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## FQH8N100C N-Channel QFET<sup>®</sup> MOSFET

## 1000 V, 8.0 A, 1.45 Ω

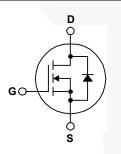
#### Description

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.

#### Features

- + 8 A, 1000 V,  $R_{DS(on)}$  = 1.45  $\Omega$  (Max.) @ V<sub>GS</sub> = 10 V
- Low Gate Charge (Typ. 53 nC)
- Low Crss (Typ. 16 pF)
- Fast Switching
- 100% Avalanche Tested
- Improved dv/dt Capability
- RoHS Compliant





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

Symbol	Parameter	FQH8N100C	Unit
	Drain-Source Voltage	1000	V
I <sub>D</sub>	Drain Current - Continuous (T <sub>C</sub> = 25°C)	8.0	А
	- Continuous (T <sub>C</sub> = 100°C)	5.0	А
I <sub>DM</sub>	Drain Current - Pulsed (Note	32	А
V <sub>GSS</sub>	Gate-Source Voltage	± 30	V
E <sub>AS</sub>	Single Pulsed Avalanche Energy (Note	2) 850	mJ
I <sub>AR</sub>	Avalanche Current (Note	1) 8.0	А
E <sub>AR</sub>	Repetitive Avalanche Energy (Note	1) 22	mJ
dv/dt	Peak Diode Recovery dv/dt (Note	3) 4.0	V/ns
P <sub>D</sub>	Power Dissipation (T <sub>C</sub> = 25°C)	225	W
	- Derate above 25°C	1.79	W/°C
T <sub>J</sub> , T <sub>STG</sub>	Operating and Storage Temperature Range	-55 to +150	°C
Τ <sub>L</sub>	Maximum Lead Temperature for Soldering, 1/8" from Case for 5 Seconds.	300	°C

## Thermal Characteristics

Symbol	Parameter	FQH8N100C	Unit	
$R_{\theta JC}$	Thermal Resistance, Junction to Case, Max.	0.56	°C/W	
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient, Max.	40		

December 2013

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## Package Marking and Ordering Information

Part Number	Top Mark	Package	Packing Method	Reel Size	Tape Width	Quantity
FQH8N100C	FQH8N100C	TO-247	Tube	N/A	N/A	30 units

