



# Mag Layers USA, INC

## Specification Sheet

**P/N : MSCDRI-7040AL-SERIES-RU**

### Products:

[Molded Power Chokes](#)

[Multilayer Chip Inductors](#)

[Lan Transformer](#)

[RF Passive / Antennas](#)

[Automotive](#)

### Certifications:

[ISO9001](#)

[IATF16949](#)

[ISO14001](#)

[QC080000](#)

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## REVISIONS

REV.	Description	Date	Approved by	Checked by	Checked by	Prepared by
00	Issue	2009.08.27	Alfa	Jill	George	Moore
01	P.2/9 Dimension "A" revised : 7.8→7.5 Dimension "B" revised : 7.4→7.5 Dimension "E" revised : 0.9→1.0 P.3/9 New item revised : 680	2009.09.11	Alfa	Marco	Sara	George
02	PT/NO Revised : MSCDRI-7040AL-SERIES-RU→ MSCDRI-7040AL-SERIES-□□ P.1/9 Index is added : Shelf life P.2/9 CHARACTERISTICS updated P.2/9 Materials updated P.6/9 High temperature storage updated	2012.03.08	Vincent	Marco	Sara	George



## I . SCOPE :

This specification applies to the Pb Free high current type SMD inductors for  
MSCDRI-7040AL-SERIES-□□

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

### PRODUCT IDENTIFICATION

**MSCDRI - 7040AL - 100 M - □□-RU**

①                      ②                      ③ ④ ⑤

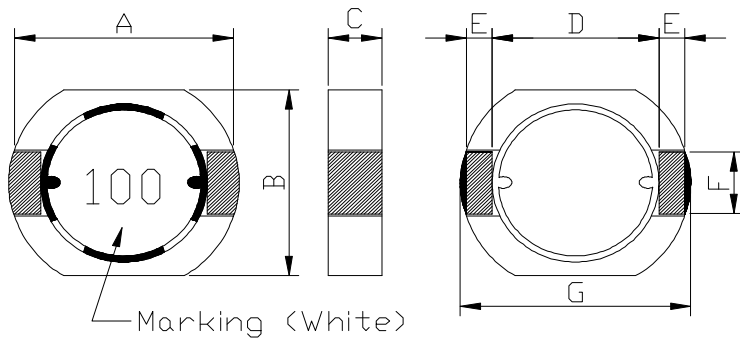
- ① Product Code
- ② Dimensions Code
- ③ Inductance Code
- ④ Tolerance Code
- ⑤ Inner Control Code

## II . INDEX :

LISTED ITEM	ATTACHEMENT & TABLES	PAGE
1. SHAPES AND DIMENSIONS	Please see (1)	2/9
2. MATERIALS	Please see (3)	2/9
3. ELECTRICAL SPECIFICATIONS	Please see (2)	2/9 , 3/9
4. CHARACTERISTICS	Please see (3)	2/9 , 3/9
5. RELIABILITY TEST METHOD	Please see (4)	4/9 , 5/9 , 6/9
6. LAND DIMENSION (Ref.)	Please see (5)	7/9
7. PACKAGING	Please see (6)	8/9 , 9/9
<b>8.STANDARD TEST CONDITIONS</b> Unless otherwise specified, test condition should be Temp.=20±5℃, Humidity=35~85% But if needed, then test condition should be Temp.=20±2℃, Humidity=65±5%		
<b>9.SHELF LIFE</b> Storage Condition:The temperature should be within-40℃ ~105℃ and humidity should be less than 75%RH. The product should be used within 12 months from the time of delivery. <b>In addition, suggest to use product within 6 months from the time of delivery.</b>		



## (1) SHAPES AND DIMENSIONS



A:	7.5±0.5	mm
B:	7.5±0.5	mm
C:	4.0 Max.	mm
D:	5.4 Typ.	mm
E:	1.0 Typ.	mm
F:	2.5 Typ.	mm
G:	9.2 Max.	mm

## (2) ELECTRICAL SPECIFICATIONS

### SEE TABLE 1

#### TEST INSTRUMENTS

L : HP 4284A PRECISION LCR METER (or equivalent)

RDC : CHROMA MODEL 16502 MILLIOHMMETER (or equivalent)

## (3) CHARACTERISTICS

(3)-1 Ambient temperature ..... +60°C Max.

