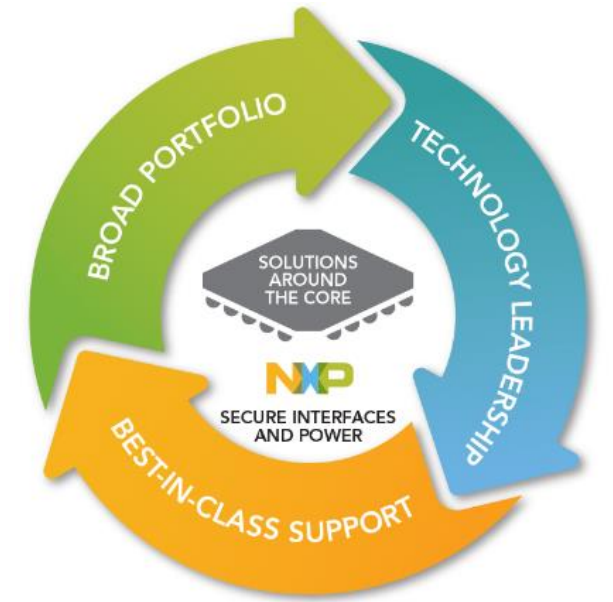


BL SECURE INTERFACES & POWER

Solutions around the Core

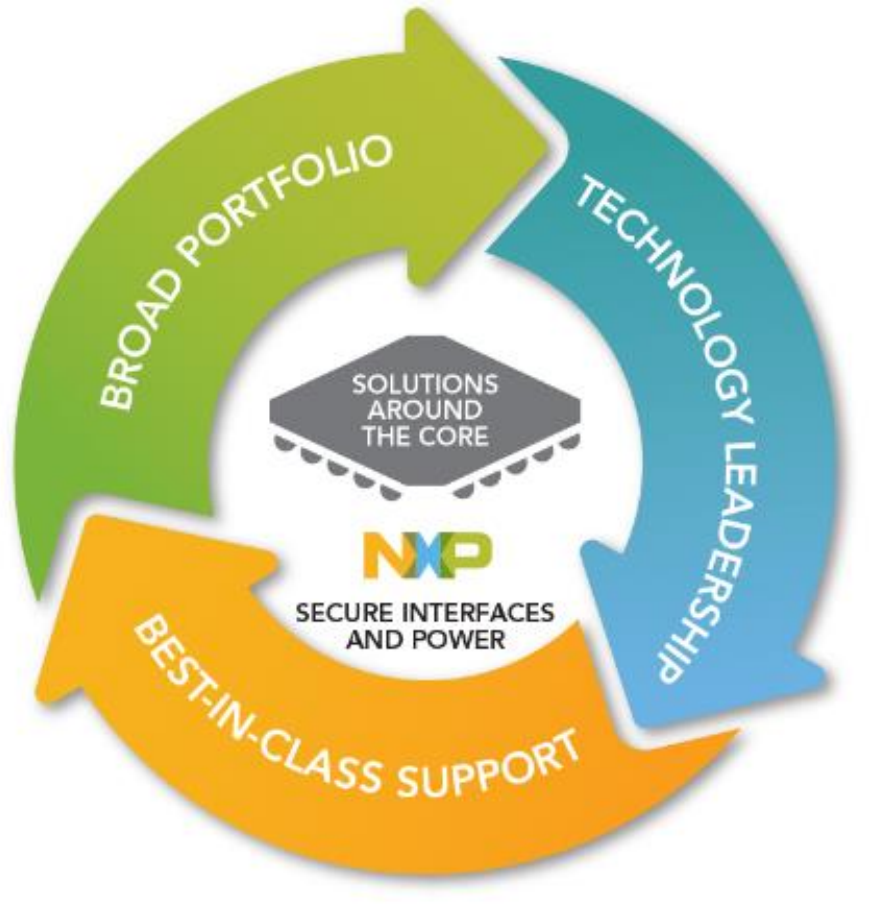


Giovanni Genna, EMEA RMM
November, 2016



SECURE CONNECTIONS
FOR A SMARTER WORLD

Agenda

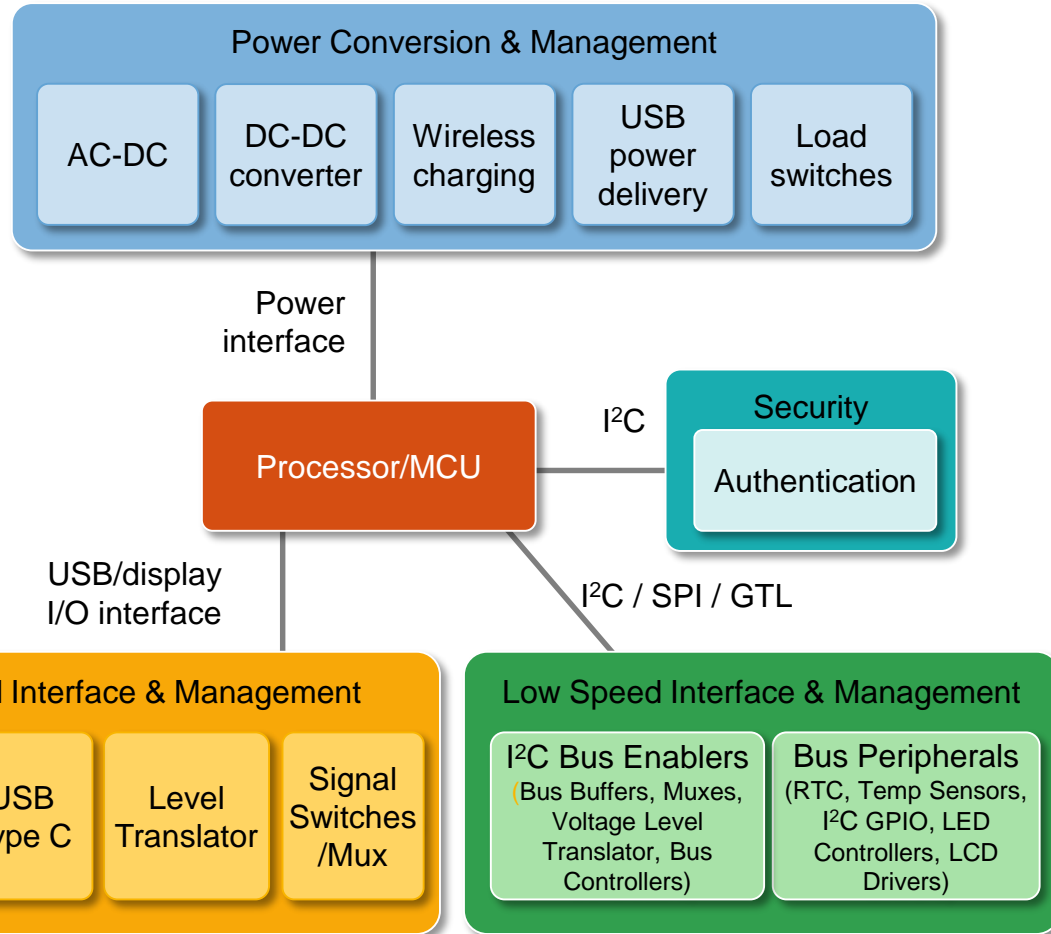


- ▶ Secure Interface and Power (BL-SIP) Fast-Facts
- ▶ BL-SIP Portfolio Overview
- ▶ BL-SIP Broad market strategy
- ▶ Discovery questions and hero parts for focus product areas
- ▶ Some Application block diagrams
- ▶ Conclusions:
 - ▶ Win more with BL-SIP and Call to action

Secure Interfaces & Power (SIP) Fast Facts

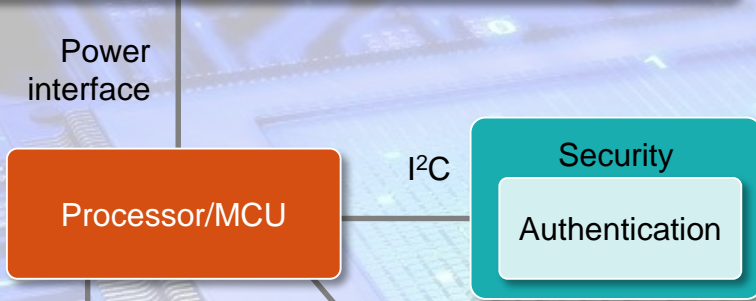
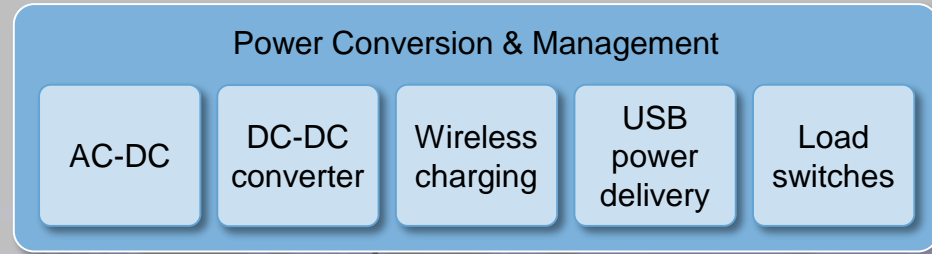
1200+	Orderable part numbers in BL-SIP
25+	Different product categories across interface & power portfolio, including automotive market segment.
~\$4B	BL-SIP SAM – a huge market !
24,000+	Worldwide end customers across broad set of applications
~50%	BL-SIP business is broad market
45	# of new BL-SIP products released since 2015

BL-SIP Portfolio



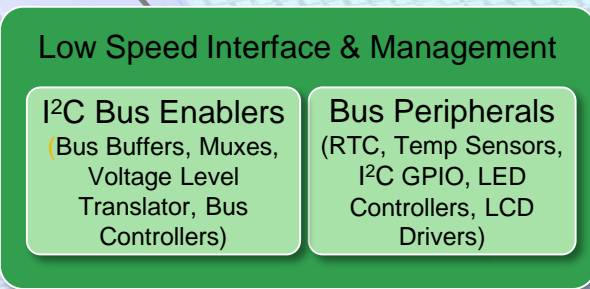
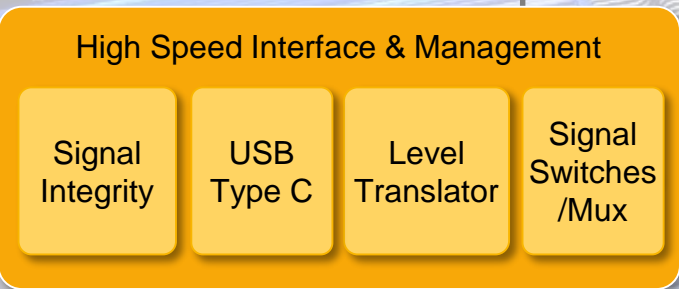
Portfolio categories		# of devices*
Power Conversion & Management	AC-DC	60+
	DC-DC converter	6
	Wireless charging	7
	USB power delivery	5+
	Load switches	20+
High Speed Interface & Management	Signal Integrity	6
	USB Type-C	5
	Level Translator	12+
	Signal Switches/Mux	20+
Low Speed Interface & Management	I2C Bus Enablers (Bus Buffers, Muxes, Voltage Level Translator, Bus Controllers, low speed protocol bridges)	70+
	Bus Peripherals (RTC, Temp Sensors, I2C GPIO, LED Controllers, LCD Drivers)	160+
Authentication	Authenticator for Anti-counterfeit	2

