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FDP10N60NZ / FDPF10N60NZ N-Channel UniFETTM II MOSFET 600 V, 10 A, 750 mΩ

Features

- R_{DS(on)} = 640 mΩ (Typ.) @ V_{GS} = 10 V, I_D = 5 A
- Low Gate Charge (Typ. 23 nC)
- Low C_{rss} (Typ. 10 pF)
- · 100% Avalanche Tested
- · Improved dv/dt Capability
- · ESD Improved Capability
- RoHS Compliant

Applications

- LCD/ LED/ PDP TV
- Lighting
- Uninterruptible Power Supply

Description

TO-220F

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 on-state resistance among the planar MOSFET, and also provides superior switching performance and higher avalanche energy strength. In addition, internal gate-source ESD diode allows UniFET 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.

November 2013



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

TO-220

Symbol	Parameter		FDP10N60NZ	FDPF10N60NZ	Unit	
V _{DSS}	Drain to Source Voltage			6	V	
V _{GSS}	Gate to Source Voltage		±	V		
I _D	Drain Current	- Continuous (T _C = 25 ^o C)		10	10 10*	
	Drain Current	- Continuous (T _C = 100 ^o C)		6	6*	A
I _{DM}	Drain Current	- Pulsed (Note 1)		40	40 40*	
E _{AS}	Single Pulsed Avalanche Energy (Note 2)		5	mJ		
I _{AR}	Avalanche Current		(Note 1)	10		А
E _{AR}	Repetitive Avalanche Energy		(Note 1)	18.5		mJ
dv/dt	Peak Diode Recovery dv/dt		(Note 3)	10		V/ns
P _D	Devuer Discipation	$(T_{\rm C} = 25^{\rm o}{\rm C})$		185	38	W
	Power Dissipation	- Derate Above 25°C		1.5	0.3	W/ºC
T _J , T _{STG}	Operating and Storage Temperature Range		-55 to	°C		
TL	Maximum Lead Temperature for Soldering, 1/8" from Case for 5 Seconds 300			00	°C	

GDS

Dran current limited by maximum junction temperature.

