

MAX ECHO[®]

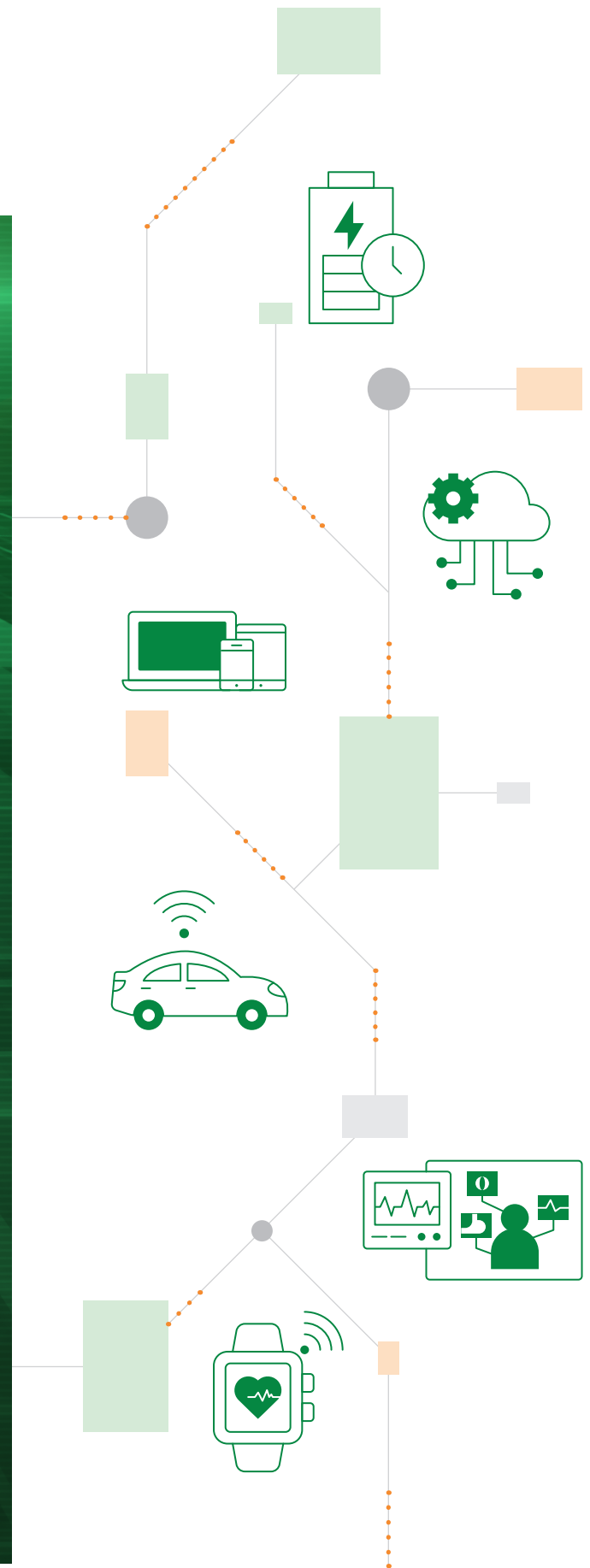
CHASING BETTER ALWAYS CUSTOMER

鈺鎧科技股份有限公司
MAX ECHO TECHNOLOGY CORP

PRODUCT BROCHURE

Professional Automotive Manufacturer
of SMD Inductor & Bead

IATF 16949
ISO 14001
ISO 9001
QC 080000



About Max Echo

About

The entire factory is now Located in Taichung Precision Science Park, Taiwan

Committed to the research and development of

Magnetic materials | Ceramic materials | Multilayer printing | Low-temperature co-firing

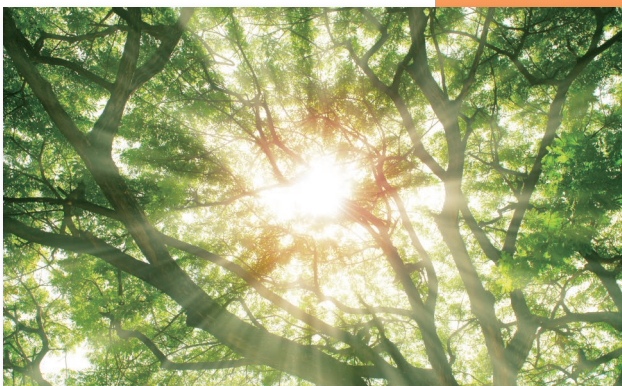
Providing customers with

Inductors | Magnetic Beads | Related magnetic or ceramic components



Customized Service

Ability of material research and development and powder batching, and has the ability to design and integrate production line equipment, adjust materials according to needs, and design equipment according to needs to strengthen process capabilities.