Solutions Around The Core in Broad Applications



USB/display I/O interface

I²C / SPI / GTL



Applications	Winning Portfolio Categories
Computing	USB Type-C solution; High speed switches; Load switches; signal integrity
	Voltage level translators
Enterprise Server Network	I ² C buffers; I ² C GPIO
	High speed switches
	Voltage level translators
Storage	Temperature sensors
	I ² C buffers; I ² C GPIO
Portable Wearable Gaming	Voltage level translators
	Load switches
	High speed switches
Wireless Infrastructure	I ² C GPIO; bus controllers; LED controllers
	I ² C buffers; I ² C GPIO
	High speed switches
Automotive	Voltage level translators
	LCD drivers; LED drivers
	RTC, Level translators

BL-SIP in Broad Applications

Application	Key product Areas	Hero products
Computing	USB type C, HS switches, Load switches, level translators, AC DC power	PTN5100, CBTL02043, CBTL08GP053, NX20P5090 PTN36241G, PCA9306, TEA1716, TEA1916, TEA1995
Storage (SSD)	Analog Switches, Level Translators, GPIO, Load Switches, temp sensors	CBTU02043, NTS0104, PCA6408A, NX5P2924, LM75BTP
Wearables (Cameras/Smartwatch/Fitness)	Load Switches, USB type C, GPIO, level translator	NX3P2902B, PTN5150A, NTS0102, PCA9570
IoT	Level Translators, signal switches, GPIO, RTC	NTB0104, CBTL02043A, PCA9555A, PCF85063A
Servers/Data centers	GTL translators, I2C translators, GPIO, Temp sensor	GTL2014, PCA9617, PCAL6416, PCT2075
Networking/Wireless Infrastructure	HS switches, memory switches, level translators, RTC	CBTL04GP043, CBTV24DD12, NTS0102, PCF85063A
Automotive Infotainment	RTC, Signal switches, level translators	PCF85063A, CBTL04GP043, NTS0104
Consumables (e.g. e-cigarettes)	Authentication, level translator	A1006, NTS0102
Video Surveillance	Level translator, RTC, USB type C, temp sensor	NTS0102, PCF85063A, PTN36043, PCT2075
EPOS	Load switches, level translators	NX5P2190, NTS0102
Medical Electronics	RTC, Authentication, LCD Driver	PCF85063A, A1006, PCF85176
Peripherals – docking, monitors, dongles	USB type C, DP to VGA	PTN36043, PTN5150, PTN3355
2 nd Tier Mobile & Portables	Load Switch, USB type C, Comparators, Analog switches	NX5P3190, PTN36043, PTN5150, NCX2200, CBTU02043
Home Appliances	RTC, Level translator, LED controller, GPIO	PCF85063A, NTS0104, PCA9955B, PCAL6416A
Building & Factory Automation	RTC, GPIO Expander, LCD Driver, Level translators	PCF85063A, PCAL6416A, PCF85176, NTS0104
Printers (3D)	Authentication, LED Controllers	A1006, PCA9955A
5 Gaming/VR	USB type C, GPIO, Level Translator, AC DC power	NX5P3190, PTN36043, PTN5150, PCAL6416A, NTS0104, TEA1755, TEA1792



BL SIP Focus products & Target applications – Broad Market

Vision: Enabling customers by delivering leading edge solutions for interface & power

Target Applications

Fast growing

- Wearables (Cameras, Fitness, Watches/Glasses)
- Storage - SSD
- IoT (DN processors)
- Drones & VR
- Video Surveillance

Focus Applications

- 2nd tier Mobile & Portables
- Printers & Consumables
- Home Appliances
- EPOS
- Metering & Automation

Grow engagement

- Server
- Networking
- Wireless Infrastructure
- Automotive Infotainment
- Gaming

Focus Products

- USB Type C ($\leq 15W$)
- Load Switches
- Signal Switches
- Authentication

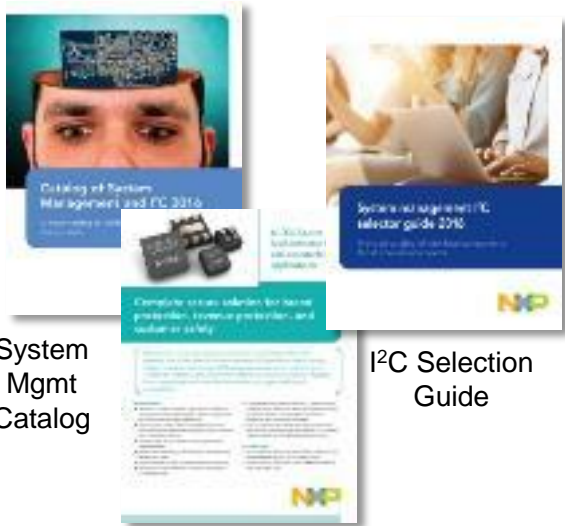
- I2C mux/buffers
- Level Translators
- GPIO Expanders
- RTC
- LED Controllers
- Temp sensors
- LCD drivers

- New technologies
- Fast growth areas
- Differentiated technology

- Broad market appeal
- Broad portfolio and market presence
- Cross-sell opportunities

What's new in BL-SIP?

PDF Collateral



System Mgmt Catalog

I2C Selection Guide

Authentication GTM



Battery Authentication White Paper

Animated Demo Videos



Type-C Demo Videos

Blog Posts



Type-C Gaining Popularity

Authentication Partner Landing Page & Webinar

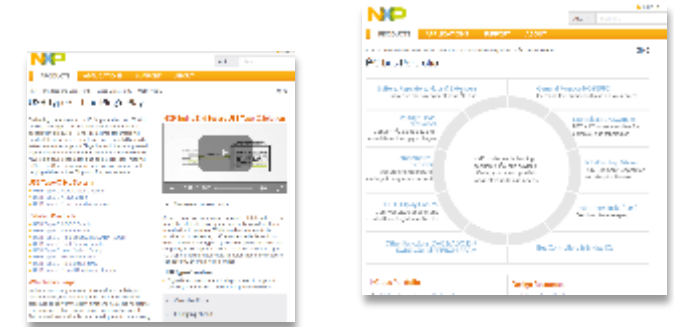


Authentication Videos

2016 Events



NXP.COM Landing Pages



Type-C Landing Page

I2C Landing Page



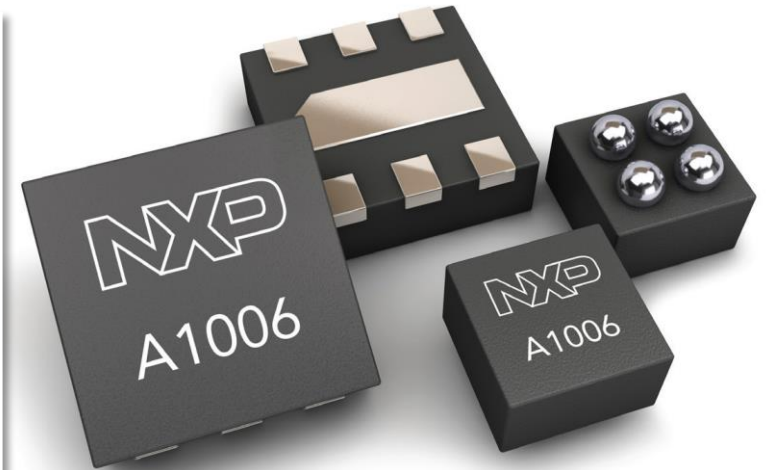
DISCOVERY QUESTIONS AND HERO PARTS FOR FOCUS PRODUCT AREAS



Authentication A1006

Discovery Questions

- Are you currently using authentication in your products?
- If so, which products (accessory, consumable, other)?
- Does your authentication solution use cryptographic protocols, and if so, which ones?
- Is your authentication solution tamper-resistant with countermeasures for invasive and non-invasive attacks?
- Are you looking to simply authenticate the identity of a device (A1006) or do you need have a more complex where you need features such as mutual authentication, encrypted sessions, longer key lengths or protocols (A710x)?

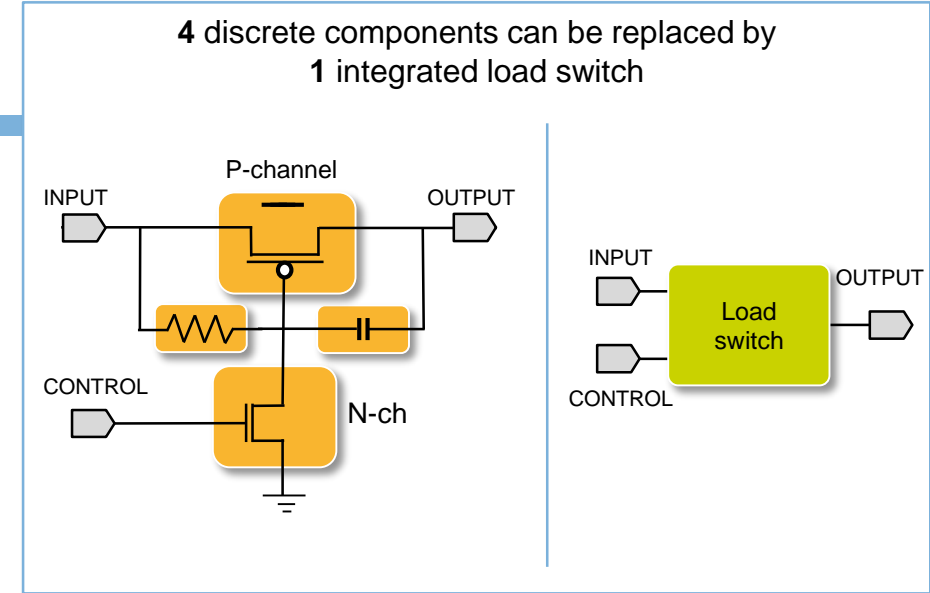


Where we should be winning	Why we should be winning	Other Emerging Markets
Consumables: printer cartridges, batteries	<ul style="list-style-type: none"> • Best in class security • 50% smaller than smallest competing solution • 85% power savings vs. nearest competitors • Elliptic curve crypto eliminates need for host-side security chip 	<ul style="list-style-type: none"> • 3D printers • Electronic cigarettes • Medical consumables
Electronic Accessories: Power adapters, vendor-specific ecosystem accessories	<ul style="list-style-type: none"> • Best in class security • 50% smaller than smallest competing solution • 85% power savings vs. nearest competitors • Elliptic curve crypto eliminates need for host-side security chip 	<ul style="list-style-type: none"> • USB Type-C accessory authentication

Load Switches

Discovery Questions

- 1) Are you currently using MOSFETs for power distribution?
- 2) Is your application battery powered or power sensitive?
- 3) Do you want the ability to turn off portions of your system when they are not being used?
- 4) Do you need over-voltage, over-current, over-temperature, and other protection features?

