

FDP025N06 N-Channel PowerTrench[®] MOSFET 60 V, 265 A, 2.5 mΩ

Features

- $R_{DS(on)} = 1.9 \text{ m}\Omega \text{ (Typ.)} @ V_{GS} = 10 \text{ V}, I_D = 75 \text{ A}$
- 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

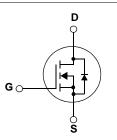
Description

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

Applications

- Synchronous Rectification for ATX / Server / Telecom PSU
- Battery Protection Circuit
- Motor Drives and Uninterruptible Power Supplies
- Renewable system





MOSFET Maximum Ratings $T_C = 25^{\circ}C$ unless otherwise noted

Symbol		Parameter			Unit	
V _{DSS}	Drain to Source Voltage			60	V	
V _{GSS}	Gate to Source Voltage	rce Voltage		±20	V	
ID	Drain Current	-Continuous (T _C = 25 ^o C, Silicon Limited)		265*		
		-Continuous (T _C = 100 ^o C, Silicor	n Limited)	190*	А	
		-Continuous (T _C = 25 ^o C, Packag	e Limited)) 120		
I _{DM}	Drain Current	- Pulsed	(Note 1)	1060	А	
E _{AS}	Single Pulsed Avalanche Energy (Note 2)		(Note 2)	2531	mJ	
dv/dt	Peak Diode Recovery dv/dt (Note 3)		(Note 3)	6.0	V/ns	
P _D	Deven Dississation	$(T_{C} = 25^{\circ}C)$		395	W	
	Power Dissipation	- Derate above 25°C		2.6	W/ºC	
T _J , T _{STG}	Operating and Storage Temperature Range			-55 to +175	°C	
TL	Maximum Lead Temperature for Soldering Purpose, 1/8" from Case for 5 Seconds			300	°C	

*Calculated continuous current based on maximum allowable junction temperature. Package limitation current is 120A.

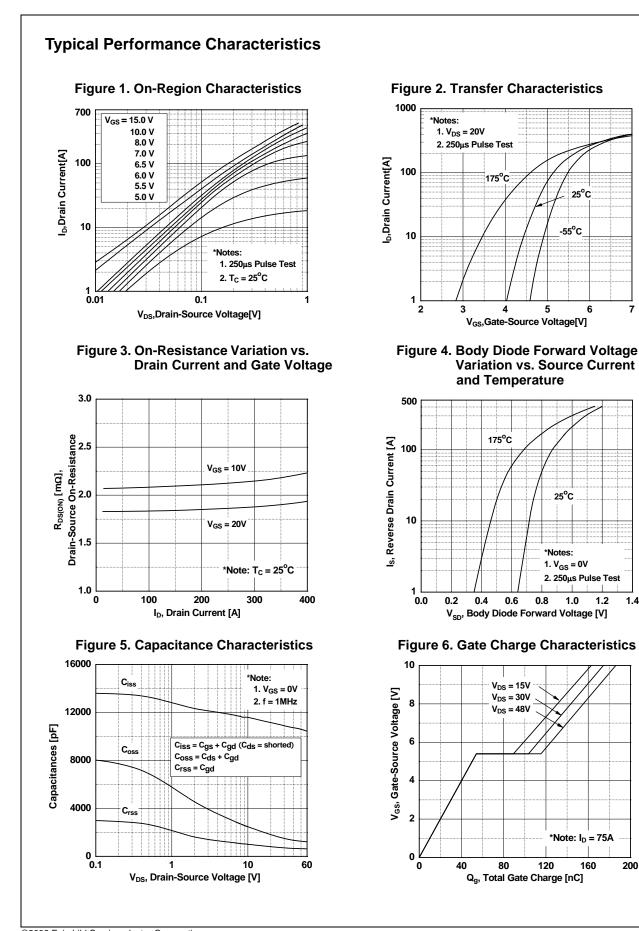
Thermal Characteristics

Symbol	Parameter	FDP025N06	Unit
$R_{ ext{ heta}JC}$	Thermal Resistance, Junction to Case, Max.	0.38	
$R_{\theta CS}$	Thermal Resistance, Case to Sink Typ.	0.5	°C/W
R_{\thetaJA}	Thermal Resistance, Junction to Ambient, Max.	62.5	

