FAIRCHILD SEMICONDUCTOR

FQPF7N65C N-Channel QFET[®] MOSFET

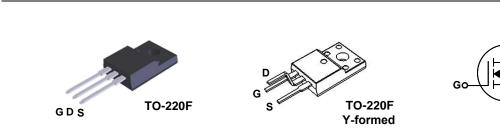
 $650~V, 7~A, 1.4~\Omega$

Description

This N-Channel enhancement mode power MOSFET is \bullet 7 A, 650 V, R_{DS(on)} = 1.4 Ω (Max.) @ V_{GS} = 10 V, I_D = 3.5 A produced using Fairchild Semiconductor®'s proprietary planar stripe and DMOS technology. This advanced MOSFET technology has been especially tailored to . Low Crss (Typ. 12 pF) reduce on-state resistance, and to provide superior • 100% Avalanche Tested 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

- Low Gate Charge (Typ. 28 nC)



Absolute Maximum Ratings T_C = 25°C unless otherwise noted

Symbol	Parameter		FQPF7N65C / FQPF7N65CYDTU	Unit	
V _{DSS}	Drain-Source Voltage		650	V	
I _D	Drain Current - Continuous ($T_C = 25^{\circ}C$)		7 *	А	
	- Continuous (T _C = 100°C)		4.2 *	А	
I _{DM}	Drain Current - Pulsed	(Note 1)	28 *	А	
V _{GSS}	Gate-Source Voltage		± 30	V	
E _{AS}	Single Pulsed Avalanche Energy	(Note 2)	212	mJ	
I _{AR}	Avalanche Current	(Note 1)	7	А	
E _{AR}	Repetitive Avalanche Energy	(Note 1)	1.6	mJ	
dv/dt	Peak Diode Recovery dv/dt	(Note 3)	4.5	V/ns	
PD	Power Dissipation (T _C = 25°C)		52	W	
	- Derate above 25°C		0.42	W/°C	
T _J , T _{STG}	Operating and Storage Temperature Range		-55 to +150	°C	
T.	Maximum lead temperature for soldering purposes, 1/8" from case for 5 seconds		200	°C	
ΤL			300		
Drain current lim	ited by maximum junction temperature.				

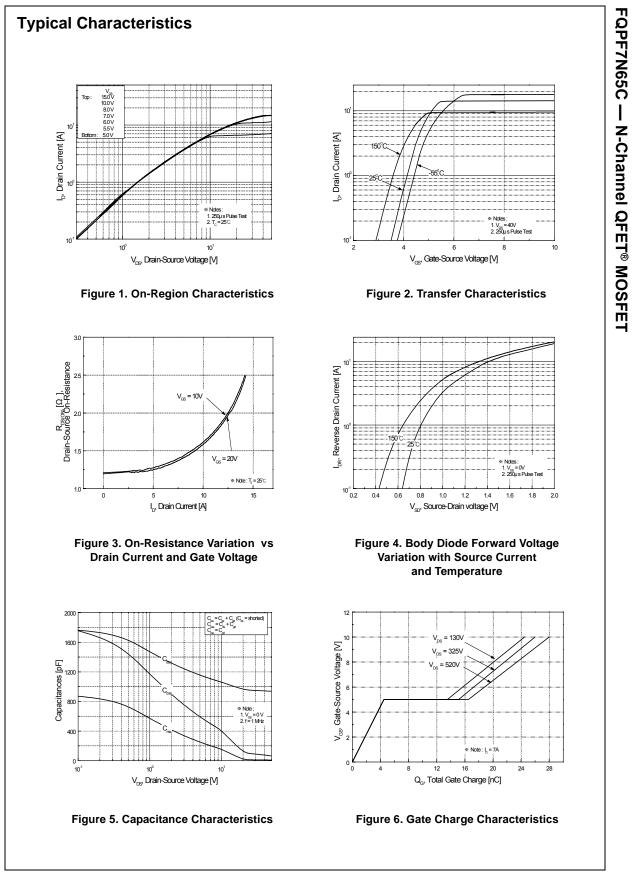
Thermal Characteristics

Symbol	Parameter	FQPF7N65C / FQPF7N65CYDTU	Unit
R _{0JC} Thermal Resistance, Junction-to-Case, Max.		2.4	°C/W
R_{\thetaJA}	Thermal Resistance, Junction-to-Ambient, Max.	62.5	°C/W

