



Standard Power PBU Focus Product Promotion

2023/02

Agenda

➤ Organization

➤ Product Overview

- Power Inductor
- RF Inductor
- EMI Bead & Common Mode Filter

➤ Summary

YAGEO Group Companies

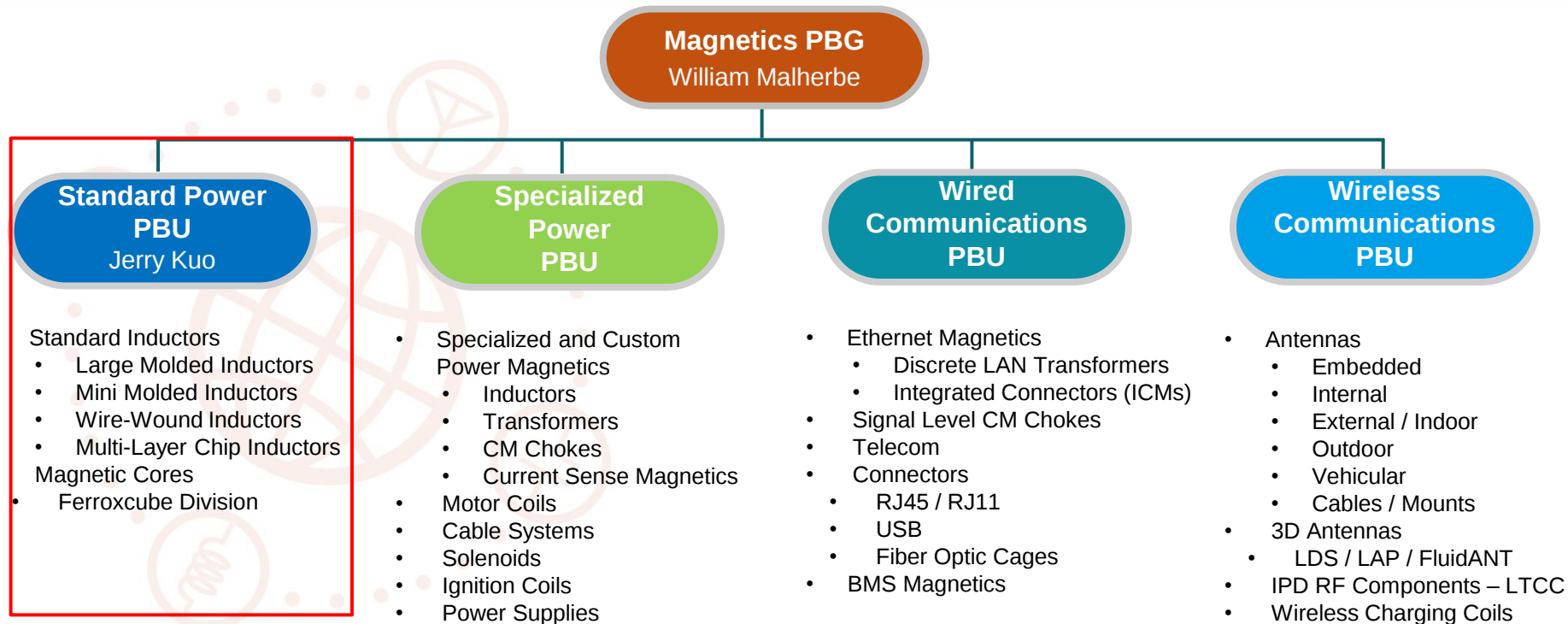


MAG LAYERS
Scientific Technics Co., Ltd



BOTH HAND

Pulse – Magnetics Product Business Group



Product Business Units



Standard
Power

High Volume Standard
Magnetic Components for
Commercial and
Automotive Markets

Mini Molded
Inductors



Large Molded
Inductors



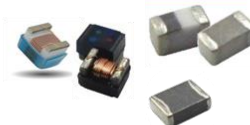
Resin Shielded
Inductors



Drum Core
Inductors



RF, Multilayer and
Thin Film Inductors



Specialized
Power

Design and manufacture
specialized power
magnetics, coils for
AC/DC & DC/DC switch-
mode power systems

Power
Inductors



Power
Transformers



Isolation
Transformers



Common Mode
Chokes



Current Sense
Magnetics



Ignition Coils



Cable
Systems



Motor
Coils



Solenoids, Actuators &
Power Supplies



Wired
Comm

Ethernet Magnetics &
Connector Modules,
Automotive Ethernet
CMC & CO Splitters,
Filters and Connectors

Ethernet
Discrete



Ethernet
Modules (ICMs)



Connectors



Telecom



Signal CM Chokes



Wireless
Comm

Design, engineering
and production of
antennas & antenna
modules for wireless
devices

Embedded



3D Antennas



Internal



External



Outdoor



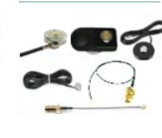
IPDRF Components
(LTCC)