(3)-2 Operate temperature range ..... -40°C ~ +125°C

(Including self temp. rise)

(3)-3 Storage temperature range ..... -40°C ~ +125°C

## MATERIALS

NO.	ITEM	DESCRIPTION & TYPE	UL NO.	MANUFACTURER
1	DR CORE	FERRITE		SHINN DER ELECTRONIC CO., LTD. RU YUAN DONG YANG GUANG MAGNETIC MATERIALS CO.,LTD.
2	RING CORE	FERRITE		FENGYIN ELECTRONICS CORP.
3	WIRE	POLYURETHANE ENAMELLED COPPER WIRE	E258243 E84081	ELEKTRISOLA CO., LTD. PACIFIC ELECTRICAL WIRE & CABLE CO., LTD.
4	SOLDER	Sn99.3%/Cu0.7%		SHENMAO TECHNOLOGY INC. OR EQUIV.
5	PIN BASE	C1100		KUAN SHAN GUANG YU ELECTRONI CO.,LTD. OR EQUIV.
6	ADHESIVE	EPOXY RESIN (FOR RING CORE ASSEMBLY)		NAGASE TRADING CO., LTD. OR EQUIV.
7	ADHESIVE	EPOXY RESIN (FOR PIN BASE ASSEMBLY)		KUNSHAN TENNKANG ELECTRIC&CHEMICAL CO.,LTD. OR EQUIV.
8	INK	BON MARQUE INK		T&K TOKA. OR EQUIV.



**TABLE 1**

MAGLAYERS PT/NO.	Inductance L( $\mu$ H)	Percent Tolerance	Test Frequency	Resistance RDC( $\Omega$ ) $\pm$ 20%	Rated DC Current		Marking
					IDC1(A)	IDC2(A)	
MSCDRI-7040AL-1R0□-□-RU	1.0	N	100kHz/0.1V	5.35m	7.30	8.00	1R0
MSCDRI-7040AL-1R5□-□-RU	1.5	N	100kHz/0.1V	7.20m	7.20	6.80	1R5
MSCDRI-7040AL-2R0□-□-RU	2.0	N	100kHz/0.1V	8.00m	7.00	6.50	2R0
MSCDRI-7040AL-2R2□-□-RU	2.2	N	100kHz/0.1V	8.00m	7.00	6.50	2R2
MSCDRI-7040AL-3R3□-□-RU	3.3	N	100kHz/0.1V	11.22m	5.40	5.50	3R3
MSCDRI-7040AL-4R7□-□-RU	4.7	N	100kHz/0.1V	14.1m	4.60	4.90	4R7
MSCDRI-7040AL-5R6□-□-RU	5.6	N	100kHz/0.1V	16.0m	4.10	4.60	5R6
MSCDRI-7040AL-6R8□-□-RU	6.8	M,N	100kHz/0.1V	22.2m	3.90	3.50	6R8
MSCDRI-7040AL-8R2□-□-RU	8.2	N	100kHz/0.1V	30.0m	3.50	3.00	8R2
MSCDRI-7040AL-100□-□-RU	10	M,N	100kHz/0.1V	34.6m	3.20	2.80	100
MSCDRI-7040AL-150□-□-RU	15	M,N	100kHz/0.1V	47.0m	2.50	2.30	150
MSCDRI-7040AL-180□-□-RU	18	M,N	100kHz/0.1V	57.5m	2.30	2.25	180
MSCDRI-7040AL-220□-□-RU	22	M,N	100kHz/0.1V	58.0m	2.20	2.20	220
MSCDRI-7040AL-330□-□-RU	33	M,N	100kHz/0.1V	95.0m	1.80	2.00	330
MSCDRI-7040AL-470□-□-RU	47	M,N	100kHz/0.1V	0.165	1.30	1.35	470
MSCDRI-7040AL-680□-□-RU	68	M,N	100kHz/0.1V	0.257	1.25	1.00	680
MSCDRI-7040AL-820□-□-RU	82	M,N	100kHz/0.1V	0.312	1.20	0.85	820
MSCDRI-7040AL-101□-□-RU	100	M,N	100kHz/0.1V	0.400	1.10	0.82	101
MSCDRI-7040AL-121□-□-RU	120	M,N	100kHz/0.1V	0.469	1.00	0.75	121
MSCDRI-7040AL-151□-□-RU	150	M,N	100kHz/0.1V	0.665	0.92	0.65	151

※ □ specify the inductance tolerance, M( $\pm$ 20%), N( $\pm$ 30%)

