#### SCOPE :

This specification applies to the Pb Free high current type SMD inductors for MSCDRI-5010X-SERIES

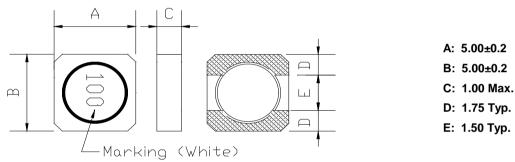
Warn: It is here not to use synchronous rectification circuit !

#### **PRODUCT INDENTIFICATION**

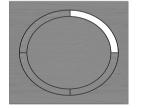
<u>MSCDRI</u> -	<u>5010X</u> -	<u>100</u>	M
1	2	3	4

- ① Product Code
- ② Dimensions Code
- **③ Inductance Code**
- Tolerance Code

#### (1) SHAPES AND DIMENSIONS



#### **Void Appearance Tolerance Limit**



 The length of the hole in the epoxy of the sealed glue position should be less than 1/4 of the DR core 's circumference, otherwise, it is NG.
 The total length of the amount of hole in the epoxy should be less than 1/4 of the DR core 's circumference, otherwise, it is NG.

#### (2) ELECTRICAL SPECIFICATIONS SEE TABLE 1

#### SEE TADLE T

TEST INSTRUMENTS

- L : HP 4284A PRECISION LCR METER (or equivalent)
- RDC : CHROMA MODEL 16502 MILLIOHMMETER (or equivalent)



mm

mm

mm

mm

mm

TABLE <sup>•</sup>	1
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MAGLAYERS	Inductance	Percent	Test	Resistance	Rated D	C Current	Mortsing
PT/NO.	L(µH)	Tolerance	Frequency	RDC(Ω)Max.	IDC1(A)	IDC2(A)	Marking
MSCDRI-5010X-R33	0.33	Ν	100kHz/0.1V	30m	3.50	3.00	R33
MSCDRI-5010X-R68	0.68	Ν	100kHz/0.1V	48m	2.50	2.00	R68
MSCDRI-5010X-1R0	1.0	M,N	100kHz/0.1V	72m	1.70	1.40	1R0
MSCDRI-5010X-1R5	1.5	M,N	100kHz/0.1V	72m	1.70	1.40	1R5
MSCDRI-5010X-2R2	2.2	M,N	100kHz/0.1V	0.100	1.40	1.20	2R2
MSCDRI-5010X-3R3	3.3	M,N	100kHz/0.1V	0.125	1.10	1.10	3R3
MSCDRI-5010X-4R7	4.7	М	100kHz/0.1V	0.175	1.00	0.98	4R7
MSCDRI-5010X-5R6	5.6	М	100kHz/0.1V	0.240	0.90	0.92	5R6
MSCDRI-5010X-6R8	6.8	М	100kHz/0.1V	0.255	0.84	0.85	6R8
MSCDRI-5010X-100	10	М	100kHz/0.1V	0.35	0.68	0.80	100
MSCDRI-5010X-150	15	М	100kHz/0.1V	0.50	0.55	0.75	150
MSCDRI-5010X-220	22	М	100kHz/0.1V	0.67	0.45	0.62	220
MSCDRI-5010X-330	33	М	100kHz/0.1V	1.05	0.38	0.55	330
MSCDRI-5010X-470	47	М	100kHz/0.1V	1.45	0.30	0.44	470
MSCDRI-5010X-680	68	М	100kHz/0.1V	2.00	0.26	0.35	680
MSCDRI-5010X-101	100	М	100kHz/0.1V	3.10	0.22	0.28	101
MSCDRI-5010X-121	120	М	100kHz/0.1V	3.50	0.20	0.25	121
MSCDRI-5010X-151	150	М	100kHz/0.1V	4.25	0.18	0.23	151
MSCDRI-5010X-221	220	М	100kHz/0.1V	6.25	0.15	0.20	221
MSCDRI-5010X-331	330	М	100kHz/0.1V	8.60	0.12	0.185	331
MSCDRI-5010X-471	470	М	100kHz/0.1V	12.7	0.09	0.150	471
MSCDRI-5010X-561	560	М	100kHz/0.1V	15.7	0.085	0.135	561

**※** □ specify the inductance tolerance, M(±20%), N(±30%)

% IDC1 : Based on inductance change ( $\triangle$ L/Lo : drop 30% Max.) @ ambient temp. 25 $^{\circ}$ C

IDC2 : Based on temperature rise ( $\triangle T$  : 40°C TYP.)