Vehicular



Cables & Mounts



Manufacturing Locations

Factories

1
Taiwan

5
China

1
Asia

Vietnam



CHILISIN Haiphong

- Wire Wound inductor
- Multilayer inductor
- Mini Molding inductor
- Core



MAG LAYERS Taoyuan
Scientific Technics Co., Ltd

- Mini Molding inductor

China



CHILISIN Hunan

- L. Molding inductor
- Wire Wound inductor



MAGIC Hunan

- L. Molding inductor
- Wire Wound Inductor



CHILISIN Dongguan

- Mini Molding inductor



MAG LAYERS Kunshan
Scientific Technics Co., Ltd

- L. Molding inductor
- Wire Wound Inductor

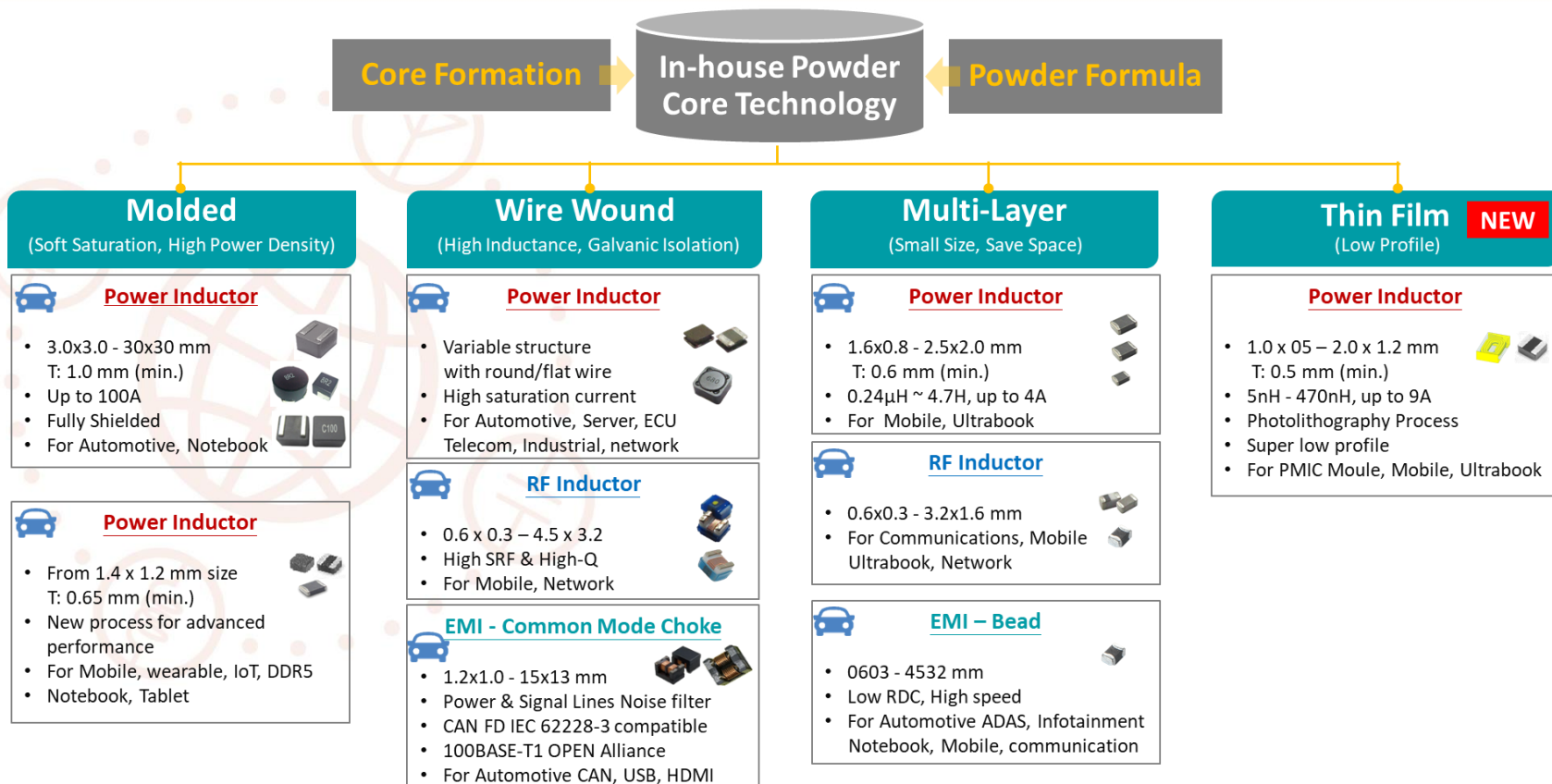


SHIN YUAN Kunshan
科學電子製品
SHIN YUAN ELECTRONIC PRODUCTS

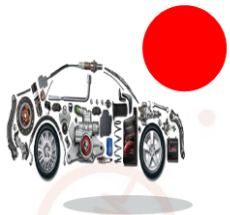
- Coils

Taiwan

Total Solution for Power / RF / EMI



Product Application Snapshot



Automotive Electronics

- PHY
- 48V mild hybrid system
- ECU
- EV Charging
- Lighting
- Infotainment
- ADAS
- Powertrain



- Power Inductor
- EMI - CMC for signal line
- EMI - CMC for power line
- EMI - Bead

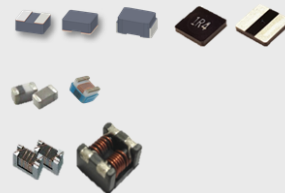


Networking/Datacenter/Industrial

- Memory (DDR5)
- WIFI 6
- NB-IOT
- 5G
- Connected Car
- Base station
- VGA
- HPC



- Power Inductor
- RF Inductor
- EMI - CMC for signal line
- EMI - CMC for power line

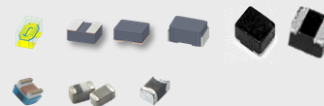


Handheld/Wearable Devices

- 5G phone
- Watch
- Tablet
- Smart Speaker
- Wireless Charging
- TWS



- Power Inductor
- RF Inductor
- EMI - Bead



Power Inductor Portfolio



Automotive



Industrial



Server
Data Center



Communication



Mobile
Tablet



Compute
Laptop



Consumer

Power Inductor

- Smartphone
- Wearable device
- Server DRAM - DDR5
- Audio Class D Amplifier
- Data Center
- Industrial control

