

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

Features

- $R_{DS(on)}$ = 640 m Ω (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.



D

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			
ID	Dasia Guarant	- Continuous (T _C = 25 ^o C)		10	10*	A	
	Drain Current	- Continuous (T _C = 100 ^o C)		6	6*		
I _{DM}	Drain Current	- Pulsed (Note 1)		40 40*		А	
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	Dower Dissinction	(T _C = 25 ^o 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		
ΓL	Maximum Lead Temperature for Soldering, 1/8" from Case for 5 Seconds			3	°C		

GDS

*Dran current limited by maximum junction temperature.

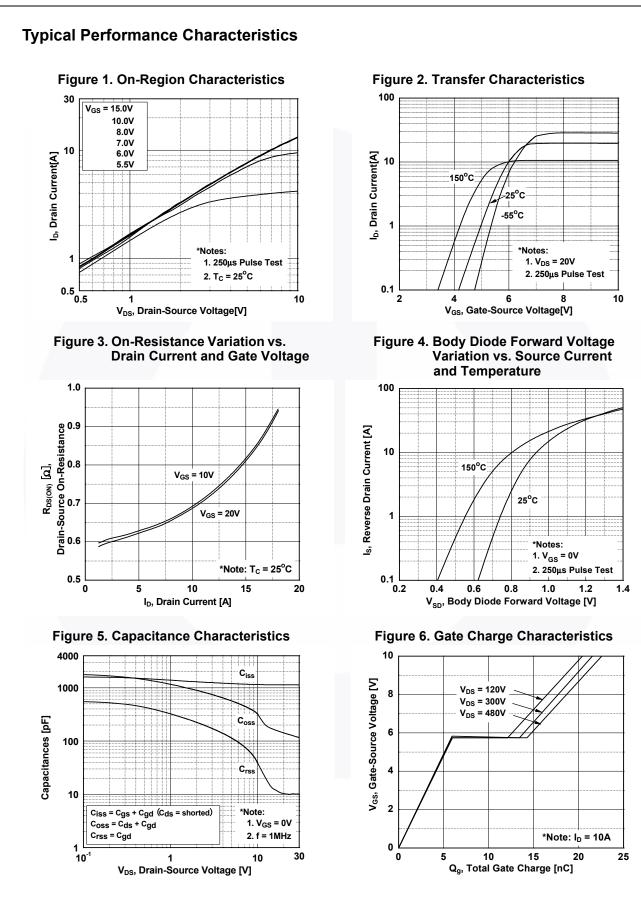
Thermal Characteristics

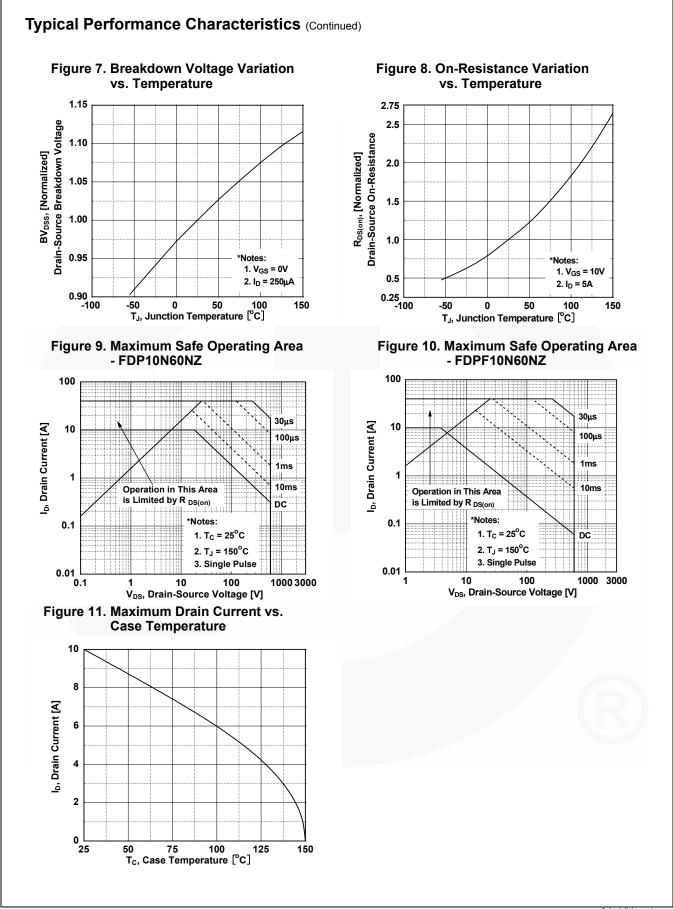
Symbol	Parameter	FDP10N60NZ	FDPF10N60NZ	Unit	
$R_{ extsf{ heta}JC}$	Thermal Resistance, Junction to Case, Max.	0.68	3.3	°C/W	
R_{\thetaJA}	Thermal Resistance, Junction to Ambient, Max.	ce, Junction to Ambient, Max. 62.5 62.5		0/11	

