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FDP61N20 N-Channel UniFETTM MOSFET 200 V, 61 A, 41 mΩ

Features

- $R_{DS(on)}$ = 34 m Ω (Typ.) @ V_{GS} = 10 V, I_D = 30.5 A
- Low Gate Charge (Typ. 58 nC)
- Low C_{rss} (Typ. 80 pF)
- 100% Avalanche Tested

Applications

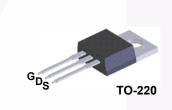
- PDP TV
- Lighting
- Uninterruptible Power Supply
- AC-DC Power Supply

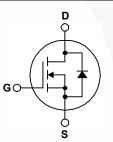
November 2013



Description

UniFETTM MOSFET is Fairchild Semiconductor's high voltage MOSFET family based on planar stripe and DMOS technology. This MOSFET is tailored to reduce on-state resistance, and to provide better switching performance and higher avalanche energy strength. 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.





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

Symbol	Parameter			FDP61N20	Unit
V _{DSS}	Drain-Source Voltage			200	V
ID	Drain Current - Continuous ($T_C = 25^{\circ}C$) - Continuous ($T_C = 100^{\circ}C$)			61 38.5	A A
I _{DM}	Drain Current	- Pulsed	(Note 1)	244	А
V _{GSS}	Gate-Source voltage			±30	V
E _{AS}	Single Pulsed Avalanche Energy (Note 2)		(Note 2)	1440	mJ
I _{AR}	Avalanche Current		(Note 1)	61	А
E _{AR}	Repetitive Avalanche Energy (Note 1)		(Note 1)	41.7	mJ
dv/dt	Peak Diode Recovery dv/dt (Note 3)		(Note 3)	4.5	V/ns
P _D	Power Dissipation	(T _C = 25°C) - Derate Above 25°C		417 3.3	W W/°C
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	FDP61N20	Unit
$R_{ extsf{ heta}JC}$	Thermal Resistance, Junction-to-Case, Max.	0.3	°C/W
$R_{ extsf{ heta}JA}$	Thermal Resistance, Junction-to-Ambient, Max.	62.5	0/00

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Part NumberTop MarkFDP61N20FDP61N20		Top Mark	Package	Package Packing Method Re		ze	Tape Wid	th Q	Quantity
		TO-220 Tube N/A		N/A			50 units		
Electric	al Chara	acteristics T _C = 25°C	cunless othe	rwise noted.					
Symbol		Parameter		Conditions		Min.	Тур.	Max.	Unit
Off Charac	teristics								
BV _{DSS}	Drain-Source Breakdown Voltage		V _{GS} = 0 \	V _{GS} = 0 V, I _D = 250 μA		200			V
ΔBV_{DSS} / ΔT_{J}	Breakdown Voltage Temperature Coefficient		I _D = 250 μ	$I_D = 250 \ \mu\text{A}$, Referenced to 25°C			0.2		V/°C
I _{DSS}	Zero Gate Voltage Drain Current		V _{DS} = 200 V _{DS} = 160	$V_{DS} = 200 V, V_{GS} = 0 V$ $V_{DS} = 160 V, T_{C} = 125^{\circ}C$				1 10	μΑ μΑ
I _{GSSF}	Gate-Body	Leakage Current, Forward	V _{GS} = 30	V, V _{DS} = 0 V				100	nA
I _{GSSR}	Gate-Body	Leakage Current, Reverse	V _{GS} = -30) V, V _{DS} = 0 V				-100	nA
On Charac	teristics								
V _{GS(th)}	Gate Threshold Voltage		$V_{DS} = V_{G}$	_S , I _D = 250 μA		3.0		5.0	V
R _{DS(on)}		Static Drain-Source On-Resistance		V, I _D = 30.5 A			0.034	0.041	Ω
9 _{FS}	Forward Tr	ward Transconductance		V, I _D = 30.5 A			44.5		S
Dynamic O	haracteristi	cs							
C _{iss}	Input Capa	t Capacitance		V _{DS} = 25 V, V _{GS} = 0 V,			2615	3380	pF
C _{oss}	Output Cap	bacitance	f = 1 MHz	f = 1 MHz			645	840	pF
C _{rss}	Reverse Tr	ansfer Capacitance					80	120	pF
Switching	Characteris	tics							
t _{d(on)}	Turn-On De	elay Time	V _{DD} = 100 V, I _D = 61 A,				40	90	ns
t _r	Turn-On Ri	se Time	V _{GS} = 10	V, R _G = 25 Ω			215	440	ns
t _{d(off)}	Turn-Off De	elay Time					125	260	ns
t _f	Turn-Off Fa	all Time			(Note 4)		170	350	ns
Qg	Total Gate	Charge		0 V, I _D = 61 A,			58	75	nC
Q _{gs}	Gate-Source	ce Charge	V _{GS} = 10	V			19		nC
Q _{gd}	Gate-Drain	Charge	(Note 4)			24		nC	
Drain-Sou	rce Diode C	haracteristics and Maximu	m Ratings						
I _S	Maximum Continuous Drain-Source Dio			Current				61	А
I _{SM}	Maximum Pulsed Drain-Source Diode F		Forward Cur	rent				244	А
V_{SD}	Drain-Sour	ce Diode Forward Voltage	V _{GS} = 0 \	/, I _S = 61 A				1.4	V
t _{rr}	Reverse R	ecovery Time		/, I _S = 61 A,			162		ns
Q _{rr}	Reverse R	ecovery Charge	dl _F /dt =10	00 A/μs			1.5		μC

