# imall

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FQT3P20 P-Channel QFET<sup>®</sup> MOSFET -200 V, -0.67 A, 2.7 Ω

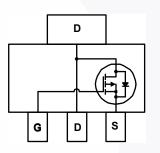
### Description

This P-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, audio amplifier, DC motor control, and variable switching power applications.

### Features

- 0.67 A, -200 V,  ${\rm R}_{\rm DS(on)}$  = 2.7  $\Omega$  (Max.) @V\_{\rm GS} = 10 V,  ${\rm I}_{\rm D}$  = 0.335 A
- Low Gate Charge ( Typ. 6.0 nC)
- Low Crss ( Typ. 7.5 pF)





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

Symbol	Parameter		FQT3P20TF	Unit
V <sub>DSS</sub>	Drain-Source Voltage		-200	V
ID	Drain Current - Continuous (T <sub>C</sub> = 25°	°C)	-0.67	A
	- Continuous (T <sub>C</sub> = 70°	°C)	-0.53	A
рм	Drain Current - Pulsed	(Note 1)	-2.7	A
V <sub>GSS</sub>	Gate-Source Voltage		± 30	V
E <sub>AS</sub>	Single Pulsed Avalanche Energy	(Note 2)	150	mJ
I <sub>AR</sub>	Avalanche Current	(Note 1)	-0.67	А
E <sub>AR</sub>	Repetitive Avalanche Energy	(Note 1)	0.25	mJ
dv/dt	Peak Diode Recovery dv/dt	(Note 3)	-5.5	V/ns
P <sub>D</sub>	D Power Dissipation ( $T_C = 25^{\circ}C$ )		2.5	W
- Derate above 25°C			0.02	W/°C
T <sub>J</sub> , T <sub>STG</sub>	Operating and Storage Temperature Range		-55 to +150	°C
Τ <sub>L</sub>	Maximum lead temperature for soldering purposes, 1/8" from case for 5 seconds		300	°C

## **Thermal Characteristics**

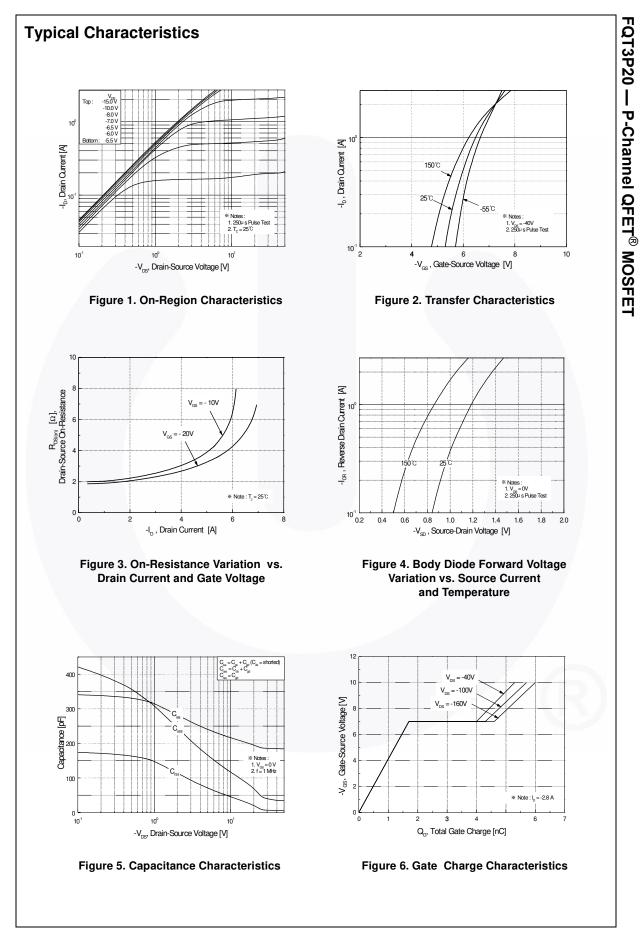
Symbol	Parameter	FQT3P20TF	Unit
$R_{ extsf{ heta}JA}$	Thermal Resistance, Junction-to-Ambient	50	°C/W

