



# Mag Layers USA, INC

## Specification Sheet

**P/N : MMD-06EZ-M1-Series-RU**

### Products:

[Molded Power Chokes](#)

[Multilayer Chip Inductors](#)

[Lan Transformer](#)

[RF Passive / Antennas](#)

[Automotive](#)

### Certifications:

[ISO9001](#)

[IATF16949](#)

[ISO14001](#)

[QC080000](#)

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Product Specification	Part Number: <b>MMD-06EZ-R15M-M1-LT</b>	SPEC.NO. 11005469
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<b>REVISIONS</b>					
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REV.	DESCRIPTION	DATE	Approved By	Checked By	Made By
<i>01</i>	<i>Final release</i>	<i>2011/10/27</i>	<i>Richard</i>	<i>Jerry CH</i>	<i>Sophia</i>



## ■ APPLICATION

PDA, notebook, desktop, and server applications  
Low profile, high current power supplies  
Battery powered devices  
DC/DC converters in distributed power systems  
DC/DC converters for field programmable gate array

## ■ FEATURES

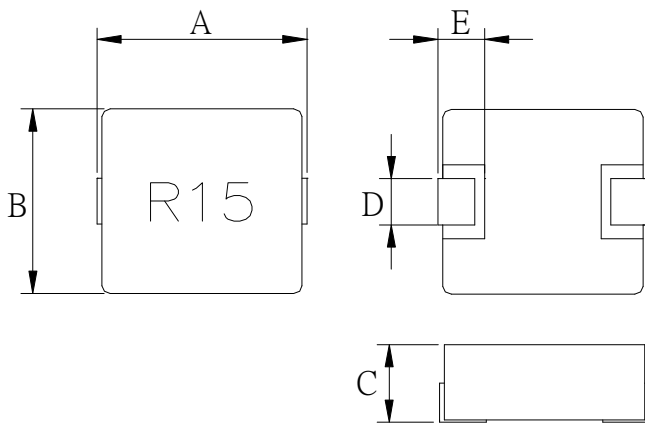
RoHS compliant  
Super low resistance, ultra high current rating  
High performance (I sat) realized by metal dust core  
Frequency Range: up to 1MHz

## ■ PRODUCT IDENTIFICATION

①      ②      ③ ④    ⑤  
MMD - 06EZ - R15 M - M1 - RU

- ① Product Code
- ② Dimensions : 6.8 x 6.4 x 5.0 mm
- ③ Inductance : R15 = 0.15  $\mu$  H
- ④ Tolerance : M =  $\pm$ 20%
- ⑤ Series Type : M1 Type

## PRODUCT DIMENSION



NOTE : Dimensions in mm

PRODUCT NO.	A	B	C	D	E
MMD-06EZ-R15M-M1-RU	6.86 ± 0.38	6.47 ± 0.25	5.0Max	3.0 ± 0.3	1.3 ± 0.3

## ELECTRICAL REQUIREMENTS

PART NUMBER	INDUCTANCE Lo (μH) ±20% @0A	R <sub>dc</sub> (mΩ)		HEAT RATING CURRENT (I <sub>dc</sub> ) DC AMPS <sup>1</sup>	SATURATION CURRENT (I <sub>sat</sub> ) DC AMPS <sup>2</sup>
		Typ.	Max		
MMD-06EZ-R15M-M1-RU	0.15	0.80	0.88	28	41