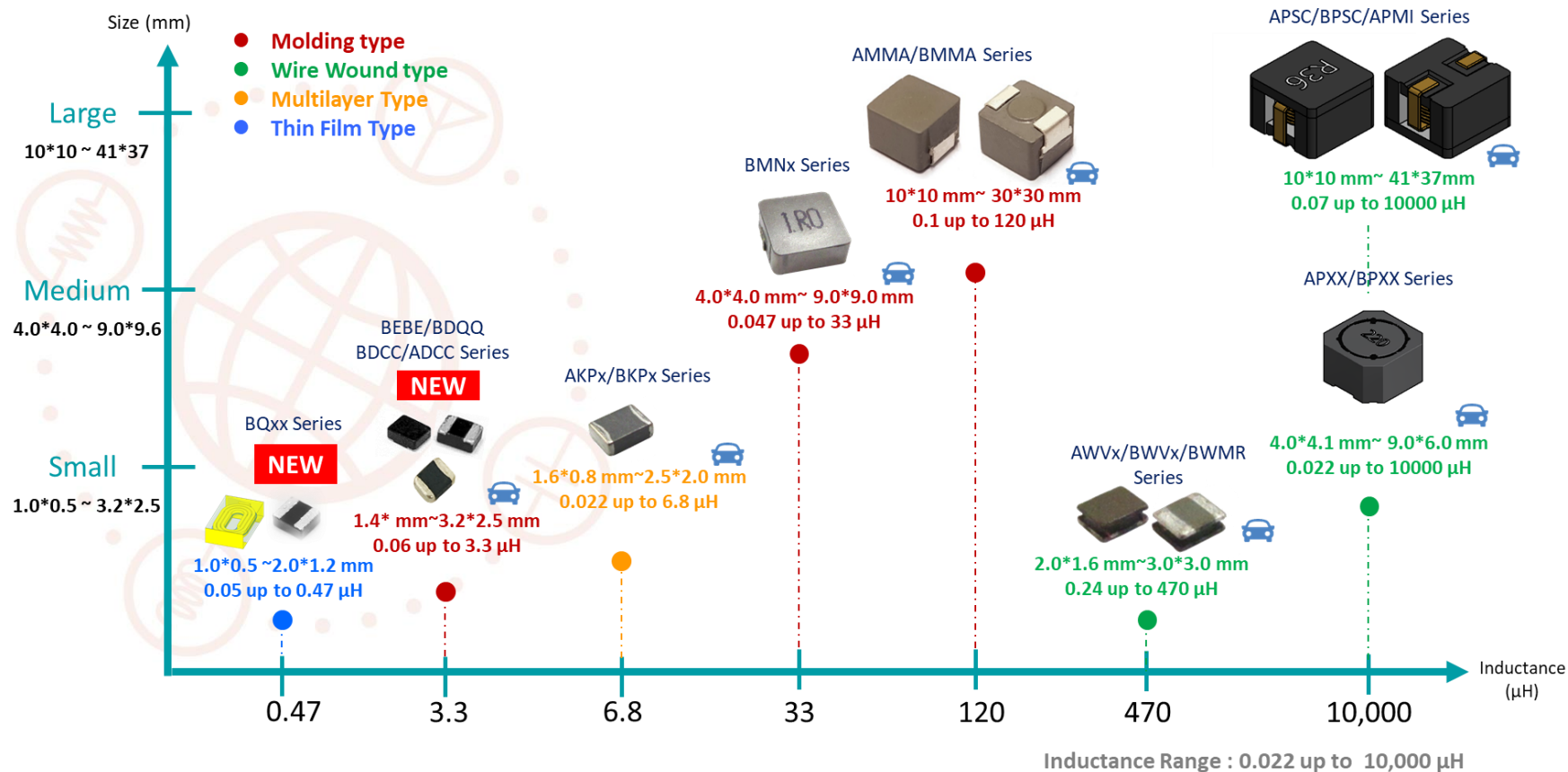
RF Inductor

- Wearable device
- Base station
- Networking
- Smartphone

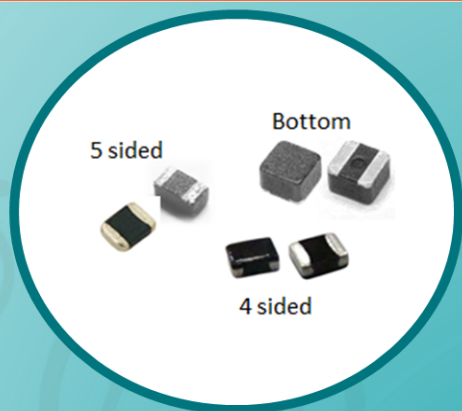
EMI Filter

- Automotive Ethernet
- CAN BUS /CAN FD BUS
- USB 2.0 - 3.1
- HDMI 2.0
- LVDS

Power Inductor Line-up



Mini Molded Inductors



Features:

Size : Standard 1.6 x 0.8 – 3.2 x 2.5 mm

Bottom Terminal 1.4x1.2- 3.2x2.5 mm

Height: 0.6 – 1.2mm

Inductance: 0.1 – 2.2μH

Max. rating current: 10A

Max. saturation current: 14A

~1,600 part numbers available

Series	Feature	Chip Size	Termination	Application
BEBE	- Low resistance - High saturation current - High Irms	1412, t=0.65-0.8mm 2012- 3225, t=0.8-1.2mm	Bottom Termination 	- DC-DC Buck - Smartphone - Notebook - Portable devices - SSD - Server
BESP	- High efficiency - Low core loss - Low resistance	4040, t=2.0mm 3225, 2520, t=1.2mm	Bottom Termination 	
BDQQ	- Low resistance - High saturation current	1412065, 141208 2012065, 201208, 201210 2016065, 201608, 201610	Bottom Termination 	
BDCC	- Half L-Shaped termination - Low resistance - High saturation current	2012-2520, t=0.8-1.2mm	L – Shaped Termination 	
BDHH	- High saturation current - Low resistance	2012-2520, t=0.8-1.0mm	Five-sided Termination 	
BDHE	Lower resistance	1608-3225, t=0.8-2.5mm	Five-sided Termination 	
BDHL	Four-Sided termination (Non-termination on the top surface)	2016-2520, t=0.8-1.2mm	Four-sided Termination 	

Key Mini Molded Inductor Products

BEBE Series

- Size: 1.4x1.2 mm – 3.0x3.0 mm
- Height 0.65mm-1.2mm
- Inductance 0.11 μ H – 2.2 μ H
- RDC 12 m Ω - 90 m Ω
- Isat up to 9A, Irms upto 8A
- Patent Pending



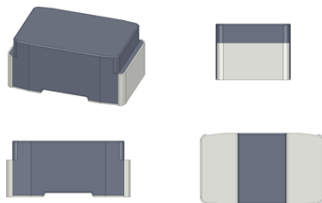
Applications:

- Smartphone, Tablet, NB
- Wearable device,
- 5G/Wi-Fi Module

BEBE1412 approved by Qualcomm (Y2020/2)
BEBE1412 design in MTK (Y2021)
BEBE2012 design in CPU chipset (Y2022/3)

BDCC - Current Inductors

- Size 2.0x1.2mm
- Height from 0.8mm
- Inductance 0.24 μ H-0.47 μ H
- RDC 22m Ω - 29 m Ω
- Isat upto 5.5A, Irms upto 4.2A
- **Half L-shape terminations**
- **Automotive Grade BDCC series**



Applications:

- Smartphones, Tablet, Notebook
- Wearable devices
- DC-DC modules

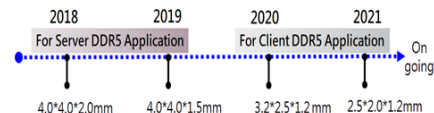
BESP- DDR5 Power Inductors

- Size 2.5x2.0 mm – 4.0x4.0mm
- Inductance 0.47 μ H-1.5 μ H
- Low RDC 4.5 m Ω - 32 m Ω
- Isat upto 9.2A, Irms upto 10.5A
- Low AC/DC losses
- **Meet JEDEC specifications**



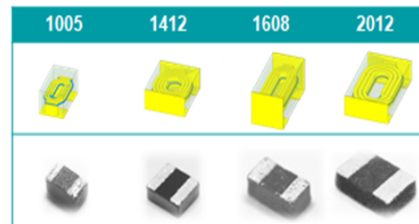
Applications:

- DDR5 power for Server/Client
- Desktop PC, NB, Tablet, Mobile



BQJM – Thin Film Power Inductors

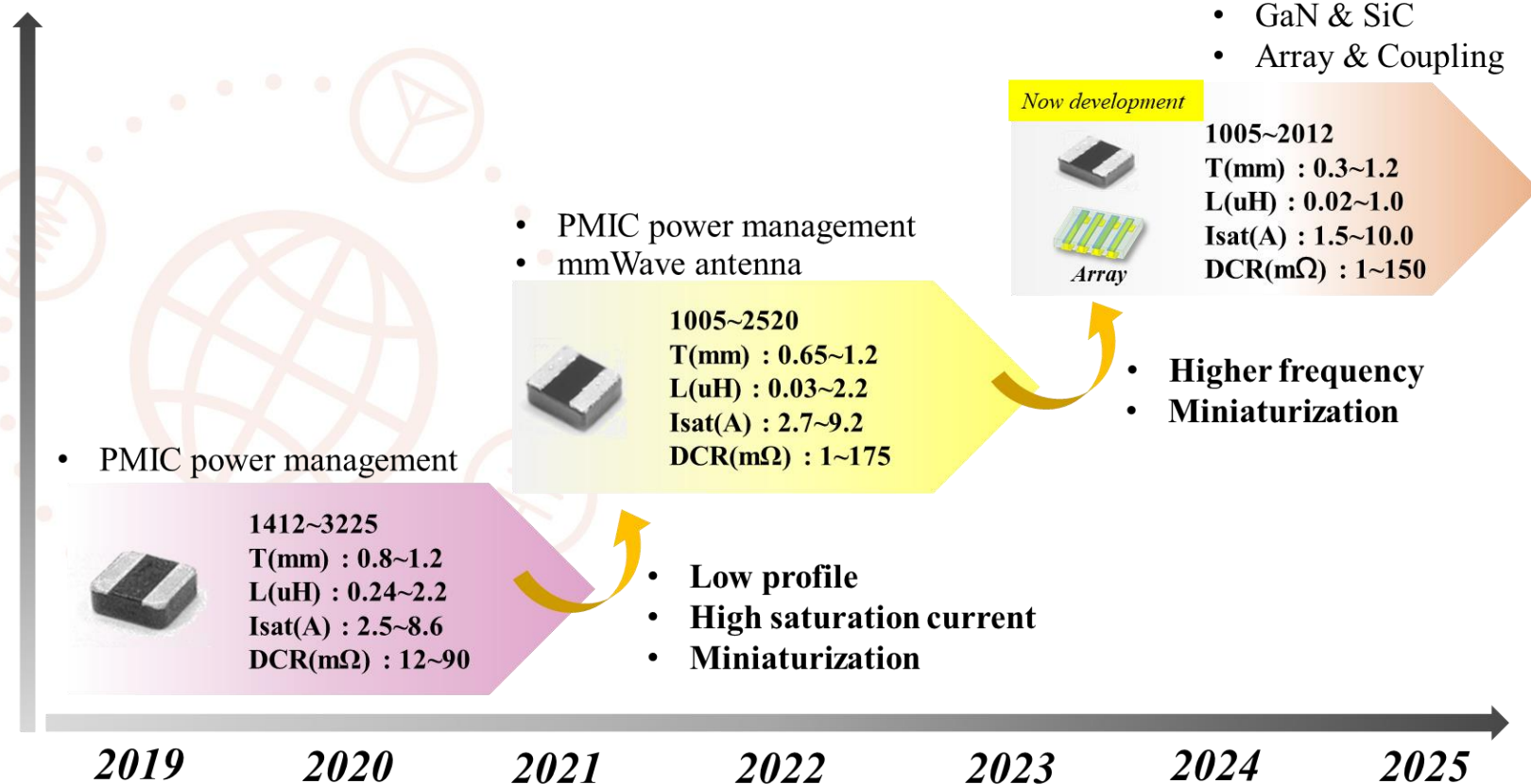
- Size: 1.0x0.5 mm – 2.0x1.2mm
- **Height 0.55 mm - 1.0 mm**
- Inductance 0.005 μ H – 2.2 μ H
- RDC 1.5 m Ω - 310 m Ω
- **Isat up to 12 A, Irms up to 7.4 A**
- Low Profile, Small size



Applications:

- Wearable Device
- PMIC/ power module
- mmWave Antenna Modules

Product Roadmap – Mini Molded



Large Molded Inductors



Features:

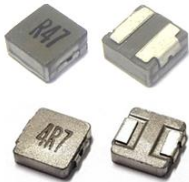
- Size: 4x4mm - 30x30mm
- Height: 1 - 10mm
- Inductance: 0.047 μ H - 47 μ H
- Traditional & Bottom terminal type
- Rating current: up to 55A
- Saturation current: up to 118A
- >2,800 part numbers
- >400 automotive parts



Special Designs:

- Stilted package for space saving
 - 4*4mm -12*12mm
- Sunk Package for Low profile
 - 1mm-1.2mm
- Coating for Corrosive/Flame Resistance
 - UV94V0,
 - 4*4mm – 17*17mm
- Custom Designs

Parts Selection

Series	AMMA, BMMA	AMNI, BMNI AMME, BMME	AMII, BMII	AMBI, BMBI	AMHP AMHT
Photo					
Features	• Standard part • Most common application	• Lower DCR & higher current • Low profile, Boost converter of LED driver	• Lower DCR and higher Isat • High current DC to DC converter	• Bottom termination • Low profile • Lowest DCR New Release	• Up to 70V rating voltage • Up to 180°C operating temperature • For Automotive Applications

Special Packages

Stilted series

- Saving space
- Shrink product size
- 4x4mm - 12x12mm



Sunk series

- Saving height
- 4x4mm - 10x10mm



Bottom Terminal

- Saving PCB saving
- Low DCR



Functional coating

- UL94 V0
- Chemical resistant



Others

- High Power
- Higher Vibration withstand



Capability to customize such as form, fit and function.