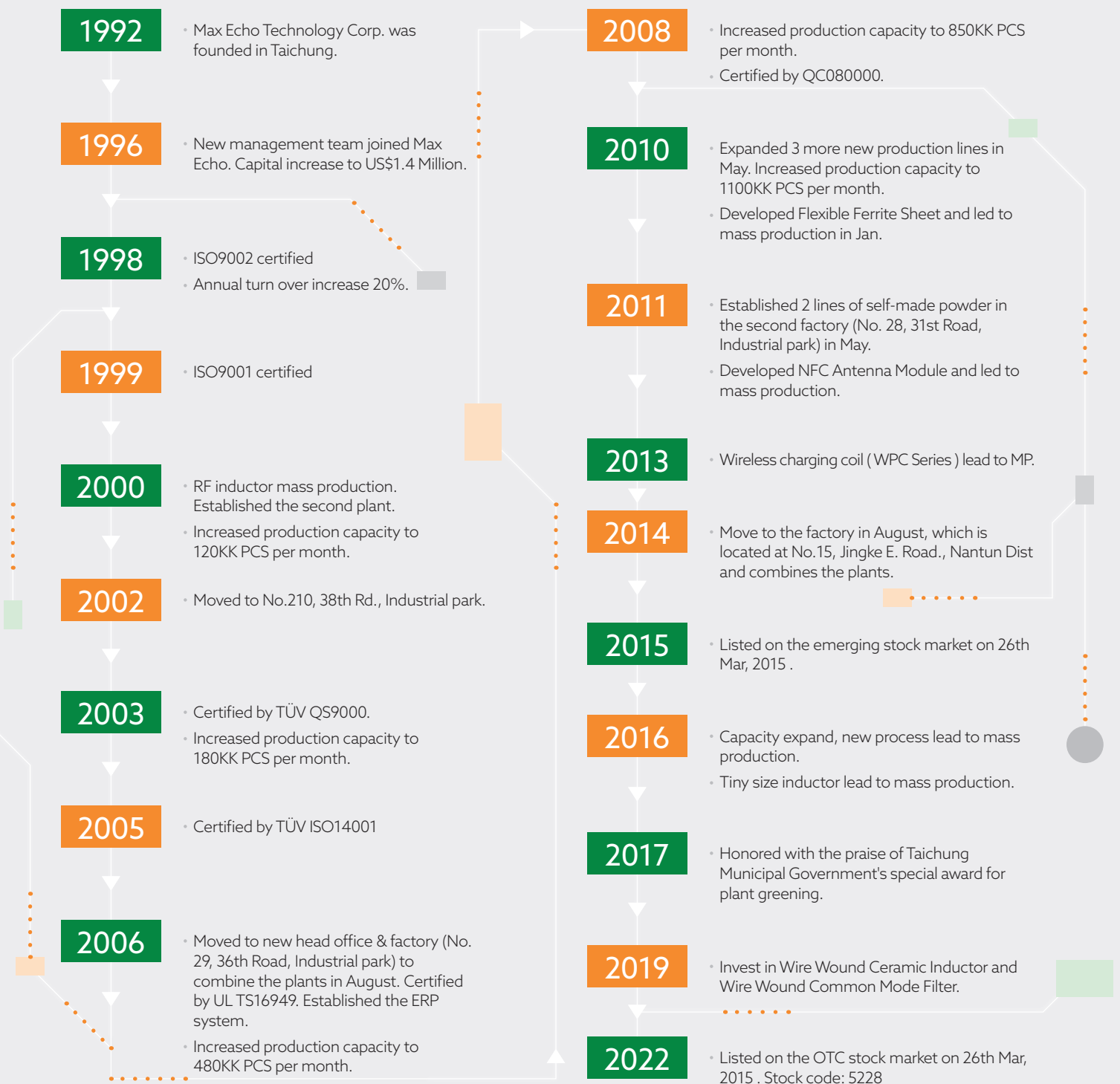


Sustainable Development

With IATF16949 as the management system, the processes of R&D, production, and sales are all customer-oriented, and the pursuit of reducing all possible quality risks is pursued. At the same time, the plant is committed to energy conservation, greening and reduction of carbon emissions, with sustainable development as its business goal.

History

Milestone



Product overview



New information

INDUCTOR RF / Power

07

SPEC

Please refer to the specification sheet for the actual characteristics

Series	Shape	Function	Dimensions [inch] mm	Inductance (H)							Rated Current mA		
				1n	10n	100n	1μ	10μ	100μ	1000μ	Range		
HBLS		RF Circuit	0603 - 2012 [0201] - [0805]	[Green bar]							0.3 nH	1 μH	50 - 1000
HBWS		RF Circuit	1005 - 2520 [0402] - [1008]	[Green bar]							1 nH	10 μH	110 - 1360
LBWS		RF Circuit	1005 - 1608 [0402] - [0603]	[Green bar]							20 nH	22 μH	130 - 1400
EBLS		Signal Line	1608 - 4532 [0603] - [1812]	[Green bar]							0.47 μH	220 μH	50 - 300
PCLS		Power Line	1608 - 2520 [0603] - [1008]	[Green bar]							0.22 μH	22 μH	50 - 1000
PDLS		Power Line	1608 - 2520 [0603] - [1008]	[Green bar]							0.16 μH	4.7 μH	1150 - 5000
KEWS		Power Line	1608 - 2012 [0603] - [0805]	[Green bar]							0.24 μH	2.2 μH	50 - 1000



BEAD

EMC / EMI

SPEC

Please refer to the specification sheet for the actual characteristics

Series	Shape	Function	Dimensions [inch] mm	Impedance (Ω)								Rated Current mA		
				600	1200	1800	2400	3000	3600	4200	5400	Range		
EBMS		Signal Line	0603 - 4532 [0201] - [1812]	████████████████████								10	2500	100 - 1000
ACMS		Power Line	1005 - 5650 [0402] - [2220]	████████████████								10	2000	1000 - 3000
BCMS		Power Line	1005 - 8530 [0402] - [3312]	████								10	880	3000 - 10000
BCAS		GHz Signal Line	1005 - 1608 [0402] - [0603]	████								120	1800	100 - 300
KCAS		GHz Power Line	3225 - 5650 [1210] - [2220]	████████████████								500	1000	500 - 4000
LDWS		GHz Power Line	1005 [0402]	████████████████████								11.98	5271	150 - 1400

Product overview



COMMON MODE FILTER

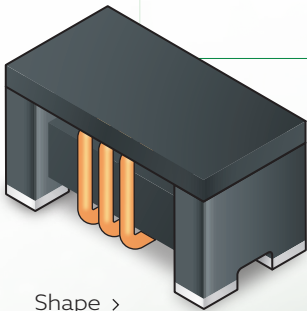
EMC / EMI

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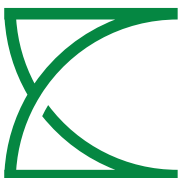
SPEC

Spec / Please refer to the specification sheet for the actual characteristics

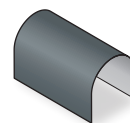
Series	Function	Dimensions [inch] mm	Impedance (Ω)							Rated Current mA		
			900	1800	2700	3600	4500	5400	6300	Range		
EOWS	SignalLine	2012 - 4532 [0805] - [1812]								67	5800	150 - 400



