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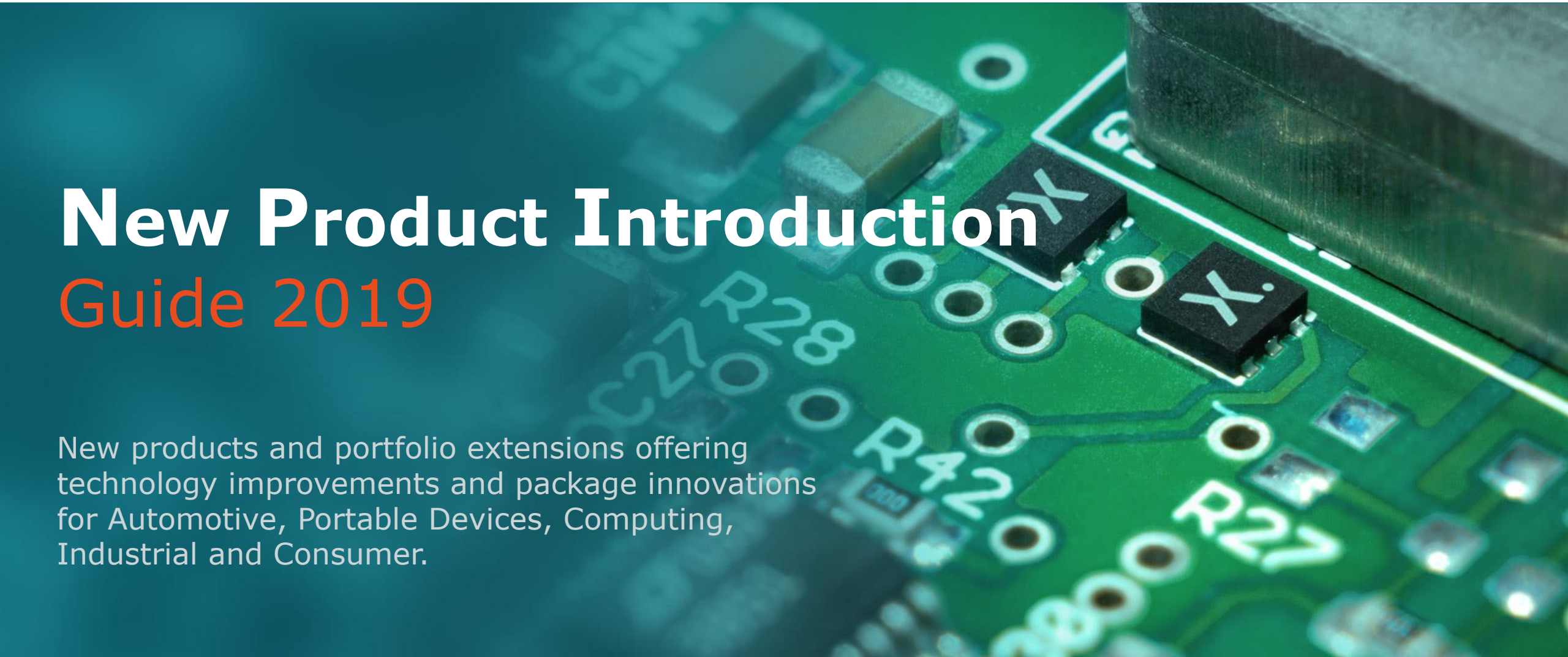
New Product Introduction
Guide 2019

New products and portfolio extensions offering technology improvements and package innovations for Automotive, Portable Devices, Computing, Industrial and Consumer.



Portfolio extension and focused segments 2019

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Diodes & Bipolar Transistors	Trench Schottkys in CFP packages	X		X	X		4
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ESD & TVS	TrEOS 1 & 2 High-Speed ESD Protection in µCSP		X	X		X	27
	Super-Speed Common Mode Filter in WLCSP		X	X		X	28
	Mobile Surge Protection in ultra compact packages		X	X		X	29
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Diodes & Bipolar Transistors

Trench Schottkys in CFP packages

Automotive qualified

Well balanced Schottky rectifier with respect to forward voltage (V_F) versus reverse current (I_R)

Design benefit

- Smallest form factor, PCB space saving
- Highest efficency by electrical peformance
- Improved thermal robustness - reduced risk of thermal runaway
- Best balance between forward voltage and reverse current

Key technical features & portfolio

- New portfolio with 60V & 100V Trench Schottkys
- AEC-Q101 qualified (175°C T_j)
- Existing portfolio offers up to 15 A forward current
- SOD123W (CFP3), SOD128 (CFP5) and SOT1289B (CFP15B)

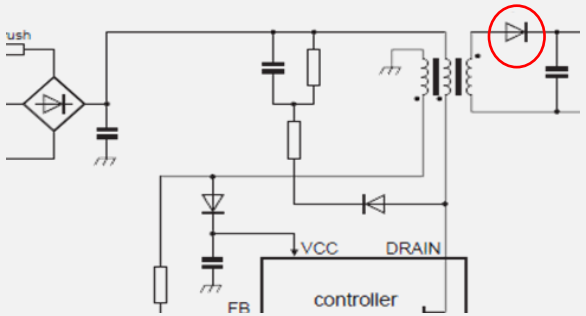
Portfolio	Voltage	Current	Package
PMEG40**T**xx	40 V	Up to 5 A	CFP3, CFP5
PMEG045**T**0xx	45 V	Up to 15 A	CFP15
PMEG60**T**xx PMEG060Txx	60 V	Up to 5 A	CFP3, CFP5, CFP15B

Functions & applications

- Rectification in power supply (e.g. USB/PD)
- DCDC conversion
- Reverse battery protection
- Or-ing (several supply sources)
- Free wheeling diode

Application diagram

e.g. Power Supply - AC/DC conversion - rectification



Available packages (W x L x H in mm)

CFP3 (SOD123W)	CFP5 (SOD128)	CFP15B (SOT1289B)
		
2.6 x 1.7 x 1.0	3.8 x 2.5 x 1.8	6.5 x 4.3 x 0.95

Recovery Rectifier in CFP packages

Automotive qualified

Standard, ultrafast and hyperfast Recovery Rectifier in state-of-the-art CFP packages

Design benefit

- High speed switching capability
- Low voltage drop (V_F @ I_F max ~ 1V)
- Low leakage current, also at high temperature
- High power density/high efficiency planar technology
- Flat package design (package height typ 1mm)
- Minimized occupation area for shrinked design
- High current pulse capability due to clip-bond technology
- Low magnetic inductance for optimum switching behavior

Key technical features & portfolio

- Hyperfast recovery rectifiers available
- CFP packages offering optimized performance
- Further portfolio under development
- AEC-Q101 qualified

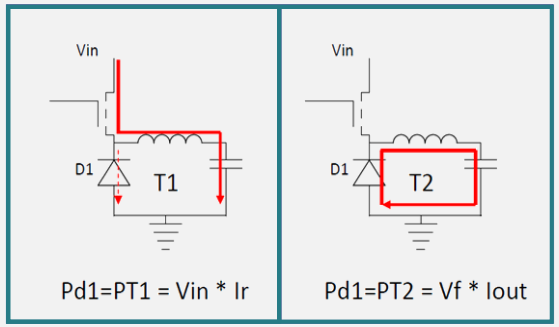
Portfolio	Voltage	Current	Package
PNE200x0ER	200 V	Up to 2 A	CFP3
PNE200x0EP	200 V	Up to 3 A	CFP5