Key Large Molded Inductor Products

BMBx / BMEx Low RDC Inductors

- Size: 4x4 mm – 10x10mm
- Inductance 0.1 μ H – 8.2 μ H
- RDC 1 m Ω – 78 m Ω
- Flat wire winding
- Isat upto 37A, Irms upto 40A
- **Automotive version AFSI series**



BMBx Series

BMEx Series

Applications:

- High efficiency DCDC
- High Power density

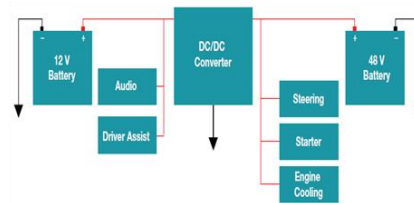
AMHP - High Voltage Inductors

- Size 6x6mm
- Inductance 0.68 μ H – 4.7 μ H
- RDC 5.7 m Ω – 31.9 m Ω
- Isat up to 20A, Irms up to 13 A
- **High Temp to 155C**
- **Withstand Voltage 70V**



Applications:

- Mild Hybrid
- Automotive LED lighting
- High Vin DCDC



AP3Y - Ultra High Current Inductors

- Size 15x15 – 30x30mm
- Height 1.0-18mm
- Inductance 1uH-68uH
- RDC 1.8m Ω - 61 m Ω
- Isat upto 100A, Irms upto 40A
- Extremely Low RDC

15.7*15.0mm



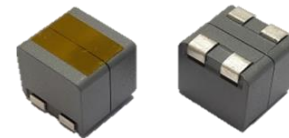
29.5*29.5mm

Applications:

- High Power DCDC
- Automotive
- THT Toroidal Choke replacement

AMDU - Dual Inductors in single package

- Size: 6.9 x 7.7 mm , 10.2 x 9.4 mm
- Height 7.3 mm , 10.85 mm
- Inductance 10 μ H – 22 μ H
- RDC 24 m Ω - 134 m Ω
- Isat up to 7.5 A, Irms up to 4.8 A
- Space saving, High reliability



Applications:

- Class D Audio Amp
- High Power density DCDC

BMMx/BMNx High Inductance Series

Description

Low profile & High inductance
molded power inductor

Features

Inductance up to 10 μ H
1.0/1.2mm height

Available part

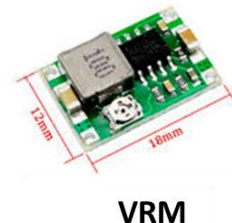
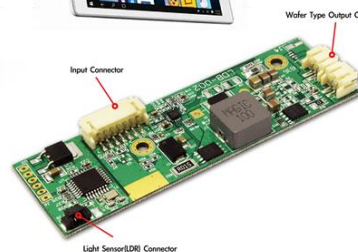
4 x 4 x 1mm, 4 x 4 x 1.2mm,
4.7 μ H-10 μ H



Application

- DC/DC converter for CPU in Notebook PC
- Thin type on-board power supply module for exchanger
- Voltage Regulator Module (VRM)
- Boost converter of LED driver

Part number	L*W(mm*mm)	H(mm)	LO(μ H) $\pm 20\%$	DCR(m Ω)		I _{rms} (A)		Isat(A)	
				Typ	Max	Typ	Max	Typ	Max
BMNI000404104R7MQX	4.1*4.1	1.0	4.7	135	160	2.6	2.3	2.5	2.1
BMNI000404106R8MQX	4.1*4.1	1.0	6.8	210	255	2	1.8	2.3	1.85
BMNI00040410100MQX	4.1*4.1	1.0	10	280	336	1.75	1.5	1.85	1.65
BMNI000404124R7MEX	4.1*4.1	1.2	4.7	94	113	2.9	2.6	2.5	2.2
BMNI00040412100MEX	4.1*4.1	1.2	10	200	240	1.8	1.6	1.6	1.4
BMME000404124R7MEX	4.4*4.2	1.2	4.7	124	145	2.4	2.1	3.2	2.8
BMME000404126R8MEX	4.4*4.2	1.2	6.8	300	355	1.7	1.5	2.7	2.3

