

Is Now Part of



ON Semiconductor®

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

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_questions@onsemi.com.

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 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 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 applications, 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 equif prese



FDP8N50NZ / FDPF8N50NZ N-Channel UniFETTM II MOSFET 500 V, 8 A, 850 m Ω

Features

- $R_{DS(on)}$ = 770 m Ω (Typ.) @ V_{GS} = 10 V, I_D = 4 A
- Low Gate Charge (Typ. 14 nC)
- Low C_{rss} (Typ. 5 pF)
- 100% Avalanche Tested
- Improve dv/dt Capability
- · ESD Improved Capability
- RoHS Compliant

Applications

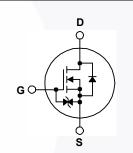
- LCD/LED TV
- Uninterruptible Power Supply
- Lighting
- AC-DC Power Supply

Description

TO-220F

UniFETTM II MOSFET is Fairchild Semiconductor's high voltage MOSFET family based on advanced planar stripe and DMOS technology. This advanced MOSFET family has the smallest on-state resistance among the planar MOSFET, and also provides superior switching performance and higher avalanche energy strength. In addition, internal gate-source ESD diode allows UniFET II MOSFET to withstand over 2kV HBM surge stress. This device family is suitable for switching power converter applications such as power factor correction (PFC), flat panel display (FPD) TV power, ATX and electronic lamp ballasts.

G_DS



MOSFET Maximum Ratings T_C = 25°C unless otherwise noted*

TO-220

Symbol		FDP8N50NZ	FDPF8N50NZ	Unit		
V _{DSS}	Drain to Source Voltage			5	V	
V _{GSS}	Gate to Source Voltage			±25		V
ID	Drain Current	- Continuous (T _C = 25 ^o C)		8 8*		•
		- Continuous (T _C = 100 ^o C)		4.8	4.8*	A
I _{DM}	Drain Current	- Pulsed (Note 1)		32	32*	А
E _{AS}	Single Pulsed Avalanche Energy (N		(Note 2)	122		mJ
I _{AR}	Avalanche Current		(Note 1)	8		Α
E _{AR}	Repetitive Avalanche Energy		(Note 1)	13		mJ
dv/dt	Peak Diode Recovery dv/dt		(Note 3)	10		V/ns
P _D	Power Dissipation	(T _C = 25 ^o C)		130	40.3	W
		- Derate above 25°C		1	0.3	W/ºC
T _J , T _{STG}	Operating and Storage Temperature Range		-55 to +150		°C	
TL	Maximum Lead Temperature for Soldering Purpose, 1/8" from Case for 5 Seconds			300		°C

Thermal Characteristics

Symbol	Parameter	FDP8N50NZ	FDPF8N50NZ	Unit
$R_{ ext{ heta}JC}$	Thermal Resistance, Junction to Case, Max.	0.96	3.1	°C/W
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient, Max.	62.5	62.5	0/00