Functions & applications

- Polarity protection
- DC/DC conversion
- AC/DC conversion
- Freewheeling of inductive load
- Standard switching application
- High-speed switching application

Application diagram

e.g. Power Supply - AC/DC conversion - rectification



Available packages (W x L x H in mm)

CFP3 (SOD123W)	CFP5 (SOD128)
	
2.6 x 1.7 x 1.0	3.8 x 2.5 x 1.8

SiGe Rectifier in CFP packages

Automotive qualified

Silicon Germanium Schottky rectifier with superior thermal stability and well balanced efficiency

Design benefit

- Thermal stability up to 175°C junction temperature
- No thermal runaway up to 175°C with full load
- Extended safe operating area
- Forward voltage <0.8V (@ 25°C) and reverse current <1nA
- Fast and soft recovery behavior
- CFP packages with optimized performance
- Reduced I_R compared to silicon based Schottky diodes
- Reduced V_F compared to Recovery Rectifiers

Key technical features & portfolio

- New SiGe technology with benchmark performance
- Further portfolio roll out planned
- Reverse voltages up to 200V
- AEC-Q101 qualified

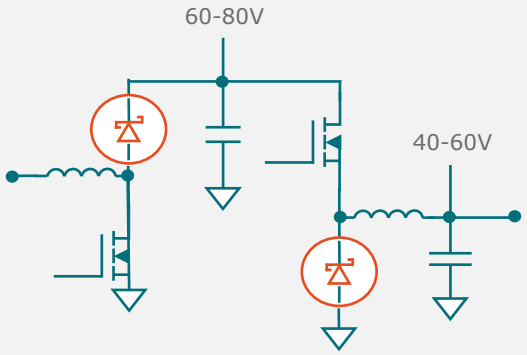
Portfolio	Voltage	Current	Package
PMEGxx0**G**x0ELR	120 – 200 V	Up to 2 A	CFP3
PMEGxx0**G**x0ELP	120 – 200 V	Up to 3 A	CFP5

Functions & applications

- High efficiency applications
- High temperature applications
- Freewheeling diode (buck/boost converter)
- Reverse polarity protection
- OR-ing

Application diagram

e.g. Freewheeling diode in buck/boost converter



Available packages (W x L x H in mm)

CFP3 (SOD123W)	CFP5 (SOD128)
	
2.6 x 1.7 x 1.0	3.8 x 2.5 x 1.8

BJTs in DPAK

Automotive qualified

Introducing DPAK to Nexperia's power BJT portfolio as complementary solution to the advanced LFPAK

Design benefit

- Complementary market standard DPAK portfolio
- Compatible to well known MJD series
- High power dissipation (P_{tot})
- Suitable for high temperature applications (175°C)
- High reliability & mechanical ruggedness through gull wing leads
- Advanced thermal behavior due to heatsink

Key technical features & portfolio

- Linear operation
- Robust bipolar technology
- 175°C junction temperature
- Addition to clip-bonded LFPAK BJT family
- LFPAK portfolio ranging up to 15 A and 100 V
- Standard qualified version and AEC-Q101 qualified

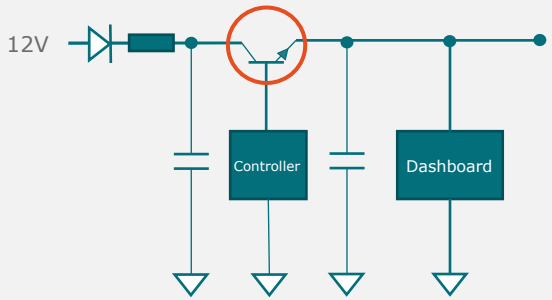
Portfolio	Voltage	Current	Polarity
MJD3xCx	100 V	3 A	NPN & PNP
MJD4xH11x	80 V	8 A	NPN & PNP
MJD3xCx-A	100 V	3 A	NPN & PNP
MJD4xH11x-A	80 V	8 A	NPN & PNP

Functions & applications

- LED automotive lighting
- Backlight dimming in LCD displays
- Linear voltage regulator
- Relay replacement
- Cost efficient motor drive
- Laser Printer
- MOSFET driver

Application diagram

e.g. Voltage stabilization for vehicle dashboard



Available packages (W x L x H in mm)

DPAK (SOT428)

6.6 x 6.1 x 2.3

Zener in SOT323

Portfolio extension at the one-stop-shop for discretes

Automotive qualified

Design benefit

- Complete series of Zener diodes
- Industrial standard E24 voltage range
- Expanding widely used Zener series to an additional package
- Suitable for wave soldering and reflow soldering
- reduce footprint & height compared to SOT23 solution

Key technical features & portfolio

- Reverse voltage range V_Z: 2.4V – 75V
- Forward current I_F max 200 mA
- Reverse power dissipation P_{ZSM} max 40W
- 1 series with European spec with B- & C- selection
- AEC-Q101 qualified

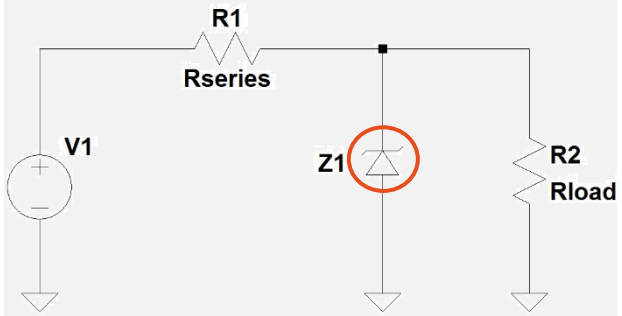
Series	# types	V_Z tolerance	V_Z nom. [V]	I_F max [mA]	P_{ZSM} [W]	P_{tot} [mW]
C-series (BZX84W-Cxx)	37	± 5 %	2.4 - 75	200	40	275
B-series (BZX84W-Bxx)	37	± 2 %	2.4 - 75	200	40	275

Functions & applications

- General voltage regulation
- Voltage reference
- Voltage stabilization

Application diagram

- Voltage stabilization



Available packages (W x L x H in mm)

SOT323

1.25 x 2 x 0.95

MOSFETs

P-channel MOSFETs in LFPAK

Automotive qualified

This program includes a series of P-channel MOSFETs in the popular LFPAK56 package

Design benefit

- For high side drive no charge pump required
- Simple interface drive circuit
- Proven package technology LFPAK56 (SOT669)
- 100% footprint compatible to Power-SO8
- Superior reliability and quality

Key technical features & portfolio

- Suitable for high temperature application - 175 °C T_j max
- Automotive quality grade (AEC-Q101) available
- Low R_{DSon} version available
- Portfolio expansion planned