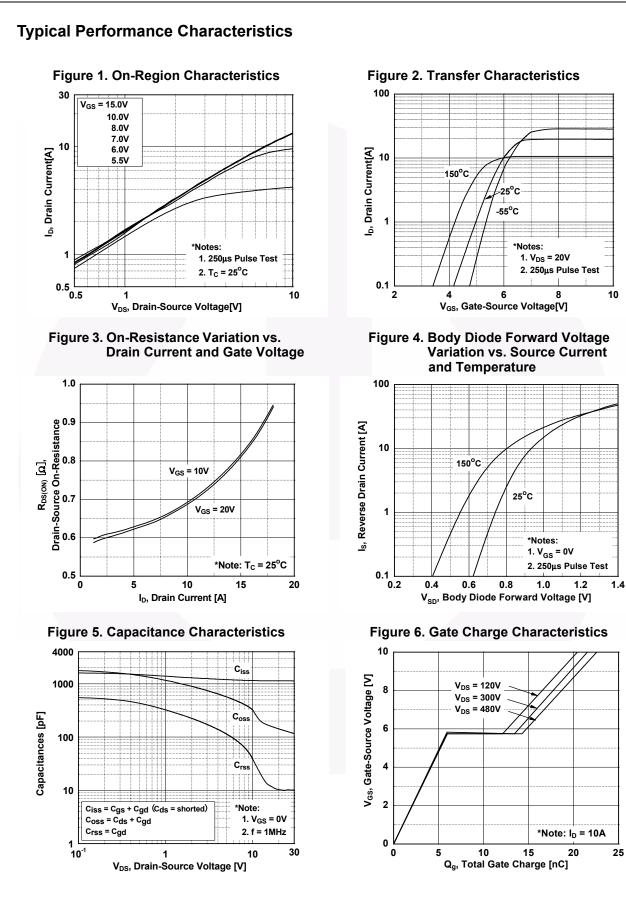
Thermal Characteristics

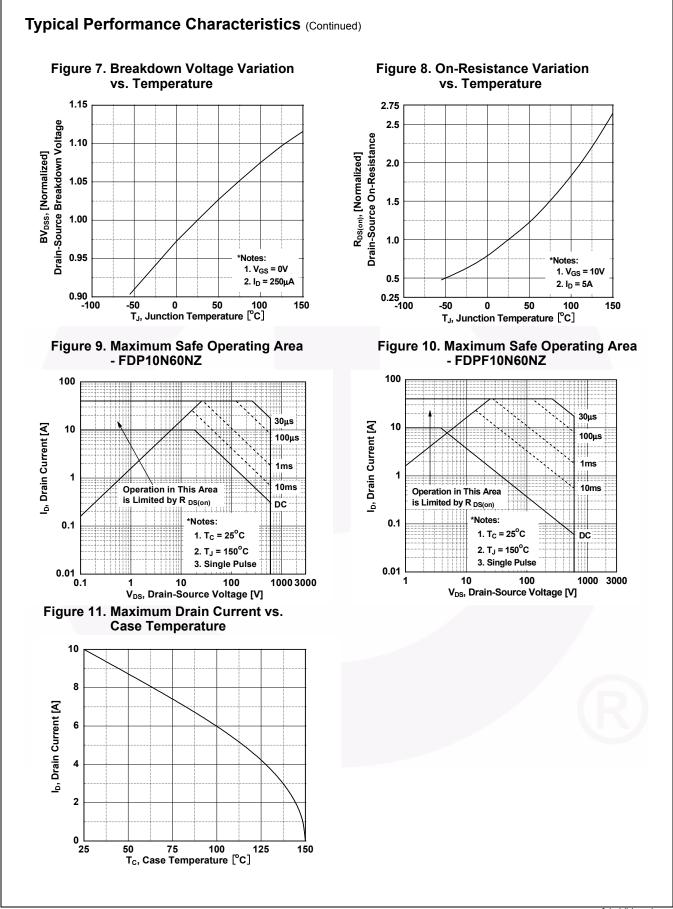
Symbol	Parameter	FDP10N60NZ	FDPF10N60NZ	Unit
$R_{ extsf{ heta}JC}$	Thermal Resistance, Junction to Case, Max.	0.68	3.3	°C/W
$R_{ extsf{ heta}JA}$	Thermal Resistance, Junction to Ambient, Max.	62.5	62.5	°C/W