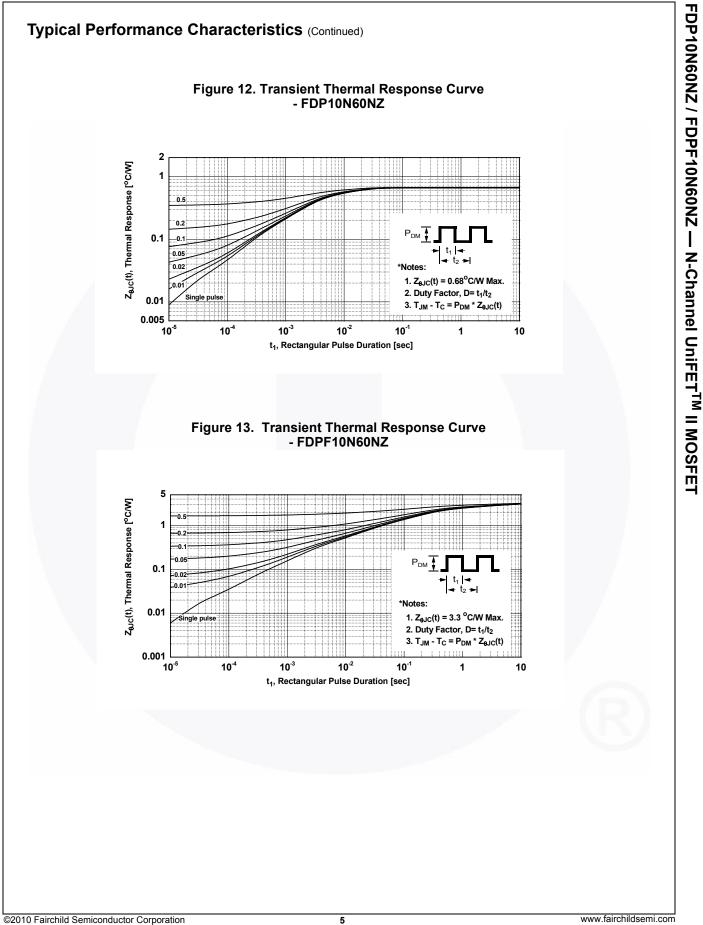
FDP10N60NZ FDP10N60NZ		Package	Package Packing Method Reel Size		e Tape Width		Qu	Quantity	
		FDP10N60NZ	TO-220	Tube	N/A		N/A	50	units
		TO-220F	TO-220F Tube N/A		N/A		50 units		
Electrica	l Chara	cteristics T _c = 25°C	c unless oth	erwise noted.					
Symbol				Test Conditions			Тур.	Max.	Unit
Off Charac	teristics						, ,, ,,		
BV _{DSS}		Source Breakdown Voltage	e In	, = 250 μΑ, V _{GS} = 0 V, T	_ = 25°C	600	-	-	V
ΔΒV _{DSS} /ΔTJ	Breakdown Voltage Temperature Coefficient			$I_D = 250 \ \mu\text{A}$, Referenced to 25°C			0.6	-	V/°C
	Zero Gat	Zero Gate Voltage Drain Current		V _{DS} = 600 V, V _{GS} = 0 V		-	-	1	μA
DSS	2010 040			_{DS} = 480 V, T _C = 125 ^o C		-	-	10	μΑ
GSS	Gate to E	Body Leakage Current	V	_{GS} = ±25 V, V _{DS} = 0 V	_	-	-	±10	μA
On Charac	teristics								
V _{GS(th)}	Gate Threshold Voltage		V	V _{GS} = V _{DS} , I _D = 250 μA			-	5.0	V
R _{DS(on)}	Static Drain to Source On Resistance			V _{GS} = 10 V, I _D = 5 A			0.64	0.75	Ω
9 _{FS}	Forward Transconductance		V	V _{DS} = 20 V, I _D = 5 A			14	-	S
Dynamic C	haracter	ristics							
C _{iss}	Input Cap	pacitance				-	1110	1475	pF
C _{oss}	Output Capacitance			─ V _{DS} = 25 V, V _{GS} = 0 V, f = 1 MHz		-	130	175	pF
C _{rss}	Reverse	Transfer Capacitance	1	f = 1 MHz		-	10	15	pF
Qg	Total Gate Charge at 10V		V	V _{DS} = 480 V, I _D = 10 A,			23	30	nC
Q _{gs}	Gate to S	Source Gate Charge	V	V _{GS} = 10 V		-	6	-	nC
Q _{gd}	Gate to Drain "Miller" Charge			(Note 4)			8	-	nC
Switching	Characte	eristics							
t _{d(on)}		Delay Time	V	V _{DD} = 300 V, I _D = 10 A,		-	25	60	ns
t _r	Turn-On Rise Time		V	$V_{GS} = 10 \text{ V}, \text{ R}_{G} = 25 \text{ W}$			50	110	ns
t _{d(off)}	Turn-Off I	Delay Time				-	70	150	ns
t _f	Turn-Off Fall Time			(Note 4)		-	50	110	ns
Drain-Sou	rce Diode	e Characteristics			¥				
I _S	1	Continuous Drain to Sour	rce Diode F	orward Current		-	-	10	Α
I _{SM}	Maximum Pulsed Drain to Source Diode			Forward Current			-	40	Α
V _{SD}	Drain to Source Diode Forward Voltage		age V	V _{GS} = 0 V, I _{SD} = 10 A			-	1.4	V
t _{rr}	Reverse F	Recovery Time	V	_{GS} = 0 V, I _{SD} = 10 A,		-	300		ns
Q _{rr}	Reverse F	Recovery Charge		$dI_{\rm F}/dt = 100 A/\mu s$		-	2.0	-	μC

