

White Goods Solutions



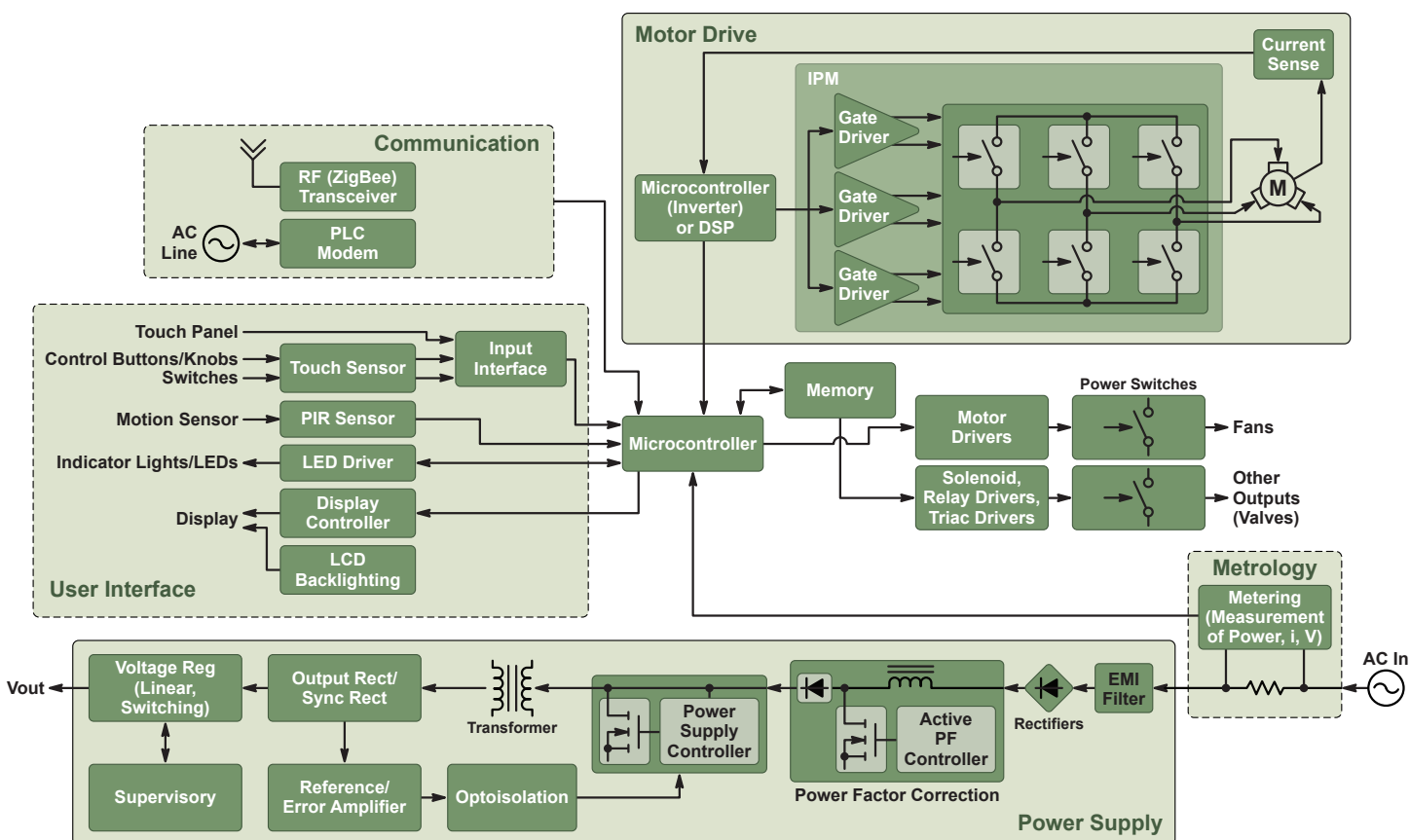
www.onsemi.com

*Power management, motor control, and interface solutions
for home appliances from ON Semiconductor.*

ON Semiconductor Provides Complete Solutions for White Goods

Functions

- **Power Supply:** Rectifies incoming AC to provide system power
- **Inverter Drive:** Used in inverter applications for variable speed motor drive
- **System Control:** Controls valves, switches, pumps, auxiliary motors, and general system operation
- **User Interface:** Input/output for human/machine interface
- **Smart Appliance:** Smart Grid and Home Area Network interface



Interface

- Light & Proximity Sensing
- Touch Switch Control
- Display Drive & Control

Power Management

- AC-DC Conversion
- DC-DC Conversion
- Power Factor Control
- Power Inversion



Connectivity

- Wired
- Wireless

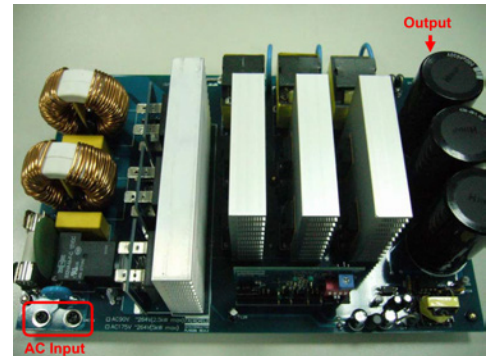
Control

- Inverter Drive
- Motor Control
- Motor Drive
- Induction Heating
- Switching & Valve Control

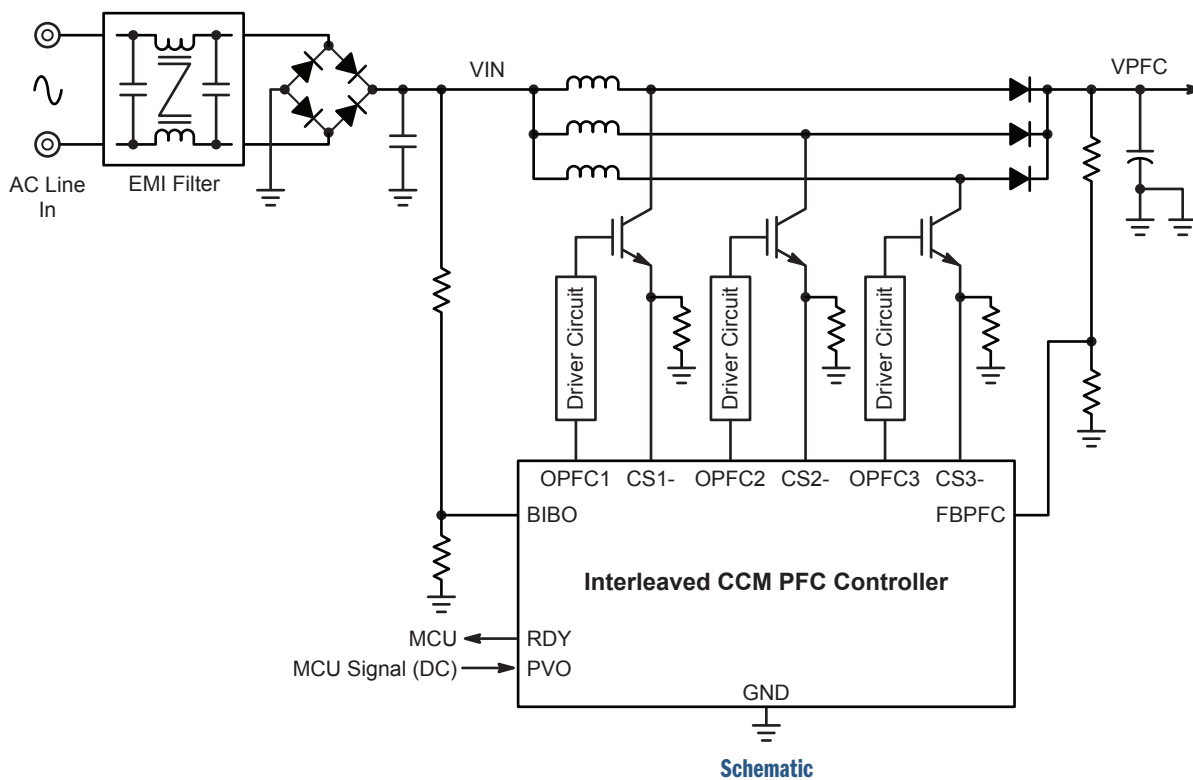
High Power Interleaved PFC Controllers

5 kW High Performance Three Channel CCM PFC

- CCM operation with average current mode control for high efficiency up to 97.6 %
- Programmable operation frequency range: 18 - 40 kHz or 55 - 75 kHz
- PFC slave channel management for high efficiency from full load to light load
- TriFault Detect protects against feedback loop failure
- SAG protection for robustness operation
- Differential current sensing for improved noise immunity
- For more information, see [AN-FEBFAN9673-B01H5000A.pdf](#)



Demo Board



Device	PFC Mode	Channels	Fsw Typ (kHz)	UVLO (V)	Latch	UVP	Vcc Max (V)	Drive Capability (mA)	Package
FAN9672	CCM	2	40 / 75	12.8	No	Yes	30	450 / 550	LQFP-32
FAN9673	CCM	3	40 / 75	12.8	No	Yes	30	450 / 550	LQFP-32

Flyback Switching Controllers

20 W, High Efficiency Offline Power Supply Features

- Simple, single switch DCM flyback topology based on NCP1251B
- Very high efficiency with synchronous output rectification based on NCP43080
- Typical efficiency 84% at full load
- Current mode control with adjustable output current
- Low cost components
- For more information, see [DN05028/D](#)



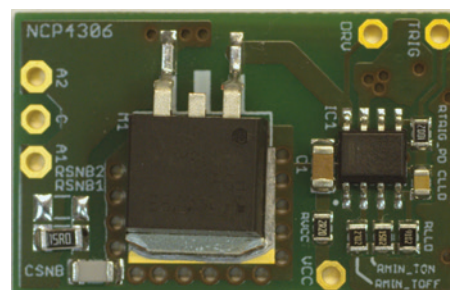
Demo Board

Device	Control Mode	F _{sw} Typ (kHz)	Standby Mode	UVLO (V)	Short Circuit Protection	Latch	Soft Start	V _{CC} Max (V)	Drive Capability (mA)	Package
NCP12600	Current	65, 100, Multimode	Yes	8.9	Yes	Yes or No	Yes	28	300 / 500	TSOP-6
NCP12510	Current	65, 100	Yes	8.9	Yes	Yes or No	Yes	35	300 / 500	TSOP-6
NCP1256	Current	65, 100	Yes	8.9	Yes	Yes or No	Yes	28	500 / 500	TSOP-6
NCP1250	Current	65, 100	Yes	8.8	Yes	Yes	Yes	28	300 / 500	TSOP-6
NCP1251	Current	65, 100	Yes	8.8	Yes	Yes or No	Yes	28	300 / 500	TSOP-6
NCP1253	Current	65, 100	Yes	8.8	Yes	Yes or No	Yes	28	300 / 500	TSOP-6

Synchronous Rectifier Controllers

Small Form Factor, High Performance Synchronous Rectification Solution Features

- Supports CCM, QR, and DCM operation
- Precise turn-off comparator 0 mV
- Wide input voltage range up to 35 V
- High operation frequency up to 1 MHz
- Adjustable minimum ON and OFF times
- Adjustable light load detection Feature
- For more information, see [EVBUM2520/D](#)



Demo Board

Device	Function	CS Rating (V)	Drive Capability (A)	Package
NCP4305	High Performance Secondary Side Synchronous Rectification Driver	200	4 / 8	SOIC-8, DFN-8, WDFN-8
NCP4308	High Performance Secondary Side Synchronous Rectification Driver without LLD	150	4 / 8	SOIC-8, DFN-8
NCP43080	High Performance Secondary Side Synchronous Rectification Driver	150	4 / 8	SOIC-8, DFN-8
NCP4306	High Performance CCM Secondary Side Synchronous Rectification Driver	200	2 / 7	TSOP-6, SOIC-8

AC-DC Regulators

NCP1076B Flyback Converter Features

- Universal AC input range (85-265 Vac)
- 18 W, 12 V single output
- Adjustable brown-out function, AC line over-voltage protection and over-power protection
- Output ripple voltage <100 mV @ full load
- Integrated protection including output OVP, OCP and SCP; input UVP and OVP; switcher OTP
- No-load power consumption <60 mW @ 85-265 Vac
- Over 84% peak efficiency at full load / 230 Vac
- For more information see [EVBUM2414/D](#)

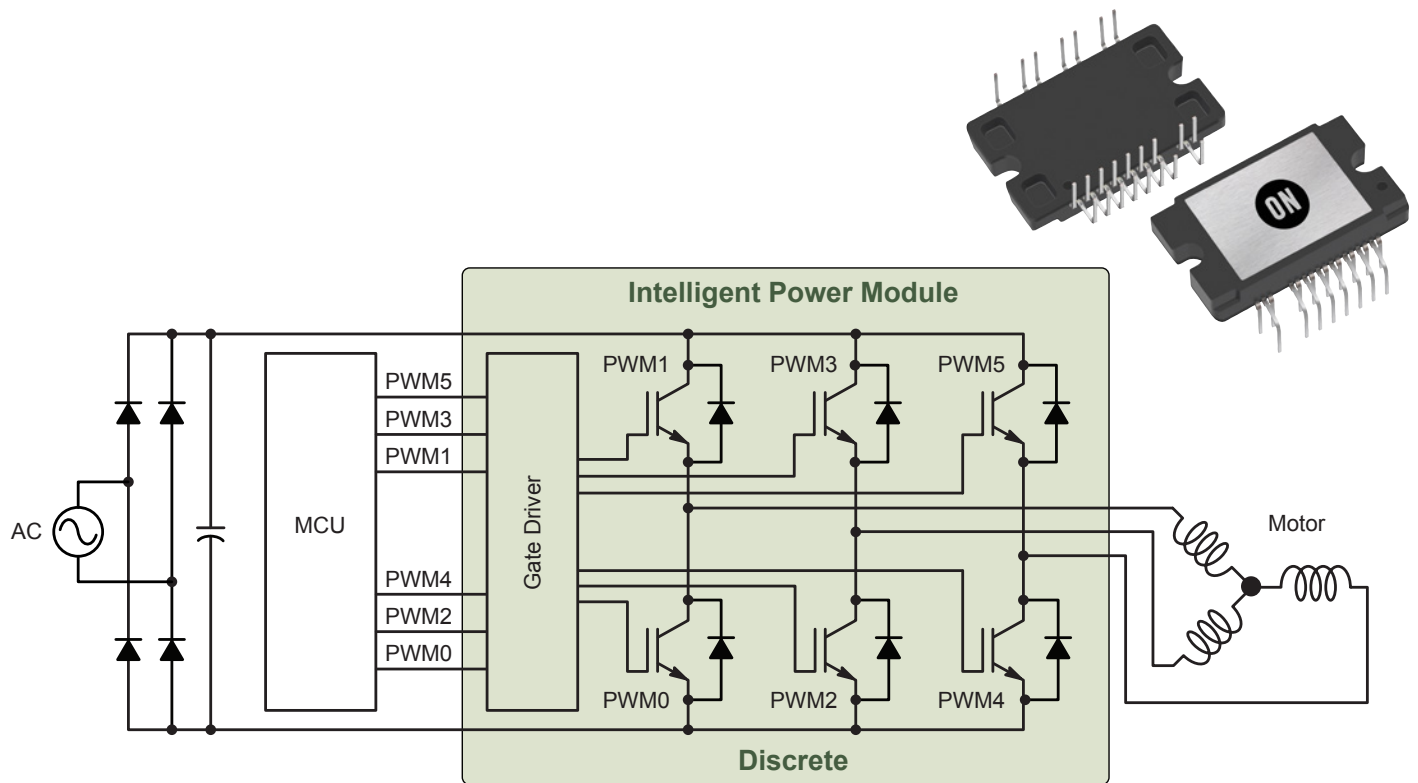
NCP1060, 12 Vout, 2 W Off-line Buck Regulator Features

- 85 - 265 Vac universal input
- 4 to 16 Vdc, depending on selected Zener value
- Less than 1% output ripple
- 100 to 150 mA for 12 Vout
- Auxiliary Vcc to run the chip improves the overall efficiency
- Over 78% peak efficiency @ 230 Vac
- For more information see [NCP1060BUCKGEVB](#)

