



Challenge

Flexible logic level translation with guaranteed performance down to 1.1V

Solution

The FXL4TD245 and FXLH1T45, bi-directional dual supply voltage translators

Advantages

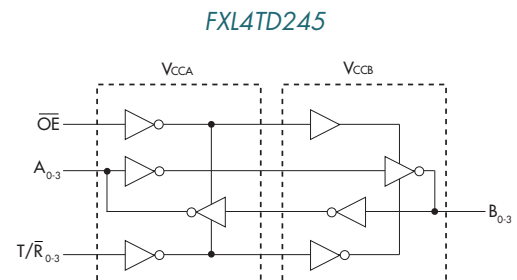
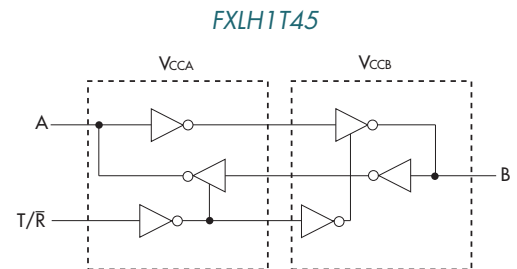
- Bi-directional interface between any two levels from 1.1V to 3.6V
- Fully configurable: track V_{CC} level
- Independent-direction control for each bit (FXL4TD245)
- Bushhold on outputs eliminates need for external pull-up/pull-down resistors (FXLH1T45)
- Ultra-compact MicroPak™ or DQFN packaging

Gain Flexibility and Save Space in Mixed Voltage Designs with Logic Translators

Today's applications often contain a mix of voltage (V_{CC}) levels requiring the need for logic level translators. The FXL4TD245, the industry's first 4-bit, low-voltage dual-supply voltage translator with independent-direction controls, increases design flexibility by allowing designers to control the direction of each bit individually compared to typical configurations that control the direction of bi-directional voltage translators in groups of 4, 8, or 16 bits. The FXLH1T45, single-bit bi-directional voltage translator with guaranteed operation from 1.1V to 3.6V, seamlessly interfaces processors to electronic subsystems operating at different voltage levels by providing both uni-directional and bi-directional translation between a variety of voltage levels.

Applications

- Set-top boxes
- Notebooks
- Digital cameras
- Security systems
- Portable medical equipment
- Industrial instrumentation
- Test and measurement equipment



Product Number	Number of Bits	Data Direction	A Side Voltage Levels (V)	B Side Voltage Levels (V)
FXLH1T45	1	Bi-Directional	1.2, 1.5, 1.8, 2.5, 3.3	1.2, 1.5, 1.8, 2.5, 3.3
FXL4TD245	4	Configurable, Bi-Directional	1.2, 1.5, 1.8, 2.5, 3.3	1.2, 1.5, 1.8, 2.5, 3.3

FOR MORE INFORMATION PLEASE VISIT THE FOLLOWING WEBSITE:

<http://www.fairchildsemi.com/logictranslator>

www.fairchildsemi.com

the
power
franchise

Motion-SPM™

FOR MORE INFORMATION PLEASE VISIT THE FOLLOWING WEBSITE:

www.fairchildsemi.com/offer/discrete/spm/mini_spm.html

Challenge

Highly efficient solution for inverter power motor drives

Solution

Motion-SPM in Mini-DIP package

Advantages

Space and cost savings

- Replaces up to 22 discrete components

System efficiency

- Built-in NPT IGBTs provide optimal trade-offs between conduction and switching losses

System reliability

- Guaranteed high junction temperature ($T_J = 150^\circ\text{C}$) and isolation voltage of 2500V
- Long short-circuit withstand time
- Under-voltage (UV), thermal shutdown (TSD), and short-circuit (SC) protection

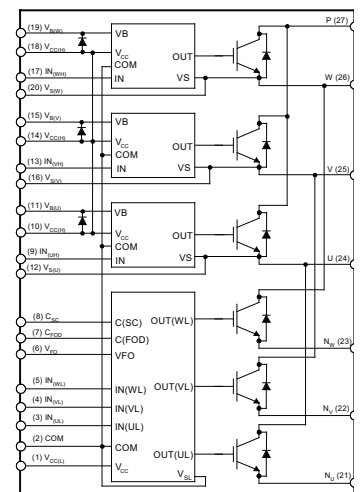
Maximize Space, Efficiency and Reliability in Home Appliances and Industrial Motors up to 3kW with Motion-SPM Power Modules

These highly efficient, integrated Motion-SPM power modules integrate three HVICs, one LVIC, six NPT IGBTs, six FRDs and three bootstrap diodes, all fully tested into a compact 44mm x 26.8mm Mini-DIP package. These modules offer superior inverter-based control for energy-efficient 3-phase motors. They also reduce board space, decrease manufacturing costs and time to market, and increase system reliability by replacing as many as 22 discrete components.

