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November 2013

FQP19N20C / FQPF19N20C N-Channel QFET[®] MOSFET

200 V, 19 A, 170 m Ω

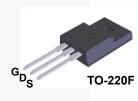
Features

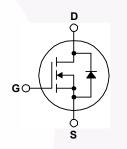
- 19 A, 200 V, $R_{DS(on)}$ = 170 m Ω (Max.) @ V_{GS} = 10 V, I_D = 9.5 A
- Low Gate Charge (Typ. 40.5 nC)
- Low Crss (Typ. 85 pF)
- 100% Avalanche Tested

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.

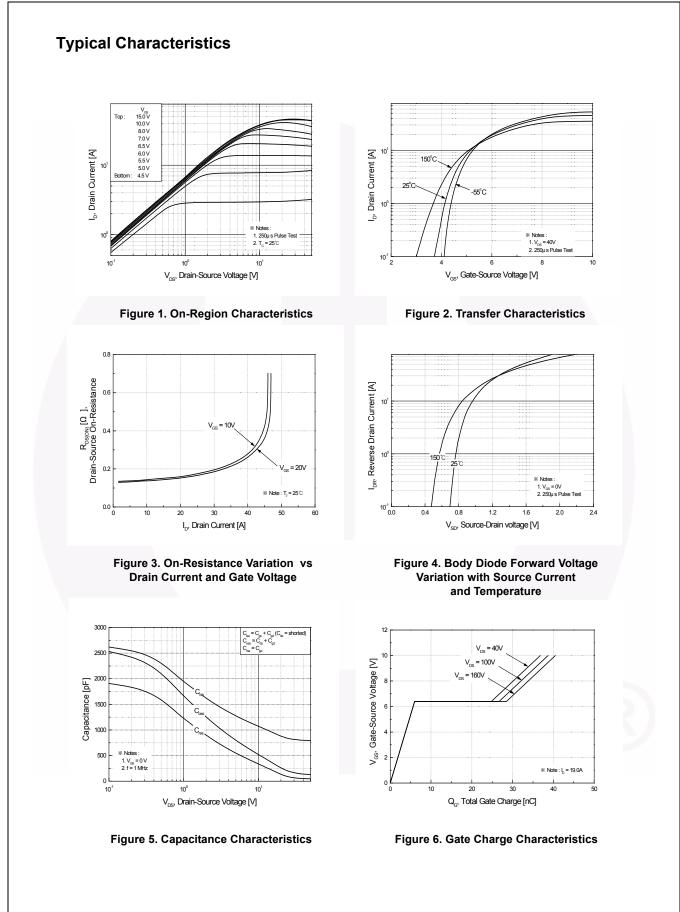
Symbol		Parameter		FQP19N20C	FQPF19N20C	Unit
V _{DSS}	Drain to Source Voltage			200		V
I _D	Drain Current	-Continuous (T _C = 25 ^o C)	-Continuous (T _C = 25 ^o C) -Continuous (T _C = 100 ^o C)		19.0 *	А
	Drain Current	-Continuous ($T_c = 100^{\circ}C$)			12.1 12.1 *	
I _{DM}	Drain Current	- Pulsed	(Note 1)	76.0	76.0 *	Α
V _{GSS}	Gate to Source Voltage	Gate to Source Voltage		± 30		V
E _{AS}	Single Pulsed Avalanche Energy		(Note 2)	433		mJ
I _{AR}	Avalanche Current			19.0		А
E _{AR}	Repetitive Avalanche Energy		(Note 1)	13.9		mJ
dv/dt	Peak Diode Recovery dv/dt (Not		(Note 3)	5.5		V/ns
P _D	Dower Dissinction	(T _C = 25°C)		139	43	W
	Power Dissipation	- Derate above 25ºC	-	1.11	0.34	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			300		°C