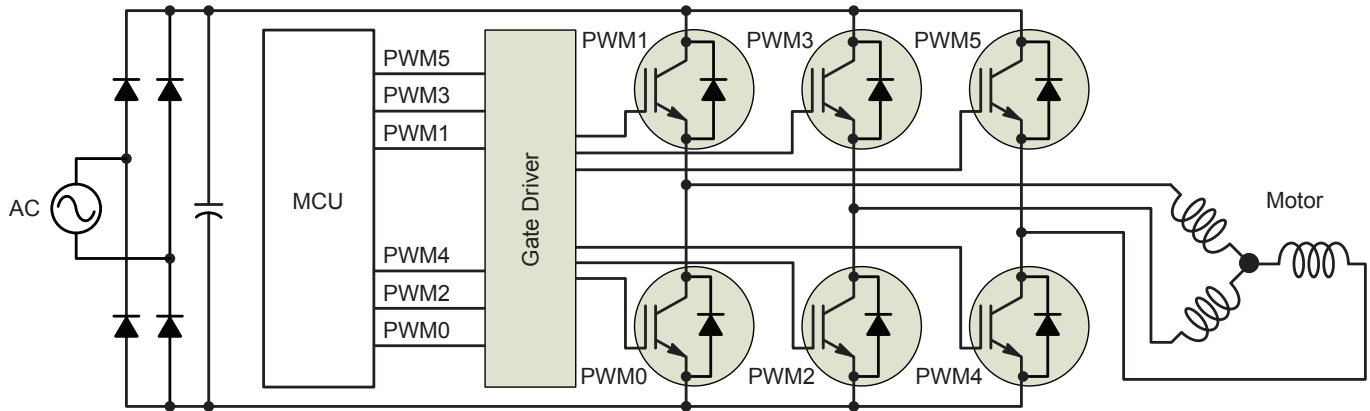


Device	Output Power Max (W)	Mode	Power Switch Voltage (V)	Peak Current Limit (mA)	RDS(on) Typ (Ω)	HV Startup Min (V)	Frequency Options (kHz)	Dynamic Self Supply	Fsw Foldback	Brown-in Brownout	Line OVP	Topology	Package
NCP1060	4	Current	700	Adj	34	21	60,100	Yes	Yes	Yes	No	Buck/Non-iso Flyback/Flyback	SOIC-10, PDIP-7
NCP1063	11	Current	700	Adj	11	21	60,100	Yes	Yes	Yes	No	Buck/Non-iso Flyback/Flyback	PDIP-7, SOIC-16
NCP1070	4	Current	700	250	22	30	65,100,130	Yes	Yes	Yes	No	Flyback	SOT-223, PDIP-7
NCP1071	5	Current	700	350	22	30	65,100,130	Yes	Yes	Yes	No	Flyback	SOT-223, PDIP-7
NCP1072	11	Current	700	350	11	30	65,100,130	Yes	Yes	Yes	No	Flyback	SOT-223, PDIP-7
NCP1075A/B	15	Current	700	350	13	30	65,100,130 (only B)	Yes	Yes	Yes	Yes	Flyback	PDIP-7 A&B
NCP1076A/B	20	Current	700	650	4.7	30	65,100,130 (only B)	Yes	Yes	Yes	Yes	Flyback	PDIP-7 A&B
NCP1077A/B	20	Current	700	850	4.7	30	65,100,130 (only B)	Yes	Yes	Yes	Yes	Flyback	PDIP-7 A&B
NCP1079A/B	30	Current	700	1050	2.7	30	65,100,130 (only B)	Yes	Yes	Yes	Yes	Flyback	PDIP-7 A&B
FSL106	10	Current	650	Adj	11.5	35	67, 100	No	No	No	No	Flyback	DIP-8
FSL116	14	Current	650	Adj	7.3	35	50, 100	No	No	No	No	Flyback	DIP-8
FSL126	17	Current	650	Adj	4.9	35	67, 100	No	No	No	No	Flyback	DIP-8
FSL136	20	Current	650	Adj	3.5	35	67, 100	No	No	No	No	Flyback	DIP-8, LSOP-8
FSL146	26	Current	650	Adj	2.1	26	67	No	No	No	No	Flyback	DIP-8
FSL156	30	Current	650	Adj	1.8	26	67	No	No	No	No	Flyback	DIP-8
FSL117	10	Current	700	800	8.8	26	67	No	No	No	Yes	Flyback	DIP-8
FSL137	20	Current	700	1300	4	26	67	No	No	No	Yes	Flyback	DIP-8
FSL126MRT	25	Current	650	1,200	4.9	26	67	No	No	No	No	Flyback	TO-220F6
FSL136MRT	35	Current	650	2,150	3.5	26	67	No	No	No	No	Flyback	TO-220F6
FSL176MRT	70	Current	650	3,500	1.3	26	67	No	No	No	No	Flyback	TO-220F6
FSL128MRT	25	Current	800	1200	6.3	26	67	No	No	No	No	Flyback	TO-220F6
FSL138MRT	35	Current	800	2150	4	26	67	No	No	No	No	Flyback	TO-220F6
FSL336	20	Current	650	Adj	3.5	13	50	Yes	Yes	No	No	Buck/Non-iso Flyback	DIP-7, LSOP-7
FSL337	20	Current	700	Adj	3.5	13	50	Yes	Yes	No	No	Buck/Non-iso Flyback	DIP-7, LSOP-7
FSL4110	9	Current	1000	520	10	26	50	Yes	No	No	Yes	Flyback	DIP-7, LSOP-7

Inverter Drive – Discrete and Module Designs



Discrete IGBTs for Inverter Design



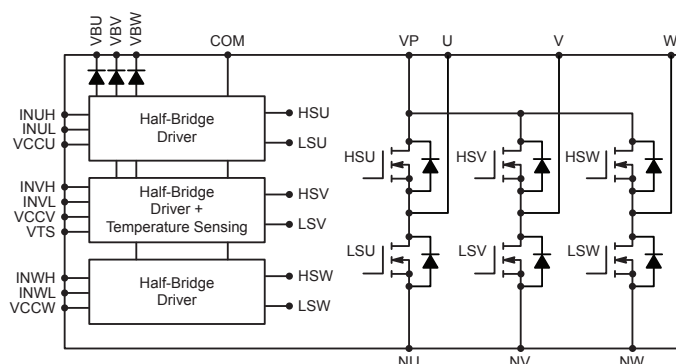
Device	V _{CES} (V)	I _C @ 25°C (A)	I _C @ 100°C (A)	Package
FGD3N60UNDF	600	6	3	DPAK
NGTB03N60R2	600	9	4.5	DPAK
FGB5N60UNDF	600	10	5	D2PAK
FGB7N60UNDF	600	14	7	D2PAK
NGTB05N60R2	600	16	8	DPAK
NGTB10N60R2	600	20	10	DPAK
FGP10N60UNDF	600	20	10	TO-220
FGPF10N60UNDF	600	20	10	TO-220F
NGTB10N60	600	20	10	TO-220F
NGTB15N60R2	600	24	14	TO-220F
FGP15N60UNDF	600	30	15	TO-220
FGPF15N60UNDF	600	30	15	TO-220F

Intelligent Power Modules (IPM) for Inverter Designs

SPM® 5 V2 Series: 50 – 200 W

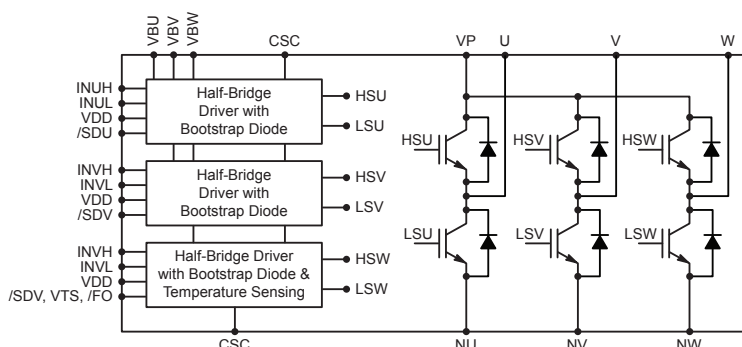
Surface mount module family with MOSFET/body diode optimized for motor drive, voltage dependent temperature output, UVLO and long short-circuit withstand time.

Device	Rating (V)	I _O (A)	R _{DS(ON)} (Ω)
FSB50760SFS	600	3.6	0.53
FSB50660SFS	600	3.1	0.7
FSB50550AS	500	1.2	1.4
FSB50450AS	500	1.5	2.4
FSB50250AS	500	1.2	3.8



SPM 8 Series: 200 – 800 W

Module family with short-circuit rated IGBT and mounting holes for heatsinking. Features include shoot-through prevention, integrated bootstrap diodes and OCP, OTP, UVLO protection.

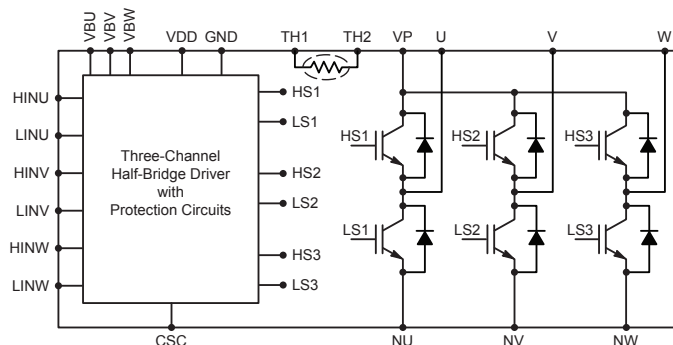
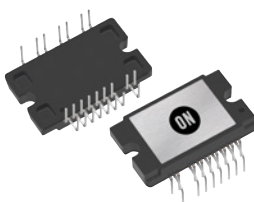


Device	Rating (V)	I _O (A)	V _{CE(SAT)} (V)
FNB81060T3	600	10	2.1

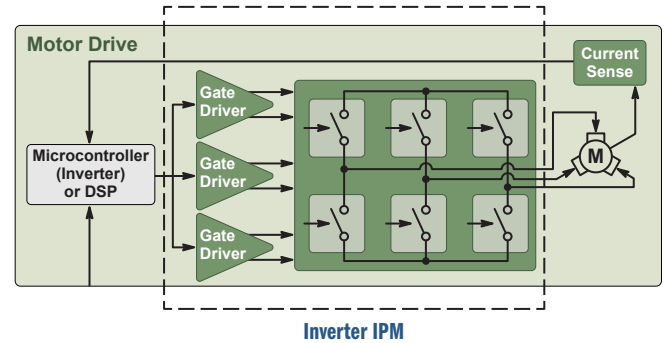
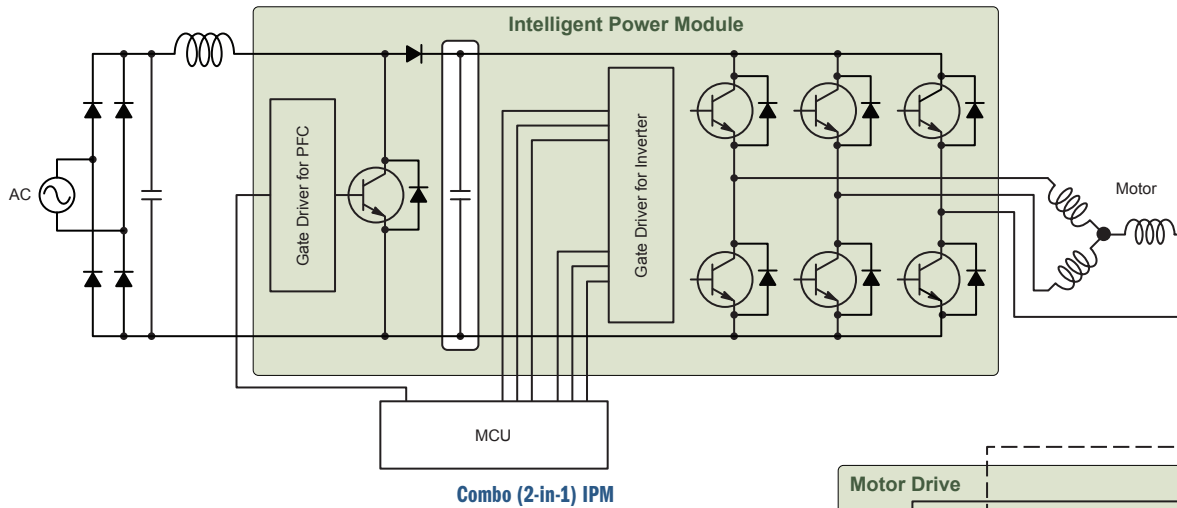
Compact IPM: 600 V / 3 – 15 A (200 W – 1.1 kW)

Module series with DBC for lowest thermal resistance and highest power density. IGBT/diode optimized for best power efficiency while meeting EMI requirements

Device	Rating (V)	I _O (A)	I _{OP} (A)
STK5C4U332J-E	600	3	6
STK5Q4U340J-E	600	5	10
STK5Q4U352J-E	600	8	16
STK5Q4U362J-E	600	10	20



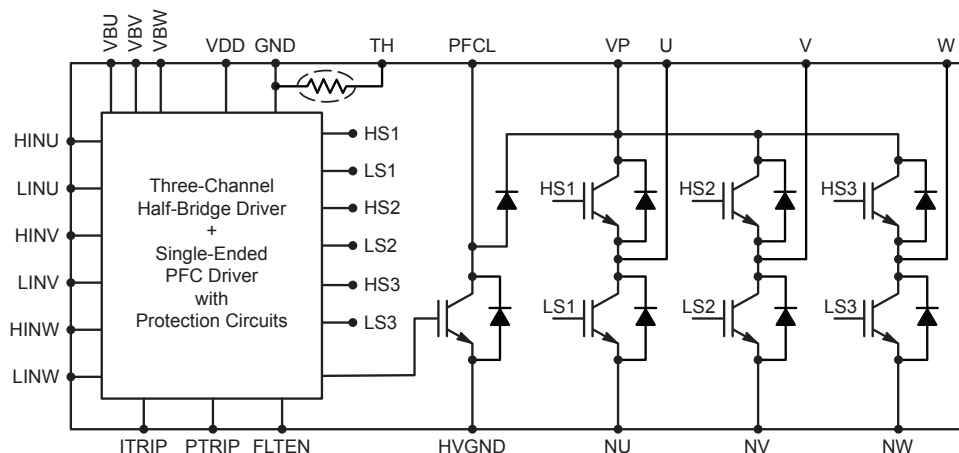
Intelligent Power Modules (IPM) for Inverter Designs



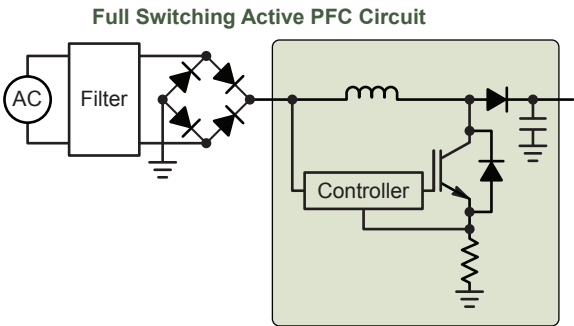
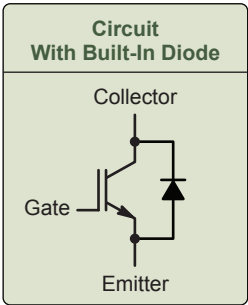
2-in-1 PFC IPM: 600 V / 15 - 30 A (1.1 - 6 kW)

All power devices for PFC and motor control are built-into one package including thermistor, OCP and low voltage protection circuit, bootstrap circuit and cross-conduction prevention circuit.