Device MarkingDevicePackageFDP025N06FDP025N06TO-220		je Reel Size Tape		e Width		Quantity	/		
		FDP025N06	-			-		50	
Electrica	l Chara	acteristics T _c =	25 ^o C unless ot	herwise noted					
Symbol		Parameter		Test Conditions		Min.	Тур.	Max.	Unit
Off Charac	teristics	6							
BV _{DSS}	Drain to Source Breakdown Voltage		ltage I	I _D = 250μA, V _{GS} = 0V		60	-	-	V
ΔBV _{DSS} ΔT _J	Breakdown Voltage Temperature		Iro	$I_D = 250 \mu A$, Referenced to $25^{\circ}C$		-	0.04	-	V/ºC
			·	$V_{DS} = 60V, V_{GS} = 0V$		-	-	1	
DSS	Zero Ga	te Voltage Drain Current		$V_{DS} = 60V, V_{GS} = 0V, T_{C} = 150^{\circ}C$		-	-	500	μA
I _{GSS}	Gate to	Body Leakage Current		$V_{GS} = \pm 20V, V_{DS} = 0V$		-	-	±100	nA
On Charac	teristics	5							
V _{GS(th)}	Gate Threshold Voltage			$V_{GS} = V_{DS}, I_{D} = 250 \mu A$		2.5	3.5	4.5	V
R _{DS(on)}	Static D	atic Drain to Source On Resistance		$V_{GS} = 10V, I_D = 75A$		-	1.9	2.5	mΩ
9FS	Forward	Transconductance	,	$V_{\rm DS} = 10V, I_{\rm D} = 75A$		-	200	-	S
Dynamic C	haracte	ristics							
C _{iss}	Input Ca	pacitance		V _{DS} = 25V, V _{GS} = 0V f = 1MHz		-	11190	14885	pF
C _{oss}		Capacitance				-	1610	2140	pF
C _{rss}	-	Transfer Capacitance				-	750	1125	pF
Q _{g(tot)}		te Charge at 10V				-	174	226	nC
Q _{gs}		Source Gate Charge		V _{DS} = 48V, I _D = 75A	-	-	54	-	nC
Q _{gd}	Gate to	Drain "Miller" Charge		V _{GS} = 10V	(Note 4)	-	50	-	nC
Switching	Charact	eristics			<u> </u>				
t _{d(on)}	Turn-On	Delay Time				-	134	278	ns
t _r	Turn-On	Rise Time		V _{DD} = 30V, I _D = 75A		-	324	658	ns
t _{d(off)}	Turn-Off	urn-Off Delay Time		V_{GS} = 10V, R_{GEN} = 25 Ω		-	348	706	ns
t _f	Turn-Off	Fall Time			(Note 4)	-	250	510	ns
Drain-Sour	ce Diod	le Characteristics	5						
I _S	Maximum Continuous Drain to Source Diode Forward Current					-	-	265	Α
I _{SM}	Maximur	n Pulsed Drain to Sou	rce Diode Forw	rward Current		-	-	1060	Α
V _{SD}	Drain to	Source Diode Forward	Voltage	V _{GS} = 0V, I _{SD} = 75A		-	-	1.3	V
t _{rr}	Reverse	Recovery Time		V _{GS} = 0V, I _{SD} = 75A		-	69	-	ns
Q _{rr}	Reverse	Recovery Charge		dI _F /dt = 100A/µs		-	152	-	nC

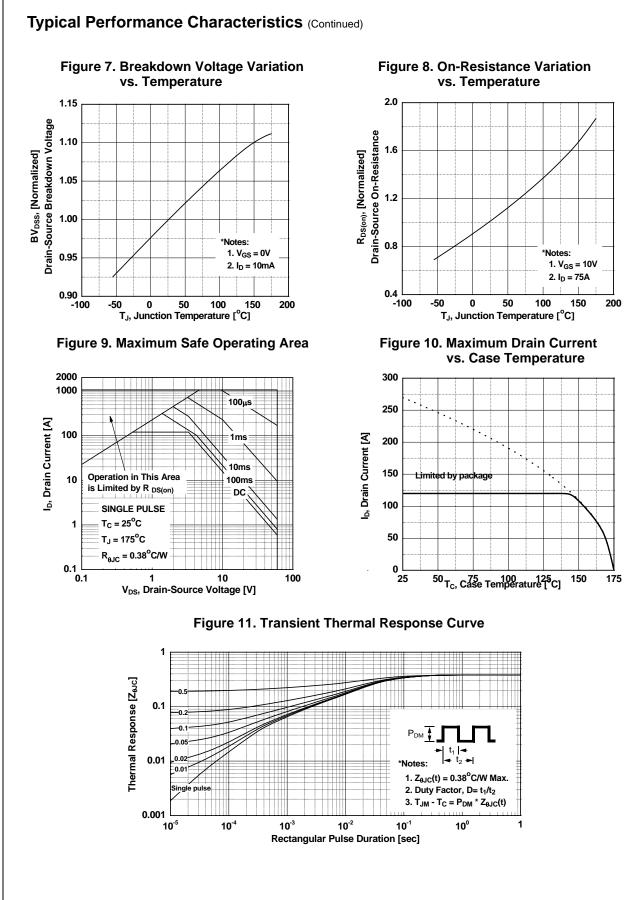
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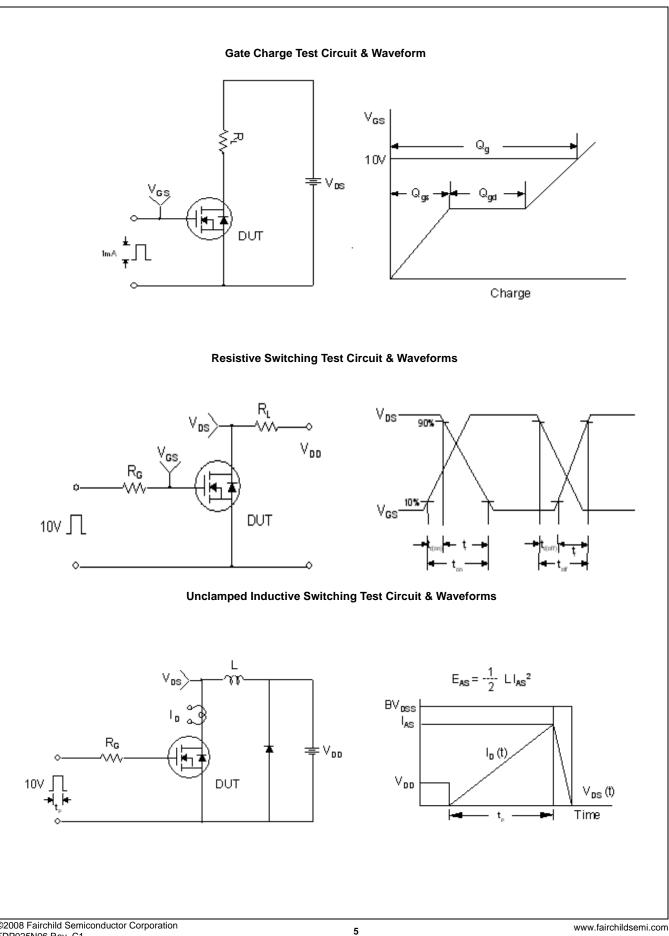


