



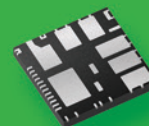
BRD8089/D
Rev. 0, Nov-2020

Energy Efficient Innovations

Industrial Motor Drive Solutions

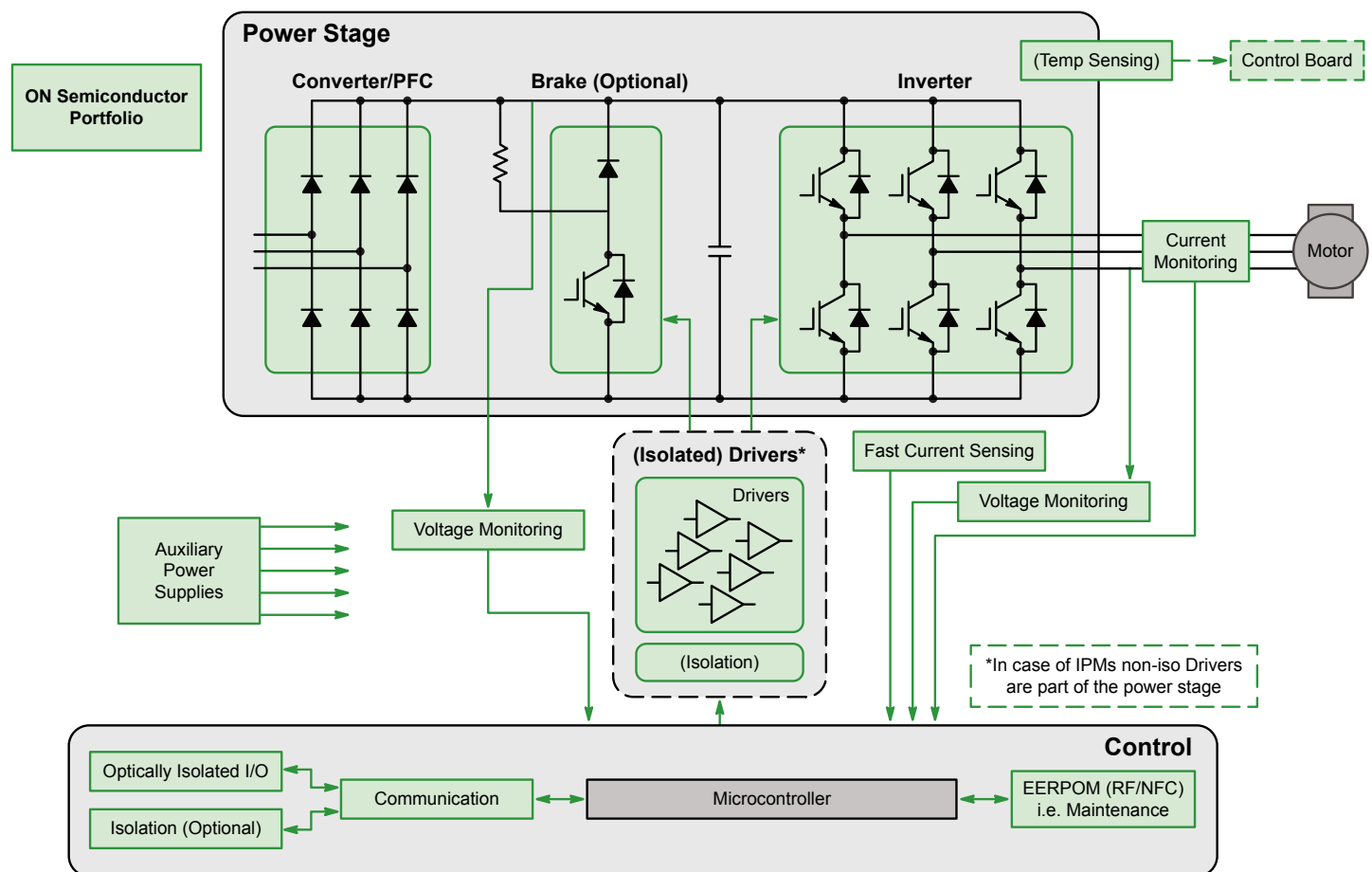


High Current, Accurate Control, and System Reliability for Industrial Motor Drive Applications from ON Semiconductor.



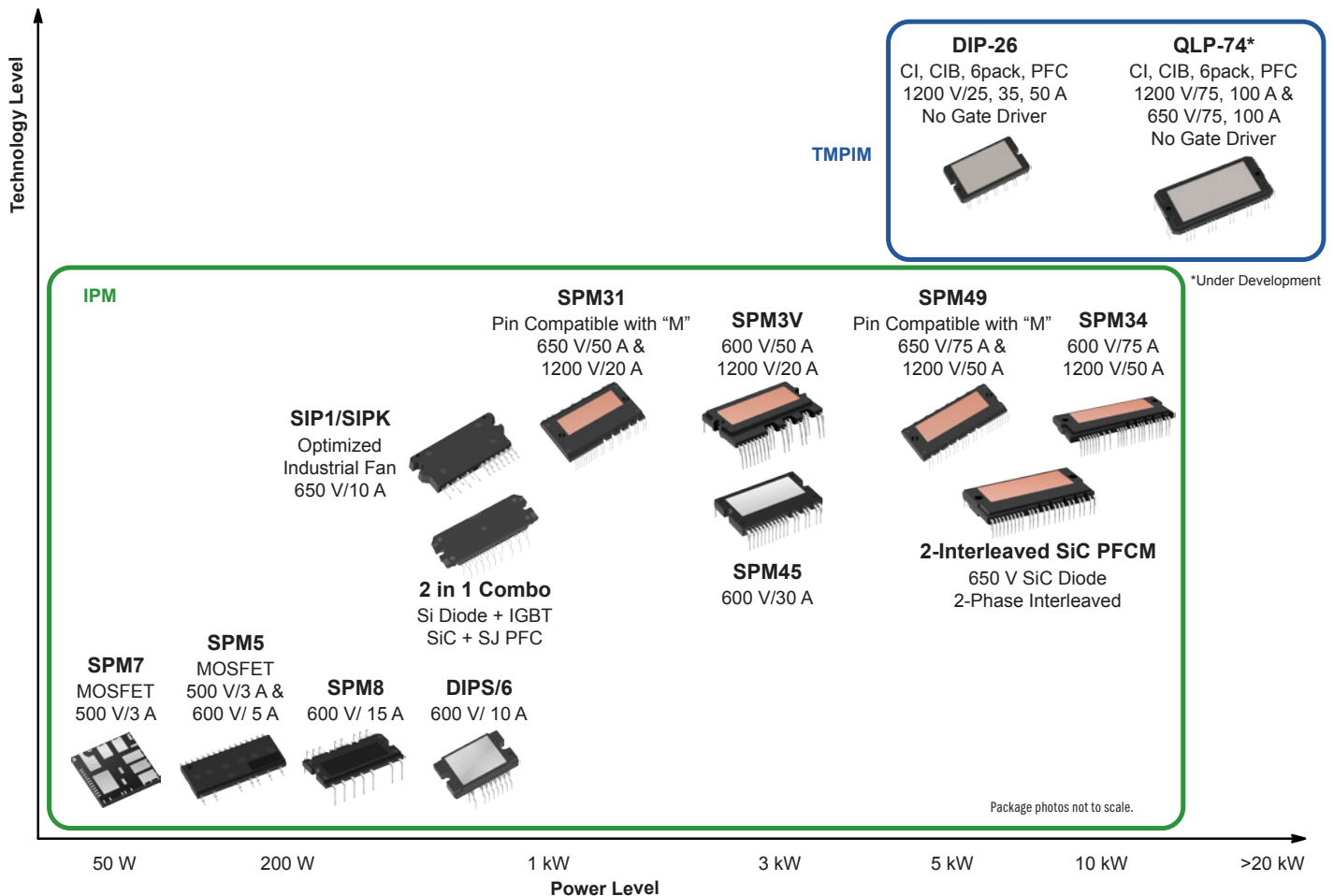
Complete System Solutions for Industrial Motor Drives

Electrical drive systems are a key component of automation systems in the industrial context since they account for a large proportion of electrical energy consumption. Such drive systems have a central function in achieving energy savings. With automation growing at an increasing pace, the motor drive is the backbone of the future industrial facility. This growth challenges us to further focus on efficiency of industrial drive systems while designing for higher currents, more accurate control, and better system reliability. The complete portfolio of motor drive solutions from ON Semiconductor addresses this challenge with our industry leading MOSFETs, IGBTs, gate drivers, and power modules provide the building blocks for high power motor drive. Galvanic isolation, analog components and small signal protection devices allow for safety and control, completing the system solution.



Power Modules

ON Semiconductor provides a broad and deep coverage of solutions for industrial motor drives. From 10's of Watts to 10's of kiloWatts, you can choose the IPM or PIM that's best for your application.



Highlight Products

IPMs

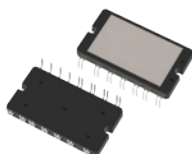


650 & 1200 V
Advanced Trench IGBT

Superior Performance
Wide Coverage

TMPIMs

DIP-26 Family
Enhanced Reliability
Outstanding Power Density



ON Semiconductor Value Proposition

Our advanced packaging technology enables a high level of integration, superior thermal performance and enhanced reliability.

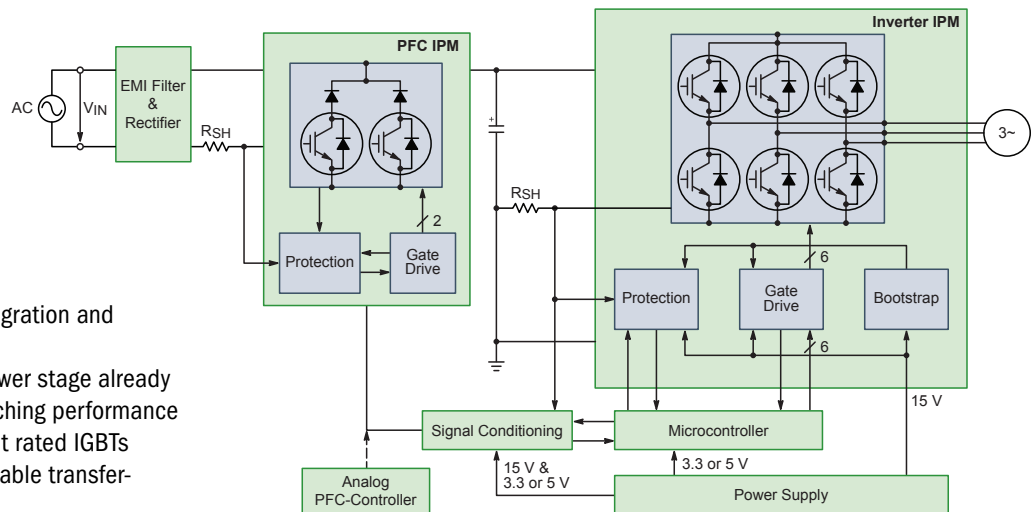


Power Modules

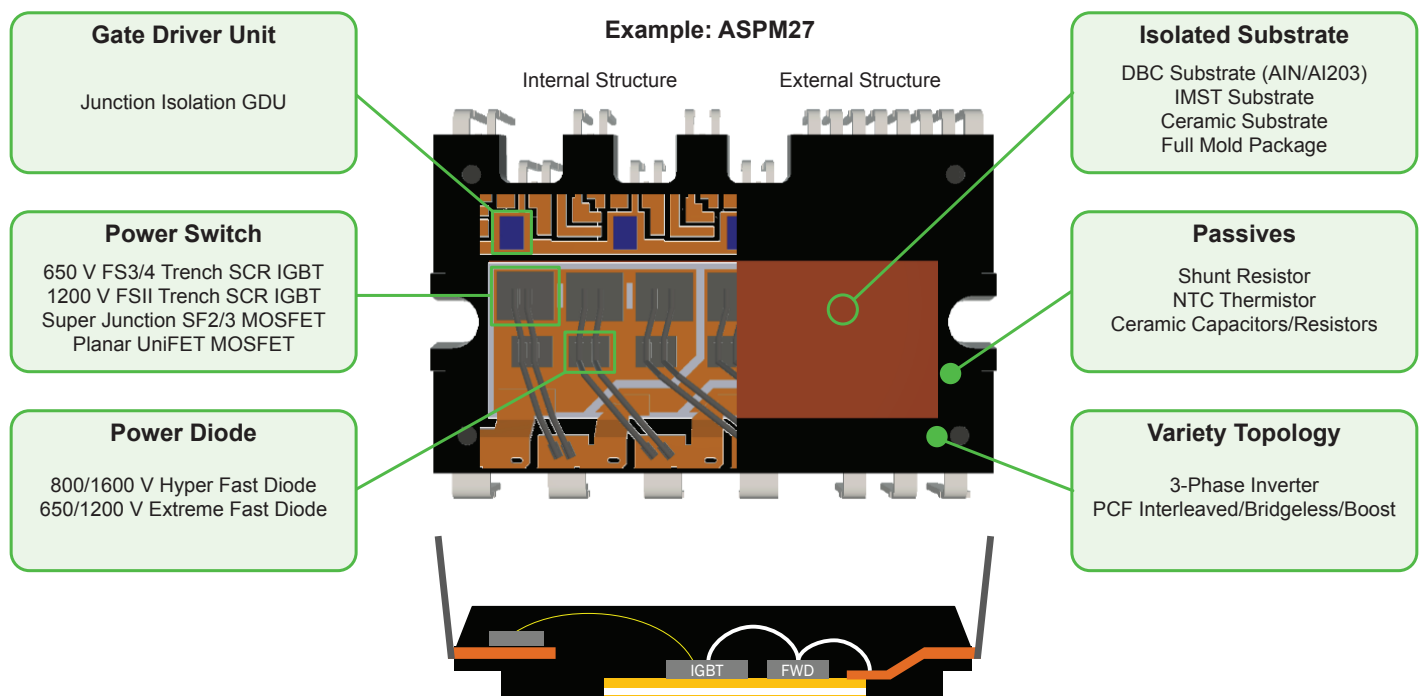
With their high level of integration, the IPM modules will help you to reduce the total system cost and increase your power density. The power stage is already optimized to meet the best trade-off between switching characteristics and EMI performance. Featuring short-circuit rated IGBTs driven by rugged gate driver ICs with key protection features combined with a reliable transfer mold package, ON Semiconductor IPMs provide you with superior reliability for your motor drive.