Device	Power (kW)	I _o (A)	Topology	Configuration
STK57FU394AG-E	3	15	Boost PFC	3 Emitter
STK5MFU3C1A-E	6	30	Boost PFC	Single



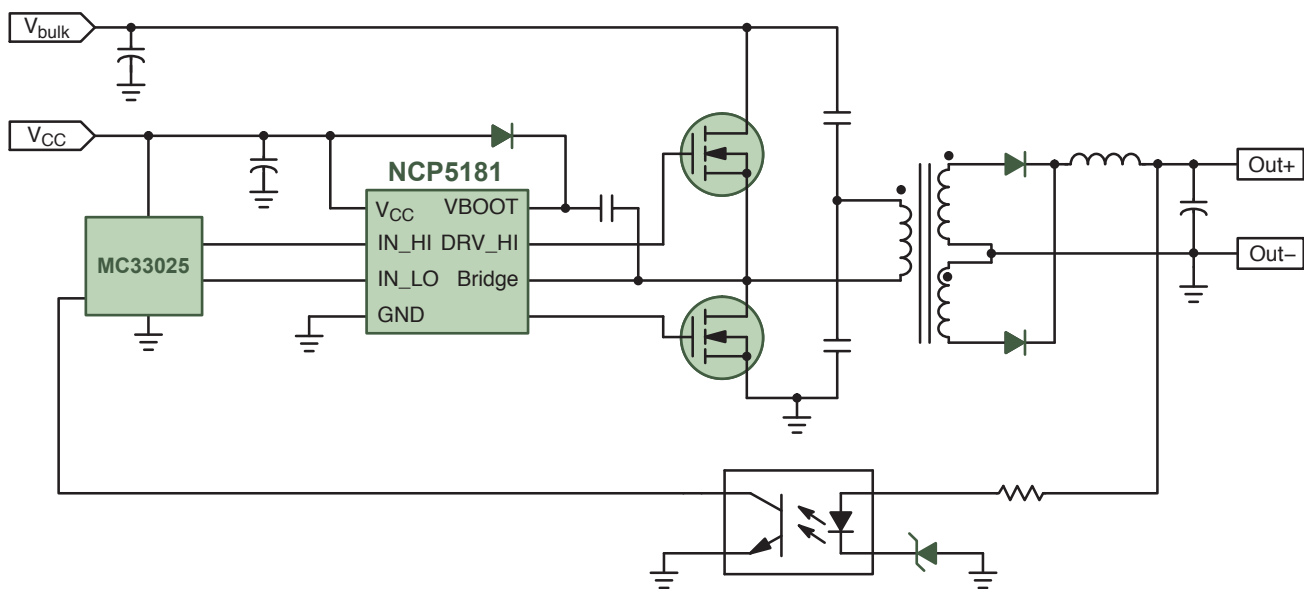
IGBTs for Power Factor Controllers



Device	V _{CES} (V)	I _c @ 25°C (A)	I _c @ 100°C (A)	Package
FGAF20N60SMD	650	40	20	TO-3PF
FGA3060ADF	600	60	30	TO-3P
NGTB30N60L2	600	100	30	TO-247
NGTB40N65IHRTG	650	80	40	TO-3P
NGTB40N65IHRWG	650	80	40	TO-247
FGAF40N60SMD	600	80	40	TO-3PF
FGAF40S65AQ	650	80	40	TO-3PF
FGA4060ADF	600	80	40	TO-3P
FGA5065ADF	650	100	50	TO-3P
FGH50T65SQD-F155	650	100	50	TO-247
FGA6065ADF	650	120	60	TO-3P
FGH75T65SQD-F155	650	150	75	TO-247

MOSFET/IGBT Gate Drivers

Device	Description	Number of Drivers	V _{CC} Max (V)	Drive Source/Sink Typ (mA)	Rise Time (ns)	Fall Time (ns)	t _{ON} Propagation Delay (ns)	t _{OFF} Propagation Delay (ns)	Cross Conduction Protection	Package
NCP5104	Single Input High and Low Side MOSFET or IGBT Driver	2	20	250/500	85	35	620	100	—	SOIC-8, PDIP-8
NCP5106	Dual Input High and Low Side MOSFET or IGBT Driver	2	20	250/500	85	35	100	100	B version	SOIC-8, PDIP-8
NCP5111	Single Input High and Low Side MOSFET or IGBT Driver	2	20	250/500	85	35	750	100	—	SOIC-8, PDIP-8
NCP5304	Dual Input High and Low Side MOSFET or IGBT Driver	2	20	250/500	85	35	100	100	Yes	SOIC-8, PDIP-8
NCP5181	Dual Input High and Low Side MOSFET or IGBT Driver	2	20	1400/2200	40	20	100	100	No	SOIC-8, PDIP-8

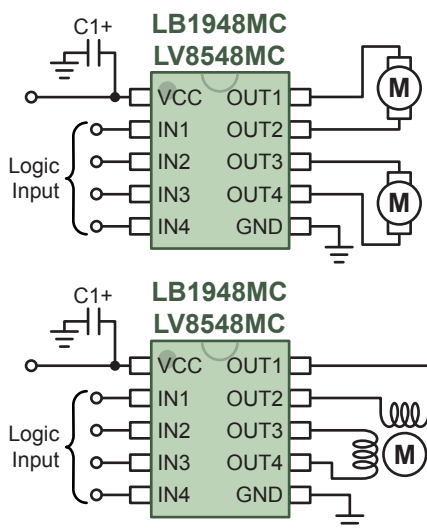
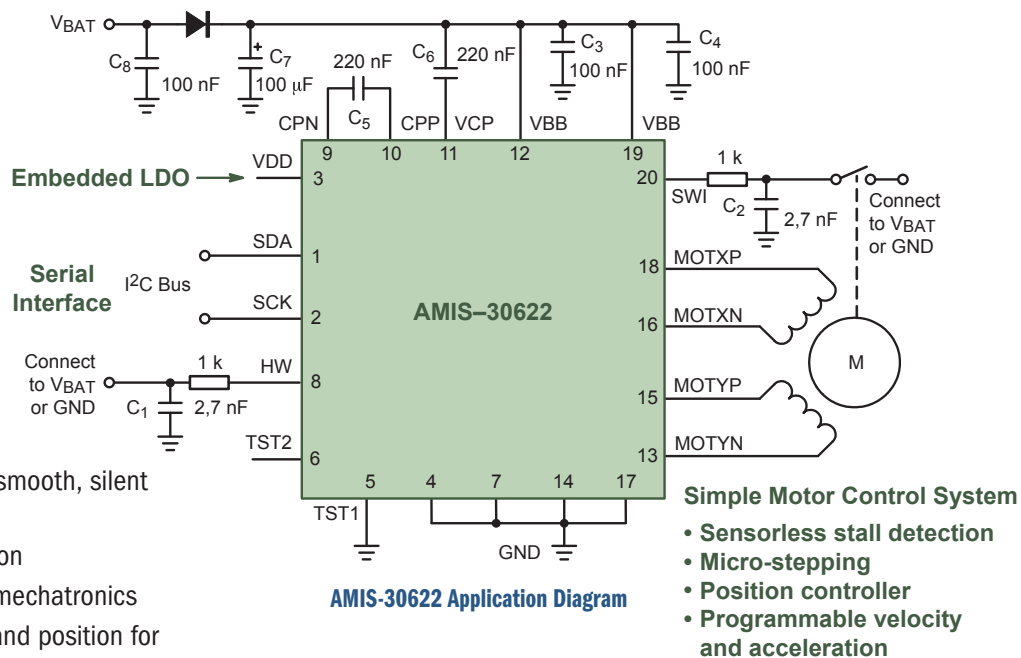


NCP5181 Application Diagram

Stepper Motor Drivers for Motion Control

AMIS-30622 Features

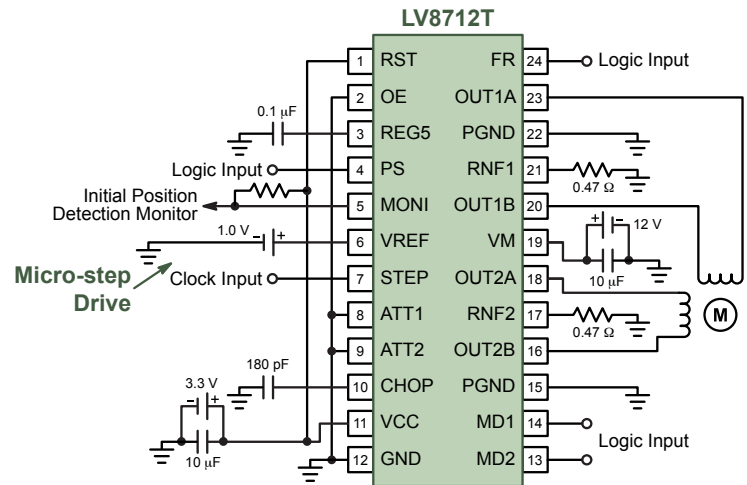
- High resolution micro-stepping for smooth, silent movement
- Integrated sensor-less stall detection
- Single chip control and drivers for mechatronics
- Dynamic control of speed, torque, and position for continuous motion



Stepper Motor Drivers for Motion Control

LV8712T & LV8713T Features

- Single channel PWM constant current control
- Excitation mode: LV8712T – full step, half step, 1/4 step, 1/8 step;
LV8713T – full step, half step, 1/16 step, 1/32 step
- Integrated thermal shutdown and low-voltage detection
- Integrated active flyback protection



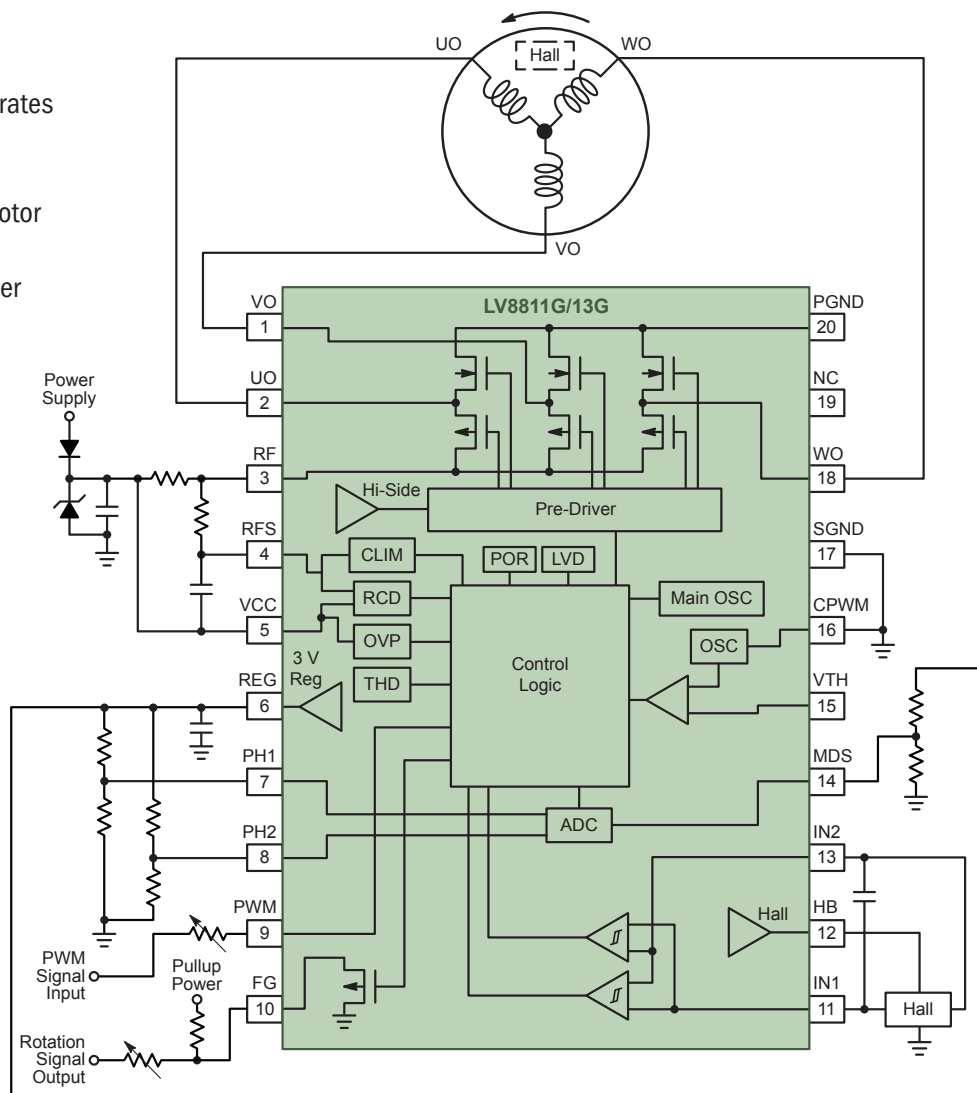
LV8712T, LV8713T: 5-12 V Application Diagram

Device	Type	V _M Max (V)	V _{CC} Max (V)	I _O Max (A)	I _O Peak Max (A)	Step Resolution	Control Type	Current Sense	Regulator Output	Package
LB1930MC	Brush DC	11	–	1	–	–	Parallel	None	No	SOIC-10
LV8711T	Stepper / Dual Brush DC	18	6	0.8	1	1, 1/2	Parallel	External Resistor	Yes	TSSOP-24
LV8712T	Stepper	18	6	0.8	1	1, 1/2, 1/4, 1/8	Clock	External Resistor	Yes	TSSOP-24
LV8713T	Stepper	18	6	0.8	1	1, 1/2, 1/16, 1/32	Clock	External Resistor	Yes	TSSOP-24
LV8548MC	Stepper / Dual Brush DC	20	–	1	–	1, 1/2	Parallel	None	No	SOIC-10
LV8549MC	Stepper	20	–	1	–	1	Parallel	None	No	SOIC-10
LB1948MC	Stepper / Dual Brush DC	20	–	0.8	–	1, 1/2	Parallel	None	No	MFP-10SK
LB1909MC	Stepper	20	–	0.8	–	1	Parallel	None	No	SOIC-10
AMIS30623	Stepper	30	40	0.8	0.8	1/16	LIN	Fully Integrated	Yes	NQFP-32, SOIC-20W
AMIS30624	Stepper	30	40	0.8	0.8	1/16	I2C	Fully Integrated	Yes	NQFP-32, SOIC-20W
LV8731V	Stepper / Dual Brush DC	36	–	2	2.5	1, 1/2, 1/4, 1/16	Clock; Parallel	External Resistor	Yes	SSOP-44K
LV8760T	Brush DC	38	6	3	4	–	Parallel	External Resistor	Yes	TSSOP-20J
AMIS30622	Stepper	40	–	0.8	0.8	1/16	I2C	Fully Integrated	No	NQFP-32, SOIC-20W

Brushless DC Motor Solutions for Cooling Fan Control

LV8811G, LV8813G, and LV8814J Features

- 3-Phase, 180° BLDC
- Flexible plug-and-play solution accelerates time to market
- Integrated limiter, thermal shutdown, overcurrent/overvoltage, and locked rotor protection increase system reliability
- Low $R_{DS(on)}$ of 0.5 mΩ reduces power and heat
- Single Hall sensor or Hall-IC control
- Sinusoidal drive
- Soft start
- Lead angle adjustment
- PWM or DC voltage control

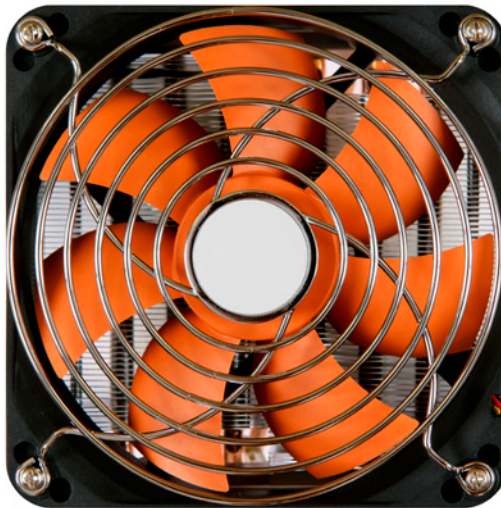
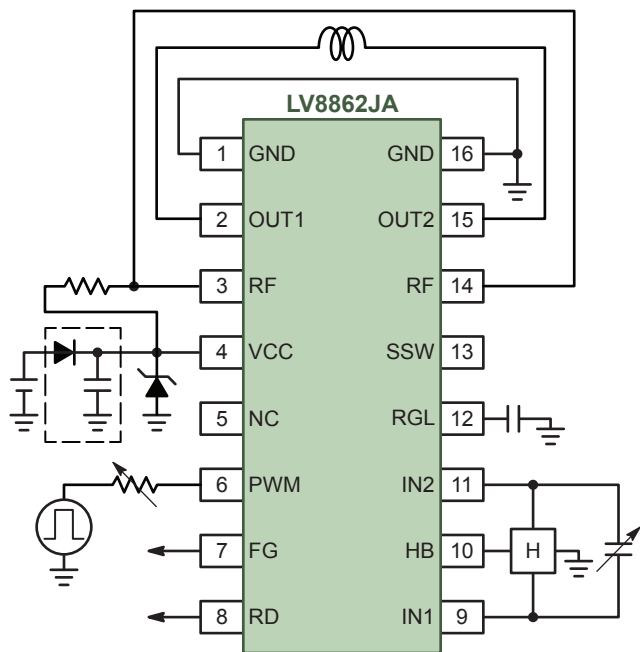


