

Is Now Part of



ON Semiconductor®

To learn more about ON Semiconductor, please visit our website at www.onsemi.com

Please note: As part of the Fairchild Semiconductor integration, some of the Fairchild orderable part numbers will need to change in order to meet ON Semiconductor's system requirements. Since the ON Semiconductor product management systems do not have the ability to manage part nomenclature that utilizes an underscore (_), the underscore (_) in the Fairchild part numbers will be changed to a dash (-). This document may contain device numbers with an underscore (_). Please check the ON Semiconductor website to verify the updated device numbers. The most current and up-to-date ordering information can be found at www.onsemi.com. Please email any questions regarding the system integration to Fairchild <a href="general-regarding-numbers-n

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 EDA 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 officer



June 2015

FPF2C8P2NL07A

F2, 3-phase, 3-level NPC module with Press-fit / NTC

General Description

Fairchild's new inverter modules provide low conduction and switching loss as well. And Press-Fit technology provides simple and reliable mounting. These modules are optimized for the applications such as solar inverter and UPS where a high efficiency and robust design is needed.

Electrical Features

- · High Efficiency
- · Low Conduction and Switching Losses
- · Field Stop IGBT for Inner and Outer Switch
- STEALTHTM Diode for Path Diode
- · Built-in NTC for Temperature Monitoring

Mechanical Features

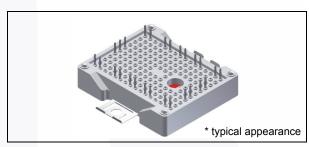
- · Compact Size: F2 Package
- · Press-fit Contact Technology
- Al₂O₃ Substrate with Low Thermal Resistance

Applications

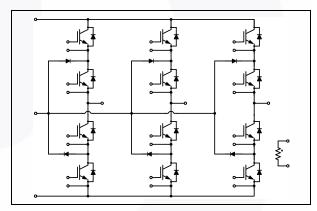
- Solar Inverter
- UPS

Related Materials

 AN-4167: Mounting Guideline for F1 / F2 Modules with Press-Fit Pins



Package Code: F2



Internal Circuit Diagram

Package Marking and Ordering Information

Device	Device Marking	Package	Packing Type	Quantity / Tray
FPF2C8P2NL07A	FPF2C8P2NL07A	F2	Tray	14

Absolute Maximum Ratings $T_C = 25^{\circ}C$ unless otherwise noted.

Symbol	Descr	Rating		
Outer IGBT	(Q1, Q4, Q5, Q8, Q9, Q12)	·		
V _{CES}	Collector-Emitter Voltage		650	V
V _{GES}	Gate-Emitter Voltage		± 20	V
I _C	Continuous Collector Current	@ T _C = 80 °C, T _{Jmax} = 175 °C	30	Α
I _{CM}	Pulsed Collector Current	limited by T _{Jmax}	60	Α
P_{D}	Maximum Power Dissipation	@ T _C = 25 °C	135	W
T _J	Operating Junction Temperature		- 40 to + 150	°C
Inner IGBT(Q2, Q3, Q6, Q7, Q10, Q11)			-
V _{CES}	Collector-Emitter Voltage		650	V
V _{GES}	Gate-Emitter Voltage		± 20	V
I _C	Continuous Collector Current	@ T _C = 80 °C, T _{Jmax} = 175 °C	50	Α
I _{CM}	Pulsed Collector Current	limited by T _{Jmax}	100	Α
P_{D}	Maximum Power Dissipation	@ T _C = 25 °C	174	W
T _J	Operating Junction Temperature		- 40 to + 150	°C
Outer - Inne	er IGBT Series Connection			
SCWT	Short Circuit Withstand Time	V_{DC} = 300 V, V_{GE} = 15 V T_{C} = 25 °C	4	μS
Diode				·
V _{RRM}	Peak Repetitive Reverse Voltage		650	V
l _F	Continuous Forward Current	@ T _C = 80 °C, T _{Jmax} = 175 °C	15	Α
I _{FM}	Maximum Forward Current		30	Α
P_{D}	Maximum Power Dissipation	@ T _C = 25 °C	100	W
T _J	Operating Junction Temperature		- 40 to + 150	°C
Module				
T _{STG}	Storage Temperature		- 40 to + 125	°C
V _{ISO}	Isolation Voltage	@ AC 1 min.	2500	V
IsoMaterial	Internal Isolation Material		Al ₂ O ₃	
T _{MOUNT}	Mounting Torque		2.0 to 5.0	Nm
Creepage	Terminal to Heat Sink		11.5	mm
	Terminal to Terminal		6.3	mm
Clearance	Terminal to Heat Sink		10.0	mm
	Terminal to Terminal		5.0	mm

Electrical Characteristics $T_C = 25$ °C unless otherwise noted.

