Code

③ Inductance Code

Tolerance Code

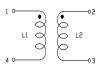
Inner Control Code

(1) SHAPES AND DIMENSIONS (mm)



A:	21.9 Max.	mm
B:	14.9 Max.	mm
C:	5.50±0.1	mm
C1:	1.40±0.1	mm
D:	6.40±0.1	mm
D1:	3.35±0.2	mm
E:	0.30±0.05	mm
E1:	13.55±0.2	mm
F:	0.30±0.10	mm
G:	8.6 Min.	mm
G1:	10.8 Max.	mm

SCHEMATIC



(2) ELECTRICAL SPECIFICATIONS SEE TABLE 1

TEST INSTRUMENTS

L : HP 4284A PRECISION LCR METER (or equivalent) RDC : CHROMA MODEL 16502 MILLIOHMMETER (or equivalent) Isat :WK3255B+3265B (or equivalent)

(3) CHARACTERISTICS

(3)-1 Operate temperature range $-40^{\circ}C \sim +125^{\circ}C$ (Including self temp. rise)

(3)-2 Storage temperature range $-40^\circ\!\!C\!\sim\!+125^\circ\!\!C$

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TABLE

MAGLAYERS	Inductance	Resistance	Rated DC Current			
	(µH)	RDC(mΩ)	Isat1(A)	Isat2(A)	Irms(A)	Marking
PT/NO.	L1,L2	L1,L2	L1,L2	L1,L2	L1,L2	
MSI-221506HPF-R15M-E	0.15±20%	0.14±10%	75.0	60.7	55	R15

% L Test Frequency : 100KHz/1.0V

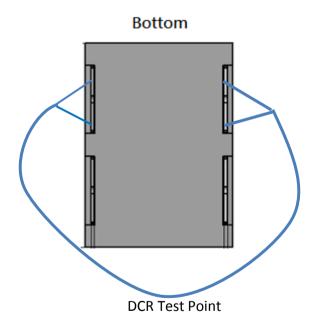
%Isat1 : Based on inductance change (△L/Lo : drop 25% Typ.)@ ambient temp. 25℃

Isat2 : Based on inductance change (\triangle L/Lo : drop 20% Typ.)@ ambient temp. 125°C

Irms : Based on temperature rise ($\triangle T$: 40°C TYP.)

Rated DC Current: The less value which is lsat 1 or Irms .

RDC TEST POINT





(4) RELIABILITY TEST METHOD ELECTRICAL

TEST ITEM	SPECIFICATION	TEST DETAILS
Temperature	∆L/L20℃≦±10%	The test shall be performed after the sample has stabilized in
characteristics	0∼2000 ppm/° C	an ambient temperature of -20 to +85 $^\circ\!\mathrm{C}$,and the value
		calculated based on the value applicable in a normal
		temperature and narmal humidity shall be $ riangle L/L20^\circ C \leq \pm 10\%$.

MECHANICAL

TEST ITEM	SPECIFICATION	TEST DETAILS
Substrate bending	∆L/Lo≦±5%	The sample shall be soldered onto the printed circuit board
		in figure 1 and a load applied unitil the figure in the arrow
	There shall be	direction is made approximately 3mm.(keep time 30 seconds)
	no mechanical	PCB dimension shall the page 7/9
	damage or elec-	F(Pressurization)
	trical damage.	$\overline{\Box}$
		R5 45±2 45±2
		10 20 R340
		PRESSURE ROD figure-1



MECHANICAL

TEST ITEM		SPECIFICATION			
Vibration	∆L/Lo≦±5%	The sample shall be soldered onto the printed circuit board			
		and when a vibration having an amplitude of 1.52mm			
	There shall be	and a frequency of from 10 to 55Hz/1 minute repeated should			
	no mechanical	be applied to the 3 directions (X,Y,Z) for 2 hours each.			
	damage.	(A total of 6 hours)			
Solderability	New solder	Flux (rosin, isopropyl alcohol{JIS-K-1522}) shall be coated			
	More than 90%	over the whole of the sample before hard, the sample shall			
		then be preheated for about 2 minutes in a temperature of			
		130 \sim 150 $^\circ\!\mathrm{C}$ and after it has been immersed to a depth 0.5mm			
		below for 3 ± 0.2 seconds fully in molten solder M705 with			
		a temperature of 245±5℃.			
		More than 90% of the electrode sections shall be couered			
		with new solder smoothly when the sample is taken out of			
		the solder bath.			
Resistance to	There shall be	Temperature profile of reflow soldering			
Soldering heat	no damage or	\odot 300 - soldering			
(reflow soldering)	problems.	o (Peak temperature 260±3 (10 sec)			
		30 sec Min (230 ⁺⁰ ℃)			
		p 150 Pre-heating (200 °)			
		Slow cooling (Stored at room			
		$\begin{bmatrix} 0 & - \\ 50 \end{bmatrix} / \begin{bmatrix} 150 \sim 180^{\circ}C \\ 150 \sim \end{bmatrix}$ (other at both temperature)			
		2 min 10 sec. 2 min. or more			
		k →k			
		The specimen shall be passed through the reflow oven with the			
		condition shown in the above profile for 1 time.			
		The specimen shall be stored at standard atmospheric conditions			
		for 1 hour, after which the measurement shall be made.			