### Electrical Characteristics T<sub>c</sub> = 25°C unless otherwise noted.

Symbol	Parameter	Test Conditions	Min.	Тур.	Max.	Unit
Off Charac	cteristics					
BV <sub>DSS</sub>	Drain-Source Breakdown Voltage	$V_{GS}$ = 0 V, I <sub>D</sub> = 250 µA	1000			V
$\Delta BV_{DSS}$ / $\Delta T_J$	Breakdown Voltage Temperature Coefficient	$I_D$ = 250 µA, Referenced to 25°C		1.4		V/°C
I <sub>DSS</sub>	Zero Gate Voltage Drain Current	V <sub>DS</sub> = 1000 V, V <sub>GS</sub> = 0 V			10	μA
		$V_{DS}$ = 800 V, $T_{C}$ = 125°C			100	μA
I <sub>GSSF</sub>	Gate-Body Leakage Current, Forward	V <sub>GS</sub> = 30 V, V <sub>DS</sub> = 0 V			100	nA
I <sub>GSSR</sub>	Gate-Body Leakage Current, Reverse	$V_{GS}$ = -30 V, $V_{DS}$ = 0 V			-100	nA
On Charac	teristics					
V <sub>GS(th)</sub>	Gate Threshold Voltage	$V_{DS} = V_{GS}, I_D = 250 \ \mu A$	3.0		5.0	V
R <sub>DS(on)</sub>	Static Drain-Source On-Resistance	V <sub>GS</sub> = 10 V, I <sub>D</sub> = 4.0A		1.2	1.45	Ω
9 <sub>FS</sub>	Forward Transconductance	V <sub>DS</sub> = 50 V, I <sub>D</sub> = 4.0 A		8.0		S
Dynamic C	haracteristics					
C <sub>iss</sub>	Input Capacitance	$V_{DS} = 25 V, V_{GS} = 0 V,$		2475	3220	pF
C <sub>oss</sub>	Output Capacitance	f = 1.0 MHz		195	255	pF
C <sub>rss</sub>	Reverse Transfer Capacitance			16	21	pF
Switching (	Characteristics					
t <sub>d(on)</sub>	Turn-On Delay Time	V <sub>DD</sub> = 500 V, I <sub>D</sub> = 8.0A,		50	110	ns
t <sub>r</sub>	Turn-On Rise Time	R <sub>G</sub> = 25 Ω		95	200	ns
t <sub>d(off)</sub>	Turn-Off Delay Time			122	254	ns
t <sub>f</sub>	Turn-Off Fall Time	(Note 4)		80	170	ns
Qg	Total Gate Charge	V <sub>DS</sub> = 800 V, I <sub>D</sub> = 8.0A,		53	70	nC
Q <sub>gs</sub>	Gate-Source Charge	V <sub>GS</sub> = 10 V	7	13		nC
Q <sub>gd</sub>	Gate-Drain Charge	(Note 4)		23		nC
Drain-Sour	ce Diode Characteristics and Maximum Ratings	5		I	1	L
I <sub>S</sub>	Maximum Continuous Drain-Source Diode Forward Current				8.0	Α
I <sub>SM</sub>	Maximum Pulsed Drain-Source Diode Forward Current				32.0	Α
V <sub>SD</sub>	Drain-Source Diode Forward Voltage	V <sub>GS</sub> = 0 V, I <sub>S</sub> = 8.0 A			1.4	V
t <sub>rr</sub>	Reverse Recovery Time	V <sub>GS</sub> = 0 V, I <sub>S</sub> = 8.0 A,		620		ns
Q <sub>rr</sub>	Reverse Recovery Charge	dI <sub>F</sub> / dt = 100 A/μs		5.2		μC

#### Notes:

1. Repetitive rating : pulse-width limited by maximum junction temperature.

2. L = 25 mH, I<sub>AS</sub> = 8.0 A, V<sub>DD</sub> = 50 V, R<sub>G</sub> = 25  $\Omega$ , starting T<sub>J</sub> = 25°C.

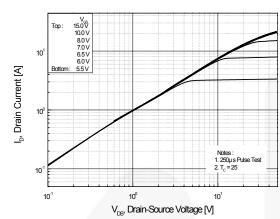
3.  $I_{SD} \leq 8.0$  A, di/dt  $\leq 200$  A/ $\mu s,~V_{DD} \leq BV_{DSS,}$  Starting ~ T\_J = 25°C.

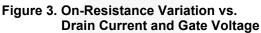
4. Essentially independent of operating temperature.

