

SEMICONDUCTOR®

## FQPF630

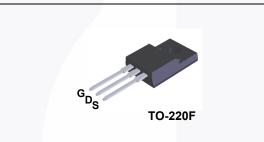
# N-Channel QFET<sup>®</sup> MOSFET 200 V, 6.3 A, 400 m $\Omega$

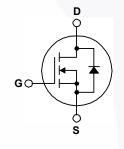
## Description

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

- 6.3 A, 200 V,  $R_{DS(on)}$  = 400 m $\Omega$  (Max.) @ V<sub>GS</sub> = 10 V, I<sub>D</sub> = 3.15 A
- Low Gate Charge (Typ. 19 nC)
- Low Crss (Typ. 35 pF)
- 100% Avalanche Tested





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

Symbol	Parameter	FQPF630	Unit
V <sub>DSS</sub>	Drain-Source Voltage	200	V
I <sub>D</sub>	Drain Current - Continuous ( $T_C = 25^{\circ}C$ )	6.3	А
	- Continuous (T <sub>C</sub> = 100°C)	4.0	Α
I <sub>DM</sub>	Drain Current - Pulsed (Note 1)	25.2	Α
V <sub>GSS</sub>	Gate-Source Voltage	± 25	V
E <sub>AS</sub>	Single Pulsed Avalanche Energy (Note 2)	164	mJ
I <sub>AR</sub>	Avalanche Current (Note 1)	6.3	А
E <sub>AR</sub>	Repetitive Avalanche Energy (Note 1)	3.8	mJ
dv/dt	Peak Diode Recovery dv/dt (Note 3)	5.5	V/ns
PD	Power Dissipation $(T_C = 25^{\circ}C)$	38	W
	- Derate Above 25°C	0.30	W/°C
T <sub>J</sub> , T <sub>STG</sub>	Operating and Storage Temperature Range	-55 to +150	°C
ΤL	Maximum Lead Temperature for Soldering, 1/8" from Case for 5 seconds	300	°C

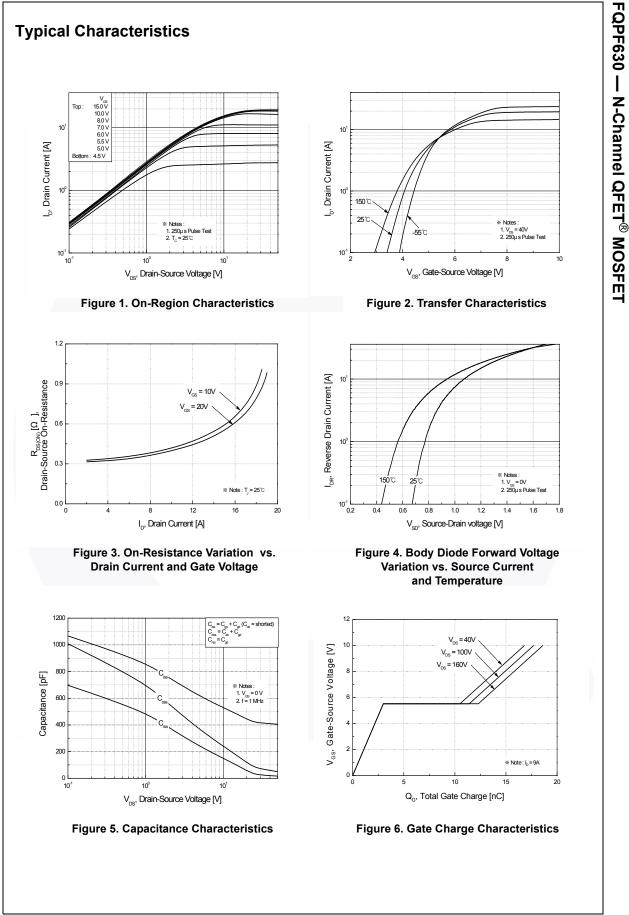
## **Thermal Characteristics**

Symbol	Symbol Parameter		Unit	
$R_{\theta JC}$	Thermal Resistance, Junction-to-Case, Max.	3.32	°C/W	
R <sub>0JA</sub> Thermal Resistance, Junction-to-Ambient, Max.		62.5	C/W	

