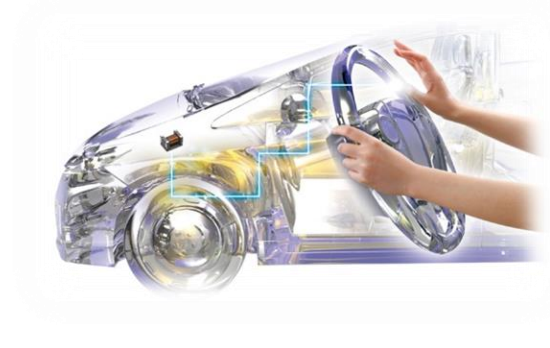


T125 MAGNETICS Playbook



INDUCTORS
EMC COMPONENTS
TRANSFORMERS
TOOLS



About this Magnetics Playbook

The following is an overview of the combined TDK and TEI Magnetics products and applications to be used as a guide for promotion and reference in the field by our sales representative community.

The contents of this product and applications guide are organized primarily by focus market segments, providing an overview of the major applications and focus applicable products within each segment. It also provides representative block diagrams and other related tools .

Contents:

- **Information and Communication Segment (ICT)**

- ✓ Target Application, and related products
- ✓ Selected Application Block diagrams

ICT



- **Industrial and Home Appliances (I&HA)**

- ✓ Target Application, and related products
- ✓ Selected Application Block diagrams

Industrial / Appliance / Energy



- **Automotive**

- ✓ Target Application, and related products
- ✓ Selected Application Block diagrams

Automotive



- **Sales and Technical Tools**

- ✓ Catalogs
- ✓ Sampling Capabilities
- ✓ Design tools



 **TDK
SIM-CAL STUDIO™**

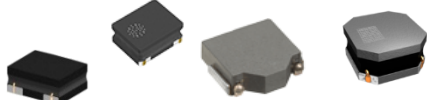
Inductor Loss Calculation Tool

Map and Product Families

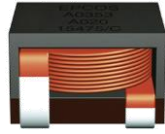
Industry Segment	Inductors (Power, Signal)	EMC Components (CM Filters, F. Beads, Ferrites)	Transformers
Automotive	ECM/ECU (Power Delivery, EMI Filtering) Car Multi-media LED Lighting (Power) ADAS (Power, Networking, Filtering)	In vehicle Networking	EV/HEV BMS BMS
Information & Communication Technology (ICT)	Power Management RF Block (TX/RX) Near Field Communication	DC Line Filtering Networking (EMI Filtering, LAN Magnetics, PoE) Interface (MIPI,USB2.0/3.0,SATA,HDMI)	DC-DC Conversion
Industrial / Appliance Energy (I&HA)	IoT Applications Power Management WiFi, Bluetooth Communication	EMC Filtering , Networking Audio Filtering	DC-DC Conversion Energy Management

Power Inductors - by Application

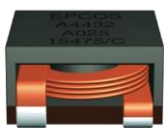
Auto grade

Product Range	Series	Application
Low Profile Area: 1.0x0.5~3.0x3.0mm Height : ~1.2mm 	- MLP(1005~2520) - TFM(1608~2520) - VLS-HBX(2016~3012) - VLS-CX(2016~3012) - MLD - VLS-CX-H - TFM-ALMA, TFM-ALVA (40V) - BCL	<u>Commercial:</u> HDDs, SSDs, Wearable devices, Thin portable devices, DC-DC conversion, Healthcare devices <u>Automotive:</u> ADAS ECU, in-Vehicle camera, radar, meter cluster, Headlights, electronic power steering
Small Size Area: 3.0*3.0~5.0*5.0mm Height: ~2.0mm 	- VLS3015CX - VLS4012HBX-1 - SPM-LR (3010~5020) - VLCF - LTF-D (3020-5022) - VLS-CX-H	<u>Commercial:</u> Thin Computing devices, Audio/Video devices, Fitness equipment , etc. <u>Automotive:</u> Car navigation, car audio, electronic power steering, headlights, other
Mid Power Area: 4.0*4.0~7.0*7.0mm Height: 2.0~5.0mm 	- VLS-EX (5045/6045) - VLS6045AF - VLCF - SPM4030~ 6550 - SPM-HZ, -VT-D - VLS-EX-H - CLF-NIT-D - HPL - B82462G,P - B82472P	<u>Commercial:</u> Computing devices, LCD TV, Monitor, Set Top Boxes, LCD Panels <u>Automotive:</u> Car navigation, car audio, ECM, airbags, headlights, electronic power steering, meters, ABS, USB Charger, other
High Power Area: 8.0*8.0~25.3*23.5mm Height: 4.0~12.0mm 	- SPM10xx, SPM12xx - SLF - SPM-XT - VLB, VLBS - VLBU - B82476B - ERU (B82559) - SPM-HZ - SPM-VT-D - HPL - SLF-H, CLF-NIT-D - B82464G,P - B82477G,D - PCM - ERU (B82559)	<u>Commercial:</u> Power supply and point of load regulators, Server, Base station, Network Router, Telecom equipment <u>Automotive:</u> LED lighting, ECM, airbags, headlights, electronic power steering, meters, ABS, other

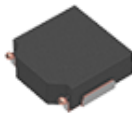
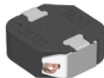
Power Inductors – ERU Series

Data Sheet Series Link	B82559AxxxxA013		B82559BxxxxA016		B82559BxxxxA019		B82559AxxxxA020	
								
LxW - H (mm)	10.7x13	4.95-6.00	16.5x17.3	6.8-10.5	18.5-19.9	7.65-10.25	22x22.3	9.8-14.1
Automotive Grade			AEC-Q200 qualified		AEC-Q200 qualified		AEC-Q200 qualified	
Series Description	ERU13		ERU16		ERU19		ERU20	
Inductance L_R μ H	I_{sat} (A)25°C	R_{DC} (typ)mΩ	I_{sat} (A)25°C	R_{DC} (typ)mΩ	I_{sat} (A)25°C	R_{DC} (typ)mΩ	I_{sat} (A)25°C	R_{DC} (typ)mΩ
0.44 μ H								
0.5 μ H	30.0	0.78						
0.95 μ H	25.0	5.95						
1 μ H			40.4	1.00	46.6	0.95	50.0	0.55
1.1 μ H	20.0	4.95						
1.25 μ H								
1.4 μ H	22.0	6.00						
1.5 μ H			40.5	1.40	48.1	1.35	50.0	0.80
2.15 μ H	15.0	4.95						
2.2 μ H			37.3	1.80	43.6	1.80	43.0	1.00
2.3 μ H								
2.4 μ H	16.5	5.95						
2.9 μ H								
3 μ H	13.0	4.95						
3.2 μ H								
3.3 μ H			30.9	2.20	35.1	2.25	34.0	1.30
3.5 μ H								
3.9 μ H	12.0	5.95						
4.35 μ H								
4.7 μ H			21.3	2.20	25.5	2.25	22.0	2.15
4.7 μ H								
6 μ H								
6.1 μ H								
6.8 μ H			18.7	6.20	21.3	7.60	19.0	2.70
7.9 μ H								
10 μ H			14.6	7.20	15.8	8.80	18.3	3.70
15 μ H			14.0	10.20	14.7	11.00	15.3	4.65
20 μ H			12.4	12.10	13.5	13.50	14.3	5.70
29 μ H							11.0	6.65
30 μ H			10.3	15.40	11.5	17.00		
35 μ H							9.3	6.65

Power Inductors – ERU Series

Data Sheet Series Link	B82559AxxxxA024		B82559AxxxxA025		B82559BxxxxA027	
						
LxW - H (mm)	24.7x22.8	12.45-21.30	23.5x25.3	9.6-14.6	27.8x25.8	11.9-16.9
Automotive Grade	AEC-Q200 qualified				AEC-Q200 qualified	
Series Description	ERU24		ERU25		ERU27	
Inductance L_R μ H	I_{sat} (A)25°C	R_{DC} (typ)mΩ	I_{sat} (A)25°C	R_{DC} (typ)mΩ	I_{sat} (A)25°C	R_{DC} (typ)mΩ
0.44 μ H			71.0	0.20		
0.5 μ H						
0.95 μ H						
1 μ H	78.5	0.45			101.5	0.46
1.1 μ H						
1.25 μ H			50.0	0.40		
1.4 μ H						
1.5 μ H	79.30	0.65			67.0	0.46
2.15 μ H						
2.2 μ H	67.90	0.85			68.0	0.68
2.3 μ H			41.0	0.60		
2.4 μ H						
2.9 μ H			33.0	1.00		
3 μ H						
3.2 μ H						
3.3 μ H	58.70	1.00			60.3	0.88
3.5 μ H						
3.9 μ H						
4.35 μ H			30.0	1.30		
4.7 μ H	46.40	1.25			53.5	1.39
4.7 μ H						
6 μ H						
6.1 μ H			28.0	1.60		
6.8 μ H	37.90	1.45			44.0	1.66
7.9 μ H			26.0	2.00		
10 μ H	31.10	1.85	24.0	2.20	34.8	1.92
15 μ H	24.60	2.80	15.0	2.20	22.9	1.92
20 μ H	21.50	3.40	15.0	2.80		
29 μ H						
30 μ H	15.70	3.60				
35 μ H						

Wire wound Metal Core Molded Power Inductors SPM, SPM-LR, SPM CT, SPM-XT

Photo	Size (mm)			Current Rating Index (Amp)	Inductance Range	Rated Current Range	TDK Series	Catalog / Spec Sheet
	W	D	Height	0 25 50				
	3.2	3.0	1.0	5.1	0.47 - 4.7uH	1.4 - 5.1	SPM3010-LR	SPM3010-LR
	3.2	3.0	1.2	4.5	0.47 - 4.7uH	1.7 - 4.5A	SPM3012-LR	SPM3012-LR
	3.2	3.0	1.5	4.8	0.47 - 4.7uH	1.9 - 4.8A	SPM3015-LR	SPM3015-LR
	3.2	3.0	2.0	4.8	0.47 - 4.7uH	1.9 - 4.8A	SPM3020-LR	SPM3020-LR
	4.4	4.1	1.0	5.6	0.47 - 10uH	1.1 - 5.6A	SPM4010-LR	SPM4010-LR
	4.4	4.1	1.2	6.7	0.47 - 4.7uH	1.7 - 6.7A	SPM4012-LR	SPM4012-LR
	4.4	4.1	1.5	6.8	0.47 - 10uH	1.5 - 6.8A	SPM4015-LR	SPM4015-LR
	4.4	4.1	2.0	8.7	0.47 - 10uH	1.8 - 8.7A	SPM4020-LR	SPM4020-LR
	5.4	5.1	1.0	5.3	0.47 - 10uH	1.2 - 5.3A	SPM5010-LR	SPM5010-LR
	5.4	5.1	1.2	5.4	0.47 - 10uH	1.3 - 5.4A	SPM5012-LR	SPM5012-LR
	5.4	5.1	1.5	9	1 - 10uH	2.3 - 9.0A	SPM5015-LR	SPM5015-LR
	5.4	5.1	2.0	8.6	1 - 10uH	2.3 - 8.6A	SPM5020-LR	SPM5020-LR
	4.2	4.0	3.0	7.8	0.4 - 3.3uH	2.2 - 7.8A	SPM4030	SPM4030
	5.2	5.0	3.0	21	0.2 - 4.7uH	3.0 - 21A	SPM5030	SPM5030
	7.1	6.5	3.0	23	0.25 - 10uH	2.6 - 23A	SPM6530	SPM6530
	7.1	6.5	5.0	20.1	0.47 - 4.7uH	7.0 - 20.1A	SPM6550	SPM6550
	7.1	6.5	5.0	17	0.33 - 0.5uH	13.2 - 17A	SPM6550CT	SPM6550CT
	10.7	10.0	4.0	15	1.0 - 22uH	3.6 - 15A	SPM10040	SPM10040
	11.5	10.0	4.0	38	0.18 - 0.68uH	18 - 38A	SPM10040XT	SPM10040XT
	13.0	12.6	6.5	22	1.0 - 2.8uH	15 - 22A	SPM12565XT	SPM12565XT

Series Description:

SPM: Standard Series

SPM-LR: Standard Series Small Size

SPM-CT: Higher Efficiency material at high Frequency

SPM-XT: Large size, High Current

Wire Wound Metal Core Molded Power Inductors

SPM-HZ, SPM-VT Auto Grade

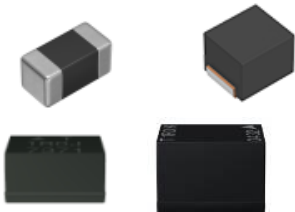
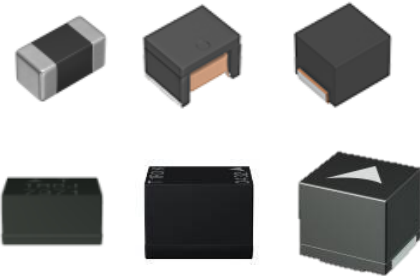
Photo	Size (mm)			Current Rating Index (Amp)	Inductance Range	Rated Current Range	TDK Series	Catalog / Spec Sheet
	W	D	Height	10 20 30 40				
SPM-VT-D -55~155°C 	5.3 7.0	5.1 6.5	3.0 4.5	17.1 23.2	0.15 - 4.7uH 0.15 - 68uH	3.8-17.1A 1.7 - 23.2A	SPM5030VT-D SPM6545VT-D	SPM5030VT-D SPM6545VT-D
	7.5	7.0	5.4	14.9	1.0 - 100uH	1.8 - 14.9A	SPM7054VT-D	SPM7054VT-D
	10.5	10.0	6.5	22.9	1.0 - 47uH	4.0 - 22.9A	SPM10065VT-D	SPM10065VT-D
	13.0	12.5	6.5	22.3	1.5 - 22uH	6.9 - 22.3A	SPM12565VT-D	SPM12565VT-D
SPM-HZ -40~125°C 	4.1	4.0	3.0	4.4	1.0 - 3.3uH	2.5 - 4.4A	SPM4030-HZ	SPM4030-HZ
	5.2	5.0	3.0	11	0.47 - 10uH	2.6 - 11.0A	SPM5030-HZ	SPM5030-HZ
	7.1	6.5	3.0	19.7	0.47 - 22uH	2.3 - 19.7A	SPM6530-HZ	SPM6530-HZ
	7.1	6.5	5.0	22	0.33 - 22uH	2.6 - 22.0A	SPM6550-HZ	SPM6550-HZ
	10.7	10.0	4.0	33	0.47 - 22uH	4.6 - 33.0A	SPM10040-HZ	SPM10040-HZ
	10.7	10.0	5.4	34.9	0.47 - 68uH	2.3 - 34.9A	SPM10054-HZ	SPM10054-HZ

Series Description:

SPM-VT-D: Automotive Grade, -55 to +155 Deg C Operating temp, AEC-Q200

SPM-HZ: Automotive Grade, -40DegC to +125C Operating Temp., AEC-Q200

Auto grade

Product Range	Series	Application
RF Inductors Signal Line 	• B82496C (0603, 0201) • B82498F (0805, 2012)	Commercial: SSD, Wearable devices, IoT devices, Automotive: Infotainment, Audio Video , ADAS, HUD, etc.
* Multilayer Ceramic RF Inductors  Super High Q High Q Standard Q High Current	• MHQ0402PSA • MHQ0603P • MHQ1005P • MLG0402P • MLG0603P • MLG0603S • MLG1005S • MLG0603PPA	Commercial: RF Amp, Antenna Matching, RF Front end Modules Automotive: Telematics, RF filtering, Antenna matching * Note: Multilayer RF inductors belong to FCOM BG
Signal Use Inductors For Standard Circuit 	• MLJ (0402, 0603) • MLF (0402, 0603, 0805) • NLV25/32 (1008, 1210) • MLF-TD25 (0402, 0603, 0805) • B82422A,T (1210) • B82432C (1812) • NLV25/32-D (1008, 1210)	Commercial: NFC circuits, Smart phones, tablet terminals, tuners, LCD-TVs, PDP-TVs, audio equipment, computers, signal processing for modules etc, Smart meters, AV equipment, xDSL. Automotive: Networking, Infotainment , A2B, C2B, Power Line filter, ECU, etc.
Signal Use Inductors For Decoupling Circuits 	• MLZ (0402,0603,0805) • NLCV25/32 (1008, 1210) • NLFV25/32 (1008, 1210) • KLZ-HR (0603, 0805) • MLZ-TD25 (0603,0805) • ADL3225V / VT (1210) • B82422H (1210) • B82432T (1812) • B82442T (2220) • NLCV25/32-D (1008, 1210)	Commercial: Smart phones, tablet terminals, note PCs, various modules such as camera modules, DSCs, video games, portable memory audio devices, navigation systems, PNDs, WLANs, SSDs. Smart meters, AV equipment, xDSL. Automotive: Networking, Infotainment, A2B, C2B, Power Line filter, ECU, Vehicle accessories (car navigation system, car audio), PoC.