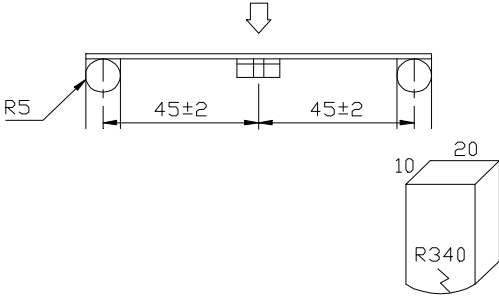
※ IDC1 : Based on inductance change ( $\Delta$ L/Lo : drop 30% Max.) @ambient Temperature : 25°C

IDC2 : Based on temperature rise ( $\Delta$ 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	$\Delta L/L_0 \leq \pm 5\%$  There shall be no mechanical damage or electrical damage.	<p>The sample shall be soldered onto the printed circuit board in figure 1 and a load applied until the figure in the arrow direction is made approximately 3mm.(keep time 30 seconds)            PCB dimension shall the page 7/9  <b>F(Pressurization)</b></p>  <p style="text-align: center;"><b>PRESSURE ROD figure-1</b></p>
Vibration	$\Delta L/L_0 \leq \pm 5\%$  There shall be no mechanical damage.	<p>The sample shall be soldered onto the printed circuit board and when a vibration having an amplitude of 1.52mm and a frequency of from 10 to 55Hz/1 minute repeated should be applied to the 3 directions (X,Y,Z) for 2 hours each.            (A total of 6 hours)</p>
Solderability	New solder More than 90%	<p>Flux (rosin, isopropyl alcohol{JIS-K-1522}) shall be coated over the whole of the sample before hard, the sample shall then be preheated for about 2 minutes in a temperature of 130~150°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°C.</p> <p>More than 90% of the electrode sections shall be covered with new solder smoothly when the sample is taken out of the solder bath.</p>

## MECHANICAL

TEST ITEM	SPECIFICATION	
Resistance to Soldering heat (reflow soldering)	There shall be no damage or problems.	<p style="text-align: center;"><b>Temperature profile of reflow soldering</b></p> <p>The specimen shall be passed through the reflow oven with the condition shown in the above profile for 1 time.</p> <p>The specimen shall be stored at standard atmospheric conditions for 1 hour, after which the measurement shall be made.</p>

## ELECTRICAL

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



## ENVIROMENT CHARACTERISTICS

TEST ITEM	SPECIFICATION																
High temperature storage	$\Delta L/L_0 \leq \pm 5\%$  There shall be no mechanical damage.	The sample shall be left for $96 \pm 4$ hours in an atmosphere with a temperature of $125^\circ\text{C}$ and a normal humidity.  Upon completion of the measurement shall be made after the sample has been left in a normal temperature and normal humidity for 1 hour.															
Low temperature storage	$\Delta L/L_0 \leq \pm 5\%$  There shall be no mechanical damage.	The sample shall be left for $96 \pm 4$ hours in an atmosphere with a temperature of $-25 \pm 3^\circ\text{C}$ .  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.															
Change of temperature	$\Delta L/L_0 \leq \pm 5\%$  There shall be no other damage of problems	The sample shall be subject to 5 continuous cycles, such as shown in the table 2 below and then it shall be subjected to standard atmospheric conditions for 1 hour, after which measurement shall be made.  <div style="text-align: center;">                         table 2  <table border="1" style="margin: auto;"> <thead> <tr> <th></th> <th style="text-align: center;">Temperature</th> <th style="text-align: center;">Duration</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">1</td> <td style="text-align: center;"><math>-25 \pm 3^\circ\text{C}</math> (Thermostat No.1)</td> <td style="text-align: center;">30 min.</td> </tr> <tr> <td style="text-align: center;">2</td> <td style="text-align: center;">Standard atmospheric</td> <td style="text-align: center;">No.1→No.2</td> </tr> <tr> <td style="text-align: center;">3</td> <td style="text-align: center;"><math>85 \pm 2^\circ\text{C}</math> (Thermostat No.2)</td> <td style="text-align: center;">30 min.</td> </tr> <tr> <td style="text-align: center;">4</td> <td style="text-align: center;">Standard atmospheric</td> <td style="text-align: center;">No.2→No.1</td> </tr> </tbody> </table> </div>		Temperature	Duration	1	$-25 \pm 3^\circ\text{C}$ (Thermostat No.1)	30 min.	2	Standard atmospheric	No.1→No.2	3	$85 \pm 2^\circ\text{C}$ (Thermostat No.2)	30 min.	4	Standard atmospheric	No.2→No.1
	Temperature	Duration															
1	$-25 \pm 3^\circ\text{C}$ (Thermostat No.1)	30 min.															
2	Standard atmospheric	No.1→No.2															
3	$85 \pm 2^\circ\text{C}$ (Thermostat No.2)	30 min.															
4	Standard atmospheric	No.2→No.1															
Moisture storage	$\Delta L/L_0 \leq \pm 5\%$  There shall be no mechanical damage.	The sample shall be left for $96 \pm 4$ hours in a temperature of $40 \pm 2^\circ\text{C}$ and a humidity(RH) of 90~95%.  Upon completion of the test, the measurement shall be made after the sample has been left in a normal temperature and normal humidity more than 1 hour.															
Test conditions :  The sample shall be reflow soldered onto the printed circuit board in every test.																	