Shape >



FLEXIBLE SINTERED FERRITE SHEET



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New information

WIRELESS CHARGING COIL

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SPEC <small>Customized Design is Available</small>					
PN	Shape	Type	Inductance	DC Resistance [Ω] max.	Thickness mm
GWC1075		RX	6.2uH ± 10%	0.35	0.76
GWC1078		RX	17uH ± 10%	0.43	0.91
GWC1079		RX	12uH ± 10%	0.2	0.79

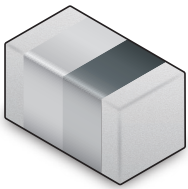
MAX ECHO[®]

CHASING BETTER ALWAYS CUSTOMER

LEAD FREE RoHS - Compliant -	IATF 16949 - Certified -	ISO 9001 - Certified -	ISO 14001 - Certified -	QC 080000 - Certified -
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Automotive grade products are verified by AEC-Q200 before product release.

INDUCTOR

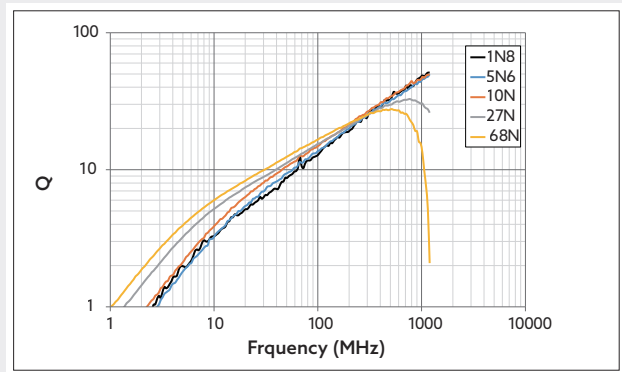
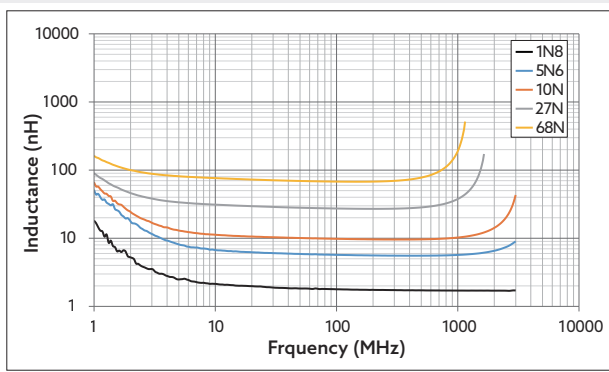


HBLS Series Multilayer High Frequency Ceramic Inductor

HBLS multilayer ceramic inductor series are made by ceramic and low resistance conductor. Provide high quality factor and SRF.

FEATURE

- SRF can be 10 GHz
- High quality factor
- Narrow tolerance is available



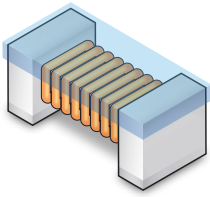
APPLICATION

- RF circuit and module.
- Various automotive electronic equipment.
- Tablet, notebook, desktop computer and peripheral equipment.

MAIN SPEC

Please refer to the specification sheet for the actual characteristics

Series	Inductance [nH]	Q factor min.	SRF [MHz] min.	DC Resistance [Ω] max.	Rated Current [mA] max.	Dimension [L×W×T] mm
HBLS0603	0.3~27	4	1000~18000	0.07~1.35	120~850	0.6×0.3×0.3
HBLS1005	0.3~270	8	400~10000	0.08~4.9	170~700	1.0×0.5×0.5
HBLS1608	1.0~1000	8~10	130~10000	0.05~5.5	210~800	1.6×0.8×0.8
HBLS2012	1.0~680	10~18	160~4000	0.1~5.5	50~400	2.0×1.25×0.85 2.0×1.25×1.25



HBWS Series **Wire Wound Ceramic Inductor**

HBWS series wire wound inductor is made by ceramic, precision automatic winding engineering, designed with wide range inductance.

Widely used in high-frequency circuits on electronic communication equipment, such as mobile phone, portable communication products and terminal products, etc.

FEATURE

- Excellent self-resonant frequency.
- Low DC resistance.
- Higher current and high quality electrical performance.

APPLICATION

- 5G communication base station
- Mobile communication device
- Smart phone, Tablet terminal, Bluetooth, Wi-Fi, device.
- RF circuit, RF module (PA, VCO, FEM etc.).



Laptop



Cellular phone



Cable modems

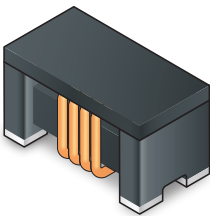


Bluetooth headset

MAIN SPEC

Please refer to the specification sheet for the actual characteristics

Series	Inductance [nH]	Q factor min.	SRF [MHz] min.	DC Resistance [Ω] max.	Rated Current [mA] max.	Dimension [L×W×T] mm
HBWS1005	1~120	13~26	1000~18000	0.045~2.66	110~1360	1.0×0.55×0.5
HBWS1608	1.6~390	16~45	350~12500	0.03~2.00	170~700	1.6×1.05×1.05
HBWS2012	2.2~390	35~60	780~6000	0.06~2.20	210~800	2.0×1.25×1.2
HBWS2520	3.3~1000	35~60	310~6000	0.06~3.30	120~1000	2.6×2.1×1.8



LBWS Series **Wire Wound Ferrite Inductor**

LBWS series wire wound ferrite inductor provide excellence noise suppression in high-frequency. Compare with multilayer type, it also provide superior performance in low DC resistance and higher current.

FEATURE

- Better performance comparing with typical surface mount ferrite inductors.
- Lower parasitic capacitance, higher SRF.
- Better DCR suitable for high current applications.