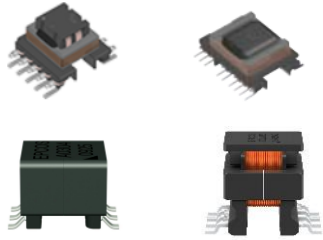
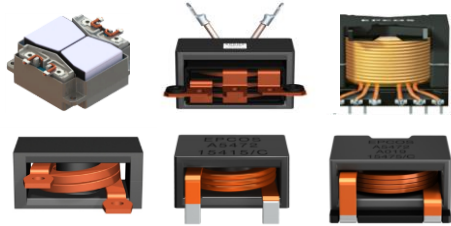
Auto grade

Product Range	Series	Application	Auto Grade
Ferrite Beads Power Line Signal Line 	• MMZ / MPZ • MMZ-E / MPZ-E (Giga) • MMZ-V / MPZ-V/N (High band GHZ)	Commercial: SSD, Wearable devices, IoT devices, Power conversion Automotive: Infotainment, Audio Video , ADAS, HUD, etc.	MMZ-D25, MPZ-D25 MMZ-ETD25 MPZ-ETD25 * KMZ1608-HR • KPZ1608-HR (*Soft Term. Type)
Noise Suppression Filters Audio Line Home Appliances 	• MAF-G / MAF-GW • MAF-F • VAF201610FA-1 • MAF2520A • VFS-VA / SA (5045,6045)	Commercial: Smartphones and tablets, portable game machines, AI speakers, Bluetooth speakers, TV speakers, LED lighting equipment, Home appliances	-----
Common Mode Filters High speed Networking 	• MCZ-DH/CH/AH(1210) • TCM-S/R (0403, 0605) • TCM-T/M/G (0605) • ACM (2012 /2520) • B82720H • B82789C,S • B82790C,S • B82791G,H • B82792C • B82793C,S • B82794C	Commercial: Networking, general, USB, HDMI, SATA, LVDS, DVI, MIPI, Ethernet. Automotive: Networking, Infotainment , CAN. Flex-Ray, Ethernet, MOST, A2B, C2B,	KCZ1210 ACM2012T-001 ACT45B ACT45R ACT1210 ACT1210R ACT1210L ACT1210G B82789C,S B82790C,S B82793C,S
Other 3 terminal Filters (L/C Filters) Ferrite Cores Clamp Filters 	• MEM Series • MEA Series • RID,BB, RH,RU,SH,SU • ZCAT Series	Commercial: Audio. Video equipment, General EMI suppression Automotive: General EMI filtering	ZCAT-V- BK Series Clamp Filters

Auto grade

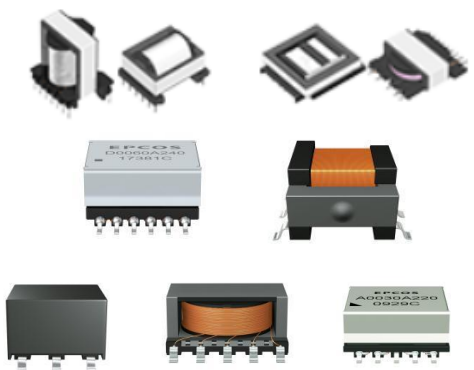
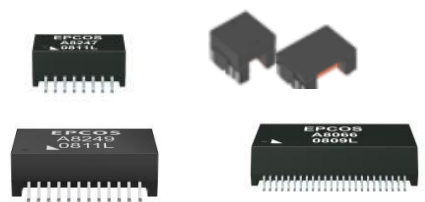
Product Range	Series	Application	Auto Grade
Common Mode Filters Power Line	• ACM (2012/2520) • ACP322S • ACM4520~ACM1513 • B82614R • B82615B • B82623G • B82625B • B82720A,K,S • B82721A,J,K • B82722A,J • B82723A,J • B82724A,B,J • B82724V • B82725A,J,S2,V • B82726S • B8272xE6 • B82730G,U • B82731H,M,T • B82732F,R,W • B82733F,V • B82734R,W • B82745S • B82746S,S4 • B82747E6,S4,S6 • B82748F,S • B82767S4 • B82791G • B82791H	Commercial: Power Supplies, SMPS, Appliances, Lighting, High Power (Solar, Drives), Charging Stations Automotive: EPS, Motor Measures against common mode noise in power lines for various DC power lines, multimedia devices, and various electronic devices, including automotive power trains and safety applications.	ACM4520V LCV70 ACM90V ACM12V B82116B,S B82622S

Auto grade

Product Range	Series	Application	Auto Grade
Transformers for BMS 	- VGT10/9EE - VMT40DR	Automotive: BMS (Battery Management System) Lithium-ion battery Voltage Monitoring Systems for XEV	- VGT10/9EE - VMT40DR
Transformers for IGBT/FET, (High Voltage Isolation 2.6KV) 	- VGT10 - VGT12 - VGT15 - VGT22 - B78307A*A003 - B78308A*A003 - B82804A*	Automotive: Intelligent Power Module Power Supply of a motor inverter for xEV Number of Outputs : 1,2,3 & 4 Isolated DC/DC (bridge & flyback) Digital isolator IC (500V & 1000V) Commercial: Gate Drive AC/DC, DC/DC converters	- VGT10 - VGT12 - VGT15 - VGT22 - B78307A*A003 - B78308A*A003
Current Sense Transformers 7A to 40A 	- VST10 - VST12.6 - B78417A2* - B78419* - B82801A1* - B82801B* - B82801C*	Automotive: XEV Power Train On Board DC/DC Converters & chargers Feedback control, Overload sensing, Load drop/shut-down detection Creepage & Clearance compliance Commercial: Switching power supplies Feedback control Overload sensing L Load drop/shut down detection	- VST10 - VST12.6 - B78417A2* - B78419*
High Power Transformers , Chokes 1.8kW, 3kW , 6.6kW, 11kW 	- VDT73PQ - B78338P* - B78547P* - B78338P* - B78337* - B82559*	Automotive: On-Board Charger (EV、 P-HEV) LLC or Phaseshift Fullbridge Transformer, Output/Resonance Choke DC/DC Converter 48Volt DC/DC	- VDT73PQ - B78338P* - B78547P* - B78338P* - B78337* - B82559*
SMT Transformer for Ultrasonic Sensors 	B78416*	Automotive: Ultrasonic transceiver driver used for Ultrasonic park assist Commercial: Industrial distance measuring Robotics	B78416*

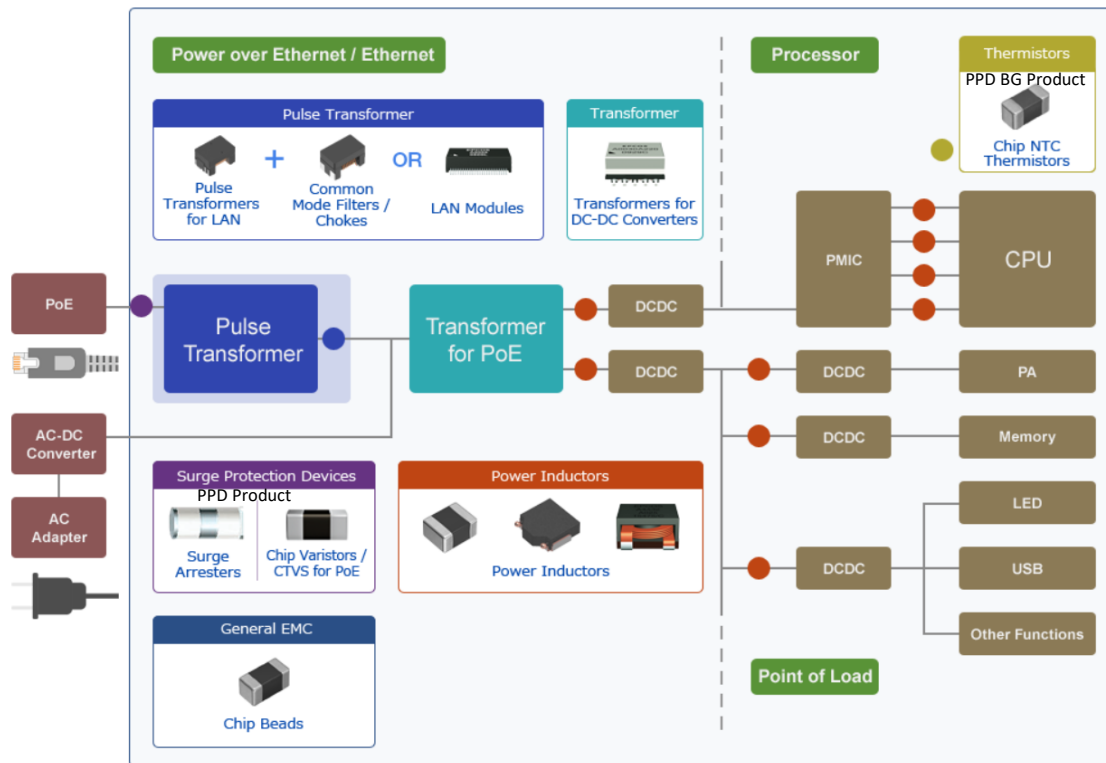
Auto grade

Transformers Range- by Application

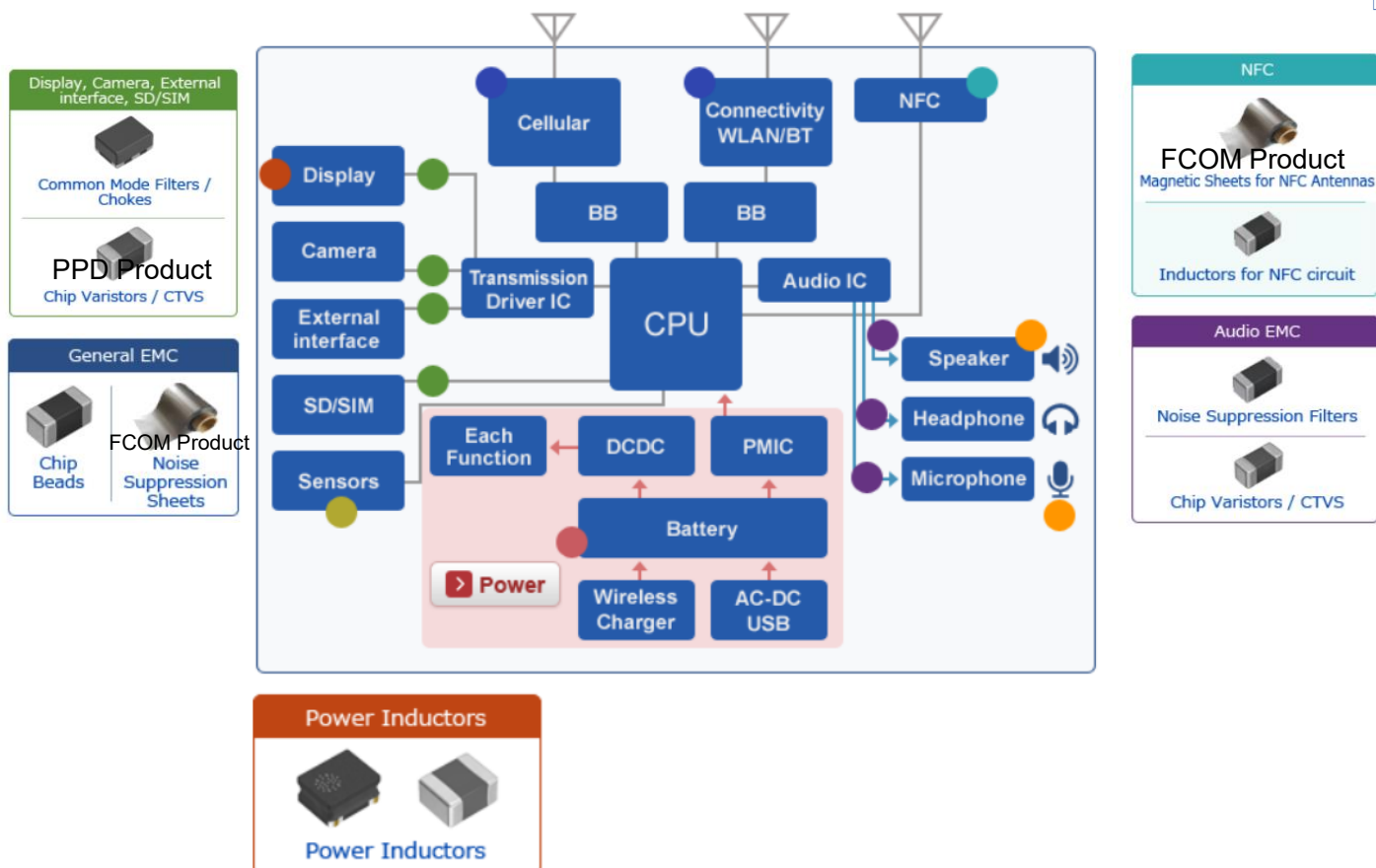
Product Range	Series	Application
	• B78362* • B78363* • B78364*	Automotive: Switching frequencies up to 700 kHz Saturation currents up to 30 A Leakage inductance 50 nH typ. Dc/DC Converter, SMPS Flyback, Buck Boost Power: 20 ... 50 W, 12 Vdc : 5 .. 200 Vdc
Transformers for AC-DC Converters 	• ECO • SRW • SRV/SRX • B82806D* • B78304B* • B82802A* • B78334B*	Commercial: AV Equipment, Digital Consumer Electronics Multi-Output power supplies Flyback converters, 10W to 80W LLC Resonance converters Power over Ethernet 12W/30W/55W/60W Active clamp forward converter SMPS Pulse, Drive, Broadband transformers Low-power DC/DC converters Isolated interface power supplies Industrial automation & Process control
Pulse Transformers for Lan Modules 	• ALT3232M • ALT4532M • ALT4532P • ALT4532H • B78476A*	Commercial: 100/1000BASE-T 1000BASE-T/2.5GBASE-T/5GBASE-T PoE+[600mA] 10GBASE-T
PFC Inductors 	• PFC27 • PFC33 • PFC35 • PFC38 • PFC41	Commercial: AV Equipment, Digital Consumer Electronics CRM (Critical Current Mode) PWM (Pulse Width Modulation)

Information & Communication Technology Power for Infrastructure

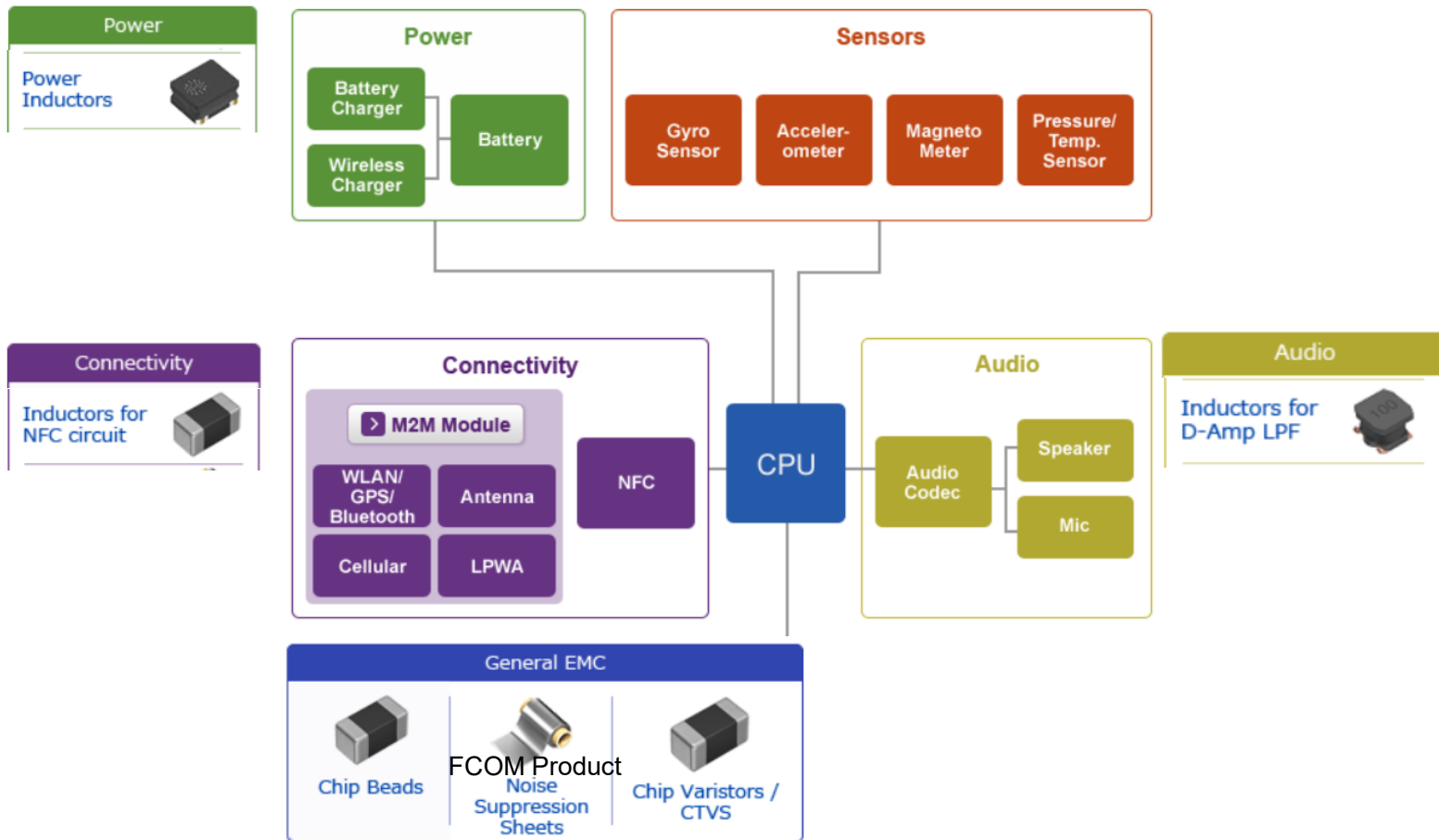
- Wide array of magnetics for Power conversion and data line including: Common Mode Filters and Chokes for PoE, Pulse Transformers for LAN, Power Inductors and more.
- Server, Base Station, Router, and Security Camera applications.



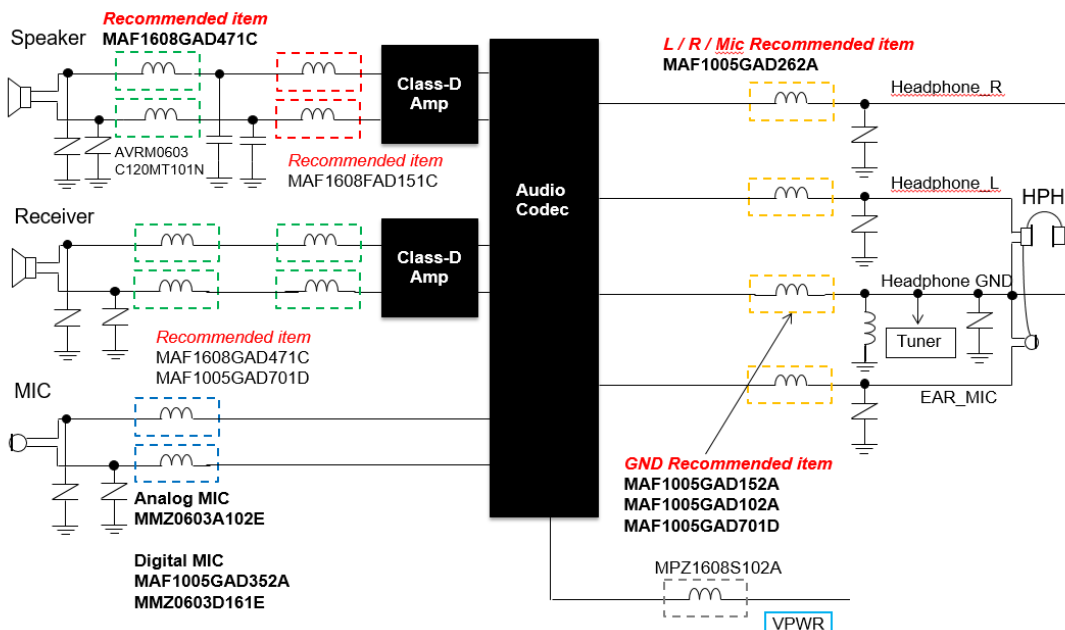
Information & Communication Technology Smartphones/Tablets