Benefits

- Reduce system cost with a high integration and excellent cooling performance
- Accelerate time to market with a power stage already optimized for low EMI and high switching performance
- Enhanced reliability with short circuit rated IGBTs driven by rugged gate driver in a reliable transfer-molded package



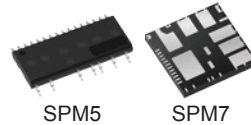
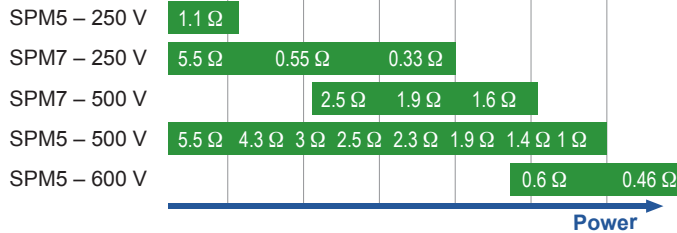
ON Semiconductor Has All In-House Technology Including Product Design and Assembly



Product Portfolio

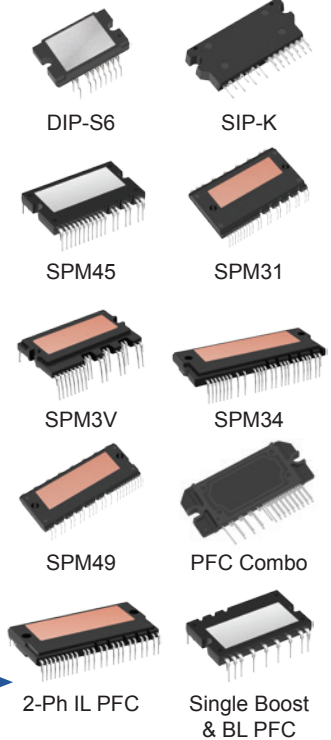
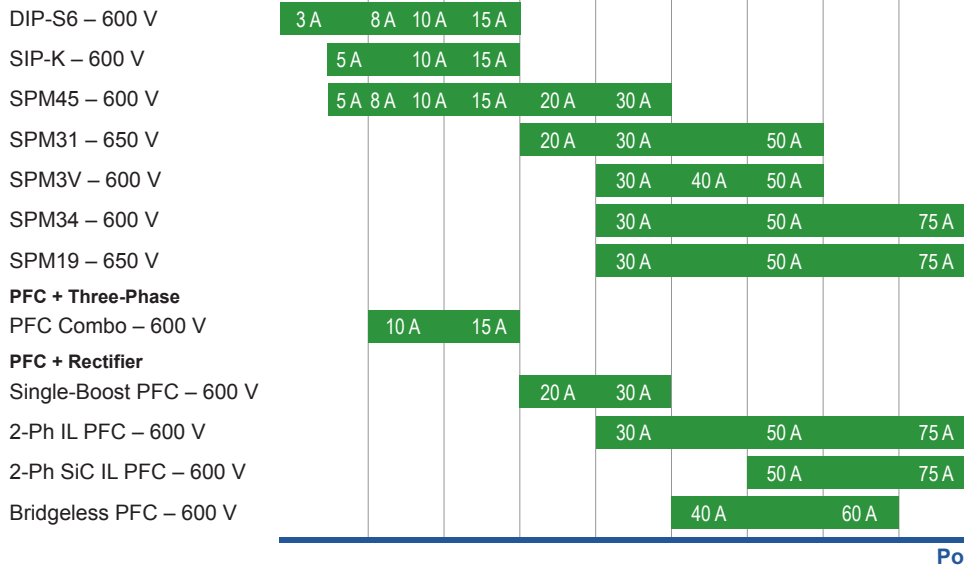
MOSFET IPMs

Three-Phase



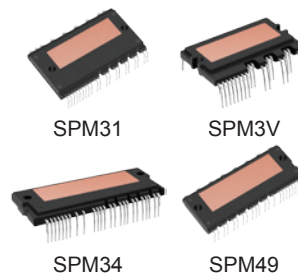
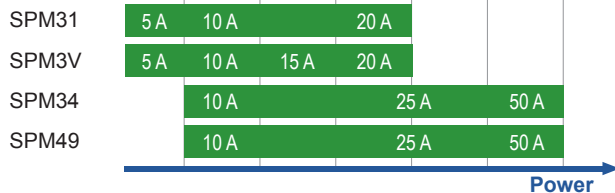
IGBT 600 & 650 V IPMs

Three-Phase



IGBT 1200 V IPMs

Three-Phase



Package photos not to scale.

Highlight Products

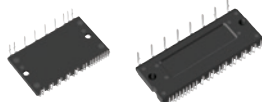
IPMs

SPM31 (Mini)

SPM49 (Large)

650 & 1200 V
Advanced Trench IGBT

Superior Performance
Wide Coverage



Transfer Molded Power Integrated Modules (TMPIM)

With the TMPIM approach, the benefits of transfer-molded modules can be extended to higher power levels, offering a compact, efficient and reliable solution for designers of inverters for industrial motor drives.

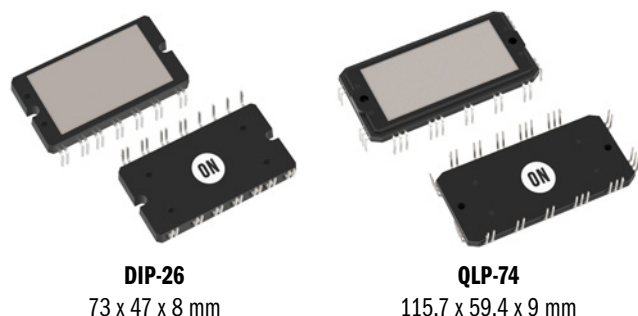
Features

- Transfer Molded Package
 - Extended Temperature and Power Cycling capability
 - High corrosion resistance
- Std. Al₂O₃ & Advanced Substrate technology
- Lower R_{th} and Increased Power Density
- 6 mm Creepage between pins and heatsink

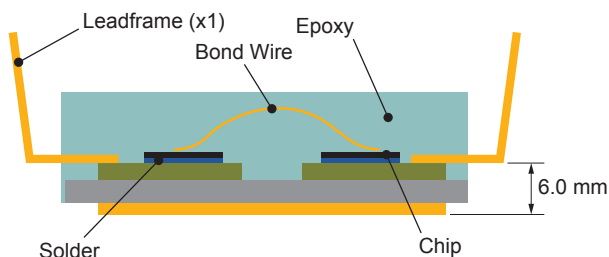
Benefits

- Enhanced reliability & longer lifetime even in harsh environments
- Full design flexibility
- Lower cooling effort
- Lighter and more compact devices

Released Packages

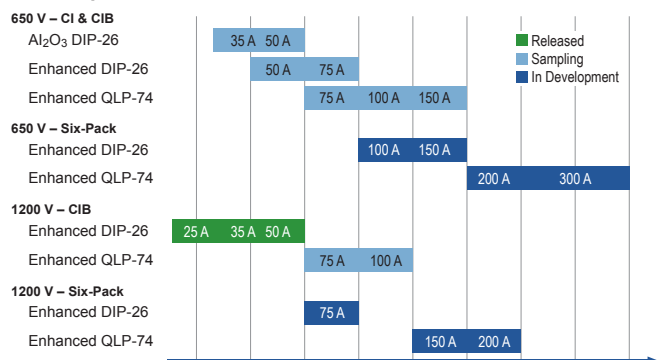


Package Structure



The TMPIM family can achieve well over 1000 thermal cycles. Power cycle curves for the modules show excellent power cycling capability, dependent on the change in junction temperature. For higher power modules in the TMPIM, a high performance enhanced substrate is used. The lower thermal resistance results in reduced thermal change resulting in higher power cycling capability when reading off the power cycling curve. Featuring our robust Field Stop II IGBTs, the short circuit rating of the TMPIMs is more than 10 μ s at 150°C and 900 V bus voltage.

Roadmap



Device	Config	V _{BR} Max (V)	Rated Current (A)	V _{CE(SAT)} Typ (V)
NXH25C120L2C2SG	CIB	1200	25	1.7
NXH35C120L2C2S1G	CI	1200	35	1.8
NXH35C120L2C2SG	CIB	1200	35	1.8
NXH35C120L2C2ESG*	CIB	1200	35	1.8
NXH50C120L2C2ES1G*	CI	1200	50	1.8
NXH50C120L2C2ESG*	CIB	1200	50	1.8

* DBC with enhanced thermal conductivity.

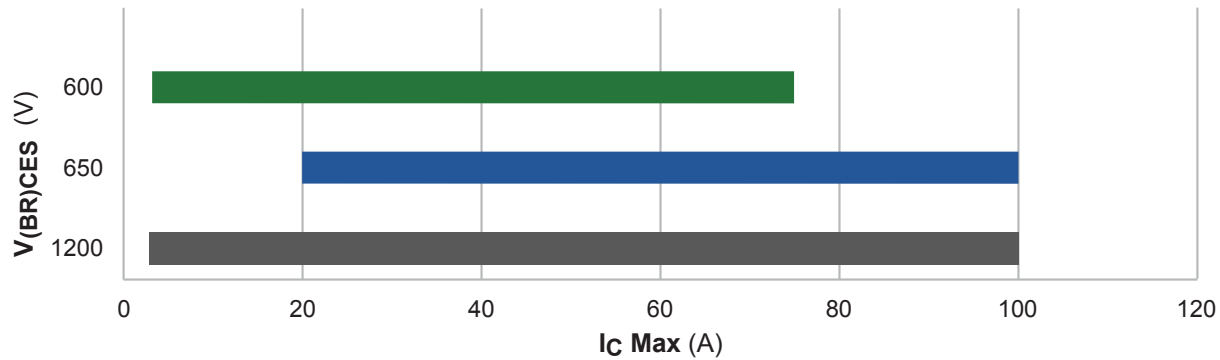
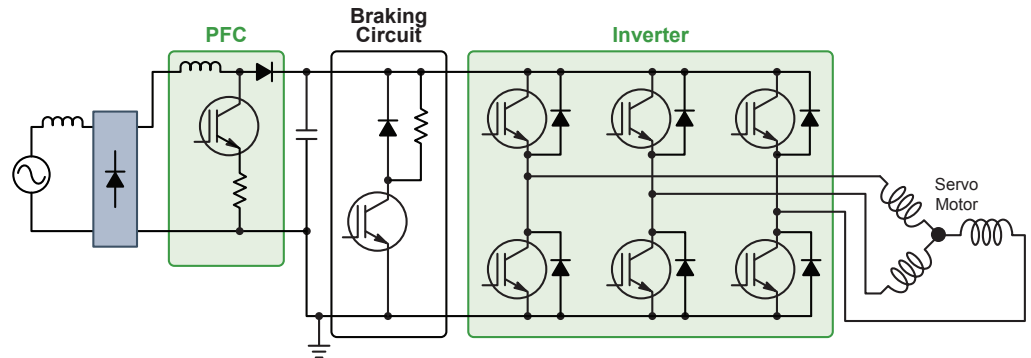
IGBTs for Motor Control

Features for Inverters

- Low V_{cesat}
- Low V_f
- Short circuit ruggedness
- $T_{jmax} = 175^{\circ}C$

Features for PFC

- Fast switching for >20 kHz
- Positive temperature coefficient for easy paralleling
- $T_{jmax} = 175^{\circ}C$