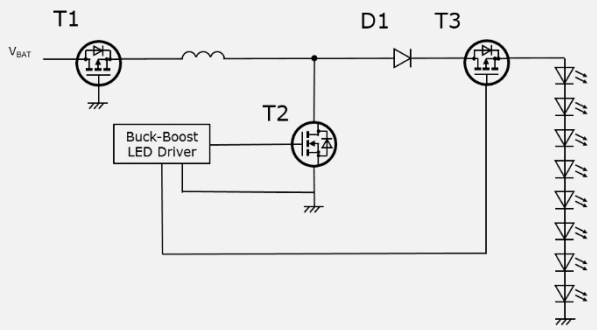
Automotive	Industrial	V_{DS} (V)	V_{GS} (V)	R_{DSon} max (mΩ) @ V_{GS} =	
				10 V	4.5 V
BUK4YxRx-20P	-	20	12		~6.5
BUK4Yxx-20P	-	20	12		~11
BUK6Y12-30P	PSMP012-30YE	30	20	12	
BUK6Y20-30P	PSMP020-30YE	30	20	20	
BUK6Y15-40P	PSMP015-40YE	40	20	15	
BUK6Y25-40P	PSMP025-40YE	40	20	25	
BUK6Y32-60P	PSMP032-60YE	60	20	32	
BUK6Y57-60P	PSMP057-60YE	60	20	57	

Functions & applications

- Reverse battery protection
- Load switch: high-side switch in low frequency, EMC sensitive applications
- Buck converter for low power non-isolated point of loads

Application diagram

- Reverse battery protection
- Power switch



Available packages (W x L x H in mm)

LFPAK56 (SOT669)

4.7 x 5.3 x 1.05

MOSFETs

Small signal low R_{DSon} MOSFETs

Automotive qualified

This program includes a comprehensive portfolio of automotive small signal low R_{DSon} MOSFETs (<1 Ohm)

Design benefit

- Largest portfolio of automotive small signal low R_{DSon} MOSFETs on the market
- Full automotive complience (AEC-Q101)
- growing portfolio in leaded and DFN packages
- Products available with 175 °C T_j max

Key technical features & portfolio

- Most parts with ESD robustness of 2kV
- R_{DSon} down to 15 mΩ and up to 6 A max drain current
- Available V_{DS} voltages of 20, 30, 40, 60, 70, 80 Volt

part number	package	polarity
PMNxxx(x)EN(E)A	SOT457	N
PMNxxxP(E)A	SOT457	P
PMVxx(x)xN(E)A	SOT23	N
PMVxx(x)xP(E)A	SOT23	P
PMPBxxxN(E)A	SOT1220	N
PMPBxxxP(E)A	SOT1220	P
BUKxDxx-x0E	SOT1220	N
BUK6Dxx(x)-x0P	SOT1220	P
PMTxxxENEA	SOT223	N

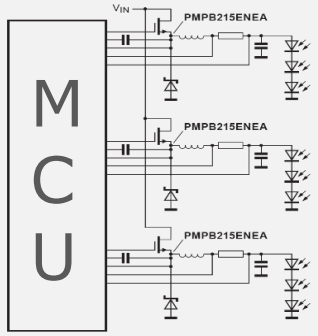
Functions & applications

Load switches in power management functions of:

- Body control units like doors, window lift, seat control …
- Entertainment systems
- Safety and control systems like air bag, LED lighting …

Application diagram

- Automotive LED lighting with PMPB215ENEA in DFN2020MD-6 (NXP_reference design)



Available packages (W x L x H in mm)

Package	SOT223 (SC-73)	SOT457 (SC-74)	SOT323 (SC-70)	DFN2020MD-6 (SOT1220)
				
Size (mm)	6.5 x 3.5 x 1.65	2.9 x 1.5 x 1.0	2.0 x 1.25 x 0.95	2.0 x 2.0 x 0.65
P_{tot} (mW)	1700	600	200	1250

MOSFETs in DFN0606

Smallest package with 0.35 mm pitch

Design benefit

- Same performance as larger package on smallest footprint.
- Ideal for mobile and space-constraint application
- Broad portfolio in N-channel and P-channel
- 2N7002 functionality in DFN0606

Functions & applications

- Mobile phone
- Wearable, portable devices
- Cell phone accessories
- E-cigarrete

Available packages (W x L x H in mm)

DFN0606

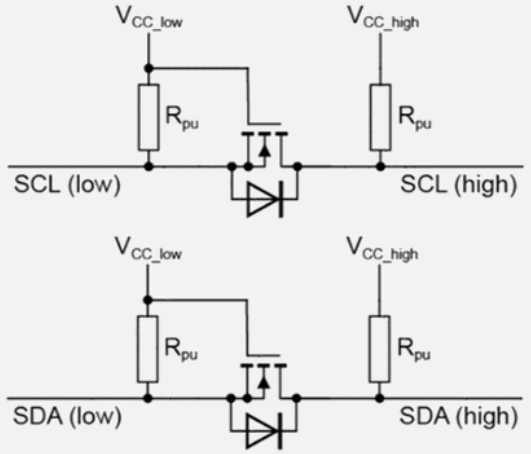
0.62 x 0.62 x 0.37

Key technical features & portfolio

- Leadless ultra small package DFN0606-3
- Lowest R_{DSon} in the market (in development) down to 170mΩ
- Low voltage drive ($V_{GS(th)}$ = 0.7 V typ)
- Voltage range of 20 V to 60 V

part number	pol	R_{DSon} typ (mΩ) @ V_{GS}: 4.5 V	V_{DS} (V)	V_{GS} (V)	V_{GSth} min (V)	V_{GSth} max (V)	ESD robustness (kV)
PMH600UNE	N	470	20	8	0.45	0.95	1
PMH550UNE		550	30	8	0.45	0.95	2
NX7002BKH		2500	60	20	1.10	1.20	2
PMH950UPE	P	1020	20	8	0.45	0.95	1
PMH1200UPE		1200	30	10	0.45	0.95	2

Application diagram



MOSFETs in WLCSP

Optimal R_{DSon} to space ratio

Design benefit

- Ultra small package, PCB space saving
- Highest efficency by electrical peformance
- Higher performance compared to leadless DFN packages

Key technical features & portfolio

- N-channel and P-channel version available
- Lowest R_{DSon} per mm²
- WLCSP 4 balls with low R_{DSon} and smallest footprint
- WLCSP 6 balls with lowest R_{DSon} and small footprint
- ESD protection above 2kV HBM

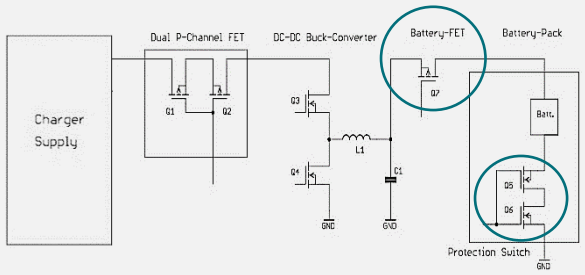
Portfolio	Package	Pol
PMCM440xxxE	WLCSP4	N-channel and P-channel
PMCM6501xxE	WLCSP6	N-channel and P-channel

Functions & applications

- Load switching for mobile devices
- Battery switch
- LED driver
- High-speed line driver

Application diagram

- Control FET
- Battery MOSFET: very low R_{DSon} required in DFN or WLCSP packages (R_{DSon} < 20 mΩ)
- protection: 20..30V common drain CSP MOSFETs, very low R_{DSon} (2-5 mΩ R_{SSon})



Available packages (W x L x H in mm)

WLCSP4	WLCSP6
	
0.78 x 0.78 x 0.345	1.48 x 0.98 x 0.345

Trench 9 Automotive MOSFETs in LFPAK

Automotive qualified

High performance Automotive grade MOSFETS in clip bonded packages

Design benefit

- Beyond automotive AEC-Q101 qualified to 175°C
- Combining the clip bond LFPAK package and the low R_{DSon} Trench 9 technology to enable improved power density
- Trench 9 superjunction technology for improved avalanche robustness to enable easier designs and improved reliability.
- Improved $V_{GS(th)}$ for better paralleling of MOSFETs in increased power requirement applications.