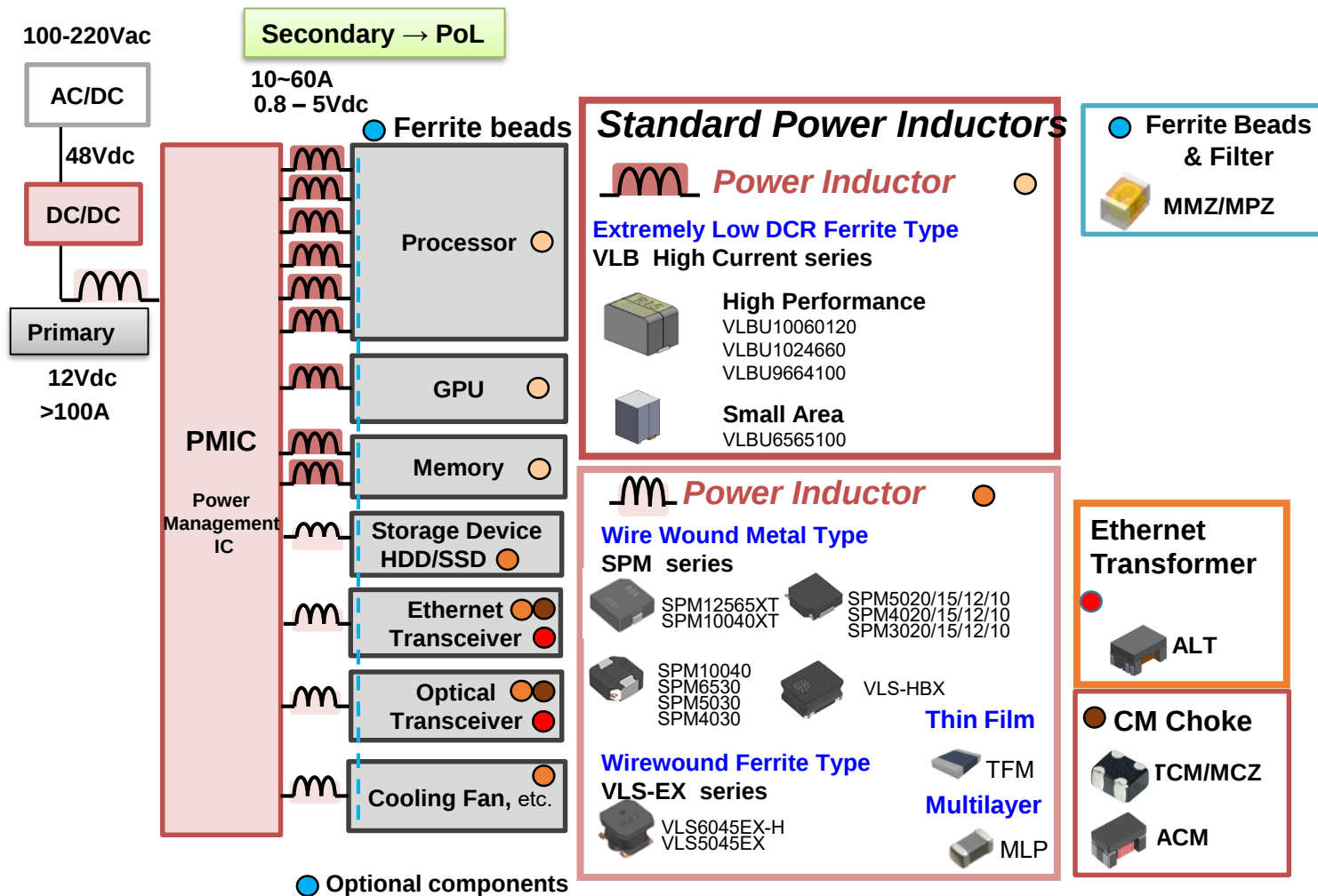
Information & Communication Technology IoT (Internet of Things)



Information & Communication Technology Smartphone Audio

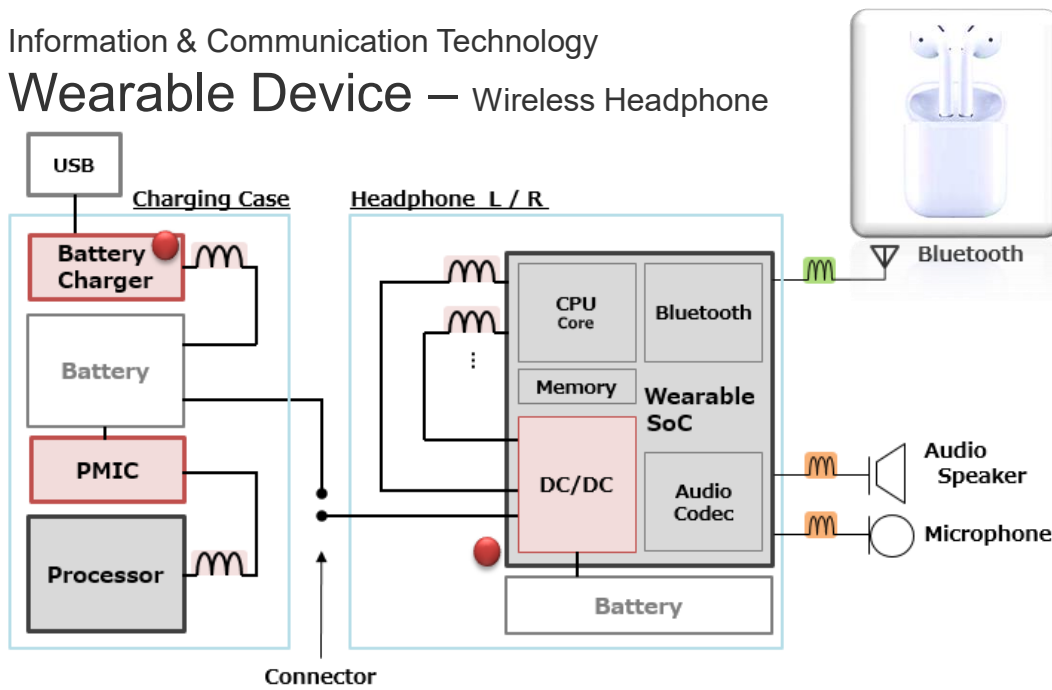


Information & Communication Technology Server-Telecom Power



Information & Communication Technology

Wearable Device – Wireless Headphone



RF Inductor
Multi-layer Type
MHQ / MLG / MLK series

High Q : MHQ1005/0603/0402 High SRF : MLK1005/0603

Standard Q : MLG1005/0603/0402

Power Inductor
Thin Film Type
TFM series TFM201610/08, TFM201208, TFM1608

Wire wound Type
VLS-HBX series VLS252012/10, VLS201612/10

Ferrite chip multi-layer Type
MLP series MLP2520, MLP2012, MLP1608

Power lines EMC
Ferrite chip Power beads
MPZ1608 series
MPZ1005 series

MPZ1005 (0402inch) MPZ1608 (0603inch)

Signal lines EMC
Ferrite chip beads
MMZ0603 series
MMZ1005 series
MMZ1005-E series

MMZ0603 (0201inch)
MMZ1005 (0402inch)
MMZ1005-E (0402inch)

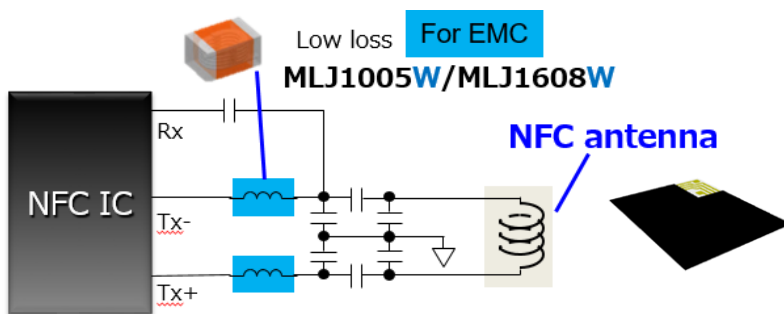
Audio Choke
Ferrite chip multi-layer Type
MAF

MAF1608/1005

Information & Communication Technology

NFC (Near Field Communication)

Differential Mode : Plastic or Ceramic case



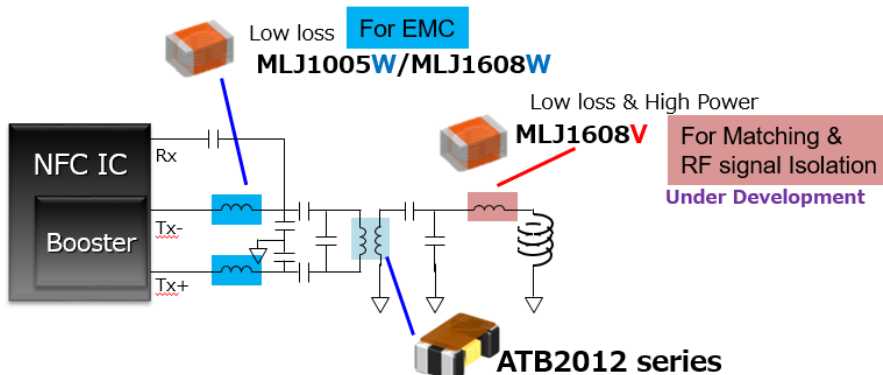
Multilayer Inductors

MLJ1005 Series
MLJ1608 Series

Magnetic Sheet

IBF Series
IFL Series

Single-ended Mode : Using Metal case or Metal frame for NFC antenna



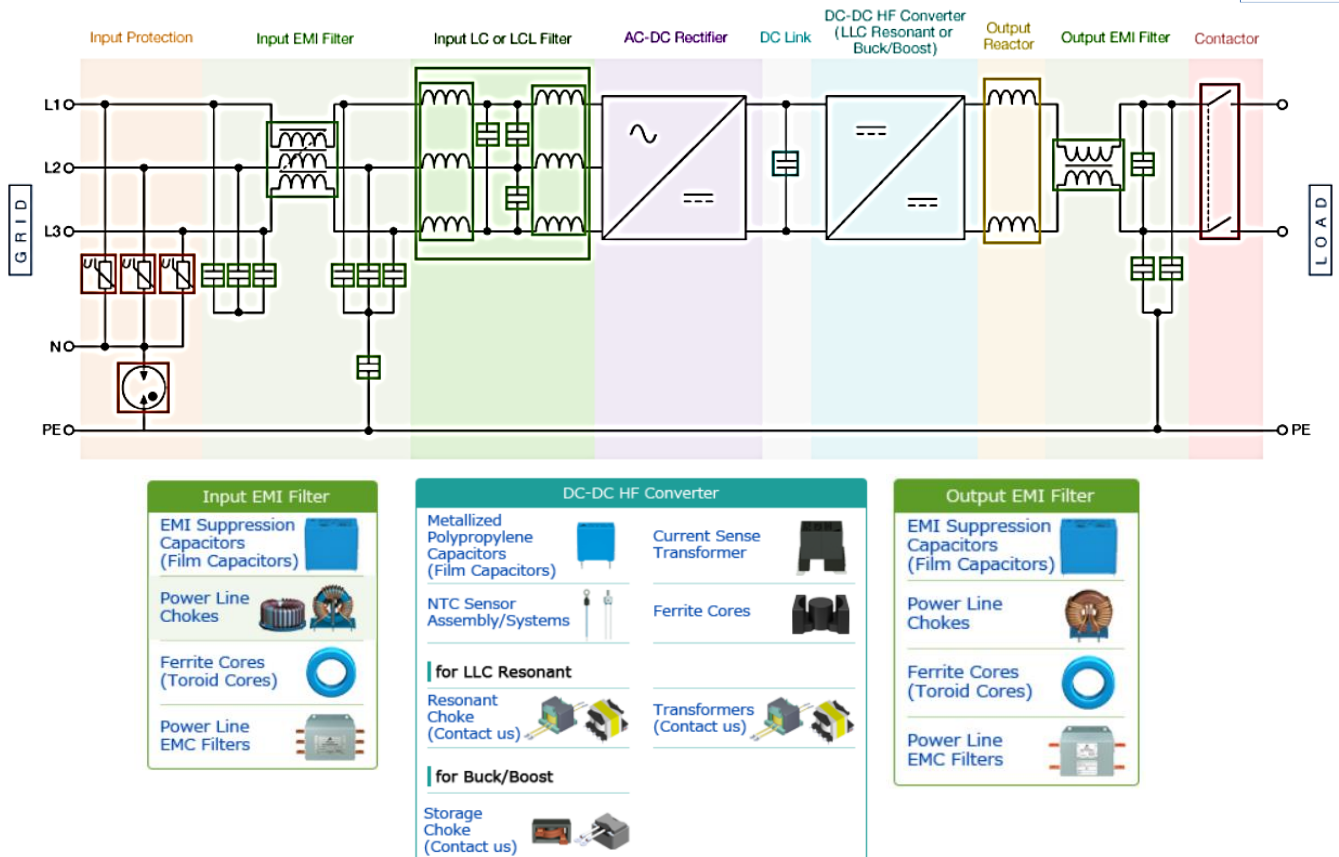
Multilayer Inductors

MLJ1005 Series
MLJ1608 Series

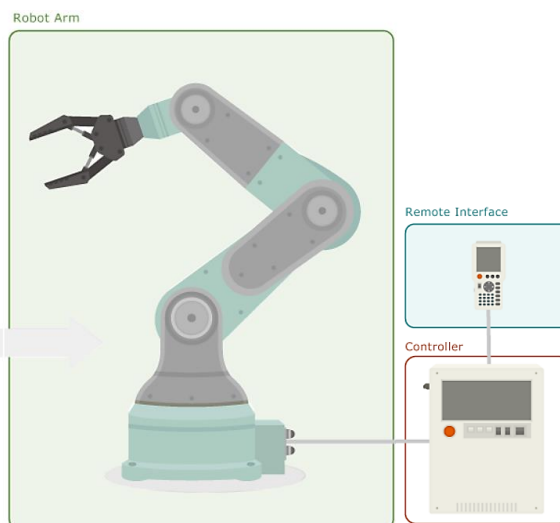
Balun

ATB2012 Series

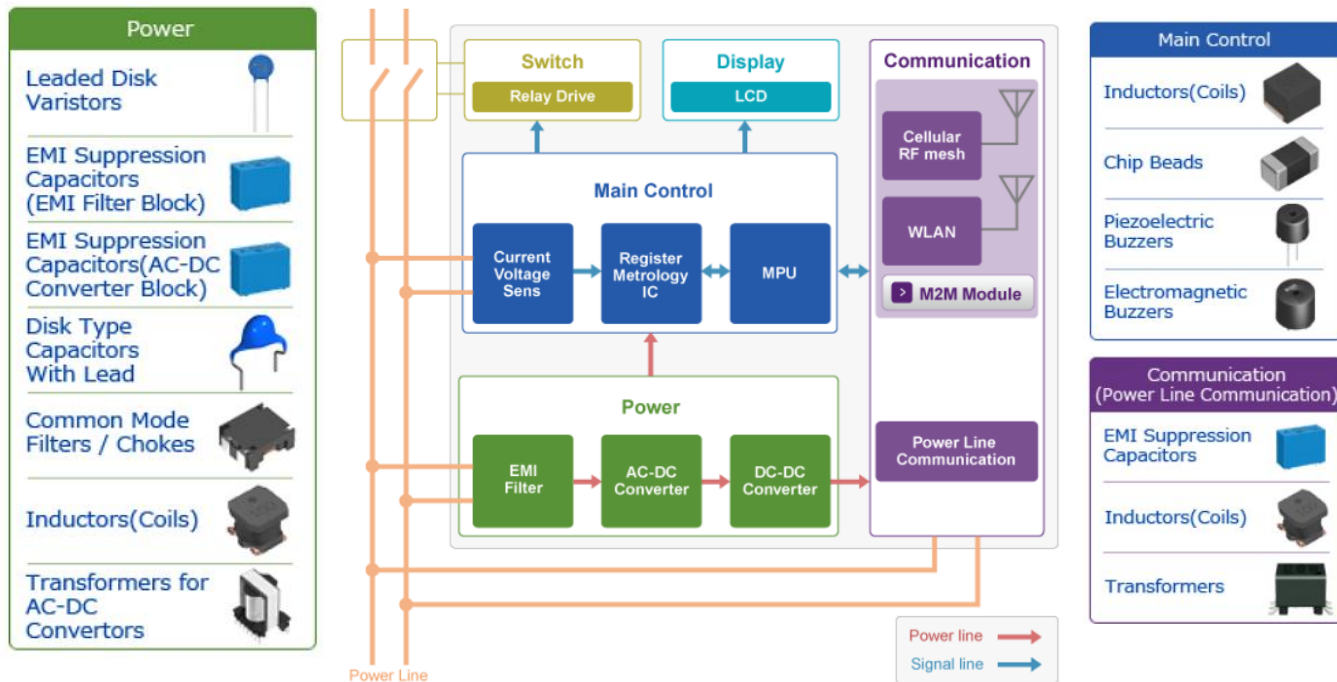
EV Fast Charger



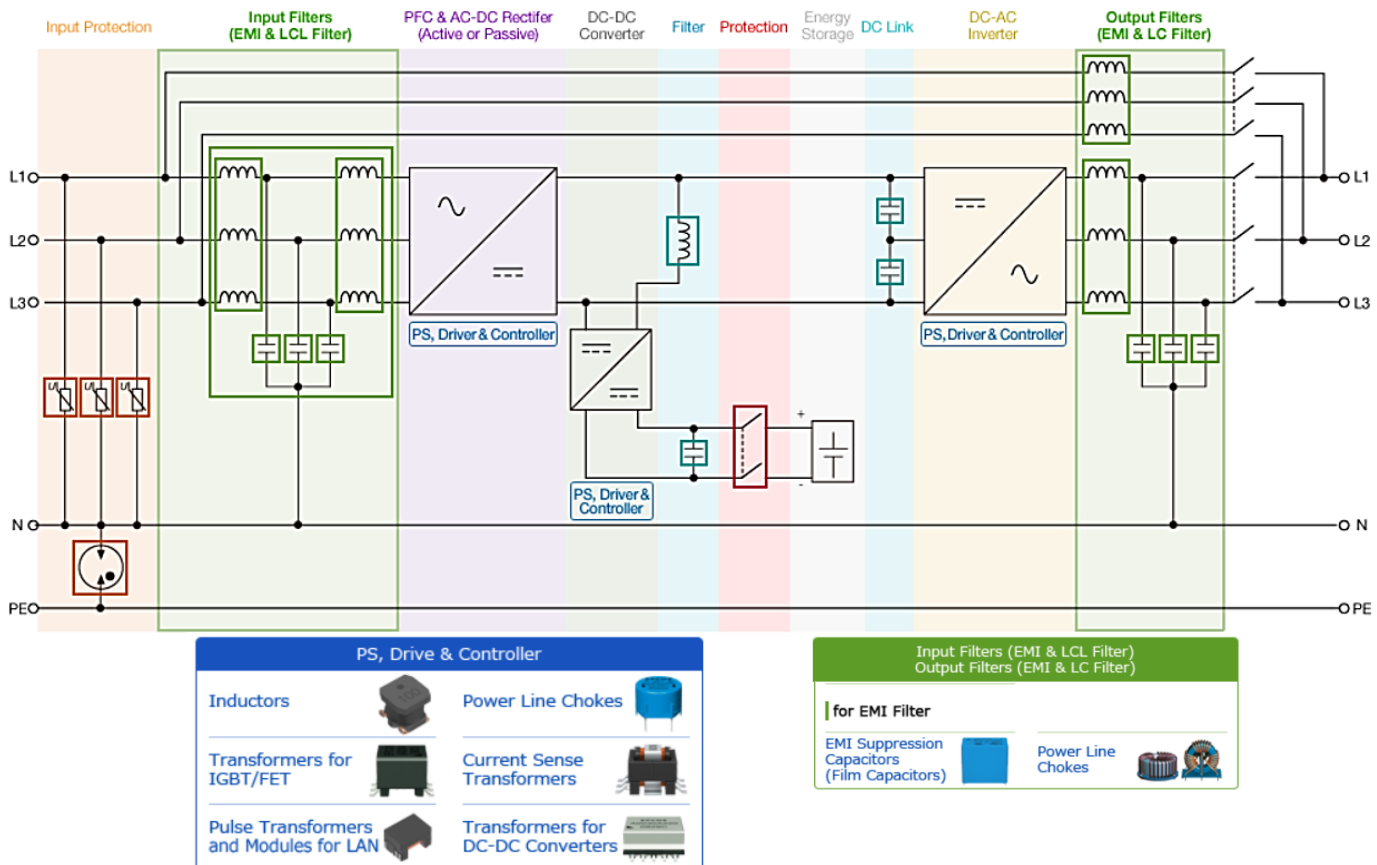
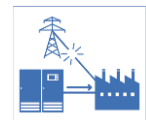
Industrial Robots