Symbol	Parameter	Conditions	Min.	Тур.	Max.	Units
Outer IGE	ВТ				<u> </u>	
Off Charac	cteristics					
BV _{CES}	Collector-Emitter Breakdown Voltage	V _{GE} = 0 V, I _C = 1 mA	650	-	-	V
I _{CES}	Collector Cut-off Current	$V_{CE} = V_{CES}$, $V_{GE} = 0$ V	-	-	250	μΑ
I _{GES}	Gate-Emitter Leakage Current	V _{GE} = V _{GES} , V _{CE} = 0 V	-	-	2	μА
On Charac	eteristics	92 920 02				
V _{GE(th)}	Gate-Emitter Threshold Voltage	$V_{GE} = V_{CE}$, $I_C = 30 \text{ mA}$	4.5	5.6	6.7	V
V _{CE(sat)}	Collector-Emitter Saturation Voltage	I _C = 30 A, V _{GE} = 15 V	-	1.55	2.2	V
CE(Sat)		I _C = 30 A, V _{GE} = 15 V @T _C = 125 °C	-	1.75	-	V
		I _C = 60 A, V _{GF} = 15 V	-	2.13	-	V
Switching	Characteristics	0 02				
t _{d(on)}	Turn-On Delay Time	V _{CC} = 300 V	-	33	-	ns
t _r	Rise Time	I _C = 30 A	-	43	-	ns
t _{d(off)}	Turn-Off Delay Time	V _{GE} = ± 15 V	-	197	-	ns
t _f	Fall Time	$R_G = 20 \Omega$ Inductive Load	-	17	-	ns
E _{ON}	Turn-On Switching Loss per Pulse	T _C = 25 °C	-	0.68	-	mJ
E _{OFF}	Turn-Off Switching Loss per Pulse		-	0.38	-	mJ
t _{d(on)}	Turn-On Delay Time	V _{CC} = 300 V	-	29	-	ns
t _r	Rise Time	I _C = 30 A	_	50	_	ns
t _{d(off)}	Turn-Off Delay Time	$V_{GE} = \pm 15 \text{ V}$	_	205	_	ns
t _f	Fall Time	$R_G = 20 \Omega$ Inductive Load	_	25	_	ns
E _{ON}	Turn-On Switching Loss per Pulse	T _C = 125 °C	_	0.86	_	mJ
E _{OFF}	Turn-Off Switching Loss per Pulse		_	0.52	_	mJ
Q _g	Total Gate Charge	$V_{CC} = 300 \text{ V}, I_{C} = 30 \text{ A}, V_{GE} = \pm 15 \text{ V}$	_	0.26	_	μС
$R_{\theta JC}$	Thermal Resistance of Junction to Case	per Chip	_	0.20	1.11	°C/V
Inner IGB	RT					
Off Charac						
		\\\ -0\\ 1 -1 mA	650	_		V
BV _{CES}	Collector-Emitter Breakdown Voltage Collector Cut-off Current	$V_{GE} = 0 \text{ V, } I_{C} = 1 \text{ mA}$		-	250	
I _{CES}		$V_{CE} = V_{CES}, V_{GE} = 0 V$	-	-	250	μΑ
I _{GES} On Charac	Gate-Emitter Leakage Current	$V_{GE} = V_{GES}, V_{CE} = 0 V$	-	_	2	μА
		\\ -\\ -50 mA	4.5	F.6	6.7	V
V _{GE(th)}	Gate-Emitter Threshold Voltage	$V_{GE} = V_{CE}, I_{C} = 50 \text{ mA}$	4.5	5.6	6.7	•
V _{CE(sat)}	Collector-Emitter Saturation Voltage	I _C = 50 A, V _{GE} = 15 V	-	1.65	2.3	V
		I _C = 50 A, V _{GE} = 15 V @T _C = 125 °C	-	1.95	-	-
Consider Indian an	Chama ata miatina	I _C = 100 A, V _{GE} = 15 V	-	2.49	-	V
	Characteristics Turn-On Delay Time	V _{CC} = 300 V		44		
t _{d(on)}	· ·	$I_{\rm C} = 50 \rm A$	-	41	-	ns
t _r	Rise Time	V _{GE} = ± 15 V	-	65	-	ns
t _{d(off)}	Turn-Off Delay Time	$R_G = 15 \Omega$	-	233	-	ns
t _f	Fall Time	Inductive Load	-	18	-	ns
E _{ON}	Turn-On Switching Loss per Pulse	$T_C = 25 ^{\circ}C$	-	0.87	-	mJ
E _{OFF}	Turn-Off Switching Loss per Pulse	V = 200 V	-	0.77	-	mJ
t _{d(on)}	Turn-On Delay Time	V _{CC} = 300 V I _C = 50 A	-	39	-	ns
t _r	Rise Time	$V_{GE} = \pm 15 \text{ V}$	-	76	-	ns
t _{d(off)}	Turn-Off Delay Time	$R_G = 15 \Omega$	-	243	-	ns
t _f	Fall Time	Inductive Load	-	20	-	ns
E _{ON}	Turn-On Switching Loss per Pulse	T _C = 125 °C		0.99	-	mJ
E _{OFF}	Turn-Off Switching Loss per Pulse		-	0.93	-	mJ
Qg	Total Gate Charge	V_{CC} = 300 V, I_{C} = 50 A, V_{GE} = ± 15 V	-	0.39	_	nC
$R_{\theta JC}$	Thermal Resistance of Junction to Case	per Chip	-	-	0.86	°C/V