TEST FREQUENCY: 100KHz, 0.25V

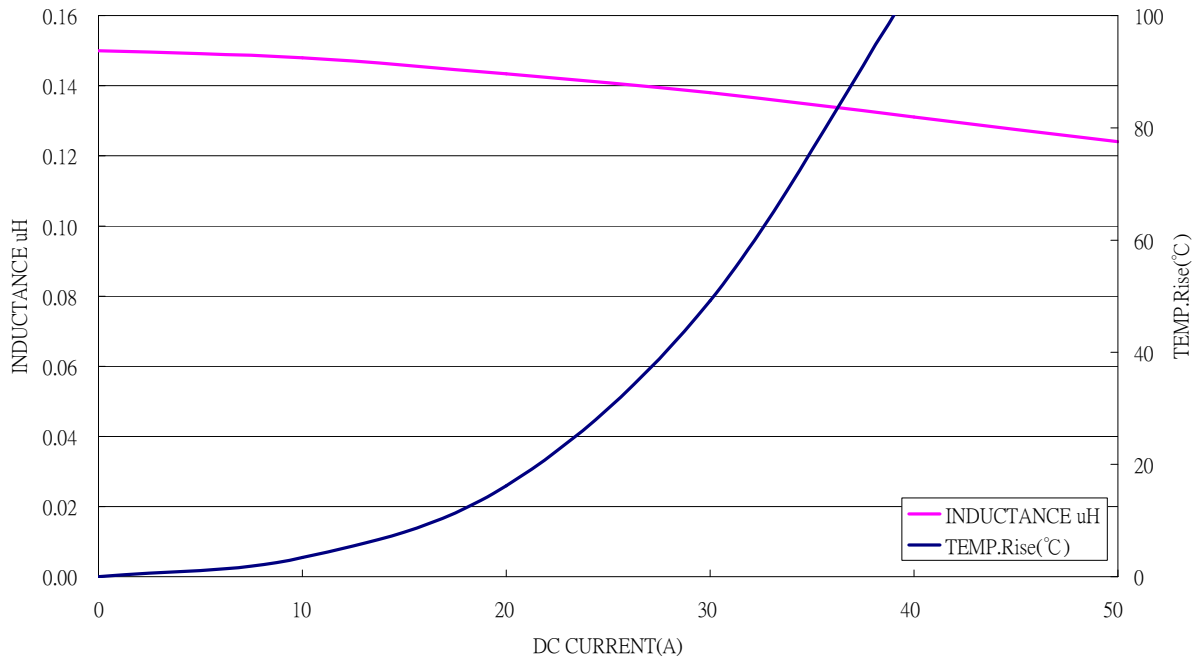
TESTING INSTRUMENT L : Agilent 4284A, WK4235, CH3302/G LCR METER  
 CH1320, CH1320S BIAS CURRENT SOURCE  
 R<sub>dc</sub> : CH11025, GOM802 MICRO OHMMETER

### NOTES:

1. DC current (I<sub>dc</sub>) that will cause an approximate ΔT of 40°C
2. DC current (I<sub>sat</sub>) that will cause Lo to drop approximately 20%
3. All test data is referenced to 25°C ambient
4. Operating Temperature Range -55°C to +150°C
5. The part temperature (ambient + temp rise) should not exceed 150°C under the worst operating conditions. Circuit design, component placement, PWB trace size and thickness, airflow and other cooling provisions all affect the part temperature. Part temperature should be verified in the end application.