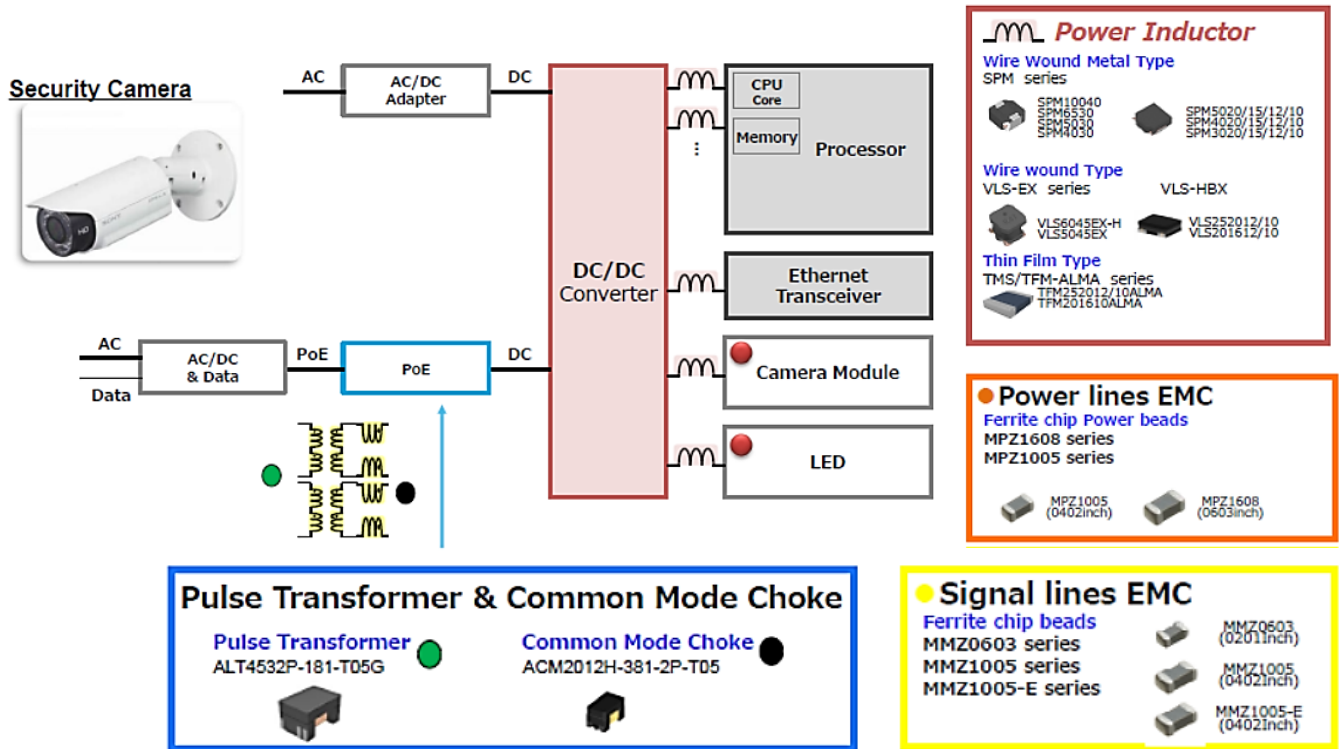
Smart Meters



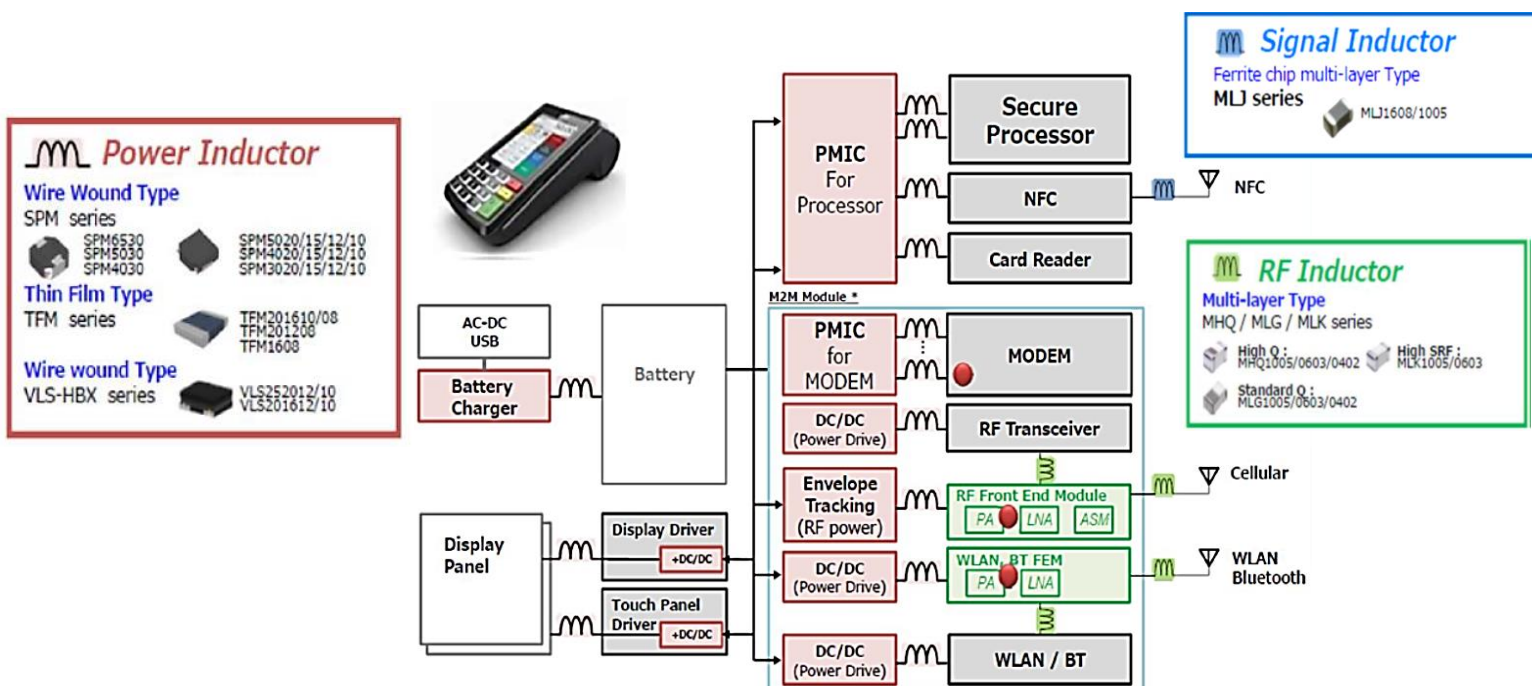
Uninterruptible Power Supply



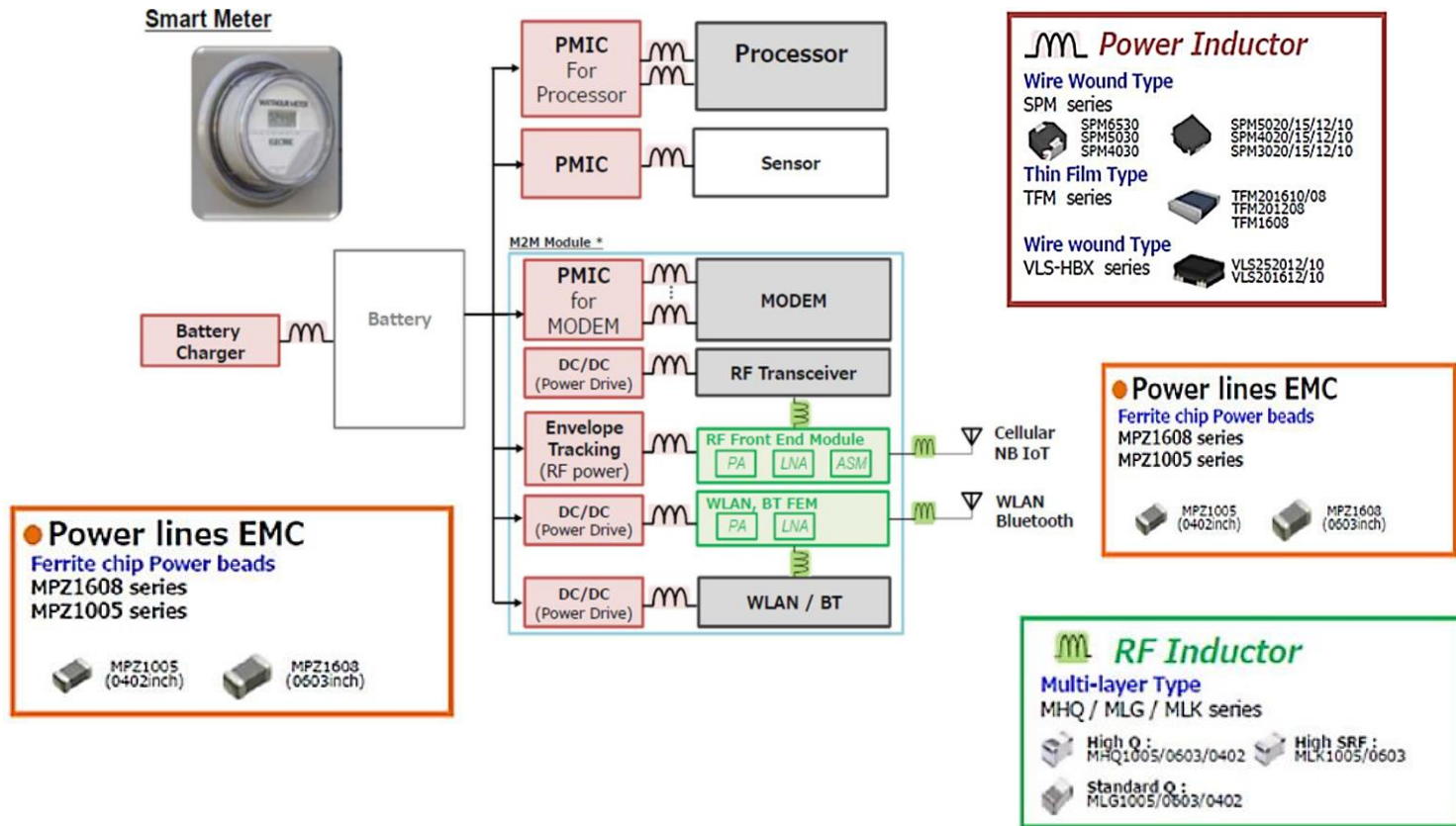
Security/Surveillance Camera



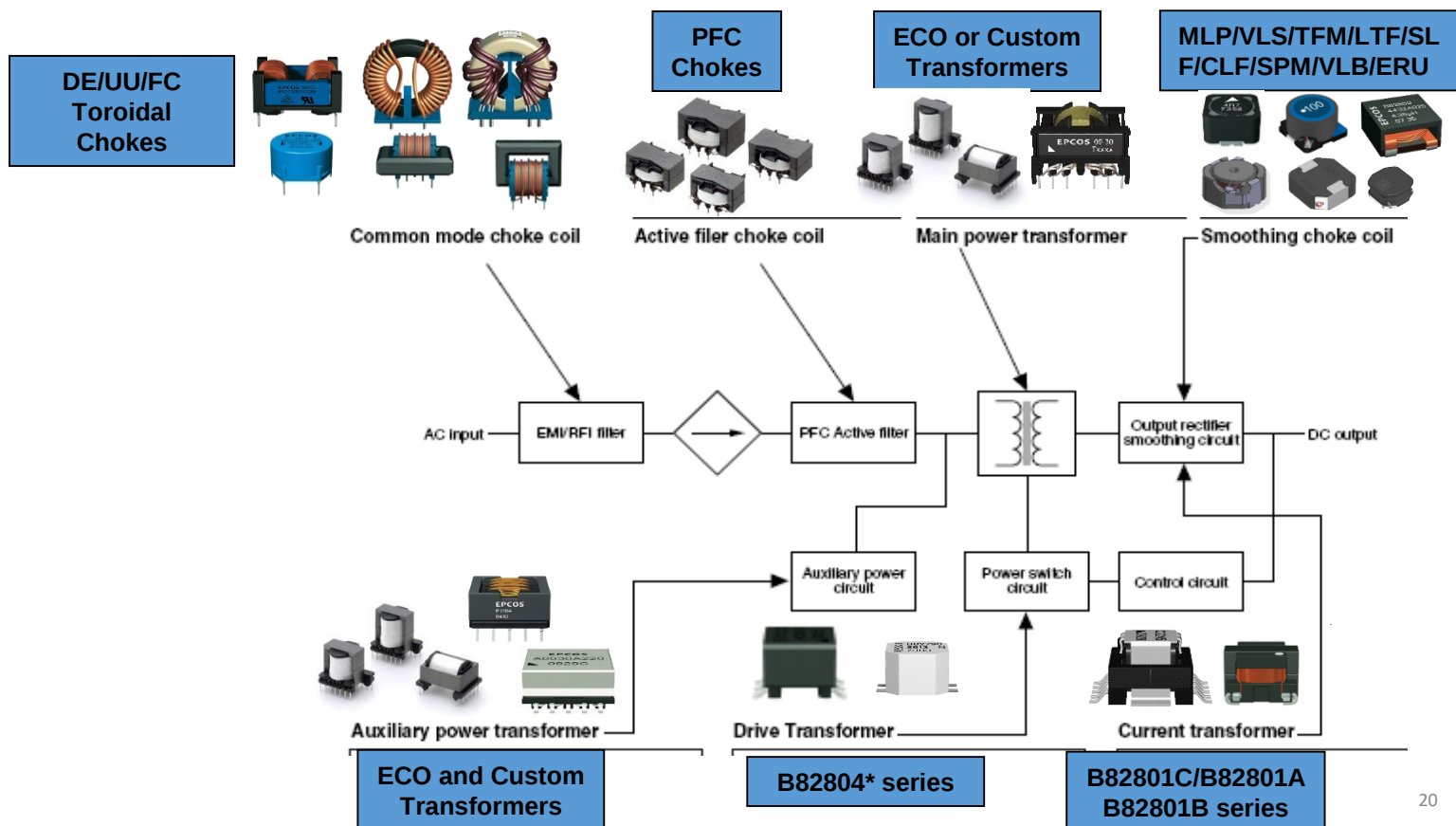
Portable Point of Sale (POS) Terminal



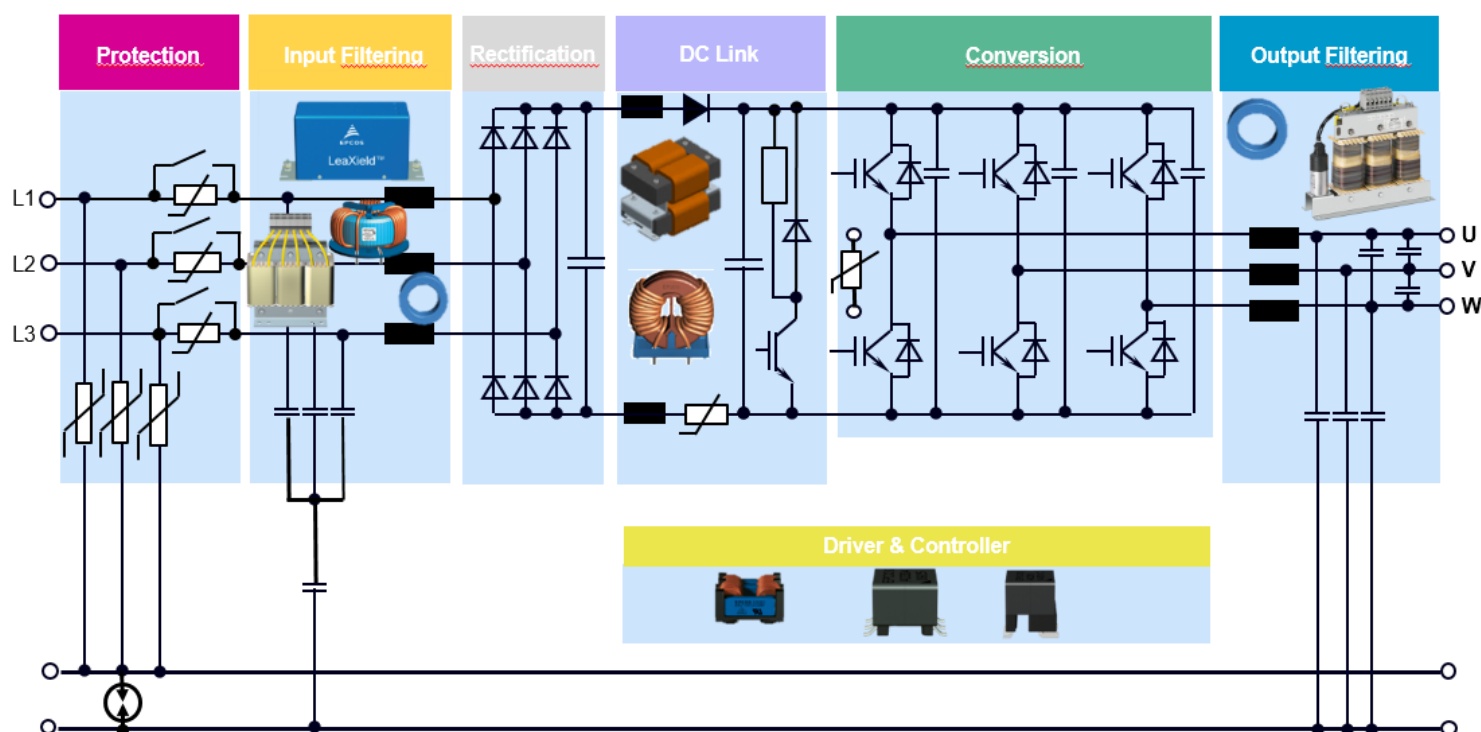
IoT – Smart Meter



AC/DC Switch Mode Power Supply Circuit



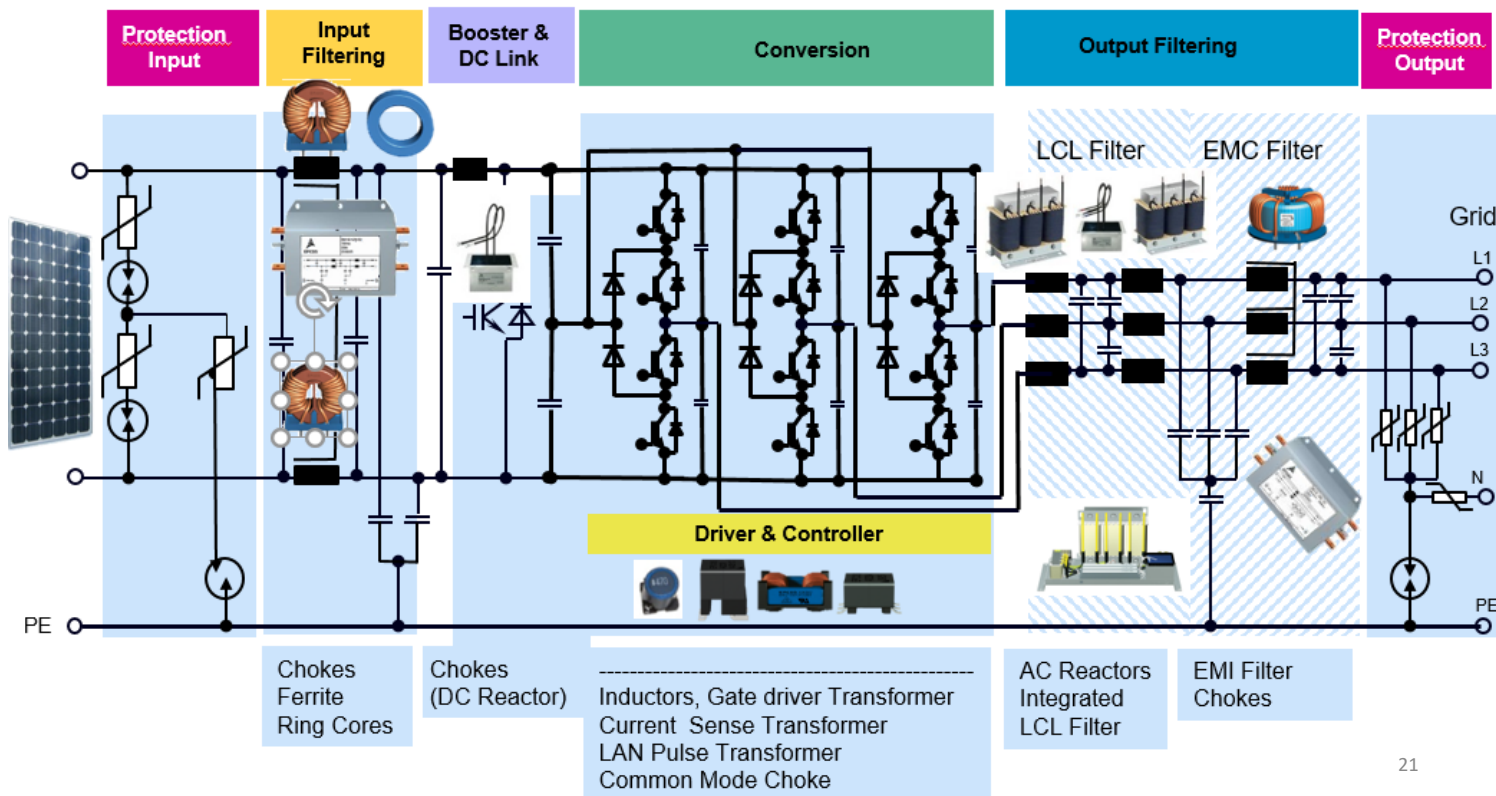
Solutions for Mid-Sized Drives



- Common mode choke, EMI Filter, Ferrites or LeaYield for filtering

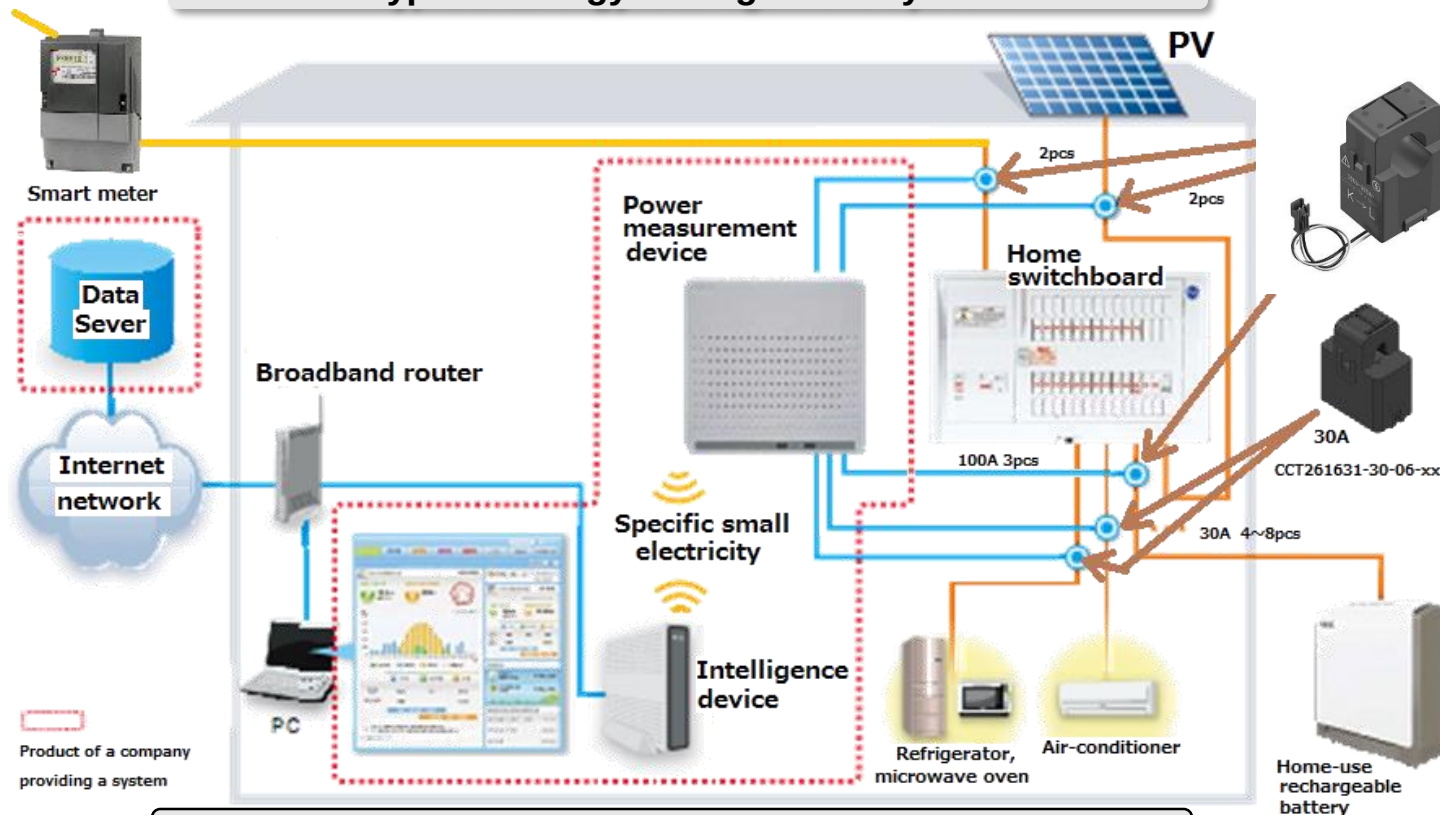
- DC Link chokes
- Output filter (SineFormer, Sine-wave, line reactor, Ferrites)
- CMC, Gate Drivers & Current Sense Transformers and MLCCs

3-Phase/3-level PhotoVoltaic (PV) inverter 50kW, transformer-less with booster

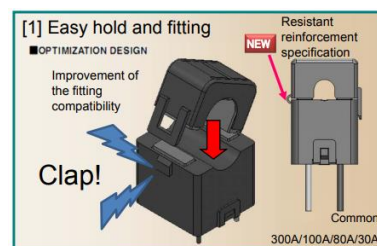


Clamp type AC Current Sensors for Energy Management Systems

Typical Energy Management System



Clamping Method of Current Sensor to Power Line



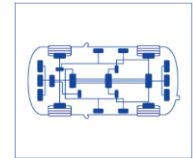
Clamp Type Current Sensor Line Up

Part No.	AC Current Range [50/60Hz]	Arms	Internal Clamp Diameter (mm)
CCT261631-30-06-00	0.1 to 30	6	6
CCT261631-30-06-02	0.1 to 30	6	6
CCT272440-80-10-00	0.1 to 80	10	10