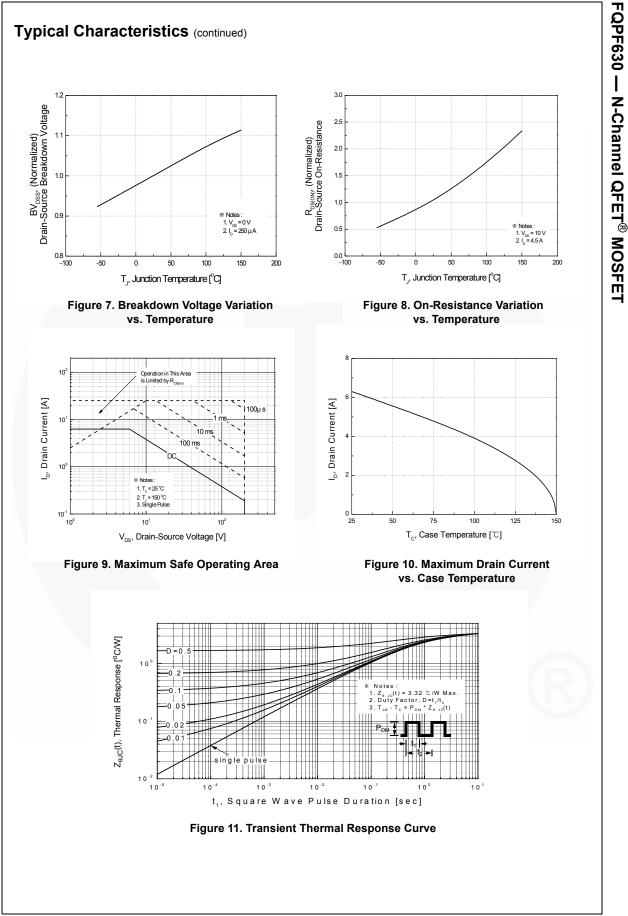
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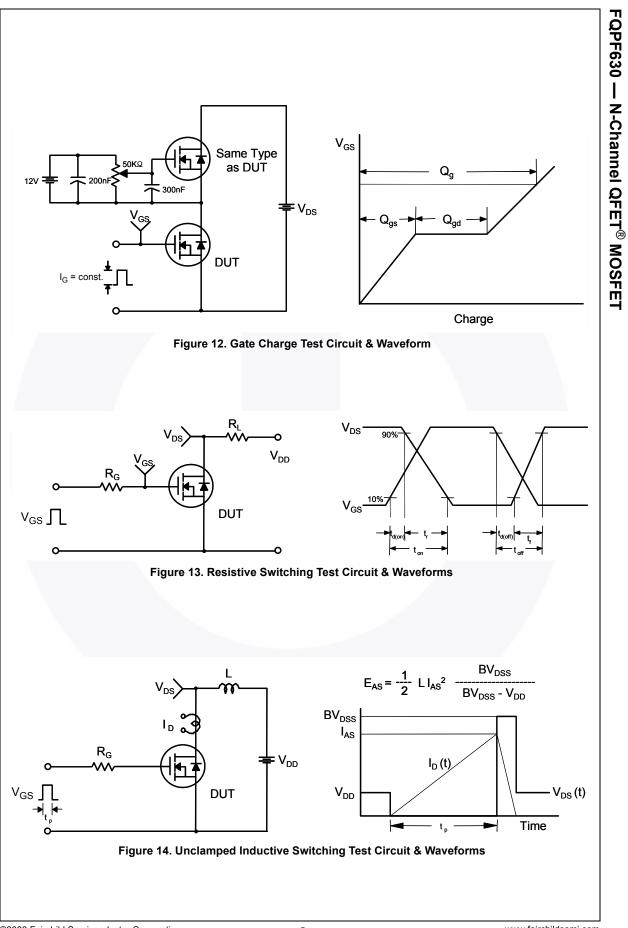
		Package	Packing Method R	Reel Size	Ta	Tape Width		Quantity	
		TO-220F	Tube N/A		N/A		50 units		
ectri	cal Cl	naracteristics	T <sub>C</sub> = 25°C	unless otherwise noted.					
Symbol		Parameter		Test Condit	ions	Min.	Тур.	Max.	Unit
Off Cha	ractor	ictics							
BV <sub>DSS</sub>	1	Source Breakdown Vo	Itane	V <sub>GS</sub> = 0 V, I <sub>D</sub> = 250 µ	IA	200			V
ABV <sub>DSS</sub>			-			200			
$\Delta T_{J}$	Breakdown Voltage Temperature Coefficient		ature	$I_D$ = 250 $\mu$ A, Referenced to 25°C			0.20		V/°C
DSS	Zero Gate Voltage Drain Current		ront	V <sub>DS</sub> = 200 V, V <sub>GS</sub> = 0 V				1	μA
			rent	V <sub>DS</sub> = 160 V, T <sub>C</sub> = 125°C				10	μA
GSSF	Gate-E	Body Leakage Current	, Forward	V <sub>GS</sub> = 25 V, V <sub>DS</sub> = 0 V				100	nA
GSSR	Gate-E	Body Leakage Current	, Reverse	$V_{GS} = -25 V, V_{DS} = 0 V$				-100	nA
On Cha	ractor	istics							
V <sub>GS(th)</sub>	aracteristics Gate Threshold Voltage			V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 250 μA		2.0		4.0	V
R <sub>DS(on)</sub>		Static Drain-Source				2.0		-	-
20(01)	On-Resistance		V <sub>GS</sub> = 10 V, I <sub>D</sub> = 3.15 A			0.34	0.4	Ω	
9 <sub>FS</sub>	Forward Transconductance			V <sub>DS</sub> = 40 V, I <sub>D</sub> = 3.15 A			4.2		S
Dunam	ic Cha	racteristics							
C <sub>iss</sub>		Capacitance		N 05 Y Y 0	\ /		420	550	pF
C <sub>oss</sub>				$V_{\rm DS} = 25  \text{V},  \text{V}_{\rm GS} = 0  \text{V},$			85	110	pF
C <sub>rss</sub>	Output Capacitance Reverse Transfer Capacitance		ce	f = 1.0 MHz			35	45	pF
133								-	
Switch	ing Ch	aracteristics			)				
d(on)	Turn-C	on Delay Time		V <sub>DD</sub> = 100 V, I <sub>D</sub> = 9 Å	A. '		8	30	ns
r	Turn-C	on Rise Time		$R_G = 25 \Omega$	-		75	160	ns
d(off)	Turn-C	off Delay Time		0	a		47	110	ns
f	Turn-C	off Fall Time			(Note 4)		64	140	ns
ე <sup>g</sup>	Total C	ate Charge		$V_{DS}$ = 160 V, $I_{D}$ = 9 A	۹,		19	25	nC
ସୁ <sub>gs</sub>	Gate-S	Source Charge		V <sub>GS</sub> = 10 V	-		3		nC
ጋ <sub>gd</sub>	Gate-E	Drain Charge			(Note 4)		9.5		nC
Drain S		Diode Characte	riation on	d Maximum Dati	200				
s					iiys			6.3	Α
S SM	Maximum Continuous Drain-Source Dic Maximum Pulsed Drain-Source Diode F						25.2	A	
S™ V <sub>SD</sub>	Drain-Source Diode Forward Voltage		1	$V_{GS} = 0 V, I_S = 6.3 A$				1.5	V
rr m		se Recovery Time		$V_{GS} = 0 V, I_S = 0.3 A$ $V_{GS} = 0 V, I_S = 9 A,$			150		ns
ີ ຊ <sub>rr</sub>		se Recovery Charge		$dI_{\rm F}$ / $dt$ = 100 A/µs	-		0.68		μC

