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October 2013



FDPF2710T

N-Channel PowerTrench[®] MOSFET 250 V, 25 A, 42.5 m Ω

Features

- + $R_{DS(on)}$ = 36.3 m Ω (Typ.)@ V_{GS} = 10 V, I_D = 25 A
- Fast Switching Speed
- Low Gate Charge
- + High Performance Trench Technology for Extremely Low $R_{\text{DS}(\text{on})}$
- High Power and Current Handling Capability
- RoHS Compliant

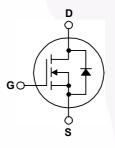
Description

This N-Channel MOSFET is produced using Fairchild Semiconductor's advance PowerTrench[®] process that has been tailored to minimize the on-state resistance while maintaining superior switching performance.

Applications

- Consumer Appliances
- Synchronous Rectification





Absolute Maximum Ratings

Symbol	Parameter			FDPF2710T	Unit	
V _{DS}	Drain-Source Voltage			250	V	
V _{GS}	Gate-Source voltage			± 30	V	
ID	Drain Current - Continuous ($T_C = 25^{\circ}C$) - Continuous ($T_C = 100^{\circ}C$)			25 18.8	A A	
I _{DM}	Drain Current	- Pulsed	(Note 1)	100	A	
E _{AS}	Single Pulsed Avalanche Energy (Note 2)		(Note 2)	145	mJ	
dv/dt	Peak Diode Recovery dv/dt (Note 3)		(Note 3)	4.5	V/ns	
P _D	Power Dissipation $(T_C = 25^{\circ}C)$ - Derate above $25^{\circ}C$			62.5 0.5	W W/°C	
T _{J,} T _{STG}	Operating and Storage Temperature Range			-55 to +150	°C	
Τ _L	Maximum Lead Temperature for Soldering Purpose, 1/8" from Case for 5 Seconds			300	°C	

Thermal Characteristics

Symbol	Parameter	FDPF2710T	Unit	
$R_{ ext{ heta}JC}$	Thermal Resistance, Junction-to-Case, Max.	2.0	°C/W	
R_{\thetaJA}	Thermal Resistance, Junction-to-Ambient, Max.	62.5	°C/W	

		Device	Pack	ckage Reel S		Tap	be Width		Quantity	
		TO-2	0-220F Tube		N/A		50 units			
Electric	al Char	acteristics T	_C = 25°C unle	ess otherwise r	oted					
Symbol				Conditions			Min	Тур	Max	Unit
Off Charac	teristics									
BV _{DSS}	Drain-Sou	irce Breakdown Volta	age	V _{GS} = 0V, I _D = 250μA, T _J = 25°C			250			V
ΔΒV _{DSS} / ΔΤ _J	Breakdown Voltage Temperature Coefficient		ıre	$I_D = 250\mu A$, Referenced to $25^{\circ}C$				0.25		V/°C
I _{DSS}	Zero Gate Voltage Drain Current			$V_{DS} = 250V, V_{GS} = 0V$ $V_{DS} = 250V, V_{GS} = 0V, T_{C} = 125^{\circ}C$					10 500	μΑ μΑ
I _{GSSF}	Gate-Bod	y Leakage Current, F		$V_{GS} = 30V, V_{DS} = 0V$					100	nA
I _{GSSR}	Gate-Body Leakage Current, Reverse		Reverse	$V_{GS} = -30V, V_{DS} = 0V$				-100	nA	
On Charac	teristics									1
V _{GS(th)}	Gate Threshold Voltage			$V_{DS} = V_{GS}, I_{D} = 250 \mu A$			3.0	3.9	5.0	V
R _{DS(on)}	Static Dra	atic Drain-Source On-Resistance		V _{GS} = 10V, I _D = 25A				36.3	42.5	mΩ
9 _{FS}	Forward 1	rward Transconductance		V _{DS} = 10V, I _D = 25A				63		S
Dynamic C	haracteris	tics								
C _{iss}	Input Cap	acitance					5470	7280	pF	
C _{oss}	Output Ca	Output Capacitance Reverse Transfer Capacitance		V _{DS} = 25V, V _{GS} = 0V, f = 1.0MHz				426	567	pF
C _{rss}	Reverse 7							97	146	pF
Switching	Characteri	stics								
t _{d(on)}	Turn-On Delay Time			$V_{DD} = 125V, I_D = 50A$			80	170	ns	
t _r	Turn-On F	Rise Time		$V_{GS} = 10V, R_{GEN} = 25\Omega$			252	514	ns	
t _{d(off)}	Turn-Off [Delay Time					112	234	ns	
t _f	Turn-Off F	all Time				(Note 4)		154	318	ns
Qg	Total Gate	e Charge		$V_{DS} = 125V, I_D = 50A$ $V_{GS} = 10V$				78	101	nC
Q _{gs}	Gate-Sou	rce Charge					34		nC	
Q _{gd}	Gate-Drain Charge			(Note 4)			18		nC	
Drain-Sour	ce Diode (Characteristics and	Maximum	Ratings					•	
I _S Maximum Continuous Drain-Source Diod			ource Diode	e Forward Cu	rrent		/		25	Α
I _{SM}	Maximum Pulsed Drain-Source Diode Fo		e Diode For	orward Current				150	Α	
V _{SD}	Drain-Source Diode Forward Voltage		/oltage	$V_{GS} = 0V, I_{S} = 25A$				1.2	V	
t _{rr}	Reverse F	Recovery Time		$V_{GS} = 0V, I_S$				163		ns
Q _{rr}	Reverse F	Recovery Charge		dl _F /dt =130A/μs				1.3		μC