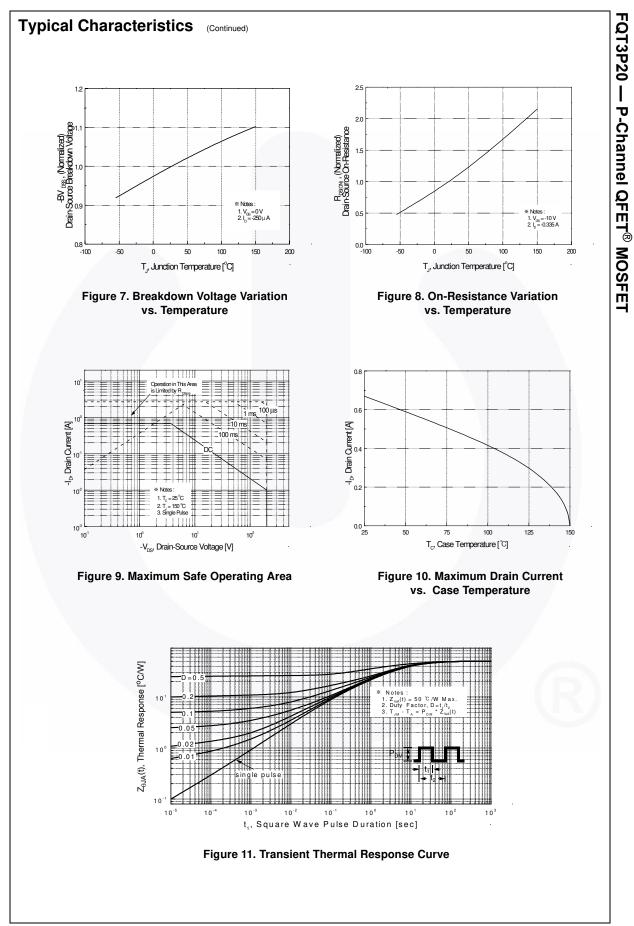
October 2013

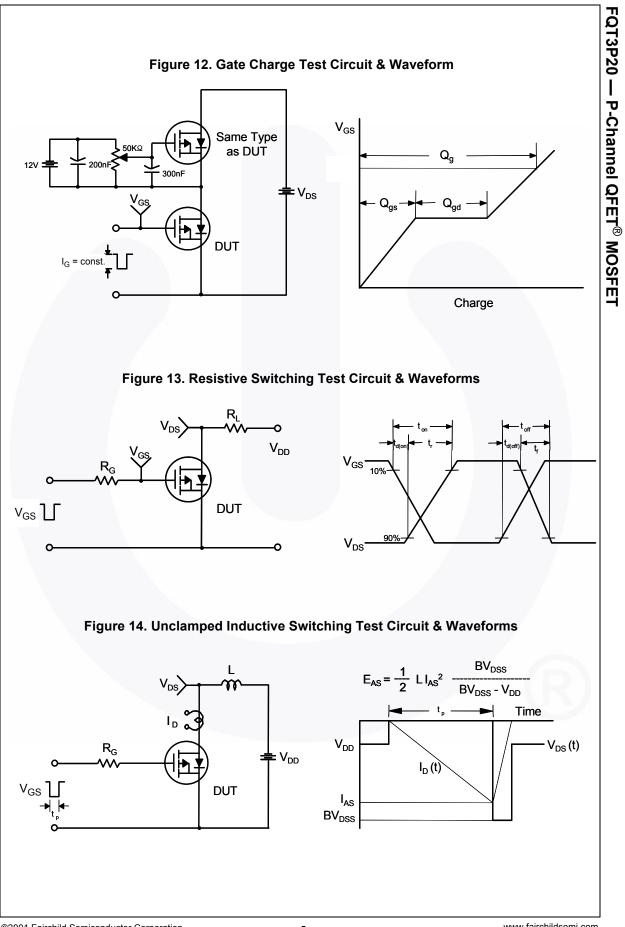
Device Marking		Device Package Reel Size			Tape Width		Quantity		
FQT3			SOT-223	OT-223 13"		12 mm		2500 units	
ectri	cal Cha	aracteristics T <sub>c = 25</sub>	5°C unless otherw	ise noted.					
Symbol		Parameter	Т	est Conditions		Min	Тур	Max	Unit
Off Cha	aracteris	stics							
BV <sub>DSS</sub>	Drain-Sc	ource Breakdown Voltage	$V_{GS} = 0 V$	, I <sub>D</sub> = -250 μA		-200			V
ΔB <sub>VDSS</sub> / ΔT <sub>J</sub>	Breakdo Coefficie	wn Voltage Temperature nt	I <sub>D</sub> = -250	$I_D = -250 \ \mu$ A, Referenced to 25°C			-0.18		V/°C
I <sub>DSS</sub>	Zero Gate Voltage Drain Current		V <sub>DS</sub> = -20	0 V, V <sub>GS</sub> = 0 V				-1	μA
			V <sub>DS</sub> = -16	0 V, T <sub>C</sub> = 125°C				-10	μA
I <sub>GSSF</sub>	Gate-Bo	dy Leakage Current, Forward	V <sub>GS</sub> = -30	V, V <sub>DS</sub> = 0 V				-100	nA
I <sub>GSSR</sub>		dy Leakage Current, Reverse		$V, V_{DS} = 0 V$				100	nA
On Cha	racteris	stics							
V <sub>GS(th)</sub>	Gate Th	reshold Voltage	$V_{DS} = V_{GS}$	<sub>S</sub> , I <sub>D</sub> = -250 μA		-3.0		-5.0	V
R <sub>DS(on)</sub>	Static Dr On-Resi	ain-Source stance	V <sub>GS</sub> = -10	V, I <sub>D</sub> = -0.335 A			2.06	2.7	Ω