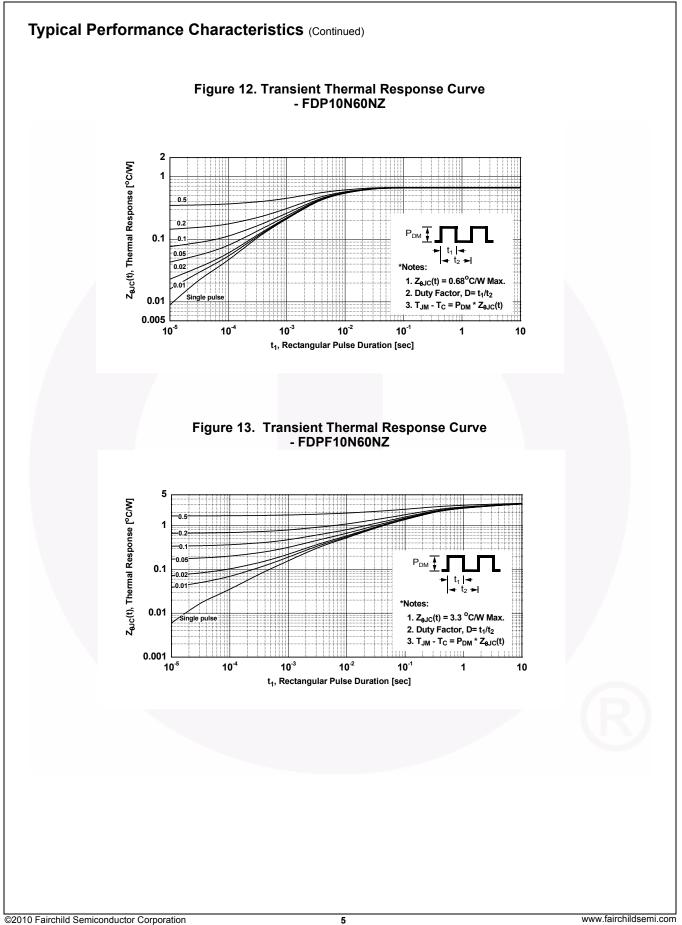
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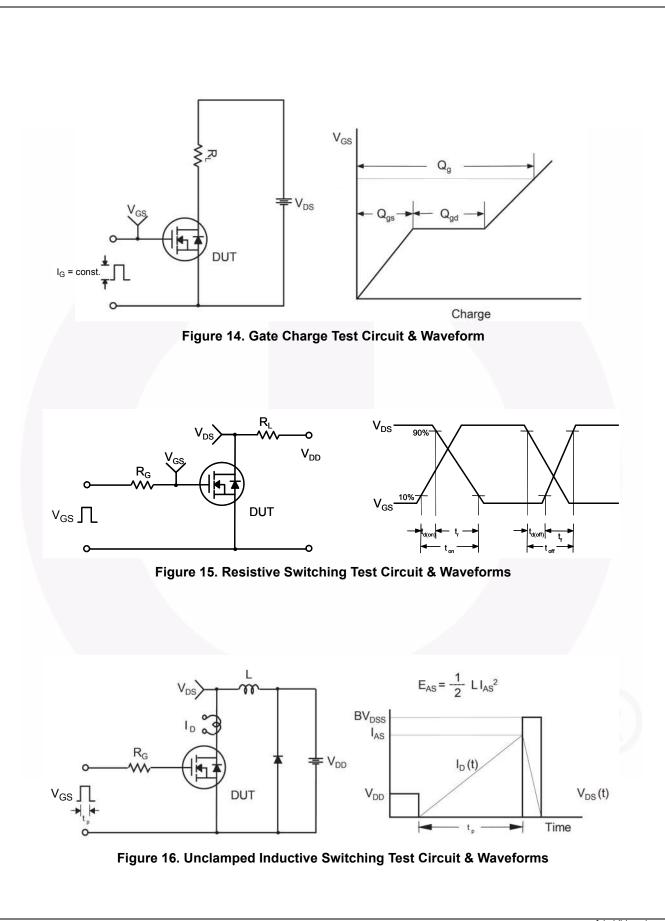
FDP10N60NZ FDP10N60NZ		Package	Package Packing Method Reel Size		e T	ape Width	Qu	antity	
		TO-220	Tube	N/A		N/A	50	50 units	
		TO-220F Tube N/A		N/A	N/A		50 units		
Electrica	l Chara	acteristics T _c = 25°C	unless othe	erwise noted.					
Symbol		Parameter		Test Conditi	ons	Min.	Тур.	Max.	Unit
Off Charac	teristics	6							1
BV _{DSS}	Drain to	Source Breakdown Voltage	١n	= 250 μA, V _{GS} = 0 V	′, T ₁ = 25 ^o C	600	-	-	V
ΔBV _{DSS} /ΔTJ	Breakdo	wn Voltage Temperature		$I_D = 250 \ \mu$ A, Referenced to 25° C			0.6	-	V/ºC
	7	ha Valtaga Drain Currant	VD	_S = 600 V, V _{GS} = 0 V	V	-	-	1	
I _{DSS}	Zero Gat	te Voltage Drain Current	V _D	_S = 480 V, T _C = 125	°C	-	-	10	μA
I _{GSS}	Gate to E	Body Leakage Current	VG	$_{\rm S}$ = ±25 V, V _{DS} = 0 V	V	-	-	±10	μA
On Charac	teristics	•							
V _{GS(th)}	Gate Th	reshold Voltage	Vo	_{SS} = V _{DS} , I _D = 250 μ.	A	3.0	-	5.0	V
R _{DS(on)}	Static Dr	ain to Source On Resistanc		_S = 10 V, I _D = 5 A		-	0.64	0.75	Ω
9 _{FS}	Forward	Transconductance	V	_{os} = 20 V, I _D = 5 A		-	14	-	S
