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FDP65N06

N-Channel UniFET[™] MOSFET 60 V, 65 A, 16 mΩ

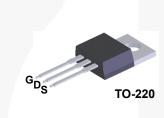
Features

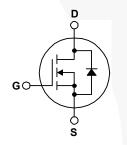
- $R_{DS(on)}$ = 13 m Ω (Typ.) @ V_{GS} = 10 V, I_D = 32.5 A
- Low Gate Charge (typical 33 nC)
- Low Crss (typical 35 pF)
- Fast Switching
- Improved dv/dt Capability



Description

UniFET[™] 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		FDP65N06	Units
V _{DSS}	Drain-Source Voltage		60	V
I _D	Drain Current - Continuous ($T_C = 25^{\circ}C$)		65	А
	- Continuous (T _C = 100°C)		41	А
I _{DM}	Drain Current - Pulsed	(Note 1)	260	А
V _{GSS}	Gate-Source Voltage		± 20	V
E _{AS}	Single Pulsed Avalanche Energy	(Note 2)	430	mJ
I _{AR}	Avalanche Current	(Note 1)	65	А
E _{AR}	Repetitive Avalanche Energy	(Note 1)	13.5	mJ
dv/dt	Peak Diode Recovery dv/dt	(Note 3)	4.5	V/ns
P _D	Power Dissipation (T _C = 25°C) - Derate above 25°C		135	W
			1.08	W/°C
T _J , T _{STG}	Operating and Storage Temperature Range		-55 to +150	°C
Τ _L	Maximum Lead Temperature for Soldering, 1/8" from Case for 5 Seconds		300	°C

Thermal Characteristics

Symbol	Parameter	FDP65N06	Units
$R_{ ext{ heta}JC}$	Thermal Resistance, Junction-to-Case, Max.	0.92	°C/W
$R_{ ext{ heta}JA}$	Thermal Resistance, Junction-to-Ambient, Max.	62.5	°C/W

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FDP65N06 -
 N-Channel
UniFET TM
MOSFET

Package Marking and Ordering Information

Device Marking	Device	Package	Reel Size	Tape Width	Quantity
FDP65N06	FDP65N06	TO-220	Tube	N/A	50 units

Electrical Characteristics T_c = 25°C unless otherwise noted.

Symbol	Parameter	Test Conditions	Min	Тур	Max	Units
Off Charac	teristics			1	1	1
BV _{DSS}	Drain-Source Breakdown Voltage	$V_{GS} = 0 V, I_D = 250 \mu A$	60	-	-	V
ΔBV_{DSS} / ΔT_J	Breakdown Voltage Temperature Coefficient	$I_D = 250 \ \mu$ A, Referenced to 25°C	-	0.5	-	V/°C
I _{DSS}	Zero Gate Voltage Drain Current	$V_{DS} = 60 \text{ V}, V_{GS} = 0 \text{ V}$	-	-	1	μA
		$V_{DS} = 48 \text{ V}, \text{ T}_{C} = 125^{\circ}\text{C}$	-	-	10	μA
I _{GSSF}	Gate-Body Leakage Current, Forward	$V_{GS} = 20 \text{ V}, V_{DS} = 0 \text{ V}$	-	-	100	nA
I _{GSSR}	Gate-Body Leakage Current, Reverse	$V_{GS} = -20 \text{ V}, V_{DS} = 0 \text{ V}$	-	-	-100	nA
On Charact	teristics					
V _{GS(th)}	Gate Threshold Voltage	$V_{DS} = V_{GS}, I_D = 250 \ \mu A$	2.0	-	4.0	V
R _{DS(on)}	Static Drain-Source On-Resistance	V _{GS} = 10 V, I _D = 32.5 A	-	0.013	0.016	Ω
9 _{FS}	Forward Transconductance	V _{DS} = 40 V, I _D = 32.5 A		39	-	S
Dynamic Cl	haracteristics					
C _{iss}	Input Capacitance	$V_{DS} = 25 \text{ V}, V_{GS} = 0 \text{ V},$	-	1670	2170	pF
C _{oss}	Output Capacitance	f = 1.0 MHz	-	464	600	pF
C _{rss}	Reverse Transfer Capacitance		-	35	52	pF
Switching C	Characteristics					
t _{d(on)}	Turn-On Delay Time	$V_{DD} = 30 \text{ V}, \text{ I}_{D} = 65 \text{ A},$	-	24	58	ns
t _r	Turn-On Rise Time	$R_{G} = 25 \Omega$	-	94	200	ns
t _{d(off)}	Turn-Off Delay Time		-	98	210	ns
t _f	Turn-Off Fall Time	(Note 4)	-	52	114	ns
Qg	Total Gate Charge	V _{DS} = 48 V, I _D = 65A,	-	33	43	nC
Q _{gs}	Gate-Source Charge	– V _{GS} = 10 V	-	10	-	nC
Q _{gd}	Gate-Drain Charge	(Note 4)	-	11	-	nC
Drain-Sour	ce Diode Characteristics and Maximum Ratings	6			1	1
I _S				-	65	Α
I _{SM}	Maximum Pulsed Drain-Source Diode Forward Current			-	260	Α
V _{SD}	Drain-Source Diode Forward Voltage	V _{GS} = 0 V, I _S = 65 A	-	-	1.4	V
t _{rr}	Reverse Recovery Time	$V_{GS} = 0 V, I_S = 65 A,$		62	-	ns
Q _{rr}	Reverse Recovery Charge	dI _F / dt = 100 A/μs	-	132		nC

