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November 2013

FQPF5N90

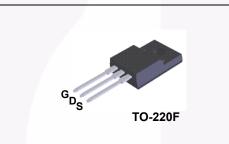
N-Channel QFET[®] MOSFET 900 V, 3 A, 2.3 Ω

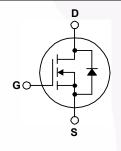
Description

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

- 3 A, 900 V, $R_{DS(on)}$ = 2.3 Ω (Max.) @ V_{GS} = 10 V, I_D = 1.5 A
- Low Gate Charge (Typ. 31 nC)
- Low Crss (Typ. 13 pF)
- 100% Avalanche Tested
- LoHS Compliant





Absolute Maximum Ratings T_c = 25°C unless otherwise noted

Symbol	Parameter	FQPF5N90	Unit
V _{DSS}	Drain-Source Voltage	900	V
I _D	Drain Current - Continuous (T _C = 25°C)	3.0	Α
	- Continuous (T _C = 100°C)	1.9	Α
I _{DM}	Drain Current - Pulsed (Note	1) 12	Α
V _{GSS}	Gate-Source Voltage	± 30	V
E _{AS}	Single Pulsed Avalanche Energy (Note	2) 660	mJ
I _{AR}	Avalanche Current (Note	1) 3.0	А
E _{AR}	Repetitive Avalanche Energy (Note	1) 5.1	mJ
dv/dt	Peak Diode Recovery dv/dt (Note	3) 4.0	V/ns
PD	Power Dissipation (T _C = 25°C)	51	W
	- Derate Above 25°C	0.41	W/°C
T _J , T _{STG}	Operating and Storage Temperature Range	-55 to +150	°C
ΤL	Maximum Lead Temperature for Soldering, 1/8" from Case for 5 seconds	300	°C

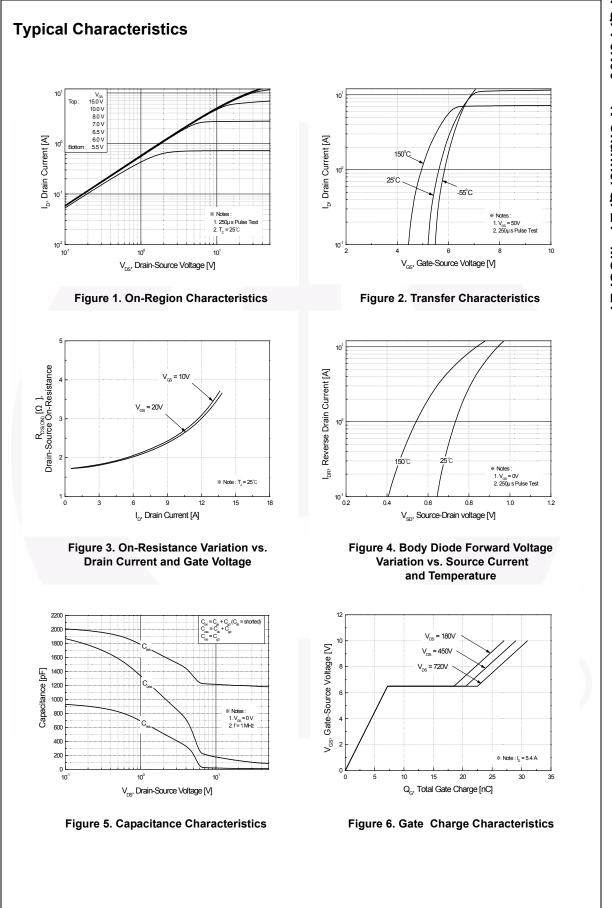
Thermal Characteristics

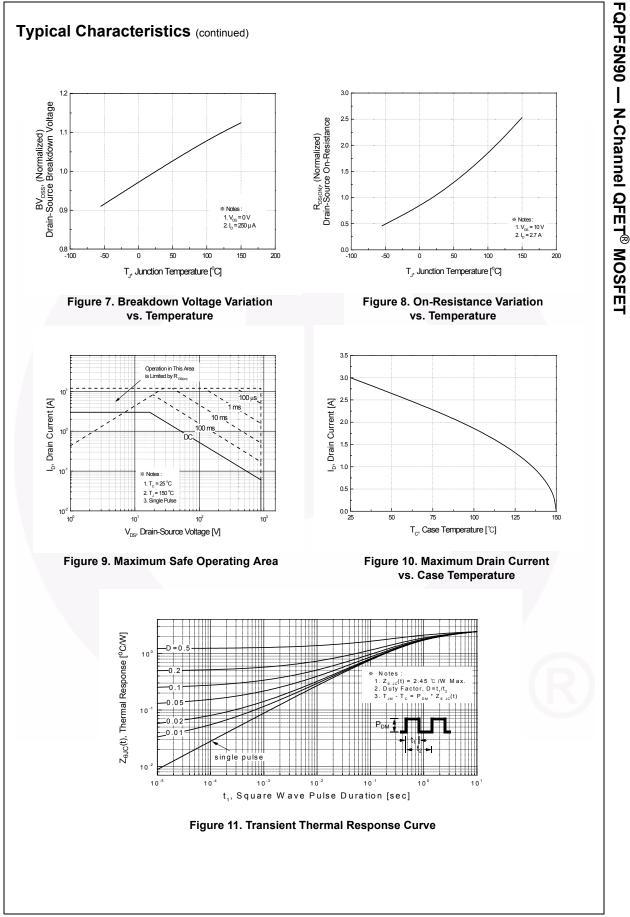
Symbol	Parameter	FQPF5N90	Unit
$R_{\theta JC}$	Thermal Resistance, Junction-to-Case, Max.	2.45	°C/W
$R_{ extsf{ heta}JA}$	Thermal Resistance, Junction-to-Ambient, Max.	62.5	C/VV