Key technical features & portfolio

- New portfolio of 40V Trench 9 MOSFETS
- Low R_{DSon} from 0.7 – 6.0 mΩ in various LFPAK packages
- SOT1023 (LFPAK56E), SOT669 (LFPAK56), SOT1235 (LFPAK88) and SOT1210 (LFPAK33)

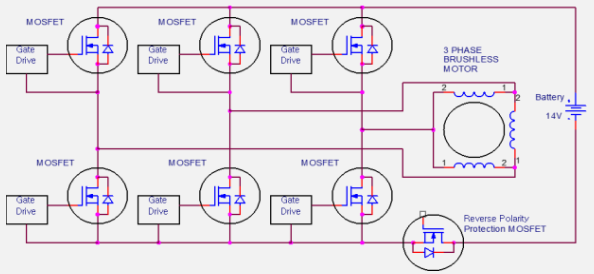
Portfolio	Voltage	R_{DSon} mΩ	Package
BUK7J1R0-40H	40 V	1.0 mΩ	LFPAK56E
BUK7Y1R4-40H	40 V	1.4 mΩ	LFPAK56
BUK9Y1R6-40H	40 V	1.6 mΩ	LFPAK56
BUK7S1R0-40H	40 V	1.0 mΩ	LFPAK88
BUK7S0R9-40H	40 V	0.9 mΩ	LFPAK88
BUK7S0R7-40H	40 V	0.7 mΩ	LFPAK88
BUK7M3R3-40H	40 V	3.3 mΩ	LFPAK33
BUK7M6R0-40H	40 V	6.0 mΩ	LFPAK33

Functions & applications

- Motor control (BLDC, braking, steering)
- DCDC
- Reverse battery protection
- Engine fans and pumps
- Engine management

Application diagram

e.g. BLDC Motor



Available packages (W x L x H in mm)

LFPAK56E (SOT1023)	LFPAK56 (SOT669)	LFPAK88 (SOT1235)
		
5.0 x 6.0 x 1.0	5.0 x 6.0 x 1.0	8.0 x 8.0 x 1.6

LFPAK33 (SOT1210)

3.3 x 3.3 x 0.85

Automotive qualified

Trench 6 Automotive MOSFETs in LFPAK33

High performance copper clip MOSFETs for engine control systems

Design benefit

- Fully automotive AEC-Q101 qualified to 175°C
- Combination of Trench 6 silicon technology in clip bonded LFPAK33 package
- Products offers low switching losses and low Rth performance
- Benchmark Rth for thermally demanding applications
- Strong fault condition tolerance due to technology features

Key technical features & portfolio

- Broad portfolio offering 30V – 100V Trench 6 MOSFETS
- Logic Level and Standard Level gate
- Strong focus at 60V 9.9 – 85mΩ
- Clip bond LFPAK33 Package

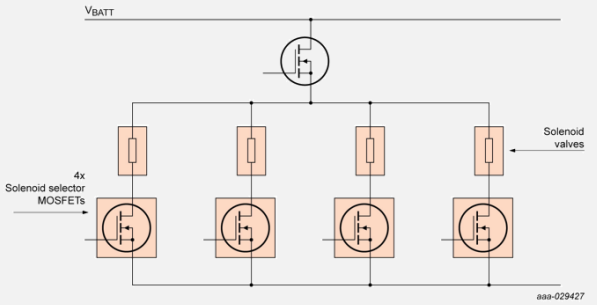
Portfolio	Voltage	R_{DSon} mΩ	Package
BUK9M12-60E	60V	12 mΩ	LFPAK33
BUK9M15-60E	60V	15 mΩ	LFPAK33
BUK9M19-60E	60V	16 mΩ	LFPAK33
BUK9M24-60E	60V	24 mΩ	LFPAK33
BUK9M42-60E	60V	42 mΩ	LFPAK33
BUK9M53-60E	60V	53 mΩ	LFPAK33
BUK9M85-60E	60V	73 mΩ	LFPAK33

Functions & applications

- Engine control systems
- Solenoid Control
- Reverse battery protection
- Engine fans and pumps
- Auxiliary loads & motor control

Application diagram

e.g. Engine Management



Available packages (W x L x H in mm)

LFPAK33 (SOT1210)

3.3 x 3.3 x 0.85

MOSFETs

NextPowerS3 low R_{DSon} 25V & 30V

Market leading R_{DSon} performance

Design benefit

- Optimized for low R_{DSon}
- Max current up to 380A
- Best-in-class Safe Operating Area (SOA)
- Copper-clip for excellent thermal performance
- High reliability LFPAK package, qualified to 175 °C
- Wave solderable; exposed leads for optimal solder coverage and visual solder inspection

Key technical features & portfolio

- Available in 25V and 30V
- Three package variants; LFPAK33 (SOT1210), LFPAK56 (SOT669) and LFPAK56E (SOT1023)

Portfolio	Voltage	R_{DSon} (max) @ V_{GS} = 10 V	Package
PSMN1R5-25MLH	25 V	1.55 mΩ*	LFPAK33
PSMNR60-25YLH	25 V	0.64 mΩ*	LFPAK56
PSMNR51-25YLH	25 V	0.61 mΩ*	LFPAK56E
PSMN1R6-30MLH	30 V	1.9 mΩ	LFPAK33
PSMNR70-30YLH	30 V	0.82 mΩ	LFPAK56
PSMNR58-30YLH	30 V	0.67 mΩ*	LFPAK56E

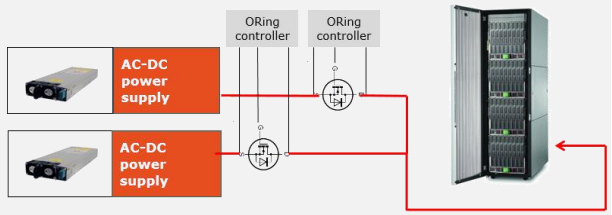
* Preliminary data

Functions & applications

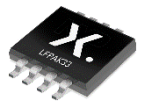
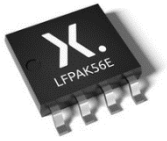
- Power OR-ing
- Battery protection
- Hot-swap
- e-Fuse
- DC switch / Load switch
- Brushed and brushless motor control
- Synchronous rectification in AC-DC and DC-DC applications