Device	Phases	Type	Output Type	V _M Max (V)	V _{CC} Max (V)	I _O Max (A)	Speed Control Type	Standby	FG	Lock Protection	Package
LB11696V	3	with Sensor	Pre	—	18	0.03	DC/PWM	Yes	1Hall/3Hall	Yes	SSOP-30
LV8139JA	3	with Sensor	Built in	—	18	0.015	DC	Yes	1Hall/3Hall	Yes	SSOP-30
LV8121V	3	with Sensor	Built in	36	36	3.5	DC	Yes	1Hall	Yes	SSOP-44K
LV8811G	3	with Sensor	Built in	20	20	2.0	DC/PWM	None	1Hall	Yes	TSSOP-20J
LV8813G	3	with Sensor	Built in	20	20	2.0	DC/PWM	None	1Hall	Yes	TSSOP-20J
LV8814J	3	with Sensor	Built in	20	20	2.0	DC/PWM	None	1Hall	Yes	SSOP-20
LV8862JA	1	with Sensor	Built in	20	20	1.5	PWM	Yes	—	Yes	TSSOP-16
LV11961HA	1	with Sensor	Built in	18	18	1.0	DC	Yes	—	Yes	HSSOP-14

Brushless DC Motor Control for Cooling Fans

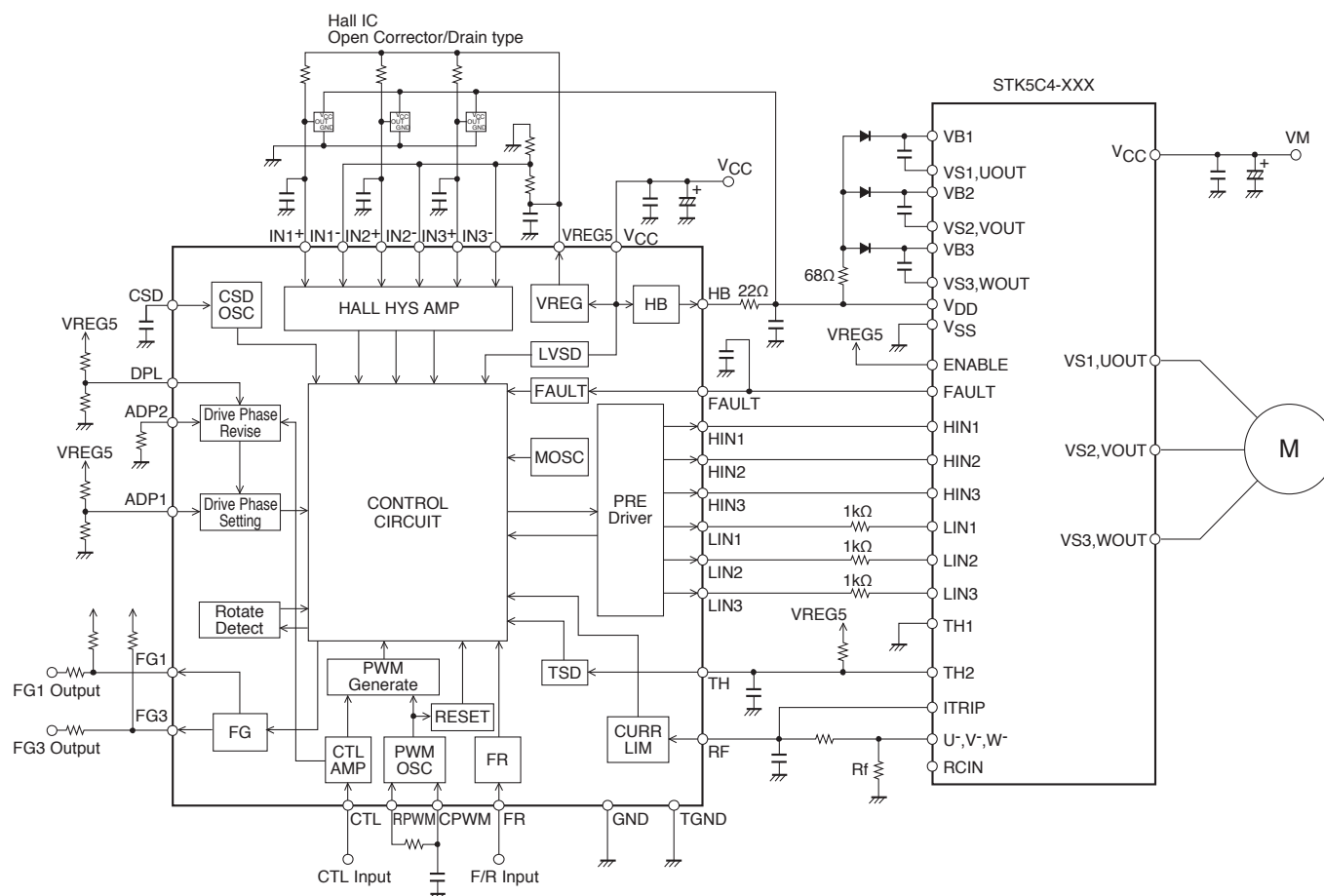
LV8862JA Features

- Integrated protection and recovery functions simplify system design and increase reliability
- Low $R_{DS(on)}$ of 0.6 m Ω reduces operating temperature and power consumption
- Single-phase full-wave operation by silent PWM driver
- Speed control by PWM input
- Lock protection and automatic recovery circuit
- PWM-soft switching drive method
- Synchronous rectification
- Soft-switch period selectable
- Low heat generation
- Quick start circuit
- Current limiter adjustable by R_f resistance
- Hall bias output pin
- FG (Rotation Pulse) / RD (Lock Detection) Pin
- TSD



LV8139JA Features

- 3-phase bipolar drive
- Sine wave PWM drive
- Drive phase setting function
- Supports power saving mode
- Supports bootstrap
- Auto recovery lock protection
- Forward/reverse switching
- Current limit
- Low voltage protection
- Overheat protection
- FG1 / FG3 output



LV8139JA Application Diagram

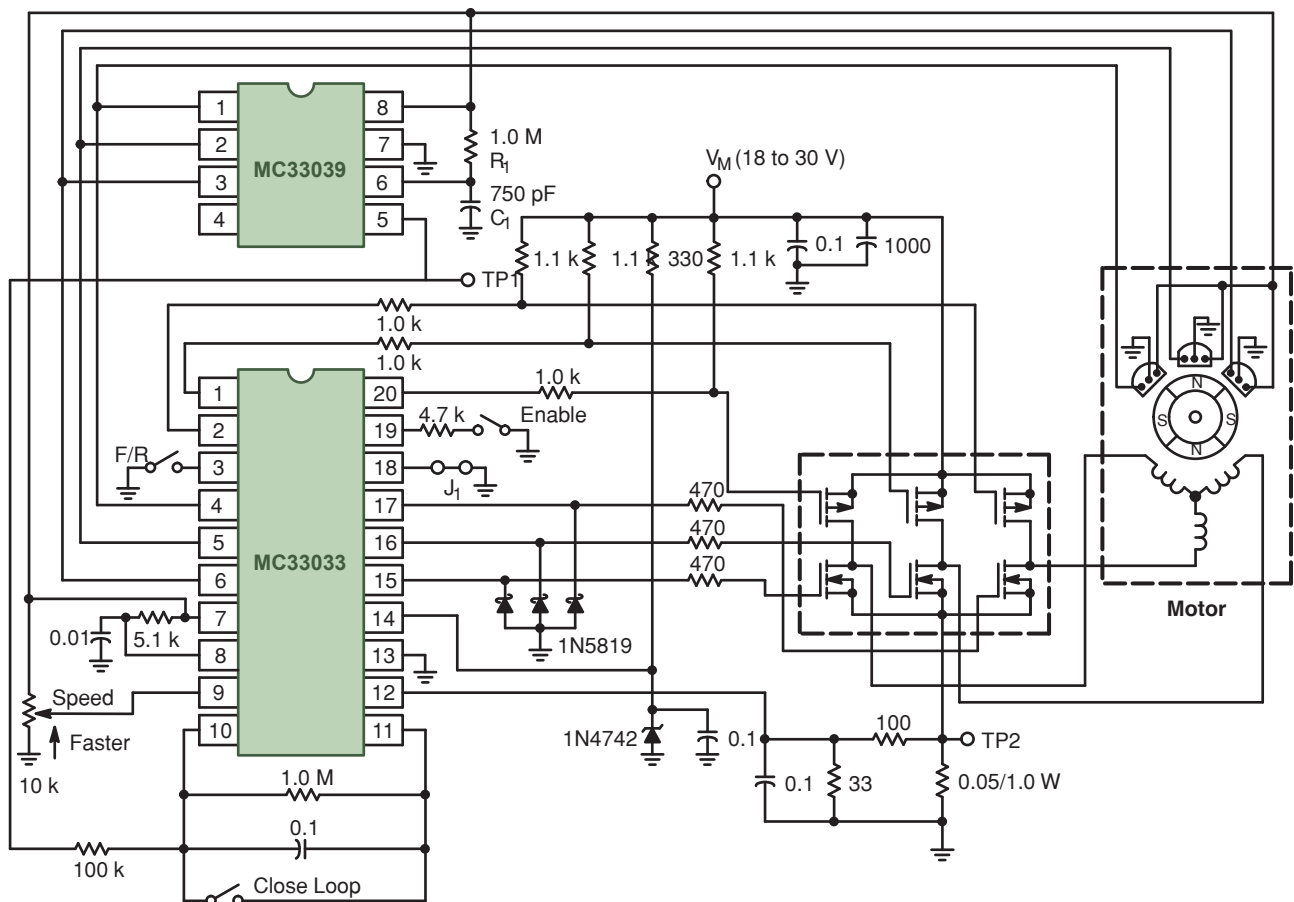
Brushless DC Motor Control

MC33033/5 Features

- Rotor position decoder for proper commutation sequencing
- Temperature compensated reference capable of supplying sensor power
- Frequency programmable sawtooth oscillator
- Three open collector top drivers
- Three high current totem pole bottom drivers

MC33039 Features

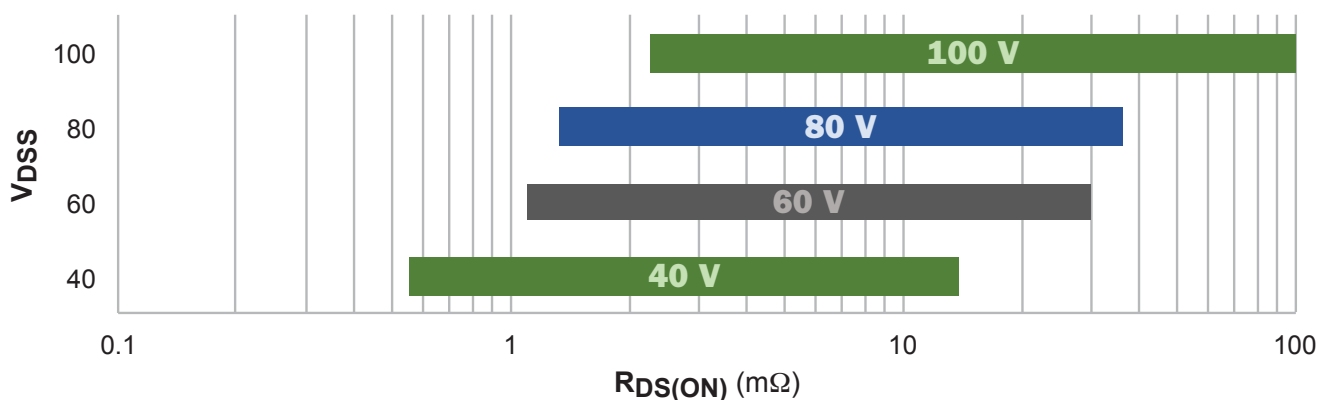
- Digital detection of each input transition for improved low speed motor operation
- Operation down to 5.5 V for direct powering from MC33035 reference
- Internal shunt regulator allows operation from a non-regulated voltage source
- Inverter output for easy conversion between 60°/300° and 120°/240° sensor phasing conventions



Application Diagram for MC33033 and MC33039

Medium Voltage Power MOSFETs for Motor Control

ON Semiconductor offers an expansive portfolio of MV Power MOSFETs, utilizing advanced Trench technology. Devices enable increased system level efficiency through low conduction losses and low switching losses, and are available in a range of standard and innovative packages.



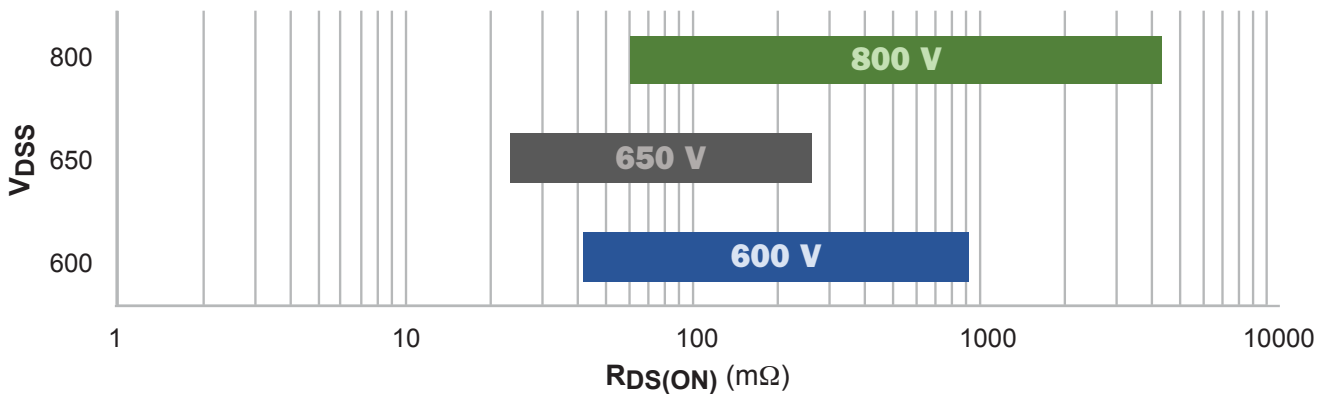
N-Channel Power MOSFETs

Device	Type	V _{DS} (V)	R _{DS(ON)} (mΩ)	Q _{G(TOT)} (nC)	Package
FDBL0065N40	Single	40	0.65	220	TO-LL (H-PSOF)
FDBL0110N60	Single	60	1.1	170	TO-LL (H-PSOF)
FDBL0150N80	Single	80	1.4	172	TO-LL (H-PSOF)
FDBL0200N100	Single	100	2	95	TO-LL (H-PSOF)
FDBL0630N150	Single	150	6.3	70	TO-LL (H-PSOF)
FDB0105N407L	Single	40	0.8	208	D2-PAK 7L (TO-263)
FDB0170N607L	Single	60	1.4	173	D2-PAK 7L (TO-263)
FDB0165N807L	Single	80	1.6	217	D2-PAK 7L (TO-263)
FDB1D7N10CL7	Single	100	1.7	116	D2-PAK 7L (TO-263)
FDB0630N1507L	Single	150	6.4	97	D2-PAK 7L (TO-263)
FDMD85100	Half Bridge	100	9.9	22	PQFN-8
FDMD8580	Half Bridge	80	4.6	57	PQFN-8
FDMD8560L	Half Bridge	60	3.2	92	PQFN-8
FDMD8540L	Half Bridge	40	1.5	81	PQFN-8
FDMD82100	Half Bridge	100	19	12	PQFN-12
FDMD8280	Half Bridge	80	8.2	31	PQFN-12
FDMD8260L	Half Bridge	60	5.8	49	PQFN-12
FDMD8240L	Half Bridge	40	2.6	40	PQFN-12

Device	Type	V _{DS} (V)	R _{DS(ON)} (mΩ)	Q _{G(TOT)} (nC)	Package
NTMFS5C404NLT	Single	40	0.67	181	SO-8FL (DFN-5)
NTMFS5C604NL	Single	60	1.2	52	SO-8FL (DFN-5)
NTMFS6H800N	Single	80	2.2	82	SO-8FL (DFN-5)
FDM86180	Single	100	3.2	60	Power56
FDMC8360L	Single	40	2.1	57	Power33
NTTFS5C453NL	Single	40	3	35	μ8FL
FDMC86570L	Single	60	4.3	63	Power33
FDMC86340	Single	80	6.5	38	Power33
FDMC86184	Single	100	8.5	21	Power33
FDMT80040DC	Single	40	0.56	241	PQFN-8 (Power88)
FDMT80060DC	Single	60	1.1	170	PQFN-8 (Power88)
FDMT80080DC	Single	80	1.35	195	PQFN-8 (Power88)
FDMT800100DC	Single	100	2.95	79	PQFN-8 (Power88)
FDMT800120DC	Single	120	4.2	76	PQFN-8 (Power88)
FDMT800150DC	Single	150	6.5	77	PQFN-8 (Power88)

High Voltage Power MOSFETs for Motor Control

ON Semiconductor offers an expansive portfolio of HV Power MOSFETs, utilizing advanced SuperFET® technology. Devices enable increased system level efficiency through low conduction losses and low switching losses, and are available in a range of standard and innovative packages.