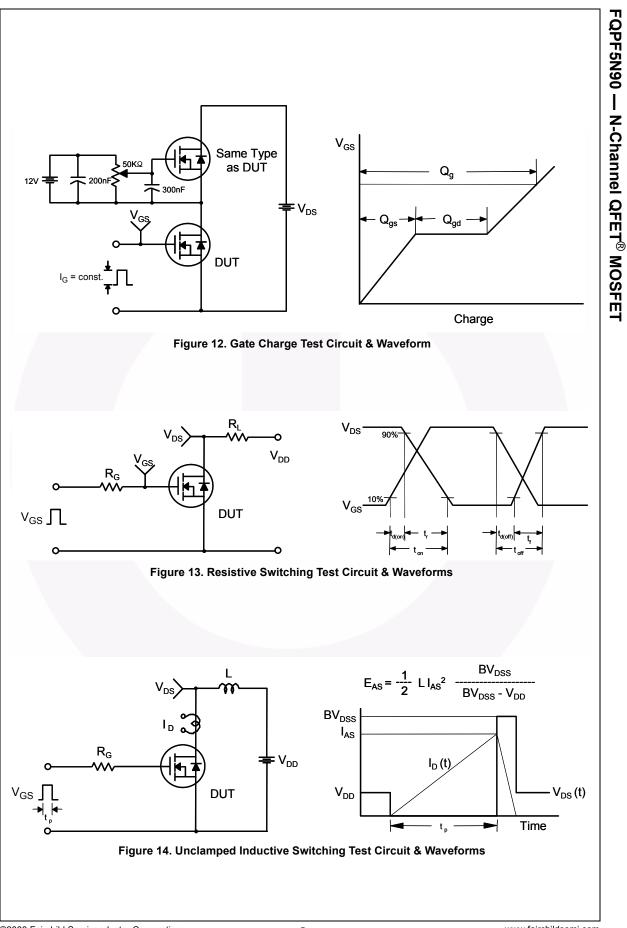
Part NumberTop MarkPackageFQPF5N90FQPF5N90TO-220F		Package	e Packing Method Reel		e Tape Width		Quantity		
		Tube N/A		N/A		50 units			
lectri	cal C	haracteristics	T _C = 25°C	unless otherwise noted.					
Symbol		Parameter		Test Conditi	ions	Min.	Тур.	Max.	Unit
Off Cha	aracto	ristics							
BV _{DSS}	1	Source Breakdown Vol	tage	V _{GS} = 0 V, I _D = 250 μA		900			V
ABV _{DSS}		down Voltage Tempera	-						
ΔT_{J}	Coeffi	0 1	laic	$I_D = 250 \ \mu A$, Referenced to $25^{\circ}C$			1.0		V/°C
DSS	Zero Gate Voltage Drain Current			V _{DS} = 900 V, V _{GS} = 0 V				10	μA
			rent	V _{DS} = 720 V, T _C = 125°C				100	μA
GSSF	Gate-I	Body Leakage Current,	Forward	V _{GS} = 30 V, V _{DS} = 0 V				100	nA
GSSR	Gate-E	Body Leakage Current,	Reverse	V_{GS} = -30 V, V_{DS} = 0	V			-100	nA
On Cha	aractor	istics							
/ _{GS(th)}	1	Threshold Voltage		V _{DS} = V _{GS} , I _D = 250 μA		3.0		5.0	V
R _{DS(on)}		Static Drain-Source		$V_{GS} = 10 \text{ V}, \text{ I}_{D} = 1.5 \text{ A}$			1.8	0.0	0
()	On-Resistance						1.0	2.3	Ω
FS	Forwa	rd Transconductance		V _{DS} = 50 V, I _D = 1.5	A		4.0		S
Dvnam	ic Cha	racteristics							
C _{iss}	1	Capacitance		V _{DS} = 25 V, V _{GS} = 0 V,			1200	1550	pF
Coss		t Capacitance		f = 1 MHz	•,		110	145	pF
C _{rss}		se Transfer Capacitanc	e		-		13	17	pF
					4		11		
	· · ·	aracteristics)		00	05	
d(on)		On Delay Time		V_{DD} = 450 V, I _D = 5.4	1 A,		28	65	ns
r		On Rise Time		R _G = 25 Ω	-		65	140	ns
d(off)		Off Delay Time			(Note 4)		65	140	ns
f		Off Fall Time			(1010-1)		50	110	ns
ე ^g	-	Bate Charge		V _{DS} = 720 V, I _D = 5.4	A,		31	40	nC
2 _{gs}		Source Charge		V _{GS} = 10 V	-		7.2		nC
ጋ _{gd}	Gate-I	Drain Charge			(Note 4)		15		nC
Drain-S	Source	Diode Character	istics an	d Maximum Rati	nas				
s	1	um Continuous Drain-			iigo			3.0	А
SM		um Pulsed Drain-Sour						12	А
V _{SD}	Drain-Source Diode Forward Voltage			$V_{GS} = 0 V, I_{S} = 3.0 A$				1.4	V
- CD		se Recovery Time	5	$V_{GS} = 0 V, I_S = 5.4 A,$ $dI_F / dt = 100 A/\mu s$			610		ns
 Q _{rr}		se Recovery Charge					5.26		μC

