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November 2013

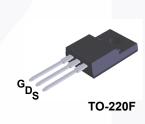
# **FQPF16N25C** N-Channel QFET<sup>®</sup> MOSFET 250 V, 15.6 A, 270 mΩ

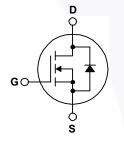
### Features

- + 15.6 A, 250 V,  $R_{DS(on)}$  = 270 m $\Omega$  (Max) @  $V_{GS}$  = 10 V,  $I_{D}$  = 7.8 A
- Low Gate Charge (Typ. 41 nC)
- Low Crss (Typ. 68 pF)
- 100% Avalanche Tested

## Description

This N-Channel enhancement mode power MOSFET is produced using Fairchild Semiconductor's proprietary planar stripe and DMOS technology. This advanced MOSFET technology has been especially tailored to reduce on-state resistance, and to provide superior switching performance and high avalanche energy strength. These devices are suitable for switched mode power supplies, active power factor correction (PFC), and electronic lamp ballasts.





### MOSFET Maximum Ratings T<sub>C</sub> = 25°C unless otherwise noted.

Symbol		Parameter		FQPF16N25C	Unit
V <sub>DSS</sub>	Drain to Source Voltage			250	V
ID	Drain Current	- Continuous (T <sub>C</sub> = 25 <sup>o</sup> C)		15.6 *	A
	Drain Current	- Continuous (T <sub>C</sub> = 100 <sup>o</sup> C)		9.8 *	A
ОМ	Drain Current	- Pulsed (Note 1)		62.4 *	A
V <sub>GSS</sub>	Gate to Source Voltage			± 30	V
E <sub>AS</sub>	Single Pulsed Avalanche Energy		Note 2)	410	mJ
AR	Avalanche Current		Note 1)	15.6	A
AR	Repetitive Avalanche Energy		Note 1)	13.9	mJ
dv/dt	Peak Diode Recovery dv/dt (Note 3)		Note 3)	5.5	V/ns
P <sub>D</sub>	Davida Dia dia atian	$(T_{\rm C} = 25^{\rm o}{\rm C})$		43	W
	Power Dissipation	- Derate Above 25°C		0.34	W/°C
Γ <sub>J</sub> , T <sub>STG</sub>	Operating and Storage Temperature Range			-55 to +150	°C
ΓL	Maximum Lead Temperature for Soldering, 1/8" from Case for 5 Seconds			300	°C

\*Drain current limited by maximum junction temperature

### **Thermal Characteristics**

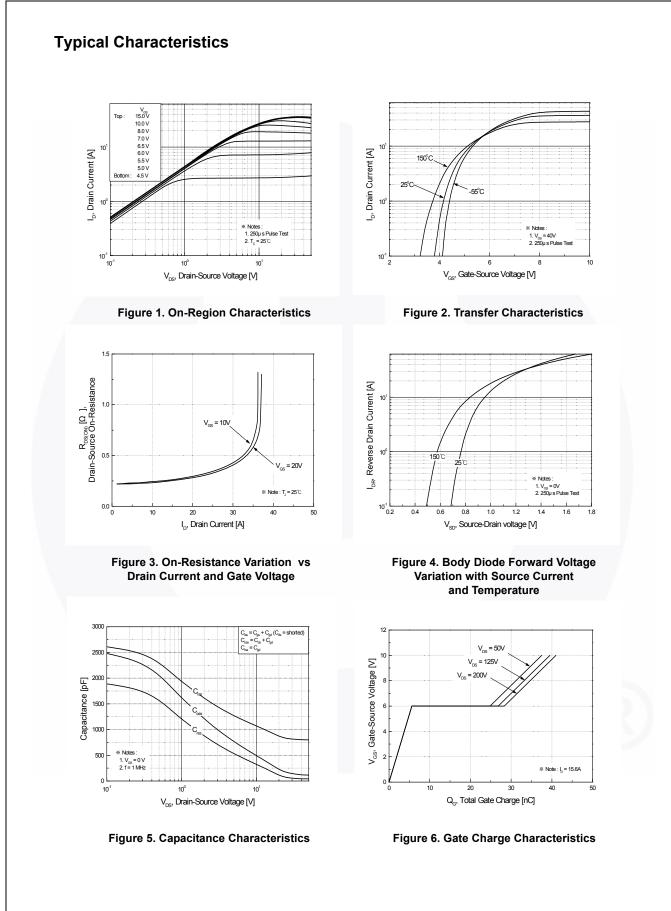
Symbol	Parameter	FQPF16N25C	Unit
$R_{ extsf{ heta}JC}$	Thermal Resistance, Junction to Case, Max	2.89	°C/W
$R_{ extsf{ heta}JA}$	Thermal Resistance, Junction to Ambient, Max	62.5	°C/W