9 <sub>FS</sub>	Forward	Transconductance	V <sub>DS</sub> = -40	V, I <sub>D</sub> = -0.335 A			0.7		S
Dynam <sub>Ciss</sub>		acteristics pacitance	V 25	V V 0 V			190	250	pF
C <sub>oss</sub>		Capacitance	f = 1.0 MF	$V_{DS} = -25 \text{ V}, V_{GS} = 0 \text{ V},$			45	60	pF
C <sub>rss</sub>		Transfer Capacitance	1 = 1.0 Wi	12			7.5	10	pF
		racteristics							F
t <sub>d(on)</sub>	-	Delay Time					8.5	25	ns
t <sub>r</sub>		Rise Time	00	0 V, I <sub>D</sub> = -2.8 A,			35	80	ns
t <sub>d(off)</sub>	Turn-Off	Delay Time	$H_{G} = 25 $	$R_{G} = 25 \Omega$			12	35	ns
t <sub>f</sub>		Fall Time			(Note 4)		25	60	ns
Q <sub>g</sub>	Total Ga	te Charge	$V_{DC} = -16$	0 V, I <sub>D</sub> = -2.8 A,			6.0	8.0	nC
Q <sub>gs</sub>	Gate-So	urce Charge	$V_{GS} = -10$	-			1.7		nC
Q <sub>gd</sub>		ain Charge			(Note 4)		2.9		nC
	ource D	Diode Characteristics	and Maxim	um Ratings		<u> </u>			
I <sub>S</sub>	Maximur	n Continuous Drain-Source D	iode Forward	Current				-0.67	Α
I <sub>SM</sub>	Maximur	n Pulsed Drain-Source Diode	Diode Forward Current				-2.7	Α	
V <sub>SD</sub>	Drain-Sc	ource Diode Forward Voltage	$V_{GS} = 0 V$	, I <sub>S</sub> = -0.67 A				-5.0	V
trr	Reverse	Recovery Time		', I <sub>S</sub> = -2.8 A,			100		ns
Qrr	Povorao	Recovery Charge	$dI_F / dt = $	100 A/us			0.34		μC