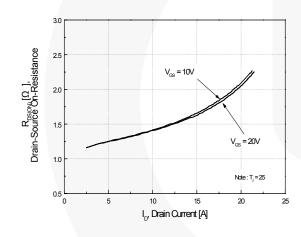
## Typical Performance Characteristics

### Figure 1. On-Region Characteristics

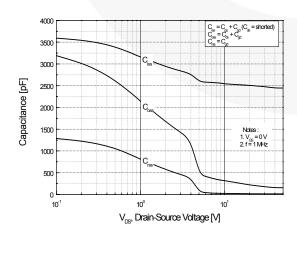
### Figure 2. Transfer Characteristics

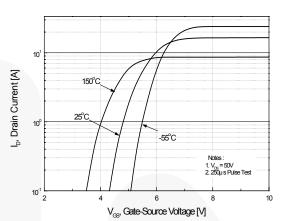


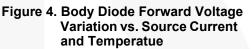


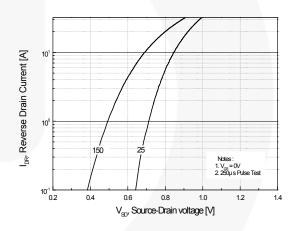




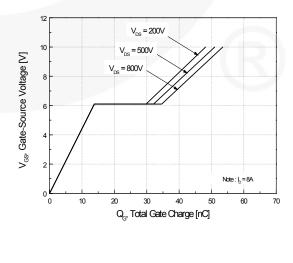


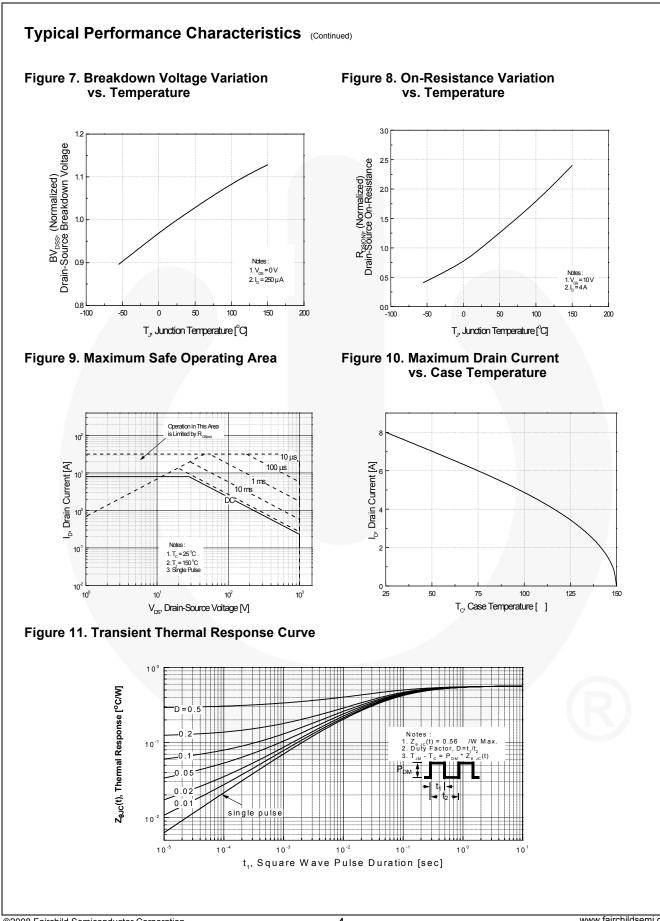






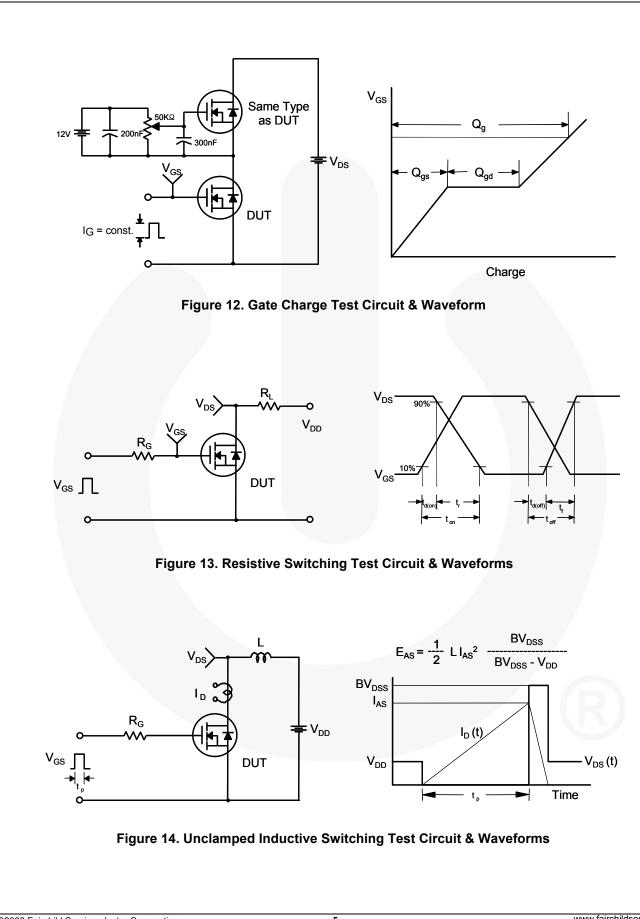
## Figure 6. Gate Charge Characteristics