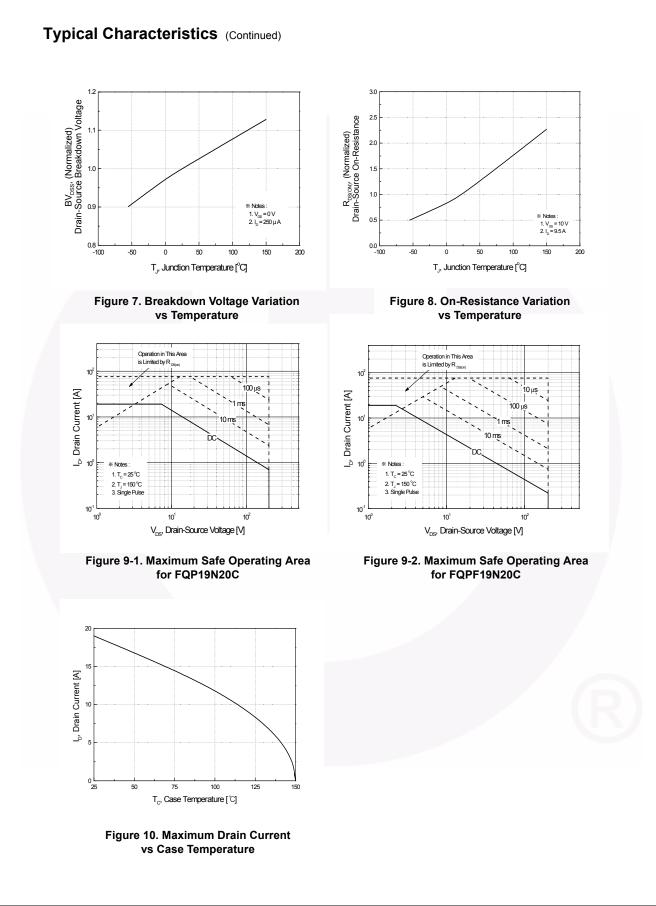
Thermal Characteristics

Symbol	Parameter	FQP19N20C	FQPF19N20C	Unit
$R_{\theta JC}$	Thermal Resistance, Junction to Case, Max	0.9	2.89	°C/W
$R_{ extsf{ heta}JA}$	Thermal Resistance, Junction to Ambient, Max	62.5	62.5	°C/W

Device Marking Device FQP19N20C FQP19N20C FQPF19N20C FQPF19N20C		Device		Package	Ree	I Size	Tape Width	Qu	Quantity	
				ube	N/A	50	50 units			
		TO-220F Tu		ube	N/A	50 units				
lectri	cal Charact	t eristics T _C = 25°C ur	nless otherv	vise noted.						
Symbol	1	Parameter		Test Conditions		Min	Тур	Мах	Unit	
Off Cha	aracteristics									
BV _{DSS}		reakdown Voltage	$V_{GS} = 0$	/, I _D = 250 μA		200			V	
ΔBV _{DSS} / ΔT _J		tage Temperature Coeffi-		μA, Referenced to	25°C		0.24		V/°C	
I _{DSS}	S Zero Gate Voltage Drain Current		-	0 V, V _{GS} = 0 V				10	μA	
								100	μA	
I _{GSSF}		kage Current, Forward						100	nA	
GSSR	Gate-Body Leal	kage Current, Reverse	$v_{GS} = -30$	0 V, V _{DS} = 0 V				-100	nA	
On Cha	racteristics									
V _{GS(th)}	Gate Threshold	Voltage	$V_{DS} = V_{C}$	_{SS} , I _D = 250 μA		2.0		4.0	V	
R _{DS(on)}	Static Drain-Sou On-Resistance	urce	V _{GS} = 10	V, I _D = 9.5 A			0.14	0.17	Ω	
9 _{FS}	Forward Transo	conductance	V _{DS} = 40	V, I _D = 9.5 A			10.8		S	
Dynam	ic Characteri	stics								
C _{iss}	Input Capacitan						830	1080	pF	
C _{oss}	Output Capacita		V _{DS} = 25 V, V _{GS} = 0 V, f = 1.0 MHz			195	255	pF		
C _{rss}	Reverse Transf					85	110	pF pF		
CISS							00	110		
Switch	ing Character	ristics								
d(on)	Turn-On Delay	Time	V_{DD} = 100 V, I _D = 19.0 A, R _G = 25 Ω			15	40	ns		
r	Turn-On Rise T	ime				150	310	ns		
d(off)	Turn-Off Delay	Time				135	280	ns		
f	Turn-Off Fall Tir	me			(Note 4)		115	240	ns	
Q _g	Total Gate Chai	rge	V _{DS} = 16	0 V, I _D = 19.0 A,			40.5	53.0	nC	
Q _{gs}	Gate-Source Cl	harge	$V_{GS} = 10 V$			6.0		nC		
Q _{gd}	Gate-Drain Cha	arge			(Note 4)		22.5		nC	
	•									
		Characteristics and		-				10.0	<u>م</u>	
S		inuous Drain-Source Diode						19.0	A	
SM		ed Drain-Source Diode For						76.0	A	
V _{SD}		iode Forward Voltage		V, I _S = 19.0 A				1.5	V	
m	Reverse Recov			/, I _S = 19.0 A,			208		ns	
Q _{rr}	Reverse Recov	ery Charge	$dI_F / dt =$	100 A/μs			1.63		μC	
tes:										