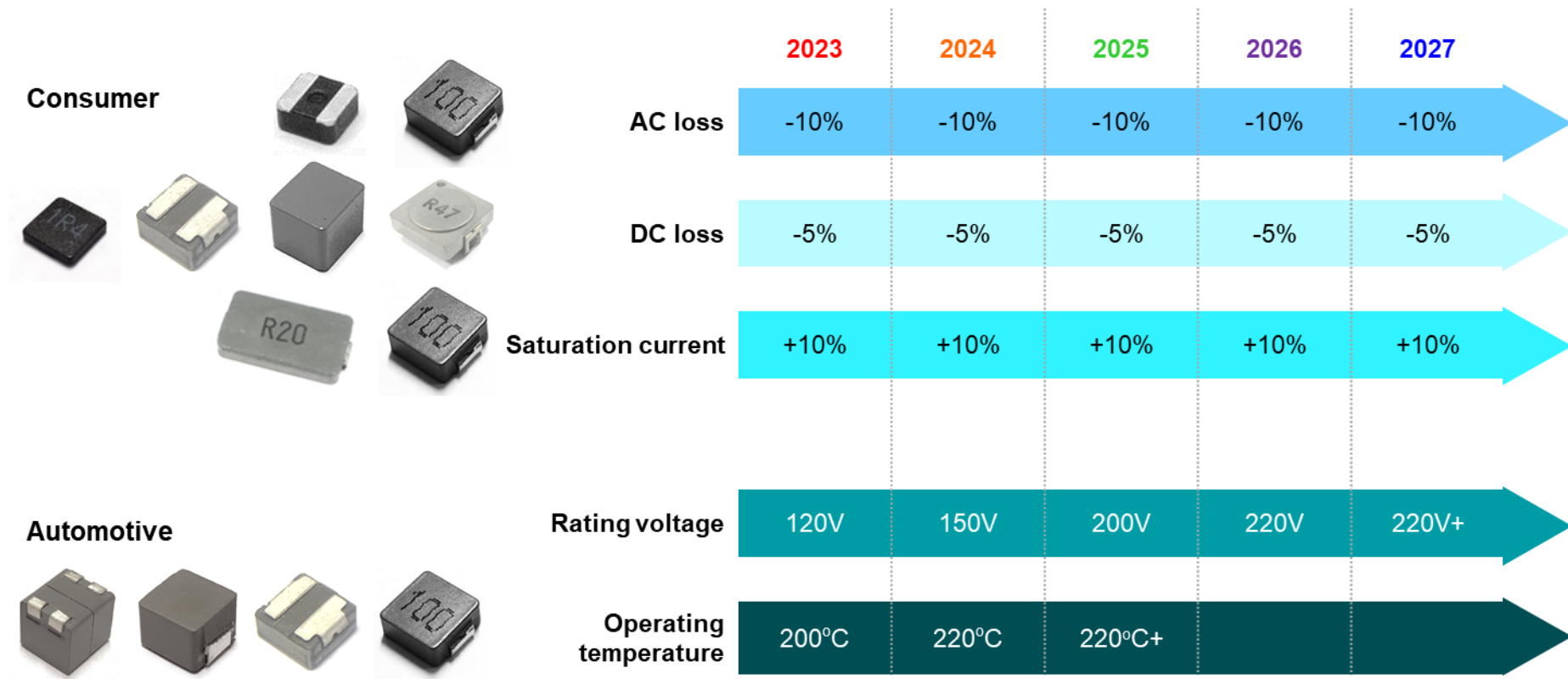


VRM

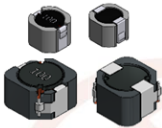
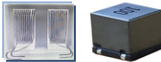


LED driver

Product Roadmap - Large Molded



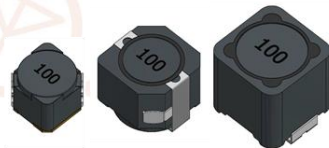
Wire Wound Inductors (Ferrite Assy)

Series	APAL/APCS	APCA	APMD	APCK	APSD	APSI/APCI	APCP	APXX
Appearance								
Feature	• High Power	• High Power	• Low RDC • High Temp	• Audio Class D amplifier	• High Temp	• High inductance	• Coupled Power Inductor	• Low Profile
Application	• Navigation • Electronic power • Infotainment	• Navigation • MCU • Infotainment • LED lights	• On board charger • Infotainment • Navigation systems • LED driver	• Audio class D amplifier	• Infotainment • MCU	• Infotainment • ADAS • BMS	• Lamp and control unit • DC to DC converter	• Navigation • MCU • Infotainment • Networking
Grade	 Automotive							

Key Ferrite Assy Inductor Products

APSC/APCI Series

- Size: 3 x 3 mm – 13 x 13 mm
- Inductance 0.47 μ H – 1000 μ H
- RDC 0.0033 Ω - 6 Ω
- Rated current up to 13.8 A
- **High temp to 180C, High Volt**



Applications:

- Infotainment, ADAS, BMS
- MCU, Networking
- LED lighting

APMD Series

- 6.8 x 6.8 - 28.0 x 26.0 mm
- Inductance 0.36 μ H – 22 μ H
- RDC 1.15 m Ω - 7.8 m Ω
- Isat up to 53 A; Irms up to 40 A
- High Temp to 180C



22 x 22 mm



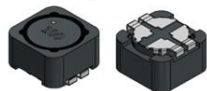
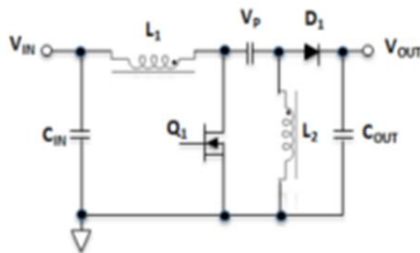
28 x 26 mm

Applications:

- High Power DCDC
- Base Station
- Automotive, Industrial

APCP Coupled Inductors

- Size: 12 x 12 mm
- Inductance 22 μ H, 33 μ H
- RDC 0.047 Ω , 0.072 Ω
- Isat up to 7.57 A
- Irms up to 3.98 A
- Excellent Coupling



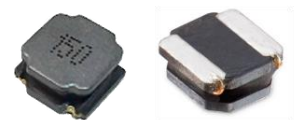
Dual winding
in one core

Applications:

- SEPIC converter
- Charger, LED lighting

AWVx Drum Core Inductor (磁封膠)

- Magnetic epoxy shield
- Size 2.0*1.6 - 8.0*8.0mm
- Inductance 0.24uH-1000uH
- Isat upto 8A
- Temp upto 150C



Applications:

- AP Routers, Set Top Box
- LCD TVs, monitors and panels
- Game consoles

RF Inductor Portfolio



Automotive



Industrial



Server
Data Center



Communication



Mobile
Tablet



Compute
Laptop



Consumer

Power Inductor

- Smartphone
- Wearable device
- Server DRAM - DDR5
- Audio Class D Amplifier
- Data Center
- Industrial control