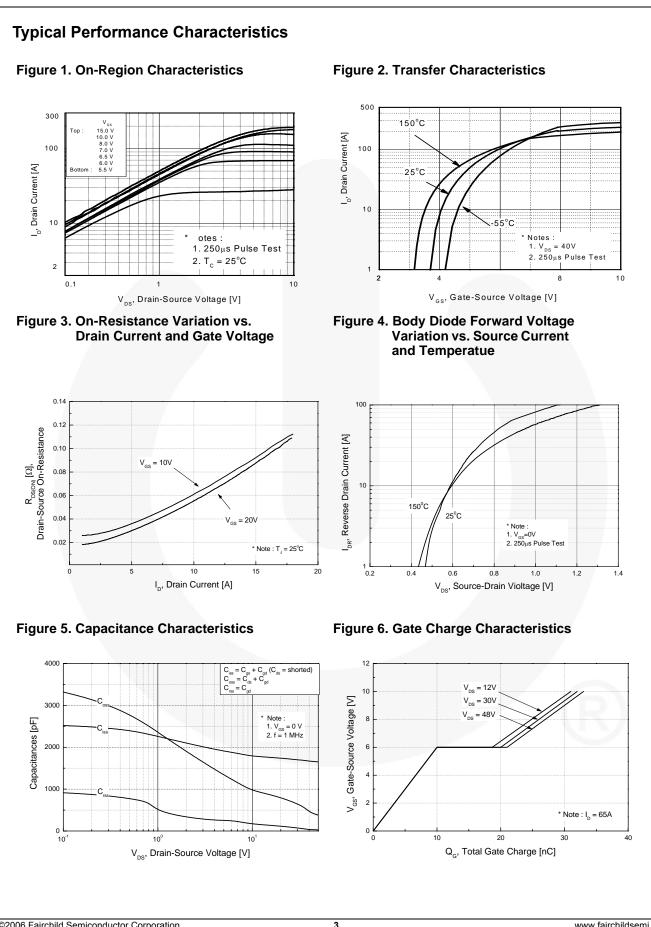
NOTES:

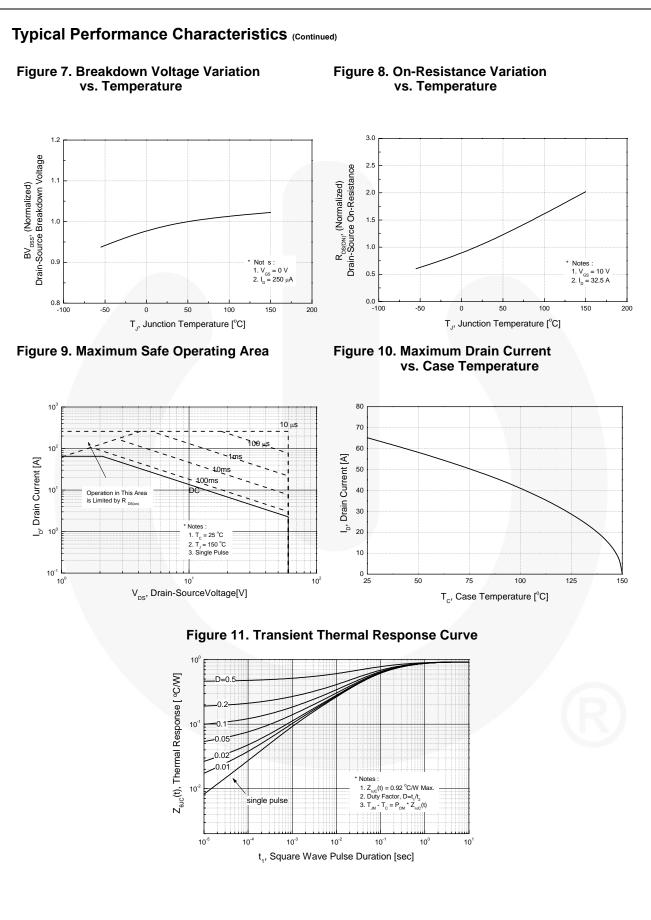
1. Repetitive Rating : Pulse width limited by maximum junction temperature.

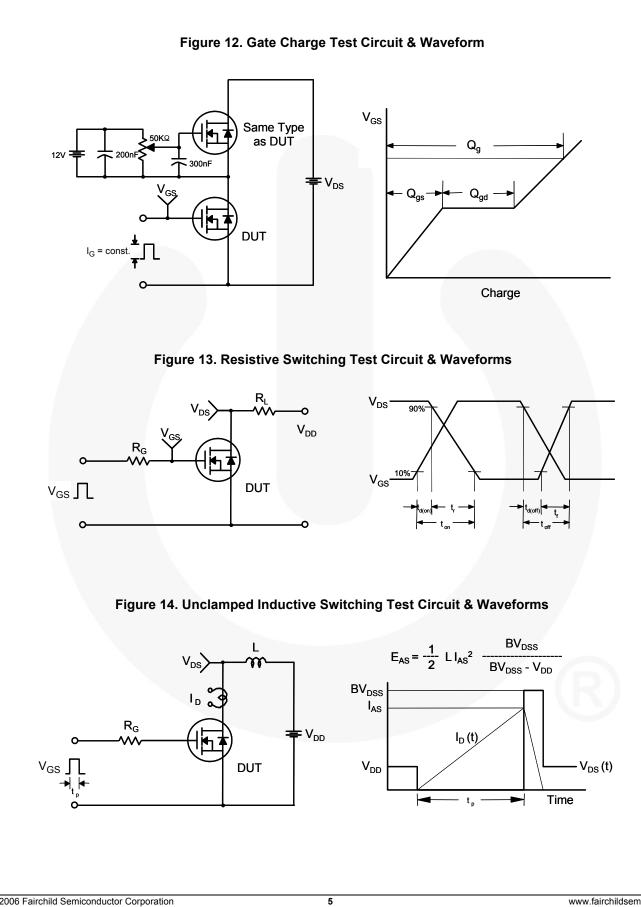
2. L = 47 $\mu\text{H},~\text{I}_{\text{AS}}$ = 65 A, V_{DD} = 50 V, R_{G} = 25 $\Omega,$ Starting $~\text{T}_{\text{J}}$ = 25°C.

