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FDPF15N65 N-Channel UniFETTM MOSFET 650 V, 15 A, 440 mΩ

Features

- $R_{DS(on)}$ = 360 m Ω (Typ.) @ V_{GS} = 10 V, I_D = 7.5 A
- Low Gate Charge (Typ. 48.5 nC)
- Low C_{rss} (Typ. 23.6 pF)
- 100% Avalanche Tested

Applications

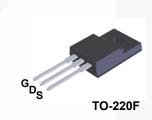
- LCD/LED/PDP TV and Monitor
- Uninterruptible Power Supply

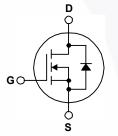


November 2013

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			FDPF15N65	Unit
V _{DSS}	Drain-Source Voltage			650	V
I _D	Drain Current	- Continuous (T _C = 25°C) - Continuous (T _C = 100°C)		15* 9.5*	A
I _{DM}	Drain Current	nt - Pulsed (Note 1)		60*	А
V _{GSS}	Gate-Source voltage	I		± 30	V
E _{AS}	Single Pulsed Avalance	che Energy (I	Note 2)	637	mJ
I _{AR}	Avalanche Current		Note 1)	15	Α
E _{AR}	Repetitive Avalanche Energy		Note 1)	25.0	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		38.5 0.3	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			300	°C

* Drain current limited by maximum junction termperature.

Thermal Characteristics

Symbol	Parameter	FDPF15N65	Unit	
$R_{\theta JC}$	Thermal Resistance, Junction-to-Case, Max.	3.3	°C/W	
$R_{ extsf{ heta}JA}$	Thermal Resistance, Junction-to-Ambient, Max.	62.5	C/W	

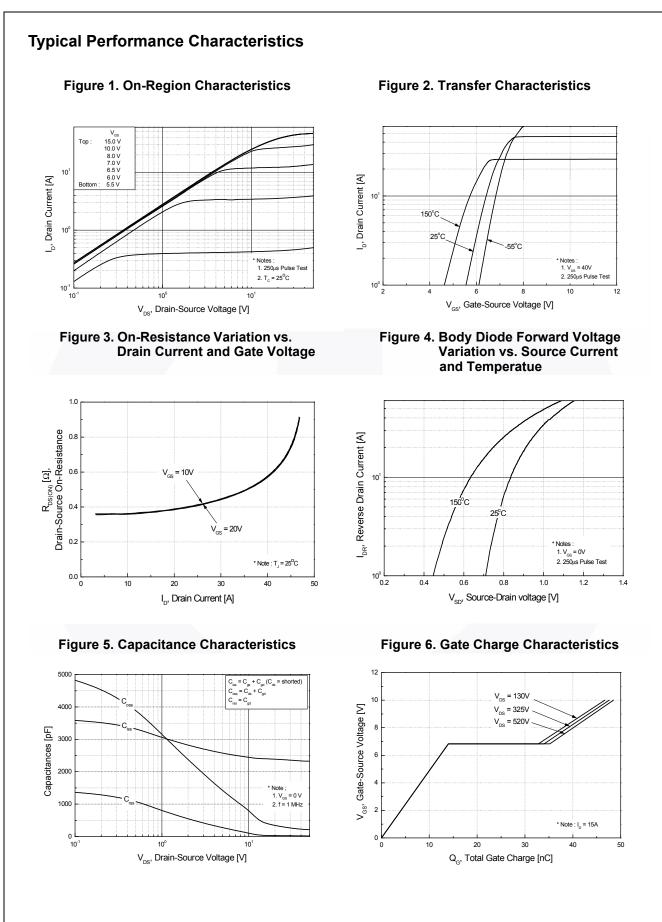
		Package	ckage Packing Method Reel Size		Tape Width N/A		Qu	Quantity	
		FDPF15N65	TO-220F Tube N/A				50 units		
Electric	al Char	acteristics T _C = 2	25°C unless	otherwise noted.					
Symbol		Parameter		Conditions		Min.	Тур.	Max.	Unit
Off Charac	cteristics						4	Į	ļ
BV _{DSS}	Drain-Source Breakdown Voltage		V _{GS}	V _{GS} = 0 V, I _D = 250 μA, T _J = 25°C		650			V
ΔBV_{DSS} / ΔT_{J}	Breakdown Voltage Temperature Coefficient		I _D =	$I_D = 250 \ \mu\text{A}$, Referenced to 25°C			0.65		V/°C
I _{DSS}	Zero Gate Voltage Drain Current			$V_{DS} = 650 \text{ V}, V_{GS} = 0 \text{ V}$ $V_{DS} = 520 \text{ V}, T_C = 125^{\circ}\text{C}$				1 10	μΑ μΑ
I _{GSSF}	Gate-Body	/ Leakage Current, Forwa	ard V _{GS}	V _{GS} = 30 V, V _{DS} = 0 V				100	nA
I _{GSSR}	Gate-Body	dy Leakage Current, Reverse		V _{GS} = -30 V, V _{DS} = 0 V				-100	nA
On Charac	teristics								
V _{GS(th)}	Gate Thre	reshold Voltage		= V _{GS} , I _D = 250 μA		3.0		5.0	V
R _{DS(on)}	Static Drai On-Resista	Drain-Source sistance		= 10 V, I _D = 7.5 A			0.36	0.44	Ω
9 _{FS}	Forward T	ransconductance	V _{DS}	= 40 V, I _D = 7.5 A			19.2		S
Dynamic C	Characterist	ics			1				
C _{iss}	Input Capa	acitance	V _{DS} = 25 V, V _{GS} = 0 V,			2380	3095	pF	
C _{oss}	Output Ca	pacitance	f = 1	= 1 MHz			295	385	pF
C _{rss}	Reverse T	everse Transfer Capacitance					23.6	35.5	pF
Switching	Characteris	stics							
t _{d(on)}	Turn-On D	Turn-On Delay Time		V _{DD} = 325 V, I _D = 15 A,			65	140	ns
t _r	Turn-On R	lise Time	V _{GS}	V_{GS} = 10 V, R _G = 21.7 Ω			125	260	ns
t _{d(off)}	Turn-Off D	elay Time					105	220	ns
t _f	Turn-Off F	all Time			(Note 4)		65	140	ns
Qg	Total Gate	Charge		$V_{DS} = 520 \text{ V}, \text{ I}_{D} = 15 \text{ A},$ $V_{GS} = 10 \text{ V}$ (Note 4)			48.5	63.0	nC
Q _{gs}	Gate-Sour	ce Charge	V _{GS}				14.0		nC
Q _{gd}	Gate-Drain	n Charge					21.2		nC
Drain-Sou	rce Diode C	haracteristics and Max	imum Ratii	ngs	l				
I _S Maximum Continuous Drain-Source Dio			e Diode For	ward Current				15*	Α
I _{SM}	Maximum Pulsed Drain-Source Diode F		de Forward	Forward Current				60	Α
V _{SD}	Drain-Sou	rce Diode Forward Voltag	ge V _{GS}	= 0 V, I _S = 15 A				1.4	V
t _{rr}	Reverse R	ecovery Time		= 0 V, I _S = 15 A,			496		ns
Q _{rr}	Reverse R	ecovery Charge	dl _F /d	t =100 A/μs			5.69		μC