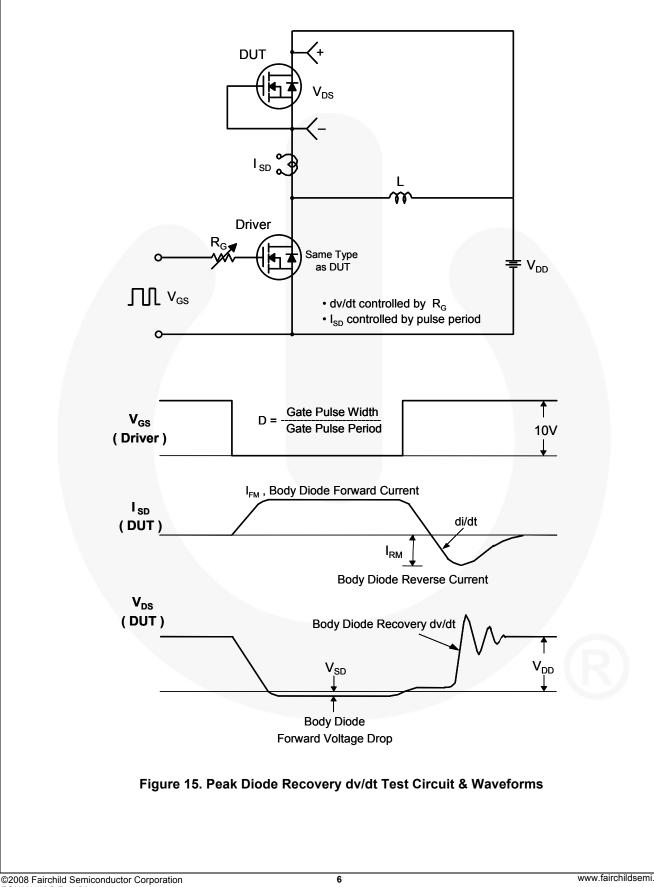


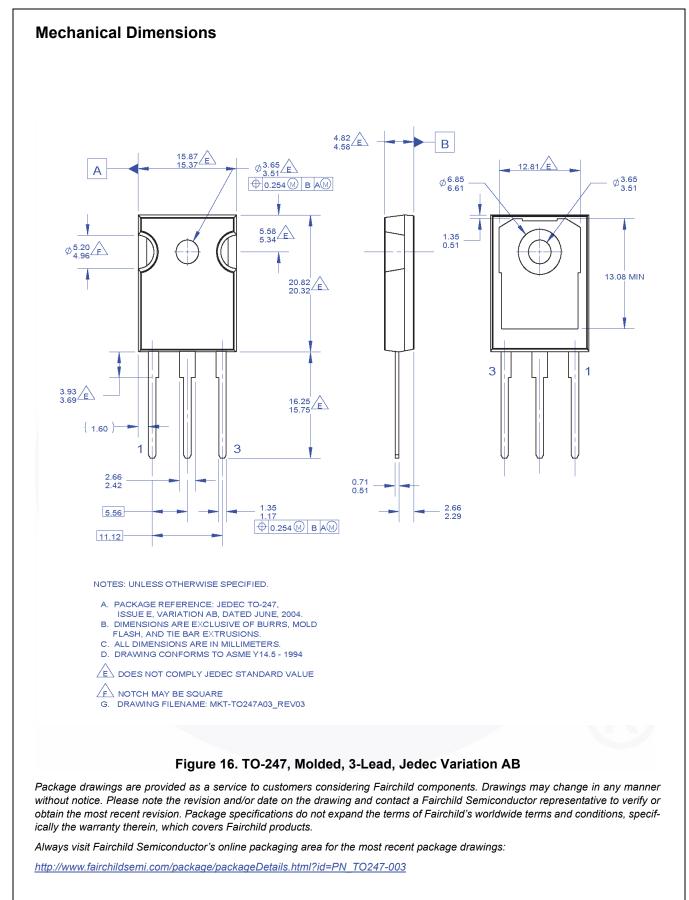
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FQH8N100C — N-Channel QFET<sup>®</sup> MOSFET



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