Notes:

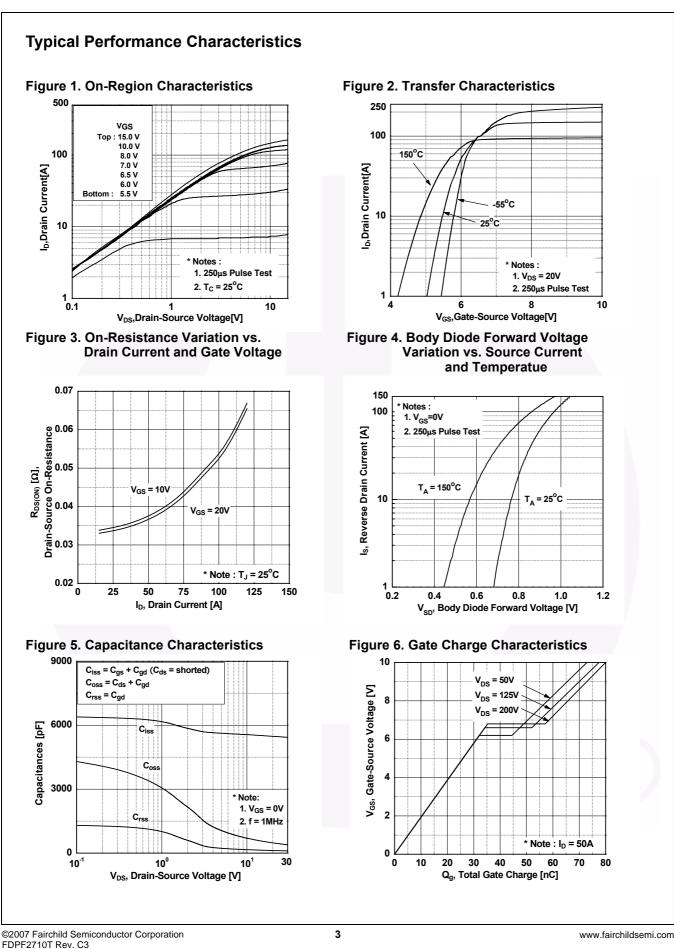
1. Repetitive Rating: Pulse width limited by maximum junction temperature