# ELECTRICAL CHARACTERISTICS

Reference data

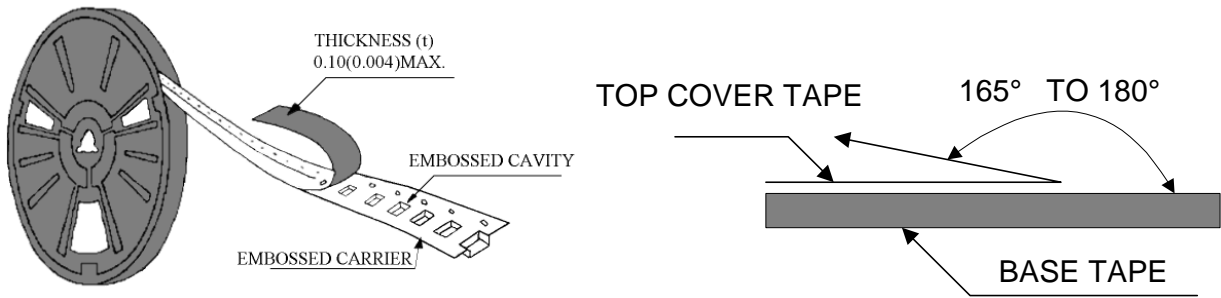


MAG.LAYERS

MMD-06EZ-R15M-M1-RU

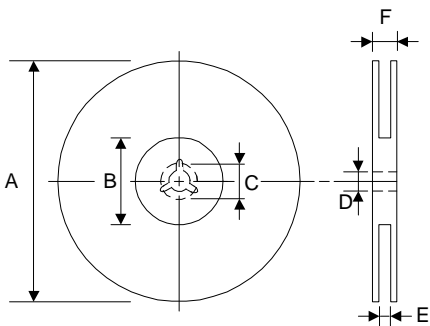
## PACKAGING

### ● Peel-off Force

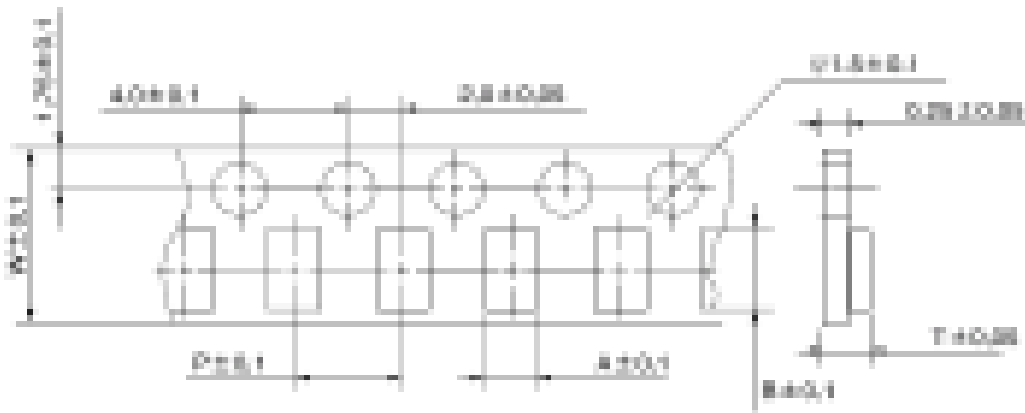


The force for peeling off cover tape is 10 to 70 grams in the arrow direction.

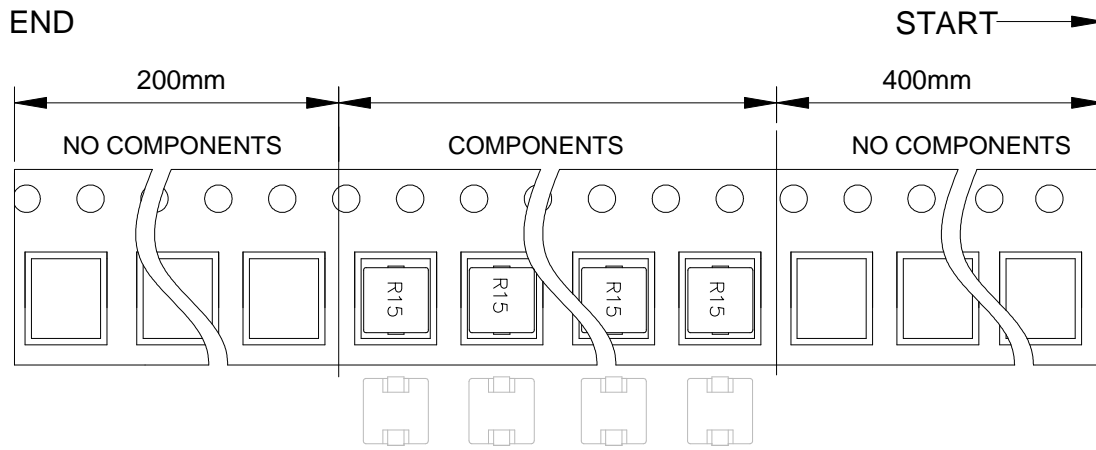
### ● Dimension (Unit: mm)



