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FQI13N50C N-Channel QFET[®] MOSFET

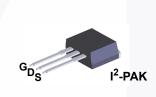
500 V, 13 A, 480 mΩ

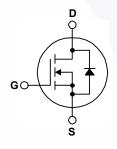
Features

- 13 A, 500 V, $R_{DS(on)}$ = 480 m Ω (Max.) @V_{GS} = 10 V, I_D = 6.5 A
- Low Gate Charge (Typ. 43 nC)
- Low Crss (Typ. 20 pF)
- 100% Avalanche Tested
- RoHS Compliant

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.





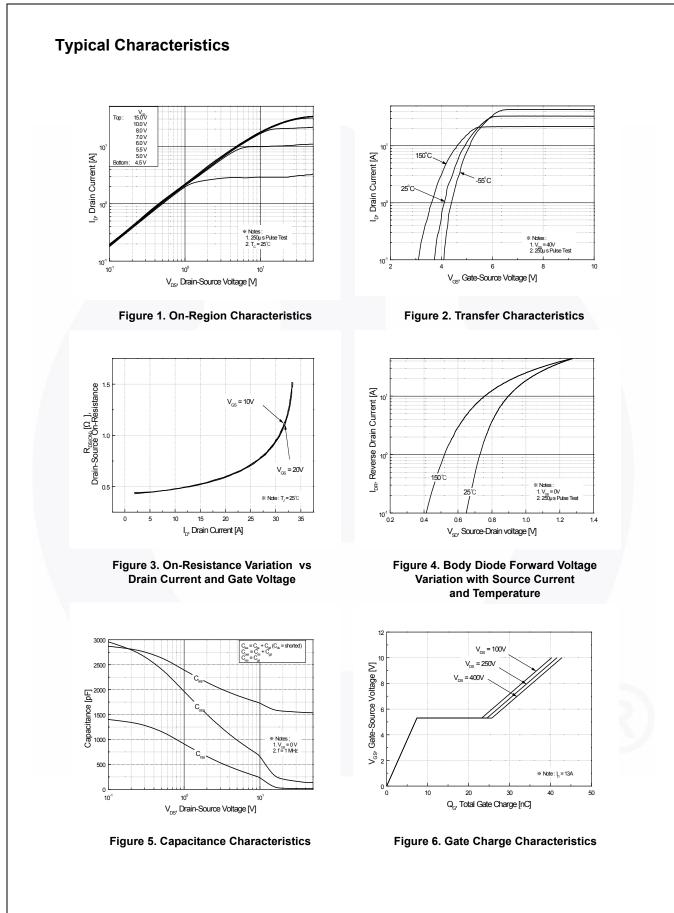
Absolute Maximum Ratings T_C = 25°C unless otherwise noted.

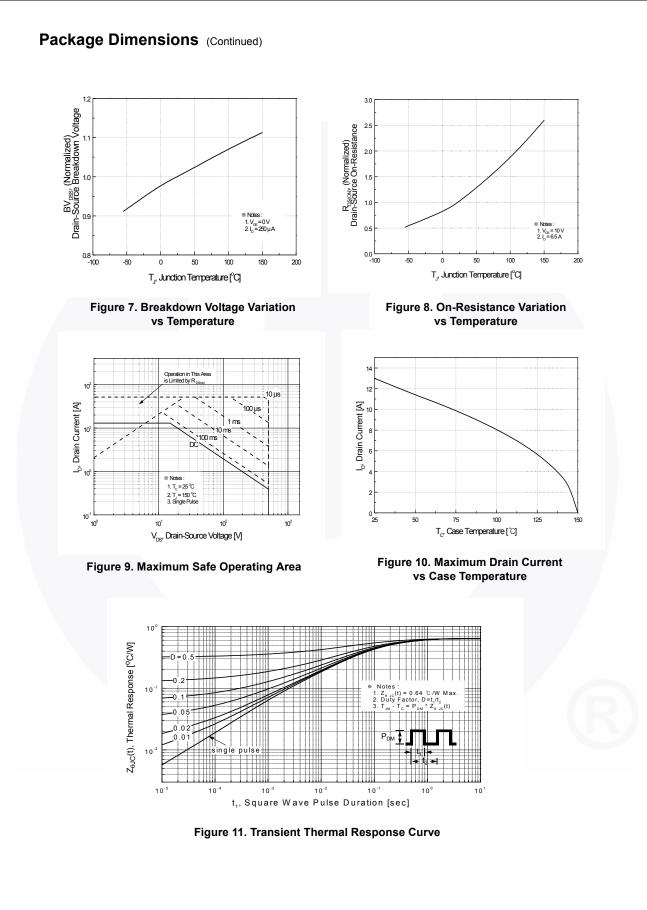
Symbol	Parameter		FQI13N50CTU	Unit
V _{DSS}	Drain-Source Voltage		500	V
I _D	Drain Current - Continuous (T _C = 25°C)		13	А
	- Continuous (T _C = 100°C)		8	А
I _{DM}	Drain Current - Pulsed	(Note 1)	52	A
V _{GSS}	Gate-Source Voltage		± 30	V
E _{AS}	Single Pulsed Avalanche Energy (Note 2)		860	mJ
I _{AR}	Avalanche Current	(Note 1)	13	A
E _{AR}	Repetitive Avalanche Energy	(Note 1)	19.5	mJ
dv/dt	Peak Diode Recovery dv/dt (Note		4.5	V/ns
P _D	Power Dissipation (T _C = 25°C)		195	W
	- Derate above 25°C		1.56	W/°C
T _J , T _{STG}	Operating and Storage Temperature Range		-55 to +150	°C
т	Maximum lead temperature for soldering purposes,		300	°C
ΤL	1/8" from case for 5 seconds		300	C