Notes:

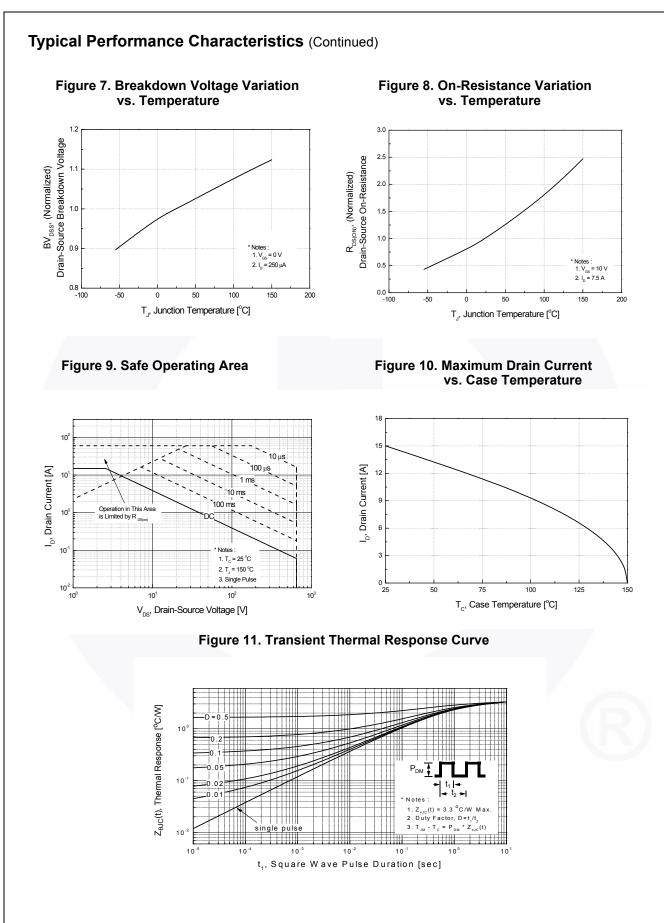
1. Repetitive rating: pulse-width limited by maximum junction temperature.