TYPE	A	B	C	D	E	F
330 mm	330±2	100±1	20±0.5	13 ±1.0	16 ±0.5	20 ±2



TYPE	SIZE	A	B	W	P	T
MMD	06EZ	6.9	7.6	16	12	5.3

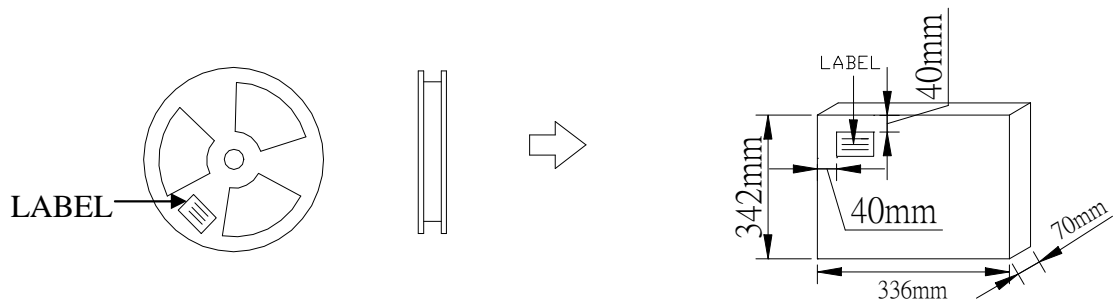


● Taping Quantity

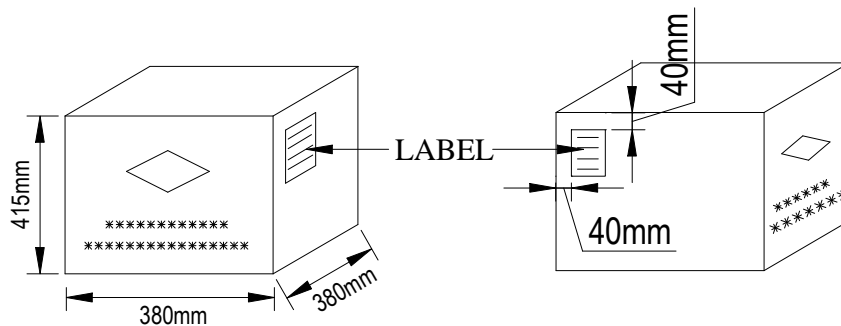
SERIES	06EZ
PCS/Reel	500

**CARTON:**

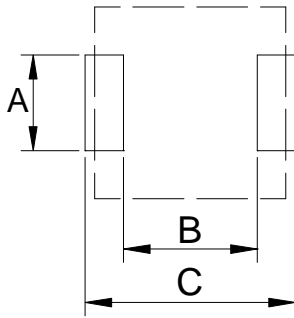
MIDDLE PACKAGING : 3 Reel /BOX



EXTERNAL PACKAGING : 5 BOX / CARTON



## RECOMMENDED PCB LAYOUT



Type	06EZ
A	3.43
B	3.71
C	7.37

### Safety precaution

(A) This product employs a core with low insulation resistance. Pay strict attention when use it.

1. Do not make any through holes and copper pattern in the oblique line area. Except a copper pattern to the electrode.
2. Don't design/mount any components in contact with this product.

(B) Provision to abnormal condition

This power choke coil itself does not have any protective function in abnormal condition such as overload, short circuit, open conditions and etc. Therefore, it shall be confirmed as the end product that there is no risk of smoking, fire, dielectric withstand voltage, insulation resistance and etc in abnormal conditions to provide protective devices and/or protection circuit in the end product.



