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November 2013

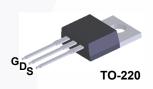
FQP11N40C / FQPF11N40C N-Channel QFET[®] MOSFET 400 V, 10.5 A, 530 mΩ

Features

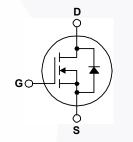
- + 10.5 A, 400 V, $\rm R_{DS(on)}$ = 530 m Ω (Max.) @ $\rm V_{GS}$ = 10 V, $\rm I_{D}$ = 5.25 A
- Low Gate Charge (Typ. 28 nC)
- Low Crss (Typ. 85 pF)
- 100% Avalanche Tested

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_C = 25°C unless otherwise noted.

Symbol	Parameter			FQP11N40C	FQPF11N40C	Unit
V _{DSS}	Drain to Source Voltage			4	V	
	Durain Querrant	-Continuous (T _C = 25 ^o C)	-Continuous (T _C = 25 ^o C)		10.5 *	А
I _D	Drain Current	-Continuous ($T_C = 100^{\circ}C$)		6.6	6.6 *	А
I _{DM}	Drain Current	- Pulsed	(Note 1)	42	42 *	А
V _{GSS}	Gate to Source Voltage	1		± 30		V
E _{AS}	Single Pulsed Avalanche Energy		(Note 2)	360		mJ
I _{AR}	Avalanche Current		(Note 1)	11		А
E _{AR}	Repetitive Avalanche Energy		(Note 1)	13.5		mJ
dv/dt	Peak Diode Recovery dv/dt (N		(Note 3)	4.5		V/ns
P _D	David Dia dia atian	(T _C = 25°C)		135	44	W
	Power Dissipation	- Derate above 25°C		1.07	0.35	W/°C
T _J , T _{STG}	Operating and Storage Temperature Range			-55 to +150		°C
TL	Maximum Lead Temperature for Soldering Purpose, 1/8" from Case for 5 Seconds			3	°C	
*Drain current li	mited by maximum junction t					

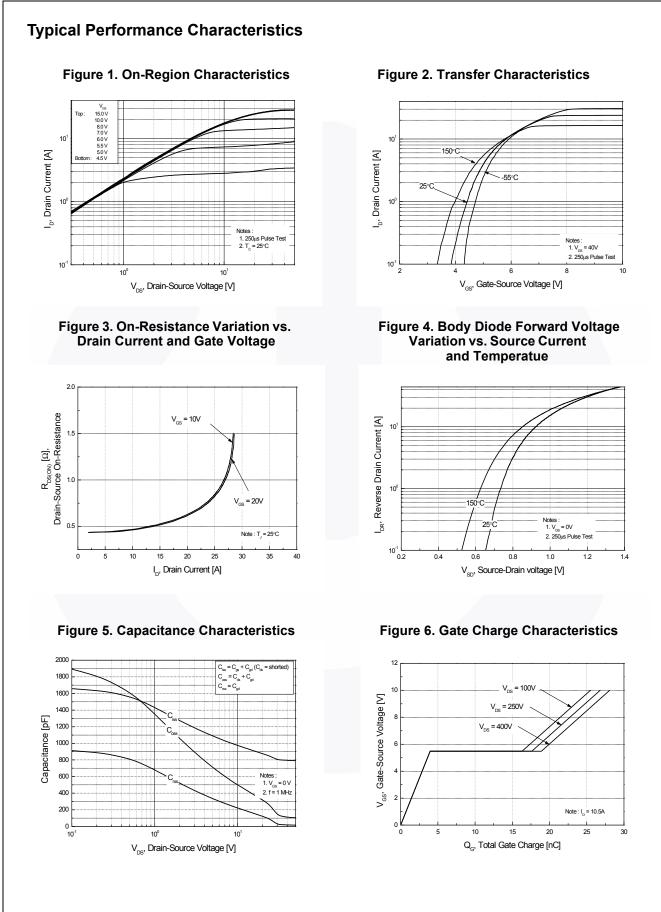
Thermal Characteristics

Symbol	Parameter	FQP11N40C	FQPF11N40C	Unit
$R_{\theta JC}$	Thermal Resistance, Junction to Case, Max	0.93	2.86	°C/W
$R_{ extsf{ heta}JA}$	Thermal Resistance, Junction to Ambient, Max	62.5	62.5	°C/W