4. Essentially independent of operating temperature.





Typical Characteristics (Continued)

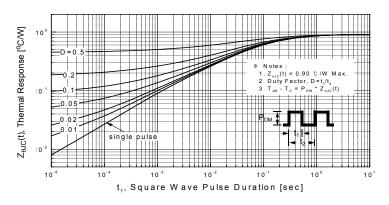
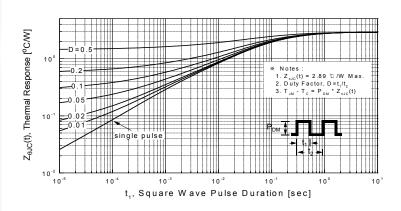
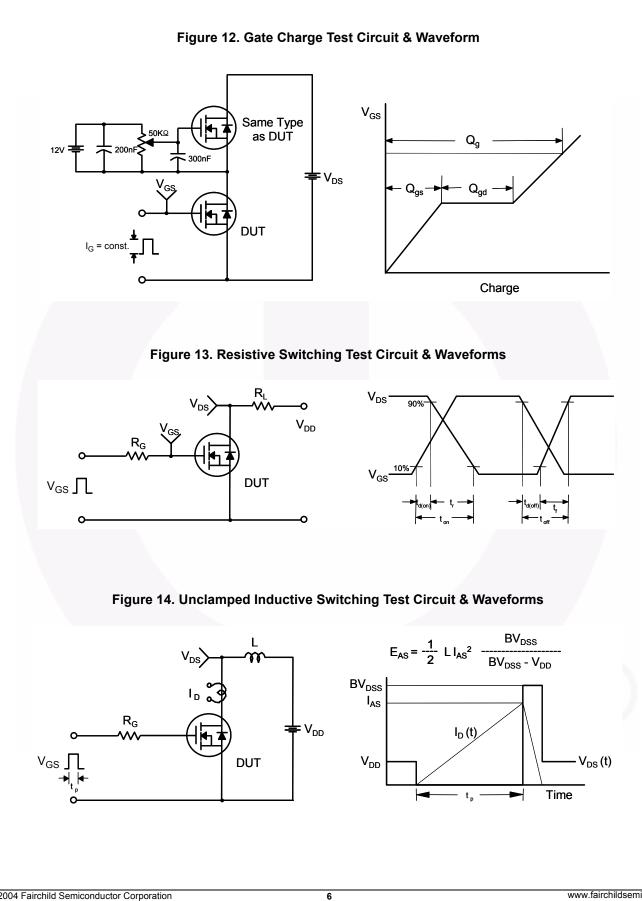
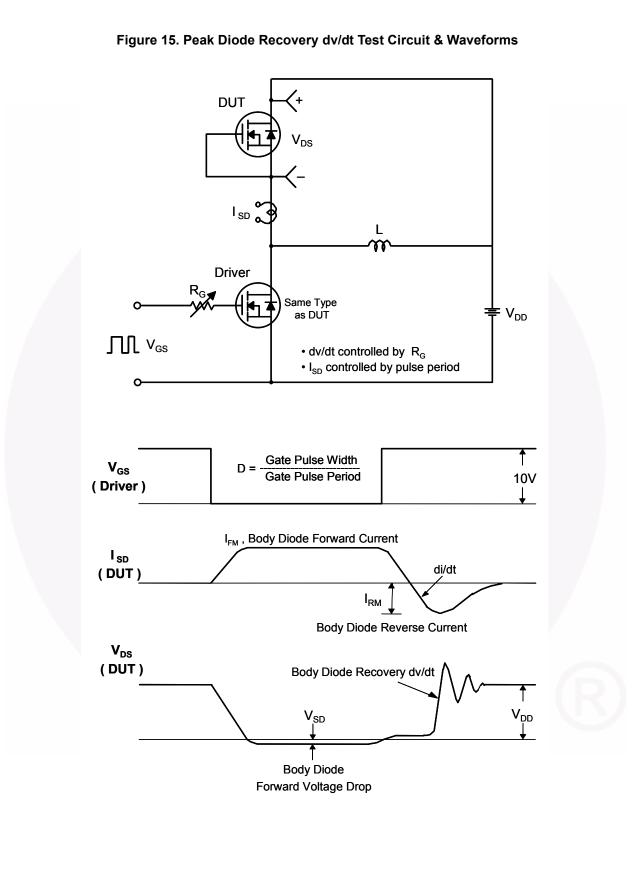


