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November 2013

FQPF5N40

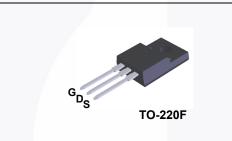
N-Channel QFET[®] MOSFET 400 V, 3.0 A, 1.6 Ω

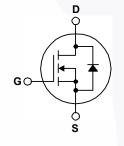
Description

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

- 3.0 A, 400 V, $R_{DS(on)}$ = 1.6 Ω (Max.) @ V_{GS} = 10 V, I_D = 1.5 A
- Low Gate Charge (Typ. 10 nC)
- Low Crss (Typ. 7 pF)
- 100% Avalanche Tested





Absolute Maximum Ratings T_C = 25°C unless otherwise noted

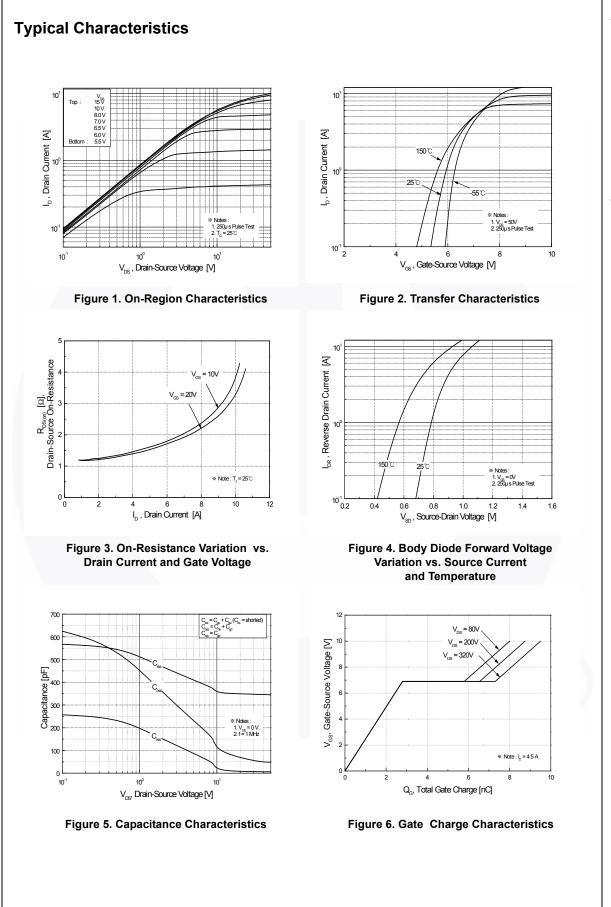
Symbol	Parameter	FQPF5N40	Unit
V _{DSS}	Drain-Source Voltage	400	V
I _D	Drain Current - Continuous (T _C = 25°C)	3.0	А
	- Continuous (T _C = 100°C)	1.9	Α
I _{DM}	Drain Current - Pulsed (Note) 12	Α
V _{GSS}	Gate-Source Voltage	± 30	V
E _{AS}	Single Pulsed Avalanche Energy (Note 2	2) 290	mJ
I _{AR}	Avalanche Current (Note) 3.0	А
E _{AR}	Repetitive Avalanche Energy (Note) 3.5	mJ
dv/dt	Peak Diode Recovery dv/dt (Note 3	3) 4.5	V/ns
PD	Power Dissipation (T _C = 25°C)	35	W
	- Derate Above 25°C	0.28	W/°C
T _J , T _{STG}	Operating and Storage Temperature Range	-55 to +150	°C
Τ _L	Maximum Lead Temperature for Soldering, 1/8" from Case for 5 seconds	300	°C