2. L = 1mH, I_{AS} = 17A, V_{DD} = 50V, R_G = 25 Ω , Starting T_J = 25 $^{\circ}\text{C}$

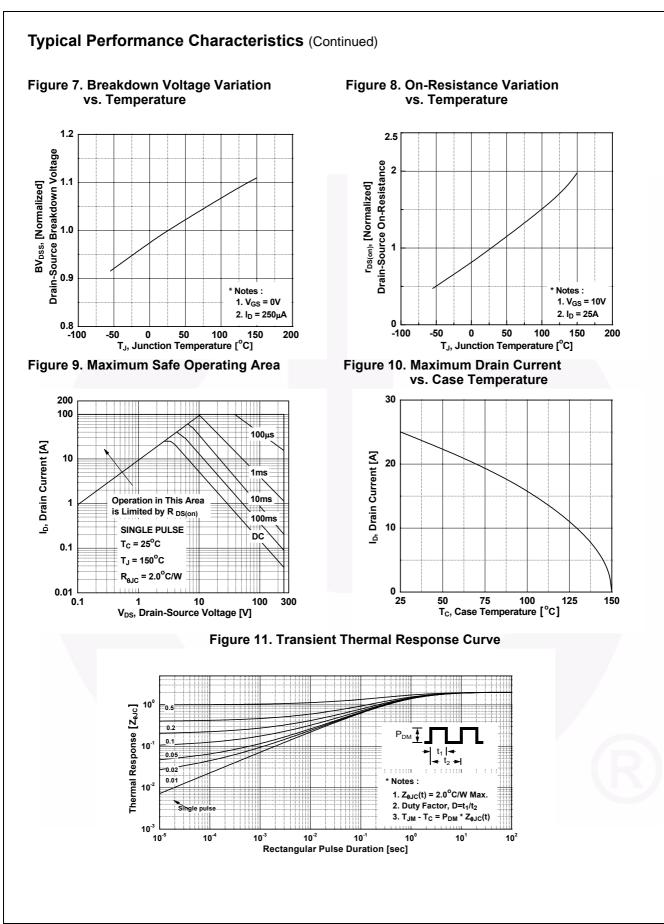
3. I_{SD} \leq 50A, di/dt \leq 200A/µs, V_{DD} \leq BV_{DSS}, Starting T_J = 25°C

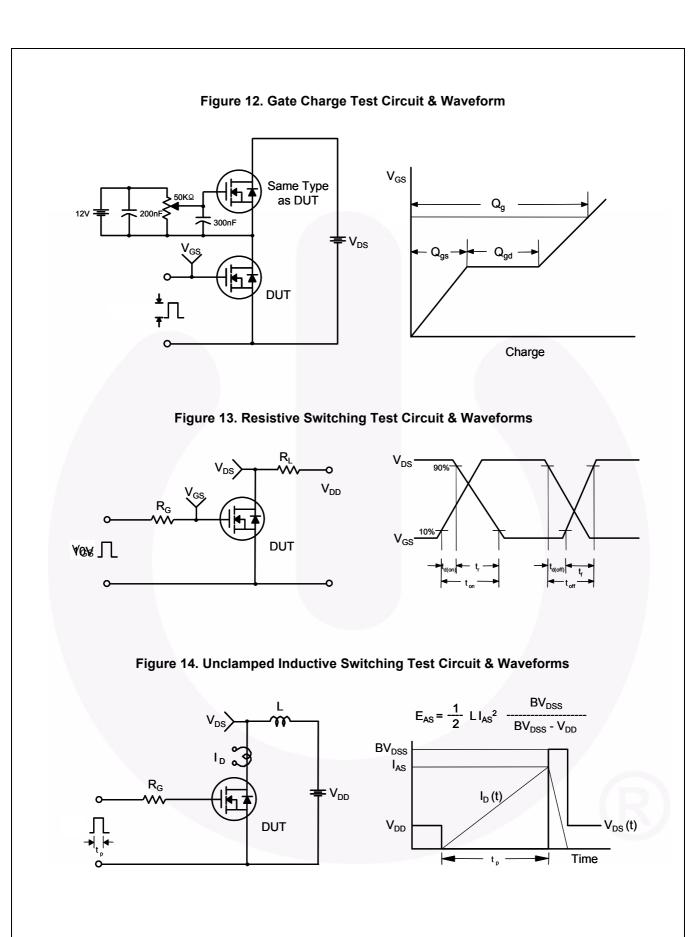
4. Essentially Independent of Operating Temperature Typical Characteristics