CCT272440-80-10-02	0.1 to 80	10	10
CCT323047-100-16-00	0.1 to 100	16	16
CCT323047-100-16-02	0.1 to 100	16	16
CCT354571-300-24-00	0.1 to 300	24	24
CCT354571-300-24-02	0.1 to 300	24	24
CCT406393-600-36-00	1 to 600	36	36
CCT406393-600-36-02	1 to 600	36	36

Training Module



Automotive/In-Vehicle Network Gateway ECU



EMC Components

Common Mode Filters / Chokes

Ethernet

ACT1210L Type

Flex Ray

ACT1210R Type

CAN/CAN-FD

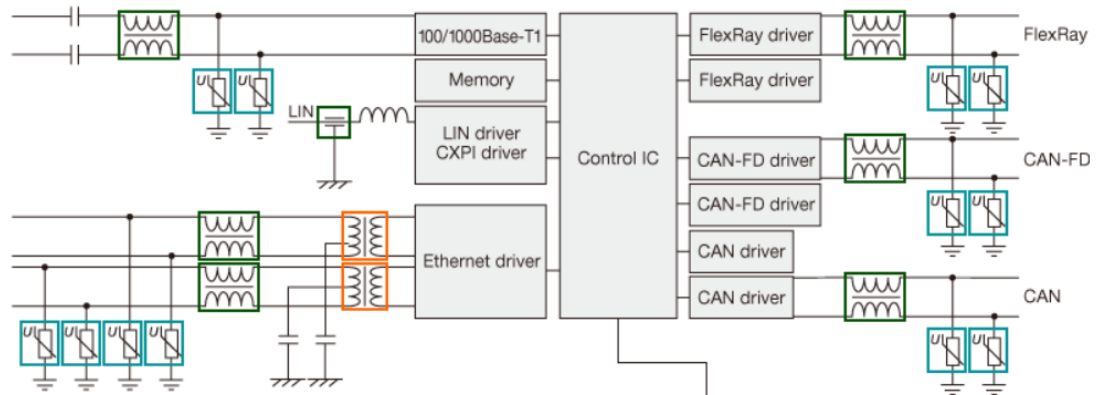
ACT1210 Type

Power Line

ACM-V Series

3-terminal Filters

YFF Series



Inductors (Coil)

Power Circuits

Wire Wound / Ferrite

CLF Series

Wire Wound / Metal

SPM Series

Thin-film / Metal

TFM Series

Automotive/Comfort In-Vehicle Infotainment



Inductors (Coils)

Power Circuits

Wire Wound / Ferrite

CLF Series

Wire Wound / Metal

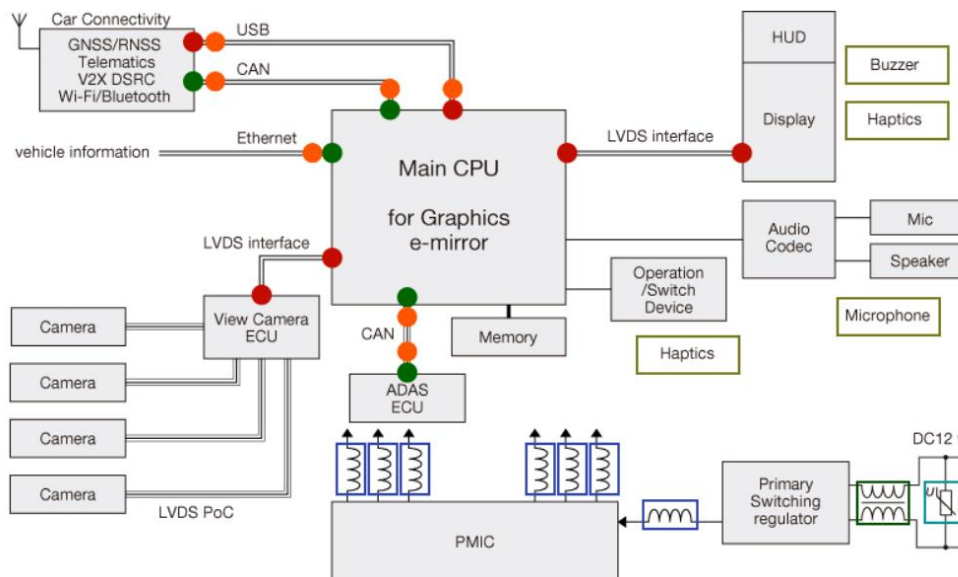
SPM Series

Thin-Film / Metal

TFM Series

Multilayer / Ferrite

MLD Series



EMC Components

Common Mode Filters/ Chokes

Signal Line

MCZ Series

ACM Series

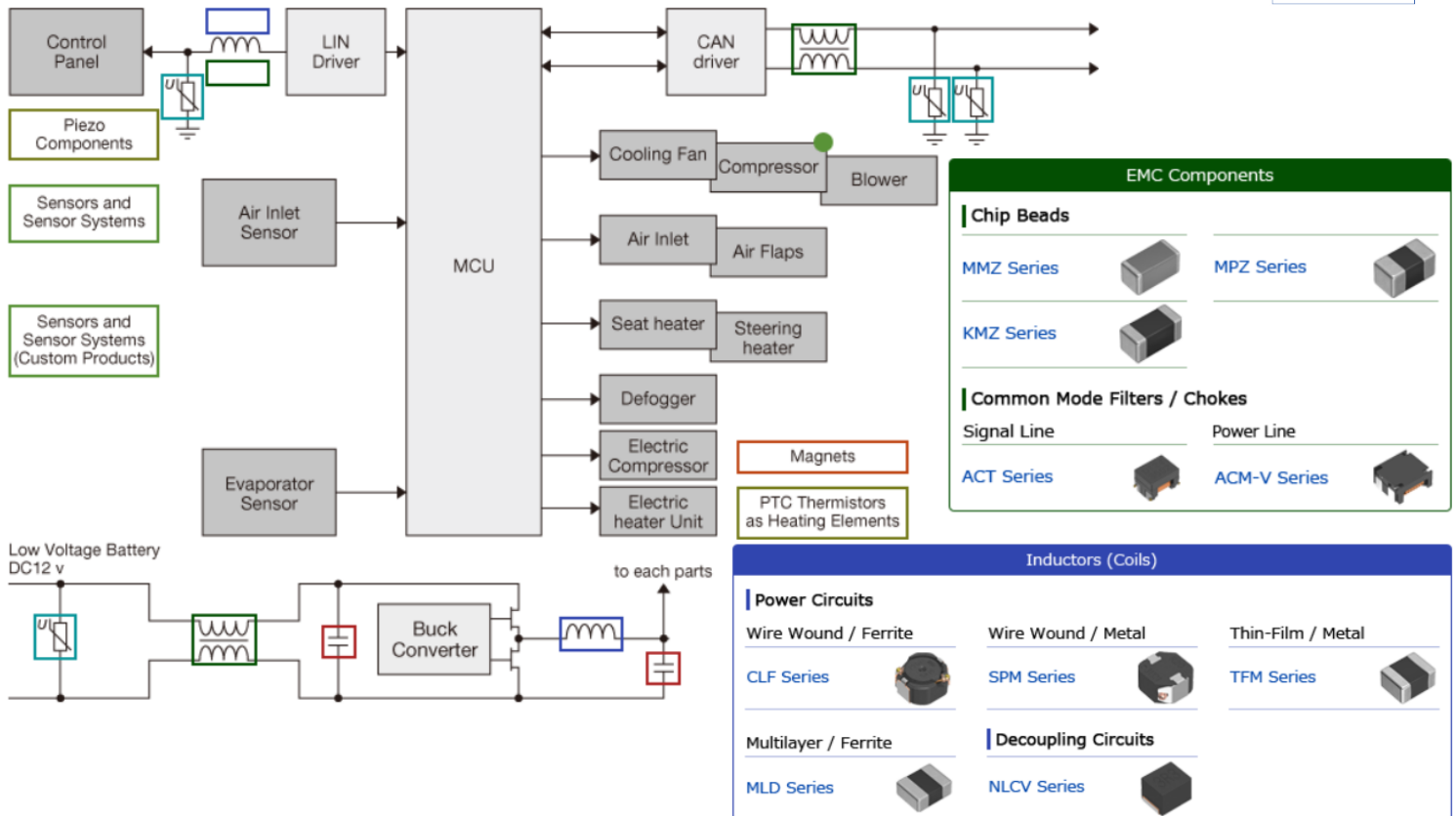
ACT Series

Power Line

ACM-V Series

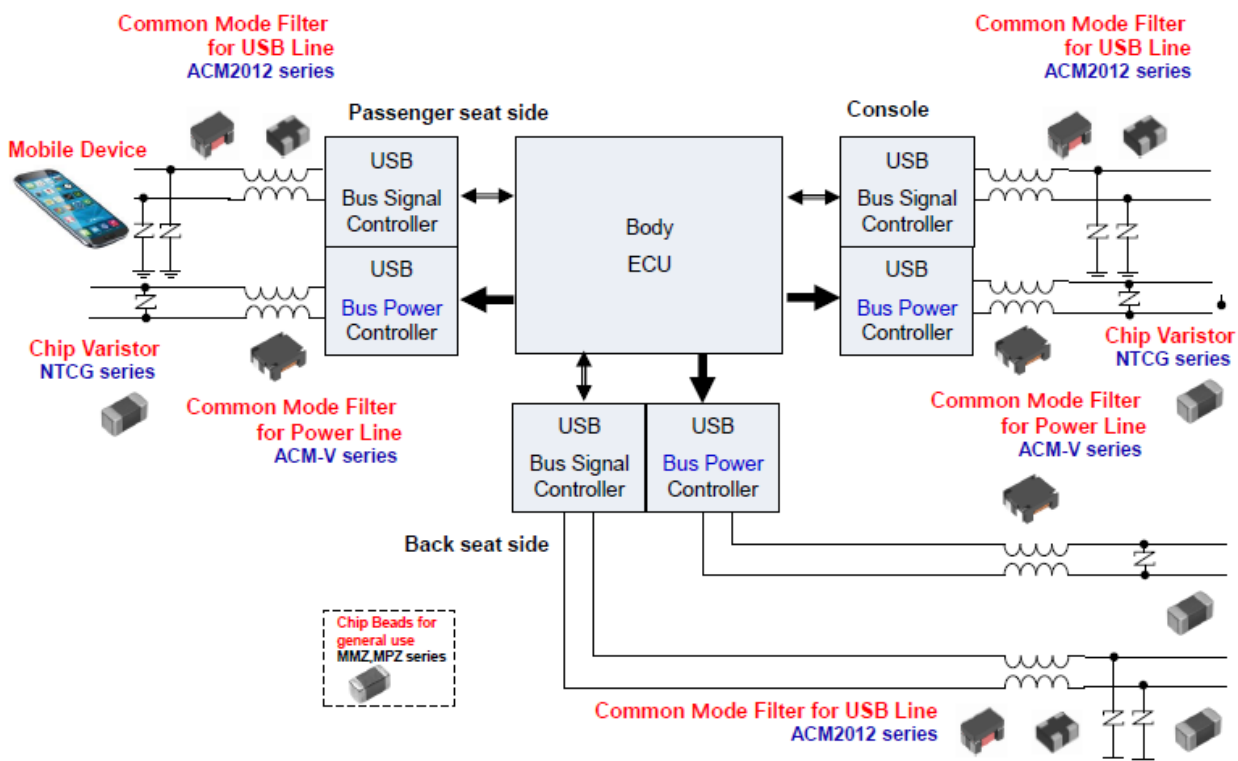
Automotive/Comfort

Climate Control



Automotive/Comfort

USB Charger



Automotive/Comfort

Wireless Charging



Inductors (Coils)