Rated DC Current : The less value which is IDC1 or IDC2.



# (4) RELIABILITY TEST METHOD

## 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.	Ţ			
		R5 45±2 45±2 10 20 R340			
		PRESSURE ROD figure-1			
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)			
	New solder	Flux (rosin, isopropyl alcohol{JIS-K-1522}) shall be coated			
Solderability	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			
		$130 \sim 150^{\circ}$ 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.			



## MECHANICAL

TEST ITEM	SPECIFICATION			
Resistance to The Soldering heat no	There shall be no damage or problems.	Temperature profile of reflow soldering $(2)$ $300$ $soldering$ $(2)$ $300$ $(Peak \ temperature \ 260\pm3^{\circ}C \ 10 \ sec$ $300$ $250$ $(Peak \ temperature \ 260\pm3^{\circ}C \ 10 \ sec$ $300$ $200$ $(Peak \ temperature \ 260\pm3^{\circ}C \ 10 \ sec$ $300$ $sec \ Min$ $(230^{+0}\ C)$ $150$ $150 \ 150 \ -180^{\circ}C$ Slow cooling $(Stored \ at \ room \ temperature)$ $temperature$		
		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 condition for 1 hour, after which the measurement shall be made.		

## ELECTRICAL

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



# **ENVIROMENT CHARACTERISTICS**

∆L/Lo≦±5%	The sam	nple sł	hall be left for 96±4 hour	s in an atmospere with	
				•	
	a temperature of 125 $^\circ\!\!\mathrm{C}$ and a normal humidity.				
There shall be	Upon co	Upon completion of the measurement shall be made after the			
no mechanical	sample	sample has been left in a normal temperature and normal			
damage.	humidit	y for 1	hour.		
∆L/Lo≦±5%	The sam	The sample shall be left for 96±4 hours in an atmosphere with			
	a tempe	rature	of -25±3℃.		
There shall be	Upon co	Upon completion of the test, the measurement shall be made			
no mechanical	after the	) samp	ole has been left in a nor	mal temperature and	
damage.	normal	humid	lity for 1 hour.		
∆L/Lo≦±5%	The sam	nple sl	hall be subject to 5 cont	inuos cycles, such as show	vn
	in the ta	ble 2 l	below and then it shall b	be subjected to standard	
There shall be	atmospl	heric c	conditions for 1 hour, af	ter which measurement	
no other dama-	shall be made.				
ge of problems					
			table 2		
			Temperature	Duration	
			-		
		1		30 min.	
			Standard		_
		2	atmospheric	No.1→No.2	
			-		
		3		30 min.	
		4		No.2→No.1	
		L	annoophono		
∆L/Lo≦±5%	The sample shall be left for 96±4 hours in a temperature of				
	40±2 $^{\circ}$ C and a humidity(RH) of 90 $\sim$ 95%.				
There shall be	Upon completion of the test, the measurement shall be made				
no mechanical	after the sample has been left in a normal temperature and				
damage.	normal humidity more than 1 hour.				
	no mechanical damage. $\triangle L/Lo \leq \pm 5\%$ There shall be no mechanical damage. $\triangle L/Lo \leq \pm 5\%$ There shall be no other dama- ge of problemsge of problems $\triangle L/Lo \leq \pm 5\%$ There shall be no other dama- ge of problems	no mechanical damage.sample humiditi $\triangle L/Lo \leq \pm 5\%$ The sam a tempeThere shall be no mechanical damage.Upon co after the normal li $\triangle L/Lo \leq \pm 5\%$ The sam in the ta atmosplThere shall be no other dama- ge of problemsThe sam in the ta atmosplge of problemsShall be shall be atmospl $\triangle L/Lo \leq \pm 5\%$ The sam atmosplThere shall be no other dama- ge of problemsThe sam atmospl $\triangle L/Lo \leq \pm 5\%$ The sam 40 ± 2°C a after the after the after the	no mechanical damage.sample has be humidity for 1 $\triangle L/Lo \leq \pm 5\%$ The sample sl a temperatureThere shall be no mechanical damage.Upon complet normal humid $\triangle L/Lo \leq \pm 5\%$ The sample sl in the table 2 l a throspheric co shall be madeThere shall be no other dama- ge of problemsImage: 11234 $\triangle L/Lo \leq \pm 5\%$ The sample sl in the table 2 l a throspheric co shall be made1123411234112341112334111123341111112334111111233411111123341111112334111111111111111111111111111 <td>no mechanical damage.sample has been left in a normal temp humidity for 1 hour.