ENVIROMENT CHARACTERISTICS

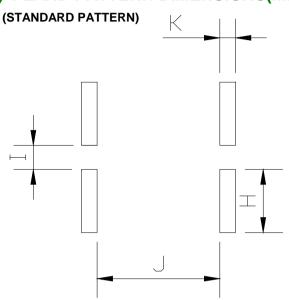
There shall be no mechanical damage. ∆L/Lo≦±5% There shall be no mechanical	a tempe Upon co sample humidity The sam a tempe Upon co after the normal I	rature omplet has bo y for 1 nple sl rature omplet samp	nall be left for 96±4 hour of -40±2℃. ion of the test, the mea	humidity. t shall be made after t perature and normal rs in an atmosphere v	the			
There shall be no mechanical damage. ∆L/Lo≦±5% There shall be no mechanical damage.	Upon co sample humidity The sam a tempe Upon co after the normal I	omplet has be y for 1 nple sl rature omplet s samp	ion of the measuremen een left in a normal temphour. hour. nall be left for 96±4 hour of -40±2°C.	t shall be made after to perature and normal rs in an atmosphere v				
no mechanical damage. ∆L/Lo≦±5% There shall be no mechanical damage.	sample humidity The sam a tempe Upon co after the normal	has be y for 1 nple sl rature omplet samp	een left in a normal temp hour. nall be left for 96±4 hour of -40±2℃. ion of the test, the mean	perature and normal rs in an atmosphere v				
damage. ∆L/Lo≦±5% There shall be no mechanical damage.	humidity The sam a tempe Upon cc after the normal I	y for 1 nple sl rature omplet samp	hour. nall be left for 96±4 hour of -40±2℃. ion of the test, the mean	rs in an atmosphere v	vith			
∆L/Lo≦±5% There shall be no mechanical damage.	The sam a tempe Upon co after the normal I	nple sl rature omplet samp	nall be left for 96±4 hour of -40±2℃. ion of the test, the mea		vith			
There shall be no mechanical damage.	a tempe Upon cc after the normal I	rature omplet samp	of -40±2℃. ion of the test, the mea		vith			
There shall be no mechanical damage.	a tempe Upon cc after the normal I	rature omplet samp	of -40±2℃. ion of the test, the mea		vith			
There shall be no mechanical damage.	Upon co after the normal I	omplet samp	ion of the test, the mea	surement shall be ma				
no mechanical damage.	after the normal	e samp		surement shall be ma	a temperature of -40±2℃.			
lamage.	normal		ole has been left in a no	Upon completion of the test, the measurement shall be made				
		ا۔ : معرب ما	after the sample has been left in a normal temperature and					
∆L/Lo≦±5%		normal humidity for 1 hour.						
	The sample shall be subject to 5 continuos cycles, such as shown							
	in the table 2 below and then it shall be subjected to standard							
There shall be	stmospheric conditions for 1 hour, after which measurement							
no other dama-	shall be made.							
ge of problems								
	table 2							
			Temperature	Duration				
		1	−40 ±3 ℃	30 min.				
			(Themostat No.1)					
		2	Standard	No.1→No.2				
		_	atmospheric					
		3	125±2℃	30 min.				
	3	(Themostat No.2)						
		4	Standard	No.2→No.1				
			atmospheric					
∆L/Lo≦±5%	The sample shall be left for 96±4 hours in a temperature of			1				
There shall be	Upon completion of the test, the measurement shall be made after the sample has been left in a normal temperature and							
J		-	-					
	o other dama- e of problems ∆L/Lo≦±5% here shall be o mechanical amage.	o other dama- e of problems shall be ∆L/Lo≦±5% The san 40±2°C a here shall be Upon co o mechanical after the amage. normal	o other dama- e of problems shall be made 1 1 2 3 4 $\Delta L/Lo \le \pm 5\%$ The sample sh $40\pm 2^{\circ}C$ and a b $40\pm 2^{\circ}C$ and a b Upon complet o mechanical after the samp amage. normal humid	b o other dama- e of problems shall be made. table 2 table 2	o other dama- e of problemsshall be made.a for problemstable 2Image: transformed base of problemsImage: transformed base of transformed base			



(5) LAND DIMENSION (Ref.)