Applications:

- Air conditioners
- Washing machines
- AC 100V - 253V 3-phase inverter drives for low power AC motor drives

Motion-SPM in Mini-DIP Package



Product Number	BV _{CES}	I _C (T _c =25°C)	Motor Rating		Package
	(V)	(A)	Watt (kW)	V _{AC} (V)	
FSBF3CH60B	600	3	0.3	100 - 253	Full molded Mini-DIP
FSBF5CH60B	600	5	0.5		
FSBF10CH60BT	600	10	0.8		
FSBF10CH60B	600	10	1		
FSBF15CH60BT	600	15	1.1		
FSBB15CH60BT	600	15	1.5		DBC based Mini-DIP
FSBB15CH60B	600	15	1.7		
FSBB20CH60BT	600	20	2.2		
FSBB20CH60B	600	20	2.4		
FSBB30CH60B	600	30	3		

FSSD06

FOR MORE INFORMATION PLEASE VISIT THE FOLLOWING WEBSITE:

www.fairchildsemi.com/pf/FS/FSSD06.html

Challenge

Expanding the ASIC/baseband processor SDIO port

Solution

The FSSD06 multiplexer switch

Advantages

- Allows 1- and 4-bit host controllers to communicate with high-voltage (2.7V- 3.6V) and dual-voltage (1.65V- 1.95V, 2.7V-3.6V) cards
- Provides high 5kV ESD capability to protect the end-system against adverse electrostatic discharge
- Low power consumption (1µA maximum) to prolong battery life
- Supports high data transfer rates up to 52MHz
- Available in a compact (3.5 x 4.5mm) 24-lead MLP package

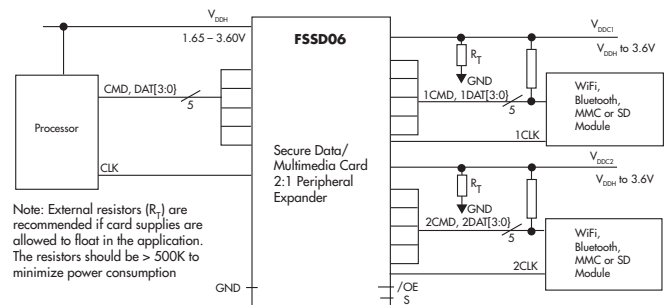
Expand SD/SDIO/MMC Capability in Multi-Functional Portable Designs with Fairchild's Multiplexer Switch

The FSSD06 multiplexer supports dual voltage SD/SDIO/MMC cards creating the ability to expand the ASIC/baseband processor SDIO port. The FSSD06 enables a 1.8V host processor to interface with dual-voltage cards, providing seamless, bi-directional communication while consuming only 1µA of battery power. It also enables high-end handheld portable devices to offer innovative card feature options.

Applications:

- Camcorders
- Portable GPSs
- PDAs
- Cell phones
- MP3 players
- All-in-one printers
- Digital cameras
- LCD monitors

1-bit/4-bit SD/MMC Card



Product Number	Function	Number of Switches	Supply Voltage Range (V)	Bandwidth (MHz)	C _{on} (pF)	Package
FSSD06	Analog Switch	6	1.65 - 3.6	120	9	3.5 mm x 4.5 mm MLP



FAN7710/11

FOR MORE INFORMATION PLEASE VISIT THE FOLLOWING WEBSITES:

www.fairchildsemi.com/pf/FA/FAN7710.html
www.fairchildsemi.com/pf/FA/FAN7711.html