SuperFET® III MOSFETs

Device	V _{DS} (V)	R _{DS(ON)} (mΩ)	Q _{G(TOT)} (nC)	Package
FCH023N65S3L4	650	23	222	TO-247-4L
FCH023N65S3	650	23	222	TO-247
FCH040N65S3	650	40	136	TO-247
FCH067N65S3	650	67	78	TO-247
FCH099N65S3	650	99	56	TO-247
FCPF067N65S3	650	67	78	TO-220F
FCPF125N65S3	650	125	44	TO-220F
FCPF165N65S3L1	650	165	35	TO-220F
FCPF250N65S3ROL	650	250	24	TO-220F
FCP067N65S3	650	67	78	TO-220
FCP099N65S3	650	99	56	TO-220
FCP125N65S3	650	125	44	TO-220
FCP190N65S3	650	190	30	TO-220
FCMT099N65S3	650	99	56	Power88
FCB070N65S3	650	70	78	D2PAK
FCB199N65S3	650	199	30	D2PAK
FCB260N65S3	650	260	24	D2PAK
FCD260N65S3	650	260	24	DPAK

SuperFET® II MOSFETs

Device	V _{DS} (V)	R _{DS(ON)} (mΩ)	Q _{G(TOT)} (nC)	Package
FCH041N60E	600	41	285	TO-247
FCH070N60E	600	70	128	TO-247
FCP099N60E	600	99	88	TO-220
FCP125N60E	600	125	75	TO-220
FCP165N60E	600	165	57	TO-220
FCPF190N60E	600	190	63	TO-220F
FCD380N60E	600	380	34	DPAK
FCH060N80-F155	800	60	270	TO-247
FCH085N80-F155	800	85	196	TO-247
FCPF220N80	800	220	78	TO-220F
FCP220N80	800	220	78	TO-220
FCP400N80Z	800	400	43	TO-220
FCB290N80	800	290	58	D2PAK
FCU850N80Z	800	850	22	IPAK
FCD850N80Z	800	850	22	DPAK

Capacitive Touch Sensors

Design-Friendly, Low-Cost Operation, High Reliability

• Adhesive free	➔	• Reduce manufacturing cost and improve reliability by eliminating existing adhesive process
• Long sensor trace	➔	• Provide flexible PCB design
• Wide range operational temperature	➔	• Available in high-temperature environment
• No extra components	➔	• Reduce BOM
• High noise immunity	➔	• Improve stability and reliability



Control Panels



Appliances



Door Phone

INTERFACE

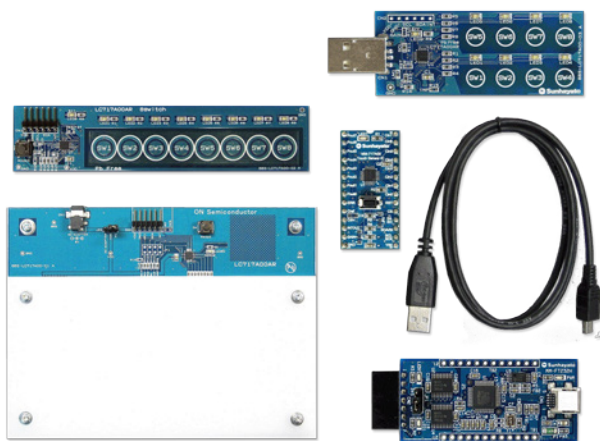
Capacitive Touch Sensors

LC717A devices are high performance, cost-effective, and highly usable capacitance converters, for use in touch switch applications. They have 8 or 16 channel capacitance-sensor inputs, and can replace mechanical switches. In particular, the LC717A30UJ has superior sensitivity performance, so it can detect both hands wearing multiple layers of gloves and hands with 15 cm of distance. In addition, it can perform gesture detection.

Features

- Differential capacitive detection using mutual capacitance
- Capacitance detection down to femtofarad level
- High sensibility performance
- High adaptability – calibration function, noise reduction, wide range temperature operation
- Design friendly – adhesive free, various circuit board design, minimal external components

Device	Proximity/Gesture Sensing (cm)	Sensing Inputs	Sensing Outputs	Interface Control	V _{DD} (V)	Package
LC717A00AJ	0-10	8	8	SPI / I2C	2.6 - 5.5	SSOP-30
LC717A00AR	0-10	8	8	SPI / I2C	2.6 - 5.5	VCT-28
LC717A10AJ/PJ	0-10	16	0	SPI / I2C	2.6 - 5.5	SSOP-30
LC717A10AR	0-10	16	0	SPI / I2C	2.6 - 5.5	VCT-28
LC717A30UJ	0-20	8	0	SPI / I2C	2.6 - 5.5	SSOP-30



LC717A00AR Evaluation Kit

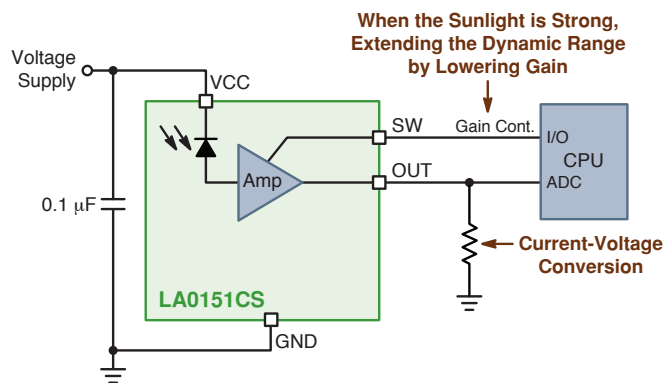
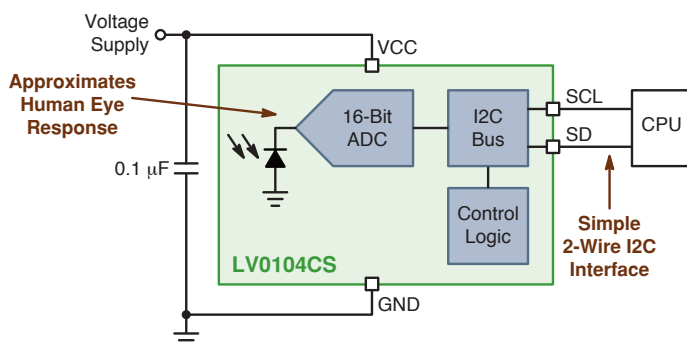
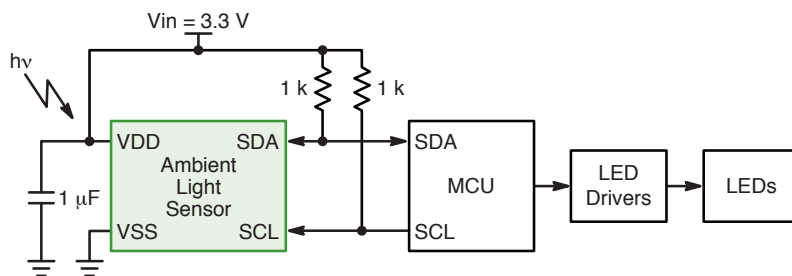


LC717A30UJ Evaluation Kit

Ambient Light & Proximity Sensors

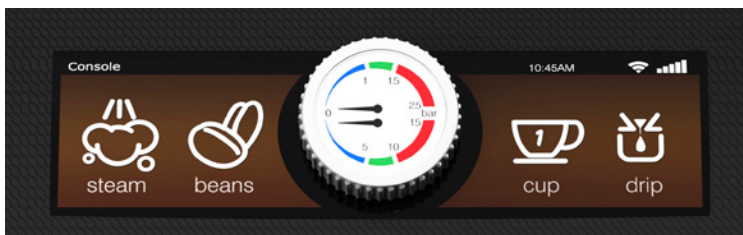
Features

- Design flexibility/customization (i.e., EEPROM if desired for trimming)
- 0.0125 lux detection with customizable filtering (i.e., Photopic Light Response)
- Dark current and temperature compensation
- Lowest power consumption per resolution bit
- I2C Interface (including High Speed Mode) and no effect on bus during power down



Device	Special Features	I _O Typ @ E _v = 100 Lux (µA)	Output Interface	V _{IN} Range (V)	T _A Range (°C)	Package
LA0151CS	2-Stage Gain Switching	8 (high gain)	Analog, linear current	2.2 - 5.5	-30 to +85	ODCSP-4
LV0104CS	Integrated Sleep Mode	—	I2C, 16-bit ADC	2.3 - 3.6	-30 to +85	ODCSP-4
LV0111CF	Standby Function	21	Analog, logarithmic current	2.3 - 5.5	-30 to +85	ODCSP-4J
NOA1212	Dark Current Compensation	51 (high gain)	Analog, linear current	2.0 - 5.5	-40 to +85	CUDFN-6
NOA1213	Dark Current Compensation	—	Analog	2.0 - 5.5	-40 to +85	CUDFN-6
NOA1305	Dark Current Compensation	—	I2C, 16-bit ADC	2.4 - 3.6	-40 to +85	CUDFN-6

LCD Drivers



Device	Duty	Com/Seg	V _{DD} Min (V)	V _{DD} Max (V)	V _{DD} -V _{EE} Min (V)	V _{DD} -V _{EE} Max (V)	Direction of Shift Data	Mode of Shift Data	Package(s)
LC79401KNE	1/64 - 1/256	80 Segment	2.7	5.5	12	32	—	—	QIP-100E
LC79430KNE	1/64 - 1/256	80 Common	2.7	5.5	12	32	Bidirectional	Single/Dual	QIP-100E
LC79431KNE	1/64 - 1/256	80 Common	2.7	5.5	12	32	Bidirectional	Single	QIP-100E

LCD Drivers

Device	Segments	Key Detect	V _{DD} Min (V)	V _{DD} Max (V)	V _{LCD} Min (V)	V _{LCD} Max (V)	V _I for Interface (V)	Output Ports	PWM Outputs	Character Generator	Package(s)
LC450029PKB	1/3 Duty: 159; 1/4 Duty: 208	—	4.5	6	VDD	VDD	VDD	—	—	—	Chip w / Au Bumps
LC450210PCH	1/8 Duty: 1600; 1/9 Duty: 1800; 1/10 Duty: 2000; 1/11 Duty: 2200; 1/12 Duty: 2400; 1/13 Duty: 2600; 1/14 Duty: 2800; 1/15 Duty: 3000; 1/16 Duty: 3200	—	2.7	5.5	4.5	16.5	3.3 or 5.0	—	—	—	Chip w / Au Bumps
LC75700T		30 (15)	2.7	5.5	—	—	VDD	4	—	—	TSSOP-20
LC75805PE	Static: 38; 1/2 Duty: 74; 1/3 Duty: 108; 1/4 Duty: 140; LED Driver: 48 channel	—	4.5	5.5	VDD	VDD	VDD	48(LED driver)	7	—	QIP-100E
LC75806PT	1/3 Duty: 225 (198) to 231 (204) 1/4 Duty: 296 (260) to 304 (268)	20 to 30	4.5	6	VDD	VDD	3.3 or 5.0	9	—	—	TQFP-100
LC75809PT	1/3 Duty: 267 (231) 1/4 Duty: 352 (304)	—	4.5	6.3	VDD	VDD	3.3 or 5.0	12	6	—	TQFP-100
LC75812PT	1/8 Duty: Dot matrix (5x7)x13+65 1/9 Duty: Dot matrix (5x8)x12+64	35 (20)	2.7	3.6	4.5	10	3.3 or 5.0	3	3	ROM 240; RAM 16	TQFP-100
LC75813T	1/3 Duty: 261 (237) 1/4 Duty: 344 (312)	—	2.7	6	2.7	6	VDD	8	—	—	TQFP-100
LC75814V	1/4 Duty: 64 (48)	—	2.7	6	2.7	6	VDD	4	—	—	SSOP-30
LC75818PT	1/8 Duty: Dot matrix (5x7)x16+80 1/9 Duty: Dot matrix (5x8)x16+80 1/10 Duty: Dot matrix (5x9)x16+80	30	2.7	3.6	4.5	10	3.3 or 5.0	4	—	ROM 240; RAM 16	TQFP-120
LC75829PW	1/3 Duty: 159 (147) 1/4 Duty: 208 (192)	—	4.5	6	VDD	VDD	3.3 or 5.0	4	—	—	SQFP-64
LC75832E/W	Static: 54 (50) 1/2 Duty: 108 (100)	—	2.7	6	2.7	6	VDD	4	—	—	QIP-64E, SQFP-64
LC75833E/W	1/3 Duty: 105 (81)	—	2.7	6	2.7	6	VDD	8	—	—	QIP-48E, SQFP-48
LC75836W	1/4 Duty: 140 (124)	—	4.5	6	VDD	VDD	3.3 or 5.0	4	—	—	SQFP-48
LC75839PW	1/3 Duty: 159 (147) 1/4 Duty: 208 (192)	—	4.5	6	VDD	VDD	3.3 or 5.0	4	3	—	SQFP-64
LC75843UGA	Static: 28 (24) 1/2 Duty: 54 (46) 1/3 Duty: 78 (66) 1/4 Duty: 100 (84)	—	4.5	6.3	VDD	VDD	3.3 or 5.0	4	3	—	TSSOP-36
LC75847T	1/3 Duty: 318 (294) 1/4 Duty: 420 (388)	—	2.7	6	2.7	6	VDD	8	—	—	TQFP-120
LC75857W	1/3 Duty: 117 (105) to 126 (114); 1/4 Duty: 152 (136) to 164 (148)	15 to 30	2.7	6	2.7	6	VDD	4	—	—	SQFP-64
LC75878W	1/8 Duty: 600; 1/9 Duty: 666 1/10 Duty: 730	—	2.7	6	4.5	11	VDD	4	—	—	SQFP-100
LC75879PT	1/3 Duty: 207 (183) 1/4 Duty: 272 (240)	—	4.5	6.3	VDD	VDD	3.3 or 5.0	8	3	—	TQFP-80J
LC75886PW	1/3 Duty: 165 (150) to 171 (156) 1/4 Duty: 216 (196) to 224 (204)	20 to 30	4.5	6	VDD	VDD	3.3 or 5.0	5	—	—	SQFP-80
LC75890W	Static: 37 (25); 1/4 Duty: 148 (100)	—	2.7	3.6	2.7	5.5	VDD	12	3	—	SQFP-48
LC75897PW	1/3 Duty: 387 (363) 1/4 Duty: 512 (480)	—	2.7	6	2.7	6	VDD	8	3	—	SQFP-144