Dynamic C	haracte	ristics							
C _{iss}	Input Ca	pacitance				-	1110	1475	pF
C _{oss}		apacitance		V _{DS} = 25 V, V _{GS} = 0 V, f = 1 MHz		-	130	175	pF
C _{rss}	Reverse	Transfer Capacitance				-	10	15	pF
Qg	Total Gat	te Charge at 10V	V	$V_{DS} = 480 \text{ V}, \text{ I}_{D} = 10 \text{ A},$ $V_{GS} = 10 \text{ V}$ (Note 4)		-	23	30	nC
Q _{gs}	Gate to S	Source Gate Charge				-	6	-	nC
Q _{gd}	Gate to I	Drain "Miller" Charge				-	8	-	nC
Switching	Charact	eristics							
t _{d(on)}	-	Delay Time	V	- 200 \/ - 10 A		-	25	60	ns
t _r		Rise Time		$V_{DD} = 300 \text{ V}, \text{ I}_{D} = 10 \text{ A},$ $V_{GS} = 10 \text{ V}, \text{ R}_{G} = 25 \text{ W}$ (Note 4)		-	50	110	ns
t _{d(off)}	Turn-Off	Delay Time				-	70	150	ns
t _f	Turn-Off	Fall Time				-	50	110	ns
Drain-Sou	rce Diod	e Characteristics	L				<u> </u>		
I _S		n Continuous Drain to Sourc	e Diode Fo	rward Current		-	-	10	Α
I _{SM}	Maximum Pulsed Drain to Source Dio						_	40	A
V _{SD}	Drain to Source Diode Forward Voltag						-	1.4	V
t _{rr}		Recovery Time	$V_{GS} = 0 V, I_{SD} = 10 A$ $V_{GS} = 0 V, I_{SD} = 10 A,$		-	300	-	ns	
Q _{rr}		Recovery Charge		$dt = 100 \text{ A/}\mu\text{s}$	-	-	2.0		μC
lotes:		, ,							