Short Circuit Withstand Rating: 10 μs

Device	V_{CES} Typ (V)	$I_{c\ Max}$ (A)	$V_{CE(sat)}$ (V)	Co-Packaged Diode	Package
FGD3N60UNDF	600	3	2	Yes	DPAK
FGPF10N60UNDF	600	10	2	Yes	TO-220FP
NGTB15N60R2FG	600	15	1.85	Yes	TO-220FP
NGTB15N120FL2	1200	15	2	Yes	TO-247
NGTG15N120FL2	1200	15	2	No	TO-247
NGTB25N120FL2	1200	25	2	Yes	TO-247
NGTG25N120FL2	1200	25	2	No	TO-247
NGTB30N120FL2	1200	30	2	Yes	TO-247
NGTB40N120FL2	1200	40	2	Yes	TO-247
NGTG40N120FL2	1200	40	2	No	TO-247
NGTB50N120FL2	1200	50	2.2	Yes	TO-247

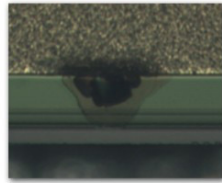
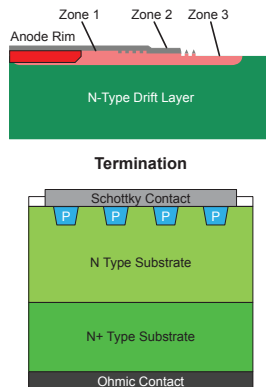
Short Circuit Withstand Rating: 5 μs

Device	V_{CES} Typ (V)	$I_{c\ Max}$ (A)	$V_{CE(sat)}$ (V)	Co-Packaged Diode	Package
NGTB03N60R2DT4G	600	4.5	1.7	Yes	DPAK
NGTB05N60R2DT4G	600	8	1.65	Yes	DPAK
NGTB10N60R2DT4G	600	10	1.7	Yes	DPAK
NGTB10N60FG	600	10	1.5	Yes	TO-220FP
NGTG12N60TF1G	600	12	1.4	No	TO-3PF
NGTB15N60S1	600	15	1.5	Yes	TO-220
NGTG15N60S1	600	15	1.5	No	TO-220
NGTB30N60L2WG	600	30	1.4	Yes	TO-247
NGTB35N60FL2	600	35	1.7	Yes	TO-247
NGTB50N60L2	600	50	1.5	Yes	TO-247
NGTB35N65FL2	650	35	1.7	Yes	TO-247
NGTG35N65FL2	650	35	1.7	No	TO-247
NGTB40N65FL2	650	40	1.7	Yes	TO-247
NGTB50N65FL2	650	50	1.8	Yes	TO-247
NGTB60N65FL2	650	60	1.64	Yes	TO-247
NGTB75N65FL2	650	75	1.7	Yes	TO-247
FGY100T65SCDT	650	100	1.5	Yes	TO-247

SiC Diodes and MOSFETs for Motor Drives

SiC from ON Semiconductor has a patented termination structure, which provides superior robustness even in harsh environmental conditions.

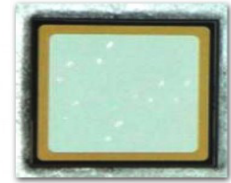
H3TRB Testing (High Temp/Humidity/Bias), 85°C/85% RH/85% V (960 V)*



Corrosion failure after 168 hours
Competitor 1



Corrosion failure after 168 hours
Competitor 2



No failure after 1,000 hours
ON Semiconductor

*JEDEC Spec is 100 V. Tested in Gel-Filled Module.

SiC Diode Features

- Very small reverse recovery loss (almost negligible)
- Low leakage current also at high temperatures
- Low forward voltage drop
- Surge and avalanche capabilities

System Benefits

- Improved efficiency
- Enables more compact devices
- Lower system costs
- Enhanced reliability

SiC MOSFET Features

- Excellent switching performance
- Short circuit capability
- Stable and reliable gate structure
- Low $R_{DS(ON)}$ increase over temperature
- Rugged body diode
- Surge and avalanche capabilities

SiC Diodes

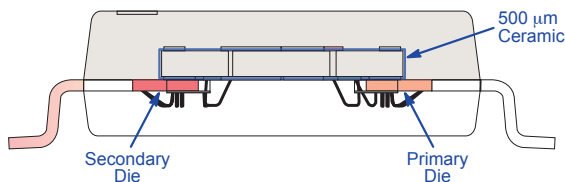
Device	Voltage (V)	Current (A)	Package(s)
FFSxyy65z	650	4, 6, 8, 10, 12, 16, 20, 30, 40, 50	TO-220, TO-247, DPAK, D2PAK, PQFN-4
FFSxyy120z	1200	5, 8, 10, 15, 20, 30, 40, 50	TO-220, TO-247, DPAK, D2PAK
NDSHxx170A	1700	5, 10, 15, 25	TO-247

SiC MOSFETs

Device	Voltage (V)	$R_{DS(ON)}$ Typ (mΩ)	Package(s)
NTxyyN90SC1	900	20, 60	TO-247-3L, TO-247-4L, D2PAK
NTxyyN120SC1	1200	20, 40, 80, 160	TO-247-3L, TO-247-4L, D2PAK

Digital Isolation

ON Semiconductor off-chip capacitive isolation brings you the speed and stable performance of a digital isolation combined with the high insulation reliability of an opto-coupler.



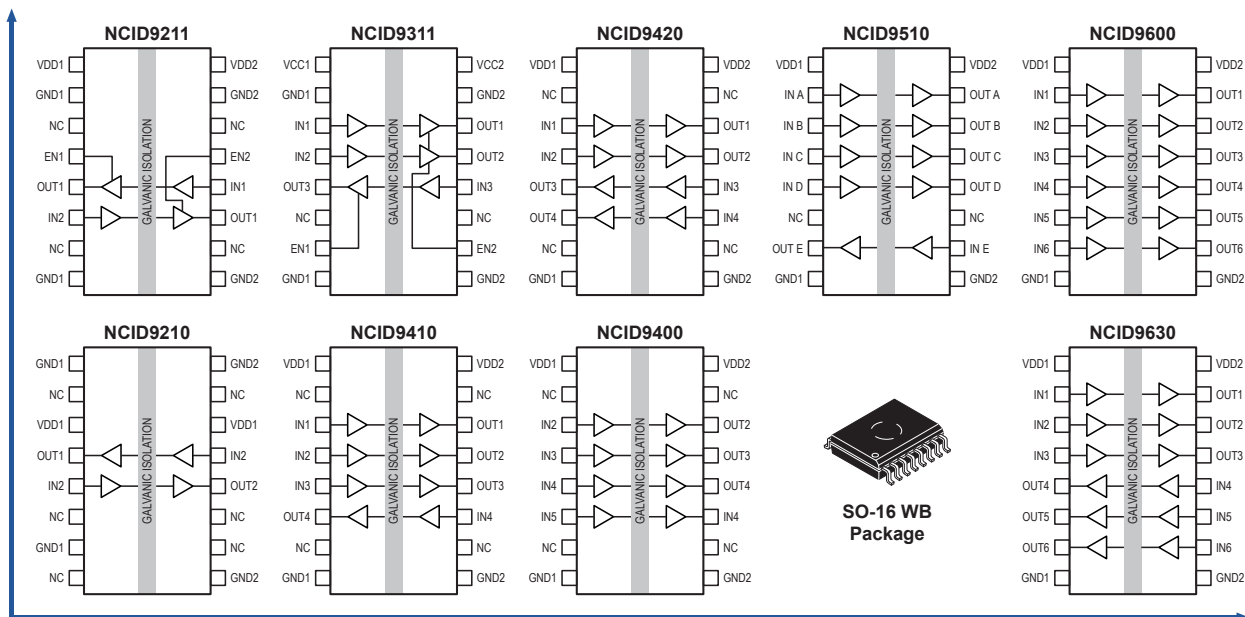
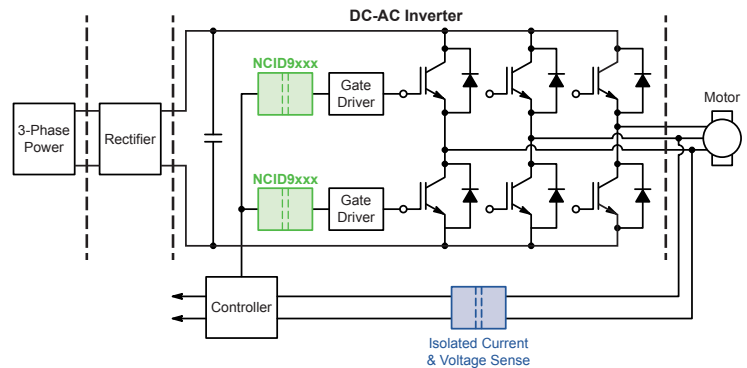
Off-Chip Capacitance Digital Isolator

Benefits

- Provides the necessary DTI to comply with the EN60950
- Higher data rates of up to 100 Mbps
- High level of protection against high-slew-rate transients
- Enhanced long-term reliability

Features

- Distance Through Isolation (DTI) > 500 μm
- CMTI > 150 $\text{kV}/\mu\text{s}$
- Low Power Consumption
- High Speed
- Extended Industrial Temperature Range: -40 to 125°C
- Safety and Regulatory Approvals UL1577 for double protection



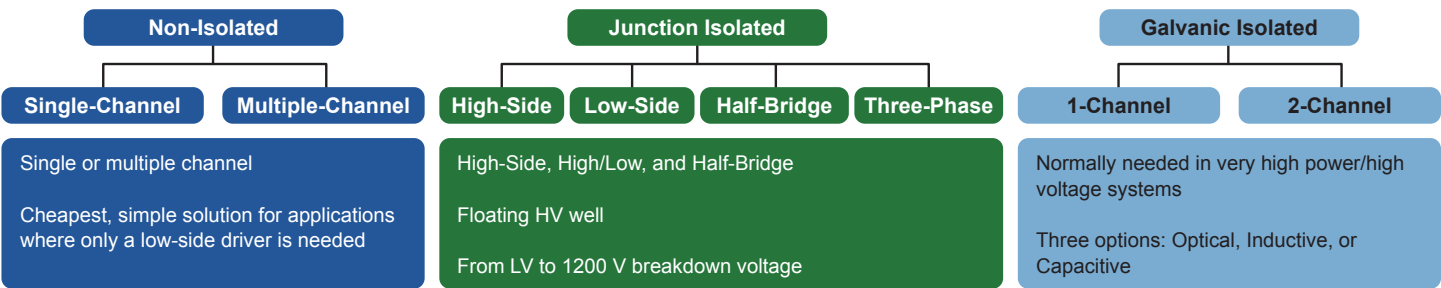
Other pinouts and channel configurations available

NCID(V)9xxx Family of Digital Isolators

We also have more than 1,000 active Opto-couplers available.
For additional information, please visit: www.onsemi.com/products/optoelectronics

Gate Drivers

The Gate Driver portfolio from ON Semiconductor covers a wide range of possibilities including multiple choices for protection features and level of isolation to safely and efficiently drive your SiC, GaN and Si devices.



Gate Drivers

Configuration		20 to 36 V	100 to 300 V	600 to 700 V	900 V	1200 V
Single Channel	Low-Side		▲	● ■ ▲		● ■
	High-Side		◆	● ■ ▲		● ■
Dual Channel	Low-Side		▲	▲		
	High-Side			◆		
	High- & Low-Side	◆	◆	◆ ●		
	Half-Bridge	◆	◆	◆	◆	◆
4-Channel	Full-Bridge	◆				
6-Channel	Three-Phase			◆		

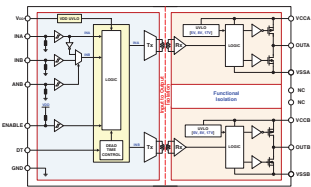
▲ Non-Isolated ■ Optical Isolation ● Digital Isolation ◆ Junction Isolation

Highlight Products

NCP5156x

Isolated drivers for SiC MOSFETs and IGBTs

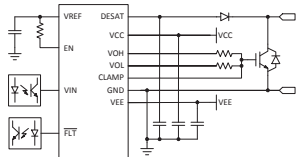
High drive current with safe isolation at high speed



NCD570x

High current drivers for IGBT

Full protection to safely drive your device



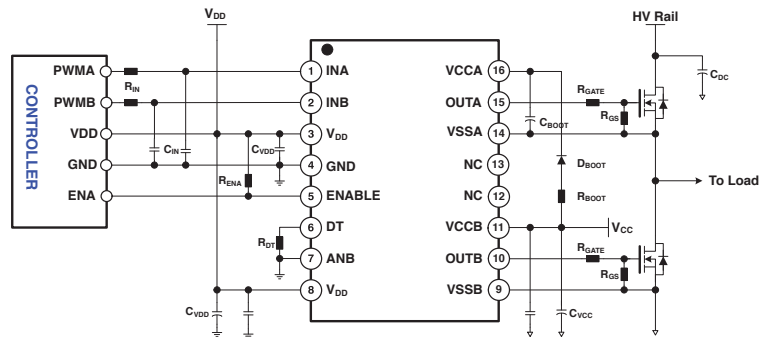
ON Semiconductor Value Proposition

Our gate drivers enable high flexibility and integration with a wide range of optional safety features in industry standard packages