APPLICATION

- Communication devices
- Tablet terminal, Laptop, HDD, Server, VRM, DC to DC converter, HUB, Router, Switch



Laptop



HDD



Tablet

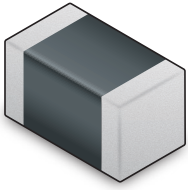


Router

MAIN SPEC

Please refer to the specification sheet for the actual characteristics

Series	Inductance [nH]	Tolerance	L measuring Frequency [MHz]	DC Resistance [Ω] max.	SRF [MHz] min.	Rated Current [A] max.	Dimension [L×W×T] mm
LBWS1005	20~3300	±5% ±10%	7.9MHz	0.049~2.2	80~2950	0.15~1.4	1.1×0.72×0.55
LBWS1608	47~22000	±5% ±10%	7.9MHz (47~8200 nH) 2.5MHz (10000~22000 nH)	0.075~8.81	19~1500	0.13~1.4	1.8×1.0×1.12

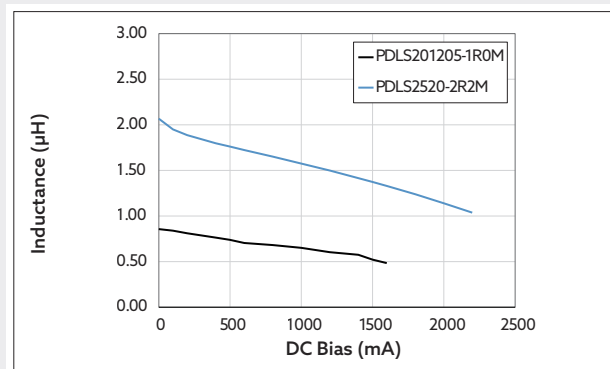


PDLS Series Multilayer Ferrite Power Inductor

The PDLS series Multilayer inductor is SMD component that possess an ultra-low DC resistance and low profile. This component can keep low inductance variation in high current application. Therefore, it is suitable in DC-DC converter.

FEATURE

- This series is small, low profile, and high efficiency.
- No cross coupling between inductors due to the complete magnetic shield
- Stable low DC resistance and high saturation current.



APPLICATION

- Electronic Equipment (Information and Communication Technology) | Power converter circuits of compact mobile communication devices such as tablet and smartphone product etc.



Set-top Box



Laptop



Cellular phone

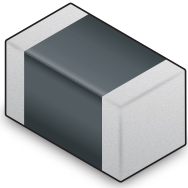


Wearable device

MAIN SPEC

Please refer to the specification sheet for the actual characteristics

Series	Inductance [µH]	L measuring Frequency [MHz]	SFR [[MHz] min.	Series [Ω] max.	Saturation Current Isat [A] typ.	Rated Current Itemp [A] max.	Dimension [L×W×T] mm
PDLS1608	1.0~3.3	1	30~100	0.25	0.2~0.9	1.15	1.6×0.8×0.8
PDLS2012	0.47~4.7	1	20~80	0.05~0.275	0.27~2.4	1.2~3.1	2.0×1.2×0.9
PDLS2016	0.16~2.2	1	40~150	0.018~0.263	1.5~5.5	1.3~5.0	2.0×1.6×0.9
PDLS2520	0.24~2.2	1	30~80	0.03~0.138	1.6~5.7	1.9~4.2	2.5×2.0×0.9



PCLS Series **Multilayer Ferrite Power Chip Inductor**

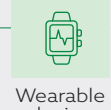
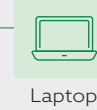
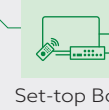
The PCLS series Multilayer inductor is SMD components that possess an ultra-low DC resistance and low profile. This component can keep low inductance variation in high current application. Therefore, it is suitable in DC-DC converter.

FEATURE

- Small size, low profile, and high efficiency.
- No cross coupling between inductors due to the complete magnetic shield, which is suitable for high dense printed circuit boards.
- Stable low DC resistance

APPLICATION

- Electronic Equipment (Information and Communication Technology) | Power converter circuits of compact mobile communication devices such as tablet and smartphone product etc.



Set-top Box

Laptop

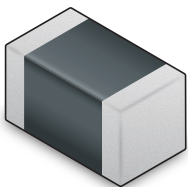
Cellular phone

Wearable device

MAIN SPEC

Please refer to the specification sheet for the actual characteristics

Series	Inductance [μH]	L measuring Frequency [MHz]	DC Resistance [Ω] max.	Rated Current [A] max.	Dimension [L×W×T] mm
PCLS1608	1.0~10	1	0.195~0.78	0.11~0.95	1.6×0.8×0.8
PCLS2012	0.47~22	1	0.0675~0.871	0.1~1.3	2.0×1.25×1.25 2.0×1.25×0.9
PCLS2016	0.22~12	1	0.0429~0.39	0.5~2	2.0×1.6×0.9
PCLS2520	0.39~10	1	0.05~0.364	0.5~2.5	2.5×2.0×1.1 2.5×2.0×0.9



KEWS Series **Metal Alloy Wire Wound Power Inductor**

The KEWS series widely used in power circuit applications. Compared with ferrite multilayer inductors, metal alloy products can exhibit high current and low DC resistance.

FEATURE

- Magnetic shield type of wound power inductor.
- With excellent DC bias characteristic by using metal magnetic material.
- With low RDC and high I-sat (Saturation Current).