1

October 2013

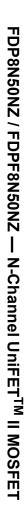
		Pack	•		e Width N/A		Quantit	у		
		TO-2					50 units			
FDPF8N	50NZ	FDPF8N50NZ	TO-2	-220F Tube I		N/A		50 units		
Electrica	I Char	acteristics T _c =	25ºC unles	s otherwi	se noted					
Symbol	Parameter			Test Conditions		Min.	Тур.	Max.	Uni	
Off Charac	teristic	S								
BV _{DSS}	Drain to	o Source Breakdown Vo	oltage	$I_D = 250 \mu A$, $V_{GS} = 0V$, $T_C = 25^{\circ}C$			500	-	-	V
ΔΒV _{DSS} / ΔΤ _J	Breakd Coeffic	own Voltage Temperatu ient	ire	$I_D = 250 \mu A$, Referenced to $25^{\circ}C$			-	0.5	-	V/ºC
	Zoro G	Zero Gate Voltage Drain Current		V _{DS} = 500V, V _{GS} = 0V		-	-	1		
IDSS	Zelo G			V _{DS} =	400V, T _C = 125 ^o C		-	-	10	μA
I _{GSS}	Gate to	Body Leakage Curren	t	V _{GS} =	_{iS} = ±25V, V _{DS} = 0V		-	-	±10	μA
On Charac	teristic	S								
V _{GS(th)}	Gate T	Gate Threshold Voltage		V _{GS} =	V _{DS} , I _D = 250μA		3.0	-	5.0	V
R _{DS(on)}		atic Drain to Source On Resistance		$V_{GS} = 10V, I_D = 4A$			-	0.77	0.85	Ω
9 _{FS}	Forward Transconductance			$V_{\rm DS} = 20V, I_{\rm D} = 4A$		-	6.3	-	S	
Dynamic C	haract	eristics								
C _{iss}	-	apacitance					-	565	735	pF
C _{oss}	Output	Itput Capacitance		$V_{DS} = 25V, V_{GS} = 0V$		-	80	105	pF	
C _{rss}	Revers	e Transfer Capacitance		f = 1MHz		-	5	8	pF	
Q _{g(tot)}	Total G	ate Charge at 10V				-	14	18	nC	
Q _{gs}	Gate to	Gate to Source Gate Charge		$V_{DS} = 400V, I_D = 8A$			-	4	-	nC
Q _{gd}	Gate to	Drain "Miller" Charge		V _{GS} = 10V (Note 4)		-	6	-	nC	
Switching	Charac	teristics							1	
t _{d(on)}		n Delay Time					-	17	45	ns
t _r	Turn-O	n Rise Time		V _{DD} =	250V, I _D = 8A	_	-	34	80	ns
t _{d(off)}	Turn-Ot	f Delay Time		$R_{G} = 25\Omega, V_{GS} = 10V$ (Note 4)		-	43	95	ns	
t _f	Turn-Of	ff Fall Time				-	27	60	ns	
Drain-Sou	rce Dio	de Characteristic	5	I				ı		
I _S	Maximum Continuous Drain to Source Diode Forward Current					-	-	8	A	
I _{SM}	Maximum Pulsed Drain to Source Diode			Forward Current			-	-	30	Α
V _{SD}	Drain to	Source Diode Forward	Voltage	V _{GS} = 0V, I _{SD} = 8A		-	-	1.4	V	
t _{rr}		Reverse Recovery Time			0V, I _{SD} = 8A		-	228	7 -	ns
Q _{rr}		e Recovery Charge		$v_{GS} = 00$, $v_{SD} = 0A$ $dI_F/dt = 100A/\mu s$		-	1.43	-	μC	

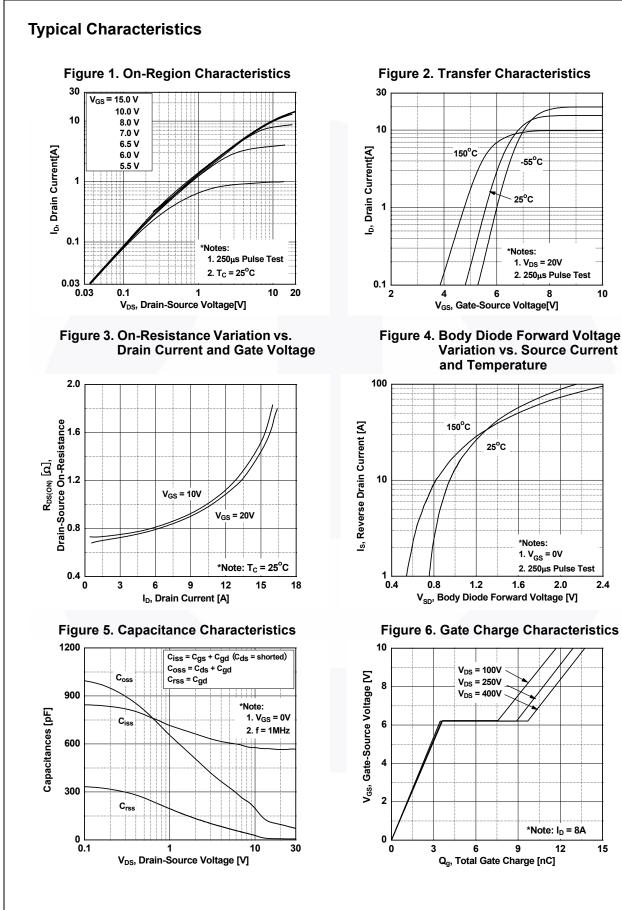
1. Repetitive Rating: Pulse width limited by maximum junction temperature

