

## FERRITE EMI DISKS AND PLATES



Ferrite disks and plates provide a simple, cost-effective solution for radiated and inductively-coupled electromagnetic interference. After the PC board soldering process, a ferrite disk or plate can be installed directly on the source of EMI (such as active devices or unwanted antennas).

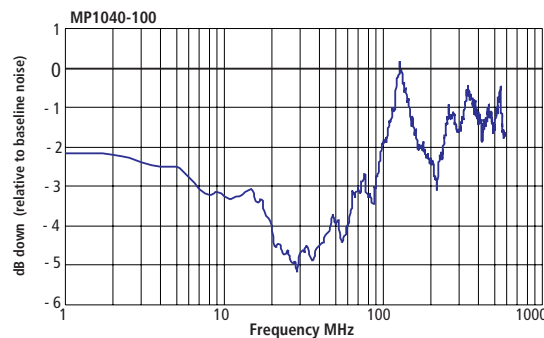
### FEATURES:

- Easy installation
- Each part for volume production is provided with permanent, double sided 3,5 mil acrylic adhesive with 218 oz. / inch<sup>2</sup> adhesion
- Samples and sample kits are available with removable and reusable adhesive for "trial and error" testing
- Variety of sizes offered
- Custom parts also available.

### APPLICATIONS:

- Ferrite disks and plates can be utilized either as inductively coupled components or EMI shields on PC board components and traces. Inductive coupling occurs when the ferrite affects the conducted wave form leaving the active component. The rise time of the wave form is effectively slowed by the ferrite, and the overshoot and associated ringing are attenuated. EMI shielding occurs when the ferrite absorbs the radiated emissions from active components, effectively protecting other boards or components in the vicinity from radiated contamination
- Can be used to locate unwanted EMI antennas
- Flat flex & ribbon cables
- Can also provide retrofit, auxiliary EMI attenuation

### EXAMPLE APPLICATION



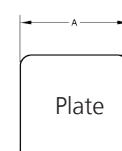
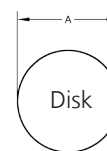
### EXAMPLE APPLICATION GRAPH EXPLANATION:

The zero line on the graph represents the base line noise recorded for an unprotected microprocessor. The curve (dB down) represent the performance of the Laird's ferrite plate relative to the baseline. The addition of the ferrite plates to the top of the processor in this specific application exhibits up to a 5 dB EMI reduction relative to the unprotected part. Performance can vary with different sizes, materials, processors and applications.

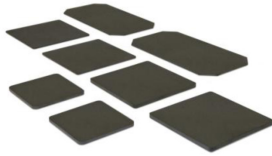
### PART NUMBER SYSTEM EXAMPLE

<b>M</b>	<b>M</b>	<b>0787</b>	<b>100</b>
M - Material	M - Disk P - Plate	Part Size Identification	Thickness Code

PART NUMBER	A mm (inches)	B mm (inches)	C mm (inches)
MM0650-100	16.51 (0.650)	-	1.27 (0.050)
MM0787-100	20.00 (0.787)	-	1.27 (0.050)
MM0787-200	20.00 (0.787)	-	1.91 (0.075)
MM1400-200	35.56 (1.400)	-	1.91 (0.075)
MM1400-300	35.56 (1.400)	-	2.54 (0.100)
MP0315-200	8.00 (0.315)	8.00 (0.315)	2.00 (0.079)
MP0350-000	26.42 (1.040)	8.89 (0.350)	1.27 (0.050)
MP0433-000	11.00 (0.433)	11.00 (0.433)	1.96 (0.077)
MP0512-200	13.00 (0.512)	13.00 (0.512)	2.00 (0.079)
MP0590-200	21.00 (0.827)	15.00 (0.591)	2.00 (0.079)
MP0591-200	15.00 (0.591)	15.00 (0.591)	2.00 (0.079)
MP0760-100	19.30 (0.760)	19.30 (0.760)	1.27 (0.050)
MP1040-100	26.42 (1.040)	26.42 (1.040)	1.27 (0.050)
MP1040-200	26.42 (1.040)	26.42 (1.040)	1.91 (0.075)
MP1040-300	26.42 (1.040)	26.42 (1.040)	2.25 (0.089)
MP1496-000	38.00 (1.496)	38.00 (1.496)	2.00 (0.079)