APPLICATION

The series is suitable for high current power circuit

- Main spec | Please refer to the specification sheet for the actual characteristics



Set-top Box

LED/LCD TV

Laptop

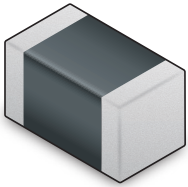
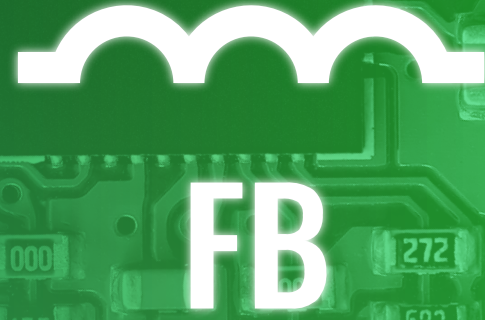
Router

MAIN SPEC

Please refer to the specification sheet for the actual characteristics

Series	Inductance [μH]	Tolerance	L measuring Frequency [MHz]	DC Resistance [Ω] max.	Saturation Current Isat. [A] typ.	Rated Current Itemp. [A] max.	Dimension [L×W×T] mm
KEWS1608	0.24~1.0	±20%	1	30~128	2.1~4.9	1.7~3.5	1.6×0.8×1.0
KEWS2012	0.24~2.2	±20%	1	25~228	2.0~6.5	1.2~3.8	2.0×1.2×1.0

CHIP BEAD

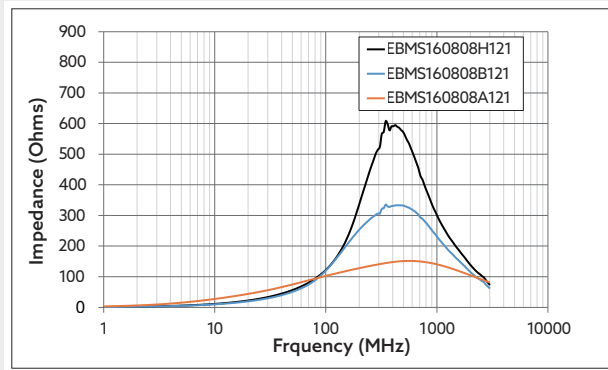


EBMS & ACMS Series **Multilayer Ferrite Chip bead**

EBMS & ACMS series are design for circuit design under 3A current. By different ferrite material, it can modified impedance behavior for different frequency noise.

FEATURE

- Small size generates high impedance.
- Excellent solder ability and high heat resistance for either flow or reflow soldering.
- Monolithic structure for high reliability.



Impedance vs Frequency

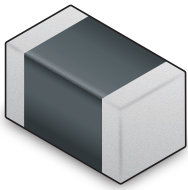
APPLICATION To suppress EMI/RFI and to prevent self-oscillation in electronic products. . . .

- Mother board, Tablet, Laptop and peripheral equipment.
- Various electronic equipments.
- Various automotive electronics equipments

MAIN SPEC

Please refer to the specification sheet for the actual characteristics

Series	Impedance [Ω] 100MHz	Rated Current [mA] max.	Dimension [L×W×T] mm	Series	Impedance [Ω] 100MHz	Rated Current [mA] max.	Dimension [L×W×T] mm
EBMS0603	10~1000	100~1000	0.6×0.3×0.3	ACMS1005	10~220	1000~3000	1.0×0.5×0.5
EBMS1005	10~1800		1.0×0.5×0.5	ACMS1608	10~1500		1.6×0.8×0.8
EBMS1608	10~2500		1.6×0.8×0.8	ACMS2012	10~2000		2.0×1.25×0.9
EBMS2012	10~2500		2.0×1.25×0.9	ACMS3216	19~1200		3.2×1.6×1.1
EBMS3216	19~2500		3.2×1.6×1.1	ACMS4532	60~1000		4.5×3.2×1.5
EBMS4532	30~150		4.5×3.2×1.5	ACMS5650	150~180		5.6×5.0×3.2



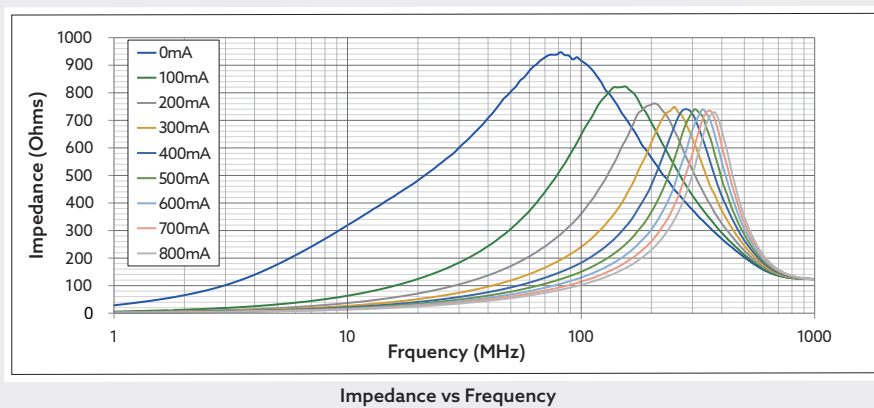
BCMS Series **Multilayer Ferrite Chip bead**

HBWS series wire wound inductor is made by ceramic, precision automatic winding engineering, designed with wide range inductance.

Widely used in high-frequency circuits on electronic communication equipment, such as mobile phone, portable communication products and terminal products, etc.

FEATURE

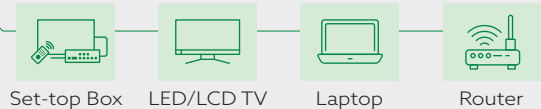
- BCMS series are design for high current noise suppression.
- Internal special structure design provide ultra low DC resistance. It make BCMS series can be apply in 10 A circuit design. BCMS series internal design also provide high saturation performance. It can provide high impedance under high current to ensure high current noise suppression.



APPLICATION

BCMS series can be apply in high current power circuit or high speed signal circuit EMI suppression.

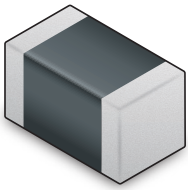
- Mother board, Tablet, Laptop and peripheral equipment.
- DSCs, DVCs, TV, Set top box.
- Digital communication equipment.