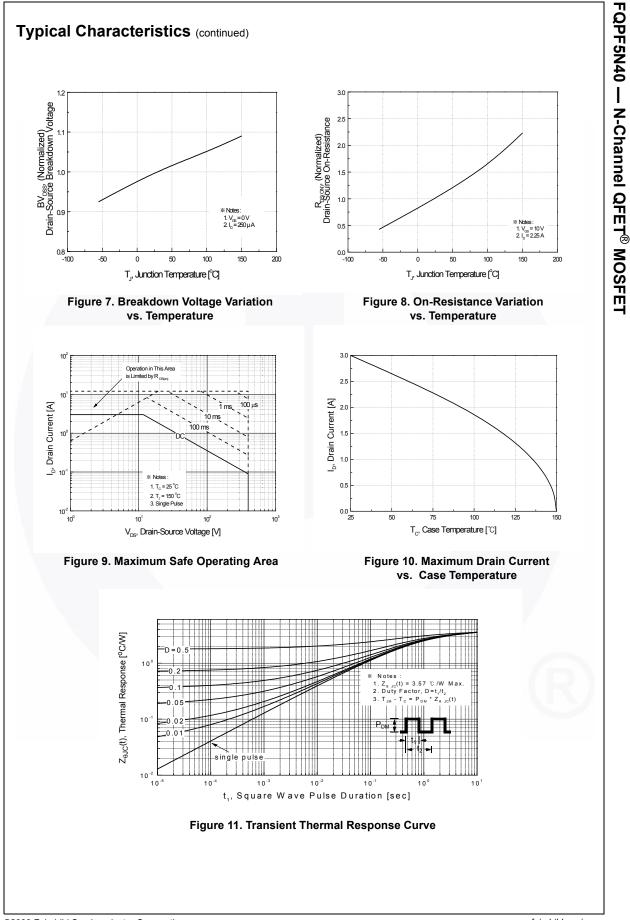
Thermal Characteristics

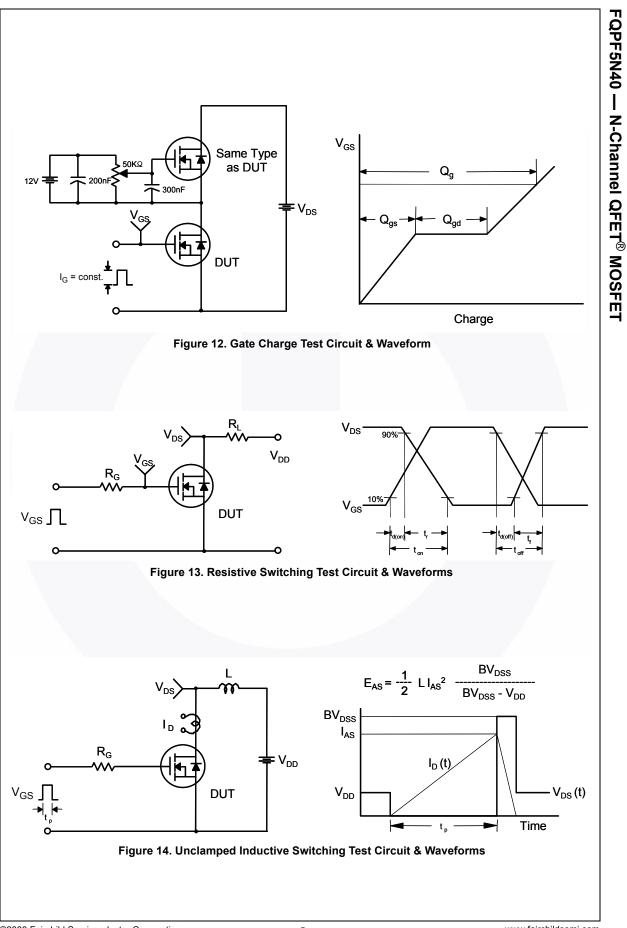
Symbol	Parameter	FQPF5N40	Unit
$R_{\theta JC}$	Thermal Resistance, Junction-to-Case, Max.	3.57	°C/W
$R_{ extsf{ heta}JA}$	Thermal Resistance, Junction-to-Ambient, Max.	62.5	C/W