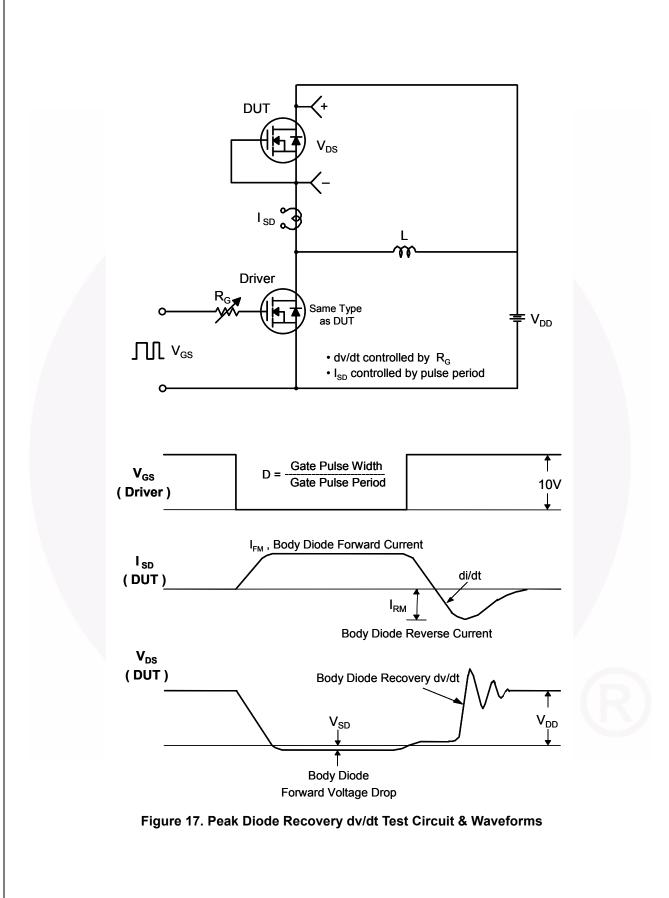


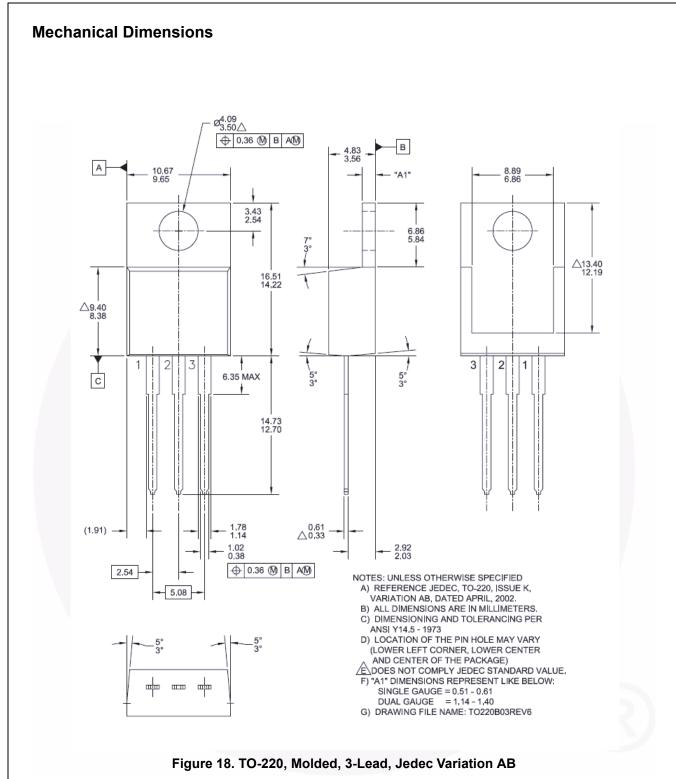




FDP10N60NZ / FDPF10N60NZ — N-Channel UniFETTM II MOSFET

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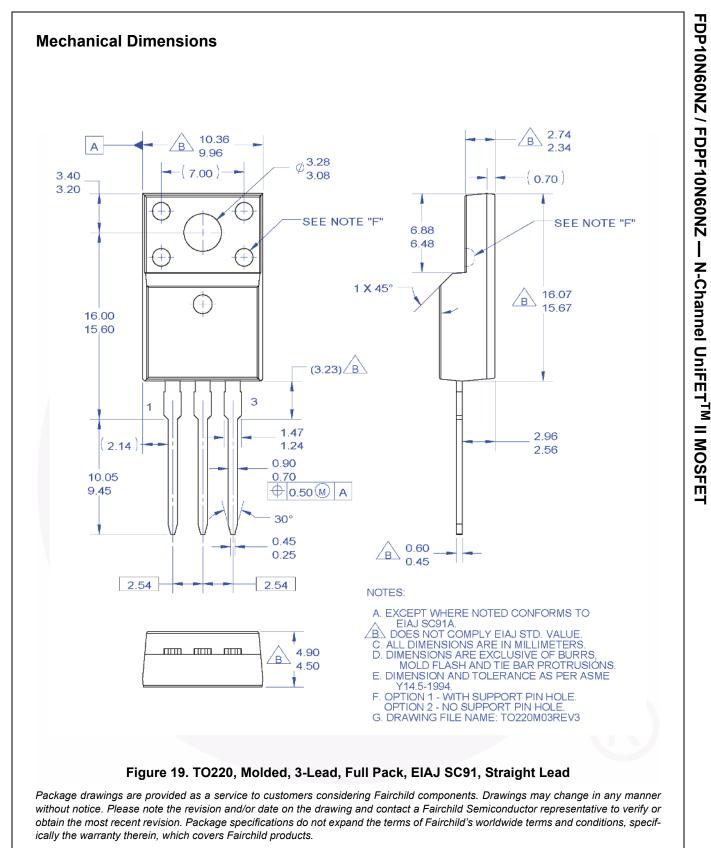


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