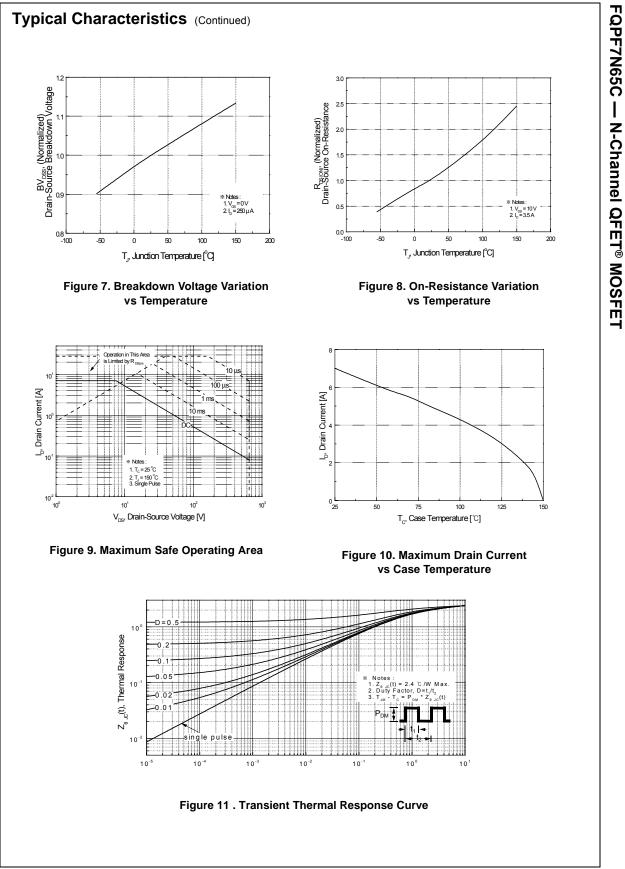
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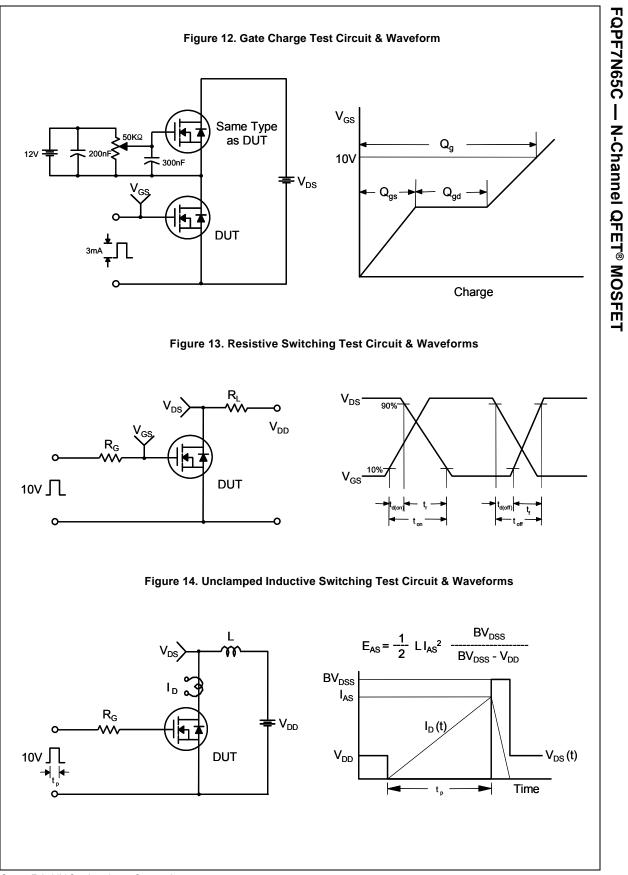
Device Marking		Device	Package	Package Reel Size		Tape Width		Quantity	
FQP	F7N65C	FQPF7N65C	TO-220F	-	-		5	50	
FQPF7N65C FQPF7N65CYDTU TO-2		TO-220F (Y-formed)	220F (Y-formed) -		-		50		
lectri	cal Cha	racteristics	= 25°C unless otherwise noted	4					
Symbol		Parameter	+	onditions	Min	Тур	Max	Unit	
Off Cha	racterist	ics							
BV _{DSS}		rce Breakdown Voltage	V _{GS} = 0 V, I _D = 2	250 μΑ	650			V	
ΔBV _{DSS} / ΔT _{.1}		n Voltage Temperature		ferenced to 25°C		0.8		V/°C	
I _{DSS}			V _{DS} = 650 V, V _G	_{3S} = 0 V			1	μA	
	∠ero Gate	Voltage Drain Current	V _{DS} = 520 V, T _C				10	μA	
I _{GSSF}	Gate-Bod	y Leakage Current, Forw	ard V_{GS} = 30 V, V_{DS}	_s = 0 V			100	nA	
I _{GSSR}	Gate-Bod	y Leakage Current, Reve	erse V_{GS} = -30 V, V_D	_S = 0 V			-100	nA	
On Cha	racterist	ics							
V _{GS(th)}		shold Voltage	$V_{DS} = V_{GS}, I_D =$	250 μΑ	2.0		4.0	V	
R _{DS(on)}	Static Drai On-Resist		V _{GS} = 10 V, I _D =	$V_{GS} = 10 \text{ V}, \text{ I}_{D} = 3.5 \text{ A}$		1.2	1.4	Ω	
9 _{FS}	Forward T	ransconductance	V _{DS} = 40 V, I _D =	3.5 A		8		S	
C _{iss} C _{oss} C _{rss}	Input Cap Output Ca Reverse T		V _{DS} = 25 V, V _{GS} f = 1.0 MHz	_S = 0 V,		955 100 12	1245 130 16	pF pF pF	
	ng Char	acteristics			1			I	
t _{d(on)}	_	Delay Time	N/ 005 V/ I	V_{DD} = 325 V, I _D = 7A, R _G = 25 Ω		20	50	ns	
t _r	Turn-On F	•				50	110	ns	
t _{d(off)}	Turn-Off D	Jelay Time				90	190	ns	
t _f	Turn-Off F			(Note 4)		55	120	ns	
Qg	Total Gate	Charge	V _{DS} = 520 V, I _D	= 7A,		28	36	nC	
Q _{gs}	Gate-Sou	rce Charge	V _{GS} = 10 V			4.5		nC	
Q _{gd}	Gate-Drai	n Charge		(Note 4)		12		nC	
Drain S		ada Charactoristia	a and Maximum	Dotingo					
l _s	I	ode Characteristic					7	A	
's I _{SM}		Continuous Drain-Source Diode Forward Current Pulsed Drain-Source Diode Forward Current				28	A		
V _{SD}		rce Diode Forward Volta		7A			1.4	V	
t _{rr}		Recovery Time	$V_{GS} = 0 V, I_S = 1$			400		ns	
Q _{rr}		Recovery Charge	00 0	$v_{GS} = 0 v, r_S = 7A,$ dl _F / dt = 100 A/µs		3.3		μC	
							I	24	