Power Circuits

Wire Wound / Ferrite

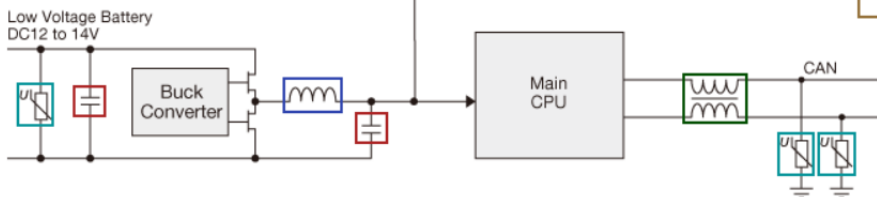
CLF Series

Wire Wound / Metal

SPM Series

High Frequency Circuits

MHQ Series



Wireless Power Transfer

Tx Coil Units and Modules

FCOM Product
WT Series

EMC Components

Common Mode Filters / Chokes

Signal Line

ACT Series

Automotive/Safety

LiDAR

EMC Components

Chip Beads

Power Line

MPZ Series

Common Mode Filters / Chokes

Signal Line

MCZ Series (Contact us)

CAN

ACT Series

Ethernet

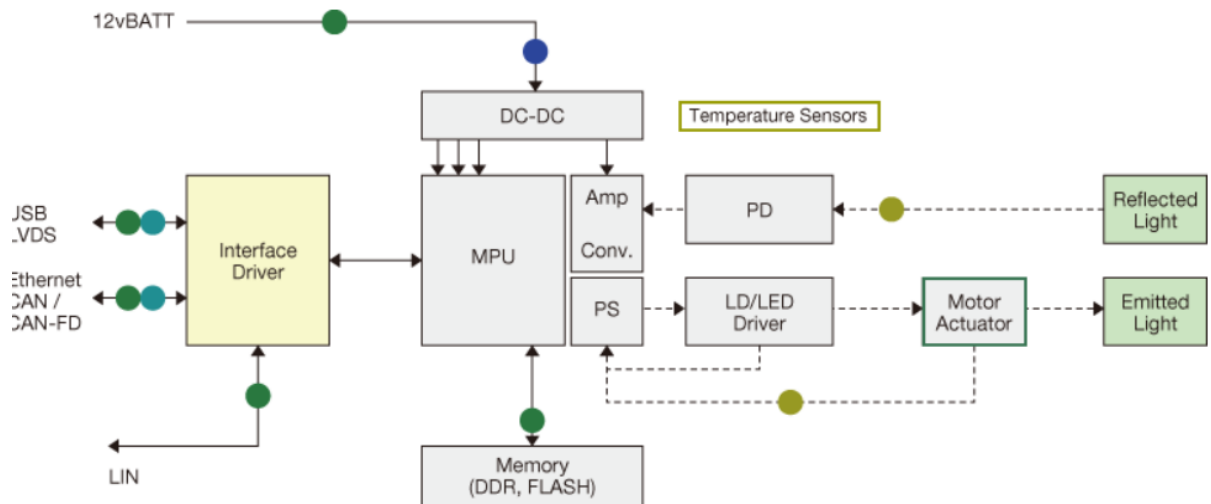
ACT1210L Type

Power Line

ACM12V Type

3-terminal Filters

YFF Series



Inductors (Coils)

Power Circuits

Wire Wound / Ferrite

CLF Series

Wire Wound / Metal

SPM Series

Thin-film / Metal

TFM Series

Automotive/Safety

Sensing Camera

Inductors (Coils)

Power Circuits
Wire Wound / Metal

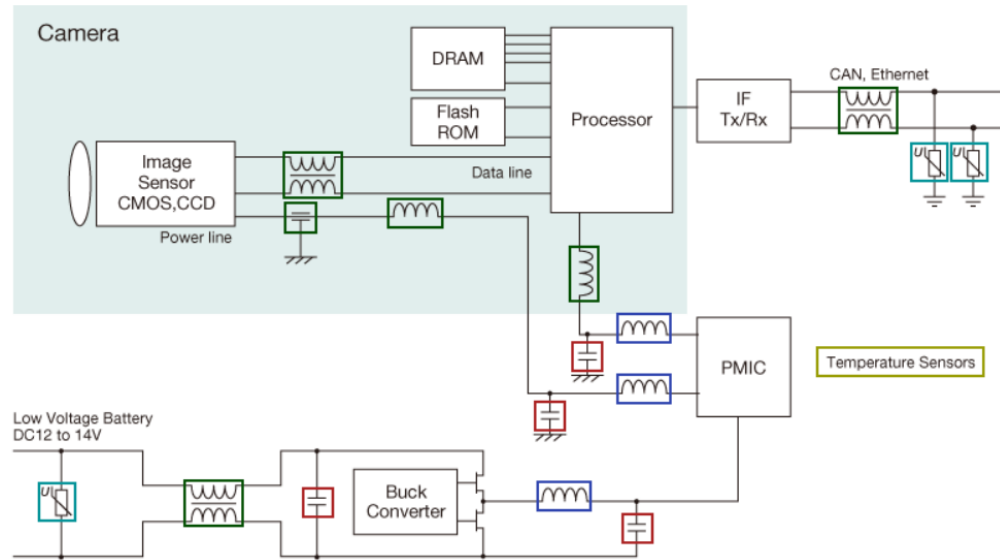
SPM Series

Thin-film / Metal

TFM Series

Wire Wound / Ferrite

HPL Series



EMC Components

Common Mode Filters / Chokes

Data Line	Power Line	Ethernet	CAN
KCZ/MCZ Series	ACM-V/LCV Type	ACT1210L Type	ACT1210 Type

Chip Beads
Power Line
MPZ Series

3-terminal Filters
Power Line
YFF Series

Automotive/Safety

Radar

Inductors (Coils)

Power Circuits
Wire Wound / Ferrite

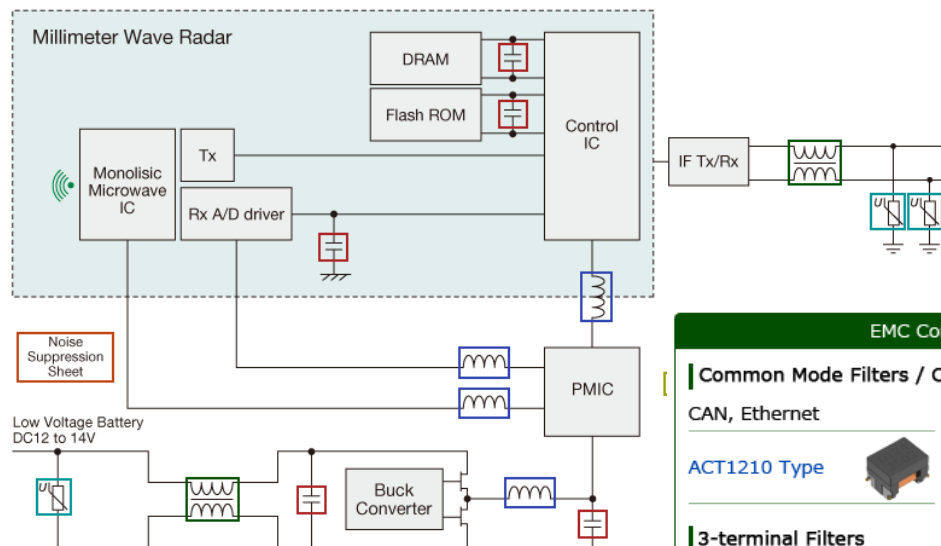
CLF Series

Wire Wound / Metal

SPM Series

Thin-Film / Metal

TFM Series



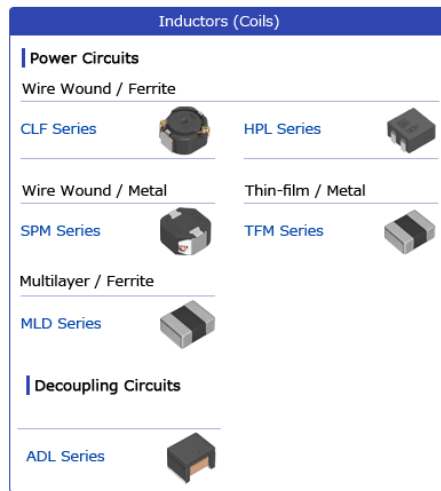
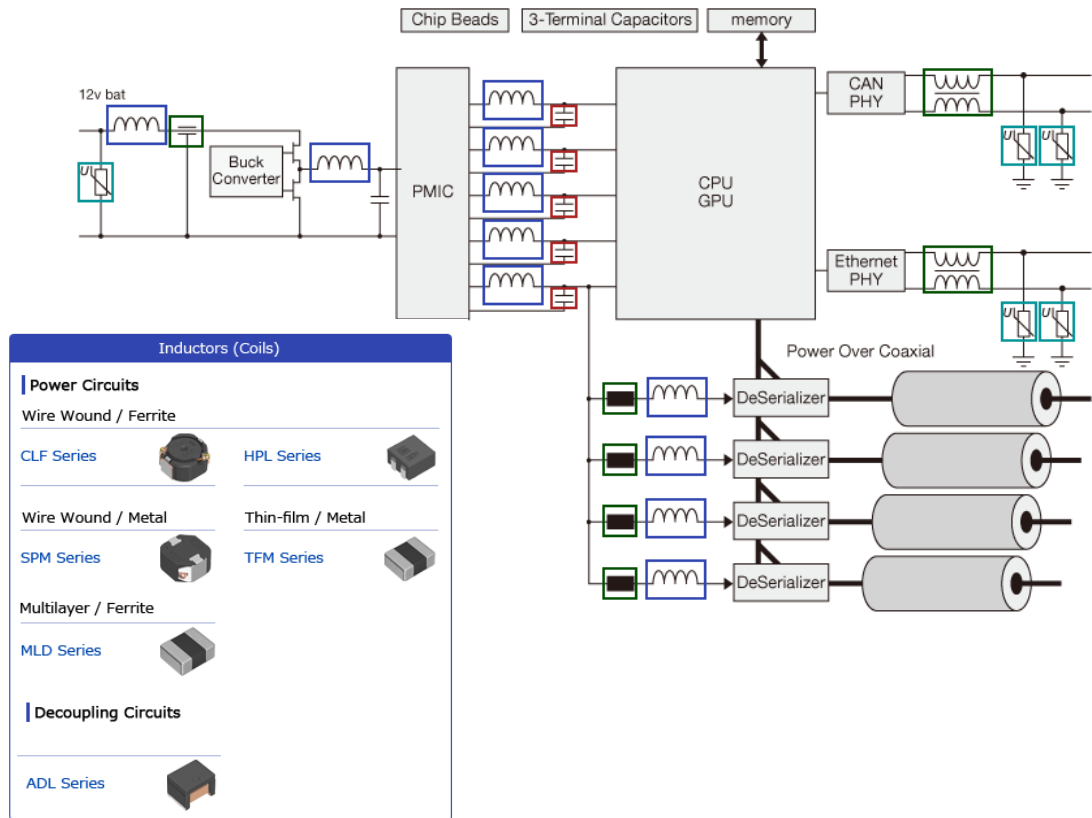
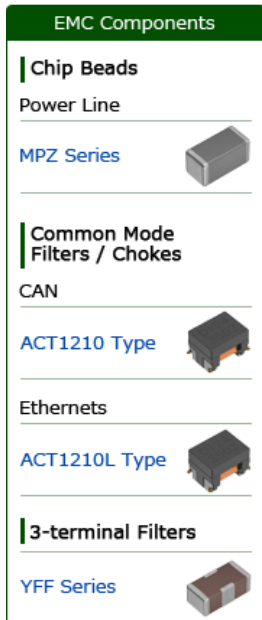
EMC Components

Common Mode Filters / Chokes

CAN, Ethernet	Power line
ACT1210 Type	LCV70 Type

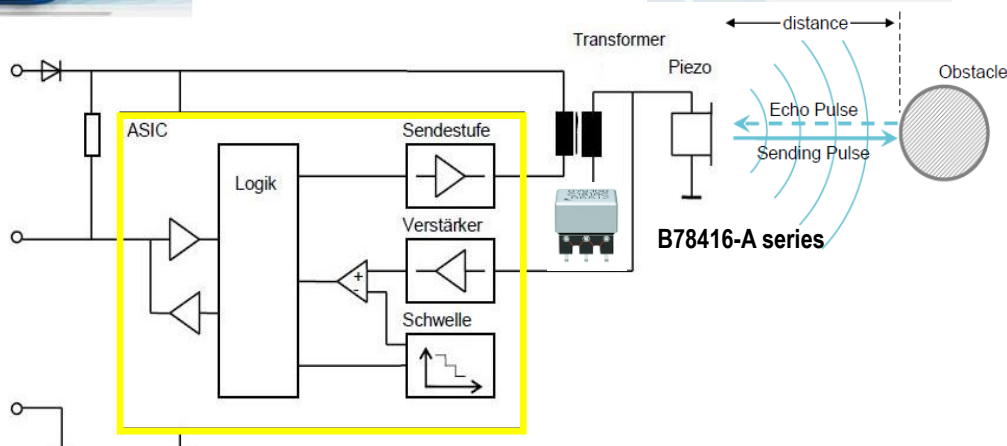
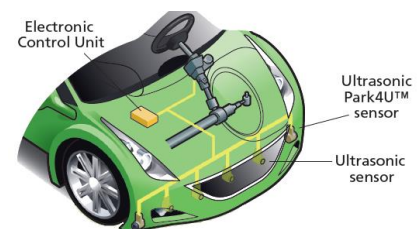
3-terminal Filters
YFF Series

Automotive/Safety ADAS/ AD ECU



Automotive/Safety Parking Assist (View Camera)

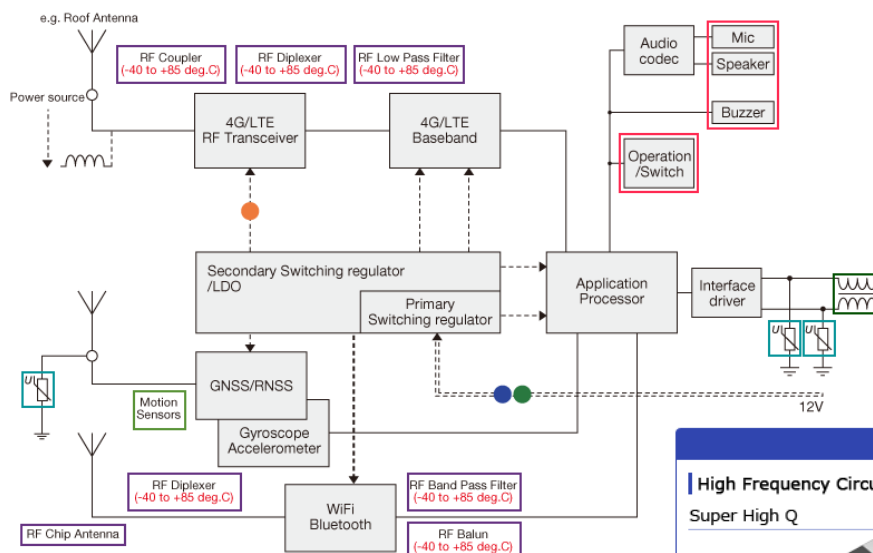
System	Description	Sensors / Transformer
Parking aid system	Optical and/or acoustical signal which announces distance from 25cm to 250cm	4 (rear) or 8 (4 front + 4 rear)
Parking assistance system	"Hands-free" automatically parking maneuvers (in combination with EPS)	10 (6 front + 4 rear)
Side View Assist	Identification of vehicles located in the blind spot of the driver	14 (8 front + 6 rear)



Automotive/V2X

Telematics Control Unit

EMC Components	
Chip Beads	
MMZ Series	
MPZ Series	
Common Mode Filters / Chokes	
Signal Line	
ACT Series	
Power Line	
ACM-V/LCV Type	
3-terminal Filters	
YFF Series	

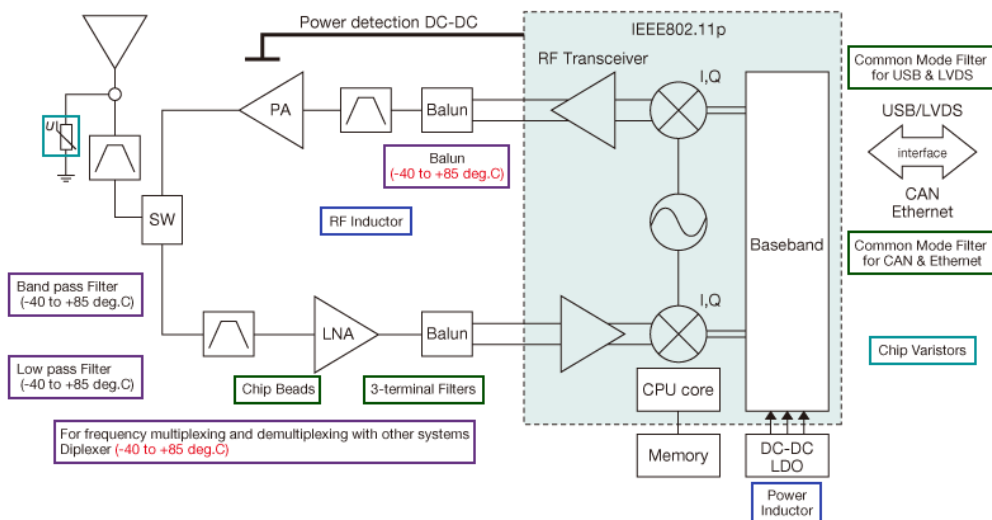


Inductors (Coils)	
High Frequency Circuits	
Super High Q	High Q
MHQ Series	MLG Series
Power Circuits	
Wire Wound / Ferrite	Wire Wound / Metal
CLF Series	SPM Series
Thin-film / Metal	Multilayer / Ferrite
TFM Series	MLD Series

Automotive/V2X

DSRC

EMC Components	
Chip Beads	
MMZ Series	
MPZ Series	
Common Mode Filters / Chokes	
USB / LVDS	
ACM Series	
MCZ Series (Contact us)	
Signal Line	
ACT Series	
3-terminal Filters	
YFF Series	