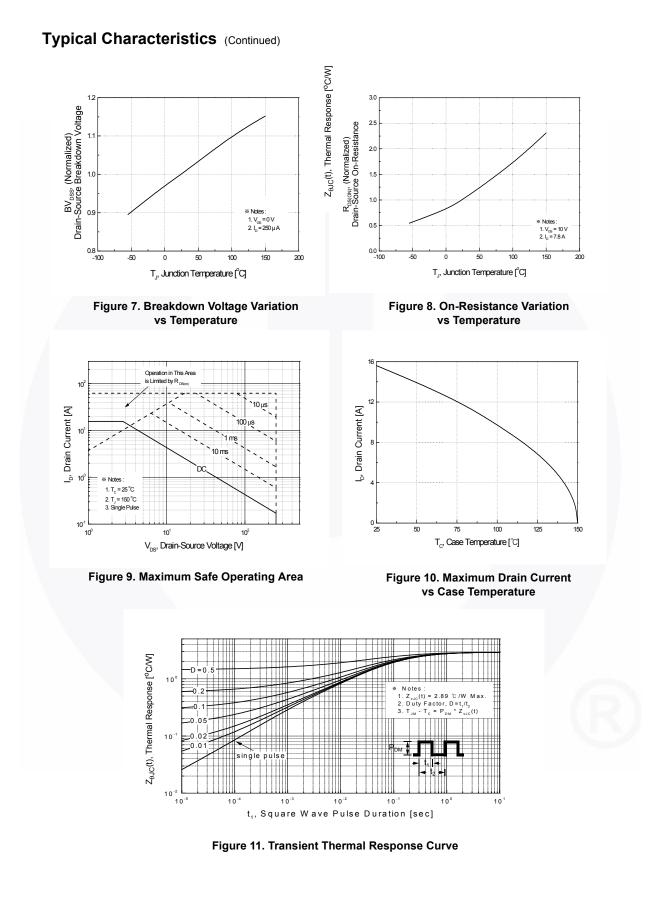
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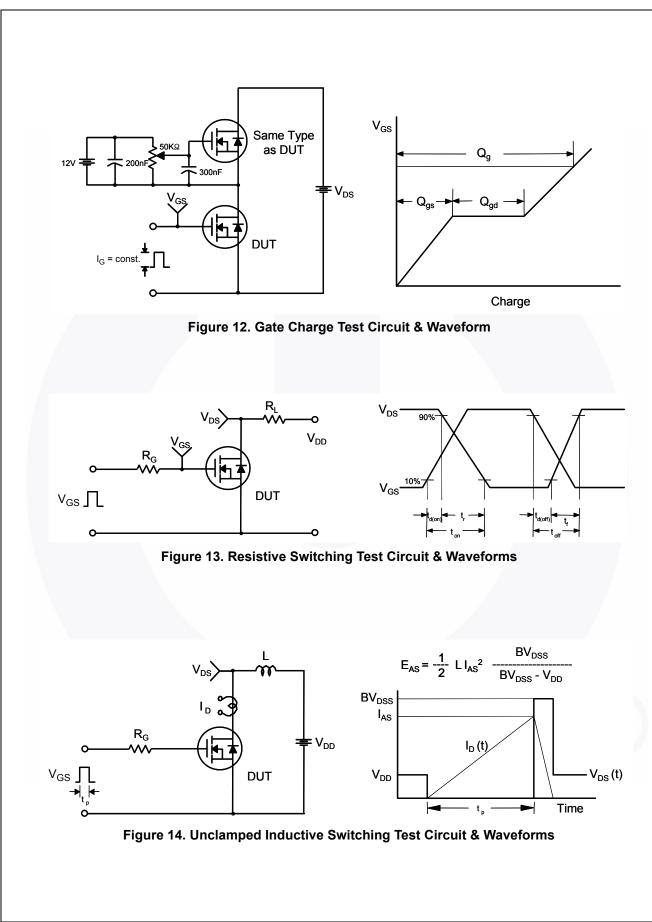
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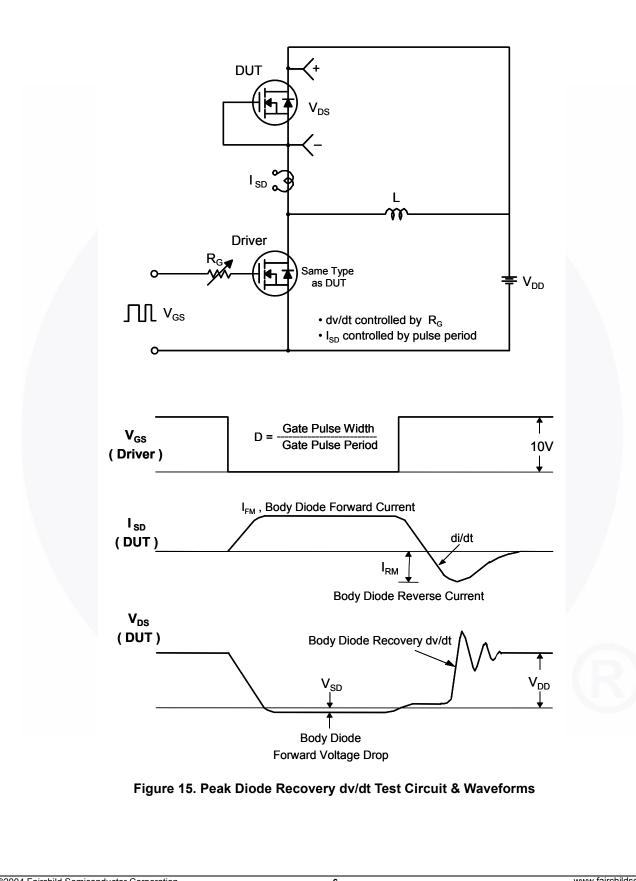
Device MarkingDeviceFQPF16N25CFQPF16N25C		Pack	age	Reel	Size	Tape Widt	h Qu	antity	
				be	N/A	50	50 units		
Electri	cal Charact	<b>teristics</b> $T_{\rm C}$ = 25°C ur	nless otherwise note	J.					
Symbol	1	Parameter	Test Cor			Min.	Тур.	Max.	Unit
Off Cha	aracteristics								
BV <sub>DSS</sub>	1	reakdown Voltage	V <sub>GS</sub> = 0 V, I <sub>D</sub> = 25	Ο μΑ		250			V
ΔBV <sub>DSS</sub>		age Temperature Coeffi-	00 0						-
$/ \Delta T_{J}$	cient	age remperature coem-	I <sub>D</sub> = 250 μA, Refer	enced to 2	25°C		0.31		V/°C
1	Zoro Coto Volto	an Drain Current	V <sub>DS</sub> = 250 V, V <sub>GS</sub> = 0 V					10	μA
IDSS	Zero Gate Voltage Drain Current		V <sub>DS</sub> = 200 V, T <sub>C</sub> = 125°C					100	μA
I <sub>GSSF</sub>	Gate-Body Leal	kage Current, Forward	$V_{GS}$ = 30 V, $V_{DS}$ =	0 V				100	nA
I <sub>GSSR</sub>	Gate-Body Leal	kage Current, Reverse	$V_{GS}$ = -30 V, $V_{DS}$ =	= 0 V				-100	nA
On Cha	racteristics								
V <sub>GS(th)</sub>	Gate Threshold	Voltage	$V_{DS} = V_{GS}, I_{D} = 25$	i0 μA		2.0		4.0	V
R <sub>DS(on)</sub>	Static Drain-Sou On-Resistance	urce	V <sub>GS</sub> = 10 V, I <sub>D</sub> = 7	8 A			0.22	0.27	Ω