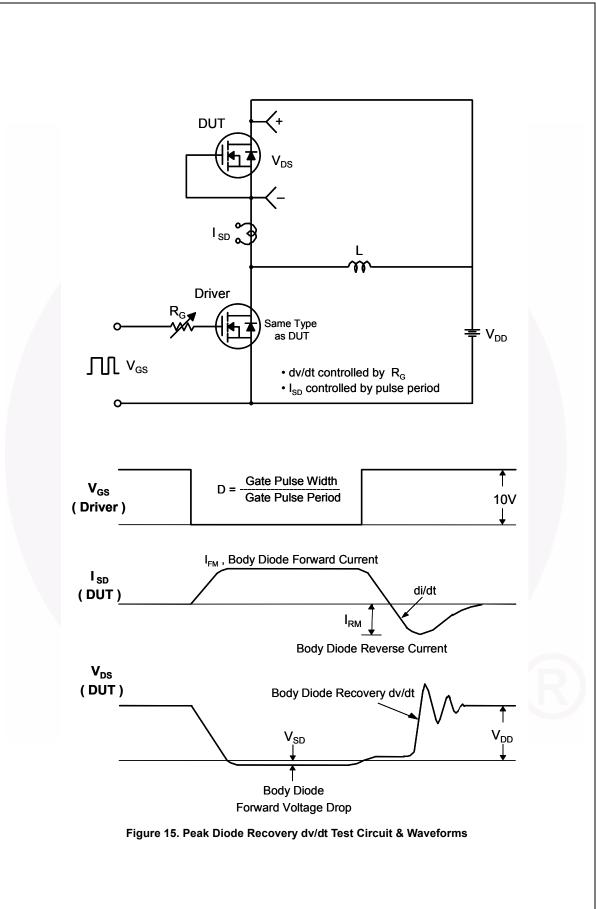
 $\begin{array}{l} 3. \ I_{SD} \leq 5.4 \ \text{A}, \ \text{di/dt} \leq 200 \ \text{A/}\mu\text{s}, \ \text{V}_{DD} \leq \text{BV}_{DSS}, \ \text{starting} \ \ \text{T}_{J} = 25^{\circ}\text{C}. \\ \text{4. Essentially independent of operating temperature.} \end{array}$

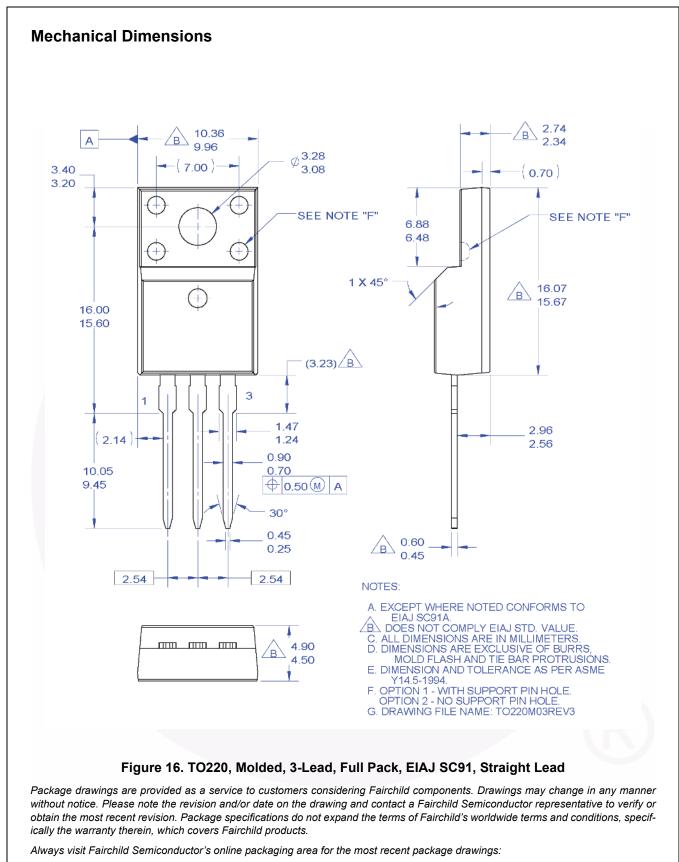
FQPF5N90 — N-Channel QFET[®] MOSFET











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

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