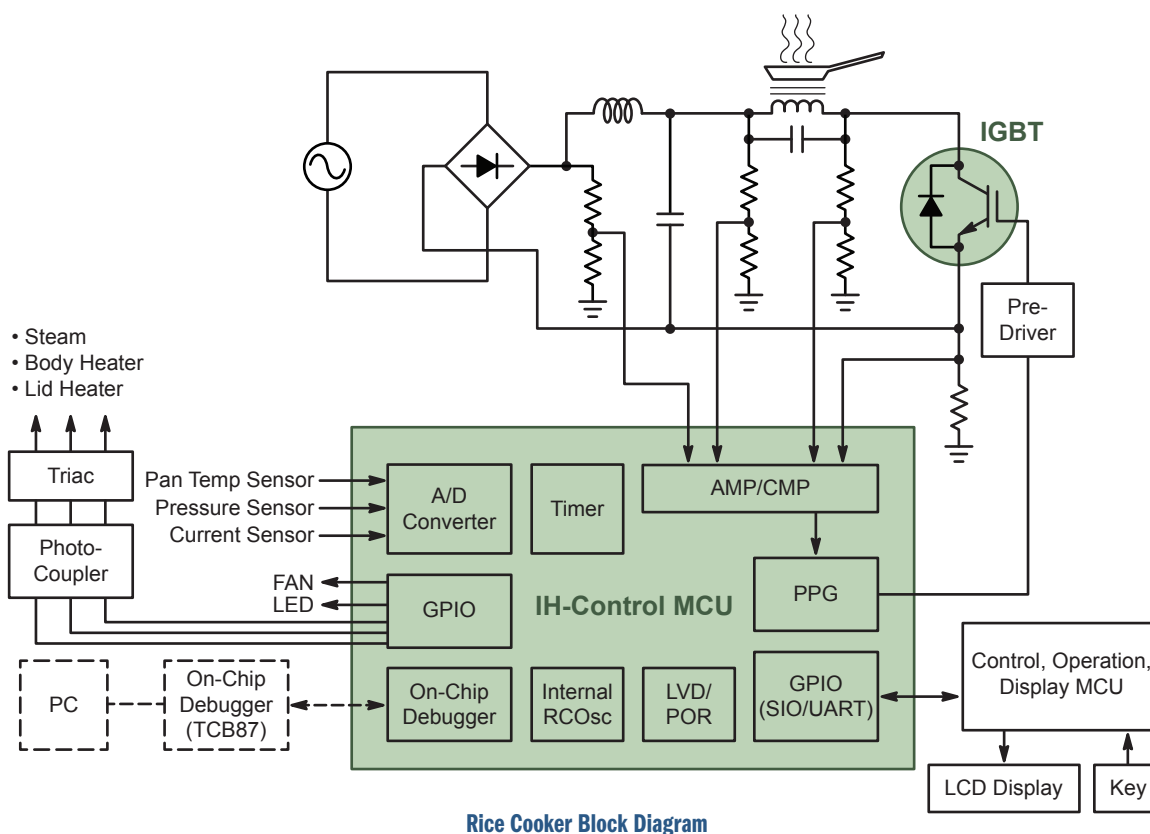
Microcontrollers for Induction Heating

LC87F2K08A/LC87F0K08A Features

- Real-time resonant tracking system enables efficient system architecture
 - Resonant inductor drive for high efficiency
 - Auto-tracking on resonant frequency over design, temperature, and aging
 - Real-time feedback achieved by hardwired integration
 - Integrated functions support design-for-safety
 - Detection of unstable AC power and IGBT overloading
 - Built-in overcurrent and overheating detection
 - Programmable threshold and reference voltage
- 



Device	Type	V _{DD} (V)	ROM (kB)	RAM (bit)	Features	Package
LC87F2K08A	8-bit	5.5 - 4.5	8	256	IGBT control circuit (PPG) x 1, analog comparator x 8, amplifier x 2	DIP-24S
LC87F0K08A	8-bit	5.5 - 4.5	8	384	IGBT control circuit (PPG) x 1, analog comparator x 8, amplifier x 2	DIP-24S



MCUs for White Goods

System Control

- Pins: 64 – 100
- ROM: 64 K – 768 K
- ADC: 16 channel

LCD Display Control

- LCD Segments: 74 x 4 (max)
- ROM: 16 K – 256 K
- ADC: 8 – 15 channel

Small Appliance System Control

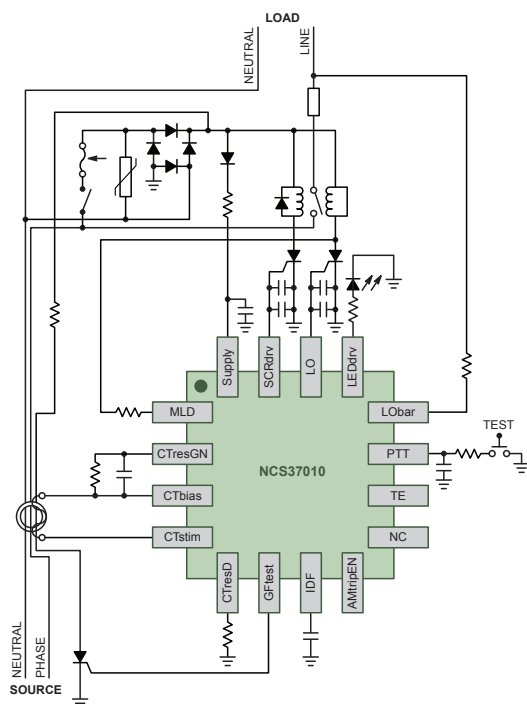
- Pins: 10 – 48
- ROM: 4 K – 50 K
- ADC: 7 – 14 channel

Device	Type	V _{DD} (V)	ROM (kB)	RAM (bit)	12-Bit ADC	Features	Package
LC87F0N04A	8-bit	5.5 - 2.8	4	128 x 9	6 channel (10-bit)	MCPWM, analog comparator x 2	SSOP-16
LC87F2608A	8-bit	2.7 - 5.5	8	512 x 9	3 channel	High speed 12-bit PWM, analog comparator	MFP-10SK
LC87F2R04A	8-bit	2.7 - 5.5	8	256 x 9	8 channel	PWM; internal OSC $\pm 5\%$, POR, LVD	SSOP-24
LC87F0G08A	8-bit	1.8 - 5.5	8	256 x 9	7 channel	PWM; internal OSC $\pm 2\%$, POR, LVD, high speed 12-bit PWM, analog comparator	SSOP-24
LC87FBG08A	8-bit	1.8 - 5.5	8	256 x 9	9 channel	PWM; internal OSC $\pm 2\%$, POR, LVD	SSOP-24, VCT-24
LC87FBK08A	8-bit	2.7 - 5.5	8	256 x 9	8 channel	PWM; internal OSC $\pm 2\%$, POR, LVD	SSOP-24
LC87FBH08A	8-bit	1.8 - 5.5	8	256 x 9	9 channel	PWM; internal OSC $\pm 2\%$, POR, LVD	QFP-36
LC87FBL08A	8-bit	2.7 - 5.5	8	256 x 9	9 channel	PWM; internal OSC $\pm 2\%$, POR, LVD	QFP-36
LC87F0808A	8-bit	3.3 - 5.5	8	256 x 9	10 channel (10-bit)	3-phase PWM, op-amp, comparator	QFP-36
LC87F2J32A	8-bit	1.8 - 5.5	32	1024 x 9	14 channel	PWM (12-bit x 2 channel), RTC, POR, LVD	QIP-48E, SQFP-48
LC87F7932B	8-bit	2.4 - 3.6	32	2048 x 9	7 channel	32-segment LCD controller for 4.5 V panel, RTC	QIP-64E, SQFP-64, DIE
LC87F2W48A	8-bit	2.7 - 5.5	50	1536 x 9	14 channel	PWM (12-bit x 2 channel), remote control receiver	SQFP-48
LC87F5M64A	8-bit	2.2 - 5.5	64	2048 x 9	11 channel (8-bit)	PWM (12-bit x 2 channel), remote control receiver	QIP-64E
LC87F2C64A	8-bit	2.4 - 5.5	64	2048 x 9	16 channel	PWM (12-bit x 4 channel), RTC, POR, LVD	QFP-80
LC87F5R96B	8-bit	2.5 - 5.5	96	4096 x 9	11 channel (8-bit)	PWM (12-bit x 2 channel), remote control receiver	QIP-64E
LC87FC096A	8-bit	2.5 - 3.6	96	4096 x 9	11 channel	PWM (12-bit x 4 channel), SMIIC	QIP-64E
LC87F5WC8A	8-bit	2.2 - 5.5	128	4096 x 9	15 channel	PWM (12-bit x 4 channel)	QIP-100E
LC87F76C8A	8-bit	2.2 - 5.5	128	4096 x 9	12 channel	32-segment LCD controller for 5.5 V panel, RTC	QFP-80
LC87F5VP6A	8-bit	2.5 - 5.5	256	10K x 9	15 channel (8-bit)	PWM (12-bit x 4 channel)	QIP-100E
LC87F7NP6A	8-bit	2.5 - 3.6	256	8192 x 9	15 channel	54-segment LCD controller for 5.5 V panel, RTC	QIP-100E
LC88F58B0A	16-bit	2.2 - 5.5	128	6144 x 8	11 channel	PWM; 3 x SIO; 2 x UART	SQFP-64
LC88FC3K0A	16-bit	2.7 - 3.6	768	48640 x 8	16 channel	3 x synchronous serial interface; 3 x I2C; 3x UART	TQFP-100

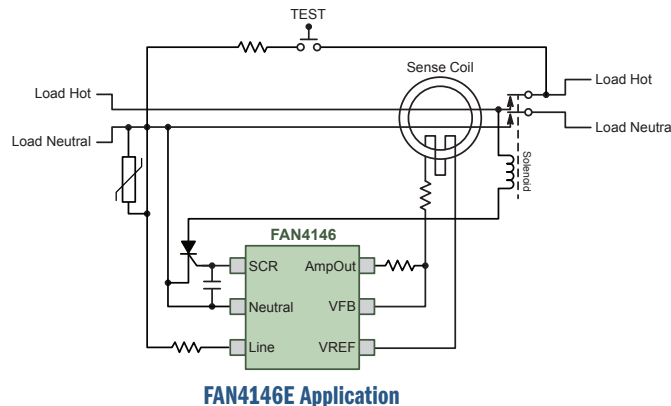
Ground Fault Circuit Interrupter (GFCI), Residual Current Device (RCD), and Earth Leakage Circuit Breaker (ELCB)

Features

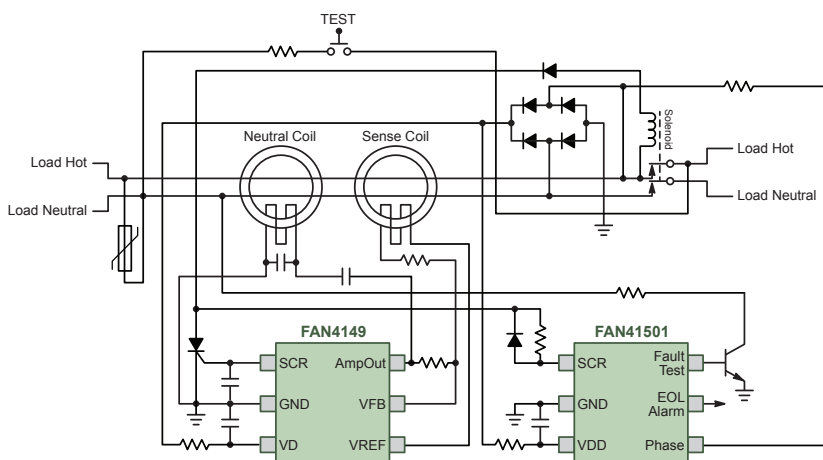
- Broad selection of GFCI controllers for industrial applications
- Proprietary solutions for impedance measurement with single coil and self-test monitoring
- Industrial grade reliability and quality
- Customized solutions available



NCS37010 Single-Coil UL943 Self-Test



FAN4146E Application



FAN4149 + FAN41501 Dual-Coil UL943 Self-Test

Device	Device	Differential Fault	Grounded-Neutral Fault	Device	Current Transformer	Mechanical Lockout	Electronic Lockout	T _A Max (°C)	Device	Package
NCS37010	Self Test GFCI controller	✓	✓	UL943, UL2231	Single coil		✓	-40 to +85	North America, Highly integrated solution with ST	QFN-16, TSSOP-16
FAN4149	Self Test GFCI controller	✓	✓	UL943, UL2231	Dual coil			-35 to +85	North America, FAN4149 + FAN41501 combination for ST GFCI	SOT-23-6LD
FAN41501	Self Test monitoring IC	✓	✓	UL943, UL2231	N/A			-35 to +85	North America, FAN4149 + FAN41501 combination for ST GFCI	SSOT-6
FAN4146E	ALCI/RCD/ELB controller	✓		UL943B, IEC61008/9, GB20044	Single coil			-35 to +85	Worldwide Use, Compact solution for appliances	SSOT-6
KA2803B	RCD/ELB controller	✓		IEC61008/9, GB20044	Single coil			-25 to +80	Worldwide Use, M54123 replacement	SOP-8



	Device	Function	Features	Package(s)	
Smart Grid Modem	NCN49599	PLC S-FSK Modem; A - D Band	• ARM Cortex M0 • Baud rate: 4800 Bauds • S-FSK modulation	• Hardware embedded MAC + PHY • Embedded 1.2 A, 2-stage power amplifier with current limitation and thermal protection	QFN-56
	NCN49597	PLC S-FSK Modem; A - D Band	• ARM Cortex M0 • Baud rate: 4800 Bauds	• S-FSK modulation • Hardware embedded MAC + PHY	QFN-52
Power Amplifier	NCS5651	Power Line Driver; Class AB	• Low distortion power line driver with optimized interface for PLC modems • Capability to drive 2.0 A peak into reactive loads	• Current shutdown minimizes power consumption during power down state • Rail-to-Rail Drop of Only ±1 V with Iout = 1.5 A	QFN-20 EP

PLL Clock Synthesizers/Generators

Features

- Based on phase-locked-loop techniques with zero PPM synthesis error
- Low jitter for high accuracy clock signals
- Available in industrial temperature range -40°C to +85°C
- Supports output interfaces: LVPECL, LVDS, HCSL, LVTTTL/LVCMOS
- Multiple PLLs and multiple output options