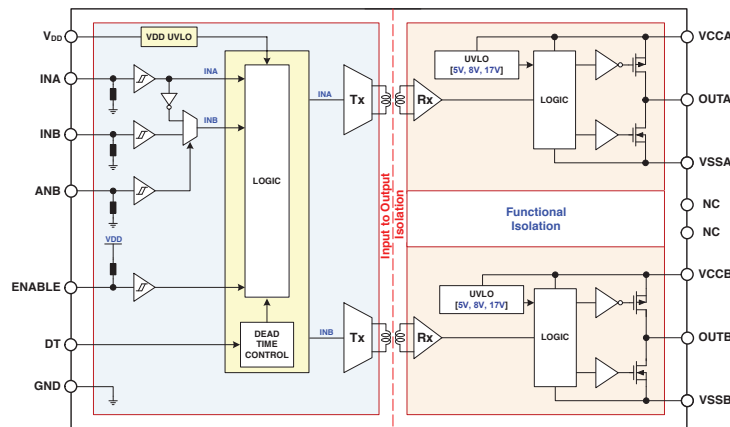
Isolated High Speed MOS/SiC Drivers

Features

- Input side isolated from output drivers by 5 kVrms isolation barrier
- 36 ns propagation delay & 8 ns delay match
- ≥ 150 V/ns DV/dt immunity
- Typical source/sink current capability
 - NCP51560: 1 A/4 A
 - NCP51561: 4 A/8 A



NCP51561 Typical Application Circuit



NCP51561 Internal Block Diagram

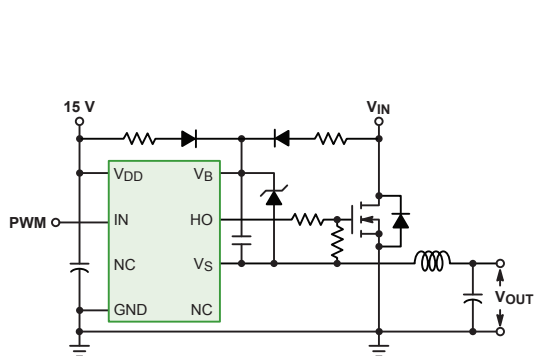
Device	Features									Target Applications								
	No of Ch	Iso (kV)	Use	Diff Input	Split Output	DESAT w/ FLT	Miller Clamp	Neg Chg Pump	I2C	Automotive				Industrial 4.0				
										Traction	PTC	OBC	HV DC-DC	UPS	Solar	Motor Control	Telecom	Server
NCP51561BxDW	2	5	MOS	✓											✓	✓		✓
NCP51561DxDW	2	5	SiC	✓										✓		✓		
NCP51560BxDW	2	5	MOS	✓										✓		✓		✓
NCP51563BxDW	2	5	MOS	✓										✓	✓	✓		
NCV51561BxDW	2	5	MOS	✓								✓	✓					
NCV51561DxDW	2	5	SiC	✓						✓	✓	✓	✓					
NCP/NCV51566BxDW	2	5	MOS	✓								✓	✓		✓		✓	✓
NCP51567CxDW	2	5	SiC	✓										✓	✓	✓		✓
NCP51752xDW	1	5	SiC	✓	✓			✓						✓	✓	✓	✓	✓
NCV51752xDW	1	5	SiC	✓	✓			✓		✓		✓	✓					
NCP51157xDW	1	5	MOS	✓	Y/N									✓	✓	✓	✓	✓
NCV51157xDW	1	5	MOS	✓	Y/N					✓	✓	✓						✓
NCP51152xD	1	3.7	MOS	✓	Y/N									✓	✓	✓	✓	✓
NCV51152xD	1	3.7	MOS	✓	Y/N					✓	✓	✓						✓
NCV51567CxDW	2	5	SiC	✓	✓					✓	✓	✓	✓	✓	✓	✓		
NCP51755xDW	1	5	SiC	✓	✓	✓	✓	✓	✓					✓	✓	✓		
NCV51755xDW	1	5	SiC	✓	✓	✓	✓	✓	✓	✓		✓	✓					
NCV51568BMN	2	2	MOS	✓													✓	✓

High Voltage Gate Drivers (HVICs)

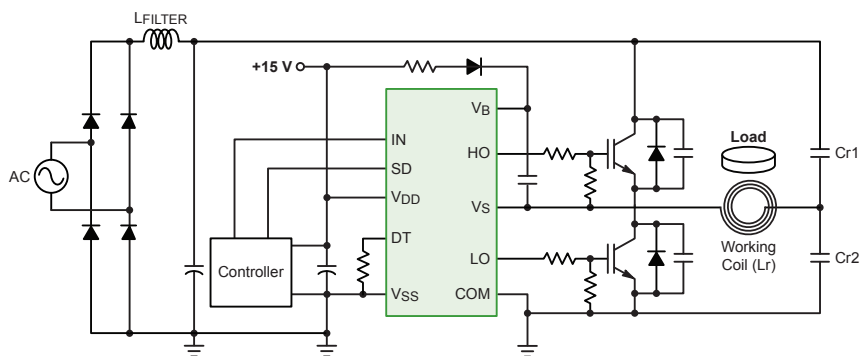
High voltage gate drivers (HVICs) from ON Semiconductor improve system reliability by utilizing an innovative common-mode dv/dt noise canceling circuit that provides excellent noise immunity. With a voltage capability up to 700 V and a very fast switching speed ($dv/dt = 50 \text{ V/ns}$ max), the devices are optimal for driving MOSFETs and IGBTs in a wide array of applications.

Features

- Better noise immunity (due to noise canceling circuit over high dv/dt common-mode noise)
- Low power consumption (IQBS/IQCC are lower than competitor's device)
- dVs/dt transient immunity voltage level (50 V/ns)
- Extended allowable negative Vs swing to -9.8 V for signal propagation @ $V_{CC} = V_{BS} = 15 \text{ V}$
- Matched propagation delay below 50 ns
- UVLO functions
- TTL compatible input threshold levels



High-Side Application Diagram



Half-Bridge Application Diagram

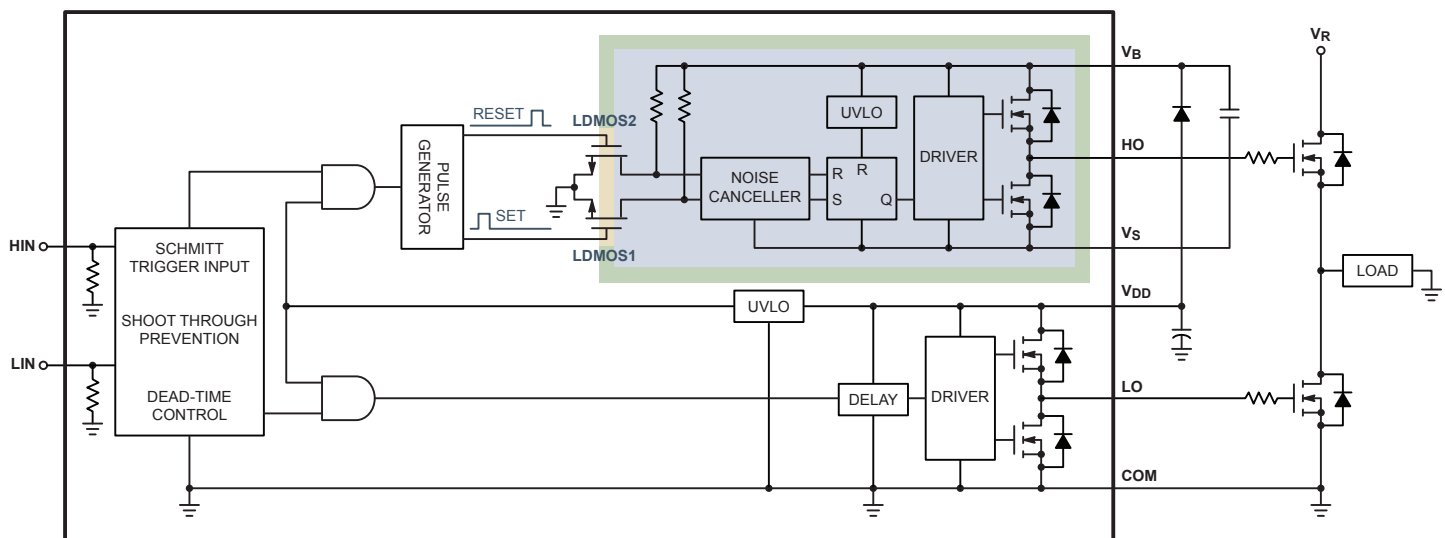
High-Side Drivers

Device	Circuit		Offset Voltage (V)	Output Current		Delay Time		Shut Down	OCP	Typical Dead Time (ns)	Package(s)
	Type	Input to Output		Source (mA)	Sink (mA)	Ton (ns)	Toff (ns)				
FAN7361	High-Side	1 to 1	600	250	500	120	90	No	No	No	SOP-8
FAN73611	High-Side	1 to 1	600	250	500	120	90	No	No	No	SOP-8
FAN7362	High-Side	1 to 1	600	250	500	120	90	No	No	No	SOP-8
FAN7371	High-Side	1 to 1	600	4000	4000	150	150	No	No	No	SOP-8
FAN73711	High-Side	1 to 1	600	4000	4000	150	150	No	No	No	SOP-8
FAN7385	2Ch High side	2 to 2	600	350	650	110	110	No	No	No	SOP-14
TND523SS	High-Side	1 to 1	600	200	400	90	85	No	No	No	SOP-8
TND524VS	High-Side	1 to 1	600	200	400	90	85	No	No	No	VEC-8

High Voltage Gate Drivers (HVICs)

High-Side & Low-Side Drivers

Device	Circuit		Offset Voltage (V)	Output Current		Delay Time		Shut Down	OCP	Typical Dead Time (ns)	Package (s)
	Type	Input to Output		Source (mA)	Sink (mA)	Ton (ns)	Toff (ns)				
FAN7382	High & Low-Side	2 to 2	600	350	650	170	200	No	No	No	DIP-8, SOP-8, SOP-14
FAN7390	High & Low-Side	2 to 2	600	4500	4500	140	140	No	No	No	SOP-8, SOP-14
FAN7390A	High & Low-Side	2 to 2	600	4500	4500	140	140	No	No	No	SOP-14
FAN73901	High & Low-Side	2 to 2	600	2500	2500	140	140	No	No	No	SOP-8
FAN7391	High & Low-Side	2 to 2	600	4500	4500	150	150	No	No	No	SOP-14
FAN7392	High & Low-Side	2 to 2	600	3000	3000	130	150	Yes	No	No	WSOP-16
FAN7842	High & Low-Side	2 to 2	200	350	650	170	200	No	No	No	SOP-8
FAN8811	High & Low-Side	2 to 2	100	3000	6000	30	28	No	No	No	WDFN -10
NCP5106A	High & Low-Side	2 to 2	600	250	500	100	100	No	No	No	DIP-8, SOP-8, DFN-10
NCP5109A	High & Low-Side	2 to 2	200	250	500	100	100	No	No	No	SOP-8, DFN-10
NCP5181	High & Low-Side	2 to 2	600	1400	2200	100	100	No	No	No	DIP-8, SOP-8
NCP5183	High & Low-Side	2 to 2	600	4300	4300	120	120	No	No	No	SOP-8
NCP51530A	High & Low-Side	2 to 2	700	2200	1700	60	60	No	No	No	SOIC-8, DFN-10
NCP51530B	High & Low-Side	2 to 2	700	2200	1700	25	25	No	No	No	SOIC-8, DFN-10



HVIC Driver Block Diagram

High Voltage Gate Drivers (HVICs)