Notes:

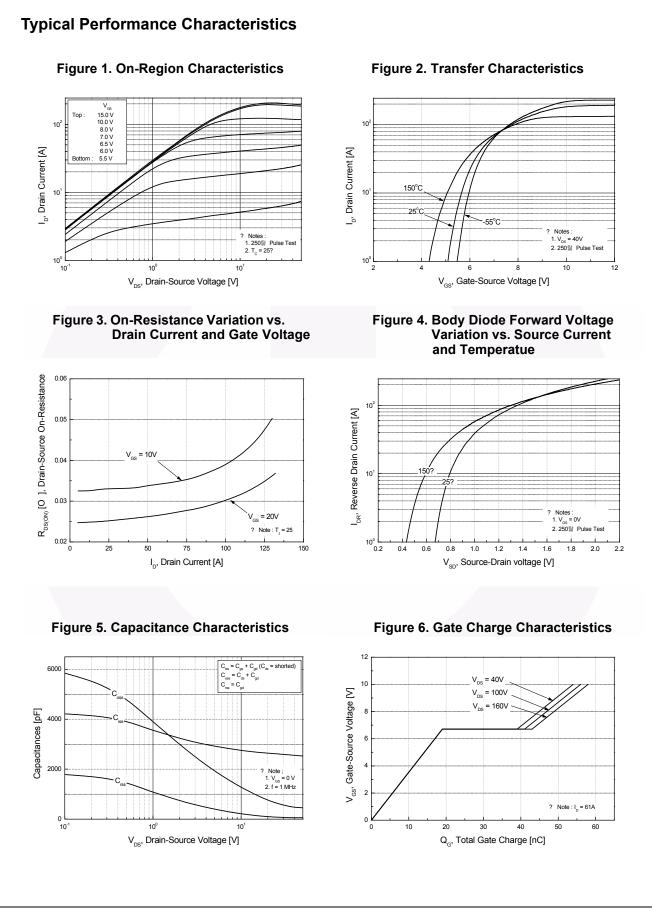
1. Repetitive rating: pulse-width limited by maximum junction temperature.