FDPF2710T — N-Channel PowerTrench® MOSFET



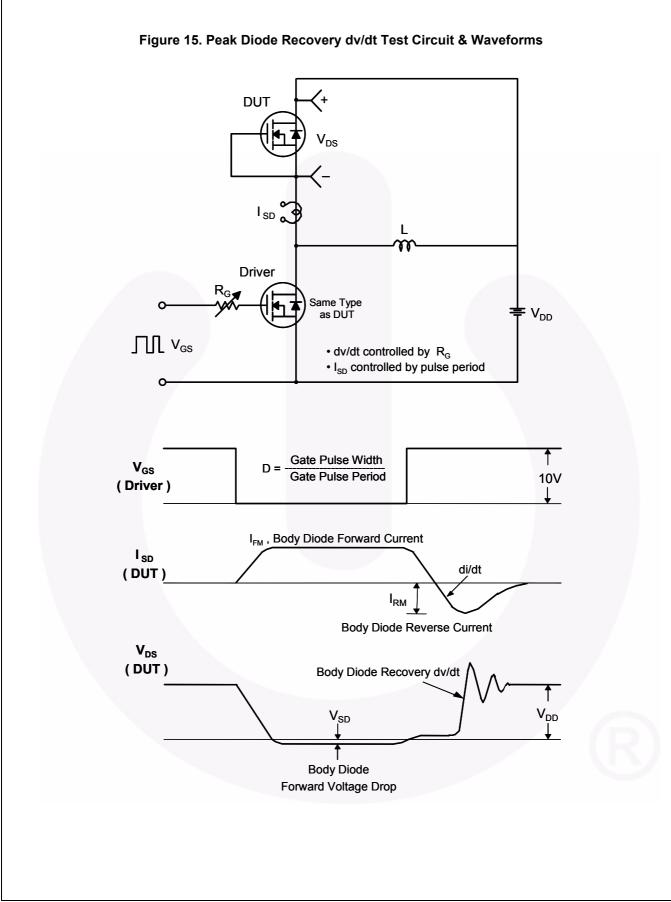
FDPF2710T — N-Channel PowerTrench® MOSFET

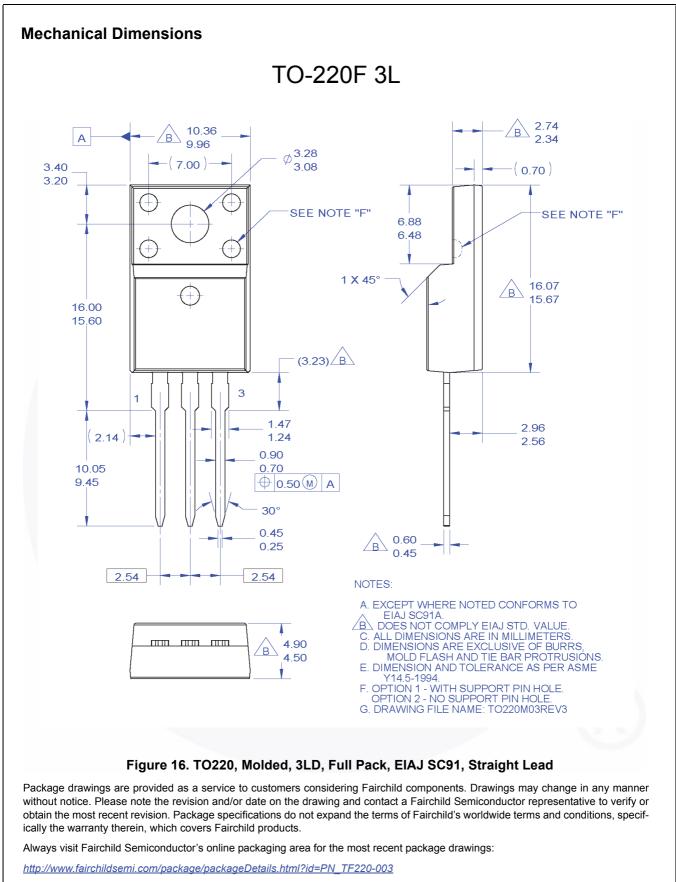




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Dimension in Millimeters

FDPF2710T — N-Channel PowerTrench[®] MOSFET



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F-PFS™

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