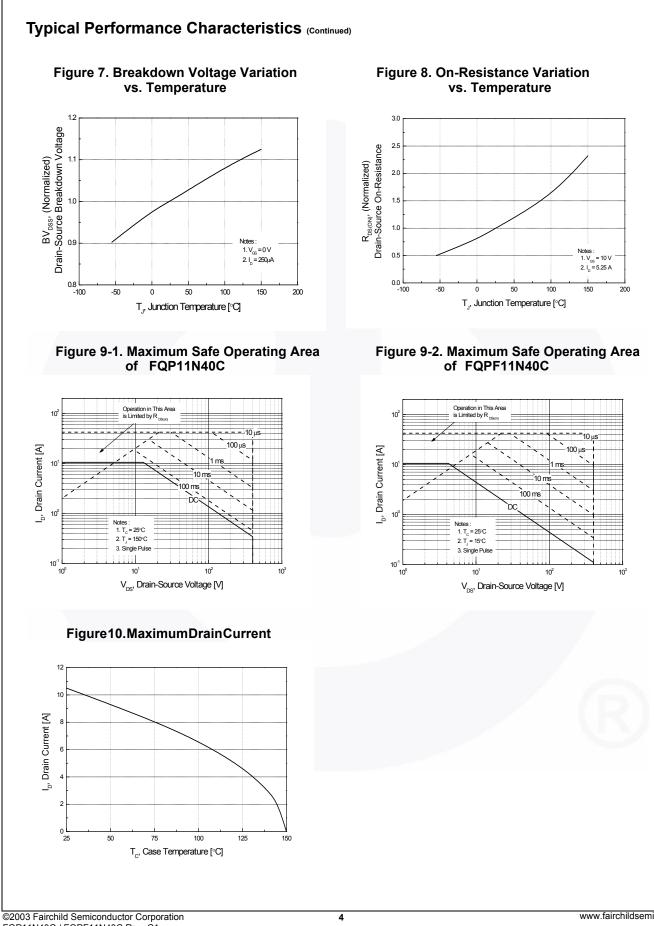
Device Marking Device FQP11N40C FQP11N40C FQPF11N40C FQPF11N40C		Device		Package	Re	el Size	Tape Widtl	ו Qu	antity	
		FQP11N40C		TO-220	-	Tube	N/A		50 units	
		TO-220F Tu		Tube	N/A	50	50 units			
lectri	cal Charact	eristics T _C = 25°C ur	nless other	wise noted.						
Symbol	1	arameter		Test Conditions		Min	Тур	Max	Unit	
Off Cha	aracteristics									
BV _{DSS}	1	eakdown Voltage	$V_{GS} = 0$	V, I _D = 250 μA		400			V	
ΔBV_{DSS} / ΔT_J		age Temperature Coeffi-	$I_D = 250 \mu\text{A}$, Referenced to 25°C			0.54		V/°C		
I _{DSS}	Zero Gate Voltage Drain Current		V _{DS} = 40	0 V, V _{GS} = 0 V				1	μA	
			$V_{DS} = 320 \text{ V}, \text{ T}_{C} = 125^{\circ}\text{C}$					10	μΑ	
I _{GSSF}	Gate-Body Leak	age Current, Forward	$V_{GS} = 30 \text{ V}, V_{DS} = 0 \text{ V}$					100	nA	
GSSR		age Current, Reverse		0 V, V _{DS} = 0 V				-100	nA	
On Cha	racteristics									
V _{GS(th)}	Gate Threshold	Voltage	$V_{DS} = V_0$	_{GS} , I _D = 250 μA		2.0		4.0	V	
R _{DS(on)}	Static Drain-Sou On-Resistance	•	$V_{GS} = 10 \text{ V}, \text{ I}_{D} = 5.25 \text{ A}$			0.43	0.53	Ω		
9 _{FS}	Forward Transco	onductance	V _{DS} = 40	V, I _D = 5.25 A			7.1		S	
Dynam	ic Characteris	stics								
C _{iss}	Input Capacitance		V _{DS} = 25	5 V, V _{GS} = 0 V,			840	1090	pF	
C _{oss}	Output Capacita	nce	f = 1.0 MHz			250	325	pF		
C _{rss}	Reverse Transfe	er Capacitance				85	110	pF		
Switch	ing Character	istics								
t _{d(on)}	Turn-On Delay T		$V_{DD} = 200 \text{ V}, \text{ I}_{D} = 10.5 \text{ A},$			14	40	ns		
t _r	Turn-On Rise Ti	ne				89	190	ns		
t _{d(off)}	Turn-Off Delay T	ĩme	NG - 25	R _G = 25 Ω			81	170	ns	
t _f	Turn-Off Fall Tim	ne			(Note 4)		81	170	ns	
Q _g	Total Gate Charg	ge	$V_{\rm DO} = 32$	20 V In = 10 5 A			28	35	nC	
Q _{gs}	Gate-Source Ch		$V_{DS} = 320 \text{ V}, \text{ I}_{D} = 10.5 \text{ A},$ $V_{GS} = 10 \text{ V} $ (Note 4)				4		nC	
Q _{gd}	Gate-Drain Char					15		nC		
		Charactoristics and	Maxim	um Patings				/		
l _s		Characteristics and nuous Drain-Source Diode						10.5	A	
's I _{SM}		d Drain-Source Diode For					42	A		
SM V _{SD}		ode Forward Voltage	V_{GS} = 0 V, I _S = 10.5 A				1.4	V		
∙sD t _{rr}	Reverse Recove	0	$V_{GS} = 0 V, I_S = 10.5 A$ $V_{GS} = 0 V, I_S = 10.5 A,$			290		ns		
		,		v, i _S – 10.5 A, 100 A/μs			2.4		μC	
Q _{rr}	Reverse Recove	a y Ghaige		100 10 μ3			2.7		μΟ	