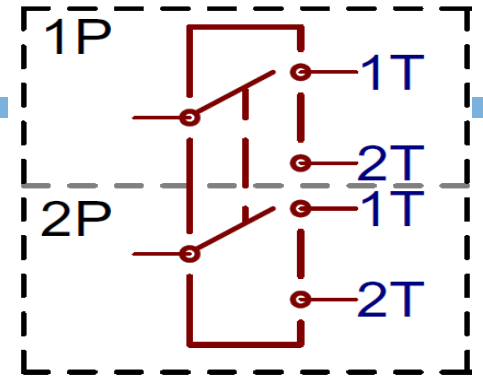


Application	Profile	Load switches	Target Applications	Value Proposition
Power sequencing and slew rate control	0.9V – 3.6V, 0.5A	NX3P2902B	Wearable and portable applications	10X lower quiescent current than competitor's device
	0.9V – 5.5V, 2.5A	NX5P2924	Mobile and USB OTG	Low and flat on resistance
Surge protection	2.5V – 20V, 5A	NX20P5090	USB Type-C applications	Currently the only 100W USB Type-C load switch in the industry.
	3.0V – 5.75V, 3A	NX5P3001	Mobile and USB OTG	With integrated low capacitance TVS for D+ and D- lines.
Charging path (with reverse current protection)	3V – 5.5V, 2A	NX5P2190	USB Type-C applications	Smaller pkg size than competitor; 90V surge protection (comp has no surge protection)
	2.5V – 5.5V, 3A	NX5P3090		

Signal Switches

Discovery Questions

- Do you need signal switches to simplify control/data signal routing and ease design and layout?
- How many inputs and outputs needed (no. of channels)?
- What are your bandwidth requirements?



Hero Parts	Target Applications	Value Proposition	Other Emerging Markets
<u>High speed Switches</u> CBTU02043 CBTL04GP043	Computing and Server	Best in class signal integrity in high speed USB, PCIe, SATA, SAS, DisplayPort and Thunderbolt	Networking and cloud computing (e.g. Cisco, Juniper, EMC)
<u>Analog Switches</u> NX3DV42 NX3DV642	Consumer electronics. TV, docking station, adaptor and Smartphones	Low Speed UART, USB 2.0, SPI Switch. MIPI Switch. Audio Switch wide product portfolio	Embedded system design
<u>Application specific switches</u> CBTV24DD12 CBTW28DD14	Enterprise SSD and Memory Module	Better signal integrity and lower cross talk Excellent quality control and long product life cycle as reputable semi vendor	RAID and mass data storage controllers reference design

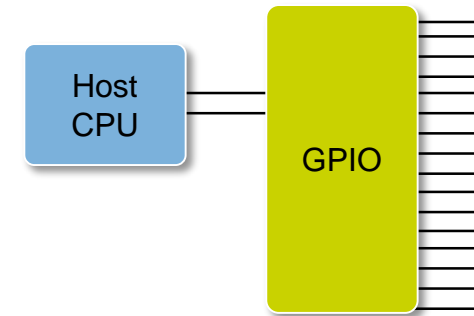


GPIO Expanders

Discovery Questions

- 1) Have you run out of I/O on your MCU?
- 2) Do you need to reduce the number of signal lines used for peripheral control?
- 3) Are you limited by the drive capability of your MCU I/O?

Allows use of 2 I/O on the host CPU to expand to up to 4, 8, 16, 24 or 40 additional I/O



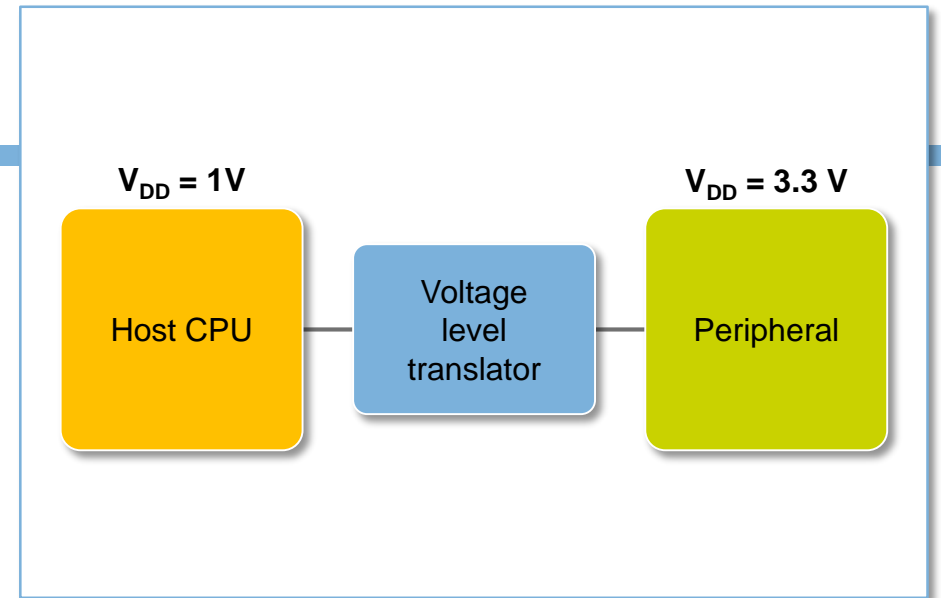
Bit-width	GPIO expanders – Hero products	Target Applications	Value Proposition
4 - bit	PCA9570	IOT devices, wearable, handheld & portable devices	Tiny package, low power consumption
8 – bit	PCAL6408A	Mobile, Tablets, Gaming, Embedded computing	Ultra low power consumption & tiny packages “Agile” I/O features: latchable inputs and programmable I/O features (drive strength, output structure, etc.)
16- bit	PCAL6416A		
16- bit	PCA9555A	Server, networking, wireless infrastructure	Low power device and various package options, fully backward compatible to PCA9555
24 - bit	PCAL6424A	Mobile, Low power applications	Ultra low voltage support, “Agile” I/O features
40 - bit	PCA9698	Home & Building automation, Networking, Computing/Server/Storage	Lots of flexibility with 40-bits available, 1MHz I ² C-bus operation



Voltage Level Translators

Discovery Questions

- 1) Do you have multiple I/O voltage or voltage rails in your system?
- 2) How many different voltages do you need to convert and what voltage do you need to convert?
- 3) Do you need to isolate system peripherals or multiple loads on the bus? (If so, promote the “Active” level translators)

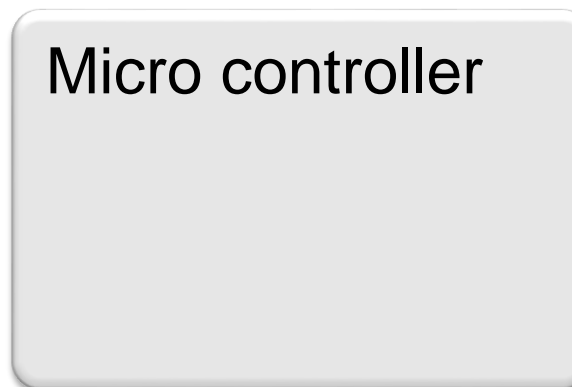
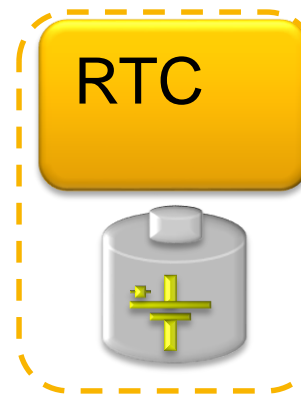


Level Translators	Type	Drive	Target Applications	Value Proposition
GTL2014	Bidirectional with direction pin	Active	Storage, Servers, Networking	On Intel's Grantley and Purley Server ref designs
NTB010x PCA9617	Bidirectional with auto direction sensing	Active	NTB: Wearable, Portable, IoT PCA: Storage, Server, Networking	NTB: Very small form factor, low power consumption (30 μA), integrated one-shot edge accelerator PCA: On Intel's server ref designs, 1MHz I2C-bus operation
NTS010x NVT200x	Bidirectional with auto direction sensing	Passive	NTS: Wearable, Portable, IoT NVT: Industrial, Computing	Very low standby current (5 μA), options for 1 to 10 bits wide

Real Time Clocks

Discovery Questions

- 1) Do you need time keeping, alarm, watchdog functions?
- 2) Do you need to keep timing and save power? You can back-up only the RTC and keep the MCU in hibernation mode
- 3) Do you want to have the flexibility to reset or interrupt the MCU?
- 4) Do you need high accuracy?
- 5) Do you need an external RTC with battery management?
- 6) Do you need to support timestamping / tamper detection functions?

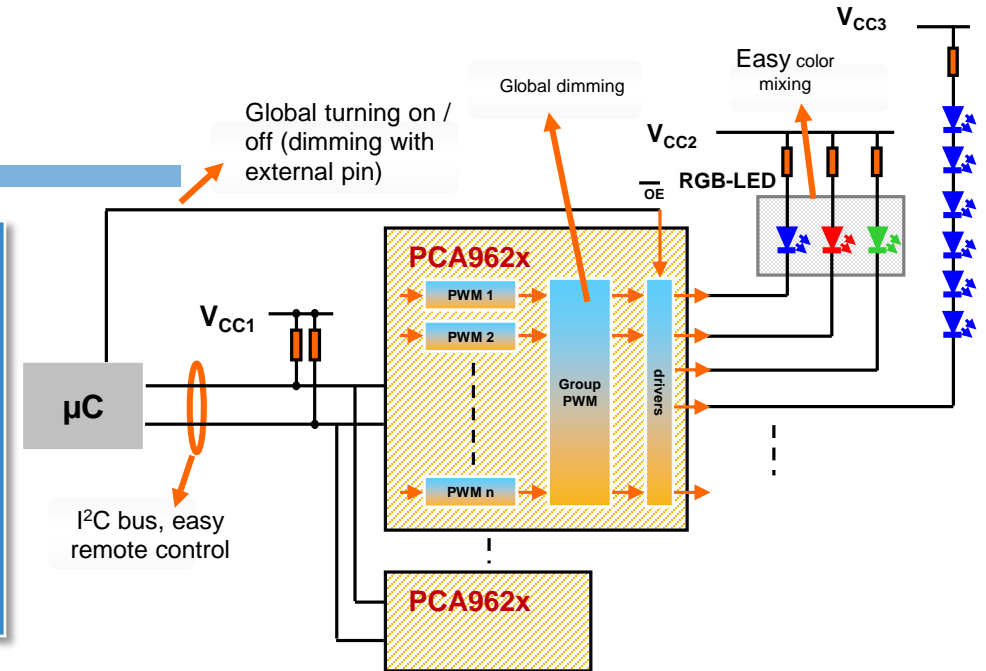


Application	Interface	Hero parts	Target Applications	Value Proposition
Low power	I2C	PCF85063A, PCF8523	Networking, Server, Consumer, POS	Industry's lowest power consumption, tiny package options with alarm feature
	SPI	PCF85063B, PCF2123		
High accuracy	I2C and SPI	PCF2127(A), PCF2129(A)	Consumer	High accuracy +/- 3 ppm with battery management, time stamp and internal crystal
Automotive	I2C	PCA85063A, PCA8565, PCA2129	Battery Management Control, Telematics	AEC-Q100 compliance, higher temperature operation
	SPI	PCA21125, PCA2129		
Latest Generation Full featured	I2C	PCF85263A, PCF85363A	Industrial	Two alarms, watchdog, electronic tuning, battery management, time stamp and 64byte RAM on 363A

LED Drivers

Discovery Questions

- 1) Do you have LEDs for backlighting or indication purposes that needs controlling?
- 2) Do you need to drive low power LEDs (20V and 40V outputs with up to 100mA output current) via I2C or SPI?
- 3) Do you want to control LED brightness / dimming / blinking / color mixing?
- 4) Do you want to reduce EMI? Free-up MCU resources and let the LED driver to generate the PWM signals



Control type	LED controller	Where are we winning	Why are we winning
Voltage source	PCA9632, PCA9633	Consumer devices, portable applications	4-bit devices with integrated PWMs to do color mixing/dimming. Low power version available (PCA9632)
Voltage source	PCA9624, PCA9685	Gaming, Home automation, Industrial	Large number of channels allows control of multiple LEDs saving GPIO pins on MCU
Constant current	PCA9955B, PCA9956B	Backlighting application, Automotive, applications required 'breathing' support	Constant current support allows precise control of current through LEDs, thermally enhanced package, 1-MHz I2C interface with software features for easy control
Constant current	PCA9745B	Backlighting application, Automotive, applications required 'breathing' support	Constant current support allows precise control of current through LEDs, thermally enhanced package, Daisy chainable SPI interface with software features for easy control



LCD Drivers

Discovery Questions

- Does your system have a passive monochrome display?
- Do you want to save I/O's on the MCU while driving the display?
- Do you need display high contrast level?
- Do you need Segment or Character driver?