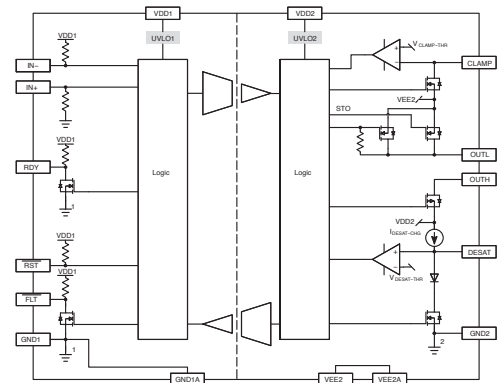
Half Bridge Drivers

Device	Circuit		Offset Voltage (V)	Output Current		Delay Time		Shut Down	OCP	Typical Dead Time (ns)	Package(s)
	Type	Input to Output		Source (mA)	Sink (mA)	Ton (ns)	Toff (ns)				
FAN7380	Half-Bridge	2 to 2	600	90	180	135	130	No	No	100	SOP-8
FAN7383	Half-Bridge	1 to 2	600	350	650	500	170	Yes	No	Variable	SOP-14
FAN73832	Half-Bridge	1 to 2	600	350	650	580	180	Yes	No	Variable	SOP-8
FAN73833	Half-Bridge	2 to 2	600	350	650	150	140	No	No	450	SOP-8
FAN7384	Half-Bridge	2 to 2	600	250	500	180	170	Yes	Yes	120	SOP-14
FAN7387	Self Osc.	1 to 2	600	350	650	550	160	Yes	No	Variable	SOP-8
FAN7388	3-Phase Half-Bridge	6 to 6	600	350	650	130	150	No	No	270	SOP-20
FAN73893	3-Phase Half-Bridge (MOSFET Target)	6 to 6 (inverting)	600	350	650	500	500	Yes	Yes	320	SOIC-28W
FAN73894	3-Phase Half-Bridge (IGBT Target)	6 to 6 (inverting)	600	350	650	500	500	Yes	Yes	320	SOIC-28W
FAN73895	3-Phase Half-Bridge (MOFET Target)	6 to 6	600	350	650	500	500	Yes	Yes	320	SOIC-28W
FAN73896	3-Phase Half-Bridge (IGBT Target)	6 to 6	600	350	650	500	500	Yes	Yes	320	SOIC-28W
FAN73912	Half Bridge	2 to 2	1200	2000	3000	500	550	Yes	No	330	WSOP-16
FAN7393A	Half Bridge	1 to 2	600	2500	2500	530	130	Yes	No	Variable	SOP-14
FAN73932	Half Bridge	1 to 2	600	2500	2500	600	200	Yes	No	400	SOP-8
FAN73933	Half Bridge	2 to 2	600	2500	2500	160	160	No	No	Variable	SOP-14
FAN7888	3-Phase Half-Bridge	6 to 6	200	350	650	130	150	No	No	270	SOP-20
FL73282	Half Bridge	2 to 2	900	350	650	150	150	No	No	170	SOP-8
NCP1392B	Half Bridge	1 to 2	600	500	1000	N/A	N/A	No	No	610	SOP-8
NCP1392D	Half Bridge	1 to 2	600	500	1000	N/A	N/A	No	No	305	SOP-8
NCP1393B	Half Bridge	1 to 2	600	1000	1500	N/A	N/A	No	No	610	SOP-8
NCP5104	Half Bridge	1 to 2	600	250	500	620	100	Yes	No	520	DIP-8, SOP-8
NCP5106B	Half Bridge	2 to 2	600	250	500	100	100	No	No	100	DIP-8, SOP-8, DFN-10
NCP5109B	Half Bridge	2 to 2	200	250	500	100	100	No	No	100	SOP-8, DFN-10
NCP5111	Half Bridge	1 to 2	600	250	500	750	100	No	No	650	DIP-8, SOP-8
NCP5304	Half Bridge	2 to 2	600	250	500	100	100	No	No	100	DIP-8, SOP-8

High Voltage, High Power IGBT/SiC MOSFET Drivers

Features

- High Current output gate drivers for high system efficiency
- Short propagation delays with accurate matching for improved system reliability
- Multiple options of safety features for system protection



NCD57000/1

	Non-Isolated	High- & Low-Side	Isolated		
Products	NCD5700/02 NCD5701/03(A/B/C) SO16 & SO8	NCD57200/01 SO8	NCD57000/01 Single Channel SO16 Wide Body	NCD57080/84/85/90 Single Channel SO8 Narrow & Wide Body	NCD57252 Dual Channel SO16 Wide Body
Features	High Drive Current Low Propagation Delay Full Features: DESAT, Clamp, UVLO, TSD, VEE	High Drive Current Dead Time Control Low Propagation Delay	High Drive Current Low Propagation Delay Full Features: DESAT, Clamp, UVLO, VEE, STO Isolation Certification: UL/VDE/IEC		

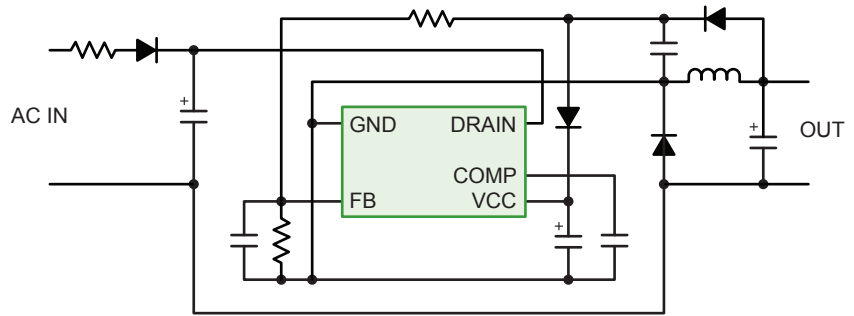
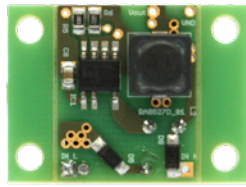
Device	Current Source/Sink (A)	No of Channels	Isolation (kV)	Diff Input	DESAT w/ FLT	Miller Clamp	VEE	Split Out	Package
NCD(V)5700/2	4/6	1	—		✓	✓	✓	✓	SOIC-16 NB
NCD(V)5701/3A	4/6	1	—		✓	✓			SOIC-8 NB
NCD(V)5701/3B	4/6	1	—		✓		✓		SOIC-8 NB
NCD(V)5701/3C	4/6	1	—		✓			✓	SOIC-8 NB
NCD(V)5707B	4/6	1	—		✓		✓		SOIC-8 NB
NCD(V)57000/1	4/6	1	5	✓	✓	✓			SOIC-16 WB
NCD(V)57080A	4/6	1	3.75	✓		✓			SOIC-8 NB
NCD(V)57080B	4/6	1	3.75	✓			✓		SOIC-8 NB
NCD(V)57080C	4/6	1	3.75	✓				✓	SOIC-8 NB
NCD(V)57081	4/6	1	3.75	✓				✓	SOIC-8 NB
NCD(V)57090A	4/6	1	5	✓		✓			SOIC-8 WB
NCD(V)57090B	4/6	1	5	✓			✓		SOIC-8 WB
NCD(V)57090C	4/6	1	5	✓				✓	SOIC-8 WB
NCD(V)57091	4/6	1	5	✓				✓	SOIC-8 WB
NCD(V)57084	4/6	1	2.5		✓				SOIC-8 NB
NCD(V)57085	4/6	1	2.5		CS w/FLT				SOIC-8 NB
NCD(V)57252	4/6	2	5						SOIC-16 WB
NCD(V)57253	4/6	2	5						SOIC-16 WB
NCD(V)57255/6	4/4	2	3						SOIC-16 NB
NCD(V)57200/1	1.9/2.3	2	—						SOIC-8 NB

Compact Power Delivery with Switching Regulators

NCP10671 Small Form Factor Buck Converter

Features

- Low standby power
- Complete portfolio for 1 – 50 W
- Integrated controller and MOSFETs



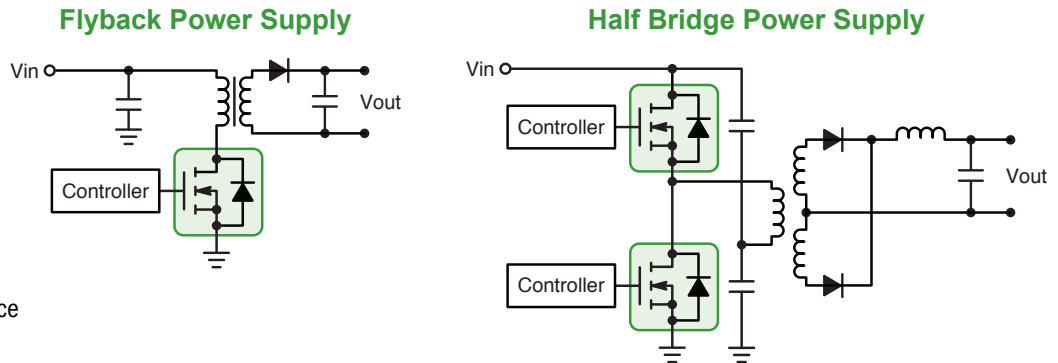
NCP10671 Non-Isolated Application

Device	P _{OUT} (W)	I _{LIMIT} (mA)	Topology	BV _{DS} (V)	R _{DS(ON)} Max (Ω)	Frequency Options (kHz)	Brown-In/ Out	Line OVP	F _{SW} Foldback	Dynamic Self Supply	Package(s)
NCP10670	1.5	100	Buck/Non-isolated Flyback/Flyback	700	41	60, 100	No	No	No	Yes	SOIC-7
NCP10671	3.7	250	Buck/Non-isolated Flyback/Flyback	700	41	60, 100	No	No	No	Yes	SOIC-7
NCP10672	7.8	780	Buck/Non-isolated Flyback/Flyback	700	14	60, 100	No	No	No	Yes	SOIC-7
NCP1060	4	Adj.	Buck/Non-isolated Flyback/Flyback	700	41	60, 100	Yes	No	Yes	Yes	SOIC-10, PDIP-7
NCP1063	11	Adj.	Buck/Non-isolated Flyback/Flyback	700	14	60, 100	Yes	No	Yes	Yes	PDIP-7, SOIC-16
NCP1070	4	250	Flyback	700	32	65, 100, 130	Yes	No	Yes	Yes	SOT-223, PDIP-7
NCP1071	5	350	Flyback	700	32	65, 100, 130	Yes	No	Yes	Yes	SOT-223, PDIP-7
NCP1072	11	350	Flyback	700	16	65, 100, 130	Yes	No	Yes	Yes	SOT-223, PDIP-7
NCP1075A/B	15	350	Flyback	700	17	65, 100, 130 (only B)	Yes	Yes	Yes	Yes	PDIP-7
NCP1076A/B	20	650	Flyback	700	6.8	65, 100, 130 (only B)	Yes	Yes	Yes	Yes	PDIP-7
NCP1077A/B	20	850	Flyback	700	6.8	65, 100, 130 (only B)	Yes	Yes	Yes	Yes	PDIP-7
NCP1079A/B	30	1050	Flyback	700	3.9	65, 100, 130 (only B)	Yes	Yes	Yes	Yes	PDIP-7
FSL106	10	Adj.	Flyback	650	20	67, 100	No	No	No	No	PDIP-8
FSL116	14	Adj.	Flyback	650	10	50, 100	No	No	No	No	PDIP-8
FSL126	17	Adj.	Flyback	650	6	67, 100	No	No	No	No	PDIP-8
FSL136	20	Adj.	Flyback	650	4	67, 100	No	No	No	No	PDIP-8, LSOP-8
FSL146	26	Adj.	Flyback	650	2.6	67	No	No	No	No	PDIP-8
FSL156	30	Adj.	Flyback	650	2.2	67	No	No	No	No	PDIP-8
FSL117	10	800	Flyback	700	10	67	No	No	No	No	PDIP-8
FSL137	20	1300	Flyback	700	4.75	67	No	No	No	No	PDIP-8
FSL126MRT	25	1200	Flyback	650	6	67	No	No	No	No	TO-220F6
FSL136MRT	35	2150	Flyback	650	4	67	No	No	No	No	TO-220F6
FSGM0465	48	1800	Flyback	650	2.6	66	No	No	No	No	TO-220F6
FSL176MRT	70	3500	Flyback	650	1.6	67	No	No	No	No	TO-220F6
FSL128MRT	25	1200	Flyback	800	7.3	67	No	No	No	No	TO-220F6
FSL138MRT	35	2150	Flyback	800	5	67	No	No	No	No	TO-220F6
FSL306	7	Adj.	Buck/Non-isolated Flyback/Flyback	650	18	50	No	No	Yes	Yes	PDIP-7, LSOP-7
FSL336	20	Adj.	Buck/Non-isolated Flyback/Flyback	650	4	50	No	No	Yes	Yes	PDIP-7, LSOP-7
FSL337	20	Adj.	Buck/Non-isolated Flyback/Flyback	700	4	50	No	No	Yes	Yes	PDIP-7, LSOP-7
FSL4110	9	520	Flyback	1000	10	50	No	Yes	No	Yes	PDIP-7, LSOP-7
FSL518A/H	12	460/600	Buck/Non-isolated Flyback/Flyback	800	8	100, 130	Yes	Yes	Yes	Yes	PDIP-7
FSL538A/H	17	660/860	Buck/Non-isolated Flyback/Flyback	800	4.6	100, 130	Yes	Yes	Yes	Yes	PDIP-7
NCP10970	5	350	Buck + LDO	670	23	65	No	No	No	Yes	SOIC-16

MOSFETs for Auxiliary Power Supplies in Industrial Motor Drives

Features

- High reliability
- Low power dissipation
- High avalanche resistance
- High-speed switching



Application Diagram

Source Voltage	Device	V_{DS} (V)	I_D (A)	$R_{DS(ON)}$ @ 10 V		C_{iss} (pF)	Q_g (nC)	Package(s)
				Typ (Ω)	Max (Ω)			
240 Vac	BFL4026	900	5	2.8	3.6	650	33	T0-220F
380 to 480 Vac	NDFPD1N150C	1500	0.1	100	150	80	4.2	T0-220F
	NDFP03N150C	1500	2.5	8	10.5	650	34	T0-220F
	NDTL03N150C	1500	2.5	8	10.5	650	34	T0-3P
	NDUL03N150C	1500	2.5	8	10.5	650	34	T0-3PF
	NDUL09N150C	1500	9	2.2	3.0	2025	114	T0-3PF
590 to 690 Vac	WPH4003	1700	3	8.2	10.5	850	48	T0-3PF