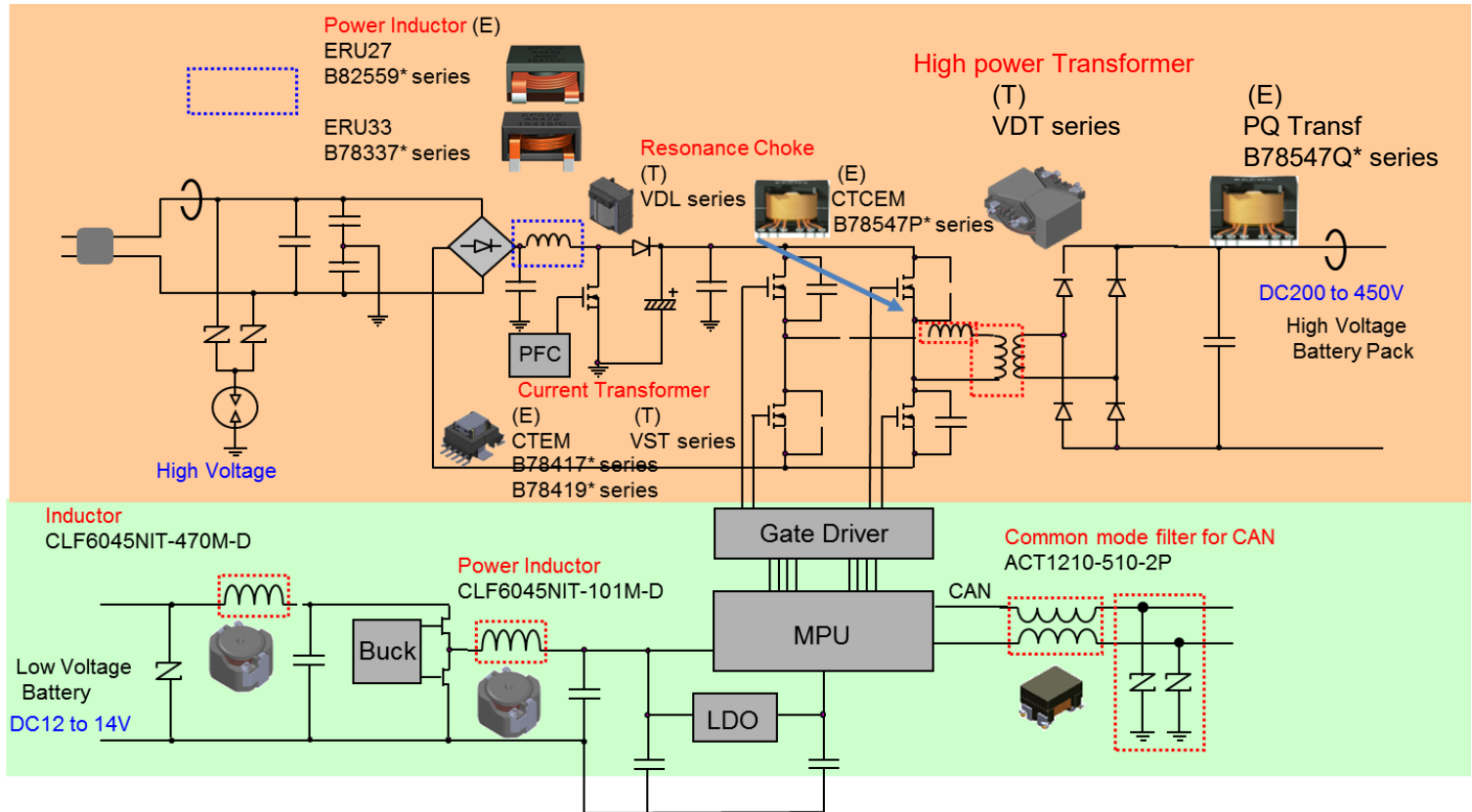


Inductors (Coils)			
Power Circuits			
Wire Wound / Ferrite	Wire Wound / Metal	Thin-film / Metal	Multilayer / Ferrite
CLF Series	SPM Series	TFM Series	MLD Series
High Frequency Circuits			
Super High Q	High Q		
MHQ Series	MLG Series		

Automotive- EHV

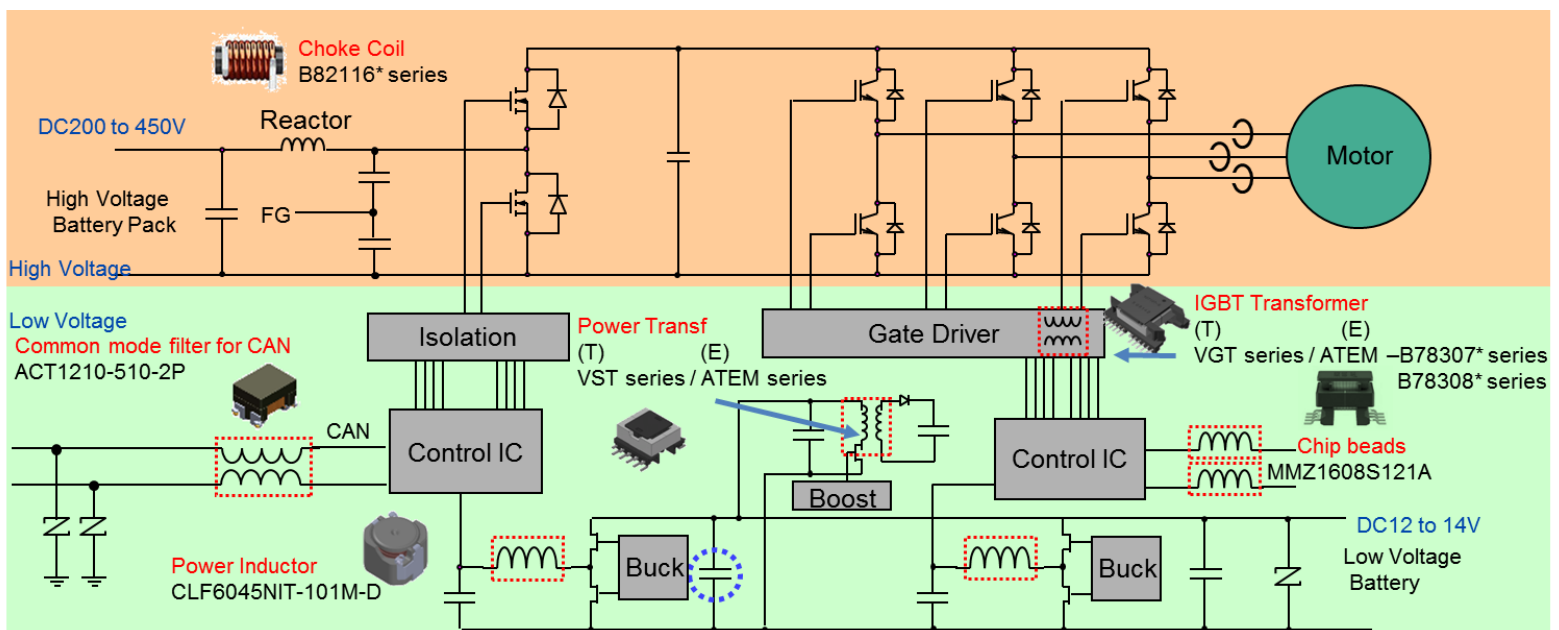
On Board Charger

(T)= TDK brand
(E)= EPCOS brand



Automotive- EHV

On Inverter and Boost Converter



DC-DC Converter (Zero Voltage Switching Phase Shift topology)



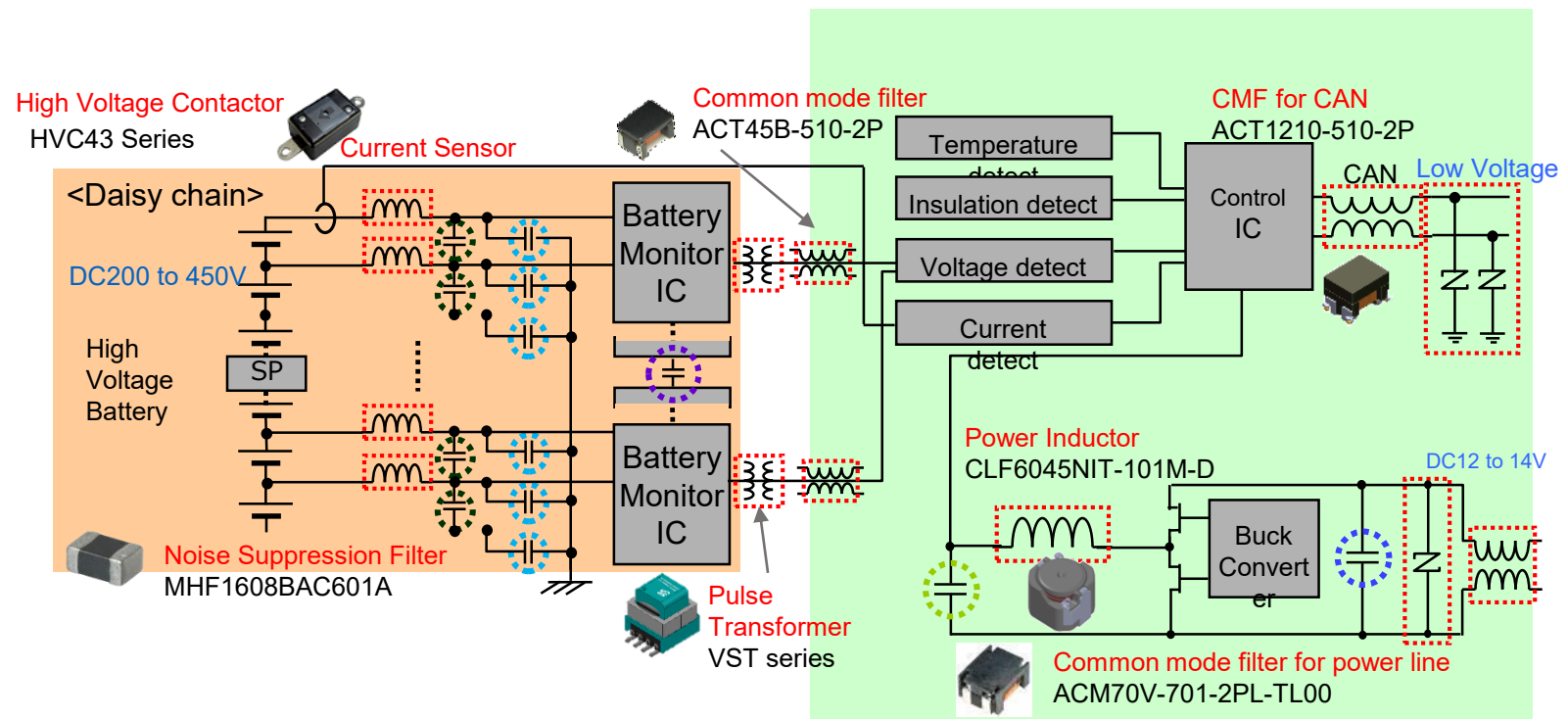
48V $\Leftrightarrow$ 12V DC/DC Converter

(T)= TDK brand
(E)= EPCOS brand



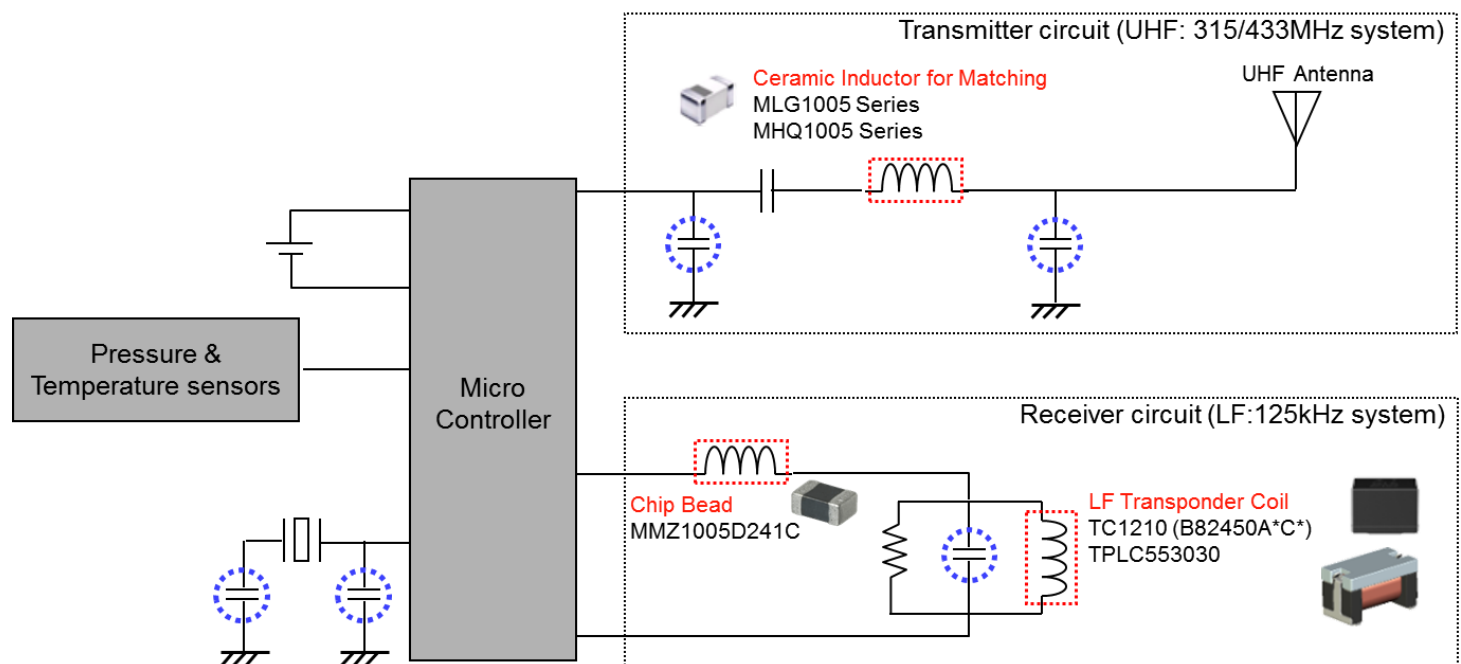
Automotive- EHV

On Battery Management System (BMS)



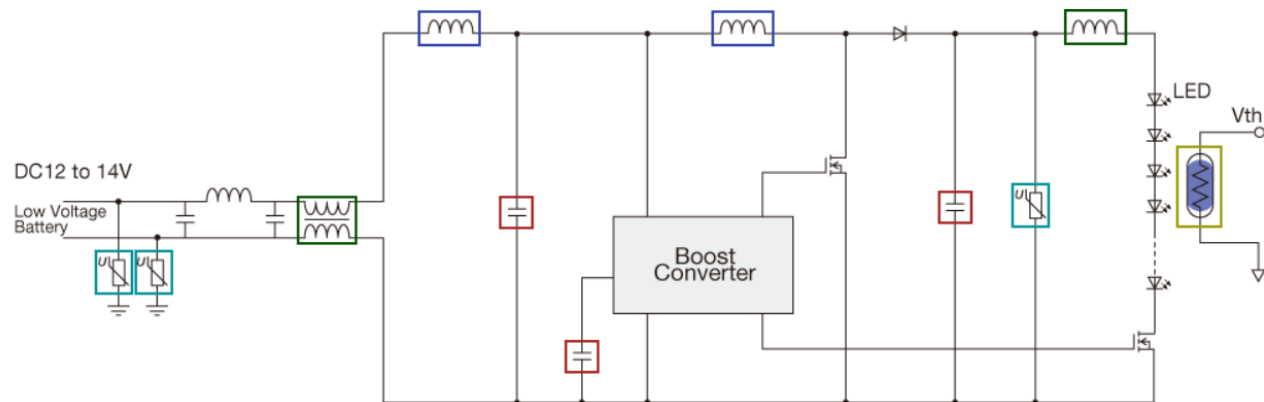
Automotive- Safety

On Tire Pressure Monitoring (TPMS)



Automotive- Safety

LED Lighting – Headlight



Inductors (Coils)

Power Circuits

CLF Series

Decoupling Circuits

NLCV32 Series

B82422H* (SIMID 1210-H) Series

EMC Components

Common Mode Filters / Chokes

Power Line

ACM-V/LCV Type

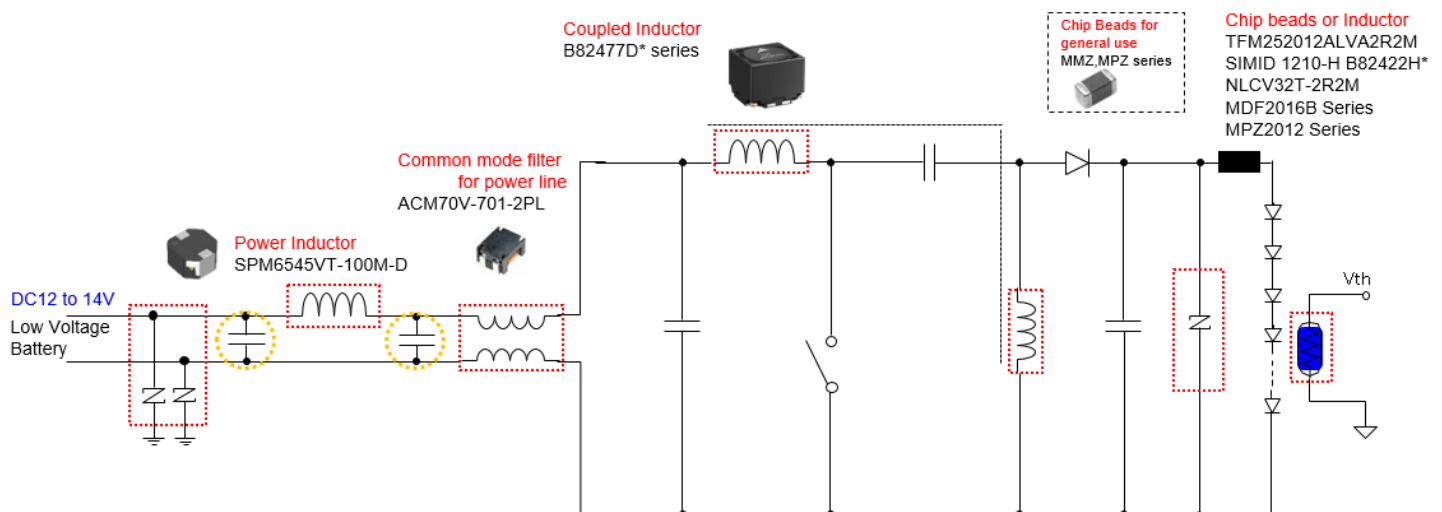
Chip Beads

Signal Line

MMZ1608F Series

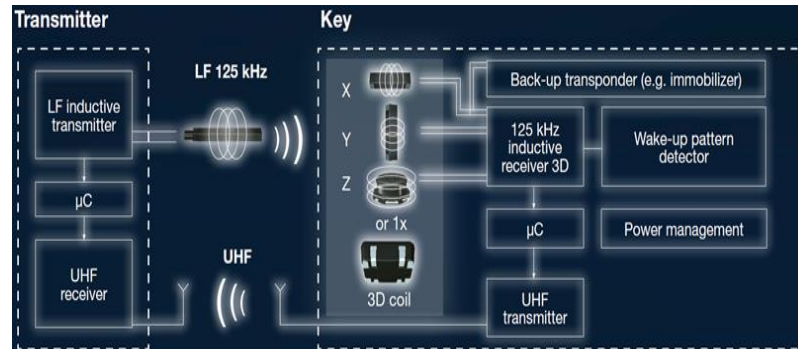
Automotive- Safety

LED Lighting - Rear Light



Automotive- Safety

PEPS Products



ECU for Smart Key System

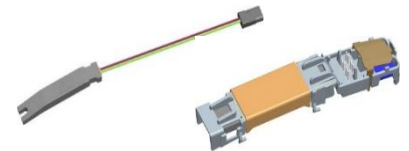
RF Inductor



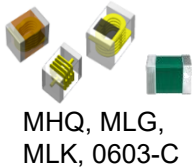
Transponder Coils



Passive components for resonance circuit (in door handle, interior and trunk LF-Antennas)



RF Inductor



Power Inductor Common Mode Filter



EMC (Chip Beads)



TDK + TEI Inductor Paper 2020 Catalog



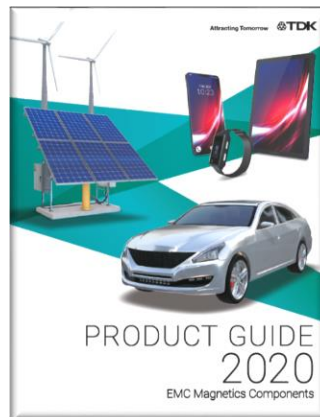
Contents:

TDK + TEI Inductors

- Power Inductors
- Signal Inductors

PDF Version Available

TDK + TEI EMC Paper 2020 Catalog



Contents:

TDK + TEI EMC products

- CM Filters (Signal, Power)
- F Beads
- EMC Cores, Clamp Filters
- Other related products