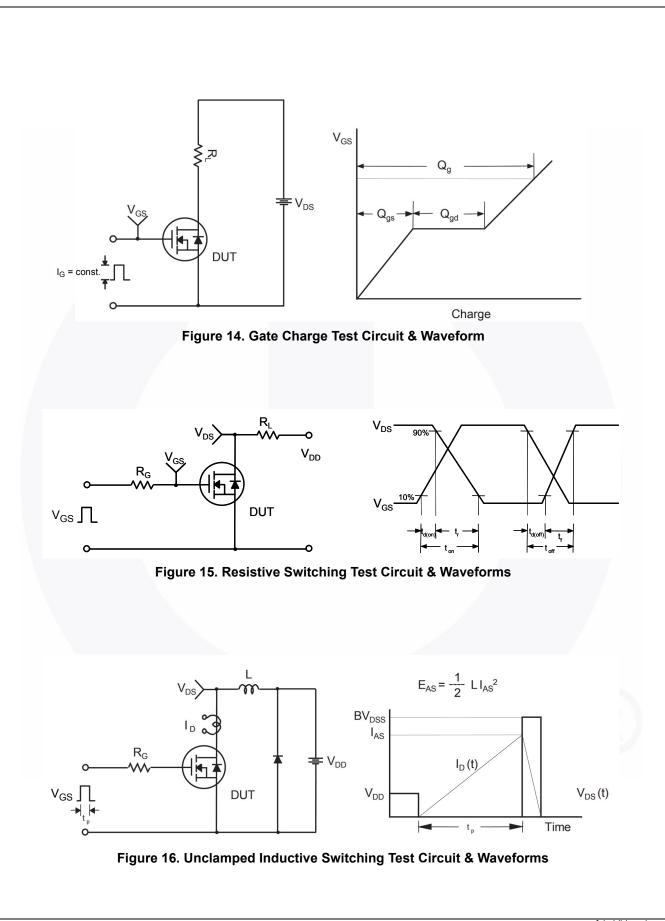
4. Essentially independent of operating temperature typical characteristics.