DC-DC Controllers and Regulators

DC-DC Regulators

Device	V _{in} (V)		Topology	Frequency (kHz)	Output Current (A)	Package(s)
	Min	Max				
LM2574	4.75	40	Buck	52	0.5	D2PAK, TO-220
LM2594	4.75	40	Buck	150	0.5	SOIC-8, PDIP-8
NCP1030	10	200	Buck, Boost	300	1.0	Micro8
LM2575	4.75	40	Buck	52	1.0	D2PAK, TO-220
LM2595	4.75	40	Buck	150	1.0	D2PAK, TO-220
CS51414	4.5	40	Buck	260	1.5	SOIC-8
NCP3063	3	40	Buck, Boost, Inverting, Buck/Boost	up to 250	1.5	DFN-8, SOIC-8, PDIP-8
NCP3064	3	40	Buck, Boost, Inverting, Buck/Boost	up to 250	1.5	DFN-8, SOIC-8, PDIP-8
NCP3065	3	40	Buck, Boost, Inverting, Buck/Boost	up to 250	1.5	DFN-8, SOIC-8, PDIP-8
NCP3066	3	40	Buck, Boost, Inverting, Buck/Boost	up to 250	1.5	DFN-8, SOIC-8, PDIP-8
MC34063A	3	40	Buck, Boost, Inverting, Buck/Boost	up to 100	1.5	DFN-8, SOIC-8, PDIP-8
CS5171/2/3	2.7	30	Boost	280/560	1.5	SOIC-8
NCP1595	4	5.5	Buck	1200	1.5	DFN-6
NCP1031	10	200	Buck, Boost	300	2.0	Micro8
NCP1597	4	5.5	Buck	1200	2.0	DFN-6
MC34166	7.5	40	Step-up/Step-down	72	3.0	D2PAK, TO-220
LM2576	4.75	40	Buck	52	3.0	D2PAK, TO-220
LM2596	4.75	40	Buck	150	3.0	D2PAK, TO-220
NCP3170	4.5	18	Buck	500/1000	3.0	SOIC-8
NCP1599	2.7	5.5	Buck	1200	3.0	DFN-6, DFN-10
NCP1593	4	5.5	Buck	1000	3.0	DFN-10
NCP3133	2.9	5.5	Buck	1100	3.0	QFN-16
MC34163	2.5	40	Buck, Boost, Inverting, Buck/Boost	up to 100	3.4	SOIC-16, PDIP-16
NCP3163	2.5	40	Buck, Boost, Inverting, Buck/Boost	up to 300	3.4	SOIC-16WB, DFN-18
FAN23SV04TA	7	18	Buck	200-1000	4.0	PQFN-34
NCP1594A	2.9	6.0	Buck	500 - 2000	4.0	WQFN-24
MC34167	7	40	PWM Step-down	72	5.0	D2PAK, TO-220
NCP3135	2.9	5.5	Buck	1100	5.0	QFN-16
NCP3136	2.9	5.5	Buck	1100	5.0	QFN-16
NCP4060A	16	80	Buck	100 - 500	6.0	QFN-19
FAN65004B	4.5	65	Buck	100 - 1000	6.0	PQFN-35
FAN2356A	4.5	24	Buck	200-1000	6.0	PQFN-34
FAN23SV56A	7	24	Buck	200-1000	6.0	PQFN-34
NCP1592	3	6	Buck	350/550/280/700	6.0	TSSOP-28 EP
FAN65005A	4.5	65	Buck	100 - 1000	8.0	PQFN-35
FAN65008B	4.5	65	Buck	100 - 1000	10	PQFN-35
FAN2360A	4.5	24	Buck	200-1000	10	PQFN-34
FAN23SV60A	7	24	Buck	200-1000	10	PQFN-34
FAN2310A	4.5	18	Buck	200-1000	10	PQFN-34
FAN23SV10MA	7	18	Buck	200-1000	10	PQFN-34
FAN2365A	4.5	24	Buck	200-1000	15	PQFN-34
FAN23SV65A	7	24	Buck	200-1000	15	PQFN-34
NCP3232	4.5	21	Buck	500	15	QFN-40
NCP3235	4	20	Buck	550	15	QFN-40
FAN2315A	4.5	18	Buck	200-1000	15	PQFN-34

DC-DC Controllers and Regulators

DC-DC Regulators (cont.)

Device	V _{in} (V)		Topology	Frequency (kHz)	Output Current (A)	Package
	Min	Max				
FAN23SV15MA	7	18	Buck	200-1000	15	PQFN-34
FAN23SV70A	7	24	Buck	200-1000	20	PQFN-34
FAN23SV20MA	7	18	Buck	200-1000	20	PQFN-34
NCP3233	3	16	Buck	300/500/1000	20	QFN-40
NCP3231	4.5	18	Buck	500	25	QFN-40
NCP3230	4.5	18	Buck	500	30	QFN-40
NCP3284	4.5	18	Buck	500/600/800/1000	30	PQFN-37

DC-DC Controllers

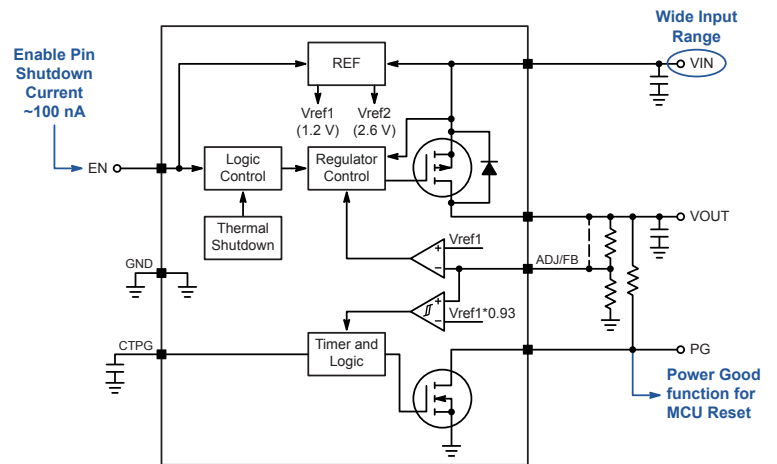
Device	V _{in} (V)		Isolated	Topology	Frequency (kHz)	Control Mode	Package(s)
	Min	Max					
NCP1342	16	700	Yes	QR Flyback	Variable	Current	SOIC-8 NB, SOIC-9 NB
NCP1568	16	700	Yes	Active Clamp Flyback	100 - 1000	Current	TSSOP-16
NCP12700	9	200	Yes	Flyback	100 - 1000	Current	MSOP-10, WQFN-10
NCP1566	13	120	Yes	Active Clamp Flyback	100 - 1000	Current or Voltage	QFN-24
NCP1034	8	100	No	Buck	25 - 500	Voltage	SOIC-16
CS5124	7.7	75	Yes	Flyback	400	Current	SOIC-8
CS51022	3.3	72	Yes	Flyback	200 - 1000	Current	SOIC-16, TSSOP-16
CS51221	3.3	72	Yes	Flyback	200 - 1000	Voltage	SOIC-16, TSSOP-16
NCP1294	3.3	72	Yes	Flyback	200 - 1000	Voltage	SOIC-16, TSSOP-16
TL494	7	40	No	Buck	40 - 200	Voltage	SOIC-16, PDIP-16
TL594	7	40	No	Buck	40 - 300	Voltage	SOIC-16, PDIP-16, TSSOP-16
SG3525	8	35	No	Half-Bridge	100 - 400	Voltage	SOIC-16, PDIP-16
NCP3011	4.5	28	No	Buck	400	Voltage	TSSOP-14
NCP3020A/B	4.5	28	No	Buck	300/600	Voltage	SOIC-8
NCP3030	4.7	28	No	Buck	1200/2400	Voltage	SOIC-8
NCP81231	4.5	28	No	Buck	150 - 1200	Current	QFN-32
NCP81239	4.5	28	No	Buck-Boost	150 - 1200	Current	QFN-32
NCP5269	3.3	28	No	Buck	300/400/600	Voltage	QFN-20
NCP81232	4.5	20	No	Buck	200 - 1200	Dual Edge	QFN-40
NCP81233	4.5	20	No	Buck	200 - 1200	Dual Edge	QFN-52
CS51031	4.5	16	No	Buck	200 - 700	Hysteretic	SOIC-8
NCP1587	4.5	13.2	No	Buck	275	Voltage	SOIC-8



Voltage Regulation – LDOs

ON Semiconductor Value Proposition

Our wide portfolio of LDOs offers best-in-class trade-offs between low noise, high PSRR, voltage drop and V_{IN}/V_{OUT} range, meeting the requirements of each specific application



NCP711 – 18V, 100mA, 1uA Iq LDO with Power Good

	Ultra-Low Noise High PSRR	Ultra-Low Iq High Efficient	Wide-Input, Low Iq	High Voltage
Products	NCP110 NCP161/3/4/7 NCP114	NCP170 NCP171	NCP502, NCP623 NCP715/6/8 NCP73x	NCP78x
Features	Ultra-Low Noise <10 μV_{RMS} High PSRR >85 dB Low Voltage Drop High Output Current	Iq <1 μA Low Voltage Drop <0.17 V Low Noise High PSRR	Enables a Wide Range of V_{IN} Up to 60 V Low Iq Multiple Output Voltages	Extended V_{IN} Up to 450 V Multiple Output Voltages

Wide-Input LDOs

Device	Iload (mA)	Vin (V)	Vout (V)	Iq (μA)	Vdrop (V)	PSRR @ 1 kHz (dB)	Package(s)
NCP502	80	12	1.5 ~ 5.0	40	0.6~1.5	55	SOT23, SC-70
NCP623	150	12	2.5 ~ 5.0	170	0.18	70	DFN-6
NCP3335A	500	12	1.5~5, Adj	31	0.34	55	DFN-10, Micro8
NCP711	100	18	2.5, 2.8, 3, 3.3, 5, Adj	1.3	0.22	70	TSOP-5, WDFN6_2x2
NCP715	50	24	1.2 ~ 5.0	3.2	0.23	60 @ 100 kHz	SC-75, SOT-323, SC-88, XDFN
NCP716	80	24	1.2 ~ 5.0	3.2	0.35	60 @ 100 kHz	WDFN6
NCP716B	150	24	3 ~ 5.0	3.2	0.7	55	TSOP-5 (2 variations)
NCP718	300	24	1.5 ~ 5.0	4	0.3	60	TSOP-5, WDFN6
LP2950	100	30	3, 3.3, 5.0	93	0.35	48	DPAK3, TO-92
NCP730	150	38	2.5, 2.8, 3, 3.3, 5, 15, Adj	1.3	0.29	70	TSOP-5, WDFN6_2x2

Voltage Regulation – LDOs

High-Input LDOs

Device	I _{load} (mA)	V _{in} (V)	V _{out} (V)	I _q (μA)	V _{drop} (V)	PSRR @ 1 kHz (dB)	Package(s)
NCP781	100	150	0.8 ~ 3.6	10	4	83	DFN-6
NCP785A	10	450	1.5 ~ 15	10	—	70	SOT-89
NCP786L	5	450	1.5 ~ 15	10	—	70	SOT-223
NCP786A	10	450	1.27 ~ 15	10	—	70	DFN6 5*6

Ultra-Low Noise, High PSRR LDOs

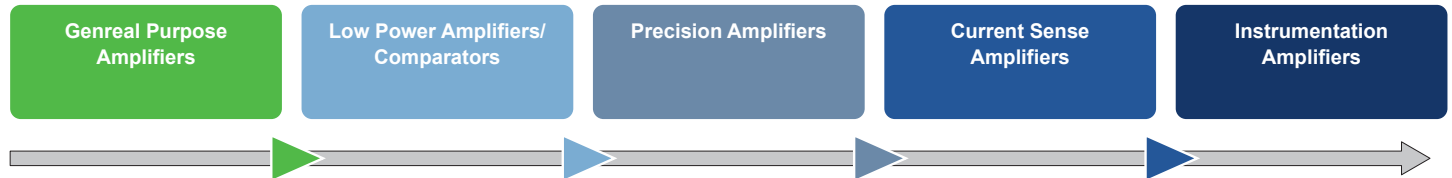
Device	I _{load} (mA)	V _{in} (V)	V _{out} (V)	I _q (μA)	V _{drop} (V)	PSRR @ 1 kHz (dB)	Package(s)
NCP110	200	5.5	0.6 - 4.0	20	0.11	95	XDFN4
NCP164	150	5.5	0.8 - 2.1	80	0.11	80	WDFN-6_2x2, TSOP-5
NCP114	300	5.5	0.75 - 3.6	50	0.135	75	UDFN-4, TSOP-5

Ultra-Low I_q LDOs

Device	I _{load} (mA)	V _{in} (V)	V _{out} (V)	I _q (μA)	V _{drop} (V)	PSRR @ 1 kHz (dB)	Package(s)
NCP170	150	5.5	0.8-3.6	0.5	0.170	45	XDFN4, TSOP5
NCP171	80	5.5	0.6-3.3	0.5	0.41	65	XDFN-4, TSOP5

Current Sense and General Purpose Amplifiers

ON Semiconductor has built a leading position in amplifiers by providing low power, high performance solutions for any power supply or signal conditioning need.