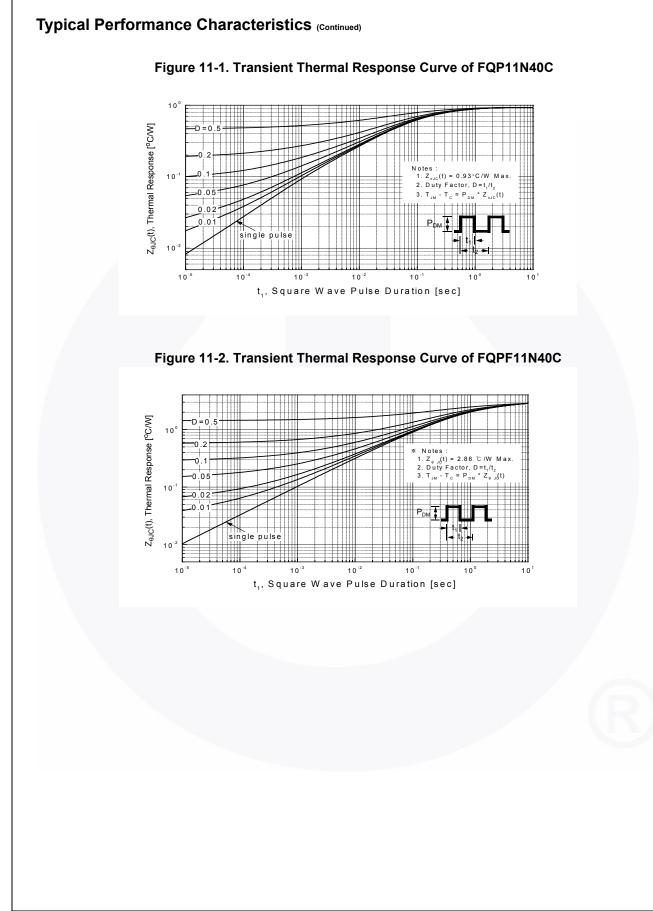
4. Essentially independent of operating temperature.