Figure 11-1. Transient Thermal Response Curve for FQP19N20C

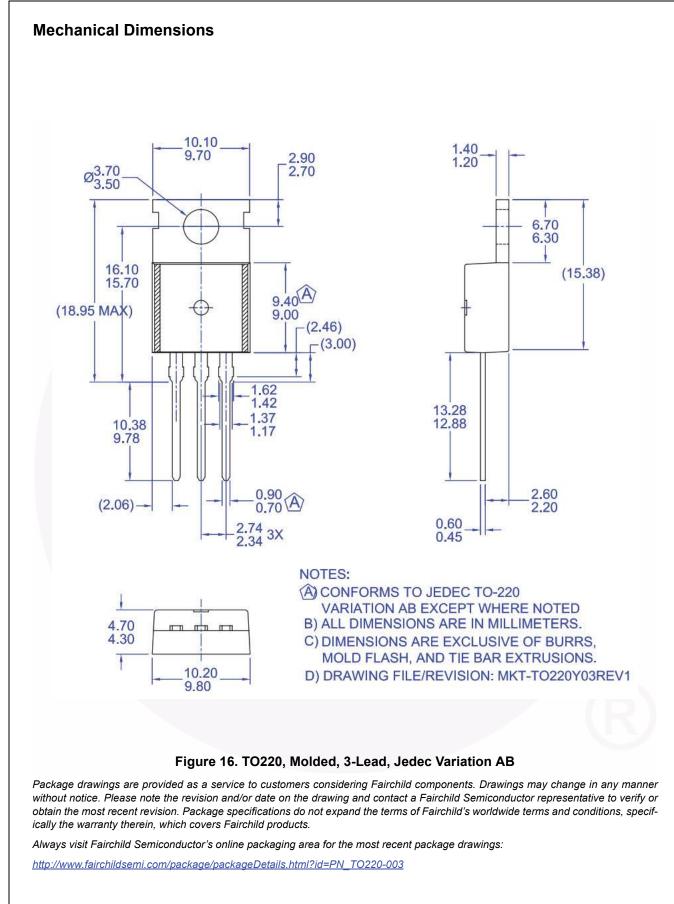


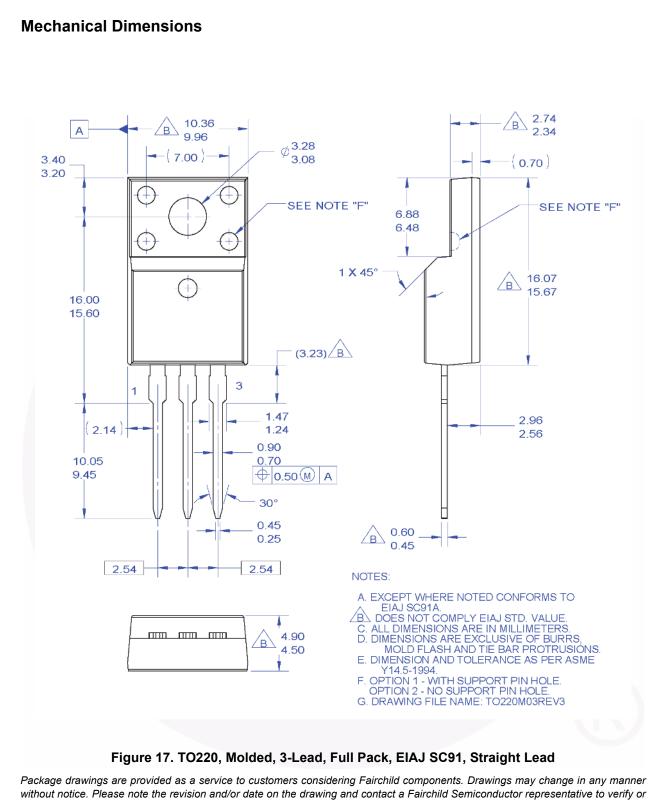






FQP19N20C / FQPF19N20C — N-Channel QFET® MOSFET





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