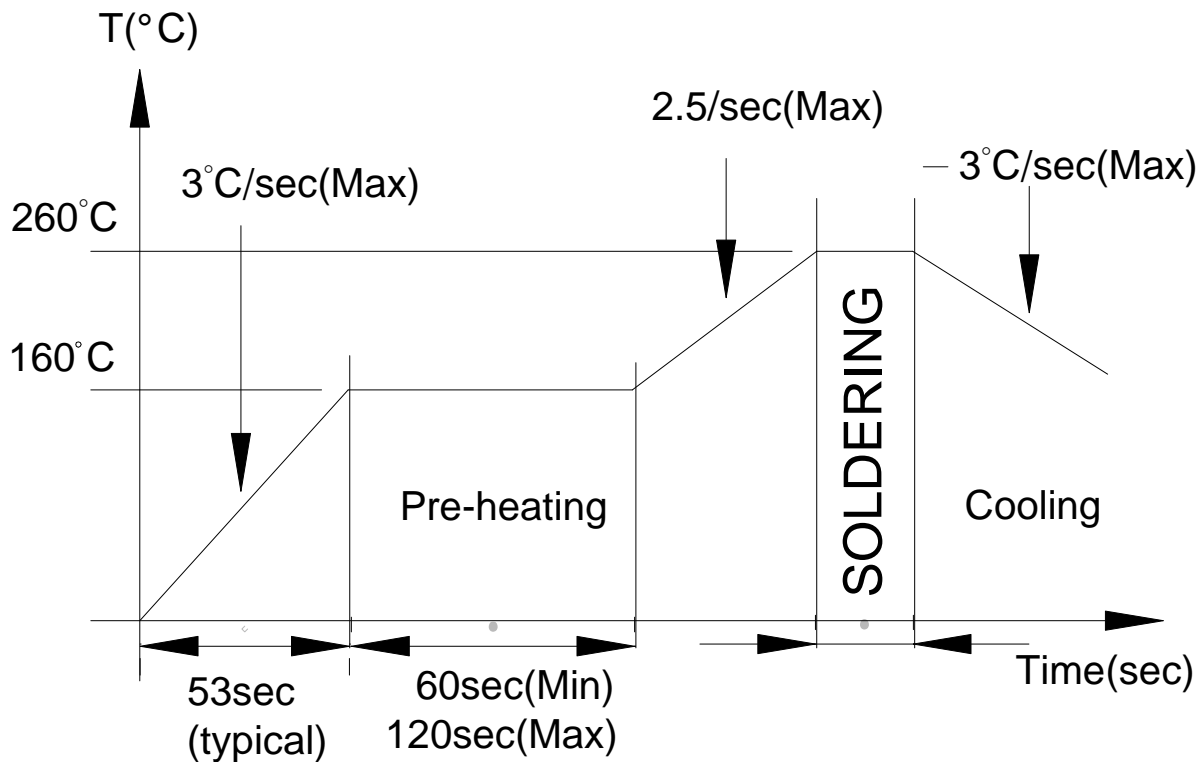
## RELIABILITY TEST

*Electrical performance test		
Item	Specification	Test method
Inductance	Refer to the electrical specifications.	Measured with a LCR meter Agilent4284A,CH3302G
DC Resistance		Micro-ohm meter CH11025
Saturation current		DC current (A) that will cause L0 to drop approximately 30% (environment temperature of 25°C )
Heat rating current		DC current (A) that will cause an approximate $\Delta T$ of 40°C (environment temperature of 25°C)
*Mechanical performance test		
bending	Change from an initial value Inductance: within $\pm 10\%$	Apply pressure gradually in the direction of the arrow at a rate of about 0.5mm/s until bent depth reaches 2mm and hold for 30 sec. Boad : 40*100mm , thickness: 1mm
Adhesion strength	Change from an initial value Inductance: within $\pm 10\%$	A static load using a R0.5 pressing tool shall be applied to the body of the specimen in the direction of the arrow and shall be hold for 60 $\pm$ 5 sec. Mesure after removing pressure.
Vibration	Change from an initial value Inductance: within $\pm 10\%$	The specimen shall be subjected to a vibration of 1.5mm amplitude, sweep frequency 10~55Hz(10Hz to 55Hz to 10Hz in aperiod of one minute) for 2hr in each of 3(X,Y,Z) axes.
Mechanical shock	Change from an initial value Inductance: within $\pm 10\%$	Dropped onto printed circuit board from 100cm height three times in x, y, z directions. The terminals shall be protected.

Item	Specification	Test method
solderability	New solder shall cover 90% minimum of the surface immersed.	Electrode shall be immersed in flux at room temperature and then shall be immersed in solder bath after preheat. Preheat $160\pm 10^{\circ}\text{C}$ , 90 sec Soldering $245\pm 5^{\circ}\text{C}$ , $3\pm 1$ sec
Resistance to soldering heat	Change from an initial value Inductance: within $\pm 10\%$	Reflow soldering method Preheat $150\sim 180^{\circ}\text{C}$ , $90\sim 120\text{sec}$ Peak temp. $260^{\circ}\text{C}$ ( $230^{\circ}\text{C}$ over $30\sim 40$ Sec.) The specimen shall be subjected to the reflow process under the above condition 2 times. Test board shall be 0.8mm thick. Base material shall be glass epoxy resin. Soldering iron method Bit temperature $230\pm 7^{\circ}\text{C}$ Period of soldering 3sec Measurement The specimen shall be stored at standard atmospheric conditions for 1 hr in prior to the measurement.
<b>*Climatic test</b>		
Low temperature	Change from an initial value Inductance: within $\pm 10\%$	The specimen shall be stored at a temperature of $-40\pm 3^{\circ}\text{C}$ for 96hr. then it shall be stabilized under standard atmospheric conditions for 1hr before measurement. measurement shall be made within 1hr.
Dry heat	Change from an initial value Inductance: within $\pm 10\%$	The specimen shall be stored at a temperature of $85\pm 3^{\circ}\text{C}$ for 96hr. then it shall be stabilized under standard atmospheric conditions for 1hr before measurement. measurement shall be made within 1hr.
Dump heat	Change from an initial value Inductance: within $\pm 10\%$	The specimen shall be stored at a temperature of $60\pm 3^{\circ}\text{C}$ with relative humidity of 90~95% for 96h. Then it shall be stabilized under standard atmospheric conditions for 1hr before measurement. Measurement shall be made within 1hr.
Temperature cycle	Change from an initial value Inductance: within $\pm 10\%$	The specimen shall be subjected to 10 continuous cycles of temperature change of $-40^{\circ}\text{C}$ for 30 min and $85^{\circ}\text{C}$ for 30 min with the transit period of 2 min or less. Then it shall be stabilized under standard atmospheric conditions for 1hr before measurement. Measurement shall be made within 1hr.

NOTE : Storage Condition : The temperature should be within  $-40^{\circ}\text{C}\sim 85^{\circ}\text{C}$  and humidity should be less than 75%RH. The product should be used within 6 months from the time of delivery.

## RECOMMENDED REFLOW SOLDERING PROFILE



- 1. IR Reflow soldering :**  
Preheat at 3°C per second to 160°C and using lead free solder ,  
IR at 260°C for 10 seconds.
- 2. Rework flow:**  
Component must withstand two IR reflow cycles with a cool down  
between cycles.

## NOTES

The contents of this data sheet are subject to change without notice. Please confirm the specifications and delivery conditions when placing your order.