2. L = 3.8mH, I_{AS} = 8A, V_{DD} = 50V, R_G = 25 Ω , Starting T_J = 25°C

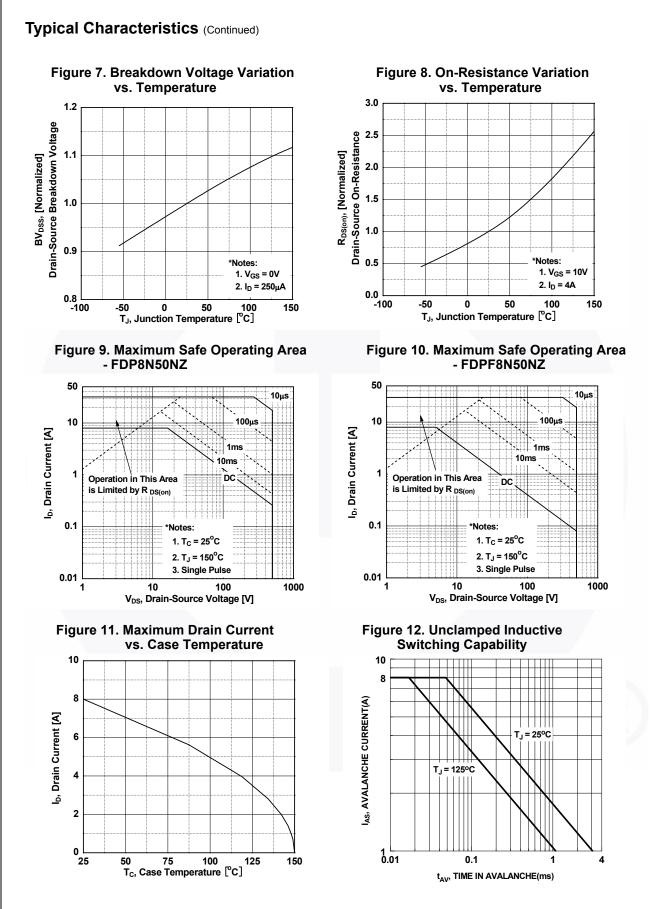
3. $I_{SD} \leq$ 8A, di/dt \leq 200A/µs, $V_{DD} \leq BV_{DSS},$ Starting T_J = 25°C

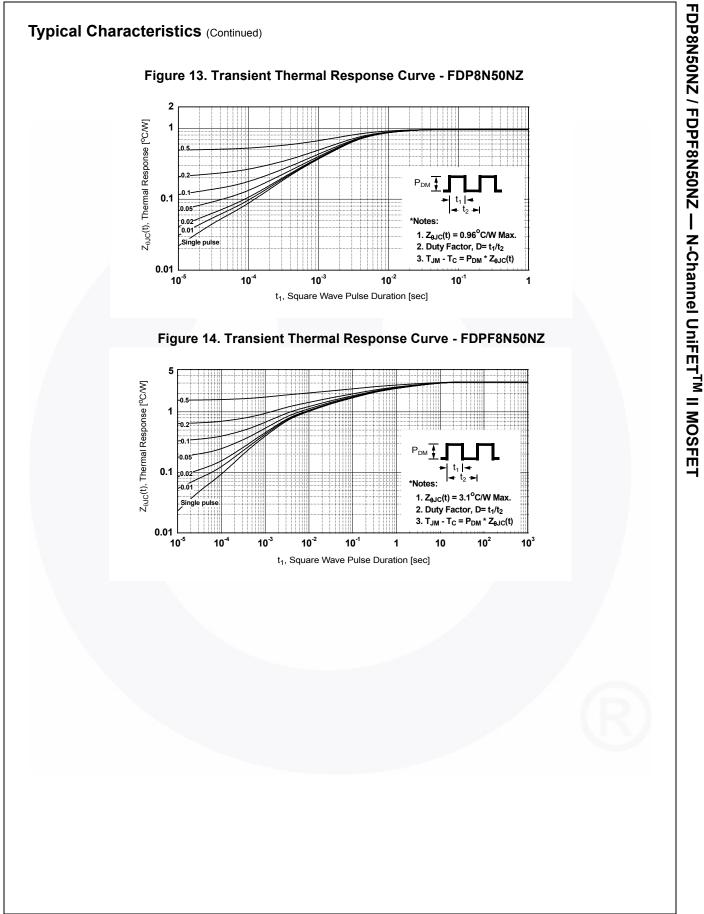
4. Essentially Independent of Operating Temperature Typical Characteristics