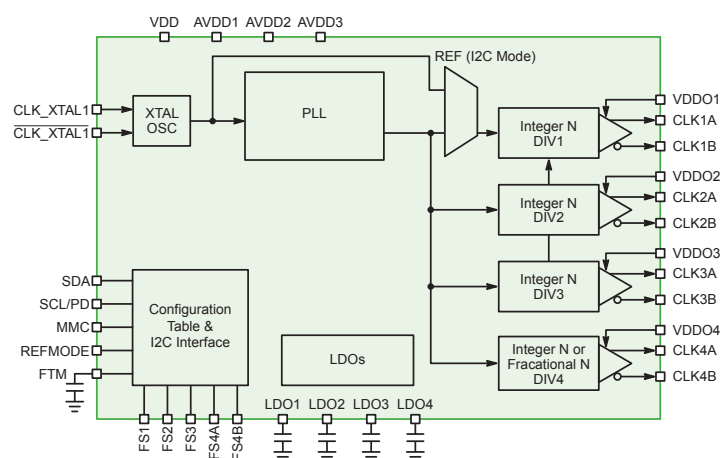


Device	Input (MHz)	Output (MHz)	Application	Input Level					Output Level	Vcc Typ (V)	Package(s)
				XTAL	CML	CMOS	LVPECL	TTL			
NB3N3002	25	25/125/200	CPU/DIMM, PCIe Gen 1, 2, 3, 4	✓		✓			HCSL	3.3	TSSOP-16
NB3N5573	25	25/100/125/200	CPU/DIMM, PCIe Gen 1, 2, 3, 4	✓		✓		✓	HCSL	3.3	TSSOP-16
NB3N51032	25	25/100/125/200	CPU/DIMM, PCIe Gen 1, 2, 3, 4	✓		✓		✓	HCSL	3.3	TSSOP-16
NB3N3020	5 to 27	5 to 210	Network GigE	✓	✓	✓	✓		ECL, LVTTTL	3.3	TSSOP-16
NB3N501	2 to 50	13 to 160	Networking, Consumer, STB	✓					CMOS	3.3, 5	SOIC-8
NB3N502	5 to 27	14 to 120	Networking, Consumer, STB	✓		✓			LVCMOS	3.3	SOIC-8
NB4N507A	10 to 27	50 to 200	Networking, Consumer, STB	✓		✓			ECL	3.3, 5	SOIC-16
NB3N508S	27	216	VCXO Set Top Box	✓		✓			LVDS	3.3, 5	TSSOP-16
NB3N511	1 to 50	14 to 200	Networking, Consumer, STB	✓					CMOS	3.3, 5	SOIC-8
NB3N51034	25	100/200	CPU/DIMM, PCIe Gen 1, 2, 3, 4	✓		✓			HCSL	3.3	TSSOP-20
NB3N51044	25	100/125	CPU/DIMM, PCIe Gen 1, 2, 3, 4	✓		✓			HCSL	3.3	TSSOP-28
NB3N51054	25	100	CPU/DIMM, PCIe Gen 1, 2, 3, 4	✓					HCSL	3.3	TSSOP-24
NB3H5150	25	25 to 250	Networking, Telecom	✓	✓	✓	✓	✓	ECL, CMOS	3.3, 2.5	QFN-32
NB3H5150-01	25	25 to 250	Networking, Telecom	✓	✓	✓	✓	✓	ECL, CMOS	3.3, 2.5	QFN-32

Programmable Multi-Rate Clock Generators

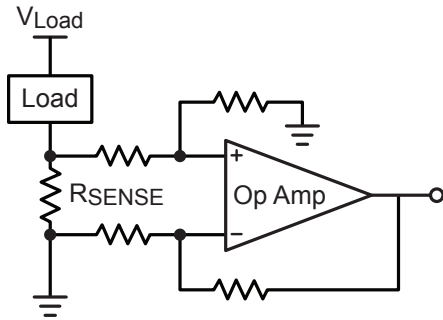
NB3H5150, NB3H5150-01 Features

- Uses 25 MHz Crystal or reference input
- External Loop Filter is not required
- User programmable frequencies with four independent output pairs
- Each output pair can be configured either as two LVCMOS outputs (or) a differential LVPECL pair
- Supports 3.3 V or 2.5 V supply voltage operation
- Each output pair has an independent supply voltage rail (VDDOx); 3.3 V, 2.5 V, 1.8 V
- I2C enabled PLL Bypass Mode and Power Down Mode
- Free GUI software to configure device for different frequencies and output types using evaluation board
- Each device preconfigured with different default frequencies, that may be overridden using I2C/SMBus interface



Current Sensing Solutions Using Amplifiers

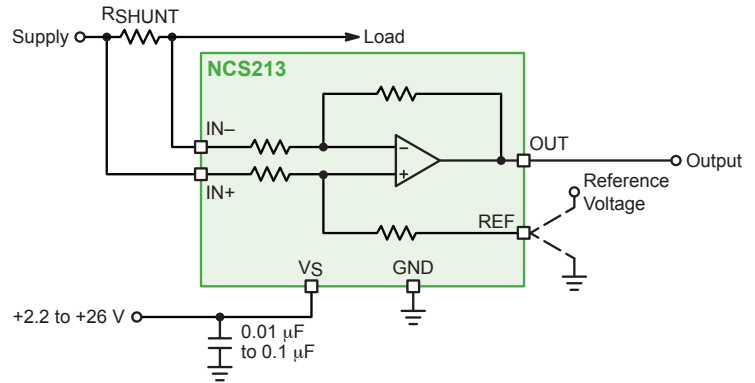
As part of an expansive portfolio, amplifiers from ON Semiconductor offer precision performance over time and temperature, making them ideal for current sensing in system monitoring and protection circuits.



Current Sensing Solution with External Gain Setting Resistors

NCSx333 Zero Drift Op Amp
 $V_{OS} = 10 \mu V$
 50 mV Shunt Drop
 Only 0.02% Offset Error

NCS200xx Low Power Op Amp
 $V_{OS} = 4 mV$
 50 mV Shunt Drop
 8% Offset Error



Current Sensing Solution with Integrated Gain Setting Resistors

NCS21x Current Sense Amplifiers
 $V_{OS} = 35 \mu V$
 50 mV Shunt Drop
 0.07% Offset Error

Zero Drift Current Sense Amplifiers (Integrated and Precision Performance)

Device	Channels	V_S Min (V)	V_S Max (V)	Input CM Range (V)	GBW (kHz)	V_{OS} Max (μV)	V_{OS} Drift ($\mu V/^{\circ}C$)	Gain Error (%)	CMRR (dB)	Features	Package
NCS21x	1	2.2	26	2.2 to 26	14	35	0.5	1	140	Low V_{OS}	SOT-363

Low Voltage, Zero Drift Amplifiers (High Precision)

Device	Channels	V_S Min (V)	V_S Max (V)	Input CM Range (V)	I_Q / Channel (μA)	GBW (kHz)	V_{OS} Max (μV)	V_{OS} Drift ($\mu V/^{\circ}C$)	CMRR (dB)	e_{p-p} (μV_{pp})	Features	Package
NCS325	1	1.8	5.5	$V_{SS}-0.1$ to $V_{DD}+0.1$	21	350	50	0.02	110	1	Low V_{OS}	SOT-23
NCSx333	1, 2, 4	1.8	5.5	$V_{SS}-0.1$ to $V_{DD}+0.1$	21	350	10	0.03	120	1	Low V_{OS}	SOT-23-5, SC-70-5, DFN-8, Micro8, SOIC-8, SOIC-14

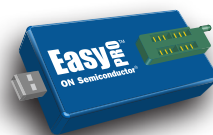
Low Voltage Amplifiers (Standard)

Device	Channels	V_S Min (V)	V_S Max (V)	I_Q / Channel (μA)	GBW (MHz)	V_{OS} Max (mV)	V_{OS} Drift ($\mu V/^{\circ}C$)	I_B (nA)	CMRR (dB)	Rail-to-Rail	Features	Package
NCS2009x	1,2	1.8	5.5	20	0.35	4	1	0.001	80	I/O	Low I_Q & V_{OS}	SOT-23-5, SC-70-5, UDFN-6, Micro8, TSSOP-8, SO-8
NCS2008x	1,2	1.8	5.5	50	1.2	4	1	0.001	80	I/O	Low I_Q & V_{OS}	SOT-23-5, SC-70-5, UDFN-6, Micro8, TSSOP-8, SO-8
NCS2006x	1,2	1.8	5.5	140	3	4	1	0.001	80	I/O	Low I_Q & V_{OS}	SOT-23-5, SC-70-5, UDFN-6, Micro8, TSSOP-8, SO-8
NCS2003x	1, 2, 4	1.7	5.5	275	7	5	2	0.001	80	Output	Fast Slew Rate, Low V_S & I_B	SOT-23-5, SOT-553, Micro8, SOIC-8, TSSOP-8
NCS2007x	1, 2, 4	2.7	36	400	3	4	2	0.005	110	Output	Wide V_S range	SOT-553, TSOP-5, Micro8, SO-8, TSSOP-8

EEPROMs for Configuration and Calibration

Features

- Broad density range: 1 kb to 2 Mb
- Wide operating V_{CC} range: 1.7 V to 5.5 V
- High endurance: 1 million program/erase cycles
- Wide temperature range: industrial and extended



EasyPRO™ is a user-friendly, portable programming tool for ON Semiconductor serial EEPROMs (I²C, SPI, Microwire)

EEPROMs

Data Transmission Standard	Density	Organization*	V _{CC} Min (V)	V _{CC} Max (V)	f _{CLK} Max (MHz)	Package(s)
I ² C	1 Mb	128k x 8	1.7, 1.8	5.5	0.4, 1	US8, SOIC-8, TSSOP-8, UDFN-8, TSOT23-5, WLCSP-4, WLCSP-5
	512 kb	64k x 8				
	256 kb	32k x 8				
	128 kb	16k x 8				
	64 kb	8k x 8				
	32 kb	4k x 8				
	16 kb	2k x 8				
	8 kb	1k x 8				
	4 kb	512 x 8				
	2 kb	256 x 8				
SPI	2 Mb	256k x 8	1.7, 1.8	5.5	10, 20	SOIC-8, TSSOP-8, UDFN-8
	1 Mb	128k x 8				
	512 kb	64k x 8				
	256 kb	32k x 8				
	128 kb	16k x 8				
	64 kb	8k x 8				
	32 kb	4k x 8				
	16 kb	2k x 8				
	8 kb	1k x 8				
	4 kb	512 x 8				
	2 kb	256 x 8				
	1 kb	128 x 8				
Microwire	16 kb	2k x 8 / 1k x 16	1.65, 1.8	5.5	2, 3, 4	SOIC-8, TSSOP-8, UDFN-8
	16 kb	2k x 8 / 1k x 16				
	8 kb	1k x 8 / 512 x 16				
	8 kb	1k x 8 / 512 x 16				
	4 kb	512 x 8 / 256 x 16				
	2 kb	256 x 8 / 128 x 16				
	1 kb	128 x 8 / 64 x 16				
	1 kb	128 x 8 / 64 x 16				

* Organization for Microwire devices is selectable.

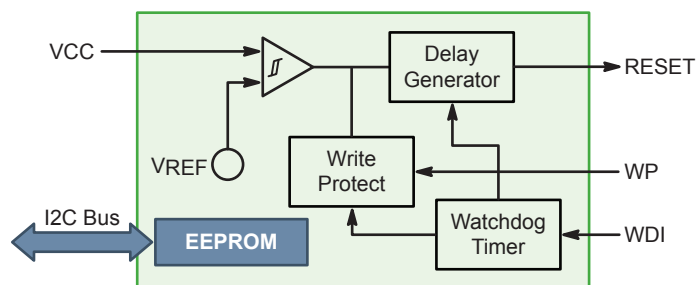
Voltage Supervisors with I2C Serial EEPROM and Watchdog Timer

Supervisory Features

- Precision power supply voltage monitor
- Available voltage thresholds: 4.50 V, 4.25 V, 3.0 V, 2.85 V, 2.55 V
- Active High or Low Reset, Manual Reset
- Watchdog Timer (N84C161, N84C163)

16 kb Serial EEPROM Features

- Supply Voltage: VCC = 2.7 to 6.0 V
- 400 KHz, 100 KHz I2C Serial Protocol
- Endurance: 1 million Write cycles
- Retention: 100 years
- Hardware Write Protect

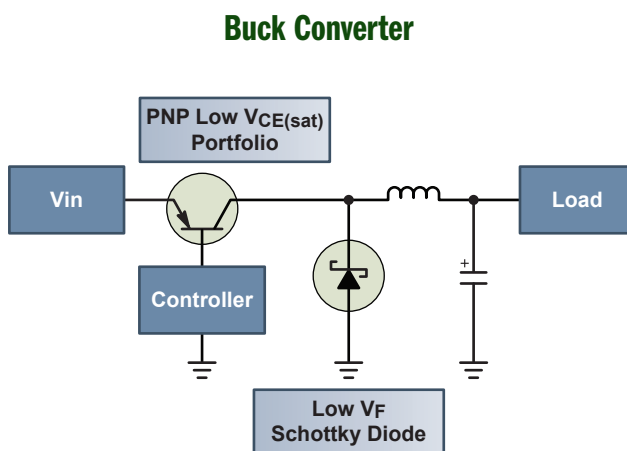
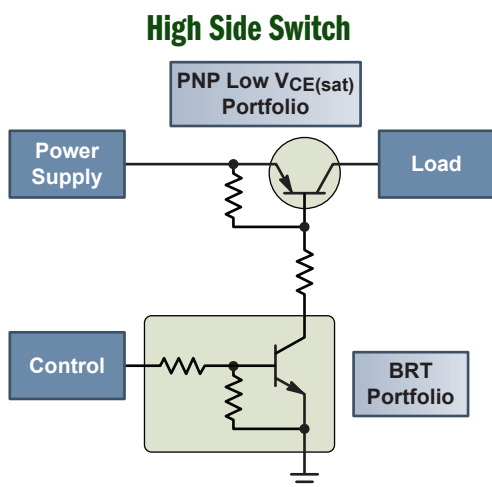


Device	Watchdog Timer	Manual Reset	Write Protect	Package
N84C161	SDA	✓	✓	SOIC-8
N84C162	—	✓	✓	SOIC-8
N84C163	—	✓	✓	SOIC-8

Wide Selection of Small Signal Discretes for White Goods

ON Semiconductor offers a wide range of devices that support the systems of white goods, including diodes, bipolar transistors, and digital transistors (BRTs). Within these different technologies, the company offers a range of large to small packaging, meeting the smaller board space requirements of space constrained environments.

Device	Voltage Range	Current Range	Key Features	Functions	Package(s)
Schottky Diodes	7 – 70 V	20 – 1000 mA	Low V_F ; Low Leakage; Duals	DC-DC converters, high-speed switching, Oring/rectifying	SOT-23, SC-70, SC-89, SC-75, SC-88, SOD-123, SOD-323, SOD-523
Switching Diodes	35 – 350 V	–	Switching speed; Low leakage	Broad range	SC-59, SOT-23, SC-70, SC-75, SC-88, SOT-563, SOD-123, SOD-323, SOD-523
Low $V_{CE(sat)}$ Transistors	12 – 100 V	700 – 6000 mA	Ultra-low $V_{CE(sat)}$; Broad portfolio	Switching of power with low power dissipation	DPAK, SOT-223, SOT-23, SC-70, SC-89, SOIC-8, ChipFET, SC-74, TSOP-6, SC-88, SOT-563
Darlington Transistors	30 – 350 V	300 mA – 50 A	High HFE	–	TO-220, TO-225, TO-247, TO-92, DPAK, SOT-223, SOT-23
Digital Transistors (BRTs)	50 V	100 – 500 mA	Integrated resistors in single package; Wide range of R1 and R2 combinations	Switching power supplies, easy interface with μC to control power to downstream electronics	SC-59, SOT-23, SC-70, SC-75, SC-88, SOT-563



Digital Transistors (BRTs)

Key Features

- Wide range of R1 and R2 combinations
- Simplifies circuit design
- Reduces board space
- Reduces component count
- Wide range of packages

Low $V_{CE(sat)}$ Transistors

Key Features

- Ultra low saturation voltage
- Broad portfolio
- Cost effective alternative to MOSFETs
- Very high current gain
- High ESD rating

Schottky Diodes

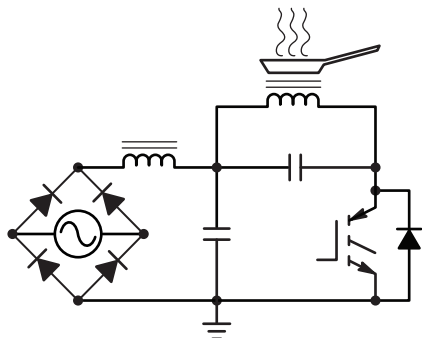
Key Features

- Low V_F diodes
- Low leakage diodes
- Dual packaged diodes
- Broad portfolio
- Very high switching speed
- Low Capacitance