Electrical Characteristics $T_C = 25$ °C unless otherwise noted.

Symbol	Parameter	Conditions	Min.	Тур.	Max.	Units
Diode			'		•	
V _{FM}	Diode Forward Voltage	I _F = 15 A	-	2.55	3.4	V
		I _F = 15 A @T _C = 125 °C	-	1.78	-	V
I _R	Reverse Leakage Current	V _R = 650 V	-	-	250	μА
t _{rr}	Reverse Recovery Time	V _R = 300 V, I _F = 15 A	-	23	-	ns
I _{rr}	Reverse Recovery Current	$di_F / dt = 700 \text{ A/us}$	-	9.9	-	Α
Q _{rr}	Reverse Recovery Charge	$T_C = 25 ^{\circ}C$	-	113	-	nC
t _{rr}	Reverse Recovery Time	V _R = 300 V, I _F = 15 A	-	49	-	ns
I _{rr}	Reverse Recovery Current	$di_F / dt = 700 \text{ A/us}$	-	15.2	-	Α
Q _{rr}	Reverse Recovery Charge	$T_{\rm C}$ = 125 °C	-	366	-	nC
$R_{\theta JC}$	Thermal Resistance of Junction to Case	per Chip	-	-	1.44	°C/W
NTC_ The	ermistor					
R _{NTC}	Rated Resistance	T _C = 25 °C	-	5.0	-	kΩ
		T _C = 100 °C	-	493	-	Ω
	Tolerance	T _C = 25 °C	- 5	-	+ 5	%
P_{D}	Power Dissipation	T _C = 25 °C	-	-	20	mW
B _{Value}	B-Constant	B _{25/50}	-	3375	-	K
		B _{25/100}	-	3436	-	K

Typical Performance Characteristic

Fig 1. Typical Output Characteristics

- Outer IGBT

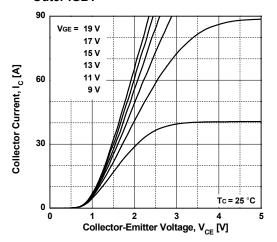


Fig 2. Typical Output Characteristics

- Outer IGBT

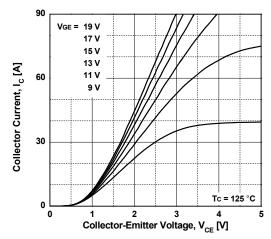


Fig 3. Typical Saturation Voltage Characteristics

- Outer IGBT

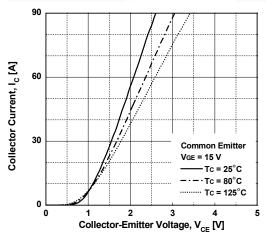


Fig 4. Switching Loss vs. Collector Current

- Outer IGBT

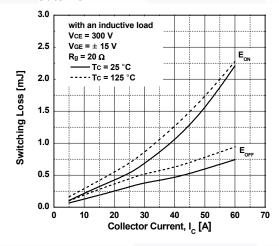


Fig 5. Switching Loss vs. Gate Resistance

- Outer IGBT

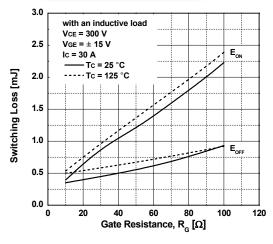
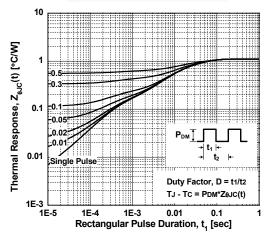