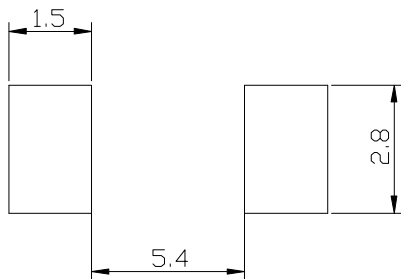


## (5) LAND DIMENSION (Ref.)

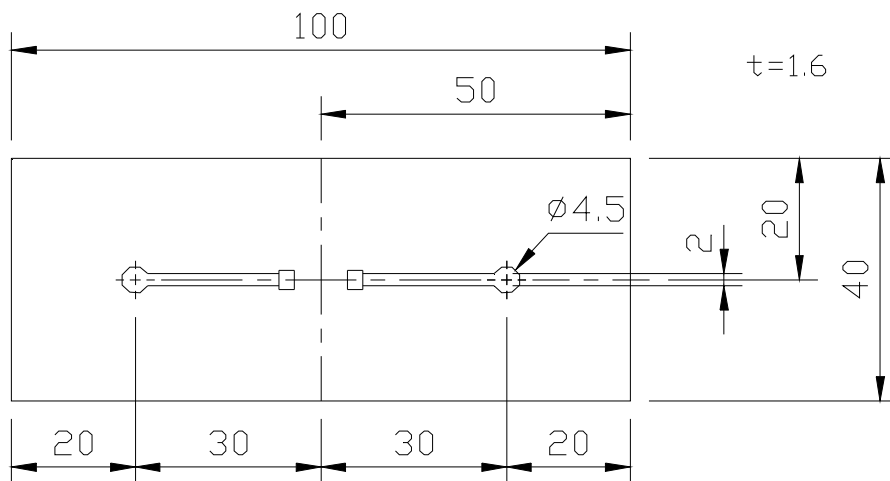
PCB: GLASS EPOXY  $t=1.6\text{mm}$

### (5)-1 LAND PATTERN DIMENSIONS

(STANDARD PATTERN) Unit : mm



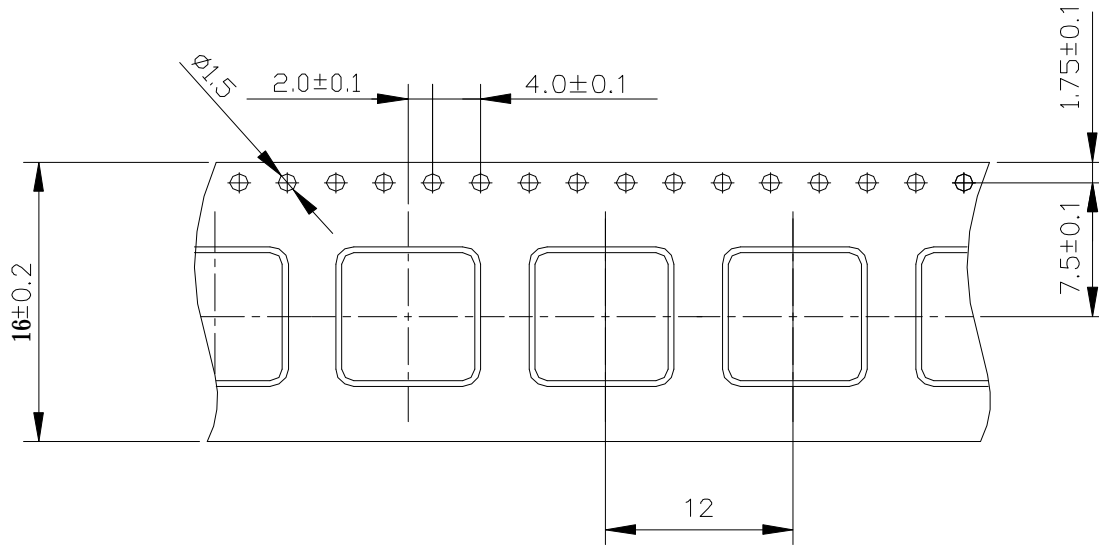
### (5)-2 SUBSTRATE BENDING TEST BENDING TEST BOARD