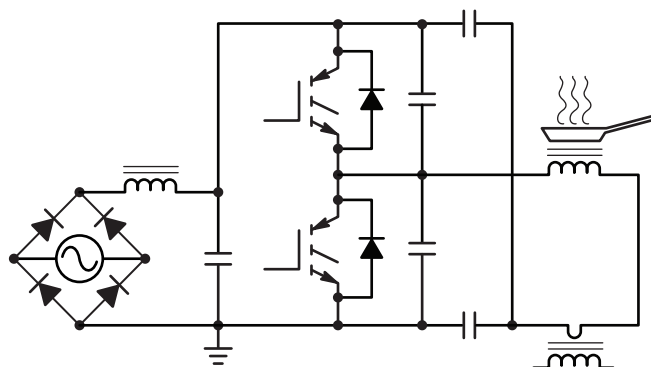
High Voltage IGBTs for Induction Heating

Induction Heating IGBTs

Device	Voltage (V)	Current (A)	Package
NGTB30N65IHL2	650	30	T0-247
NGTB40N65IHRWG	650	40	T0-247
NGTB40N65IHRTG	650	40	T0-3P
FGH40T65UQDF-F155	650	40	T0-247
FGA40T65UQDF	650	40	T0-3P
NGTB40N65IHL2	650	40	T0-247
NGTB15N120IHR	1200	15	T0-247
NGTB15N135IHR	1350	15	T0-247
NGTB20N120IHR	1200	20	T0-247
NGTB20N135IHR	1350	20	T0-247
NGTB30N120IHR	1200	30	T0-247
NGTB30N135IHR	1350	30	T0-247
NGT40N135IHR	1350	40	T0-247
FGH30S150P	1500	30	T0-247
FGA50S110P	1100	50	T0-3P



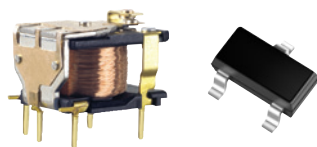
**Quasi-Resonant Flyback
Tailored for 1000-3500 W
Cookers**



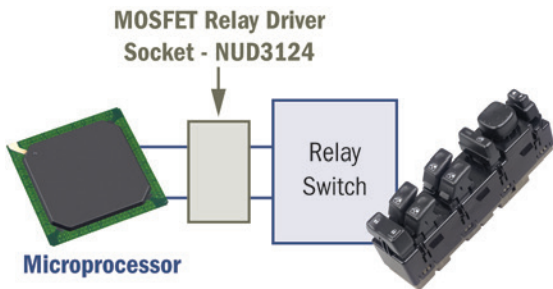
**Resonant Half-Bridge
Tailored for 1000-3500 W
Burners**

Integrated, Reliable Drive Circuits for Motors and Electro-Mechanical Relays

Most relays mounted to a PCB
require a relay driver circuit!



24 V Relay Driver Socket



Features

- Integrates diodes, resistors and capacitors into one circuit
- Delivers additional current to the relay coil and protects against ESD
- Meets IEC61000-4-4 Electrical Fast Transient (EFT) test standards

Relay Drivers

Device	Configuration	Circuit Type *	Voltage (V)	Current (mA)	Package
MDC3105	Single	Bipolar-Clamp	5	500	SOT-23
MDC3105D	Dual	Bipolar-Clamp	5	500	SC-74
NUD3105	Single	MOSFET	5	500	SOT-23
NUD3105D	Dual	MOSFET	5	500	SC-74
NUD3112	Single	MOSFET	12	500	SOT-23
NUD3112D	Dual	MOSFET	12	500	SC-74
NUD3124	Single	MOSFET	24	150	SOT-23
NUD3124D	Dual	MOSFET	24	150	SC-74
NUD3160	Single	MOSFET	60	150	SOT-23
NUD3160D	Dual	MOSFET	60	150	SC-74

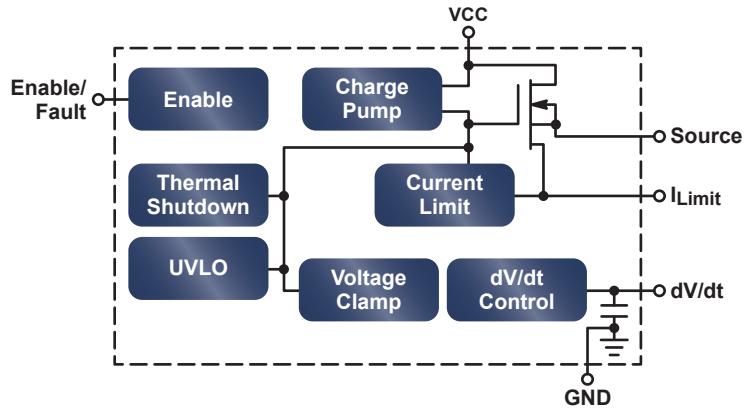
* **Bipolar:** the driver circuit consists of a transistor combined with resistors and diodes.
MOSFET: the driver circuit consists of a MOSFET combined with resistors and diodes.

Electronic Fuses for Motor, Pump, Relay, and In-Box LED

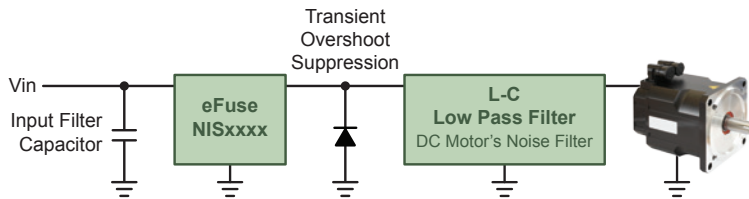
3 - 12 V Power Bus Hot Plug Protection

Features

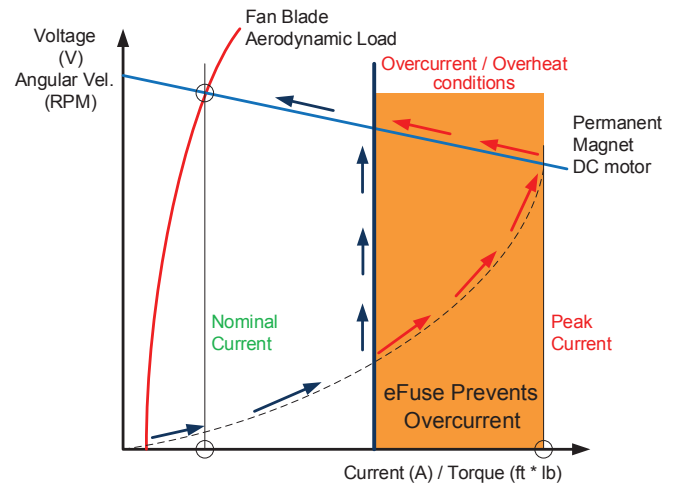
- Low $R_{DS(ON)}$, high operating and trip currents (I_{OP} , I_{TRIP})
- Overvoltage protection
- Precise I_{TRIP} control
- Slew rate control
- Thermal shut-down
- EN pin for synchronizing multiple eFuses
- Outperforms poly-fuses:
 - Tighter spec tolerances
 - Lower resistance
 - Shorter trip-time
 - Superior repeatability
- High efficiency with high current capability
- eFuses in parallel achieve practically any desired level of I_{OP} and I_{TRIP}



Typical Feature Set for eFuse



Typical Application Block Diagram



DC Motor I/V Characteristics

Device	Nominal Voltage (V)	Input Voltage (V)	Vclamp (V)	Continuous Current (A)	Trip Current (A)	$R_{DS(ON)}$ (mΩ)	Auto-Retry	Latch	Package
NIS5431	3.3	-0.6 to 14	3.85	5	Adjustable	35	✓	✓	WDFN-10
NIS5452	5	-0.6 to 14	5.85	5	Adjustable	35	✓	✓	WDFN-10
NIS5232	12	-0.6 to 18	15	4.2	Adjustable	44	**	✓	DFN-10
NIS5820*	12	-0.3 to 22	14	8	Adjustable	24	✓	✓	WDFN-10
NIS5020*	12	-0.3 to 22	14	10	Adjustable	14	✓	✓	WDFN-10
NIS5021*	12	-0.3 to 22	14	12	Adjustable	14	✓	✓	WDFN-10

* Pending 1Q18. ** Auto-retry available on NIS5132MN2.

Sales and Design Assistance from ON Semiconductor

ON Semiconductor Technical Support
www.onsemi.com/support

ON SEMICONDUCTOR INTERNATIONAL SALES OFFICES		
GREATER CHINA	Beijing	86-10-8577-8200
	Hong Kong	852-2689-0088
	Shenzhen	86-755-8209-1128
	Shanghai	86-21-5131-7168
	Taipei, Taiwan	886-2-2377-9911
FRANCE	Paris	33 (0)1 39-26-41-00
GERMANY	Munich	49 (0) 89-93-0808-0
INDIA	Bangalore	91-98-808-86706
ISRAEL	Raanana	972 (0) 9-9609-111
ITALY	Milan	39 02 9239311
JAPAN	Tokyo	81-3-6880-1777
KOREA	Seoul	82-31-786-3700
MALAYSIA	Penang	60-4-6463877
SINGAPORE	Singapore	65-6484-8603
SLOVAKIA	Piestany	421 33 790 2450
UNITED KINGDOM	Maidenhead	44 (0) 1628 244326

**For a comprehensive listing of
ON Semiconductor Sales Offices, Distributors,
and Rep Firms, please visit:**

Americas & EMEA: www.onsemi.com/sales
China: www.onsemi.cn/sales
Japan: www.onsemi.jp/sales



AMERICAS REP FIRMS			
Alabama	Huntsville	e-Components	(256) 533-2444
Brazil	Countrywide	Ammon & Rizos	(+55) 11-4688-1960
California	Bay Area	Electec	(408) 496-0706
Canada	Eastern Canada	Astec	(905) 607-1444
Connecticut	Statewide	Paragon Electronic Systems	(603) 645-7630
Florida	Statewide	e-Components	(888) 468-2444
Georgia	Atlanta	e-Components	(888) 468-2444
Illinois	Statewide	Matrix - Design Technology	(952) 400-1070
Indiana	Fishers	Bear VAI	(317) 570-0707
Iowa	Statewide	Matrix - Design Technology	(319) 362-6824
Maine	Statewide	Paragon Electronic Systems	(603) 645-7630
Maryland	Columbia	Mechtronics Sales	(410) 309-9600
Massachusetts	Statewide	Paragon Electronic Systems	(603) 645-7630
Mexico	Countrywide	Ammon & Rizos	(+55) 11-4688-1960
Michigan	St. Joseph	Bear VAI	(440) 526-1991
Minnesota	Eden Prairie	Matrix - Design Technology	(952) 400-1070
Missouri	Belton	Matrix - Design Technology	(816) 589-2308
Nebraska	Statewide	Matrix - Design Technology	(816) 589-2308
New Hampshire	Statewide	Paragon Electronic Systems	(603) 645-7630
New Jersey	Statewide	S.J. Metro	(516) 942-3232
New York	Binghamton	TriTech - Full Line Rep	(607) 722-3580
	Jericho	S.J. Metro	(516) 942-3232
	Rochester	TriTech - Full Line Rep	(585) 385-6500
North Carolina	Raleigh	e-Components	(888) 468-2444
North Dakota	Statewide	Matrix - Design Technology	(952) 400-1070
Ohio	Brecksville	Bear VAI Technology	(440) 526-1991
Puerto Rico	Countrywide	e-Components	(888) 468-2444
Rhode Island	Statewide	Paragon Electronic Systems	(603) 645-7630
South Dakota	Statewide	Matrix - Design Technology	(952) 400-1070
Vermont	Statewide	Paragon Electronic Systems	(603) 645-7630
Wisconsin	Statewide	Matrix - Design Technology	(952) 400-1070

ON Semiconductor Distribution Partners

Allied Electronics	www.alliedelec.com	(800) 433-5700
ALTIMA Company, Macnica, Inc.	www.alt-macnica.co.jp/about/english.html	(81) 45 476 2155
Arrow Electronics	www.arrow.com	(800) 777-2776
Avnet	www.em.avnet.com	(800) 332-8638
Daiwa Distribution Ltd.	www.daiwahk.com	(852) 2341 3351
Digi-Key	www.digikey.com	(800) 344-4539
EBV Elektronik	www.ebv.com/en/locations.html	(49) 8121 774-0
Future & FAI Electronics	www.futureelectronics.com/contact	1-800-FUTURE1 (388-8731)
Mouser Electronics	www.mouser.com	(800) 346-6873
Newark/Farnell	www.farnell.com/onsemi	(800) 4-NEWARK
OS Electronics Co., Ltd.	www.oselec.com	Japanese: (81) 3 3255 5985 Other Languages: (81) 3 3255 6066
Promate Electronic Co.	www.promate.com.tw	(886) 2 2659 0303
Ryoden Corporation	www.ryoden.co.jp/en	(81) 3 5396 6310
Ryosan Company, Limited	www.ryosan.co.jp/eng	(81) 3 3862 2635
RS Components	www.rs-components.com	(44) 153 644 4414
Segyung Bristestone Co.	www.bristestone.com	(82) 2 3218 1511
Serial Microelectronics, HK	www.serialsys.com.hk	(852) 2790 8220
World Peace Industries Co.	www.wpi-group.com	(852) 2365 4860
WT Microelectronics Co.	www.wtmec.com	(852) 2950 0820
Yosun Electronics	www.yosun.com.tw	(886) 2 2659 8168

EasyPro is a trademark and GreenPoint and IMST are registered trademarks of Semiconductor Components Industries, LLC (SCILLC) or its subsidiaries in the United States and/or other countries. 80 PLUS is a registered trademark of ECOS Consulting. ENERGY STAR and the ENERGY STAR logo are registered U.S. marks. All other brand names and product names appearing in this document are trademarks of their respective holders.

ON Semiconductor and the ON Semiconductor logo are trademarks of Semiconductor Components Industries, LLC dba ON Semiconductor or its subsidiaries in the United States and/or other countries. ON Semiconductor owns the rights to a number of patents, trademarks, copyrights, trade secrets, and other intellectual property. A listing of ON Semiconductor's product/patent coverage may be accessed at www.onsemi.com/site/pdf/Patent-Marking.pdf. ON Semiconductor reserves the right to make changes without further notice to any products herein. ON Semiconductor makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does ON Semiconductor assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation special, consequential or incidental damages. Buyer is responsible for its products and applications using ON Semiconductor products, including compliance with all laws, regulations and safety requirements or standards, regardless of any support or applications information provided by ON Semiconductor. "Typical" parameters which may be provided in ON Semiconductor data sheets and/or specifications can and do vary in different applications and actual performance may vary over time. All operating parameters, including "Typicals" must be validated for each customer application by customer's technical experts. ON Semiconductor does not convey any license under its patent rights nor the rights of others. ON Semiconductor products are not designed, intended, or authorized for use as a critical component in life support systems or any FDA Class 3 medical devices or medical devices with a same or similar classification in a foreign jurisdiction or any devices intended for implantation in the human body. Should Buyer purchase or use ON Semiconductor products for any such unintended or unauthorized application, Buyer shall indemnify and hold ON Semiconductor and its officers, employees, subsidiaries, affiliates, and distributors harmless against all claims, costs, damages, and expenses, and reasonable attorney fees arising out of, directly or indirectly, any claim of personal injury or death associated with such unintended or unauthorized use, even if such claim alleges that ON Semiconductor was negligent regarding the design or manufacture of the part. ON Semiconductor is an Equal Opportunity/Affirmative Action Employer. This literature is subject to all applicable copyright laws and is not for resale in any manner.

PUBLICATION ORDERING INFORMATION

LITERATURE FULFILLMENT:

Literature Distribution Center for ON Semiconductor
19521 E. 32nd Pkwy, Aurora, Colorado 80011 USA
Phone: 303-675-2175 or 800-344-3860 Toll Free USA/Canada
Fax: 303-675-2176 or 800-344-3867 Toll Free USA/Canada
Email: orderlit@onsemi.com

N. American Technical Support: 800-282-9855 Toll Free
USA/Canada.

Europe, Middle East and Africa Technical Support:
Phone: 421 33 790 2910

ON Semiconductor Website: www.onsemi.com

Order Literature: <http://www.onsemi.com/orderlit>

For additional information, please contact your local
Sales Representative

Mouser Electronics

Authorized Distributor

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

[ON Semiconductor:](#)

[STK5C4-330J1-E](#)