Fig 6. Transient Thermal Impedance

- Outer IGBT



Typical Performance Characteristic

Fig 7. Typical Output Characteristics

- Inner IGBT

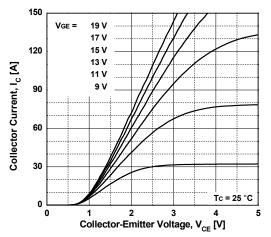


Fig 8. Typical Output Characteristics

- Inner IGBT

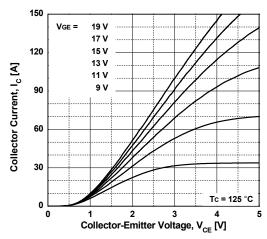


Fig 9. Typical Saturation Voltage Characteristics

- Inner IGBT

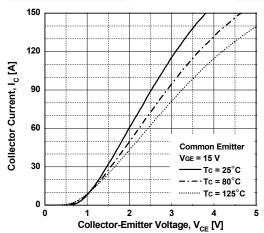


Fig 10. Switching Loss vs. Collector Current

- Inner IGBT

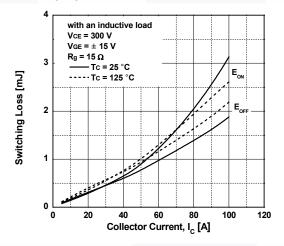


Fig 11. Switching Loss vs. Gate Resistance
- Inner IGBT

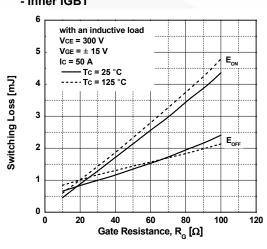
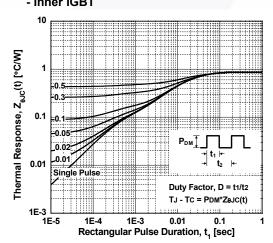


Fig 12. Transient Thermal Impedance
- Inner IGBT



Typical Performance Characteristic

Fig 13. Reverse Bias Safe Operating Area (RBSOA)

- Outer IGBT

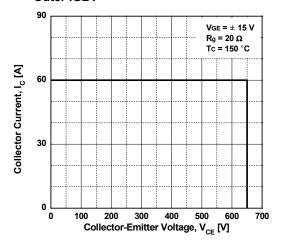


Fig 14. Reverse Bias Safe Operating Area (RBSOA)

- Inner IGBT

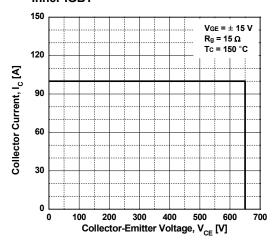


Fig 15. Typical Forward Voltage Drop

- Diode

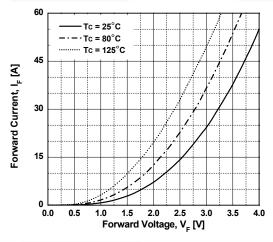


Fig 16. Reverse Recovery Energy vs. Forward Current

- Diode

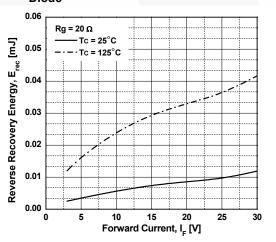
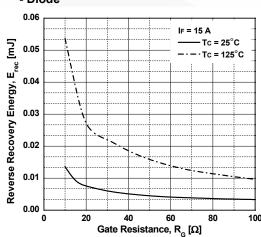
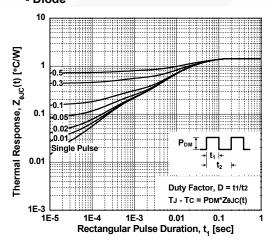


Fig 17. Reverse Recovery Energy vs. Gate Resistance Fig 18. Transient Thermal Impedance