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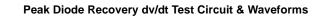
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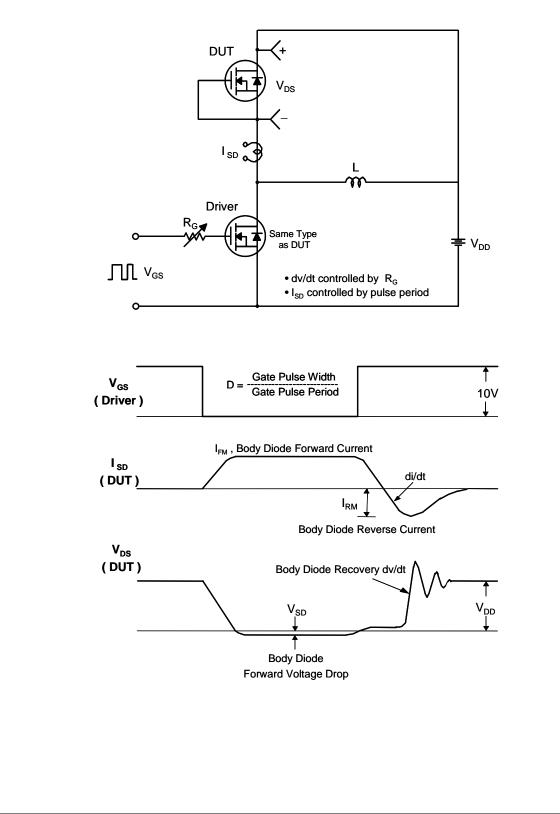


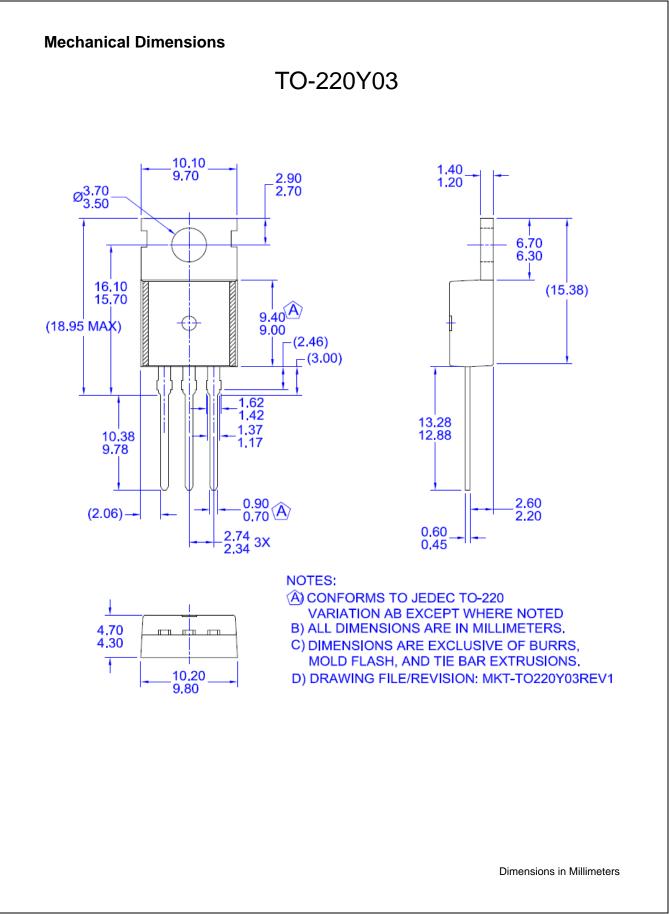
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