## FERRITE PLATES FOR WIRELESS CHARGING MP & 33 SERIES



### FEATURES



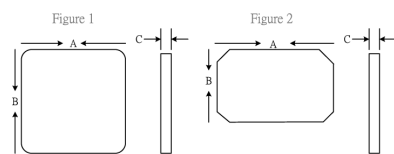
- Ferrite materials are Wireless Power Consortium (WPC) listed, recommended & certified for interoperability test
- Optimized for highest charging efficiency
- Precise dimension control and automotive grade available
- -40°C to 125°C operating temperature
- Available in wide range of size selection, custom shapes are also available

### APPLICATIONS

- Wireless charger for general consumer electronics, transmitter (TX) or receiver (RX)
- Aftermarket charging pads
- Wireless charger for Office, Residential and Public Area applications
- Wireless charger embedded solution for automobile central console, arm-rest, etc.
- Power tools or any industrial devices that need power transmission without metallic contact

### DIMENSIONS

PART NUMBER	A mm (inches)	B mm (inches)	C mm (inches)	Fig. #
MP1040-3M0	26.42 (1.040)	26.42 (1.040)	2.25 (0.089)	1
MP1496-0M0	38.00 (1.496)	38.00 (1.496)	2.00 (0.079)	1
MP2106-0M0	53.00 (2.087)	53.00 (2.087)	2.50 (0.099)	1
MP2126-0M0	53.80 (2.118)	53.80 (2.118)	1.10 (0.043)	1
MP2170-1M0	47.20 (1.858)	55.20 (2.173)	2.50 (0.099)	1
MP3940-0M0	100.00 (3.937)	56.00 (2.205)	1.10 (0.043)	1
33P2098-0M0	53.30 (2.099)	53.30 (2.099)	2.50 (0.099)	1
33P3839-0M0	97.50 (3.839)	50.00 (1.969)	1.10 (0.043)	2



### PART NUMBER SYSTEM EXAMPLE

33	P	2098	0M0
M-28 Material 33-33 Material	Plate	Part Size Code	Thickness Code Catalog or Custom Information

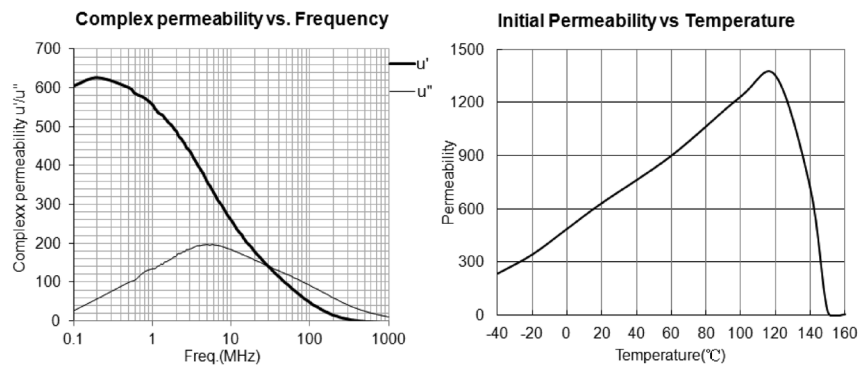
FERRITE PLATES FOR WIRELESS CHARGING  
MP & 33 SERIES