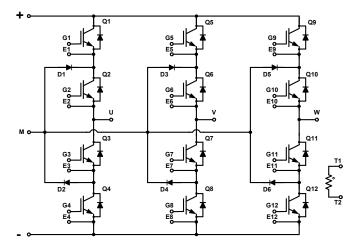
- Diode



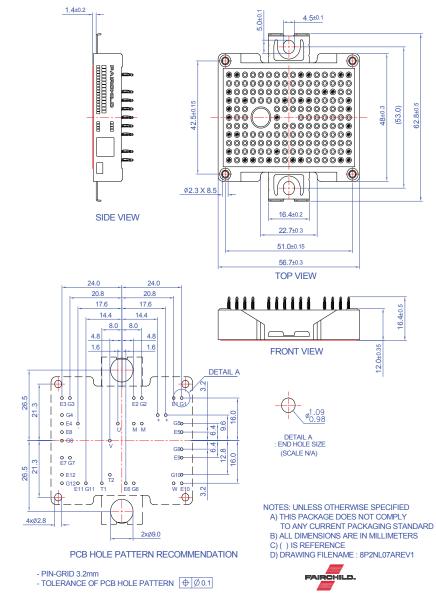
- Diode



Internal Circuit Diagram



Package Outlines [mm]







TRADEMARKS

Build it Now™

The following includes registered and unregistered trademarks and service marks, owned by Fairchild Semiconductor and/or its global subsidiaries, and is not intended to be an exhaustive list of all such trademarks.

F-PFS™ AccuPower™ **FRFET®** AttitudeEngine™

Global Power Resource SM Awinda[®] AX-CAP®* GreenBridge™ BitSiC™ Green FPS™

CorePLUS™ CorePOWER™ GTO™ CROSS VOLT M IntelliMAX™ CTI™ ISOPLANAR™

Current Transfer Logic™ DEUXPEED® and Better™

Dual Cool™ EcoSPARK® EfficientMax™ ESBC™ ■(R)

Fairchild® Fairchild Semiconductor® FACT Quiet Series™ FACT FAST® FastvCore™ FETBench™

Green FPS™ e-Series™ Gmax™

Making Small Speakers Sound Louder

MegaBuck™ MICROCOUPLER™ MicroFET™ MicroPak™

MicroPak2™ Miller Drive™ Motion Max™ Motion Grid® MTi[®] MTx[®] MVN® mWSaver® OptoHiT™

OPTOLOGIC®

OPTOPLANAR®

Power Supply WebDesigner™ PowerTrench⁶

PowerXS[™] Programmable Active Droop™

QFET⁰ QSTM Quiet Series™ RapidConfigure™

Saving our world, 1mW/W/kW at a time™

SignalWise™ SmartMax™ SMART START™

Solutions for Your Success™

SPM STEALTH™ SuperFET® SuperSOT™-3 SuperSOT™-6 SuperSOT™-8 SupreMOS® SyncFET™ Sync-Lock™

TinyPower™ TinyPWM™ TinyWire™ Tran SiC™ TriFault Detect™ TRUECURRENT®* μSerDes™ UHC® Ultra FRFET™ UniFET* **VCXTM**

SYSTEM GENERAL®

TinyBoost®

TinyBuck[®]

TinyCalc™

TinyLogic[®]

TINYOPTO™

VisualMax™ VoltagePlus™ Xsens™ 仙童™

FPSTM

FAIRCHILD SEMICONDUCTOR RESERVES THE RIGHT TO MAKE CHANGES WITHOUT FURTHER NOTICE TO ANY PRODUCTS HEREIN TO IMPROVE RELIABILITY, FUNCTION, OR DESIGN. TO OBTAIN THE LATEST, MOST UP-TO-DATE DATASHEET AND PRODUCT INFORMATION, VISIT OUR WEBSITE AT <u>HTTP://WWW.FAIRCHILDSEMI.COM.</u> FAIRCHILD DOES NOT ASSUME ANY LIABILITY ARISING OUT OF THE APPLICATION OR USE OF ANY PRODUCT OR CIRCUIT DESCRIBED HEREIN; NEITHER DOES IT CONVEY ANY LICENSE UNDER ITS PATENT RIGHTS, NOR THE RIGHTS OF OTHERS. THESE SPECIFICATIONS DO NOT EXPAND THE TERMS OF FAIRCHILD'S WORLDWIDE TERMS AND CONDITIONS, SPECIFICALLY THE WARRANTY THEREIN, WHICH COVERS THESE PRODUCTS.

LIFE SUPPORT POLICY

FAIRCHILD'S PRODUCTS ARE NOT AUTHORIZED FOR USE AS CRITICAL COMPONENTS IN LIFE SUPPORT DEVICES OR SYSTEMS WITHOUT THE EXPRESS WRITTEN APPROVAL OF FAIRCHILD SEMICONDUCTOR CORPORATION.