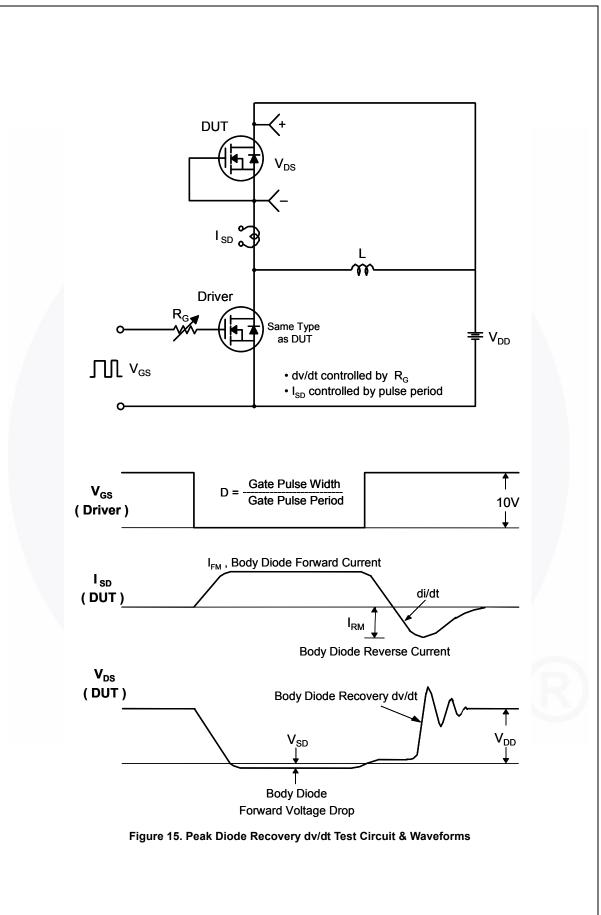
3.  $I_{SD} \le 9$  A, di/dt  $\le 300$  A/µs,  $V_{DD} \le BV_{DSS}$ , starting  $T_J = 25^{\circ}$ C. 4. Essentially independent of operating temperature. FQPF630 — N-Channel QFET<sup>®</sup> MOSFET