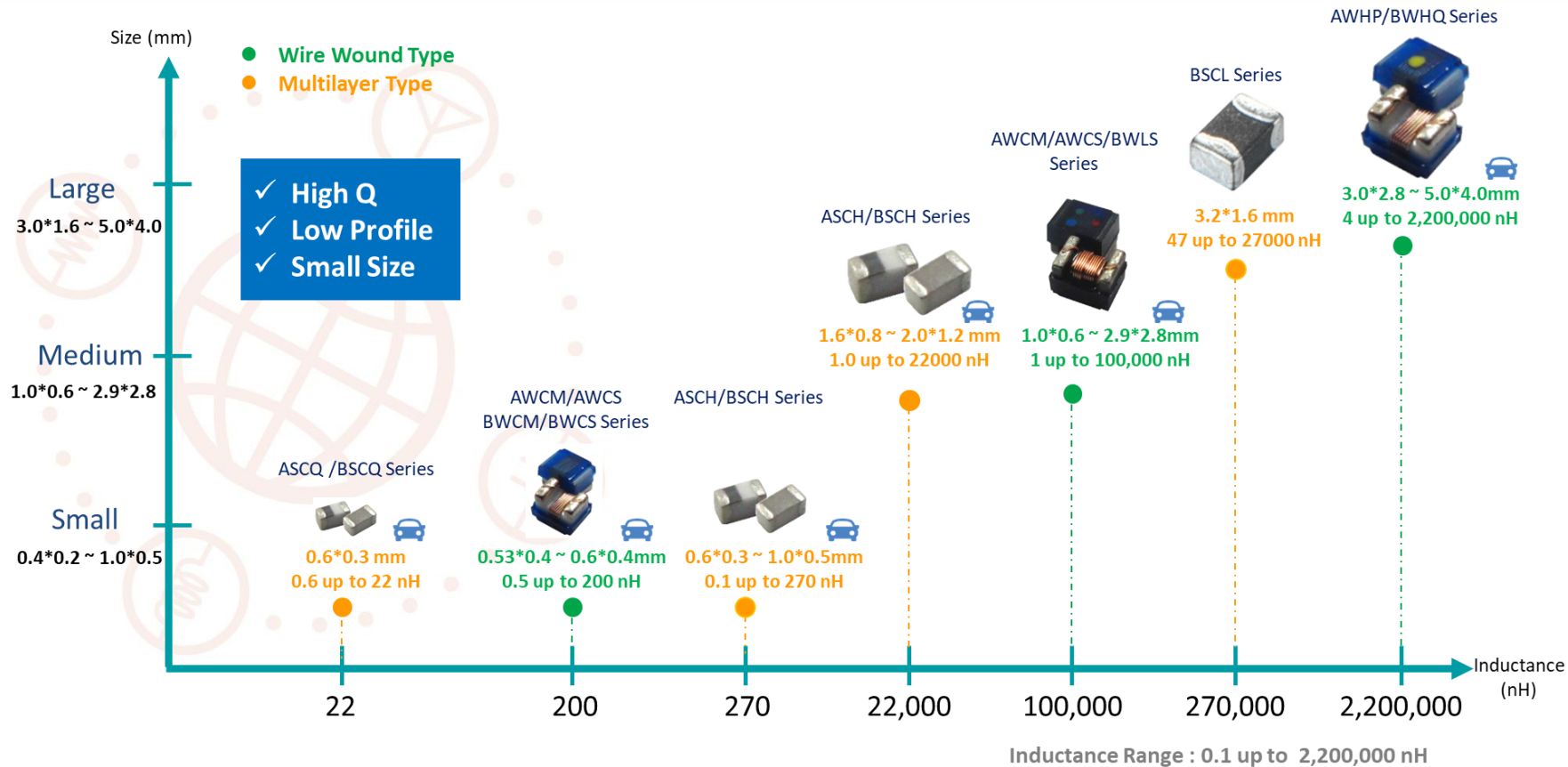
RF Inductor

- Wearable device
- Base station
- Networking
- Smartphone

EMI Filter

- Automotive Ethernet
- CAN BUS /CAN FD BUS
- USB 2.0 - 3.1
- HDMI 2.0
- LVDS

RF Inductor Line-up



EMI Filter Portfolio



Automotive



Industrial



Server
Data Center



Communication



Mobile
Tablet



Compute
Laptop



Consumer

Power Inductor

- Smartphone
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- Server DRAM - DDR5
- Audio Class D Amplifier
- Data Center
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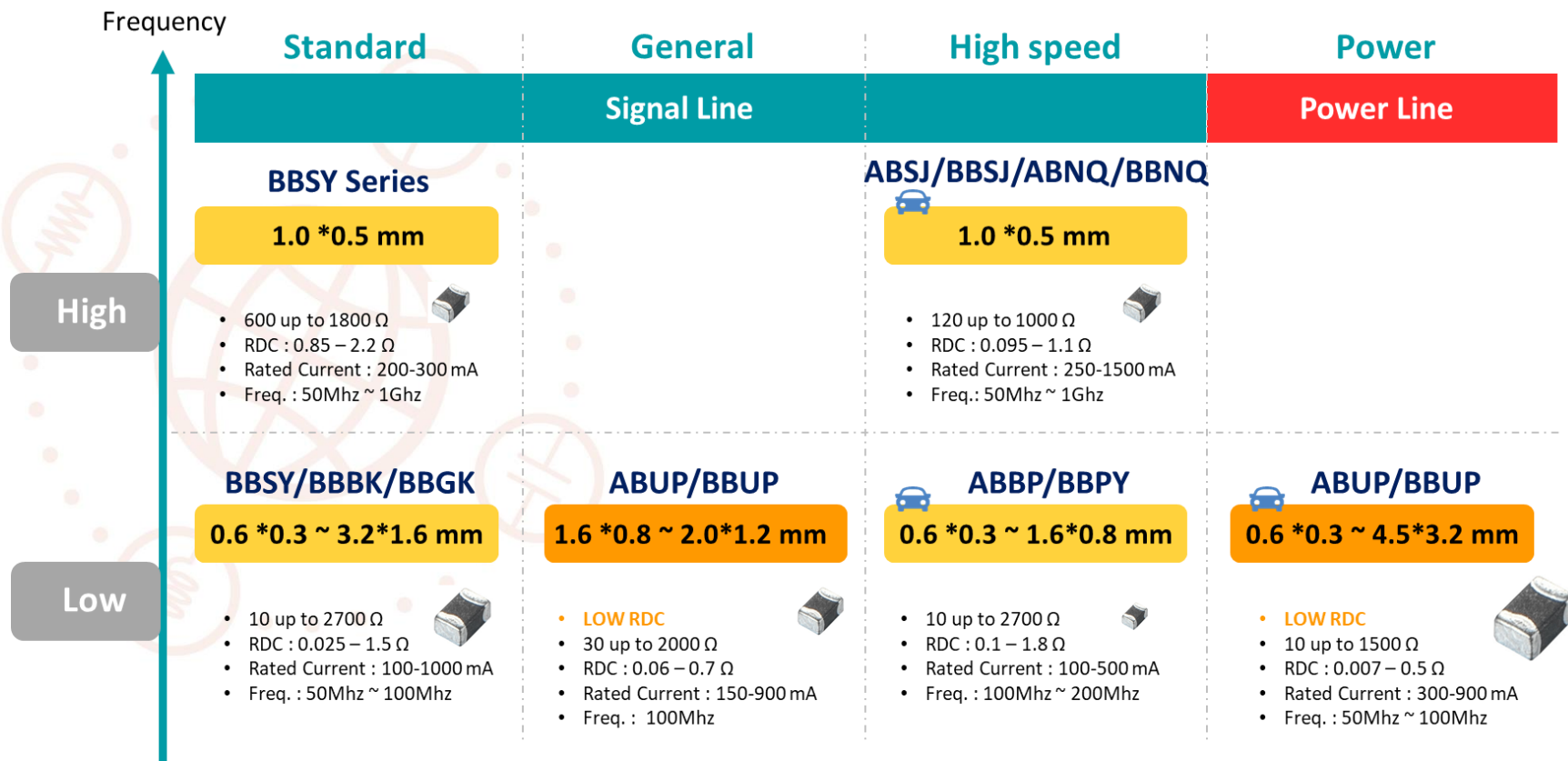
RF Inductor