MATERIAL SPECIFICATIONS

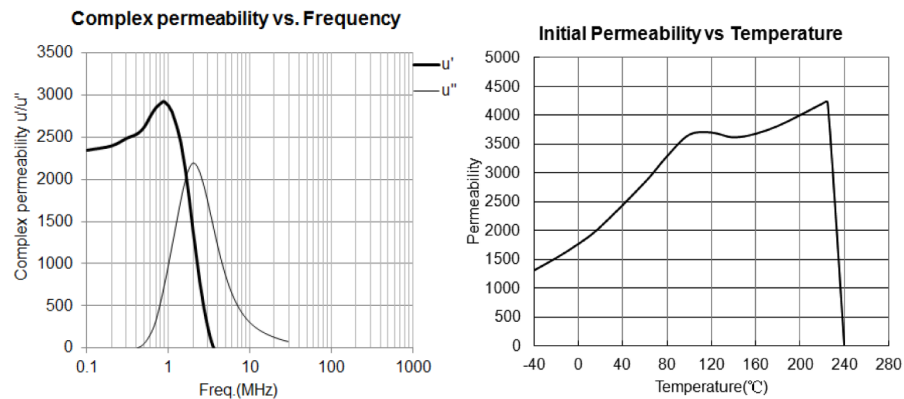
PROPERTY	SYMBOL	UNIT	28 Material (WPC Listed)	33 Material
Initial Permeability	$\mu_i$		650	2300
Flux Density	$B$	mT [Gauss]	280 [2800]	390 [3900]
@ Field Strength	$H$	A/m [Oe]	800 [10]	800 [10]
Residual Field Strength	$B_r$	mT [Gauss]	130 [1300]	55 [550]
Coercive Strength	$H_c$	A/m [Oe]	32 [0.4]	9 [0.1]
Loss Factor @ Frequency	$\tan \delta / \mu_i$ f	10 <sup>-6</sup>	500	6
		MHz	0.1	0.1
Curie Temperature	$T_c$	°C	> 140	> 200
Resistivity	$\rho$	$\Omega$ -cm	10 <sup>5</sup>	5 x 10 <sup>2</sup>

TYPICAL ELECTRICAL CHARACTERISTICS

28 MATERIAL



33 MATERIAL



FLEXIBLE FERRITE SHEETS FOR NFC & WIRELESS CHARGING  
MHLL SERIES



**FEATURES**



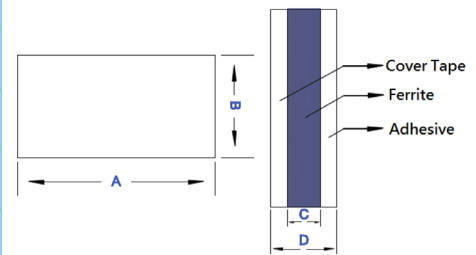
- Flexible ferrite sheets for 13.56 MHz NFC, RFID application & wireless charging application
- Made by thin, high permeability sintered ferrite with PET film and adhesive tape
- Standard ferrite layer thickness 0.05mm, 0.1mm and 0.2mm
- Custom size or thickness available upon request
- Operating temperature -40°C to 85°C
- RoHS compliant

**APPLICATIONS**

- NFC antenna for mobile phones
- NFC antenna for automobile
- NFC or RFID antenna for security & access control system
- Wireless charging for mobile phones and battery powered handheld electronic devices
- NFC or RFID read/write devices, improved read distance
- EMI suppression for IC or IC circuitry

**SHAPES AND DIMENSIONS**

PART NUMBER	A mm (inches)	B mm (inches)	C mm (inches)	D mm (inches)
MHLL5040-000	50 (1.969)	40 (1.575)	0.20 (0.008)	0.35 (0.014)
MHLL5040-200	50 (1.969)	40 (1.575)	0.10 (0.004)	0.20 (0.008)
MHLL6060-300	60 (2.362)	60 (2.362)	0.05 (0.002)	0.09 (0.004)
MHLL12060-000	120 (4.724)	60 (2.362)	0.20 (0.008)	0.35 (0.014)
MHLL12060-200	120 (4.724)	60 (2.362)	0.10 (0.004)	0.20 (0.008)