<math>\triangle L/Lo \leq \pm 5\%</math>The sample shall be left for 96±4 hour a temperature of -25±3°C.There shall be no mechanical damage.Upon completion of the test, the meas after the sample has been left in a nor normal humidity for 1 hour.<math>\triangle L/Lo \leq \pm 5\%</math>The sample shall be subject to 5 cont in the table 2 below and then it shall be atmospheric conditions for 1 hour, after shall be made.There shall be no other dama- ge of problemsTemperature 1 -25±3°C (Themostat No.1)2Standard atmospheric3<math>85\pm 2°C</math> (Themostat No.2)4Standard atmospheric<math>\triangle L/Lo \leq \pm 5\%</math>The sample shall be left for 96±4 hour 40±2°C and a humidity(RH) of 90~95%There shall be no mechanicalThe sample has been left in a nor after the sample has been left in a nor</td> <td>no mechanical damage.sample has been left in a normal temperature and normal humidity for 1 hour.<math>\triangle L/Lo \leq \pm 5\%</math>The sample shall be left for 96±4 hours in an atmosphere with a temperature of -25±3°C.There shall be no mechanical damage.Upon completion of the test, the measurement shall be made after the sample has been left in a normal temperature and normal humidity for 1 hour.<math>\triangle L/Lo \leq \pm 5\%</math>The sample shall be subject to 5 continuos cycles, such as show in the table 2 below and then it shall be subjected to standard atmospheric conditions for 1 hour, after which measurement shall be made.ge of problems<math>table 2</math>table 2Temperature Duration 1<math>2</math><math>Standard</math> atmospheric<math>3</math><math>85\pm 2^{\circ}C</math> <math>30</math> min.<math>3</math><math>85\pm 2^{\circ}C</math> <math>30</math> min.<math>3</math><math>85\pm 2^{\circ}C</math> <math>30</math> min.<math>4</math><math>Standard</math> atmospheric<math>4</math><math>Standard</math> <math>atmospheric<math>4</math><math>Standard</math> <math>atmospheric<math>4</math><math>Standard</math> <math>atmospheric<math>\Delta L/Lo \leq \pm 5\%</math>The sample shall be left for 96±4 hours in a temperature of <math>40\pm 2^{\circ}C</math> and a humidity(RH) of 90~95%.There shall be no mechanicalThe sample has been left in a normal temperature and</math></math></math></td>	no mechanical damage.sample has been left in a normal temp humidity for 1 hour. $\triangle L/Lo \leq \pm 5\%$ The sample shall be left for 96±4 hour a temperature of -25±3°C.There shall be no mechanical damage.Upon completion of the test, the meas after the sample has been left in a nor normal humidity for 1 hour. $\triangle L/Lo \leq \pm 5\%$ The sample shall be subject to 5 cont in the table 2 below and then it shall be atmospheric conditions for 1 hour, after shall be made.There shall be no other dama- ge of problemsTemperature 1 -25±3°C (Themostat No.1)2Standard atmospheric3 $85\pm 2°C$ (Themostat No.2)4Standard atmospheric $\triangle L/Lo \leq \pm 5\%$ The sample shall be left for 96±4 hour 40±2°C and a humidity(RH) of 90~95%There shall be no mechanicalThe sample has been left in a nor after the sample has been left in a nor	no mechanical damage.sample has been left in a normal temperature and normal humidity for 1 hour. $\triangle L/Lo \leq \pm 5\%$ The sample shall be left for 96±4 hours in an atmosphere with a temperature of -25±3°C.There shall be no mechanical damage.Upon completion of the test, the measurement shall be made after the sample has been left in a normal temperature and normal humidity for 1 hour. $\triangle L/Lo \leq \pm 5\%$ The sample shall be subject to 5 continuos cycles, such as show in the table 2 below and then it shall be subjected to standard atmospheric conditions for 1 hour, after which measurement shall be made.ge of problems $table 2$ table 2Temperature Duration 1 $2$ $Standard$ atmospheric $3$ $85\pm 2^{\circ}C$ $30$ min. $3$ $85\pm 2^{\circ}C$ $30$ min. $3$ $85\pm 2^{\circ}C$ $30$ min. $4$ $Standard$ atmospheric $4$ $Standard$ $atmospheric4Standardatmospheric4Standardatmospheric\Delta L/Lo \leq \pm 5\%The sample shall be left for 96±4 hours in a temperature of40\pm 2^{\circ}C and a humidity(RH) of 90~95%.There shall beno mechanicalThe sample has been left in a normal temperature and$