- Smartphone
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EMI Filter

- Automotive Ethernet
- CAN BUS /CAN FD BUS
- USB 2.0 - 3.1
- HDMI 2.0
- LVDS

EMI - Ferrite Bead Line-up



Product Roadmap - Multilayer



CY2022



CY2023



CY2024

Multilayer Chip Beads

Smaller Size, High
Current, Lower RDC

- 1005/1608/2012/3216
- Impedance(Ω): 22~470
- RDC ($m\Omega$) : 7~200
- Rated Current (mA) : 1,000~4,000

- 1005/1608/2012/3216
- Impedance(Ω): 22~600
- RDC ($m\Omega$) : 7~200
- Rated Current (mA) : 1,000~6,000

- 1005/1608/2012/3216
- Impedance(Ω): 22~1,000
- RDC ($m\Omega$) : 5~200
- Rated Current (mA) : 1,000~8,000

Multilayer Power Inductor

Smaller Size, High
Current, Lower RDC

- 1608/2012/2016/2520
- L (μH) : 0.22~2.2
- RDC ($m\Omega$) : 24~400
- Rated Current (mA) : 1,000~2,000

- 1608/2012/2016/2520
- L (μH) : 0.22~4.7
- RDC ($m\Omega$) : 24~400
- Rated Current (mA) : 1,000~3,000

- 1608/2012/2016/2520
- L (μH) : 0.22~6.8
- RDC ($m\Omega$) : 24~440
- Rated Current (mA) : 1,000~4,800

Multilayer RF Inductor

Higher Inductance,
Higher Q Value

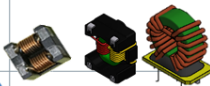
- 0603
- L (nH) : 1.0~100
- Q:14
- Tolerance: $\pm 0.1nH$

- 0603
- L (nH) : 1.0~120
- Q:14
- Tolerance: $\pm 0.1nH$

- 0603
- L (nH) : 1.0~120
- Q:14
- Tolerance: $\pm 0.1nH$

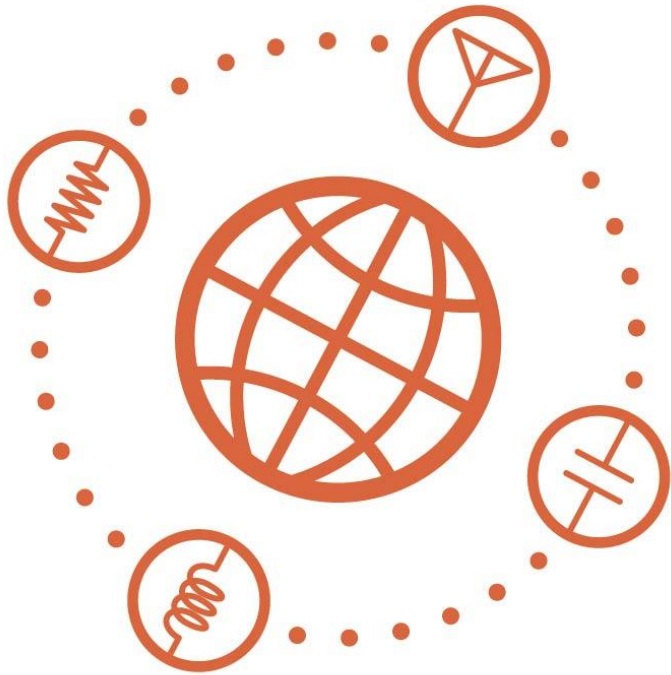
Unit: mm

Overview of Common Mode Choke Products

Size (mm/inch code)	Automotive Ethernet		CAN BUS		USB 2.0 IEEE1394b	LVDS	HDMI 2.0	USB3.1/ G1, G2	Powertrain	
	100 Base-T1	1000 Base-T1	Classical	FD						
Signal line Speed	100Mbps	1000Mbps	~8Mbps		480Mbps	~1.5GMps	6Gbps	10Gbps	Power Line	
1.2 x 1.0 (1210/0504)	Not applicable				BWCU001210 		BWCU00121 			
1.6 x 0.8 (1608/0603)					BWCU001608 					
2.0 x 1.2 (2012/0805)					BWCU/BWCC 002012  AWCU002012 		BWCU002012 	BWCU00201  AWCU002012		
2.3 x 1.5 , 2.5 x 2.0 (2315/, 2520/1008)					BWCU00231512 				BWCU00252012 	
3.2 x 1.6 (3216/1206-3225/1210)					 AWCU003225 	 AWCU003225 	 AWCU003325 	 AWCU003325 	BWCU003212  AWCU003212 	BWCU003216 
4.5 x 3.2 (4532/1812)	 AWCU004532  			 AWCU004532  						
7.0 x 6.0 Above ~									 APPM/APPS /APTE BPPM 	

Summary

1. We can provide the cross parts of competitor's serial and customize inductor.
2. To build robust and stable inductor with high efficiency to approach the technology trend with high temperature, high voltage and high power application in future.



Thank you!