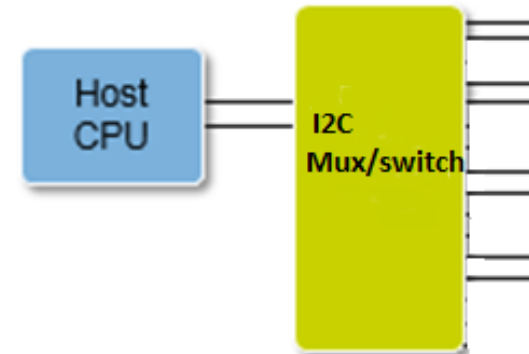
Part number	Where we are winning	Why we are winning
PCA8561	Automotive and Industrial; small displays with driver mounted on the back.	Small number of segment counts, small package size, programmable frame frequency, automotive qualified, low power consumption
PCA(F)85162 / PCA(F)85176 PCA(F)8551 / PCA(F)8553	E-metering, automotive, white goods	Automotive qualified, low power consumption
PCA8538 / PCA8539 / PCA2117 (character driver)	Automotive, Industrial	COG, automotive qualified, high and programmable frame frequency, high VLCD with integrated charge pump, internal temperature sensor



I2C muxes and switches

Discovery Questions

- Do you have issue with I2C slaves having same address?
- Do you have many slaves on the I2C bus and need to split the bus to simplify architecture?
- Do you need debug capability and multi-master support in your system?

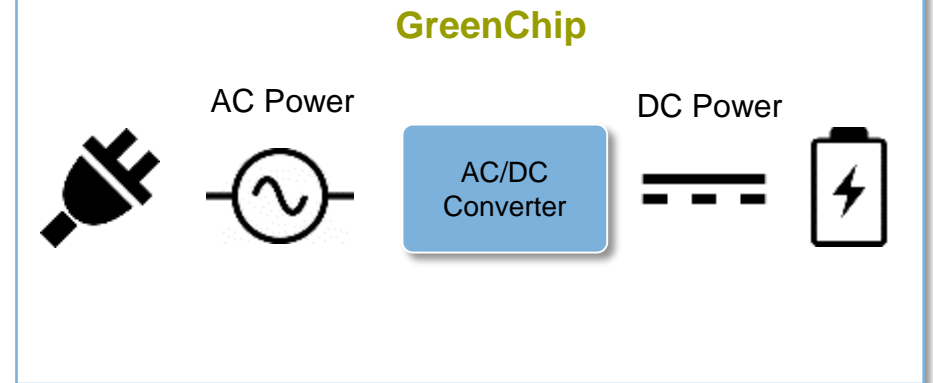


Function	Device	Where are we winning	Why are we winning
Multiplexer	PCA9547, PCA9847	Servers, networking, Telecom, wireless infrastructure	Low voltage device with address configurability
Switches	PCA9546A, PCA9846, PCA9848		Low voltage device with address configurability, level translation capability built in
Demux / Arbiter	PCA9541A, PCA9641		Multi-master system support with hardware arbitration capability

AC/DC Converters

Discovery Questions





- 1) Does the system require AC power input?
- 2) Is the system power consumption <300W?
- 3) Are low standby power and high efficiency important in the design?



Part number	Target applications	Value Proposition
TEA1721 / TEA1723 Flyback regulator +Transient controller	Low-power (<10W) Electronics <ul style="list-style-type: none"> • Thermostat, White Goods user interface 	Low no-load standby power (<20mW)
TEA1836 + TEA1892 QR Flyback controller+ SyncRec	Less than 75W Power Supplies <ul style="list-style-type: none"> • Wall Wart Charger, Ultrabook, Set-top Box 	Integrated X-cap discharge Low no-load standby power (<30mW) High efficiency, up to 93%
TEA1755 + TEA1792 Flyback+ PFC controller +SyncRec	Greater than 75W Power Supplies <ul style="list-style-type: none"> • Desktop, Gaming Console, White Goods 	Low no-load standby power (<100mW)
TEA1916 + TEA1995 LLC Resonant+PFC controller +SyncRec Adaptive ctrl	Greater than 90W Power Supplies <ul style="list-style-type: none"> • Desktop, Gaming Console 	Low no-load standby power (<75mW), High efficiency - up to 94% Ultra-slim design



AC/DC Converters

Power Range	PFC Control	Primary Control	Secondary Control	Standby control
Resonant > 90 W 		TEA171x (TEA1713, TEA1716) TEA1916 (GreenChip LLC)	TEA179xA (TEA1791A/92A) TEA1892A TEA1795 TEA1995	TEA1708
Flyback > 75 W 		TEA175x (TEA17150/51/52/53/55) (GreenChip III)	TEA176x (TEA1761/62) TEA179x (TEA1791/92) TEA1892 TEA1993	TEA1703 TEA1708
Flyback < 75 W 	n.a.	TEA173x (TEA1731/33/38) TEA183x (TEA1832/33/36) (GreenChip MPA)	TEA176x (TEA1761/62) TEA179x (TEA1791/92) TEA1892 TEA1993	TEA1703 TEA1708
Flyback < 12 W 	n.a	TEA172x (TEA1721/23) (GreenChip LPA)	n.a.	Integrated in primary control IC

AC/DC Converters

AC-to-DC solutions overview:

<http://www.nxp.com/products/power-management/ac-to-dc-solutions>

Flyback SMPS Design Tool:

<http://www.nxp.com/pages/flyback-smps-design-tool>

Buck SMPS Design Tool:

<http://www.nxp.com/pages/buck-smps-design-tool>

NXP Flyback SMPS Design Tool
Flyback converter

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Language: English

Basics
 Design
 Design
 Options
 Key Results
 Summary
 More
 My Designs

Input Specifications

AC input
 Universal mains (90V_{AC} to 264V_{AC})
 User defined

Voltage
 Minimum: 90 V_{AC}
 Maximum: 264 V_{AC}

Frequency
 Typical: 50 Hz

TEA1721: Typical configuration

Segment & Application	Range				
	<15W	15 - 45W	45 - 75W	75 - 120W	> 120W
Computing <ul style="list-style-type: none"> PCPower All in One Notebook Netbook Ultrabook Convertible laptop 	TEA1721ADB1059 5W/12V DCM Buck TEA1720ADB1132 10.6W/5V DCM Flyback	TEA1836DB1200 45W/19.5V QR/DCM Flyback TEA1832DB1253 45W/19.5V FF/CCM Flyback	TEA1836DB1094 65W/19.5V QR/DCM Flyback	TEA1755DB1100 90W/19.5V QR/DCM PFC + QR/DCM Flyback TEA1716DB1255 90W/19.5V QR/DCM PFC + LLC	TEA1716DB1266 240W/(12V&24V) QR/DCM PFC + LLC TEA1716DB1258 150W/19.5V QR/DCM PFC + LLC
Computing Peripherals <ul style="list-style-type: none"> Printer Cable Modems Gateways & Routers 	TEA1721ADB1102 5W/5V DCM Flyback TEA1720ADB1132 10.6W/5V DCM Flyback	TEA1836DB1200 45W/19.5V QR/DCM Flyback TEA1832DB1253 45W/19.5V FF/CCM Flyback	TEA1836DB1094 65W/19.5V QR/DCM Flyback		
Gaming <ul style="list-style-type: none"> Portable Games Consoles Wired Games Consoles 	TEA1721ADB1102 5W/5V DCM Flyback TEA1720ADB1132 10.6W/5V DCM Flyback	TEA1836DB1200 45W/19.5V QR/DCM Flyback TEA1832DB1253 45W/19.5V FF/CCM Flyback		TEA1755DB1100 90W/19.5V QR/DCM PFC + QR/DCM Flyback	TEA1716DB1266 240W/(12V&24V) QR/DCM PFC + LLC TEA1716DB1258 150W/19.5V QR/DCM PFC + LLC
Tablet <ul style="list-style-type: none"> Tablet Detachable laptop eBook reader 	TEA1721ADB1059 5W/12V DCM Buck TEA1720ADB1132 10.6W/5V DCM Flyback	TEA1836DB1200 45W/19.5V QR/DCM Flyback TEA1832DB1253 45W/19.5V FF/CCM Flyback			
(Smart) Phones <ul style="list-style-type: none"> Smart Phones Other Mobile Phones Cordless Phones 	TEA1721ADB1059 5W/12V DCM Buck TEA1720ADB1132 10.6W/5V DCM Flyback				
Wireless Charging <ul style="list-style-type: none"> Wireless Charging 	TEA1720ADB1180 10W/5V DCM Flyback	TEA1836DB1200 45W/19.5V QR/DCM Flyback			
Display <ul style="list-style-type: none"> Flat Panel TVs 	TEA1721ADB1061 5W/(3.3V&12V) DCM Flyback	TEA1832DB1253 45W/19.5V FF/CCM Flyback	TEA1836DB1094 65W/19.5V QR/DCM Flyback	TEA1755DB1100 90W/19.5V QR/DCM PFC +	TEA1716DB1266 240W/(12V&24V) QR/DCM PFC + LLC

Some SMPS Reference Designs

TEA1721ADB1061: Flyback
Dual output 12V/3.3V, **5W**

Board size: 42mm x 51mm



TEA1721ADB1062: Flyback
Triple output 24V/12V/3.3V, **5W**

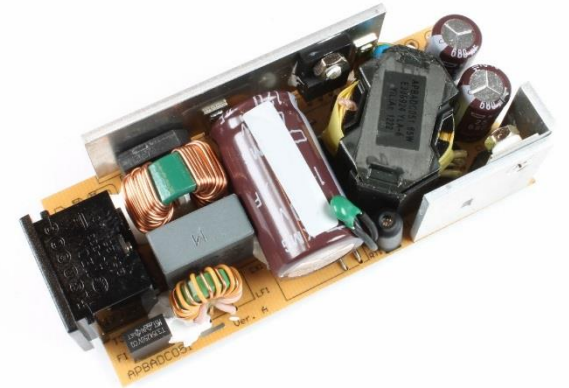
Board size: 61 mm x 59.7 mm



TEA1832DB1253: Flyback
19.5V up to **45W**



TEA1733DB: Flyback
19.5V up to **65W**



TEA1755DB1100:
Flyback supply up
to **90W**



TEA1716DB1255:
Resonant designed to
supply up to **90W**



Wireless Charging Transmitter



Discovery Questions

- Do you need a Wireless Transmitter up to 8.5 W?
- Are you looking for a Qi compliant solution or anyway for a Qi compliant performance, >70% efficiency and ultra low standby power?
- Are you looking for the most integrated and plug & play solution in the market?