MAIN SPEC

Please refer to the specification sheet for the actual characteristics

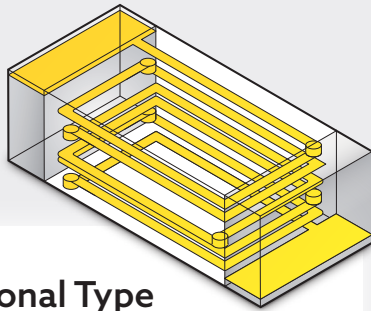
Series	Impedance [Ω] 100MHz	Rated Current [mA] max.	Dimension [L×W×T] mm
BCMS1005	10~30	4000~10000	1.0×0.5×0.5
BCMS1608	10~70		1.6×0.8×0.8
BCMS2012	10~120		2.0×1.25×0.9
BCMS3216	19~220		3.2×1.6×1.1
BCMS4030	56		4.0×3.0×2.2
BCMS4516	45~180		4.5×1.6×1.6
BCMS4532	47~880		4.5×3.2×1.5
BCMS5650	100~800		5.6×5.0×3.2
BCMS8530	56~100		8.5×3.0×2.2



BCAS Series Multilayer GHz High Frequency Ferrite Chip Bead

Traditional Multilayer chip bead is limit by internal silver structure and printing technology. Internal silver circuit will cause too many parasitic capacitance. Thus, impedance behavior is limited in low frequency. By improving printing technology and internal structure, BCAS series can be used in GHz High Frequency noise suppression. It can solve high speed signal circuit EMI suppression issue.

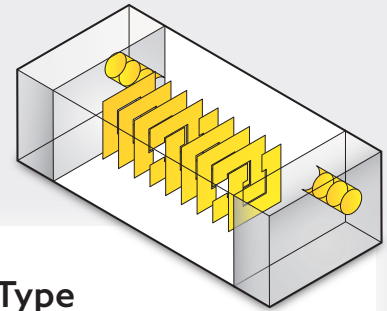
FEATURE



Traditional Type

- In the traditional vertical structure

the parasitic capacitance exists between internal electrodes and external terminal electrodes, which impedance is lower around hundreds MHz.



New Type

- With new transverse structure

THE DISTRIBUTED CAPACITANCE IS REDUCED.

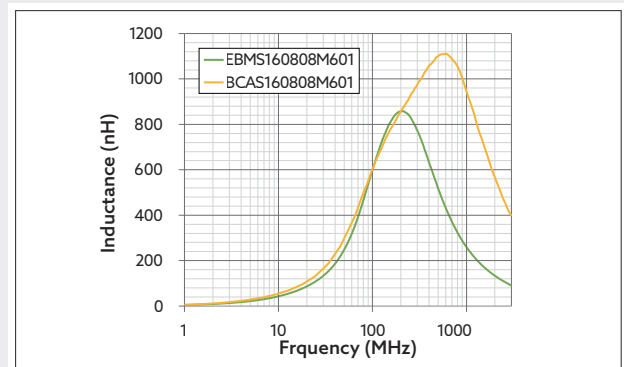
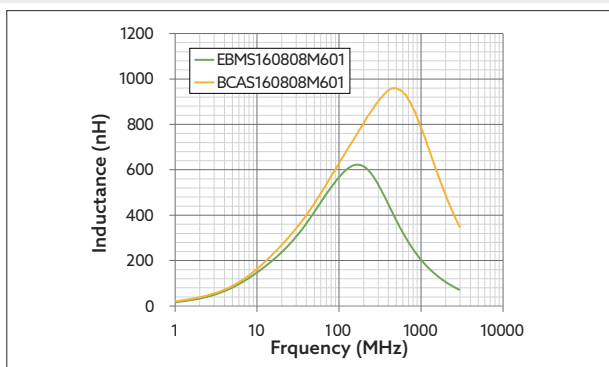
The impedance will be increased to **3** times of traditional type at 1GHz.



- The BCAS series is similar to EBMS series at frequency below 100MHz, however the impedance is 3 times higher at 1GHz.

- The BCAS series is intended for high speed signal lines as a broad frequency range.

- The magnetic shielded structure minimizes crosstalk.



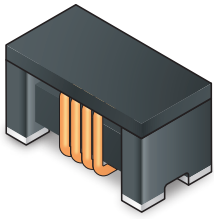
APPLICATION Suitable for high frequency noise suppression

- 5G modules, Bluetooth modules, Wifi modules

MAIN SPEC

Please refer to the specification sheet for the actual characteristics

Series	Impedance [Ω] 100MHz	Impedance [Ω] 1GHz	DC Resistance [Ω] max.	Rated Current [mA] max.	Dimension [L×W×T] mm
BCAS1005	220~1800	420~1400	0.7~1.6	100~200	1.0×0.5×0.5
BCAS1608	120~1500	200~1500	0.25~2.2	200~300	1.6×0.8×0.8



LDWS Series **Wire Wound Ferrite Bead**

The LDWS series wire wound ferrite bead has good noise suppression against high-frequency, and superior performance in low DC resistance and high current

FEATURE

- Better performance comparing with typical SMD ferrite inductors.
- Wider bandwidth and higher impedance, and higher self-resonant frequency.
- Better DCR suitable for high current applications

APPLICATION

The series is suitable for EMI suppression of high current power line or high speed signal line.

- Mother board, Tablet, Laptop and peripheral equipment.
- DSC, DVC, TV, Set-top box.
- Digital communication equipment.