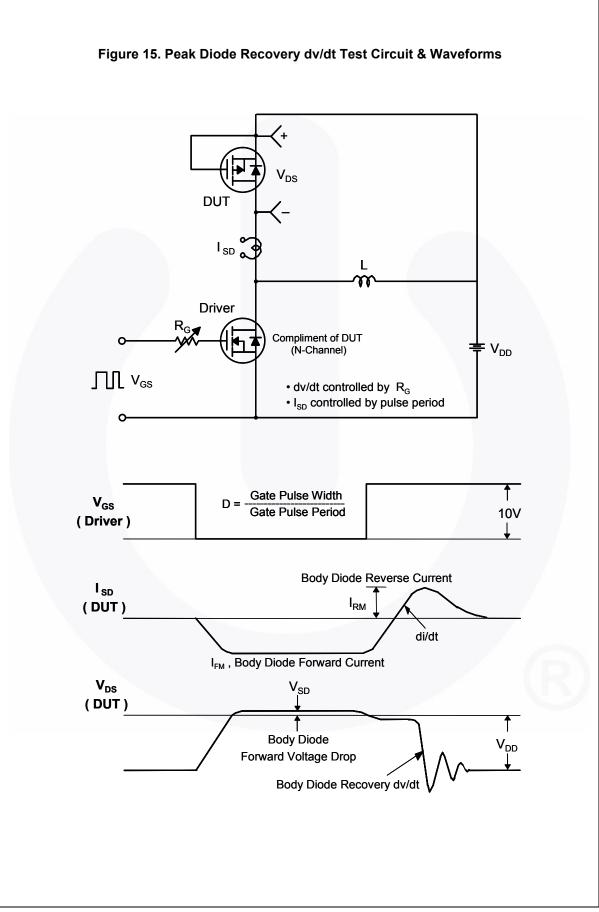
2. L = 500mH,  $I_{AS}$  = 0.67A,  $V_{DD}$  = 50V,  $H_G$  = 25 M, Starting T\_J = 2 3.  $I_{SD}$  = 2-28A, di/dt ≤ 300A/µs,  $V_{DD}$  = 80V<sub>DSS</sub>, Starting T\_J = 25°C 4. Essentially independent of operating temperature

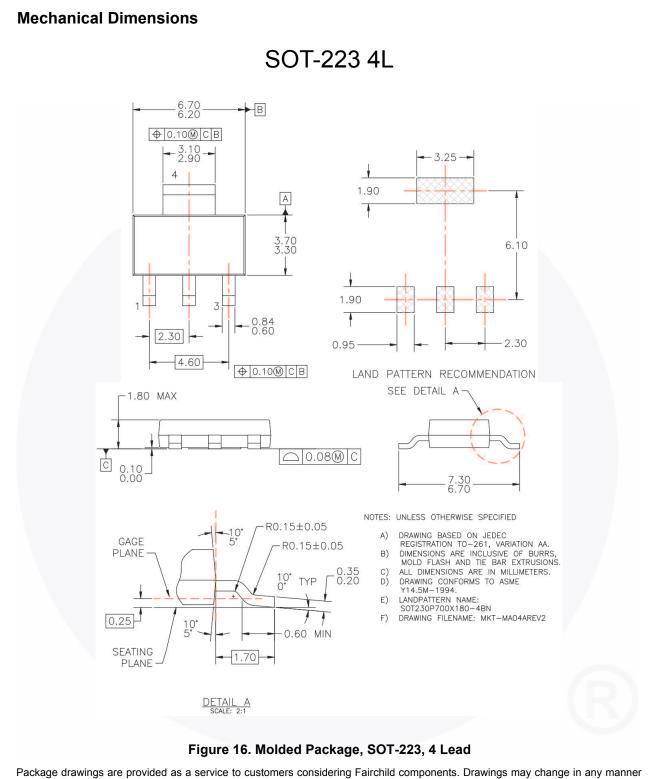
FQT3P20 — P-Channel QFET<sup>®</sup> MOSFET











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**Dimension in Millimeters** 



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