2. L = 0.58 mH, I_{AS} = 61 A, V_{DD} = 50 V, R_G = 25 Ω , starting T_J = 25°C.

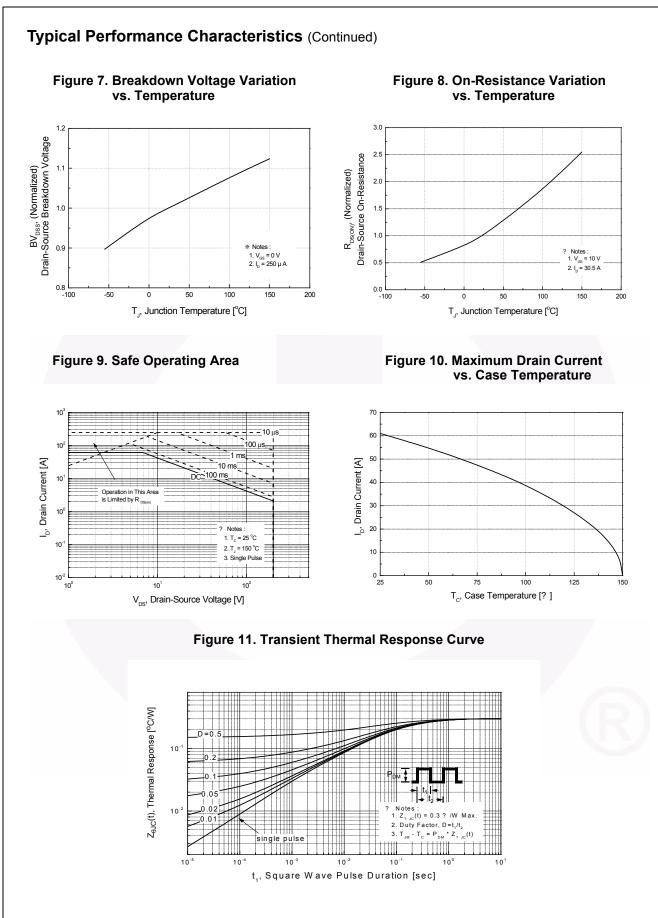
3. I_{SD} \leq 61 A, di/dt \leq 200 A/µs, V_{DD} \leq BV_{DSS}, starting T_J = 25°C.

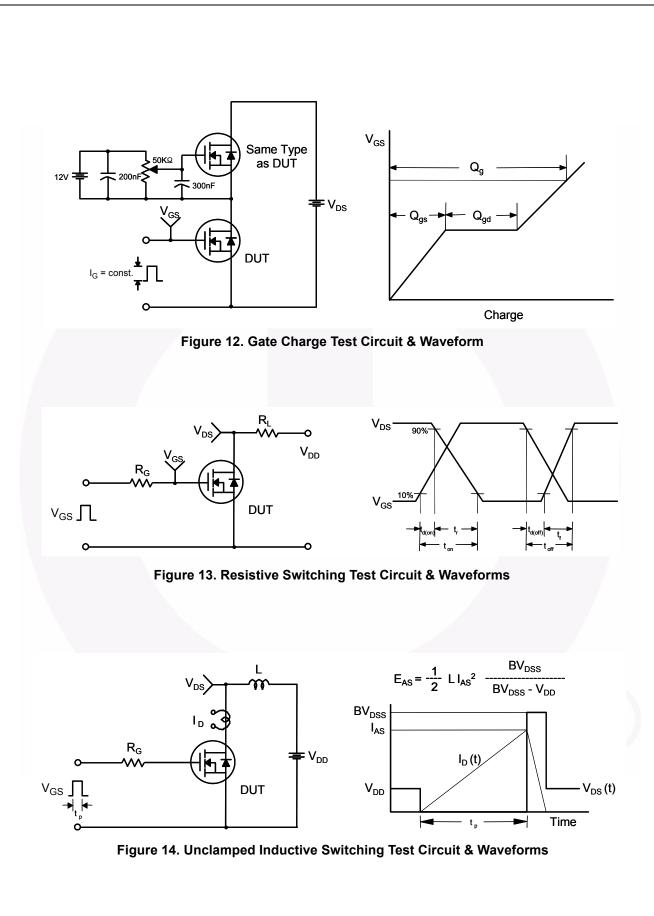
4. Essentially independent of operating temperature typical characteristics.