Application diagram

e.g. Power OR-ing allows redundant power supllies to be coupled in high reliability applications



Available packages (W x L x H in mm)

LFPAK33 (SOD1210)	LFPAK56 (SOD669)	LFPAK56E (SOT1023)
		
3.3 x 3.3 x 0.9	5.0 x 6.0 x 1.0	5.0 x 6.0 x 1.0

MOSFETs

NextPower 100V

Market leading Q_{rr} performance

Design benefit

- Low Q_{rr} for higher efficiency and lower spiking
- Low $Q_G \times R_{DSon}$ FOM for high efficiency switching applications
- Strong avalanche energy rating (Eas)
- Avalanche rated and 100% tested
- Ha-free and RoHS compliant LFPAK56 package
- Wave-solderable LFPAK56 package

Key technical features & portfolio

- New 100V portfolio
- packages: LFPAK56 (SOT669) and LFPAK56E (SOT1023)

Portfolio	Voltage	R_{DSon} (max) @ V_{GS} = 10 V	Package
PSMN3R9-100YSF	100 V	4.3 mΩ*	LFPAK56E
PSMN5R6-100YSF	100 V	5.6 mΩ*	LFPAK56E
PSMN6R9-100YSF	100 V	7 mΩ	LFPAK56
PSMN8R7-100YSF	100 V	9 mΩ	LFPAK56
PSMN011-100YSF	100 V	10.9 mΩ*	LFPAK56

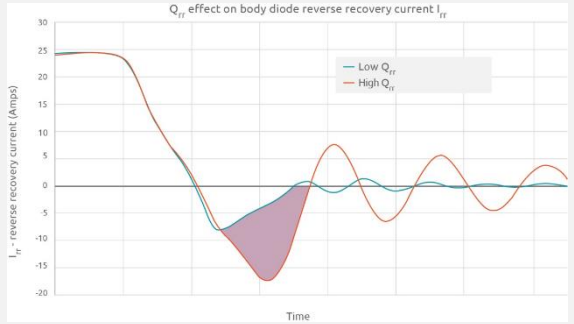
* Preliminary data

Functions & applications

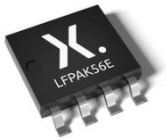
- Synchronous rectifier in AC:DC & DC:DC
- Primary side switch – 48 V DC:DC
- BLDC motor control
- USB-PD adapters
- Full-bridge and half-bridge applications
- Flyback and resonant topologies

Application performance

Simulations show that choosing a MOSFET with 2x Qrr increases voltage spiking by 8% and reduces efficiency by 5%



Available packages (W x L x H in mm)

LFPAK56 (SOD669)	LFPAK56E (SOT1023)
	
5.0 x 6.0 x 1.0	5.0 x 6.0 x 1.0

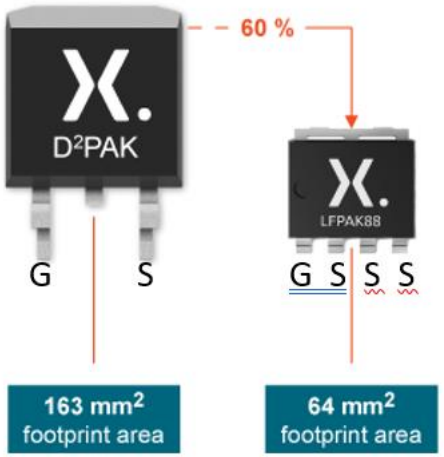
Additional information

- Benefits of Low Q_{rr} MOSFETs in switching applications (Quick Learning video)
- Benefits of low Q_{rr} MOSFETs in motor control applications (Quick Learning video)
- Q_{rr}: overlooked and underappreciated in efficiency battle (Blog post)

NextPowerS3 40V LFPAK88

Driving power-density to the next level

Space saving footprint - D2PAK Vs LFPAK88



- 60% footprint reduction
- 65% height reduction
- 86% space reduction
- Gate-compatible with D2PAK

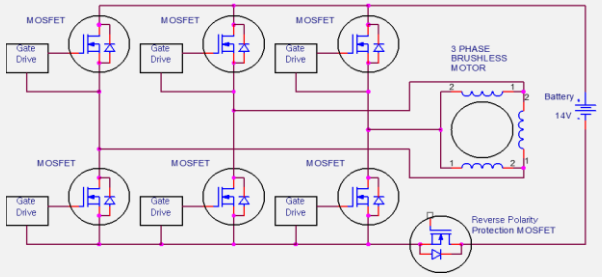
Portfolio	Voltage	R_{DSon} (max) @ V_{GS} = 10 V	Package
PSMNR70-40SSH	40 V	0.7 mΩ	LFPAK88
PSMNR90-40SSH	40 V	0.9 mΩ	LFPAK88
PSMN1R0-40SSH	40 V	1.0 mΩ	LFPAK88

Functions & applications

- BLDC motor control
- Battery protection
- e-Fuse
- Power OR-ing
- Synchronous rectification

Application diagram

e.g. BLDC Motor



Package details (W x L x H in mm)

LFPAK88 (SOT1235)

8.0 x 8.8 x 1.6

MOSFETs

Logic

74AXPnT245 – transceiver

Quad dual supply translating transceiver; 3-state

Design benefit

- Translating transceiver for wide voltage ranges.
- Low static and dynamic power consumption for portable applications.
- I_{off} circuitry provides power-down mode operation
- Specified from -40 °C to 125 °C

Key technical features & portfolio

- New portfolio with 4-bit & 8-bit dual supply transceivers
- Wide supply voltage offers from 0.9V to 5.5V
- Small footprint packages for both TSSOP and DHVQFN

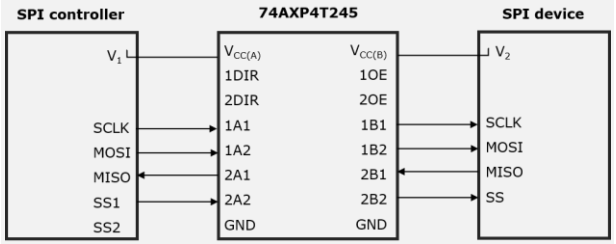
Portfolio	$V_{CC(A)}$ & $V_{CC(B)}$	I_{CC}	Package
74AXP4T245PW	0.9V – 5.5V	24µA	TSSOP16
74AXP4T245BQ	0.9V – 5.5V	24µA	DHVQFN16
74AXP8T245PW	0.9V – 5.5V	35µA	TSSOP24
74AXP8T245BQ	0.9V – 5.5V	35µA	DHVQFN24

Functions & applications

- Industrial applications
- General portable consumer applications
- Enterprise and Telecom applications

Application diagram

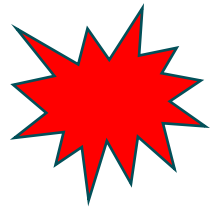
SPI interface application



Available packages (W x L x H in mm)

PW (SOD403-1)	BQ (SOD763-1)
	
5 x 4.4 x 1.1	3.5 x 2.5 x 1.0

PW (SOD355-1)	BQ (SOD815-1)
	