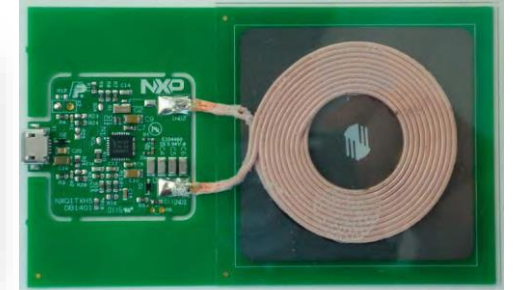
25 x 25 mm PCB



45 x 45 mm PCB



NXQ1TXH5DB1401 Demo board:

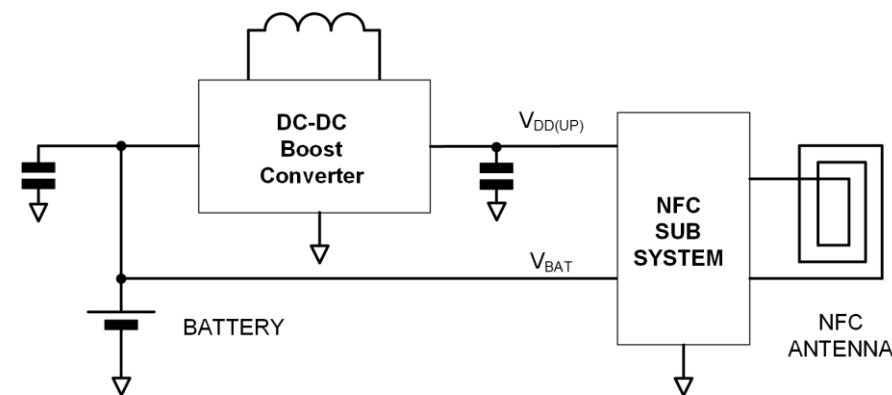


Part number	Where we will win	Value proposition
NXQ1TXH5	Smart Phones Wearables Infrastructure	<ul style="list-style-type: none"> • Qi compliant with FOD (Foreign Object Detection) feature (NXQ1TXH5) • Very low component count, enabling 30% - 50% lower cost than competition • 2-layer PCB; components on top-side only • Easy PCB design and manufacturing. PCB area scalable with power: <ul style="list-style-type: none"> • 50 mm diameter for 8.5 W TX power → 5 W at RX • 30 mm diameter for 5 W TX power → 3 W at RX • 20 mm diameter for 3 W TX power → 2 W at RX • High system efficiency: >70% at 1.5W • Very low power consumption: standby power of ~10mW (vs 100mW of competition) – meets 5-star standby power rating • Low EMI by use of Class D audio expertise of NXP - 8dB margin on EN55022
NXQ1TXL5		<ul style="list-style-type: none"> • Low-cost Plug & play device • No tuning, no configuration • No Qi certification possible and no FOD but still high-end full Qi compliant performance – end user will not see the difference

NFC boosters

Discovery Questions

- 1) Do you use NFC in battery powered system or battery-backed system?
- 2) Do you need to improve the NFC communication distance?
- 3) Do you need to reduce the size of the NFC antenna by keeping the same NFC performance?



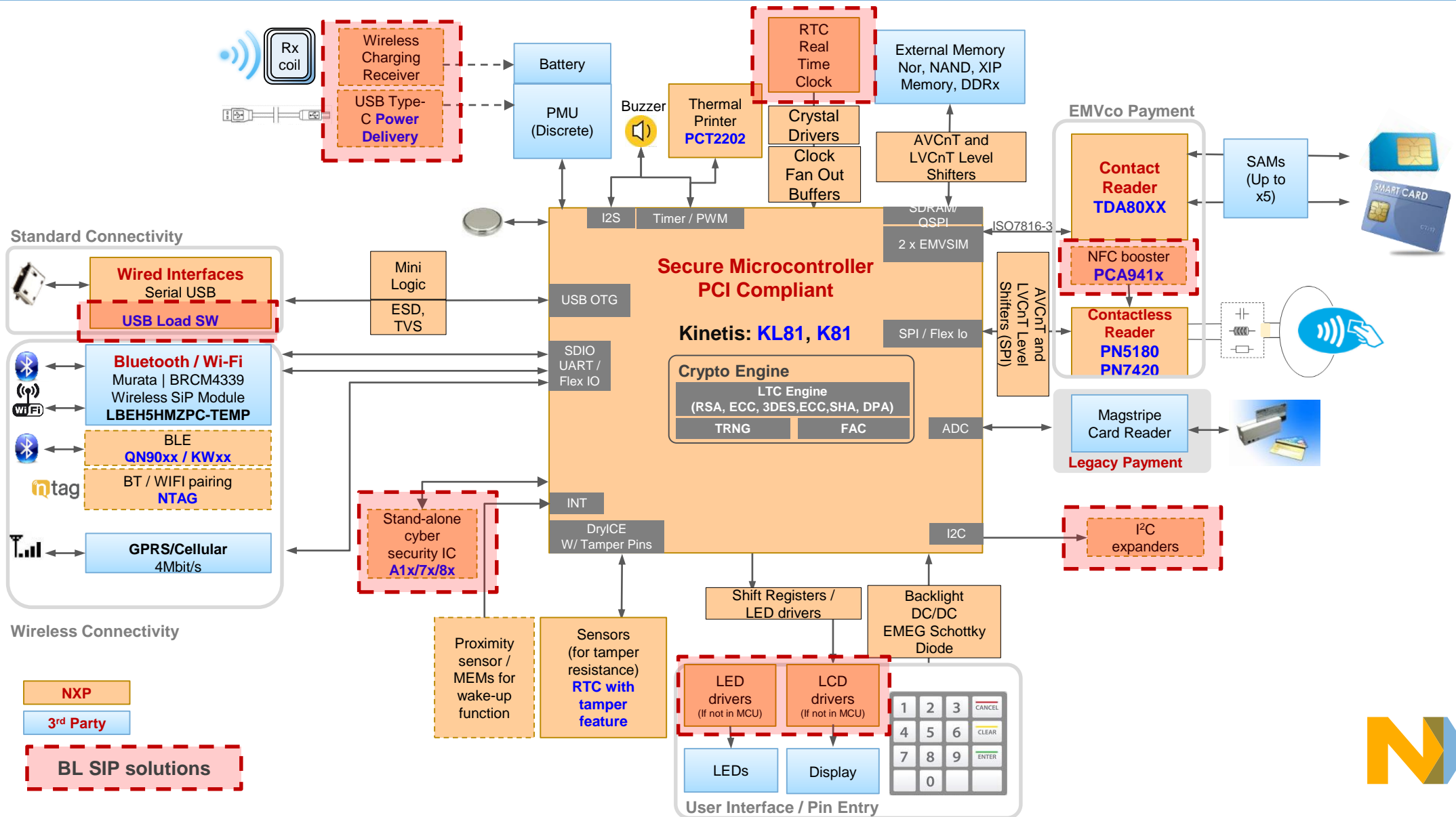
Part number	Where we are winning	Why we are winning
PCA9410 PCA9411	Mobile, wearables, battery powered devices	<p>Enhances performance of the NXP NFC PN548, PN66T or later generations</p> <ul style="list-style-type: none">• Provide 5V (or 5.25V) for reliable performance regardless of battery level• Lower Baseband Noise (compared to competitor)• Higher switching frequency, smaller inductor footprint (compared to competitor)• Small footprint WLCS package• Proven performance with NXP NFC



