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FDD7N60NZ / FDU7N60NZTU N-Channel UniFETTM II MOSFET 600 V, 5.5 A, 1.25 Ω

Features

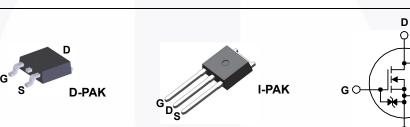
- $R_{DS(on)}$ = 1.05 Ω (Typ.) @ V_{GS} = 10 V, I_D = 2.75 A
- Low Gate Charge (Typ. 13 nC)
- Low C_{rss} (Typ. 7 pF)
- 100% Avalanche Tested
- Improved dv/dt Capability
- · ESD Improved Capability
- RoHS Compliant

Applications

- Lighting
- Uninterruptible Power Supply

Description

UniFETTM II MOSFET is Fairchild Semiconductor's high voltage MOSFET family based on advanced planar stripe and DMOS technology. This advanced MOSFET family has the smallest onstate resistance among the planar MOSFET, and also provides superior switching performance and higher avalanche energy strength. In addition, internal gate-source ESD diode allows UniFETTM II MOSFET to withstand over 2kV HBM surge stress. This device family is suitable for switching power converter applications such as power factor correction (PFC), flat panel display (FPD) TV power, ATX and electronic lamp ballasts.



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

Symbol	Parameter			FDD7N60NZTM/ FDU7N60NZTU	Unit	
V _{DSS}	Drain to Source Voltage	ain to Source Voltage			V	
V _{GSS}	Gate to Source Voltage	Gate to Source Voltage		±25	V	
ID	Drain Current	- Continuous (T _C = 25 ^o C)		5.5	Α	
	Drain Current	- Continuous (T _C = 100 ^o C)		3.3		
I _{DM}	Drain Current	- Pulsed	(Note 1)	22	А	
E _{AS}	Single Pulsed Avalanche Energy (Note 2)		(Note 2)	347	mJ	
I _{AR}	Avalanche Current		(Note 1)	5.5	A	
E _{AR}	Repetitive Avalanche Energy		(Note 1)	12.5	mJ	
dv/dt	Peak Diode Recovery dv/dt (Note 3)		(Note 3)	10	V/ns	
P _D	Power Dissipation	(T _C = 25°C)		90	W	
		- Derate Above 25°C		0.7	W/ºC	
T _J , T _{STG}	Operating and Storage Temperature Range			-55 to +150	°C	
TL	Maximum Lead Temperature for Soldering, 1/8" from Case for 5 Seconds		Seconds	300	°C	

Thermal Characteristics

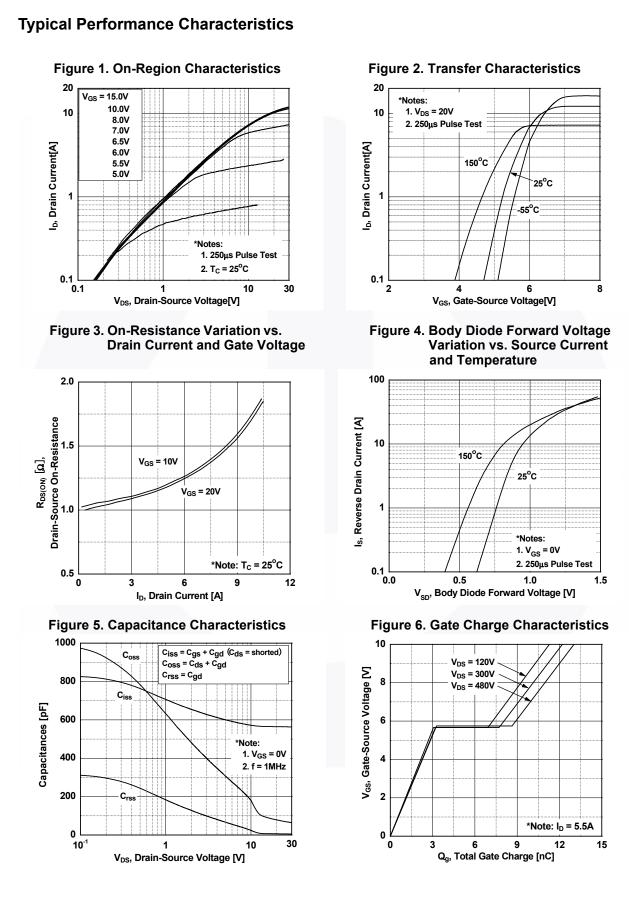
Symbol	Parameter	FDD7N60NZTM/ FDU7N60NZTU	Unit
$R_{\theta JC}$	Thermal Resistance, Junction to Case, Max.	1.4	°C/W
$R_{ extsf{ heta}JA}$	Thermal Resistance, Junction to Ambient, Max. 90		°C/W