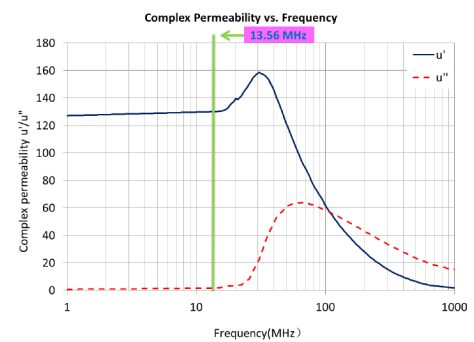
**PART NUMBER SYSTEM EXAMPLE**

MHLL	12060	000
Material Code	Part Size Code	Thickness Code Catalog or Custom Information

**MATERIAL SPECIFICATIONS**

PROPERTY	MHLL Series	
Real Permeability	$\mu'$ @ 13.56MHz, 0.1V	130 $\pm$ 20%
Imaginary Permeability	$\mu''$ @ 13.56MHz, 0.1V	5 max
Operating Temperature	°C	-40°C ~ +85°C

**TYPICAL ELECTRICAL CHARACTERISTICS**



FLEXIBLE FERRITE SHEETS FOR NFC & WIRELESS CHARGING  
MSLL SERIES



**FEATURES**



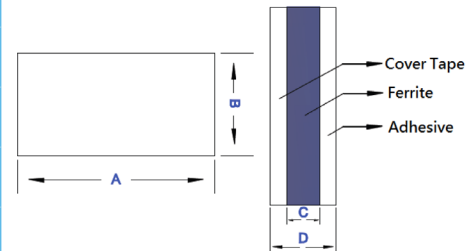
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MSLL6060-300	60 (2.362)	60 (2.362)	0.05 (0.002)	0.09 (0.004)
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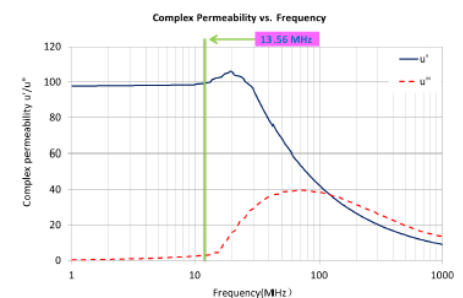
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Material Code	Part Size Code	Thickness Code Catalog or Custom Information

**MATERIAL SPECIFICATIONS**

PROPERTY		MSLL Series
Real Permeability	$\mu'$ @ 13.56MHz, 0.1V	100 ± 20%
Imaginary Permeability	$\mu''$ @ 13.56MHz, 0.1V	5 max
Operating Temperature	°C	-40°C ~ +85°C

**TYPICAL ELECTRICAL CHARACTERISTICS**



FLEXIBLE FERRITE SHEETS FOR NFC & WIRELESS CHARGING  
MULL SERIES



**FEATURES**



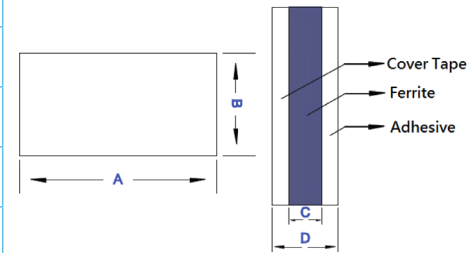
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**PART NUMBER SYSTEM EXAMPLE**

MULL	12060	000
Material Code	Part Size Code	Thickness Code Catalog or Custom Information

**MATERIAL SPECIFICATIONS**

PROPERTY	MULL Series	
Real Permeability	$\mu'$ @ 13.56MHz, 0.1V	150 ± 20%
Imaginary Permeability	$\mu''$ @ 13.56MHz, 0.1V	5 max
Operating Temperature	°C	-40°C ~ +85°C

**TYPICAL ELECTRICAL CHARACTERISTICS**