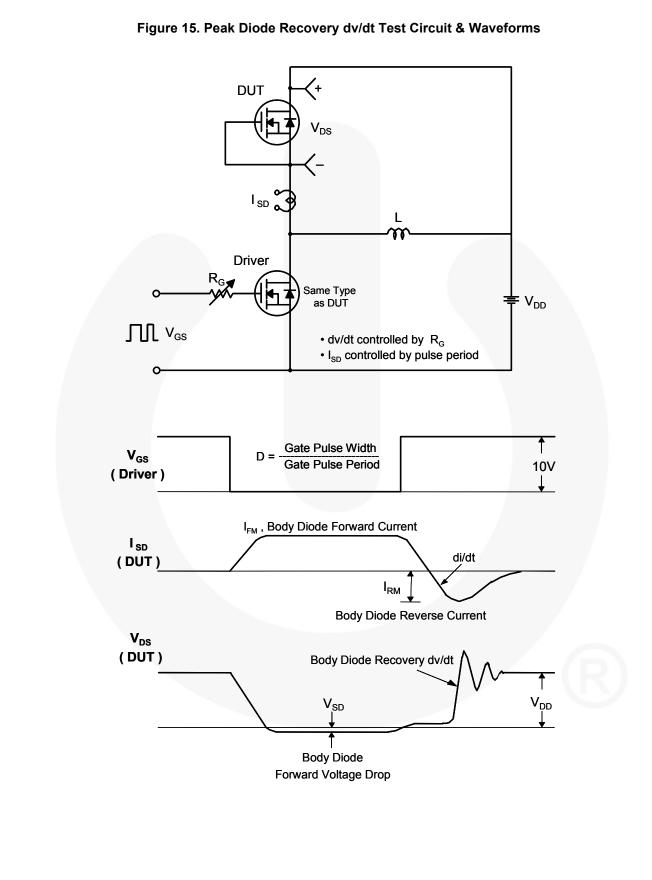
3. I_{SD} \leq 65 A, di/dt ≤ 200 A/µs, V_{DD} $\leq BV_{DSS,}$ Starting $\ T_{J}$ = 25°C.

4. Essentially independent of operating temperature.









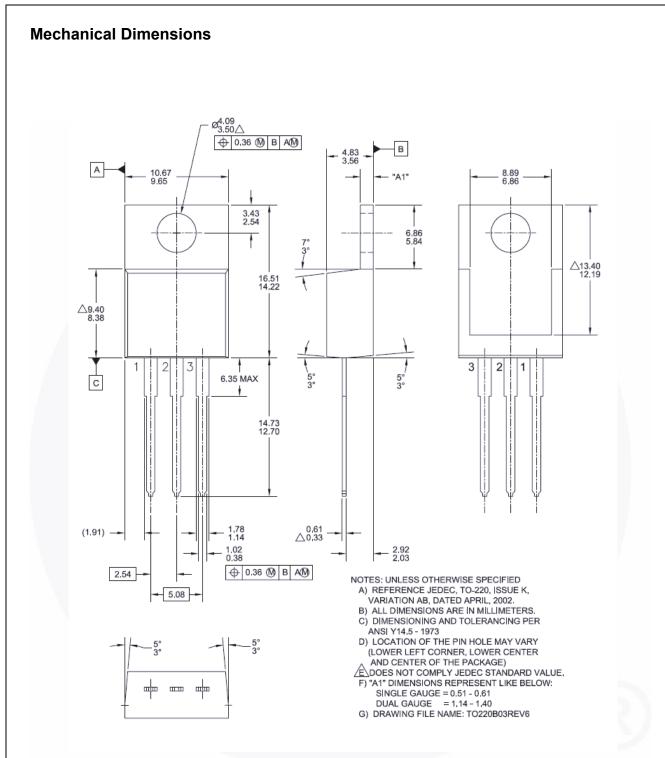


Figure 16. TO-220, Molded, 3-Lead, Jedec Variation AB

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