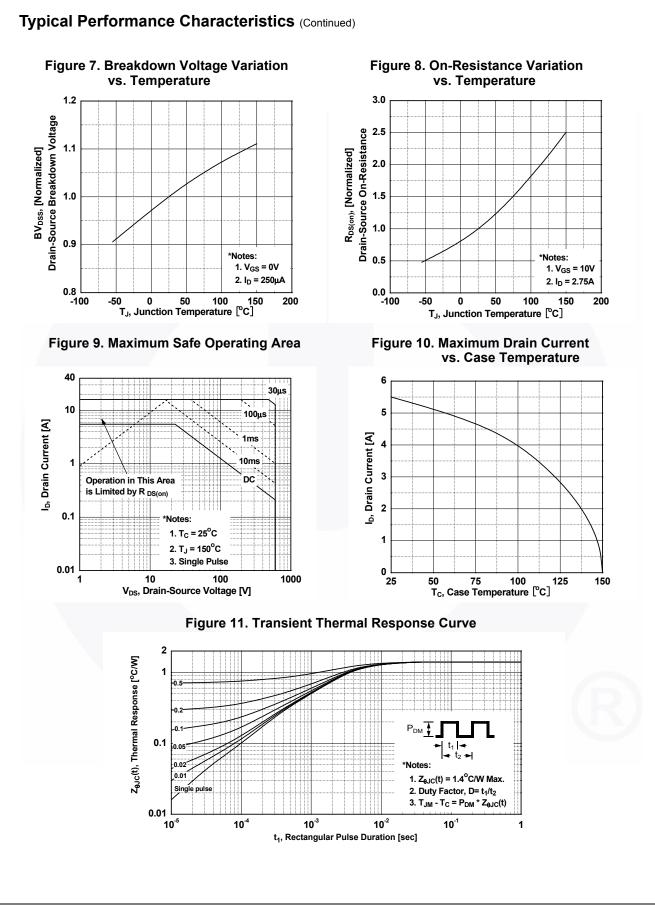
November 2013

Part Number T		Top Mark	Package	Package Packing Method Reel Siz		e T	ape Width	Qu	antity	
FDD7N60NZTM F		FDD7N60NZ	DPAK	Tape and Reel	330 mm			2500 units		
FDU7N60	FDU7N60NZTU FDU7N60NZ		IPAK Tube N/		N/A	N/A		75 units		
Electrica	l Chara	icteristics T _c = 25°C i	unless other	wise noted.						
Symbol		Parameter		Test Condition	S	Min.	Тур.	Max.	Unit	
- Off Charac	teristics				1				1	
BV _{DSS}	Drain to Source Breakdown Voltage		In =	I _D = 250 μA, V _{GS} = 0 V, T _J = 25 ^o C		600	-	-	V	
ABV _{DSS}		wn Voltage Temperature								
$/\Delta T_J$	Coefficie			250 μA, Referenced	to 25°C	-	0.6	-	- V/ºC	
DSS	Zero Gat	o Gate Voltage Drain Current		s = 600 V, V _{GS} = 0 V		-	-	50 μA		
033				s = 480 V, T _C = 125 ^o C		-	-	100		
GSS	Gate to E	Body Leakage Current	V _{GS}	$_{\rm S} = \pm 25 \text{ V}, \text{ V}_{\rm DS} = 0 \text{ V}$		-	-	±10	μA	
On Charac	teristics									
V _{GS(th)}	Gate Thr	eshold Voltage	V _{GS}	_S = V _{DS} , I _D = 250 μA		3.0	-	5.0	V	
R _{DS(on)}	Static Dra	ain to Source On Resistance	e V _{GS}	_S = 10 V, I _D = 2.75 A		-	1.05	1.25	Ω	
9 _{FS}	Forward	Transconductance	V _{DS}	_S = 20 V, I _D = 2.75 A		-	7.3	-	S	
Dynamic C	haracte	ristics								
C _{iss}	Input Cap	pacitance				-	550	730	pF	
C _{oss}	Output C	apacitance		── V _{DS} = 25 V, V _{GS} = 0 V, f = 1 MHz		-	70	90	pF	
C _{rss}	Reverse	Transfer Capacitance	1 -		-	-	7	10	pF	
Q _{g(tot)}	Total Gat	e Charge at 10V	Vpc	_s = 400 V, I _D = 5.5 A,		-	13	17	nC	
Q _{gs}	Gate to S	Source Gate Charge		s = 10 V		-	3	-	nC	
Q _{gd}	Gate to D	Drain "Miller" Charge		(Note 4)		-	5.6	-	nC	
Switching	Characte	eristics								
t _{d(on)}		Delay Time				-	17.5	45	ns	
r		Rise Time	VDD	V_{DD} = 250 V, I _D = 5.5 A, V_{GS} = 10 V, R _G = 25 Ω		-	30	70	ns	
t _{d(off)}		Delay Time				-	40	90	ns	
t _f	Turn-Off	,			(Note 4)	-	25	60	ns	
	rce Diod	e Characteristics					11			
I _s	-	Continuous Drain to Source	e Diode For	ward Current		-	-	5.5	A	
I _{SM}	Maximum Pulsed Drain to Source Diode F					-	-	22	Α	
V _{SD}	Drain to Source Diode Forward Voltage		ge V _G s	$V_{GS} = 0 V, I_{SD} = 5.5 A$		-	-	1.4	V	
	Reverse I	Recovery Time	$V_{GS} = 0 V, I_{SD} = 5.5 A,$ dI _F /dt = 100 A/µs		-	250		ns		
t _{rr}		Recovery Charge			-	1.4	-	μC		