7.8 x 4.4 x 2.0	5.5 x 3.5 x 1.0



Logic

GX4 MicroPak

4 pad, low power gates

Design benefit

- X2SON4 MicroPak provide the industry's smallest footprint for logic plastic packages
- with a pad spacing ≥0.4mm no step-down stencil required - enables low cost board manufacturing
- RoHS and dark-green compliant with NiPdAu lead finish
- Low profile height of 0.35mm

Key technical features & portfolio

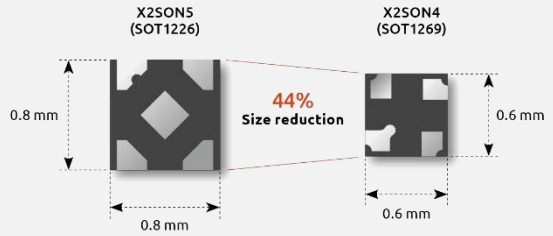
- AUP and LVC families offer
  - 1G34GX4: Buffer
  - 1G17GX4: Buffer Schmitt-trigger
  - 1G07GX4: Buffer with open-drain
  - 1G04GX4: Inverter
  - 1G14GX4: Inverter Schmitt-trigger
- Propagation delay
  - AUP1G: t_{pd} 4.0ns (V_{cc} 1.8V, C_L 15pF)
  - LVC1G: t_{pd} 2.0ns (V_{cc} 2.5V, C_L 50pF)
- Static current 0.01µA for LVC1G and 0.1µA for AUP1G

Portfolio	Voltage	Max. Output	Temperature Range
LVC1G	1.65-5.5V	± 32mA	−40 to +125 °C
AUP1G	0.8-3.6V	± 4mA	−40 to +125 °C

Functions & applications

- Space constrained applications such as smartphones, tablets and portables
- Communication and industrial applications

Package advantage



Available packages (W x L x H in mm)

GX4 (SOT1296-2)

0.6 x 0.6 x 0.32

Logic

74AVC1T8xxx Qualcomm

Single dual-supply translating 2-input OR or NOR with strobe

Design benefit

- Low cost alternative solution for Qualcomm's reference board design.
- Wide supply voltage range
  - ✓ $V_{CC(A)}$: 0.8 V to 3.6 V
  - ✓ $V_{CC(B)}$: 0.8 V to 3.6 V
- Supports mixed-mode voltage operations
- Maximum data rates:
  - ✓ 500 Mbit/s(1.8V to 3.3V translation)
  - ✓ 320 Mbit/s(translate to 2.5V or 1.8V)

Key technical features & portfolio

- Over-voltage tolerant inputs, accepts voltages up to 3.6V
- I_{OFF} circuitry provides partial power down operation
- Inputs with Schmitt trigger action
- Suspend mode
- High noise immunity

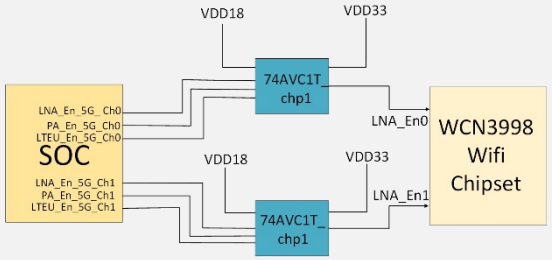
Portfolio	$V_{CC(A)}$ & $V_{CC(B)}$	Output Current	Prop del (t_{PD})	T_{amb}
74AVC1T8832GS	0.8 – 3.6V	+/-12mA	2.4ns	-40~125°C
74AVC1T8128GS	0.8 – 3.6V	+/-12mA	2.4ns	-40~125°C

Functions & applications

- Wireless module
- Mobile / Portable applications
- Industrial applications

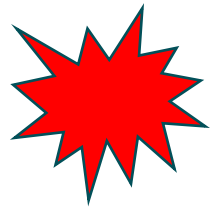
Application diagram

- Example of voltage translation between the MCU and a WIFI chipset on different voltage rails



Available packages (W x L x H in mm)

Package name	XSON8
	
pin count	8
version	SOT833-1
suffix	GT
Pitch (mm)	0.50
W x L x H (mm)	1.0 x 1.95 x 0.50



Logic

LV-A logic Family

Low leakage family for partial power down by I_{OFF} circuit

Design benefit

- I_{OFF} circuitry supports partial power-down
- Low noise operation: VOL(p) < 0.8 V
- Fully specified at 3.3 V and 5.0 V supply nodes
- overvoltage tolerant inputs support mixed-mode voltage
- Schmitt-trigger inputs for slowly transitioning input signals
- Latch-up performance exceeds 250 mA
- ESD - HBM exceeds 3 kV (ANSI/ESDA/JEDEC JS-001, Class 2)

Key technical features & portfolio

- I_{OFF} power down
- Low noise
- 3.3V and 5V supply voltage support
- Translater function

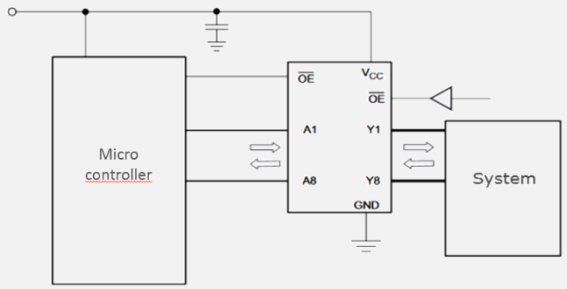
Part number	Portfolio size	features
74LVxxxAxx	8 parts	Inverter, buffer, transceiver, OVT, CMOS inputs
74LVxxxATxx	5 parts	Inverter, buffer, transceiver, OVT, TTL inputs
74AHCVxxxAxx	6 parts	Inverter, buffer, transceiver, OVT, Schmitt trigger inputs
74AHCTxxxAxx	7 parts	Inverter, buffer, transceiver, OVT, TTL inputs

Functions & applications

- The LV-A family is designed to support applications where in different modes e.g. stand-by mode a part of the PCB is shut down. Applications:
- Printer
- TV sets
- Desktop and notebook computer

Application diagram

- Example of voltage translation between MCU and system rail at different voltage



Available packages

Package name	TSSOP	TSSOP
		
Pin count	14	20
version	SOT402-1	SOT360-1
suffix	PW	PW
Pitch (mm)	0.65	0.65
W x L x H (mm)	6.4 x 5.0 x 1.1	6.4 x 6.5 x 1.1

Autosense translators NXB/NXS

On roadmap

A family of 1-8 bit bidirectional level shifter and voltage translator with auto direction sensing

Design benefit

- Two completely separate power lines may be used
- translates logic voltage levels with auto direction sensing
- versions for open-drain (NXB) and push-pull CMOS logic (NXS) output
- Pb-free, RoHS and dark green compliant
- specified for partial power-down applications using I_{OFF}
- Automotive version on roadmap

Key technical features & portfolio

- voltages: $V_{CC(A)}$= 1.65 V to 3.6 V; $V_{CC(B)}$= 2.3 V to 5.5 V
- Maximum data rates: 26 Mbps (Push-pull)
- Inputs accept voltages up to 5.5 V
- Latch-up performance <100 mA per JESD 78B Class II