Set-top Box



LED/LCD TV



Laptop

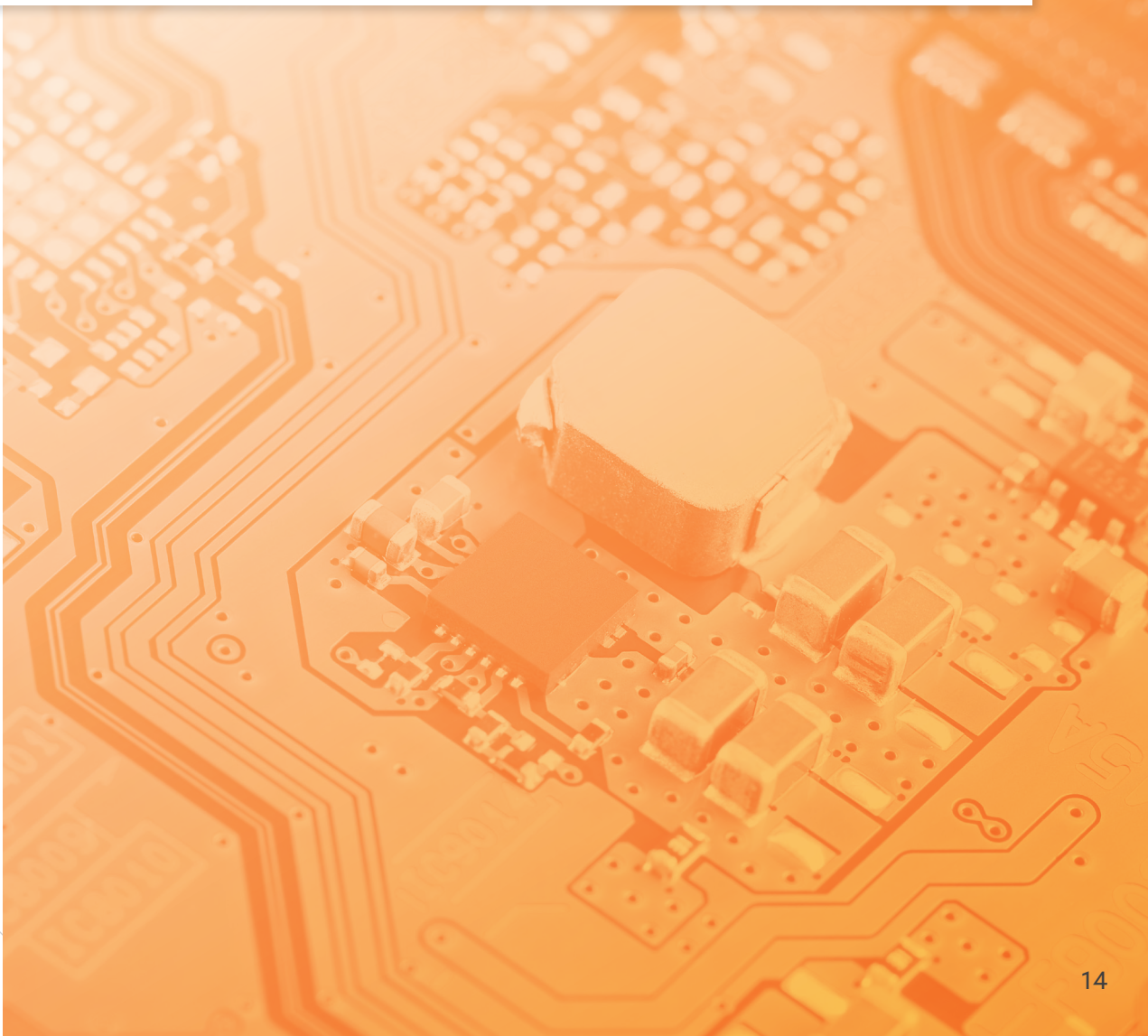
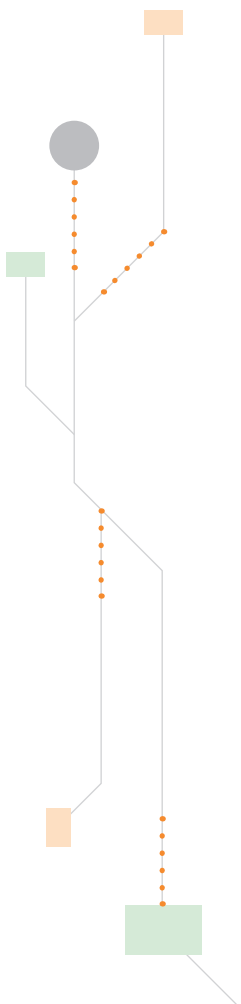


Router

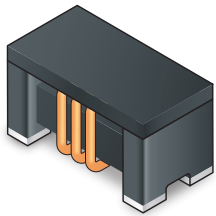
MAIN SPEC

Please refer to the specification sheet for the actual characteristics

Series	Inductance [nH]	Impedance [Ω] 100MHz	Impedance [Ω] 900MHz	DC Resistance [Ω] max.	Rated Current [mA] max.	Dimension [L×W×T] mm
LDWS1005	20~3300	11.98~5271	93.76~153.6	0.049~2.2	150~1400	1.1×0.72×0.55



COMMON MODE FILTER



EOWS Series Wire Wound Common Mode Filter

The EOWS series common mode filter utilizes ferrite material and wire wound design structure which is for suppression common mode noise. Simultaneously suppresses differential mode noise and does not affect the performance of the differential mode main signal.

FEATURE

- High impedance in the high frequency band and have an effect of suppressing noise.
- Designed for impedance from 67 to 2200Ω. Compatible for wide range of noise and signal frequency.
- The product has high coupling and reduce losses in differential mode, allowing for high-speed data transmission.

APPLICATION

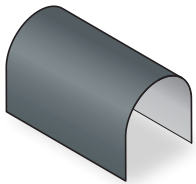
- Electronic device transmission interface: such as USB, IEEE1394, LVDS, display port, HDMI etc.