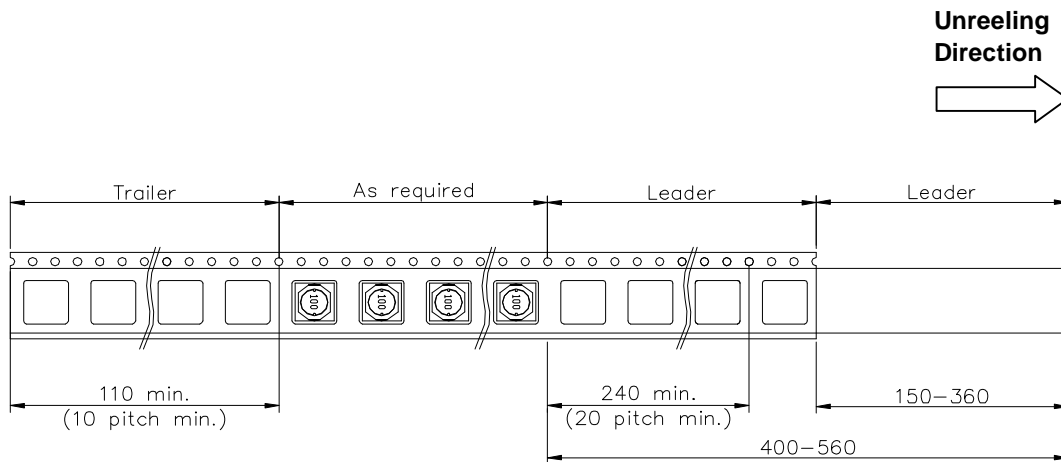
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## (6) PACKAGING

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

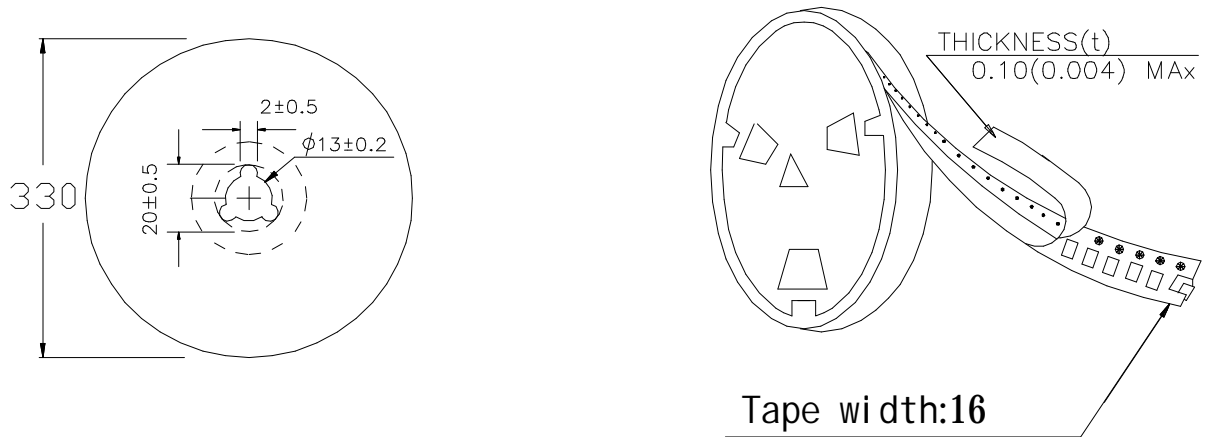


### (6)-2 TAPING DIMENSIONS (mm)



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### (6)-3 REEL DIMENSIONS (mm)



### (6)-4 QUANTITY

1000 pcs/Reel

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