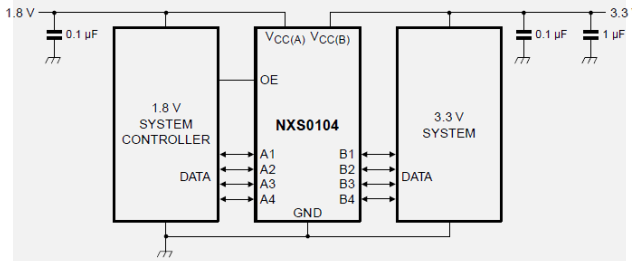
Part number		Portfolio size	packages
NXx0101xx	1 bit	6	GM= XSON6 (SOT886), GS= XSON6 (SOT1202), GW= TSSOP6 (SOT363-1)
NXx0102xx	2 bit	4	GT= XSON8 (SOT833-1) DC= VSSOP8 (SOT765-1)
NXx0104xx	4 bit	6	GU12= XQFN12 (SOT1174-1) BQ= DQFN14 (SOT762-1) PW= TSSOP14 (SOT402-1)
NXx0108xx	8 bit	4	BQ= DQFN20 (SOT764-1) PW= TSSOP20 (SOT360-1)

Functions & applications

- Mobile application like smartphone, wearables
- Computing application like notebook, tablet, desktop PC
- Industrial application
- Automotive applications (on roadmap)

Application diagram

- Example of voltage translation between 1.8V MCU and 3.3V system rail



Available packages (selection)

Package name	XSON6	XSON8	XQFN12
			
pin count	6	8	12
Version	SOT1202	SOT833-1	SOT1174-1
Suffix	GS	GT	GU12
Pitch (mm)	0.35	0.50	0.40
W x L x H (mm)	1.0 x 1.0 x 0.35	1.0 x 1.95 x 0.50	2.0 x 1.7 x 0.50

MicroPak packages AEC-Q100 qualified

Automotive qualified

Automotive qualified Mini logic in leadless packages

Design benefit

- Optimized for speed and power
- Low propagation delay
- Low dynamic power dissipation
- Pb-free, RoHS and dark green compliant
- specified for partial power-down applications using I_{OFF}

Key technical features & portfolio

- Very small footprint - up to 65% space saving over traditional leaded packages
- pin pitch options: 0.5, 0.35 mm
- Low profile height: 0.5 or 0.35 mm
- Leadless - no bent leads, no co-planarity issues
- Pb-free, RoHS and dark green compliant

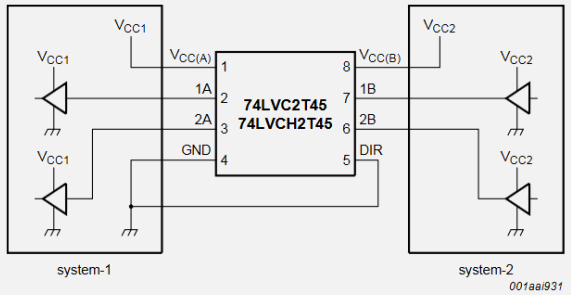
Part number	Types	Features
74AUPxxxxxGx-Q100	7	Gates, Inverter, buffer, voltage translator, multiplexer, OVT, CMOS or Schmitt trigger inputs
74AVC1T45GS-Q100	1	single bit, dual supply transceiver, bidirectional level translation
74LVCxxxxxGx-Q100	14	Gates, Inverter, buffer, voltage translator, multiplexer, OVT, CMOS or Schmitt trigger inputs

Functions & applications

- space constraint automotive applications e.g.:
- Infotainment
- ADAS
- BMS

Application diagram

- Example of uni-directional logic level-shifting translation



Available packages (selection)

Package name	XSON6	XSON6	XSON8
			
pin count	6	6	8
version	SOT1202	SOT886	SOT833-1
suffix	GS	GM	GT
Pitch (mm)	0.35	0.50	0.50
W x L x H (mm)	1.0 x 1.0 x 0.35	1.0 x 1.45 x 0.50	1.0 x 1.95 x 0.50

Logic

ESD & TVS

TrEOS 1 & 2 High-Speed ESD Protection in µCSP

Ideal combination of low capacitance, low clamping voltage and high surge robustness to protect sensitive high-speed interfaces

Design benefit

- Maximizing the three pillars of ESD protection
  - *Low capacitance* for highest signal integrity
  - *Low clamping* for enhanced system protection
  - *High ESD & Surge robustness* against transients
- Snap-back technology allows for lowest clamping voltage
- Designed to fulfill IEC 61000 standard in final application

Key technical features & portfolio

- Extremely low capacitance down to 0.1 pF
- Extremely low clamping down to 0.1 Ω (R_{dyn})
- High ESD and surge robustness up to 20 A at 8/20 µs
- Extremely fast switching time under 1 ns

	Portfolio (Excerpt)	**Capacitance**	**Clamping**	**Surge**	**Package**
TrEOS 1	PESD3V3Z1BSF	0.28 pF	5.7 V	9.5 A	SOD962
	PESD3V3Z1BCSF	0.45 pF	4.6 V	15 A	SOD962
	PESD3V3W1BCSF	0.55 pF	3.8 V	20 A	SOD962
	PESD9V0C1BSF	0.20 pF	5.8 V	9 A	SOD962
TrEOS 2	PESD2V0Y1BSF	0.69 pF	4.6 V	6 A	SOD962
	PESD2V5Y1BSF	0.25 pF	6.1 V	4 A	SOD962
	PESD4V0Y1BSF	0.24 pF	6.5 V	4 A	SOD962

@ 16 A TLP

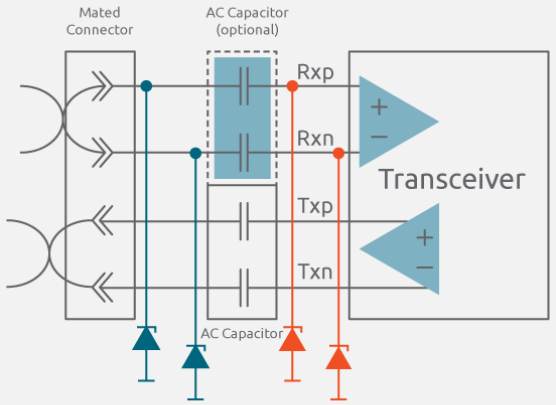
Functions & applications

Suitable for data-lines up to ~20Gbps

- USB Type-C (USB 3.2), MicroUSB
- Thunderbolt
- HDMI 2.1
- SD-Card protection
- All other sensitive I/Os

Application diagram

USB3.2 Rx/Tx Protection



Available packages (W x L x H in mm)

SOD962-2
(DSN0603-2)

0.6 x 0.3 x 0.3

Small-footprint package with low-inductance & extreme-robustness

Super-Speed Common Mode Filter in WLCSP

2 in 1 solution combining common-mode (CM) suppression with Nexperia's best-in-class TrEOS ESD protection

Design benefit

- Common-Mode Filter & ESD protection on one footprint
  - Best CM suppression at all GHz data-line signal fundamentals
  - Widest differential passband to keep signal integrity
  - Uncompromising TrEOS High-Speed ESD protection
- Reduces part count and accelerates PCB placement
- Portfolio of ESD-only devices with identical footprint allows system level EMI characterization with or without CMF