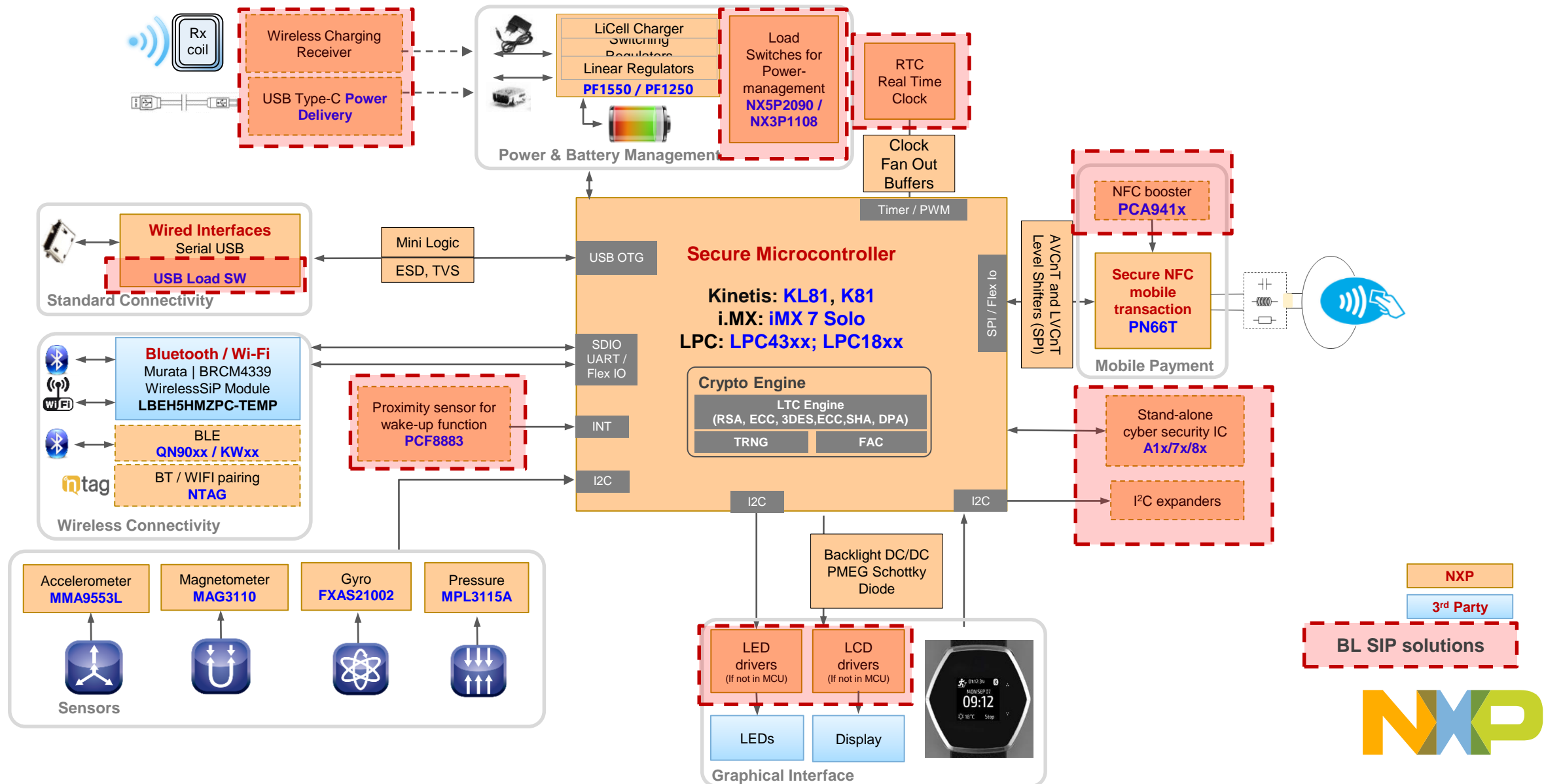
SOME APPLICATION BLOCK DIAGRAMS



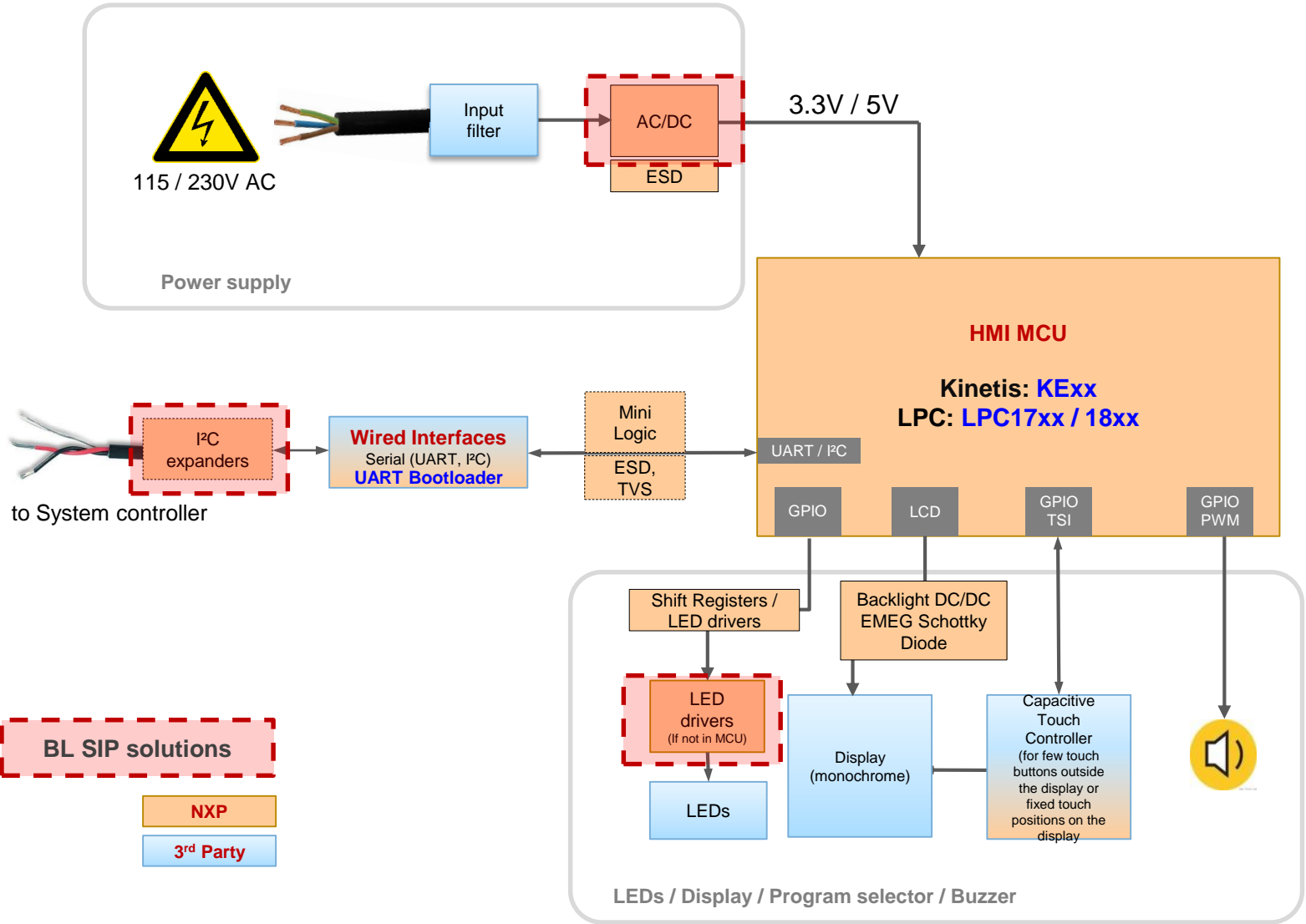
mPOS: architecture block diagram



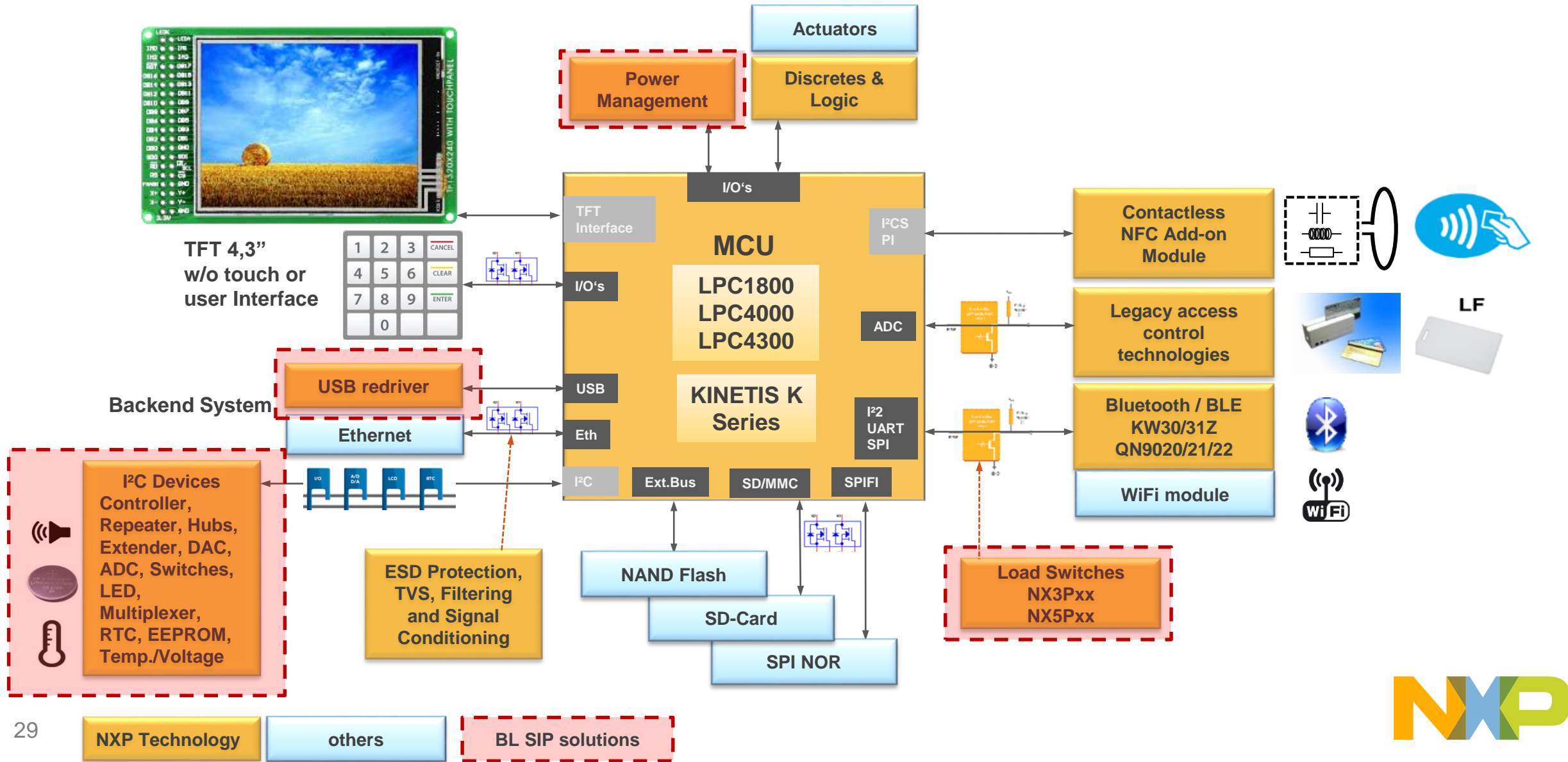
Smart/Fitness watch: enhanced architecture