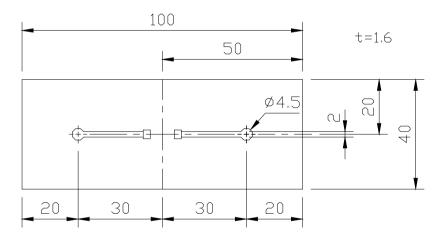
PCB: GLASS EPOXY t=1.6mm

(5)-1 LAND PATTERN DIMENSIONS(mm)



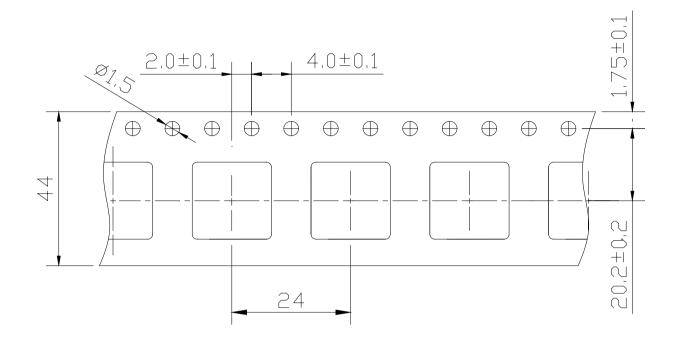
H: 7.2	mm
I: 2.8	mm
J: 12.90	mm
K: 1.2	mm

(5)-2 SUBSTRATE BENDING TEST BENDING TEST BOARD



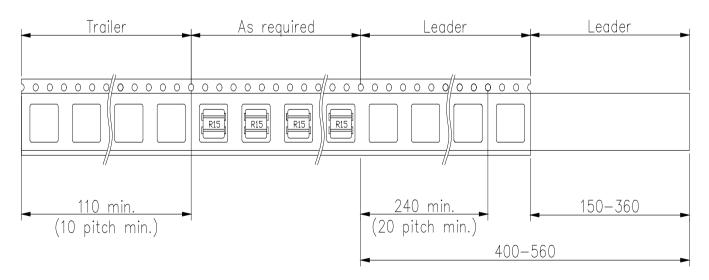


(6) PACKAGING (6)-1 CARRIER TAPE DIMENSIONS (mm)



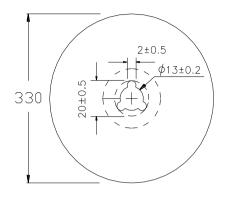
(6)-2 TAPING DIMENSIONS (mm)

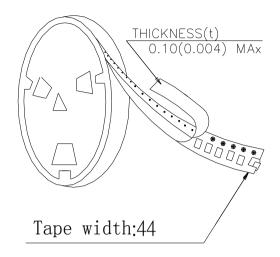






(6)-3 REEL DIMENSIONS (mm)





(6)-4 QUANTITY

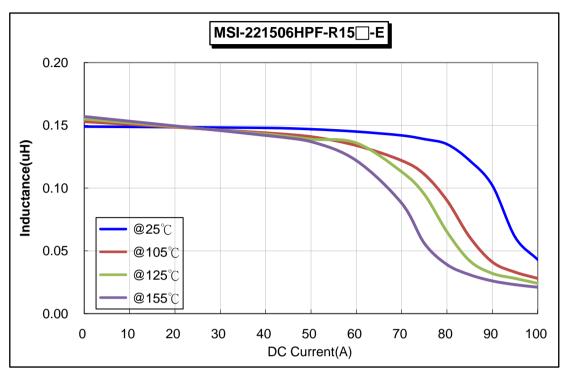
300 pcs/Reel

The products are packaged so that no damage will be sustained.

Please note that the contents may change without any prior notice due to reasons such as upgrading.

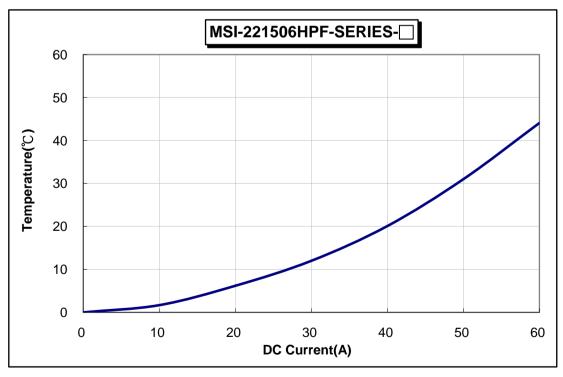


TYPICAL ELECTRICAL CHARACTERISTICS



INDUCTANCE vs. DC CURRENT@100kHz/1.0V

Temperature Rise vs. DC Current





MSI-221506HPF-SERIES-

ATTACHMENT-1