General Purpose Operational Amplifiers and Comparators

ON Semiconductor industry standard Op. Amps and comparators, offer the best price to performance ratio. With high volume manufacturing capacity and industry leading quality standards, our components are the safe choice for your design.

Comparators

Device	Channels	V _S Min (V)	V _S Max (V)	I _q (mA)	t _{RESP} (H-L) (μA)	V _{OS} Max (mV)	Package(s)
LM2903	2	2	36	0.4	1.5	15	SO-8, Micro8
LM293	2	2	36	0.4	1.3	9	SO-8, Micro8
LM393	2	2	36	0.4	1.3	9	SO-8, Micro8, PDIP-8
LM239/339	4	3	36	0.8	1.3	5	SO-14, TSSOP-14, PDIP-14
LM2901	4	3	36	0.8	1.3	7	SO-14, TSSOP-14, PDIP-14
TS391, TL331	1	2	36	0.5	0.35	9	TSOP-5
LM211	1	5	30	1.2	0.2	0.7	SO-8
LM311	1	5	30	1.2	0.2	0.2	SO-8, PDIP-8

Operational Amplifiers

Device	Channels	V _S Min (V)	V _S Max (V)	I _q /Ch (mA)	GBW (μA)	V _{OS} Max (mV)	Package(s)
NCV952	2	2.7	26	0.75	3.5	8	TSSOP-8
MC3320x	1,2,4	1.8	12	0.9	2.2	6	SO-8, Micro8, SO-14, TSSOP-14
LM321	1	3	32	0.75	1	9	SOT-23-5
LM224	4	3	32	1.2	1	5	SO-14, TSSOP-14
LM258	2	3	32	0.75	1	5	SO-8, Micro8
LM2902/V	4	3	32	1.2	1	7	SO-14, TSSOP-14
LM2904/V	2	3	32	0.75	1	7	SO-8, Micro8
LM324,A	4	3	32	1.2	1	3	SO-14, TSSOP-14
LM358, A	2	3	32	0.75	1	7	SO-8, Micro8
NCS7101	1	1.8	10	1.0	1	9	SOT-23-5
LM301A	1	3	18	1.2	1	7.5	SO-8
LM201A	1	3	18	1.2	1	2	SO-8

Current Sense and General Purpose Amplifiers

New General Purpose Operational Amplifiers and Comparators

Op Amps	Legacy	High Voltage	Low Power
	LM358	NCS20072	NCS20082
Channels	2	2	2
GBW	1 MHz	3 MHz	1.2 MHz
Max V _{OS} Over Temp	9 mV	4.5 mV	4 mV
V _{OS} Drift Over Temp	7 μ V/°C	2 μ V/°C	1 μ V/°C
Typ I _Q per Channel @ 5 V	0.35 mA	0.410 mA	0.042 mA
Common Mode Range	0 V to V _{DD} - 1.7 V	0 V to V _{DD} - 1.35 V	V _{SS} - 0.2 to V _{DD} + 0.2 V
I _{IB} Max Over Temp	500 nA	1 nA	500 nA
Supply Voltage	3 to 32 V	2.7 to 36 V	3 to 32 V

Comparators	Legacy	Low Power	High Speed
	LM393	NCV2393	NCS2250
Channels	2	2	1
Response Time	1300 ns @ 5 mV Overdrive	2100 ns @ 5 mV Overdrive	90 ns @ 20 mV Overdrive
Max V _{OS} Over Temp	9 mV	14 mV	7 mV
Typ I _Q per Channel @ 5 V	0.2 mA	0.006 mA	0.16 mA
Common Mode Range	0 V to V _{DD} - 1.5 V	0 V to V _{DD} - 1.5 V	V _{SS} - 0.2 to V _{DD} + 0.2 V
I _{IB} Max Over Temp	400 nA	0.6 nA	1 nA
Supply Voltage	2 to 36 V	2.7 to 16 V	1.8 to 5.5 V

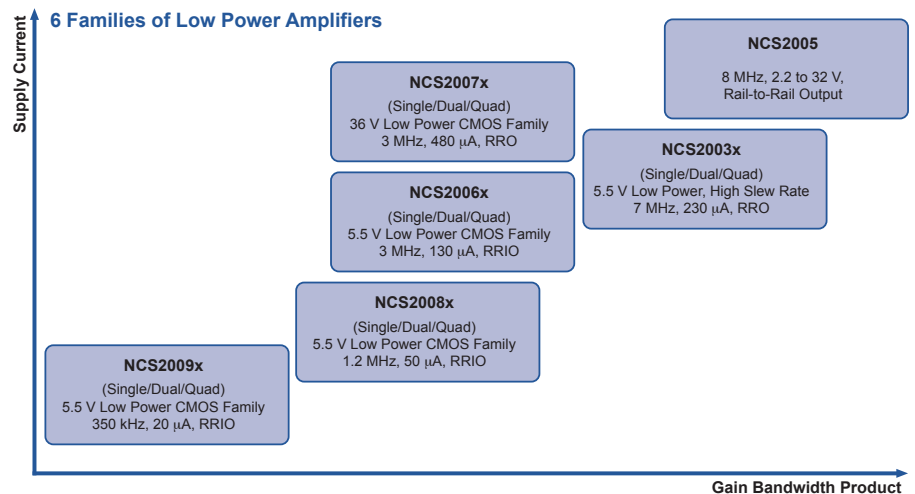
Low Power Op Amps

Good Price/Performance Balance

- Low Current Consumption
- Low Voltage Options
- Rail to Rail
- Wide offering of GWB Op. Amps

Space Saving Packages

- Single, Dual and Quad Small packages (SOT23, SC-70, SOIC 8, SOIC 14)



Current Sense and General Purpose Amplifiers

High Precision Operational Amplifiers

Zero Drift Architecture

- Internally calibrates the offsets through a feedback loop to provide low error at the output
- Enables offsets as low as 10 μV at lower speeds

Voltage Offset E-Trim

- Low Offset voltage through internal memory
- Accommodates for offset induced due to package stress by trimming after package

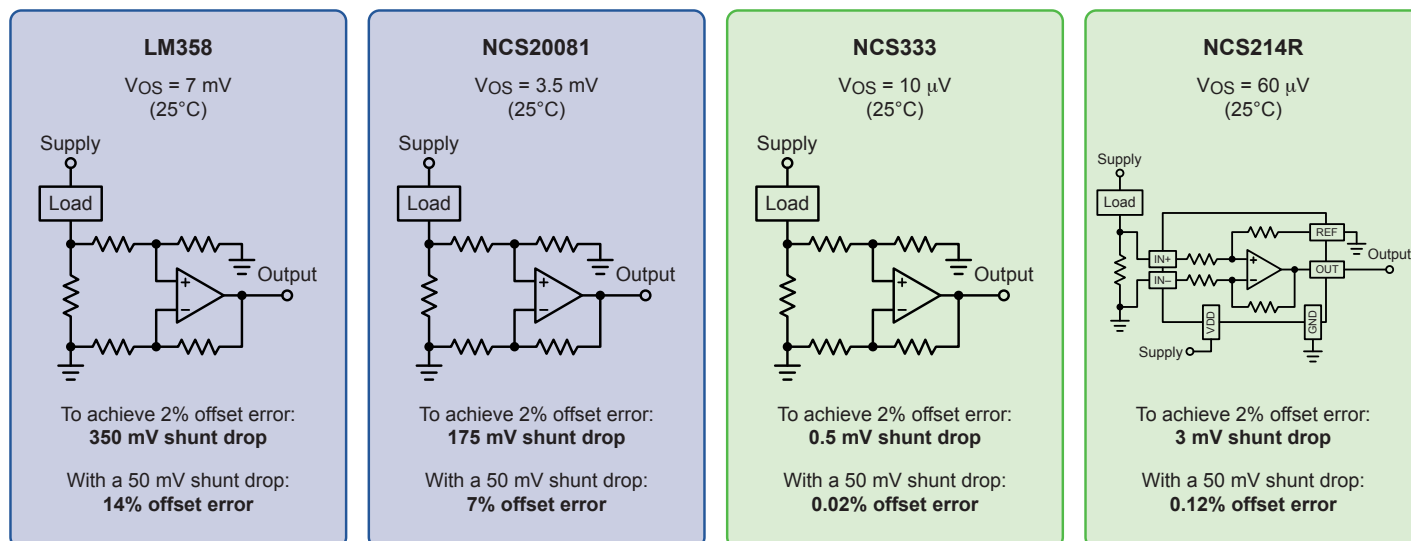
High Precision Op Amps

Device	Channels	V _S Min (V)	V _S Max (V)	I _q Typ (mA)	GBW Typ (MHz)	SR Typ (V/ μs)	$\Delta V_{os}/\Delta T$ ($\mu\text{V}/^\circ\text{C}$)	V _{os} Max (mV)	Package(s)
NCS2325	2	1.8	5.5	0.021	0.05	0.27	0.1	14	Micro8, SOIC-8
NCS2333	2	1.8	5.5	0.021	0.03	0.27	0.1	0.04	Micro8, SOIC-8/UDFN-8
NCS4325	4	1.8	5.5	0.021	0.05	0.27	0.1	14	SOIC-14
NCS325	1	1.8	5.5	0.021	0.05	0.35	0.16	14	TSOP-5/SOT-23-5
NCS/V2187x	1/2/4	1.8	5.5	40	45	0.35	0.1	0.4	TSOP-5/SC705, UDFN8/Micro8/SOIC-14
NCS/V333A	1	1.8	5.5	0.028	0.03	0.35	0.1	0.03	SC-88A/SC-70-5, TSOP-5/SOT-23-5
NCS/V4333	4	1.8	5.5	0.021	0.03	0.35	0.15	0.095	SOIC-14
NCS21911	1	4	36	0.475	0.025	2	1.6	0.02	TSOP-5/SOT-23-5
NCS20166	1	3	5.5	1.2	1.05	10	0.5	5	TSOP-5/SOT-23-5
NCS7101	1	1.8	10	1.0	9	1	9	9	SOT-23-5
LM301A	1	3	18	1.2	7.5	1	7.5	7.5	SO-8
LM201A	1	3	18	1.2	2	1	2	2	SO-8

Current Sense and General Purpose Amplifiers

Current Sense Amplifiers

In addition to traditional, stand-alone op-amps, ON Semiconductor offers current sense amplifiers which integrate the feedback resistors for a higher accuracy, more compact solution.



Reduced voltage drop across sense resistor

Reduced power dissipation

System efficiency improves

Reduced offset voltage

Improved accuracy

System performance improves

Low Voltage Current Sensing Using Zero Drift Op Amps (High Precision) – Stand Alone

Device	Channels	V_S Min (V)	V_S Max (V)	GBW Typ (kHz)	V_{OS} Max (mV)	V_{OS} Drift (μ V/°C)	CMRR (dB)	Features
NCS(V)333A NCS(V)2333 NCS(V)4333	1, 2, 4	1.8	5.5	350	10	0.03	120	Low V_{OS}
NCS(V)21911/2/4	1, 2, 4	4	36	2000	25	0.02	130	Higher GBW, Low V_{OS}

Low Voltage Current Sensing Solutions (Cost Effective) – Stand Alone

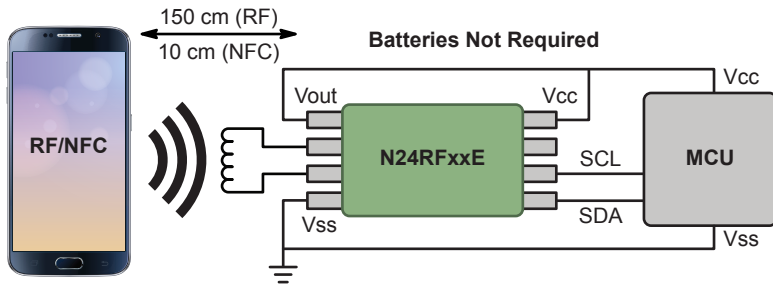
Device	Channels	V_S Min (V)	V_S Max (V)	GBW Typ (MHz)	V_{OS} Max (mV)	V_{OS} Drift (μ V/°C)	CMRR (dB)	Features
NCS(V)2009x	1, 2	1.8	5.5	0.35	4	1	80	Low I_Q & V_{OS}
NCS(V)2008x	1, 2	1.8	5.5	1.2	4	1	80	Low I_Q & V_{OS}
NCS(V)2006x	1, 2	1.8	5.5	3	4	1	80	Low I_Q & V_{OS}
NCS(V)2003x	1, 2, 4	1.7	5.5	7	5	2	80	Fast Slew Rate, Low V_S & I_B
NCS(V)2007x	1, 2, 4	2.7	36	3	4	2	110	Wide V_S Range

Zero Drift Current Sense Amplifiers (integrated and Precision Performance) – Integrated Resistors

Device	Channels	V_S Min (V)	V_S Max (V)	GBW Typ (kHz)	V_{OS} Max (mV)	V_{OS} Drift (μ V/°C)	CMRR (dB)	Features
NCS(V)21xR	1	2.2	26	25-90	As low as 35	0.5	105	Low V_{OS} and drift over time and temp
NCS199AxR	1	2.2	26	40-90	150	0.5	100	Low V_{OS} and drift over time and temp

EEPROM with Integrated RF/NFC Function

RF/NFC EEPROM N24RF series allows data to be wirelessly written/retrieved from the device without powering the system. Tags are utilized to store ID information, calibration data, calibration date, fault data, and maintenance logs.