Appliance or industrial mid-range HMI



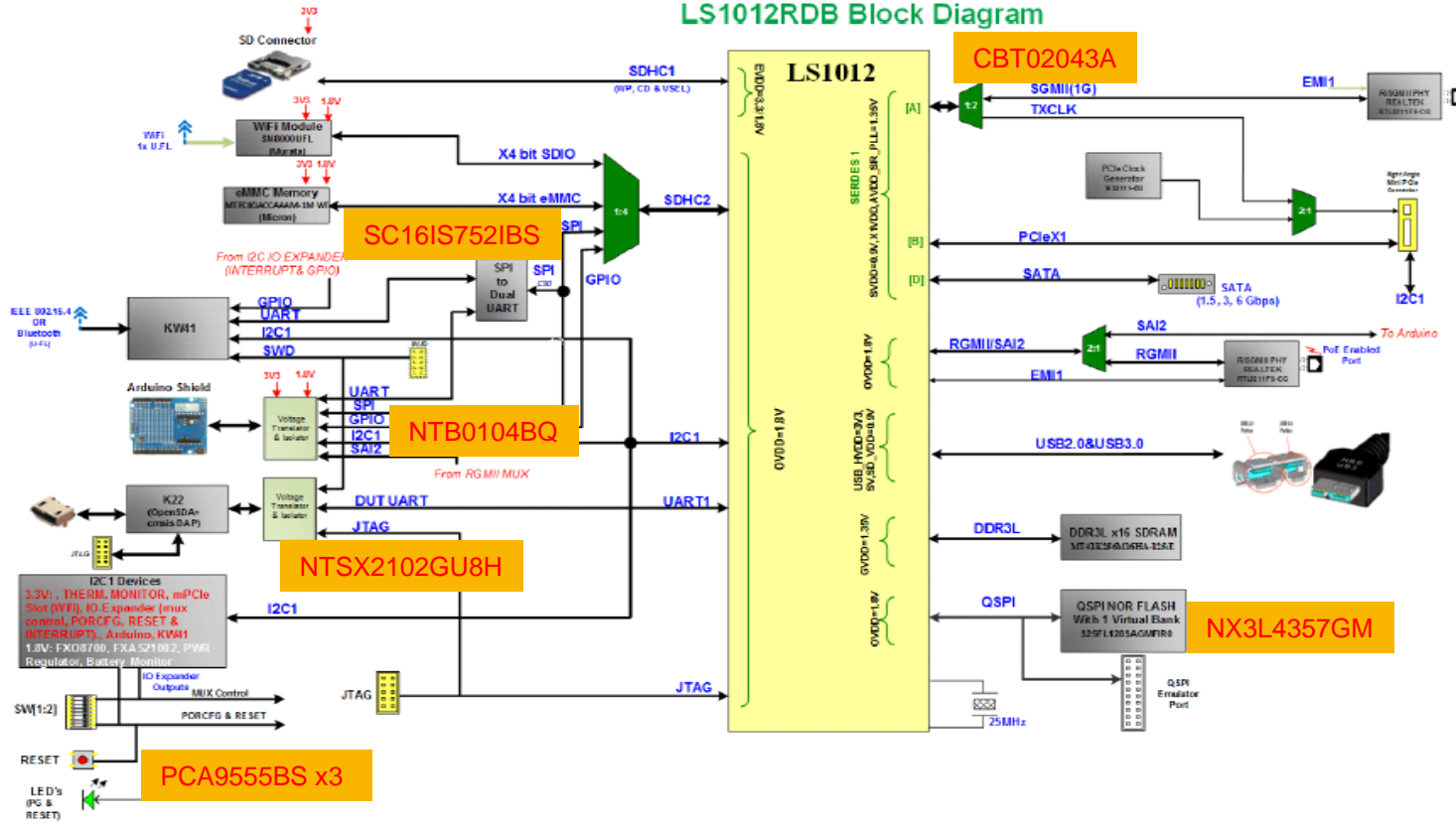
Access Control: enhanced architecture



IoT Gateway: Digital Networking

BL SIP

LS1012RDB Block Diagram



BLSIP Parts	Description	Quantity per board	~\$ value Disti ASP
CBT02043A	IC DIFF MUX/DEMUX 3.3V	1	\$0.55
SC16IS752IBS	IC INTERFACE I2C/SPI SLAVE TO UART BRIDGE 2.5-3.3V	1	\$1.25
PCA9555BS	IC I/O EXPANDER 16-BIT 2.3-5.5V	3	\$1.50
NTSX2102GU8H	IC DUAL SUPPLY XCVR 50 MBPS 5.5V	1	\$0.16
NX3L4357GM	IC LIN SW SP3T MUX/DEM UX 3:1 1.4-4.3V	1	\$0.20
NT0104BQ	IC DUAL XLTR XCVR 4BIT 1.2-3.6/1.65-5.5V DHVQFN14	1	\$0.17
SA56004X (Equivalent pin compatible part on board)	IC TEMP MONITOR DUAL - 40C/+125C 5.5V MSOP RM-8	1	\$0.30
Total		9	\$4.13

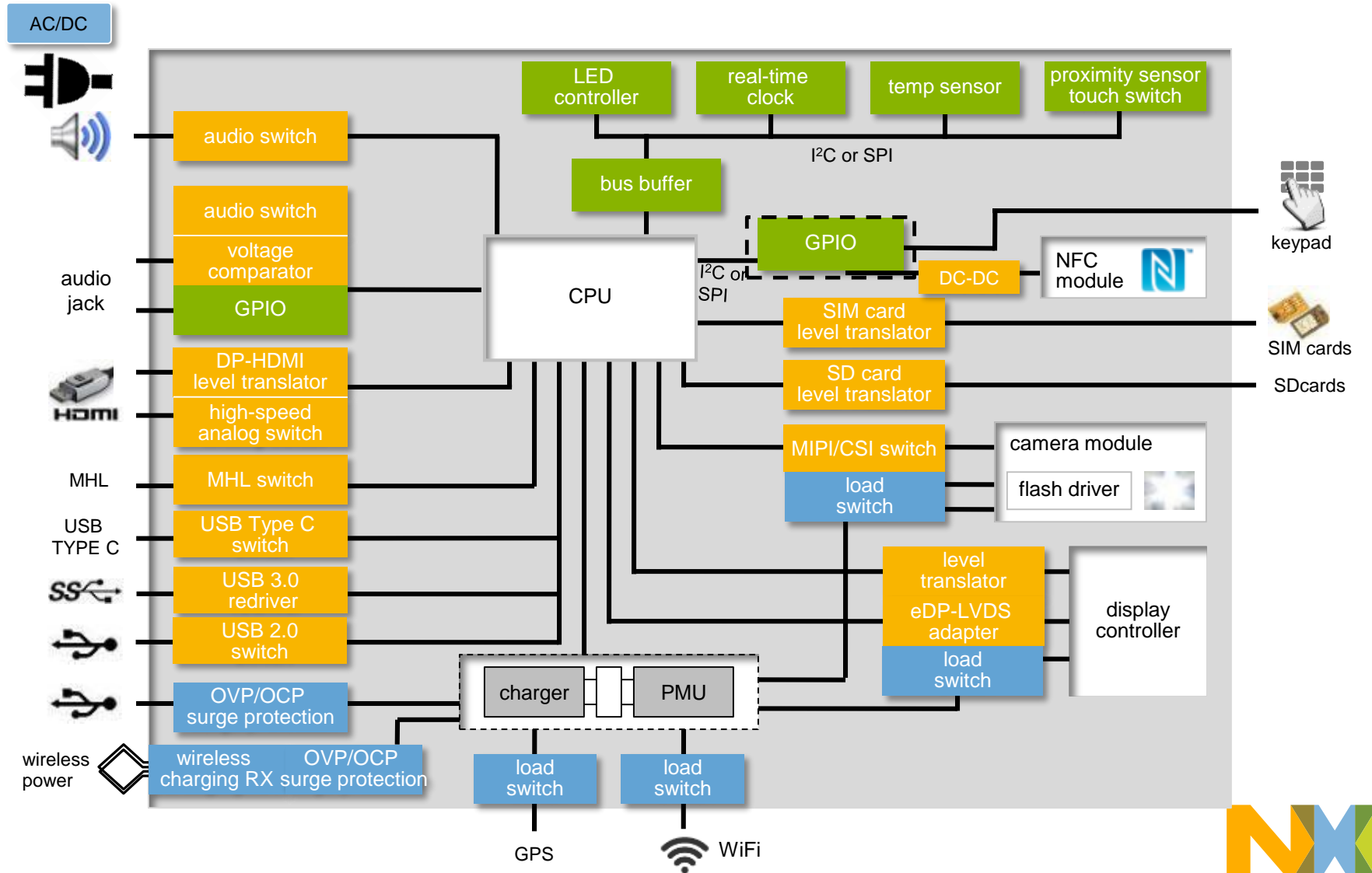
Portable

BL-SIP BOM

\$5

BL-SIP Functions

13+



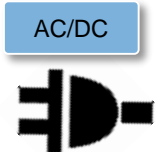
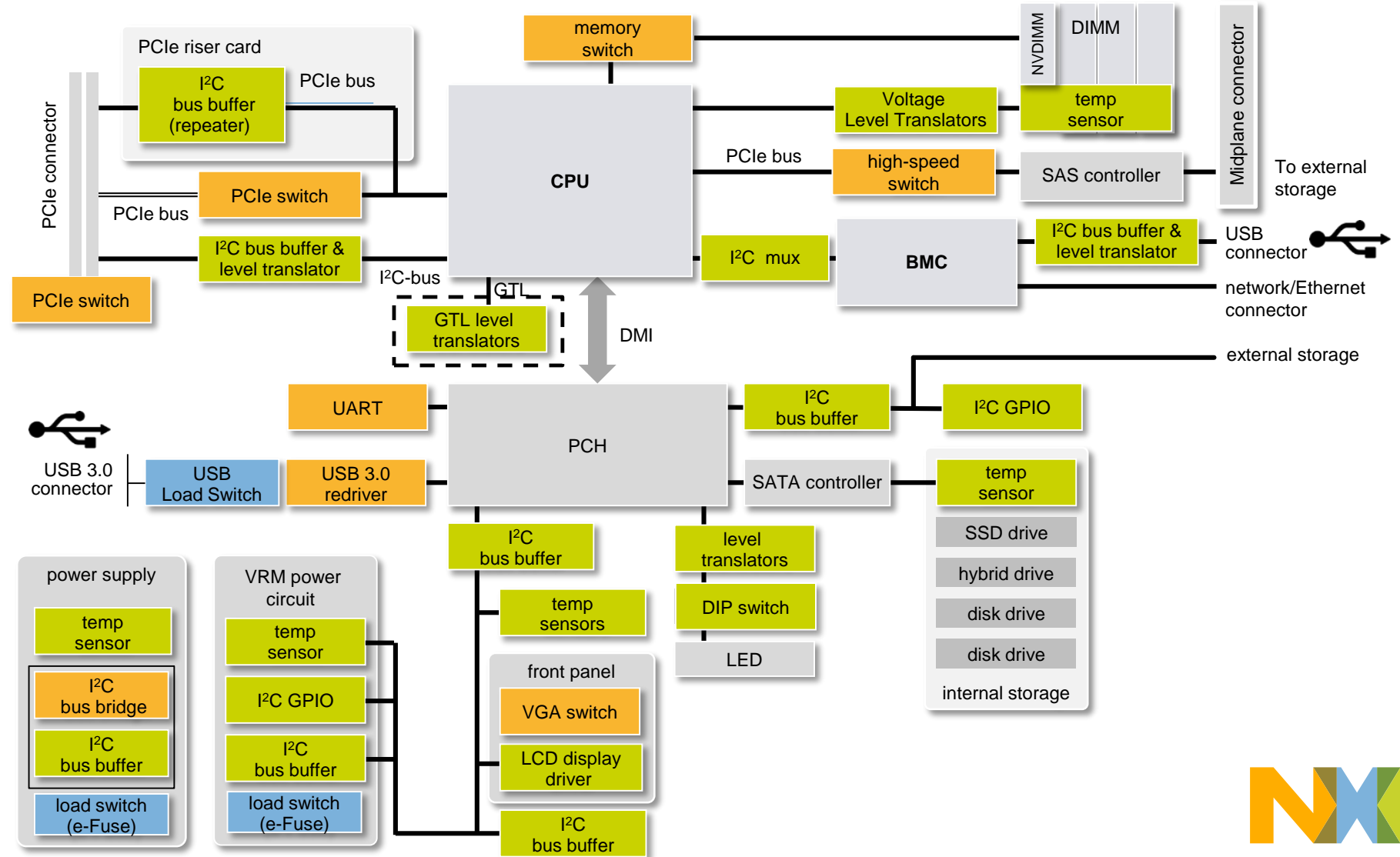
Enterprise Storage Server