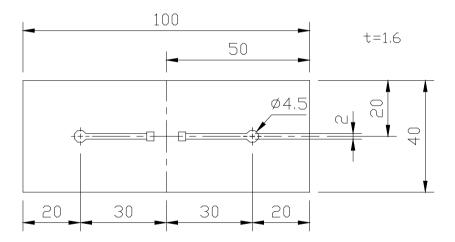


PCB: GLASS EPOXY t=1.6mm

(5)-1 LAND PATTERN DIMENSIONS

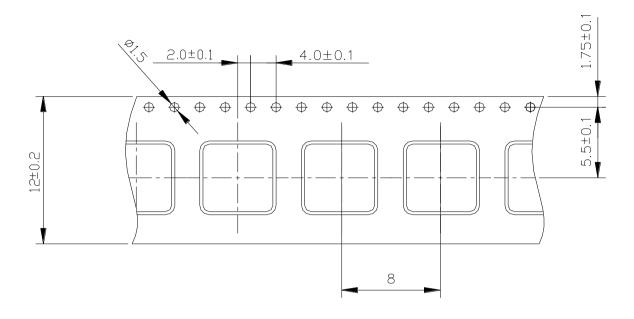
(STANDARD PATTERN) unit : mm

#### (5)-2 SUBSTRATE BENDING TEST BENDING TEST BOARD

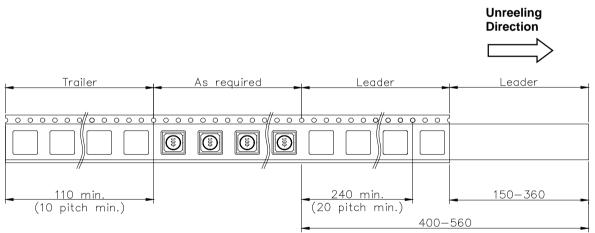




## (6) PACKAGING (6)-1 CARRIER TAPE DIMENSIONS (mm)

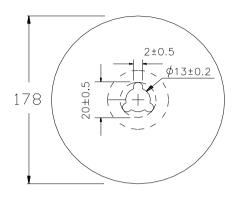


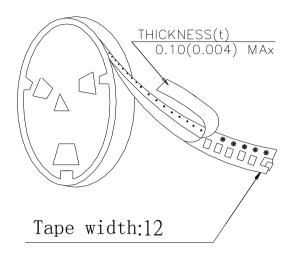
## (6)-2 TAPING DIMENSIONS (mm)





# (6)-3 REEL DIMENSIONS (mm)





## (6)-4 QUANTITY

#### 1000pcs/Reel

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



MSCDRI-5010X-SERIES