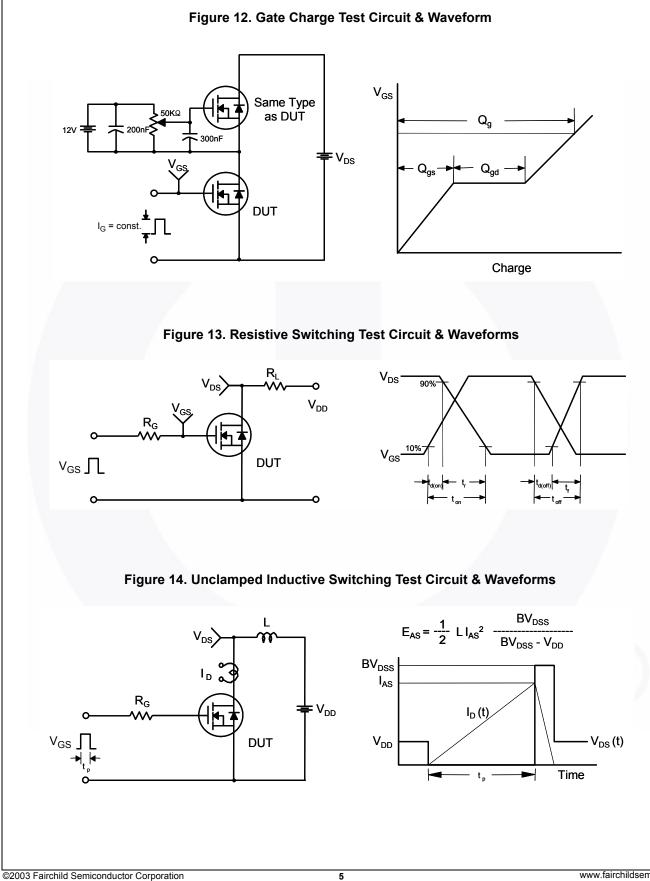
Thermal Characteristics

Symbol	Parameter	FQI13N50CTU	Unit
$R_{\theta JC}$	Thermal Resistance, Junction-to-Case, Max.	0.64	°C/W
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient, Max.	62.5	°C/W

	Device MarkingDeviceFQI13N50CFQI13N50CTU		Package	Reel Size	Таре	Width	Qua	antity	
SymbolParameterTest ConditionsMinTypMaOff CharacteristicsSWDssDrain-Source Breakdown Voltage $V_{GS} = 0 V$, $I_{D} = 250 \mu$ A, Referenced to 25° C0.5JBVDssBreakdown Voltage Temperature $I_{D} = 250 \mu$ A, Referenced to 25° C0.5JDSsZero Gate Voltage Drain Current $V_{OS} = 500 V$, $V_{OS} = 0 V$ 10GSSFGate-Body Leakage Current, Forward $V_{OS} = 30 V$, $V_{OS} = 0 V$ 100IdessRGate-Body Leakage Current, Reverse $V_{GS} = 30 V$, $V_{DS} = 0 V$ 100On CharacteristicsVos100100On CharacteristicsVos+0 V, $I_{D} = 6.5 A$ 0.390.4OrseForward Transconductance $V_{DS} = 400 V$, $I_{D} = 6.5 A$ 15OrgsInput Capacitance $V_{DS} = 25 V$, $V_{GS} = 0 V$, $I_{-} = 1800$ 205OrgsNetwerse Transfer Capacitance $V_{DS} = 25 V$, $V_{GS} = 0 V$, $I_{-} = 1800$ 205Switching Characteristics100211GaterTurn-Off Belay Time100211 r_{GS} Turn-Off Belay Time130270 r_{GS} Total Gate Charge $V_{OS} = 400 V$, $I_{D} = 13 A$, $$ 130270 r_{GS} Turn-Off Fall Time130270 r_{GS} Turn-Off Belay Time130270 r_{GS} </th <th colspan="2">-</th> <th colspan="2"></th> <th colspan="2">50 units</th>			-				50 units		
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Gass Gate-Body Leakage Current, Reverse $V_{GS} = -30 \ V, V_{DS} = 0 \ V$	0005	Gate-Rody	Leakage Current Forward						μA nA
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		Drain-Sour	ce Diode Forward Voltage	V _{GS} = 0 V, I _S = 1	3 A			1.4	V
	rr	Reverse Re	ecovery Time	V _{GS} = 0 V, I _S = 1	3 A,		410		ns
Q_{rr} Reverse Recovery Charge $dI_F / dt = 100 \text{ A/}\mu\text{s}$ 4.5		Reverse Re	ecovery Charge	dI _F / dt = 100 A/µ	S		4.5		μC
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FQI13N50C Rev. C1