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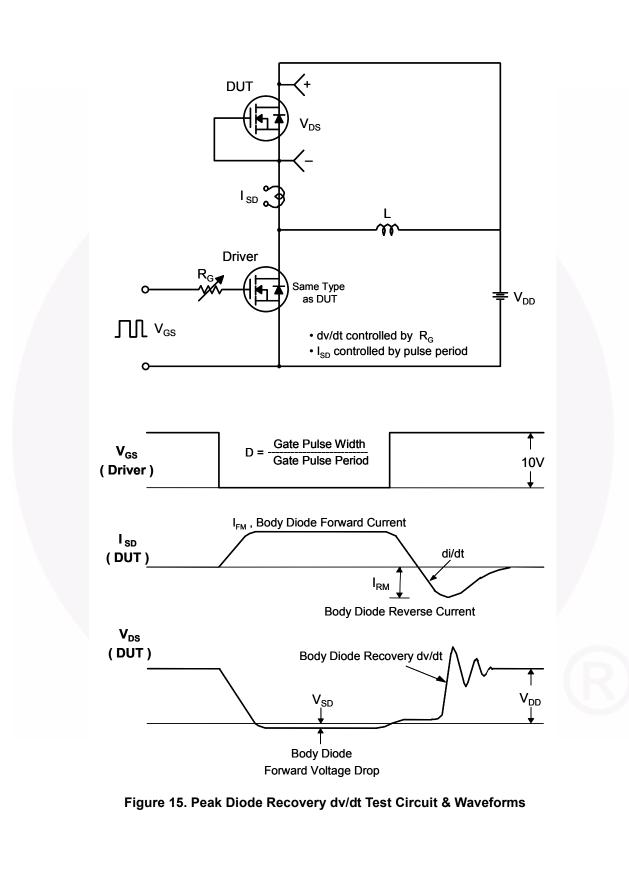
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FDP61N20 — N-Channel UniFETTM MOSFET

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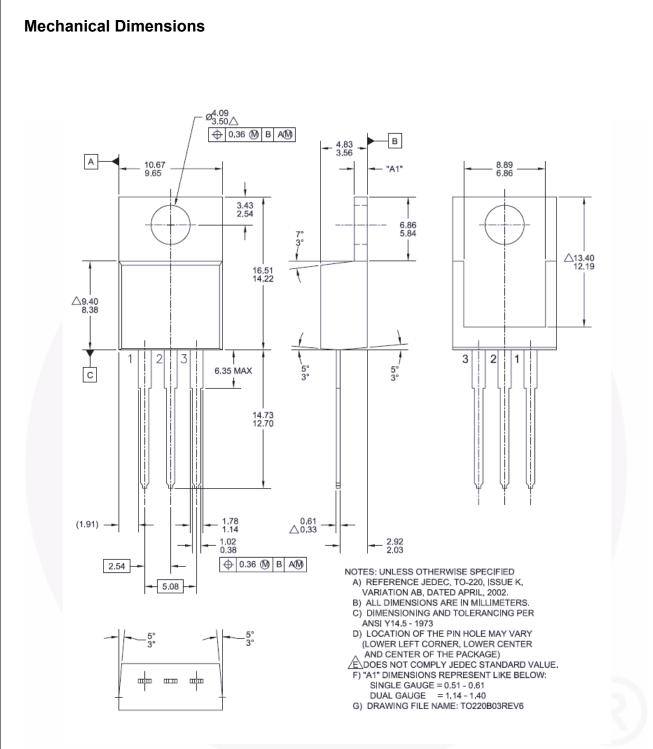


Figure 16. TO-220, Molded, 3-Lead, Jedec Variation AB

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