Challenge

Compact IC ballast solution

Solution

The highly integrated FAN7710 and FAN7711

Advantages

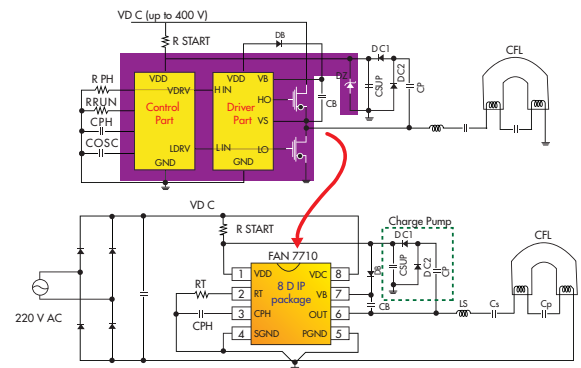
- Built-in adaptive ZVS control increases system stability and eliminates external open-lamp circuit protection
- Built-in 15V shunt regulator ensures stable operation
- Two fewer frequency and time control pins, compared to the four pins simplify system design
- Programmable preheat time and run frequency enhances flexibility
- Built-in HVIC utilizing a noise-canceling circuit feature (over high dv/dt common-mode noise), UVLO function and a shoot-through-preventing output buffer increases reliability

Save Space and Reduce Component Count in Lighting Applications with Highly Integrated Ballast ICs

The FAN7710 combines one high-side 625V gate driver circuit, two 550V MOSFETs, a frequency control circuit and a shunt regulator into one ultra-compact 8-DIP package.

The FAN7710's high functionality and built-in protection features save board space, reduce power dissipation and result in excellent temperature characteristics and enhanced reliability in CFL applications. In addition to the FAN7710, Fairchild offers the FAN7711 for linear fluorescent lamp (LFL) designs as well as CFL applications. This ballast IC integrates all but the two high-power MOSFETs offered by the FAN7710 making it ideal for LFL designs.

Highly Integrated Ballast IC



Applications:

- Compact Fluorescent Lamp (CFL) designs
- Linear Fluorescent Lamp (LFL) designs

Product	Package	Startup Current (mA)	Frequency Variance (%)	Output Current		Protection		Features
				Sink (mA)	Source (mA)	OLP/OVP	TSD	
FAN7710	8DIP	0.12	±8 (Internal Ct)	800 (ID saturation)		Auto Detect	Yes	Integrate Half-Bridge MOSFET
FAN7711	8SOP/DIP	0.12	±8 (Internal Ct)	650	350	Auto Detect	Yes	Controller + Gate Driver



FDMS96XX

FOR MORE INFORMATION PLEASE VISIT THE FOLLOWING WEBSITES:

www.fairchildsemi.com/pf/FD/FDMS9600S.html
www.fairchildsemi.com/pf/FD/FDMS9620S.html

Challenge

Energy-efficient synchronous buck converters in minimal space

Solution

The Dual Power56 Synchronous Buck Power Stage Solution, the FDMS9600S and the FDMS9620S

Advantages

- Optimized matching and sizing of high and low side MOSFETs for higher efficiency
- Integrated Schottky diode on the low side MOSFET, which enhances the switching speed
- Integrated devices that save over 50 percent board space compared to discrete solutions
- The high side and low side MOSFETs are internally connected for ease of design

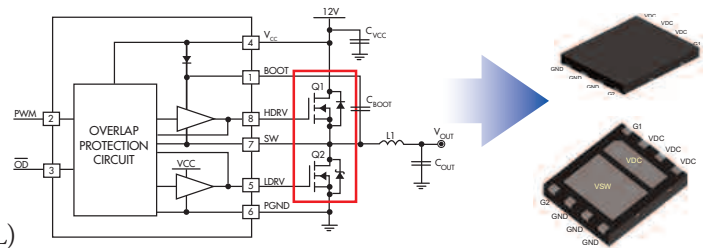
High Side and Low Side Integrated Solutions Deliver Higher Efficiency in a Smaller Footprint for Synchronous Buck Converter Applications

The FDMS96XX module series consists of one high-side and one low-side MOSFET housed in a space-efficient 5mm x 6mm Dual Power56 package. By combining these discrete components into a single MLP package, this integrated dual MOSFET solution saves over 50 percent in valuable board space, while providing high efficiency. Since the internal MOSFETs have been carefully selected to thermally balance both the high and the low side MOSFETs, this leads to both higher efficiency compared to discrete options and also provides optimal distribution of temperature inside the package.