Features

- RF/NFC wireless interface
- I2C interface to MCU
- Analog Vout for battery free operation
- 2,000,000 write cycles of endurance
- ICCR read current of 300 μ A
- ICCW write current of 400 μ A
- Low power standby mode current of 100 μ A

Benefits

- Enables On-site wireless and battery-less fault and maintenance diagnostics
- Continuous data logging monitoring the relevant parameters from the MCU
- Data is secured over time even in harsh industrial environments

Device	Memory Density (kb)	Energy Harvesting Output	Package(s)
N24RF64DWPT3G	64	No	SOIC-8
N24RF64DTP3G	64		TSSOP-8
N24RF16DWPT3G	16		SOIC-8
N24RF16DTP3G	16		TSSOP-8
N24RF04DWPT3G	4		SOIC-8
N24RF04DTP3G	4		TSSOP-8
N24RF64EDWPT3G	64	Yes	SOIC-8
N24RF64EDTPT3G	64		TSSOP-8
N24RF16EDWPT3G	16		SOIC-8
N24RF16EDTPT3G	16		TSSOP-8
N24RF04EDWPT3G	4		SOIC-8
N24RF04EDTPT3G	4		TSSOP-8

Protection and Signal Devices – Overview

Transistors

Small Signal BJTs

- Low VCE(sat)
- Digital Transistors (BRT)
- Darlington
- General purpose
- RF BJTs

Bipolar Power BJTs

- Audio
- General purpose
- Low VCE(sat)
- Darlington

JFETs

Constant Current Regulators

- Singles
- Arrays
- Switched PWM
- Fixed or adjustable

Diodes

Small Signal Diodes

- Switching
- Schottky
- RF diodes

Zener Diodes

- 1.8 to 200 V

Protection diodes

- ESD protection
- CAN/Lin Protection

Protection Arrays

Advanced Products

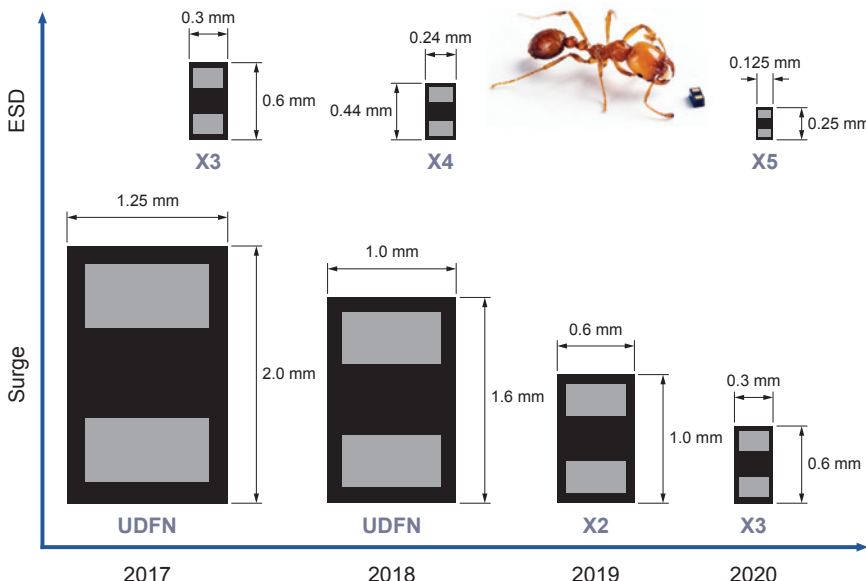
Filters

- EMI filters:
- Common-mode filters for higher frequency Audio
- Memory/SIM card data filters

eFUSES

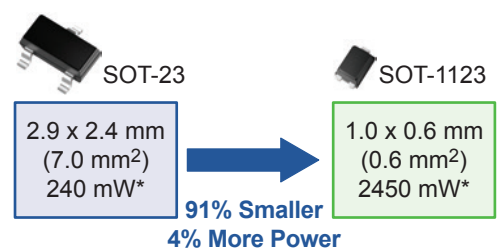
- Over 6000 Part numbers (256 “new”)
- 90 package types (176 derivatives)
- Over 500 direct customers serviced
- Shipped over 36 Billion units in CY19
- +100 new products released past 12 months
- Extensive capacities

Micropackaged ESD & Schottky



Highest power density packaging with industry leading electrical performance

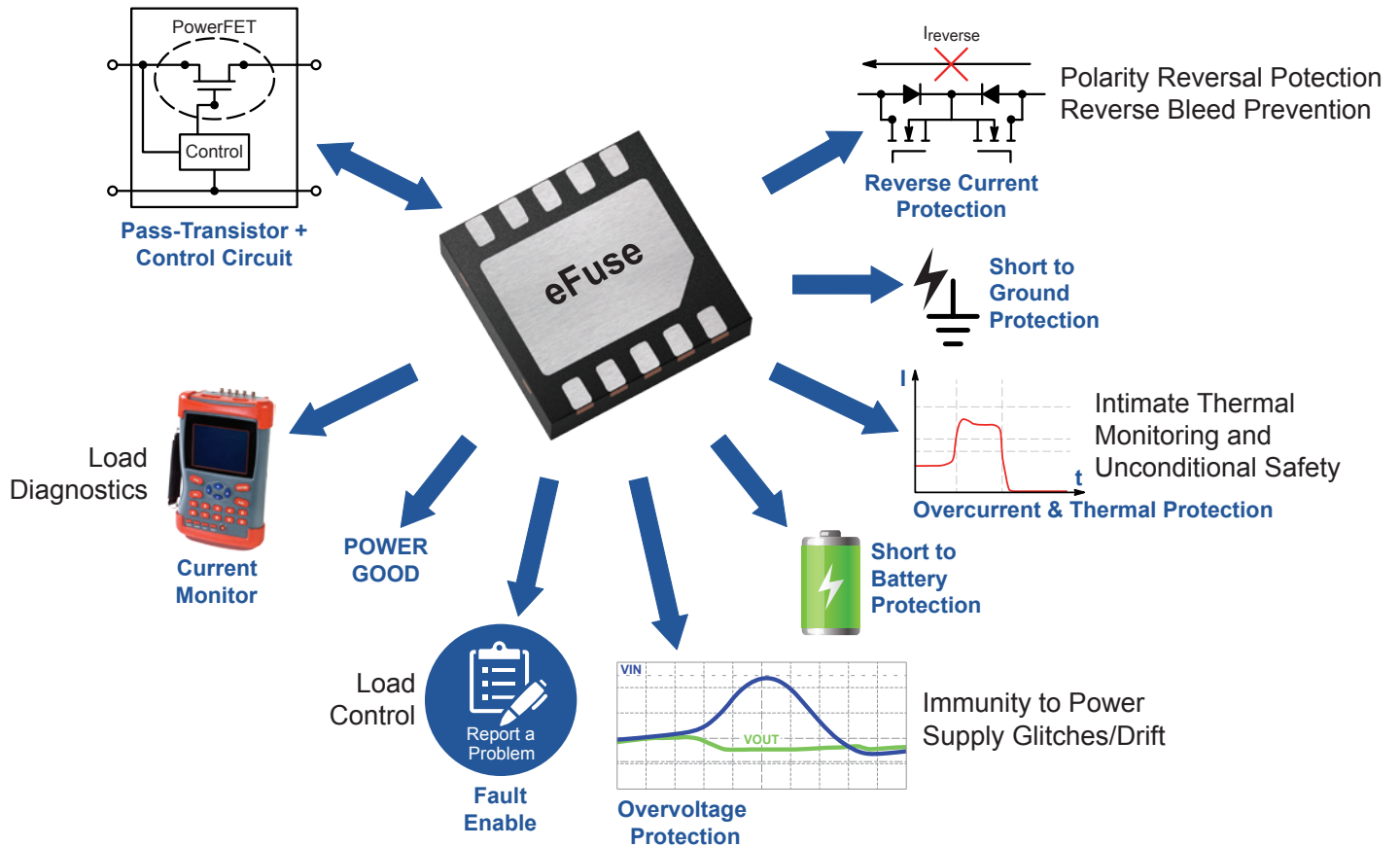
Small Signal Bipolar Transistors



Smaller footprints, highest possible power density resulting in compact, high efficiency solutions

eFuses

An eFuse is more than just a fuse. It provides among others, integrated overcurrent, thermal and overvoltage protection.



eFuses

Device	Nominal Voltage (V)	Input Voltage (V)	V_{clamp} (V)	Continuous Current (A)	Trip Current (A)	$R_{DS(ON)}$ (m Ω)	Reverse Current Blocking	IMON (ISENSE Pin)	Auto-Retry	Latch	Package
NIS5135	5	-0.6 to 18	6.65	3.6	Adjustable	68			✓	✓	DFN3x3
NIS5232	12	-0.6 to 18	15	4.2	Adjustable	44			✓*	✓	DFN3x3
NIS5420	12	-0.6 to 18	14	4.2	Adjustable	44		✓	✓	✓	WDFN3x3
NIS5820	12	-0.6 to 18	14	8	Adjustable	24			✓	✓	WDFN3x3
NIS5020	12	-0.6 to 18	14	10	Adjustable	14			✓	✓	WDFN3x3
NIS5021	12	-0.6 to 18	14	12	Adjustable	14			✓	✓	WDFN4x4
NIS6150	5	-0.3 to 10	6.1, 6.9	1	Adjustable	140	✓	✓	✓	✓	WDFN3x3 wettable flank
NIS6350	5	-0.3 to 10	6.1, 6.9	3	Adjustable	70			✓	✓	WDFN3x3 wettable flank
NIS6432	3.3	-0.3 to 14	4	3.5	Adjustable	46	✓	✓	✓	✓	WQFN2x3
NIS6452	5	-0.3 to 14	6.65	3.5	Adjustable	46	✓	✓	✓	✓	WQFN2x3
NIS4461	24	-0.6 to 30	N/A	4.2	Adjustable	44		✓	✓	✓	WDFN3x3

* NIS5132MN2

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Industrial Power & Motion



Robotics, automation, and the Industrial IoT are built on a foundation of power conversion and motor control. The migration from mechanical systems to electrical ones continues apace. Robust and efficient power electronics enable the factories of the future. ON Semiconductor's full selection of IGBTs, MOSFETs, power modules, and gate drivers provide the building blocks for this transformation. Our power conversion and motor control ICs, along with sensing and protection devices, complete the full system solution for any industrial application. ON Semiconductor's products have the efficiency and reliability for your designs.

Solutions

Industrial Drive

Electrical drive systems are a key component of automation systems in the industrial context since they account for a large proportion of electrical energy consumption. Such drive systems have a central function in achieving energy savings.



Robotics

As our systems get smarter and more aware, the applications for robotics continue to grow. These robots and assistants will transform many aspects of our lives, from industry to medical care to transportation. At the heart of the robot are the motors and actuators which allow it to move and interact with us and our world.



Power Conversion

There is an increasing focus on achieving higher and consistent power conversion efficiencies at any load in high-voltage applications such as industrial/factory automation and other adjacent markets. As such applications are seeking high level of performance in addition to equal emphasis on carbon footprint reductions, future ready power conversion topologies are fundamental to make such applications commercially viable and sustainable.



Product Families
Interactive Block Diagrams
Download Strata Software

Product Families

Wide Bandgap Solutions

Silicon Carbide (SiC) and Gallium Nitride (GaN) are the next generation materials for high performance power conversion and electric vehicle. These wide bandgap (WBG) materials will power future applications for high performance



Power Module Solutions

Power modules are important building blocks in power conversion and motor control applications having power ratings of 100 W to 100 kW. Solar and UPS systems use power modules to boost the voltage from the solar panels and batteries to a suitable DC voltage.



Gate Driver Solutions

Every switch needs a gate driver. Gate Driver Products are the interface between control signals (from a digital or analog controller) and power switches (IGBTs, MOSFETs, SiC MOSFETs, and GaN HEMTs). ON Semiconductor's diverse portfolio of gate drivers contains the right solution for a range of systems including Automotive, Industrial, Cloud and Telecom applications.



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