MAIN SPEC

Please refer to the specification sheet for the actual characteristics

Series	Common Mode Impedance [Ω] typ. ±25%	DC Resistance [Ω]	Rated Current [A]	Rated Voltage [V]	Insulation Resistance [MΩ] min.	Withstand voltage [VAC]	Dimension [L×W×T] mm
EOWS2012	67-2000 (at 100MHZ)	0.25~2.5	0.15~0.4	50	10	125	2.0×1.2×1.2
EOWS3216	90-2200 (at 100MHZ)	0.3~1.6	0.2~0.37	50	10	125	3.2×1.6×1.9
EOWS3225	550~5100 (at 10MHZ)	0.4~1.5	0.15~0.3	80	10	125	3.2×2.5×2.5
EOWS4532	600~5800 (at 10MHZ)	0.6~2.0	0.15~0.25	50	10	125	4.5×3.2×2.6

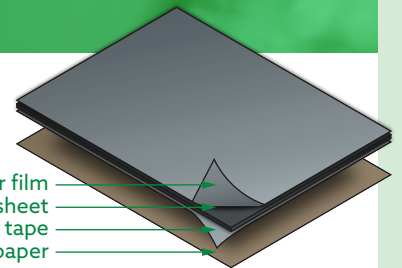
FLEXIBLE SINTERED FERRITE SHEET



EBHS Series Flexible Sintered Ferrite Sheet

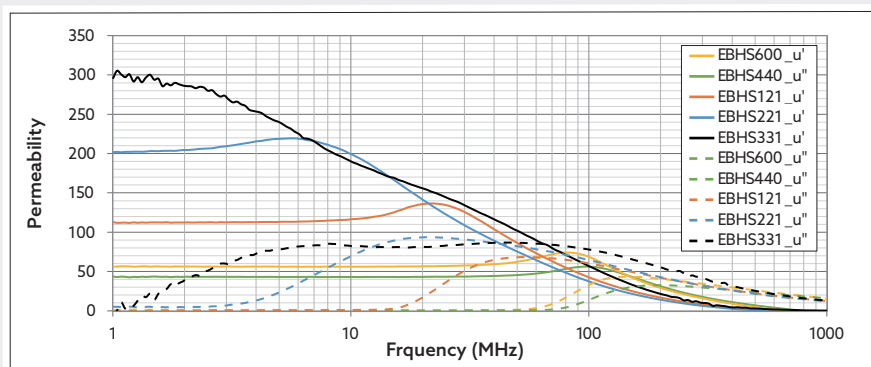
With μ' and/or μ'' , the sintered ferrite contained in the flexible sheet can be applied to prevent electromagnetic waves from being transmitted through the shield and/or convert electromagnetic waves to thermal energy.

Cover film
Ferrite sheet
Adhesive tape
Release paper



FEATURE

- Sintered ferrite for 13.56MHz NFC which has high permeability & lower permeability loss.
- Shielded to improved loop antenna distance.
- Suitable for wireless charging and suppressing electromagnetic interference.



APPLICATION EBHS series is use to EMI suppression or control magnetic field concentration.

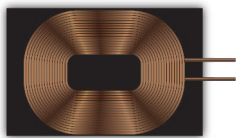
- RFID, NFC, Wireless charging, communication device noise suppression.

MAIN SPEC

Accept for customized design

Series	μ' Typ. @1MHz	μ'' Typ. @1MHz	Surface Resistivity [Ω /Square] min.	Operation Temperature Range °C	Dimension mm	Thickness mm
EBHS_440	44	2	1G	-40 to +85	120×120	0.1~0.5
EBHS_600	60	2				
EBHS_121	120	3				
EBHS_221	220	2				
EBHS_301	300	2				

WIRELESS CHARGING COIL

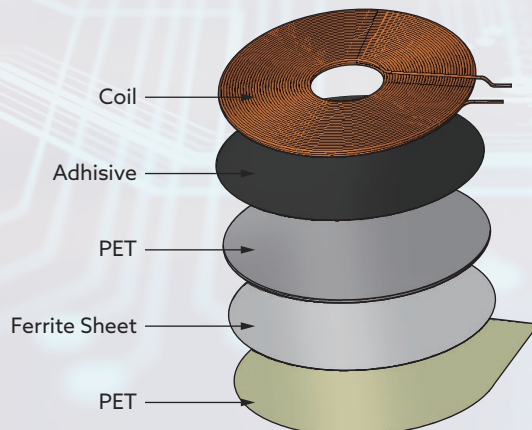
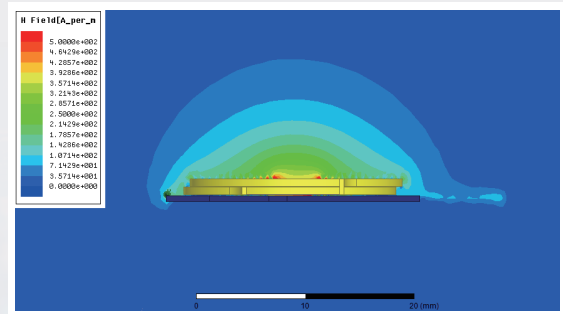
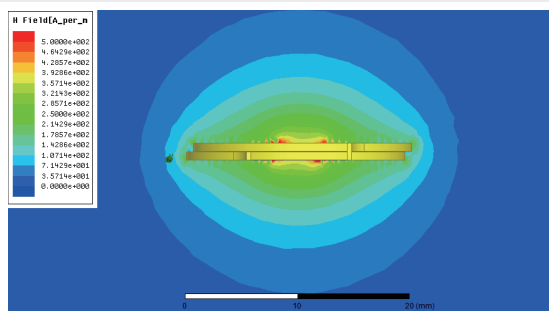


Wireless charging coil

Ferrite has a high permeability, and therefore can concentrate magnetic fields in the vicinity. It improves charging efficiency by "focusing" the magnetic fields, constraining them to the transmitter and receiver coil vicinity. It also serves to protect other circuitry and other devices from the magnetic fields.

FEATURE

- For Rx application up to 10 W.
- Blocks charging flux from sensitive components for batteries.
- High permeability shielding for wireless charging receiving coil.
- High saturation powdered iron - not affected by Durable construction permanent locating magnets.





APPLICATION This series is for wireless charging RX design, Accept for customized design

- For consumer electronic product under 15W, such as smart phone, smart watch, and other handheld device. It can be applied to hand tools or medical equipment that require a high dustproof and waterproof.

MAIN SPEC Accept for customized design

PN	Type	Inductance	DC Resistance [Ω] max.	Ferrite Sheet Thickness mm
GWC1075	RX	6.2uH ±10%	0.35	0.76
GWC1078	RX	17uH ±10%	0.43	0.91
GWC1079	RX	12uH ±10%	0.2	0.79



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