Key technical features & portfolio

- Leading common-mode suppression up to -38 dB
- Extremely wide differential pass-band up to 10 GHz
- High ESD ruggedness 15-20 kV, exceeding IEC 61000-4-2
- TrEOS ESD protection up to 15 kV contact discharge

Portfolio (Excerpt)	**Passband**[1)]	**Rejection**	**V_{ESD}**	**Package**
PCMFxUSB3S	6 GHz	-38 dB	15 kV	WLCSP5/10/15
PCMFxUSB3B/C	8 GHz	-36 dB	20 kV	WLCSP5/10/15
PCMFxUSB3BA/C	10 GHz	-35 dB	15 kV	WLCSP5/10/15
PESDxUSB3B/C	16.1 GHz	-	20 kV	WLCSP5/10/15
PESDxUSB3S	17 GHz	-	15 kV	WLCSP5/10/15

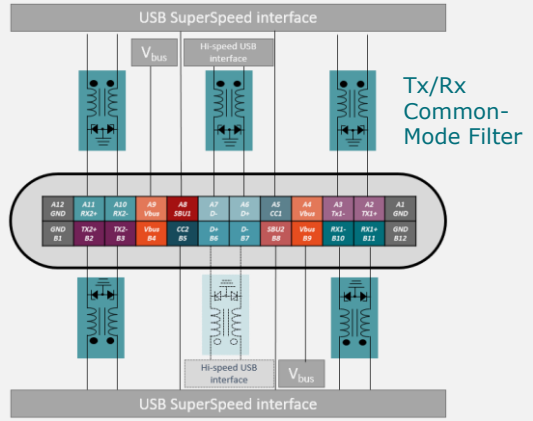
1) S21dd f3dB

Functions & applications

- Ultra-high-speed data-lines incl. USB 3.2
- HDMI 2.1
- MIPI CSI camera interface
- MIPI DSI display interface
- Thunderbolt

Application diagram

USB Type-C Dongle



Available packages (W x L x H in mm)

WLCSP5	WLCSP10	WLCSP15
		
0.8 x 1.2 x 0.6	1.6 x 1.2 x 0.6	2.4 x 1.2 x 0.6

- Smallest footprint & lowest inductive path to ground due to wafer level chip scale package
- Package design allows for optimal RF routing

Mobile Surge Protection in compact packages

Superior Protection against transient over-voltage with leading edge performance-to-space ratio

Design benefit

- High surge robustness devices for single-line protection
- Ultra-low clamping to safeguard sensitive ICs
- Wide-ranging product portfolio for various design needs
- All products in ultra flat & compact leadless packages
- Optimized design to avoid latch-up effect

Key technical features & portfolio

- High surge robustness up to 100 A at 8/20 µs pulse
- Range of reverse standoff voltages from 3.3 V to 26 V
- Low dynamical resistance down to 0.1 Ω (TLP)
- Protection against electrostatic discharge up to 30 kV

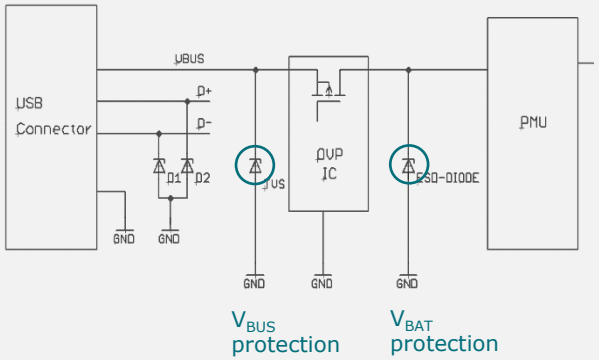
Portfolio (Excerpt)	**Voltage**	**Current**	**Clamping**	**Package**
PTVS5V5D1BL	5.5 V	35 A	10.3 V	DFN1006-2
PTVS3V3Z1BSC	3.3 V	70 A	11.0 V	DSN1006-2
PTVS5V0Z1BSC	5.0 V	60 A	12.0 V	DSN1006-2
PTVS5V0Z1USKP	5.0 V	100 A	17.2 V	DSN1608-2
PTVS26VZ1USK	26.0 V	32 A	47.9 V	DSN1608-2

Functions & applications

- USB – PD (Power Delivery)
- USB Type-C (CC-/SBU-line)
- Supply line
- Battery line
- Audio interface

Application diagram

V_{Bus} & V_{BAT} protection



Available packages (W x L x H in mm)

DFN1006-2 (SOD882)	**DSN1006-2** (SOD993)	**DSN1608-2** (SOD964)
		
1.0 x 0.6 x 0.5	1.0 x 0.6 x 0.27	1.6 x 0.8 x 0.29

In-Vehicle Network (IVN) protection

Automotive qualified

Family of ESD Protection diodes for automotive In-Vehicle-Network (IVN) lines

Design benefit

- New generation of protection technology, optimized for the latest generation of transceiver
- Drop in replacement for existing PESD1CAN and PESD1LIN – 2nd source in-house
- Approved by major automotive OEM

Key technical features & portfolio

- Handles higher surge current than predecessor
- Higher ESD robustness - withstands higher failure voltages
- Lower (=better) ESD clamping voltage offers improved system level protection
- 8 new products for CAN-FD – DFN package in 2H'19

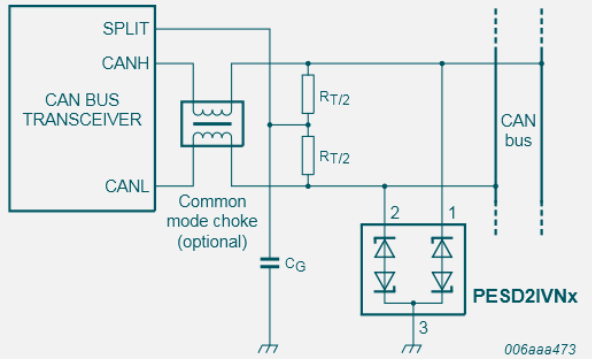
Portfolio (Excerpt)	V_{RWM}	lines	$C_{D\ max}$	Package
PESD1IVN2x-A	24/ 27	1	17 pF	SOD323
PESD1IVN27-U	27	1	17 pF	SOT323
PESD2IVN2x-T	24/ 27	2	17 pF	SOT23
PESD2IVN2x-U	24/ 27	2	17 pF	SOT323
PESD2CANFDVx-x	24/ 27	2	6 pF	SOT23/ SOT323
PESD2CANFDUx-x	24/ 27	2	3.5 pF	SOT23/ SOT323

Functions & applications

- Protection of transceiver devices at in-vehicle networks (IVN)
- Family of products for CAN, CAN-FD LIN, FlexRay, et.al. interfaces

Application diagram

ESD protection for CAN bus



Available packages (W x L x H in mm)

Package	SOT23	SOT323 (SC70)	SOD323 (SC76)
			
W x L x H (mm)	2.9 x 1.3 x 1.0	2.0 x 1.25 x 0.95	1.7 x 1.25 x 0.95
P_{tot} (mW)	250	200	400

ESD & TVS

EFFICIENCY WINS.