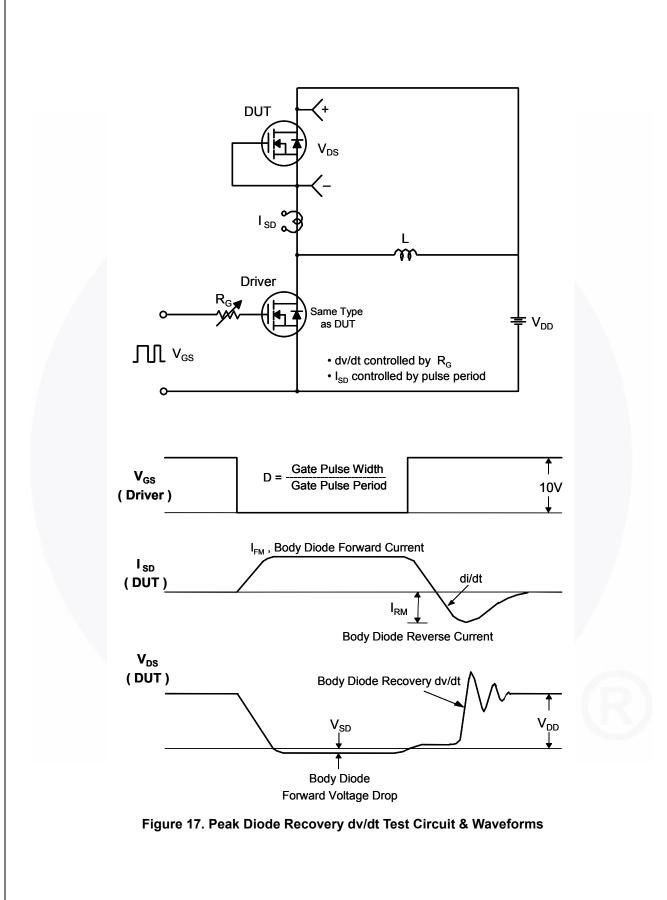


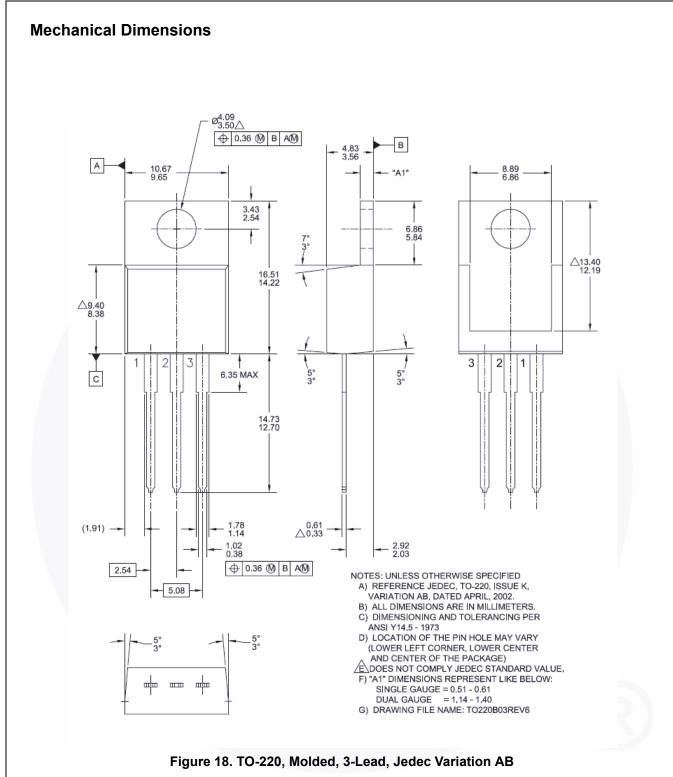










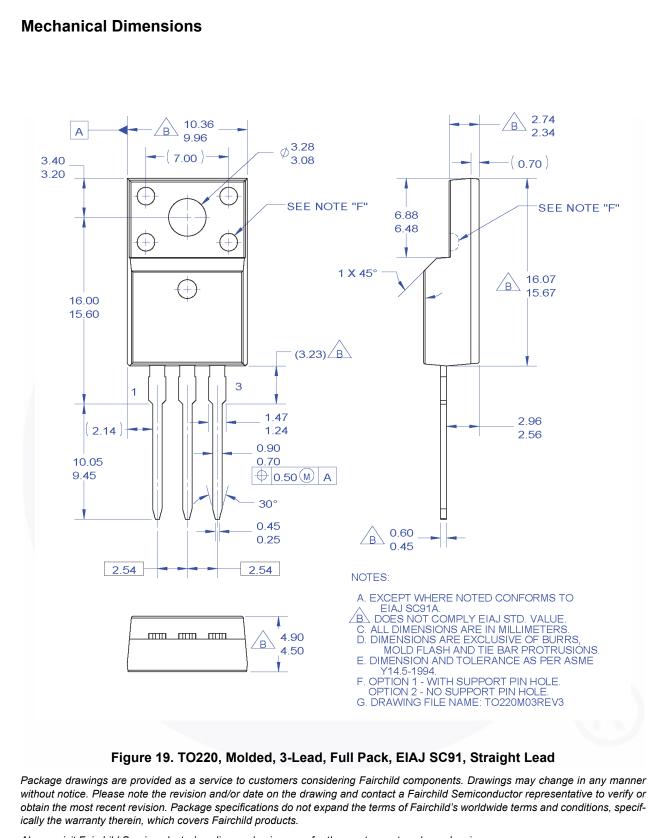


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N-Channel UniFETTM II MOSFET



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