FQP11N40C / FQPF11N40C — N-Channel QFET[®] MOSFET

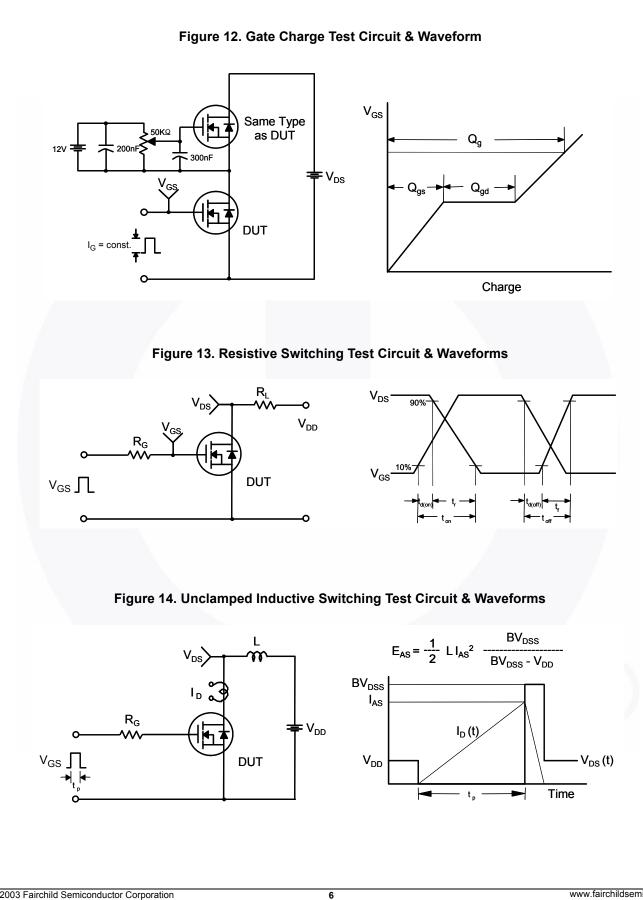


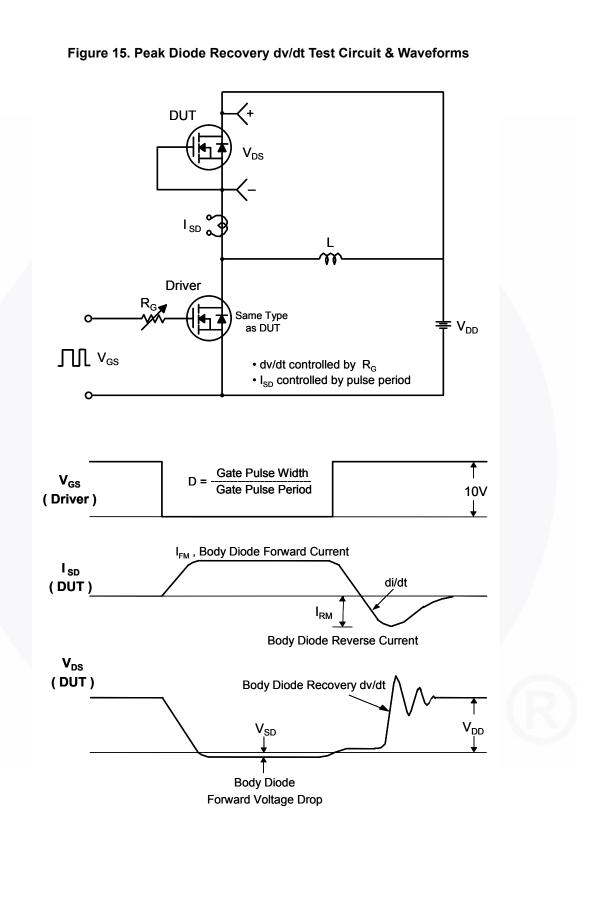




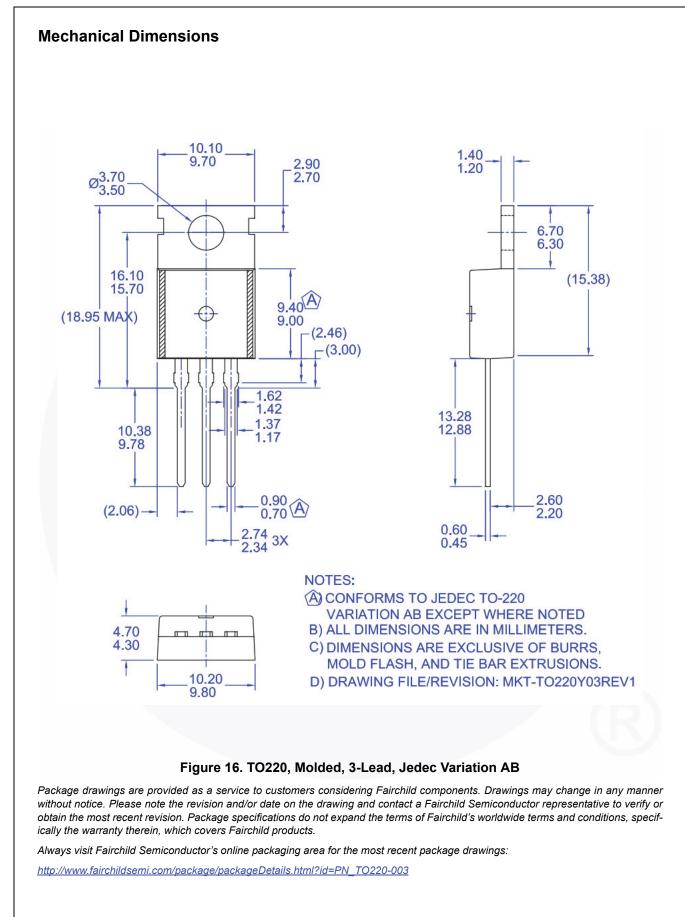