Applications:

FDMS96xx Series in Dual Power56

- Servers
- Notebooks
- High-performance desktop PCs
- Game consoles
- Graphic cards
- Point-of-load (POL) DC-DC converters



Product Number	V _{DS} (V)	V _{GS} (V)	Current (A)	Max R _{DS(ON)} @ 10V (mΩ)	Max R _{DS(ON)} @ 4.5V (mΩ)	Type Q _{gTOT} @ 4.5V (nC)	Type Q _{gD} @ 4.5V (nC)	Package MLP
FDMS9600S	30	20	12-14	8.5 5	12 7	10 30	3 9	5 x 6
FDMS9620S	30	20	6-8	21 13	29.5 17	5 9	2 3	5 x 6



Challenge

Minimizing conduction losses in low frequency (50 ~ 400Hz) industrial applications

Solution

The FGH30N60LSD low saturation IGBT, complemented by the FCH47N60E, Fairchild's SuperFET™ FRFET®, offers high operating frequency of up to 250 kHz and extremely low on-resistance $R_{DS(ON)}$, Typ. = 0.062 Ohms.

Advantages

- Designed for low frequency (50 ~ 400Hz) industrial applications
- Low saturation voltage ($V_{CE(SAT)} = 1.1V @ I_C = 30A$) to improve efficiency
- Can be combined with, and complement SuperFET™ FRFET® FCH47N60F for further energy efficiency

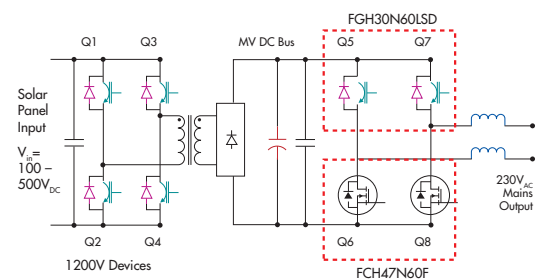
Improve Energy Efficiency in Industrial Applications with Fairchild's Low Saturation IGBT, FGH30N60LSD

Featuring extremely low saturation voltage ($V_{CE(sat)}$, Typ. = 1.1V), the FGH30N60LSD is specially designed to increase system efficiency while meeting low frequency requirements. For additional energy efficiency in industrial applications that require both low and high switching frequency switches, this IGBT can be combined with, and complement Fairchild's SuperFET™ FRFET®, the FCH47N60F. This device offers high operating frequency of up to 250 kHz and extremely low on-resistance $R_{DS(ON)}$, Typ. = 0.062 Ohms.

Applications:

- Solar inverters
- Welding applications
- UPS applications
- Other low frequency (50 ~ 400Hz) industrial applications

Two Stage Topology: Phase Shift SMPS + Inverter



Product Number	BV_{CES} Min (V)	$I_C @ 100^\circ C$	$V_{CE(SAT)}$ TYP (V)	t_f TYP (μs)	Package
FGH30N60LSD	600	30	1.1	1.3	TO-247



Challenge

Increase system protection and thermal performance in portable applications

Solution

Highly integrated IntelliMAX FPF214X and FPF216X series of advanced load switches

Advantages

- Ultra-compact and thermally efficient 2mm x 2mm MLP packaging for superior thermal performance
- “Power Good” signal to indicate stable output power signal for software management
- Integrated current limiting with fast limiting response time
- Additional reverse-current function to protect against reverse-current flow conditions in accessory or battery-powered applications

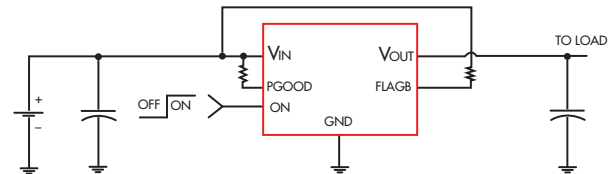
Achieve 45 Percent Improved Thermal Dissipation in Portable Applications with IntelliMAX Advanced Load Switches

The FPF214X and FPF216X series of advanced load switches feature superior thermal performance and full system protection for portable applications operating between 1.8V and 5.5V. These highly integrated advanced load switches simplify design, reduce component count and minimize board space by integrating a 0.11Ω current-limited P-channel MOSFET with protection and control features, including thermal shutdown, controlled turn-on, reverse-current blocking and under-voltage lockout (UVLO). With its 2mm x 2mm green-compliant MicroFET™ MLP package, this series offers 45 percent enhanced thermal performance compared to traditional SOT-23 packages.