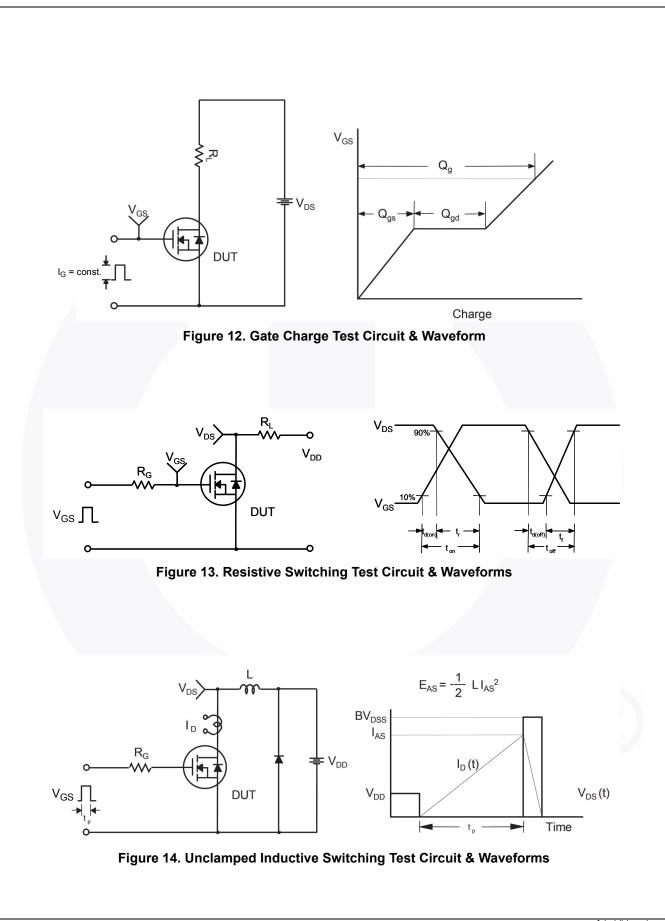
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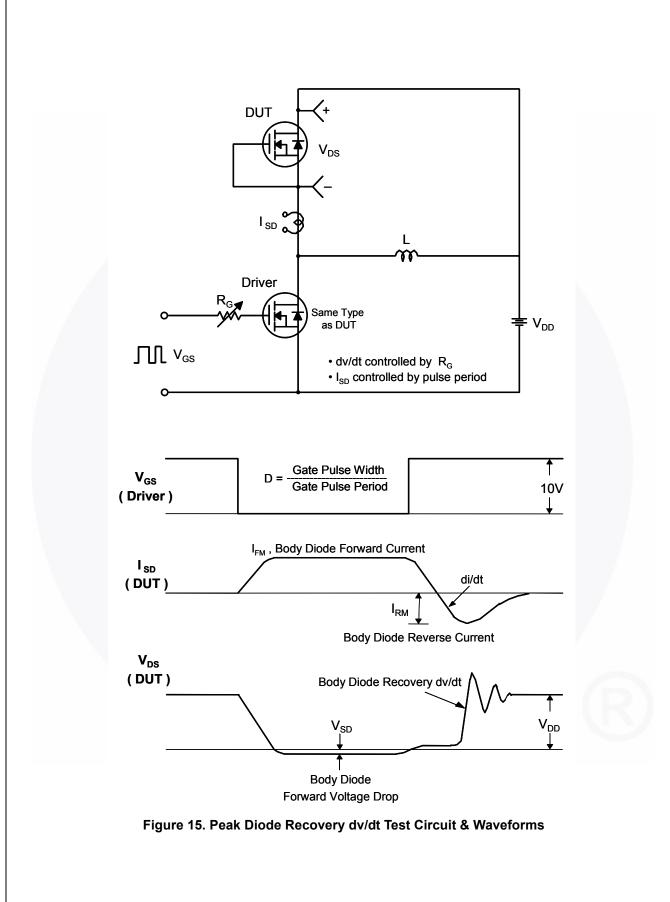