BL-SIP BOM

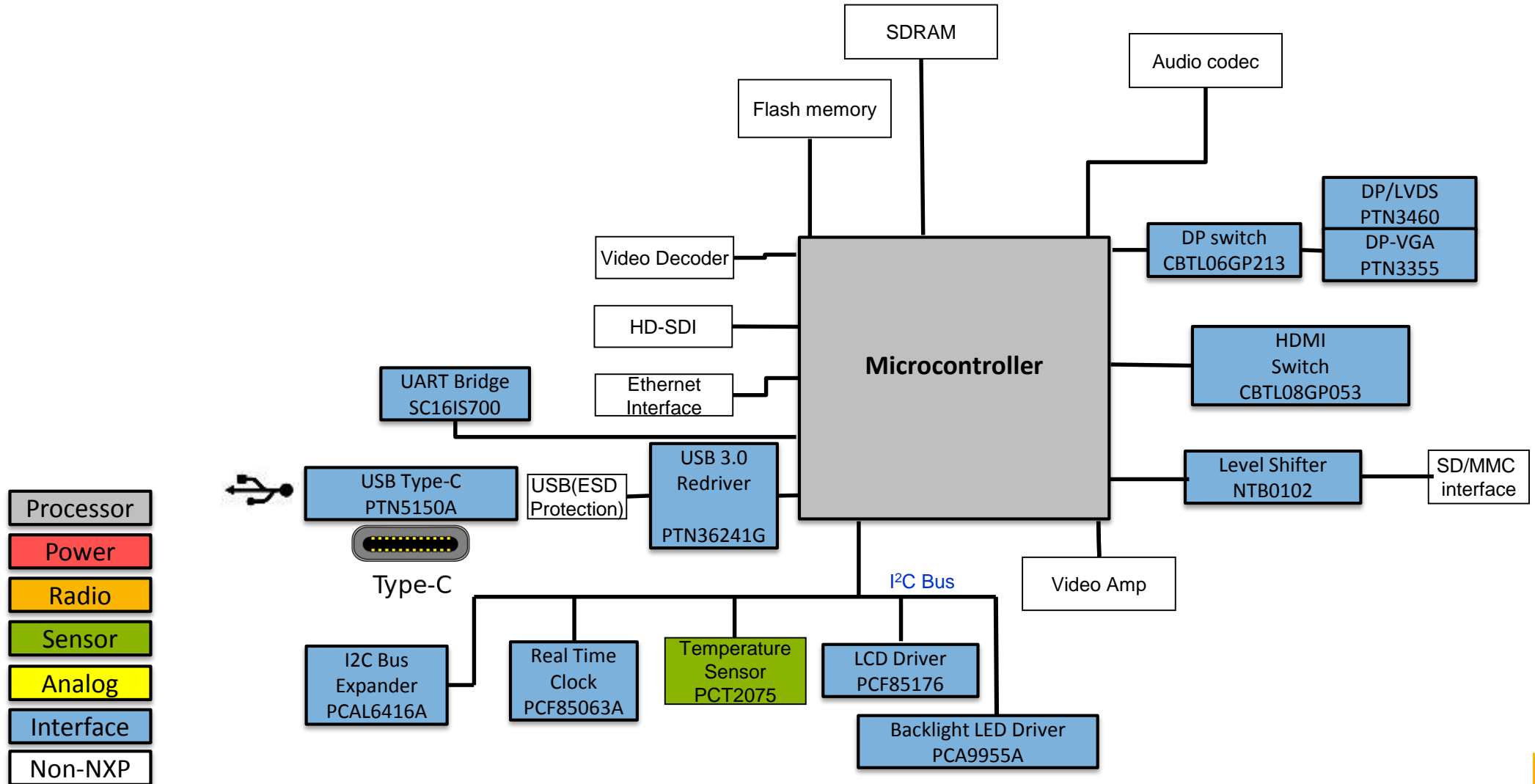
~\$8

BL-SIP Functions

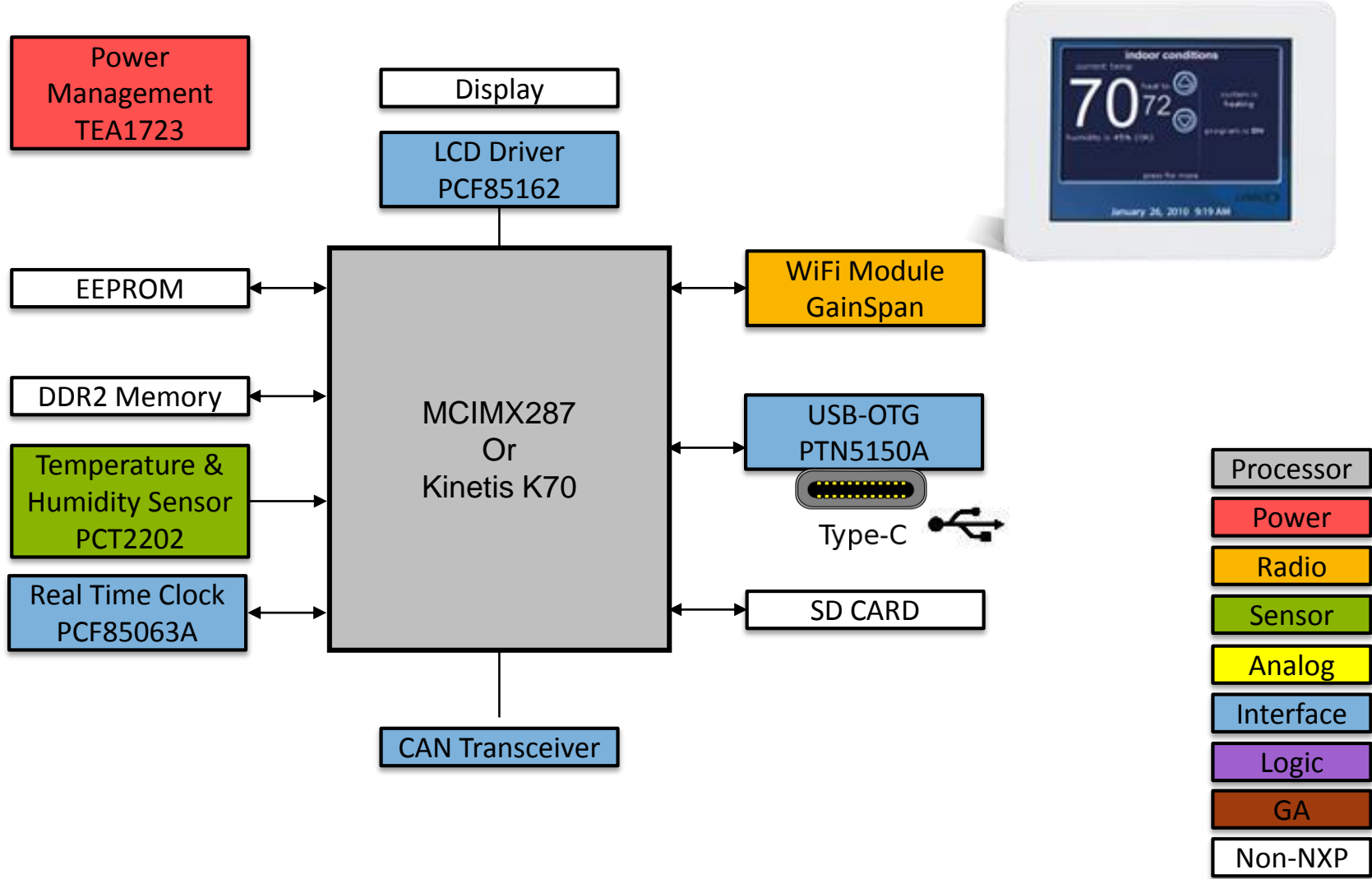
11+



Video Surveillance



IoT Home Automation: residential thermostat



CONCLUSIONS



Win MORE with SIP

Discovery questions for every customer:

- ① Is there a need for **load switches** to replace discrete MOSFET for power switching and add over voltage/current protection?
- ② Is the processor limited by I/O's and hence is there a need for **GPIO expanders** to enable communication with peripherals, drive control signals or read inputs?
- ③ Do you need **voltage level translators** to resolve I/O voltage mismatch between processor and peripherals?
- ④ Is there a need for external low power **real time clocks**?
- ⑤ Are **signal switches** needed to simplify control/data signal routing, ease design/layout or support multiple peripherals using limited number of ports?

Interface	Signal Switches & Mux
DisplayPort	CBTL06DP213
HDMI	CBTL06GP213
PCIe/SATA/SAS/USB 3.1	CBTL01023 (1 lane) CBTU02043 (2 Lanes) CBTL04083 (4 Lanes)
Memory Parallel Bus (DDR)	CBTU4411 (11 Ch) CBTV24DD12 (12 Ch) CBTW28DD14 (14 Ch)
USB 2.0	NX3DV221
USB Type-C (DP Alt-Mode)	CBTL08GP053
Cross-bar	CBTL04GP043
Audio	NCX8200GU
PC bus	PCA9546A
General Purpose	NX3L4357

Interface	Voltage Level Translators
Audio	NTS0104, NTB0104
PC bus	PCA9306 NVT2002 PCA9515 PCA9517A
SPI bus	NVT2006
DDR4 PC bus	PCA9617
GTL	GTL2014 GTL2034
General Purpose	NTSX2102 NTB0104
DisplayPort	PTN3356

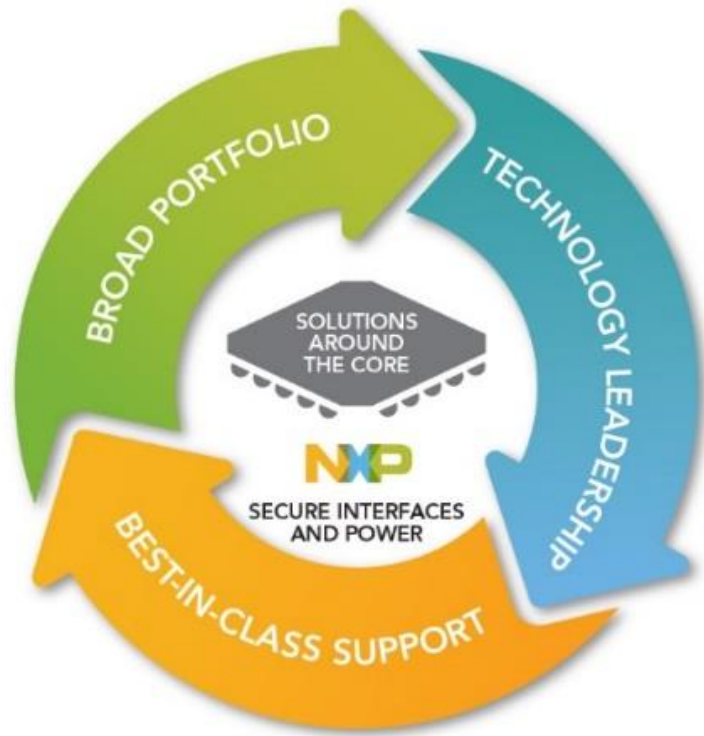
Application	Profile	Load switches
Power sequencing and slew rate control	0.9V – 3.6V, 0.5A	NX3P2902B
	0.9V – 5.5V, 2.5A	NX5P2924
Surge protection	2.5V – 20V, 5A	NX20P5090
	3.0V – 5.75V, 3A	NX5P3001
Charging path (with reverse current protection)	3V – 5.5V, 2A	NX5P2190
	2.5V – 5.5V, 3A	NX5P3090
Power sequencing and slew rate control	0.9V – 3.6V, 0.5A	NX3P2902B

Application	Features	Real time clock
General purpose	Tiny footprint	PCF85063A
Time-stamp	Alarm, watchdog, timestamp	PCF85263
Low power	100nA low power, PC/SPI interface option	PCF8523, PCF2123
High accuracy	Integrated TCXO, +/- 3ppm accuracy	PCA2129T
Automotive	AEC-Q100 qualified	PCA8565, PCA21125,

Bit-Width	GPIO Expanders
4-bit	PCA9536, PCA9537
8-bit	PCA9557, PCA6408A
16-bit	PCA9555, PCA9535A PCAL6416A
24-bit	PCAL6424A
40-bit	PCA9698

Call to Action !

- BL-SIP offers solutions “***Around The Core***” for a broad range of applications, i.e. industrial, computing, automotive, etc.,
- Ask **discovery questions** at your customers to identify BL-SIP sockets
- **Cross-Sell** BL-SIP portfolio with every microprocessor opportunity
- Win **5 -10 devices/project** from BL-SIP at every customer
- We are here to support you → **replace our competitor sockets!**



| SECURE CONNECTIONS
FOR A SMARTER WORLD |