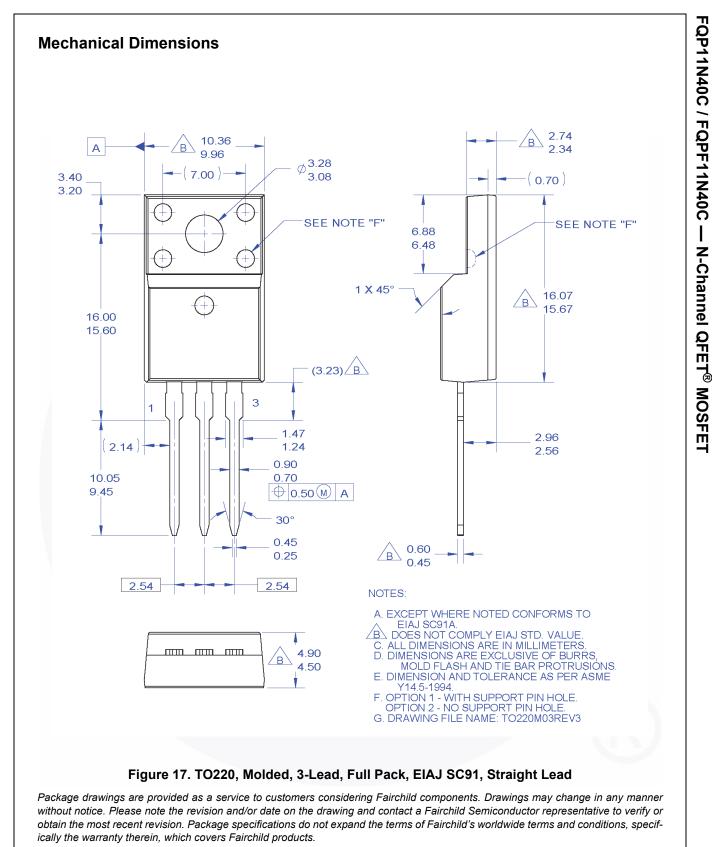
FQP11N40C / FQPF11N40C — N-Channel QFET[®] MOSFET





FQP11N40C / FQPF11N40C — N-Channel QFET® MOSFET





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