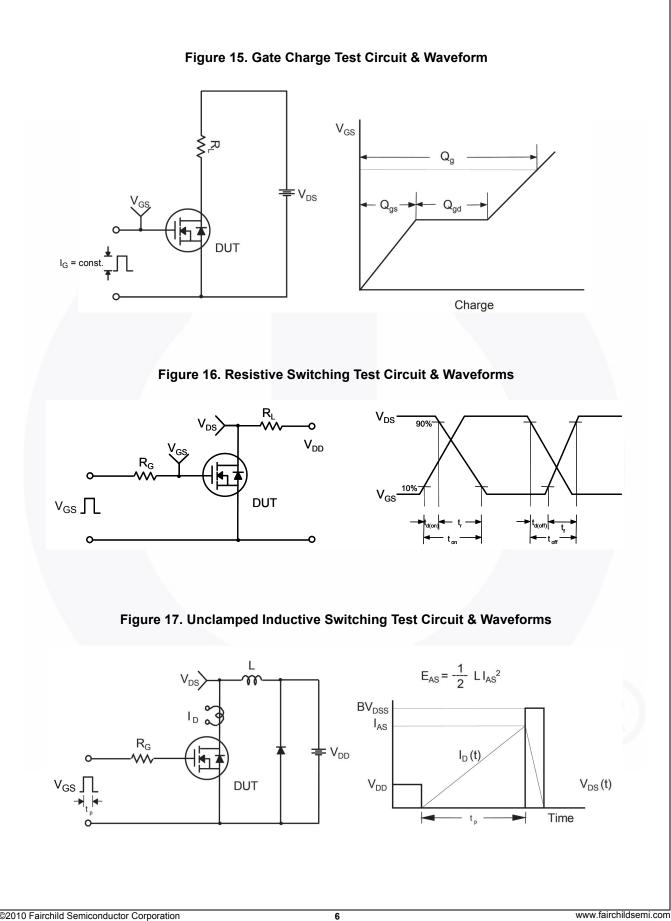


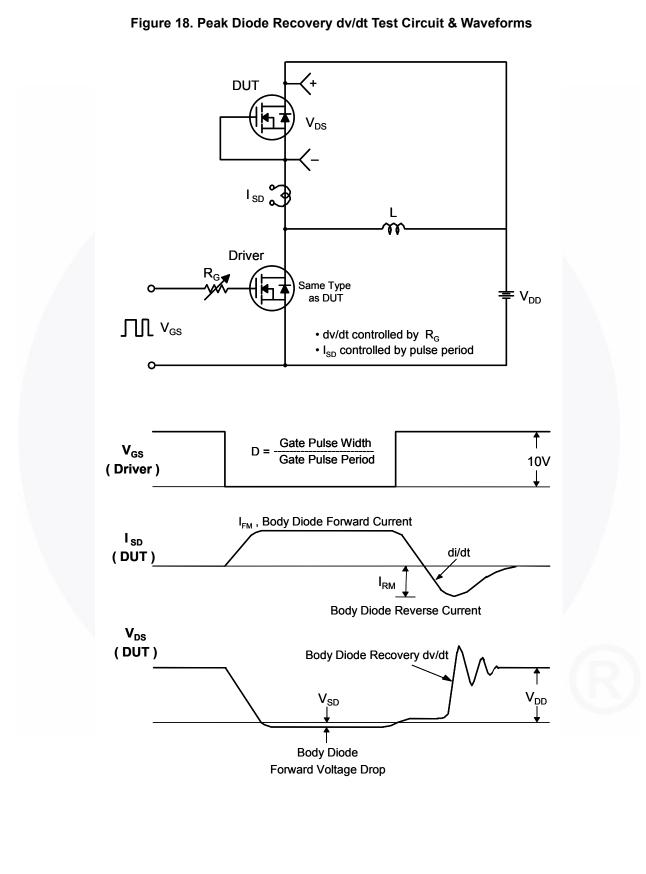
©2010 Fairchild Semiconductor Corporation FDP8N50NZ / FDPF8N50NZ Rev. C2