PDF Version Available

Off Line Shareable Excel Based Catalogs

Inductor Catalog – XLS File



EMC Catalog (F Beads, CM Filters– XLS File



A	B	C	D	E	F	G	H	I	J			
 Inductors for DC to DC Converters *Active connection to the internet required for the datasheet hyperlinks to work												
Photo	Description	Size (mm)			Current Rating Index (Amp)				Inductance Range	Rated Current Range	TDK Series	Catalog / Spec Sheet
		W	D	Height	25	50	75	100A+				
		7.5	7.0	5.4	14.9				1.0 - 100uH	1.8 - 14.9A	SPM7054VT-D	SPM7054VT-D
		10.5	10.0	6.5	22.9				1.0 - 47uH	4.0 - 22.9A	SPM10065VT-D	SPM10065VT-D
		13.0	12.5	6.5	22.3				1.5 - 22uH	6.9 - 22.3A	SPM12565VT-D	SPM12565VT-D
		4.1	4.0	3.0	4.4				1.0 - 3.3uH	2.5 - 4.4A	SPM4030-HZ	SPM4030-HZ
Power Inductor - STD and Auto		Signal Inductors		High Frequency Inductors		Transponder Coils		Clamp AC Current Sensor		... (+) : (-)		

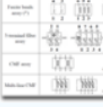
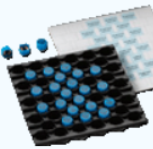
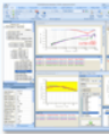
Hyperlinks to Datasheets

*Active connection to the internet required for the datasheet hyperlinks to work										
Photo	Features	Size (mm)			Current Rating Index (Amp)		Impedance (Ohm) @ 100MHz	Rated Current Range (mA)	TDK Series	Catalog / Spec Sheet
		W (typ)	D (typ)	Height (max)	0.02A	7.0A				
		2.0	1.3	1.05	6.0		30 - 1000	1500 - 6000	MPZ2012	MPZ2012
	Low DCR	0.6	0.3	0.33	1.9		22 - 120	1000 - 1900	MPZ0603-H	MPZ0603-H
		1.0	0.5	0.55	3.0		33 - 220	1500 - 3000	MPZ1005-H	MPZ1005-H
	GHz noise countermeasure	1.0	0.5	0.55	1.5		33 - 330 200 - 800 @1GHz	450 - 1500	MPZ1005-E	MPZ1005-E
	High GHz noise	1.0	0.5	0.55	0.8		15-30 80 - 170 @1GHz	600 - 800	MPZ1005-V	MPZ1005-V
Ferrite Beads Common Mode Filters -Signal Common Mode Filters -Power 3 Terminal Filters Noise Suppression Filters										

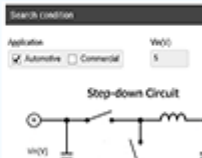
Online Engineering Resources and Tools

Technical Support Tools

TDK provides S-parameter, equivalent circuit model, SPICE model, and libraries for various simulators. We also offer software tools to display/print frequency characteristics, temperature characteristics, and DC bias characteristics of TDK components and to check their effects.

» TVCL - TDK Virtual Component Library S-parameter, Equivalent Circuit Model, SPICE Model, Libraries for Simulators of TDK brand components 	 SIM-CAL STUDIO™ contains useful simulation and calculation tools. NEW	» EPCOS Design Tools Design tools and simulation models for EPCOS brand components 
» TDK Sample Kits Sample kits for multilayer ceramic capacitors, inductors (for high frequency circuits), and chip beads can be ordered online through distributors' websites. 	» EPCOS Sample Kits A short description of each sample kit and detailed information from PDF files. Sample kits are available to place an order through the distributor's web site. 	» SEAT - SElection Assistant of TDK components Windows application to see the electrical characteristics of TDK brand components and simulate their effects  Discontinued in the end of September 2018.

Inductors (Coils)

» Inductor Loss Calculation Tool A tool that can simulate the loss etc. of the appropriate inductor(coil) from the driving condition of the power supply circuit. 	- Calculate and provide Power inductor proposal for Buck or Boost Converter - Calculate Total Loss of specific inductor based on operating conditions
» DC-DC Converter Design Support Tool NEW This tool proposes an appropriate inductor coil) and multilayer ceramic chip capacitor from the driving conditions of the power supply circuit. 	Calculate and provide Power inductor proposal for DC-DC converter and include Inductor and Caps

Transformers

» TDK Transformer Design NEW Automatic calculation immediately recommends transformer specifications based on the condition inputted. Input voltage: Wide input (AC90V~AC264V) Output power : 5~40W, Output voltage : 5~50V Maximum number of outputs: 2 	- AC-DC transformer design tool, allows the design of a semi-custom transformer by the customer based on their electrical and mechanical specs. - A unique part numbers and spec sheet of the final design is provided and the tool allows sample ordering via Digi-Key for a seamless operation.
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[Link](#)



Inductor Loss Calculation Tool

Calculates and provides inductor recommendations for Step-down or Boost DC converter based on customer application parameters. This tool can also provide Loss calculation for a specific part number.

Please enter the application and driving conditions of the power supply circuit, and click the [Simulate] button.

(This is reference data, and does not guarantee the products characteristics.)

by Circuit Condition

by Part No.

Search condition

Application

☐ Automotive ☒ Commercial

Vin(V)

12

Vout(V)

3

Iout(A)

4.5

Freq./kHz

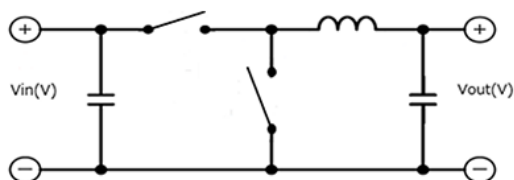
500

Environmental temperature/°C

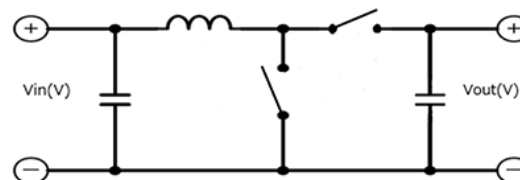
20

Parametric Input

Step-down Circuit



Boost Circuit



Simulate

Calculation Output

[Current condition] Application: Commercial Vin(V): 12 Vout(V): 3 Iout(A): 4.5 Freq./kHz: 500 Environmental temperature/°C: 20

Inductance

Red : Recommended Inductance Value

☐ 1.5μH ☐ 2.2μH ☒ 3.3μH ☐ 4.7μH ☐ 5.6μH ☐ 6μH ☐ 6.8μH

Graph	Images	Part No.	L x W Size	Inductance	Rdc / Ω	Isat.[Max.]	Isat.[Typ.]	Itemp.[Typ.]	Mounting Board	Total Loss / W	Temp. Rise / °C	Mounting Area / mm²
☒		VLS5045EX-3R3N	5.0mm x 5.0mm	3.3μH	0.027	5.2A (30% Down)		4.2A (40°C Rise)	C	0.64	56.46	25
☐		SPM5030T-3R3M	5.2mm x 5.0mm	3.3μH	0.0268		4.3A (20% Down)	6A (40°C Rise)	C	0.62	23.82	26
☐		SPM5015T-3R3M-LR	5.4mm x 5.1mm	3.3μH	0.075		4.4A (30% Down)	3.5A (40°C Rise)	C	1.58	77.93	27.54
☐		SPM5020T-3R3M-LR	5.4mm x 5.1mm	3.3μH	0.053		6.5A (30% Down)	3.9A (40°C Rise)	C	1.15	60.45	27.54
☐		VLS6045AF-3R3N	6.0mm x 6.0mm	3.3μH	0.022	5A (30% Down)		5A (40°C Rise)	C	0.52	36.95	36
☐		VLS6045EX-3R3N	6.0mm x 6.0mm	3.3μH	0.023	6.5A (30% Down)		4.95A (40°C Rise)	C	0.56	39.47	36
☐		SPM6530T-3R3M	7.1mm x 6.5mm	3.3μH	0.027		7.3A (20% Down)	6.8A (40°C Rise)	C	0.61	23.66	46.15

Recommended parts



Inductor Loss Calculation Tool

Calculates and provides inductor recommendations for Step-down or Boost DC converter based on customer application parameters. This tool can also provide Loss calculation for a specific part number.

Please enter the application and driving conditions of the power supply circuit, and click the [Simulate] button.
(This is reference data, and does not guarantee the products characteristics.)

by Circuit Condition

by Part No.

Product Selection

Please enter or select a part number.

Add

Product	Remove
SPM6530T-100M-HZ	x

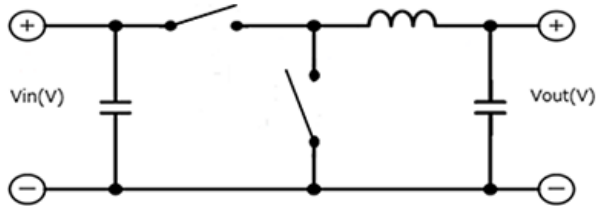
Part Number Input

Driving Conditions

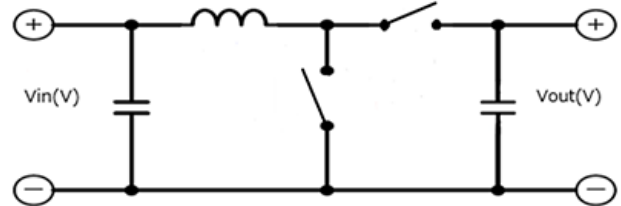
Vin(V) 5 Vout(V) 2 Iout(A) 1.5 Freq./kHz 500 Environmental temperature/°C 20

Parameter Input

Step-down Circuit



Boost Circuit



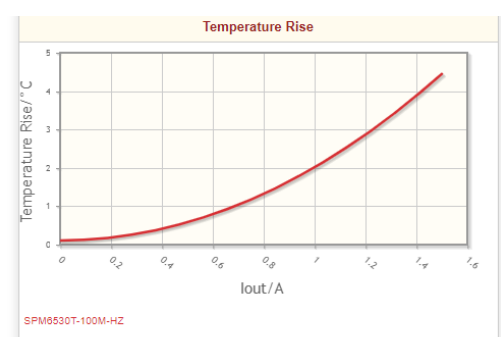
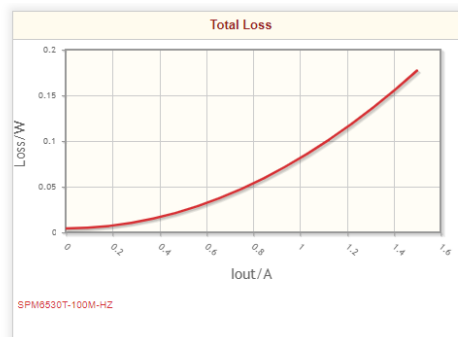
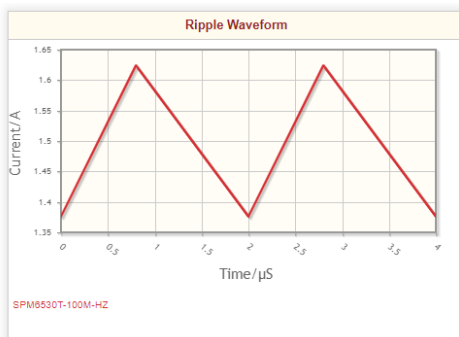
Simulate

Calculation Output

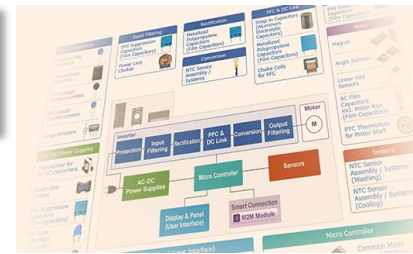
[Current condition] Vin(V): 5 Vout(V): 2 Iout(A): 1.5 Freq./kHz: 500 Environmental temperature/°C: 20

Graph	Images	Part No.	L x W Size	Inductance	Rdc / Ω	Isat.[Max.]	Isat.[Typ.]	Itemp.[Typ.]	Mounting Board	Total Loss / W	Temp. Rise / °C	Mounting Area / mm²
☒		SPM6530T-100M-HZ	7.1mm x 6.5mm	10μH	0.0785		3.9A (20% Down)	4.2A (40°C Rise)	C	0.18	4.45	46.15

Interactive Charts



Below is a collection of related product overviews and application notes for further details.



Product Overviews

- [Compact dual inductors with high saturation current](#)
- [High frequency power inductors for automotive applications designed for outstanding reliability to reduce failure risks](#)
- [Ferrite Shield-Type Automotive Power Inductors](#)
- [Metal Power Inductor SPM Series](#)
- [Power Inductor VLS Series](#)
- [Metal Power Inductor TFM Series](#)
- [3D transponder coils for 22 kHz with high sensitivity](#)
- [Power Supply Inductor for High speed In-vehicle LAN](#)
- [Ferrite coils support NFC ideally](#)
- [Robust wire-wound power inductors withstands high temperatures and vibration](#)

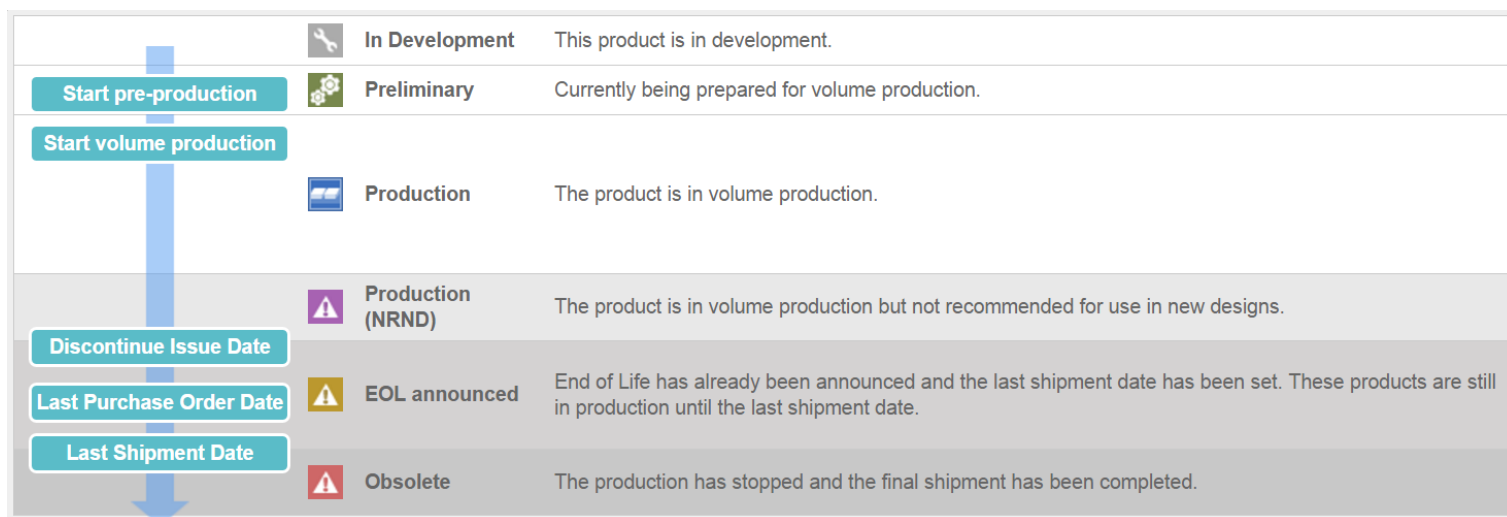
Application Notes

- [Automotive LED Lighting](#)
- [Vehicle-to-Vehicle and Infrastructure-to-Vehicle Communication \(V2X\) to Realize Autonomous Driving Technology](#)
- [Automotive communication interface: Products recommended for PoC use \(PoC filter inductors, chip beads\)](#)
- [How to Use Power Inductors](#)
- [Driving new mobility](#)
- [Selection Guide for Power Inductors in Consideration of Leakage Flux](#)
- [Recommended Products for Use with Class-D Amplifiers \(Noise Suppression Filters, Inductors for LPFs, ESD Notch Filters\)](#)

Solution Guides

- [Soft Termination Capacitors, Inductors, and Chip Beads for High-Reliability Products for Automotive Applications](#)
- [Ensuring communication quality and filtering suitable for PoC \(Power over Coax\)](#)
- [Measures Against Acoustic Noise in Power Inductors](#)
- [TDMA Noise Countermeasures, Reception Sensitivity Improvement, and ESD \(Electrostatic Discharge\) Countermeasures in Microphone Lines, Using Noise Suppression Filters and ESD Notch Filters](#)

Product lifecycles are a normal part of business and require attention for on-going procurement and support. Leading edge parts will inevitably replace older parts, and the availability of these older parts will depend on market demand and profitability among other things. As a leading manufacturer of MLCCs, TDK has the responsibility to keep our customers informed of the production status for all products offered in our capacitor portfolio. This status can be found on the TDK website or from your local TDK Sales Representative.



TDK Product Life Cycle Designations used on tdk.com. Circuit designers are advised to avoid NRND parts in new designs.

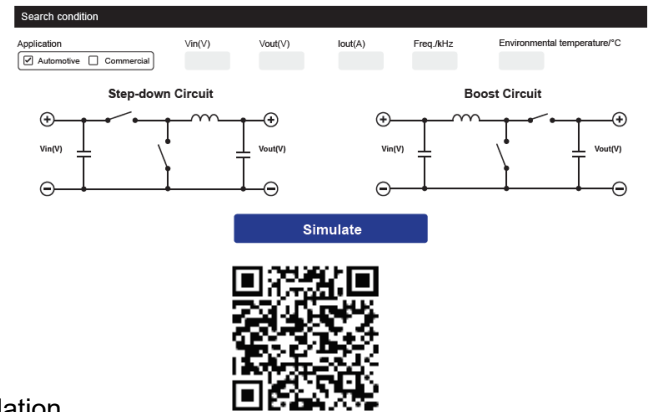
In addition to part numbers that have been designated End of Life (EOL), TDK also provides advanced notice of product in lifecycle decline. These parts are labeled Not Recommended for New Designs (NRND) and should not be used in new designs going forward. The NRND item list will always be in a state of flux. TDK will still support NRND items until official EOL notification (with last time buy detail) is provided, however designers should confirm the product life cycle status before designing in MLCCs for long term procurement and support.

Inductor Calculator with Total Loss Estimation Tool

An online tool for inductor calculation for Step-down or Boost type converters, based on the application operating conditions input by the user. The output provides a list of available solutions with estimated total losses for a more complete inductor selection.

More details can be found here, or by contacting TDK:

https://product.tdk.com/en/search/inductor/inductor/smd/core_loss_simulation



Transformer Design Tool

An online AC-DC transformer configuration tool for custom transformer designs. This tool allows sample ordering.

https://product.tdk.com/en/search/transformer/transformer/ac_dc-converter/diy_tool



TDK Magnetics Business Group – Product Links

Inductors

<https://product.tdk.com/info/en/products/inductor/inductor/smd/catalog.html>

EMC Components

<https://product.tdk.com/info/en/products/emc/index.html>

Transformers

<https://product.tdk.com/info/en/products/transformer/catalog.html>

Transponder Coils

<https://product.tdk.com/info/en/products/inductor/inductor/transponder/index.html>

Ferrite Cores

<https://product.tdk.com/info/en/products/ferrite/catalog.html>

Application Guides

<https://product.tdk.com/info/en/applicationguide/index.html>

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