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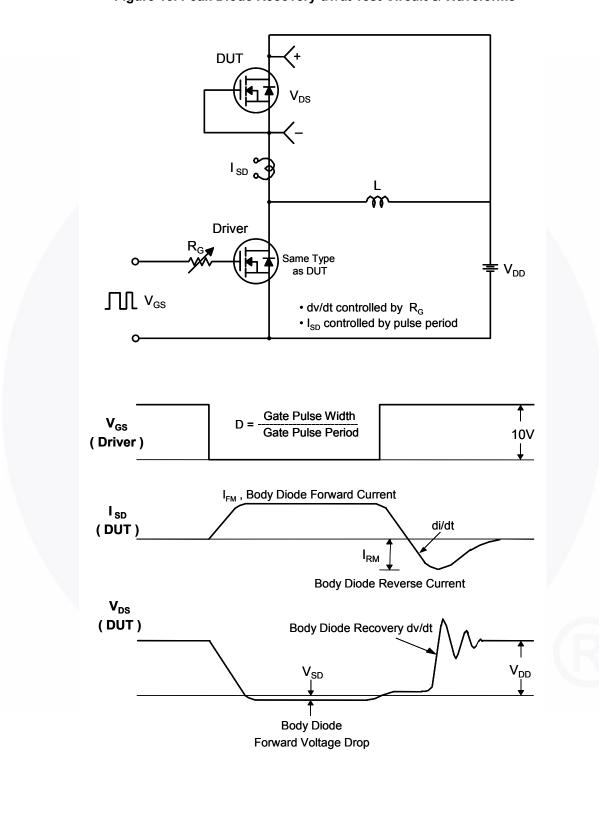
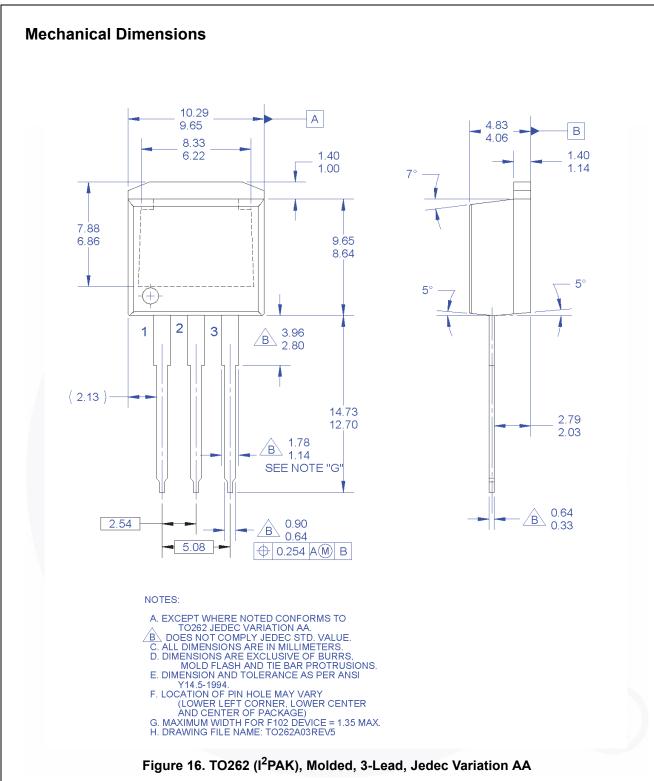


Figure 15. Peak Diode Recovery dv/dt Test Circuit & Waveforms



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FQI13N50C — N-Channel QFET[®] MOSFET



SEMICONDUCTOR

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+	MicroPak™	Solutions for Your Success™	
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- 2. A critical component in any component of a life support, device, or system whose failure to perform can be reasonably expected to cause the failure of the life support device or system, or to affect its safety or effectiveness.

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PRODUCT STATUS DEFINITIONS Definition of Terms

Datasheet Identification	Product Status	Definition
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Preliminary	First Production	Datasheet contains preliminary data; supplementary data will be published at a later date. Fairchild Semiconductor reserves the right to make changes at any time without notice to improve design.
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