9 <sub>FS</sub>	Forward Transo	conductance	V <sub>DS</sub> = 40 V, I <sub>D</sub> = 7	8 A			10.5		S
Dvnam	ic Characteri	stics							
C <sub>iss</sub>	Input Capacitan		V <sub>DS</sub> = 25 V, V <sub>GS</sub> = 0 V, f = 1.0 MHz			830	1080	pF	
C <sub>oss</sub>	Output Capacita	ance				170	220	pF	
C <sub>rss</sub>	Reverse Transf	er Capacitance				68	89	pF	
Switch	ing Character	riation							
	ing Character Turn-On Delay						15	40	ns
t <sub>d(on)</sub> t <sub>r</sub>	Turn-On Rise T		V <sub>DD</sub> = 125 V, I <sub>D</sub> = 15.6 A,			130	270		
			V <sub>GS</sub> = 10 V, R <sub>G</sub> = 2	25 Ω	-				ns
t <sub>d(off)</sub>	Turn-Off Delay		(Note 4)			135	280	ns	
t <sub>f</sub>	Turn-Off Fall Tir				. ,		105	220	ns
Q <sub>g</sub>	Total Gate Char	-	$V_{DS} = 200 \text{ V}, \text{ I}_{D} = 15.6 \text{ A},$ $V_{GS} = 10 \text{ V}$		-	41	53.5	nC	
Q <sub>gs</sub>	Gate-Source Cl	-				5.6		nC	
Q <sub>gd</sub>	Gate-Drain Cha	Irge			(Note 4)		22.7		nC
		Characteristics and		ngs					<b>—</b> —
I <sub>S</sub>	Maximum Continuous Drain-Source Diode Forward Current						15.6	A	
I <sub>SM</sub>		ed Drain-Source Diode For						62.4	A
V <sub>SD</sub>		iode Forward Voltage	V <sub>GS</sub> = 0 V, I <sub>S</sub> = 15.6 A				1.5	V	
t <sub>rr</sub>	Reverse Recov		V <sub>GS</sub> = 0 V, I <sub>S</sub> = 15.6 A,			260		ns	
Q <sub>rr</sub>	Reverse Recov	ery Charge	dI <sub>F</sub> / dt = 100 A/μs				2.47		μC