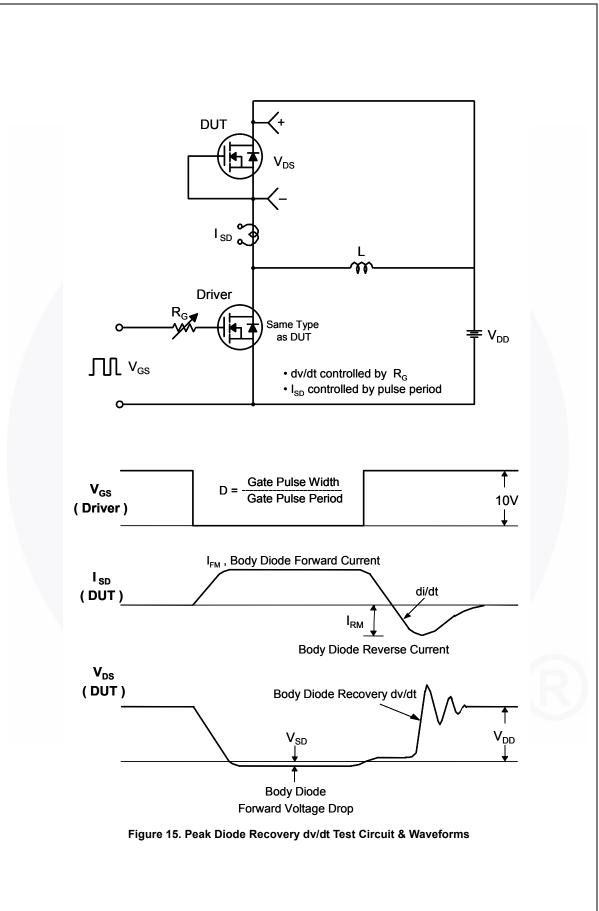
Part NumberTop MarkPackageFQPF5N40FQPF5N40TO-220F		Package	e Packing Method Reel Size		Tape Width		Quantity		
		Tube N/A		N/A		50 units			
lectri	cal C	haracteristics	T _C = 25°C	unless otherwise noted.					
Symbol		Parameter		Test Conditi	ions	Min.	Тур.	Max.	Unit
Off Cha	aracte	ristics							
BV _{DSS}	1	Source Breakdown V	oltage	V _{GS} = 0 V, I _D = 250 μA		400			V
ΔBV _{DSS}	Break Coeffi	down Voltage Tempe cient	rature	$I_D = 250 \ \mu\text{A}, \text{Referenced to } 25^{\circ}\text{C}$			0.38		V/°C
DSS				V _{DS} = 400 V, V _{GS} = 0	ν			1	μA
200	Zero (Gate Voltage Drain Co	urrent	$V_{\rm DS} = 320 \text{ V}, \text{ T}_{\rm C} = 125^{\circ}\text{C}$				10	μA
GSSF	Gate-I	Body Leakage Currer	nt, Forward	$V_{GS} = 30 \text{ V}, \text{ V}_{DS} = 0 \text{ V}$				100	nA
GSSR		Body Leakage Currer		$V_{GS} = -30 \text{ V}, \text{ V}_{DS} = 0 \text{ V}$				-100	nA
On Cha	aracter	ristics					I		
/ _{GS(th)}	1	Threshold Voltage		$V_{DS} = V_{GS}, I_{D} = 250$	μA	3.0		5.0	V
R _{DS(on)}		Drain-Source esistance		V _{GS} = 10 V, I _D = 1.5	A		1.27	1.6	Ω
FS	Forwa	rd Transconductance		V _{DS} = 50 V, I _D = 1.5	A		2.8		S
Dvnam	ic Cha	racteristics			1		<u> </u>		
Siss	1	Capacitance		$V_{DS} = 25 V, V_{GS} = 0$	V		350	460	pF
Soss		t Capacitance		$v_{DS} = 23 v$, $v_{GS} = 0$ f = 1 MHz	v,		60	80	pF
Srss		se Transfer Capacita	nce		_		7	9	pF
	ina Ch	aracteristics			4				
d(on)		On Delay Time)		12	30	ns
r		On Rise Time		$V_{DD} = 200 \text{ V}, \text{ I}_{D} = 4.5$	» А,		60	130	ns
d(off)	Turn-0	Off Delay Time		R _G = 25 Ω	-		20	50	ns
f	Turn-C	Off Fall Time			(Note 4)		30	70	ns
λ ^g	Total 0	Gate Charge		V _{DS} = 320 V, I _D = 4.5	5 A		10	13	nC
λ _{gs}	Gate-	Source Charge		$V_{GS} = 10 V$,		3.0		nC
2 _{gd}	Gate-I	Drain Charge		00	(Note 4)		4.5		nC
	Source	Diode Charact	ristics an	d Maximum Rati	nge		1 1		1
s	1	num Continuous Drai			iigo			3.0	Α
S SM	Maximum Pulsed Drain-Source Diode F							12	A
/ _{SD}		Source Diode Forwar		$V_{GS} = 0 \text{ V}, \text{ I}_{S} = 3.0 \text{ A}$				1.5	V
rr su		se Recovery Time		$V_{GS} = 0 V, I_S = 4.5 A$			190		ns
יי 2 _{יי}		se Recovery Charge		$dI_{\rm F}$ / dt = 100 A/µs			1.0		μC
	110101	ee needevery enarge		-1			1.0		μο

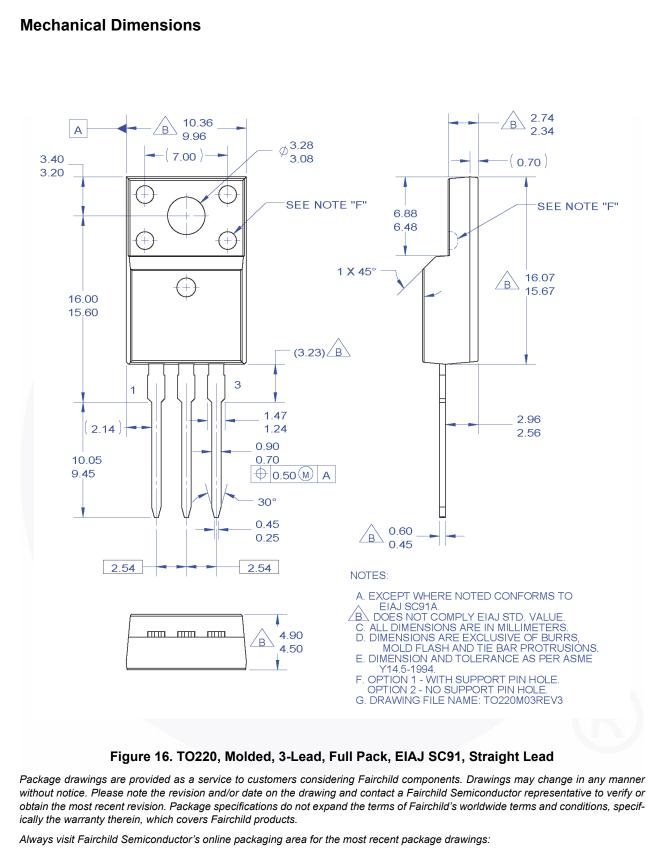
3. $I_{SD} \le 4.5 \text{ A}$, di/dt $\le 200 \text{ A/}\mu$ s, $V_{DD} \le BV_{DSS}$, starting $T_J = 25^{\circ}C$. 4. Essentially independent of operating temperature.











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



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