Applications:

- PDAs
- Cell phones
- GPS devices
- MP3 players
- Digital cameras
- Peripheral ports
- Portable medical devices
- Hot swap supplies

IntelliMAX FPF214x Series



Product Number*	Current Lim Min (mA)	R _{on} Typ (mΩ)	On Pin State	Behavior/Options	Flag Output Pin	Power Good
FPF2140	200	110	Active HI	Auto Restart	Yes	Yes
FPF2142	200	110	Active HI	Shutdown	Yes	Yes
FPF2143	200	110	Active HI	Current Source	Yes	Yes
FPF2144	400	110	Active HI	Auto Restart	Yes	Yes
FPF2146	400	110	Active HI	Shutdown	Yes	Yes
FPF2147	400	110	Active HI	Current Source	Yes	Yes
FPF2148	200	110	Active LO	Current Source	Yes	Yes
FPF2163	Adj. (0.15-1.5A)	120	Active HI	Auto Restart	Yes	No
FPF2164	Adj. (0.15-1.5A)	120	Active HI	Shutdown	Yes	No
FPF2165	Adj. (0.15-1.5A)	120	Active HI	Current Source	Yes	No

*All products are in MLP 2 x 2 package type. V_{IN} range on all products is 1.8V to 5.5V



**DATASHEETS,
SAMPLES, BUY**

**TECHNICAL
INFORMATION**

APPLICATIONS

DESIGN CENTER

SUPPORT

COMPANY

INVESTORS

Fairchild offers the industry's broadest portfolio of power and analog components and design resources.

Amplifiers & Comparators

Comparators
High Performance
Amplifiers (>15MHz)
Operational Amplifiers

Diodes & Rectifiers

Bridge Rectifiers
Rectifiers
Schottky Diodes & Rectifiers
Small Signal Diodes
Transient Voltage
Suppressors
Zener Diodes

Interface

LVDS
• Drivers
• Receivers
Serializers/Deserializers
• μ SerDes™
USB Transceivers

Logic/TinyLogic®

• Logic by Family
• Logic by Function
• TinyLogic®
• Translator

Signal Conversion

Voltage to Frequency
Converters

Timing Circuits

Timers

Power Modules

IGBT Modules
Smart Power Modules (SPM®)
• Motion-SPM™
• PDP-SPM™

Optoelectronics

Infrared Light Emitting Diodes
Optical Interrupt Switches
Optically Coupled Solid
State Relays
Optocouplers
Photosensors
Reflective Object Sensors

Switches

Analog Switches
Audio Switches
Bus Switches
Full Function Load Switches
(IntelliMAX™)
Load Switches
USB Switches
Video Switches

Power Controllers

Ground Fault Interrupt
Controllers
Off-Line Conversion (FPS™)
• Green (FPS™)
Power Factor Correction
Controllers
PWM & PM Controllers
PWM Controllers
SMPS Controllers

Power Drivers

DrMOS
High Voltage Gate Drivers
(HVIC)
LED Drivers

Transistors

BJTs
IGBT
• IGBT Discrete
• IGBT Module
• Motion-SPM™
• PDP-SPM™
JFETs
MOSFETs
• Full Function Load Switches
(IntelliMAX™)
• MOSFET/Schottky Combos
Small Signal Transistors

**Voltage Reference,
Supervisory, and Other**

Voltage Detectors
Voltage Stabilizers
Voltage Supervisory-
Microprocessors

TRIACS

TRIACs

Filters

Video Filter Drivers
Video Switch Matrix

Temperature Management

Temperature Sensors

Voltage Regulators

Charge Pump Regulators
Integrated Switching
Regulators
LDOs
Shunt Regulators
Standard Regulators

Application-based Products

Audio
• Audio Power Amplifiers
• Audio Switches
Lighting and Display
• Ballast Controllers
• CCFL Controllers
• Landing Correction ICs
• PDP-SPM™
• Vertical Output ICs
Motor Drivers
• Low Voltage (DC, Actuator)
• Motion-SPM™
RF Power Amplifiers
USB
• USB Transceivers
• USB Switches
Video
• High Performance Video
Multiplexers
• Triple Video DACs
• Video Filter Drivers
• Video Switch Matrix
• Video Switches

For datasheets, application notes,
samples and more, please visit:

www.fairchildsemi.com

problem **solved**

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