- 1. Life support devices or systems are devices or systems which, (a) are intended for surgical implant into the body or (b) support or sustain life, and (c) whose failure to perform when properly used in accordance with instructions for use provided in the labeling, can be reasonably expected to result in a significant injury of the user
- 2. A critical component in any component of a life support, device, or system whose failure to perform can be reasonably expected to cause the failure of the life support device or system, or to affect its safety or effectiveness.

ANTI-COUNTERFEITING POLICY

Fairchild Semiconductor Corporation's Anti-Counterfeiting Policy. Fairchild's Anti-Counterfeiting Policy is also stated on our external website, www.fairchildsemi.com, under Sales Support.

Counterfeiting of semiconductor parts is a growing problem in the industry. All manufacturers of semiconductor products are experiencing counterfeiting of their parts. Customers who inadvertently purchase counterfeit parts experience many problems such as loss of brand reputation, substandard performance, failed applications, and increased cost of production and manufacturing delays. Fairchild is taking strong measures to protect ourselves and our customers from the proliferation of counterfeit parts. Fairchild strongly encourages customers to purchase Fairchild parts either directly from Fairchild or from Authorized Fairchild Distributors who are listed by country on our web page cited above. Products customers buy either from Fairchild directly or from Authorized Fairchild Distributors are genuine parts, have full traceability, meet Fairchild's quality standards for handling and storage and provide access to Fairchild's full range of up-to-date technical and product information. Fairchild and our Authorized Distributors will stand behind all warranties and will appropriately address any warranty issues that may arise. Fairchild will not provide any warranty coverage or other assistance for parts bought from Unauthorized Sources. Fairchild is committed to combat this global problem and encourage our customers to do their part in stopping this practice by buying direct or from authorized distributors.

PRODUCT STATUS DEFINITIONS

Definition of Terms

Datasheet Identification	Product Status	Definition	
Advance Information	Formative / In Design	Datasheet contains the design specifications for product development. Specifications may change in any manner without notice.	
		Datasheet contains preliminary data; supplementary data will be published at a later date. Fairchild Semiconductor reserves the right to make changes at any time without notice to improve design.	
		Datasheet contains final specifications. Fairchild Semiconductor reserves the right to make changes at any time without notice to improve the design.	
Obsolete Not In Production		Datasheet contains specifications on a product that is discontinued by Fairchild Semiconductor. The datasheet is for reference information only.	

Rev. 174

^{*} Trademarks of System General Corporation, used under license by Fairchild Semiconductor.

ON Semiconductor and in 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/pdt/Patent-Marking.pdf. ON Semiconductor reserves the right to make changes without further notice to any products herein. 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 exp

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
Japan Customer Focus Center
Phone: 81-3-5817-1050

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: FPF2C8P2NL07A



Компания «ЭлектроПласт» предлагает заключение долгосрочных отношений при поставках импортных электронных компонентов на взаимовыгодных условиях!

Наши преимущества:

- Оперативные поставки широкого спектра электронных компонентов отечественного и импортного производства напрямую от производителей и с крупнейших мировых складов;
- Поставка более 17-ти миллионов наименований электронных компонентов;
- Поставка сложных, дефицитных, либо снятых с производства позиций;
- Оперативные сроки поставки под заказ (от 5 рабочих дней);
- Экспресс доставка в любую точку России;
- Техническая поддержка проекта, помощь в подборе аналогов, поставка прототипов;
- Система менеджмента качества сертифицирована по Международному стандарту ISO 9001:
- Лицензия ФСБ на осуществление работ с использованием сведений, составляющих государственную тайну;
- Поставка специализированных компонентов (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Aeroflex, Peregrine, Syfer, Eurofarad, Texas Instrument, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits, General Dynamics и др.);

Помимо этого, одним из направлений компании «ЭлектроПласт» является направление «Источники питания». Мы предлагаем Вам помощь Конструкторского отдела:

- Подбор оптимального решения, техническое обоснование при выборе компонента;
- Подбор аналогов;
- Консультации по применению компонента;
- Поставка образцов и прототипов;
- Техническая поддержка проекта;
- Защита от снятия компонента с производства.



Как с нами связаться

Телефон: 8 (812) 309 58 32 (многоканальный)

Факс: 8 (812) 320-02-42

Электронная почта: <u>org@eplast1.ru</u>

Адрес: 198099, г. Санкт-Петербург, ул. Калинина,

дом 2, корпус 4, литера А.