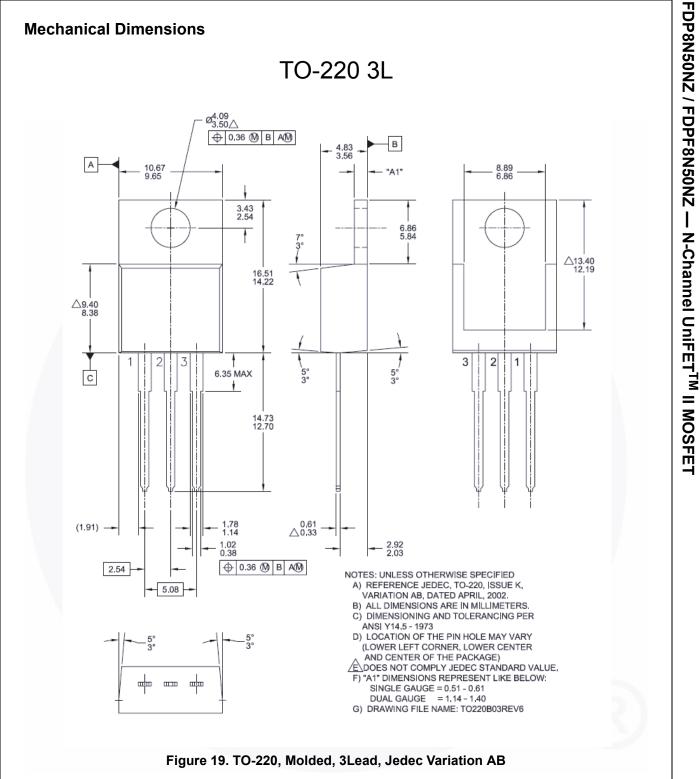




5





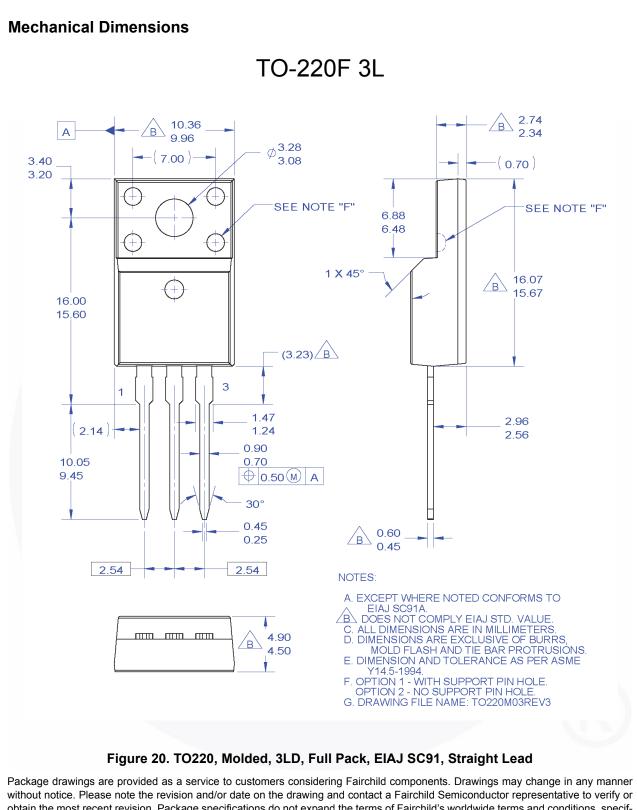


Package drawings are provided as a service to customers considering Fairchild components. Drawings may change in any manner without notice. Please note the revision and/or date on the drawing and contact a Fairchild Semiconductor representative to verify or obtain the most recent revision. Package specifications do not expand the terms of Fairchild's worldwide terms and conditions, specifically the warranty therein, which covers Fairchild products.

Always visit Fairchild Semiconductor's online packaging area for the most recent package drawings:

http://www.fairchildsemi.com/package/packageDetails.html?id=PN_TT220-003

Dimension in Millimeters



obtain the most recent revision. Package specifications do not expand the terms of Fairchild's worldwide terms and conditions, specifically the warranty therein, which covers Fairchild products.