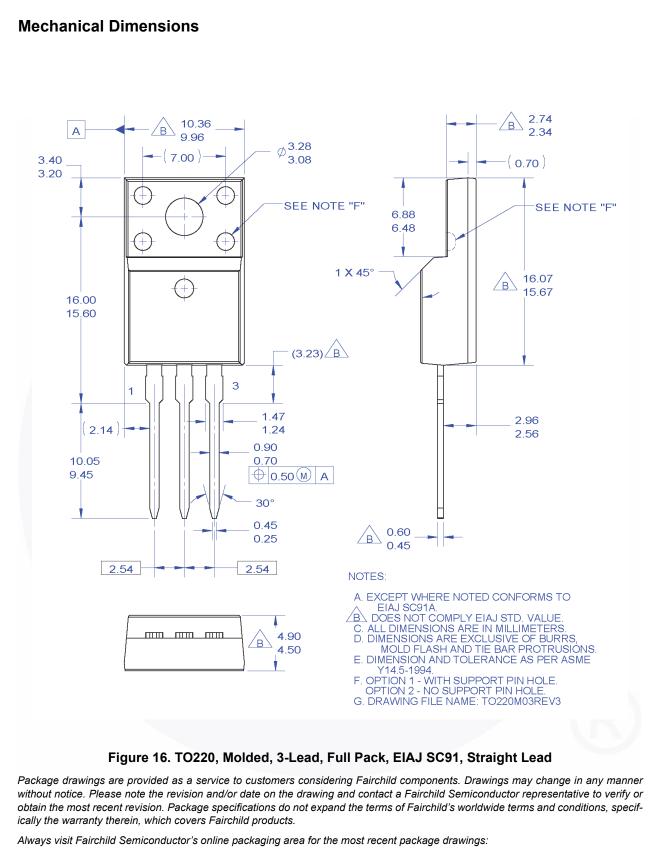


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FQPF630 — N-Channel QFET<sup>®</sup> MOSFET



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