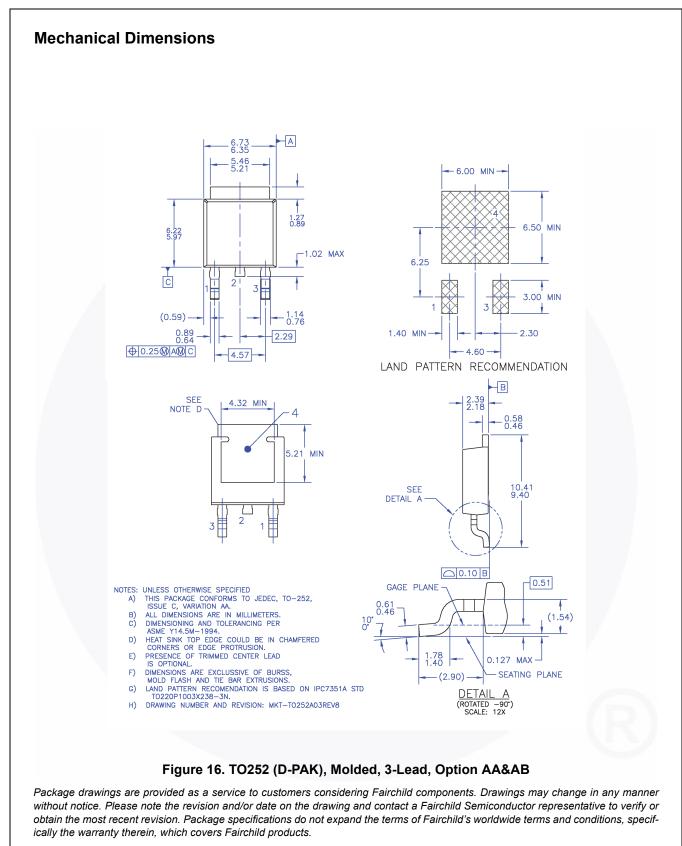




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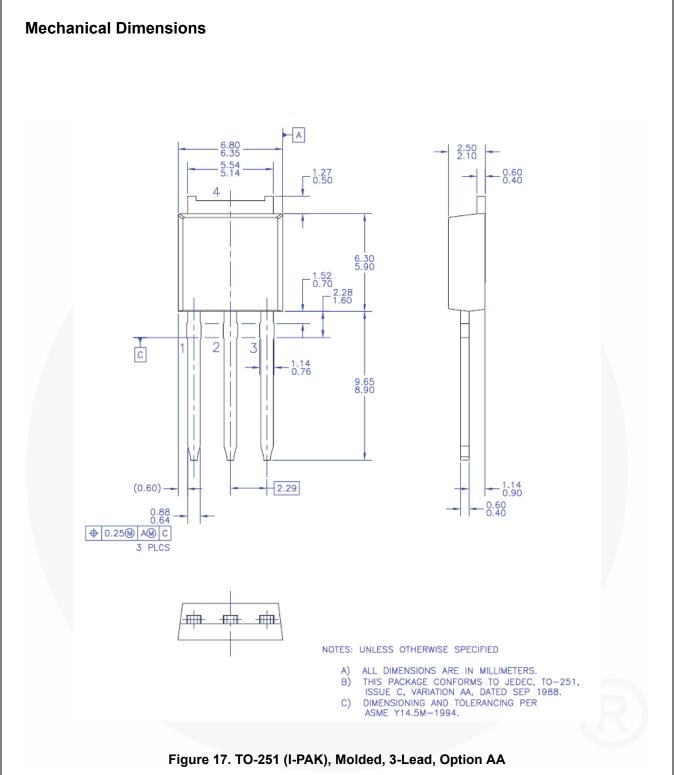




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FDD7N60NZ / FDU7N60NZTU — N-Channel UniFETTM II MOSFET



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F-PES™

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