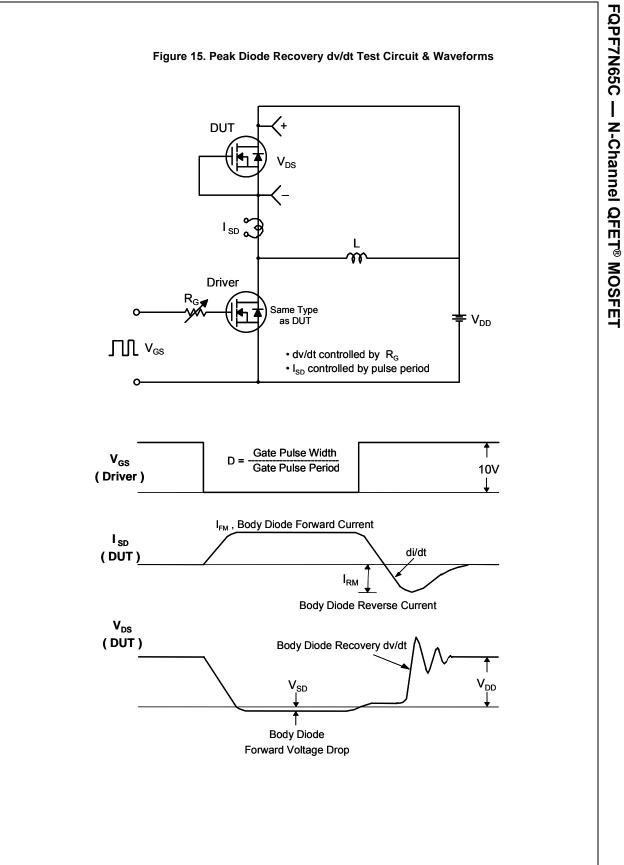
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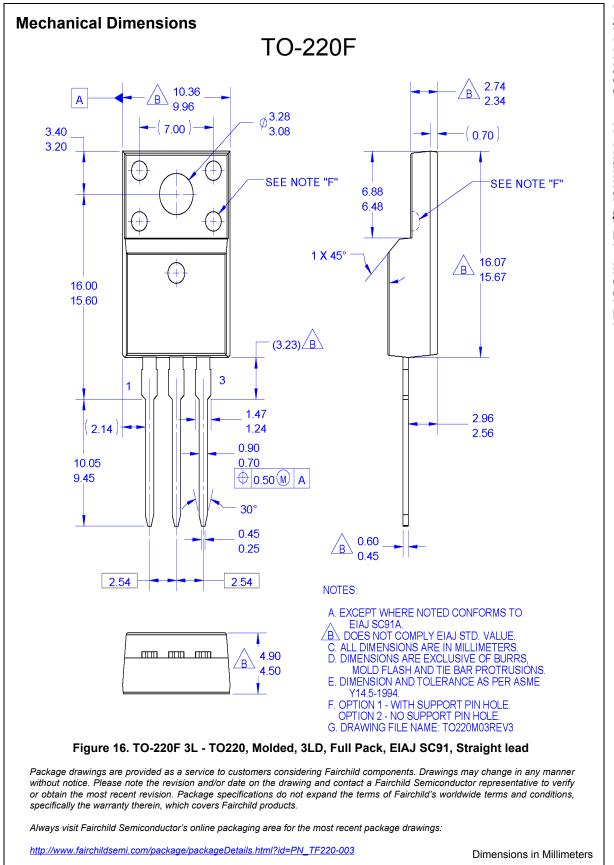