Always visit Fairchild Semiconductor's online packaging area for the most recent package drawings:

http://www.fairchildsemi.com/package/packageDetails.html?id=PN_TF220-003

Dimension in Millimeters

FDP8N50NZ / FDPF8N50NZ — N-Channel UniFETTM II MOSFET



SEMICONDUCTOR

TRADEMARKS

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.

AccuPower™ AX-CAP®* BitSiC™ Build it Now™ CorePLUS™ CorePOWER™ <i>CROSSVOLT</i> ™ CTL™ Current Transfer Logic™ DEUXPEED® Dual Cool™ EcoSPARK®	
EfficentMax™ ESBC™	
B	

Fairchild® Fairchild Semiconductor® FACT Quiet Series™ FACT[®] FAST[®] FastvCore™ FETBench™ FPS™

FRFET® Global Power ResourceSM GreenBridge™ Green FPS™ Green FPS™ e-Series™ G*max*™ GTO™ IntelliMAX™ ISOPLANAR™ Marking Small Speakers Sound Louder and Better™ MegaBuck™ MICROCOUPLER™ MicroFET™ MicroPak™ MicroPak2™ MillerDrive™ MotionMax™ mWSaver® OptoHiT™ **OPTOLOGIC® OPTOPLANAR[®]**

F-PFS™

 $(1)_{\mathbb{B}}$ PowerTrench® PowerXS™ Programmable Active Droop™ QFET QS™ 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®

SYSTEM^{®*} GENERAL TinyBoost[®] TinyBuck® TinyCalc™ TinyLogic® TINYOPTO™ TinvPower™ TinyPWM™ TinyWire™ TranSiC™ TriFault Detect™ TRUECURRENT®* uSerDes™ UHC® Ultra FRFET™ UniFFT™ VCX™

VisualMax™

XS™

VoltagePlus™

Sync-Lock™

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

DISCLAIMER

FAIRCHILD SEMICONDUCTOR RESERVES THE RIGHT TO MAKE CHANGES WITHOUT FURTHER NOTICE TO ANY PRODUCTS HEREIN TO IMPROVE RELIABILITY, FUNCTION, OR DESIGN. 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.

SvncFET™

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.

As used here in:

- Life support devices or systems are devices or systems which, (a) are 1. 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 manufactures 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 application, 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 handing 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 and 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 Tern

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.
Preliminary	First Production	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.
No Identification Needed	Full Production	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.

ON Semiconductor and 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 <u>www.onsemi.com/site/pdf/Patent-Marking.pdf</u>. 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 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 haves against all claims, costs, damages, and expenses, and reasonable attorney fees arising out of, directly ori indirectly, any claim of personal injury or death

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

© Semiconductor Components Industries, LLC

Mouser Electronics

Authorized Distributor

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

ON Semiconductor: <u>FDPF8N50NZ</u>



Мы молодая и активно развивающаяся компания в области поставок электронных компонентов. Мы поставляем электронные компоненты отечественного и импортного производства напрямую от производителей и с крупнейших складов мира.

Благодаря сотрудничеству с мировыми поставщиками мы осуществляем комплексные и плановые поставки широчайшего спектра электронных компонентов.

Собственная эффективная логистика и склад в обеспечивает надежную поставку продукции в точно указанные сроки по всей России.

Мы осуществляем техническую поддержку нашим клиентам и предпродажную проверку качества продукции. На все поставляемые продукты мы предоставляем гарантию.

Осуществляем поставки продукции под контролем ВП МО РФ на предприятия военно-промышленного комплекса России, а также работаем в рамках 275 ФЗ с открытием отдельных счетов в уполномоченном банке. Система менеджмента качества компании соответствует требованиям ГОСТ ISO 9001.

Минимальные сроки поставки, гибкие цены, неограниченный ассортимент и индивидуальный подход к клиентам являются основой для выстраивания долгосрочного и эффективного сотрудничества с предприятиями радиоэлектронной промышленности, предприятиями ВПК и научноисследовательскими институтами России.

С нами вы становитесь еще успешнее!

Наши контакты:

Телефон: +7 812 627 14 35

Электронная почта: sales@st-electron.ru

Адрес: 198099, Санкт-Петербург, Промышленная ул, дом № 19, литера Н, помещение 100-Н Офис 331