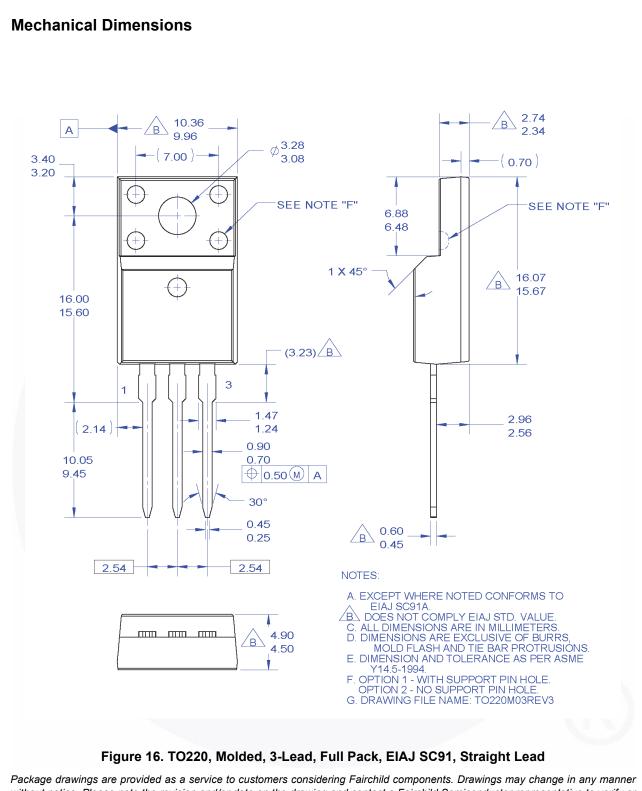
4. Essentially independent of operating temperature











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