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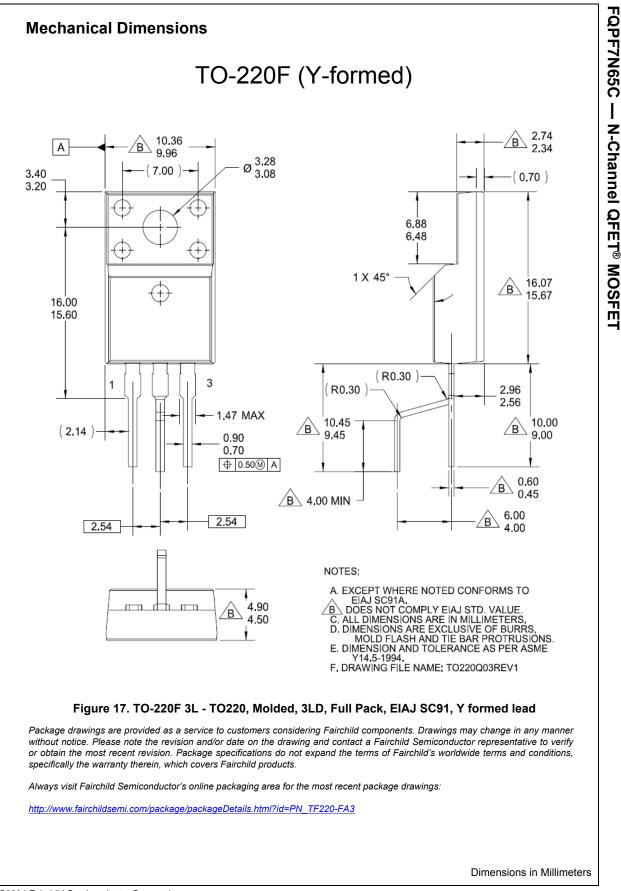


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FQPF7N65C — N-Channel QFET[®] MOSFET





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