2. L = 5.23 mH, I_{AS} = 15 A, V_{DD} = 50 V, R_G = 25 Ω , starting T_J = 25°C. 3. I_{SD} \leq 15 A, di/dt \leq 200 A/µs, V_{DD} \leq BV_{DSS}, starting T_J = 25°C.

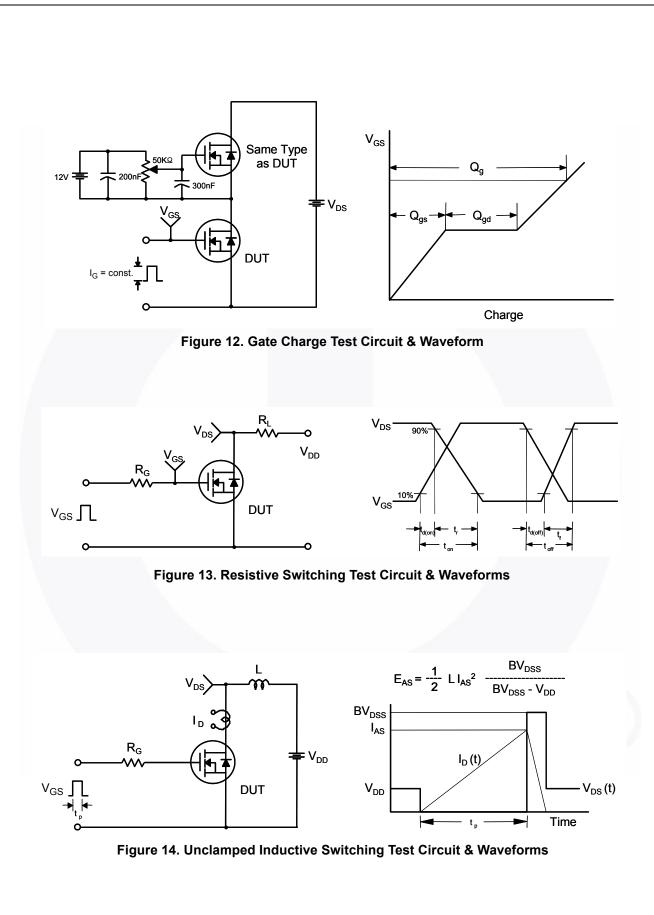
4. Essentially independent of operating temperature typical characteristics.



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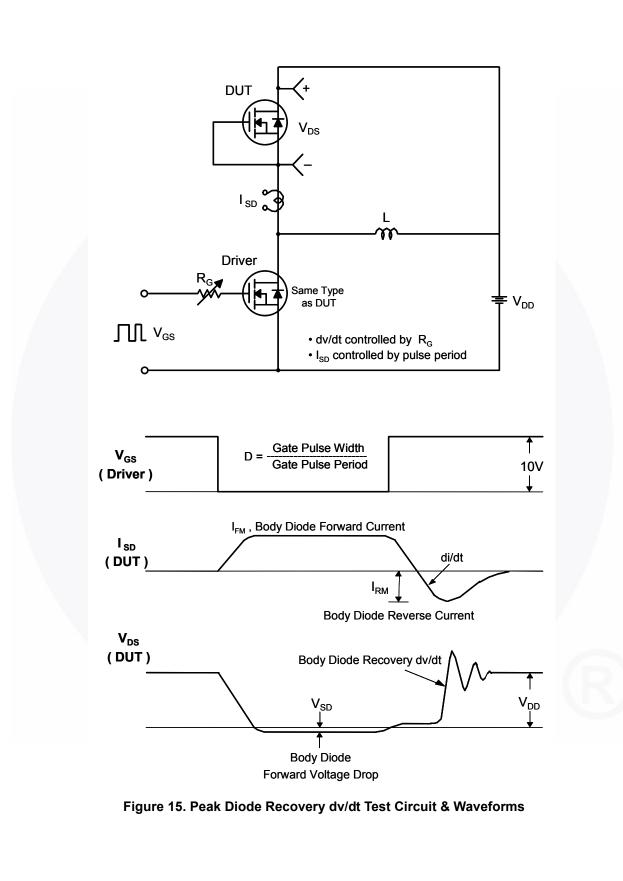


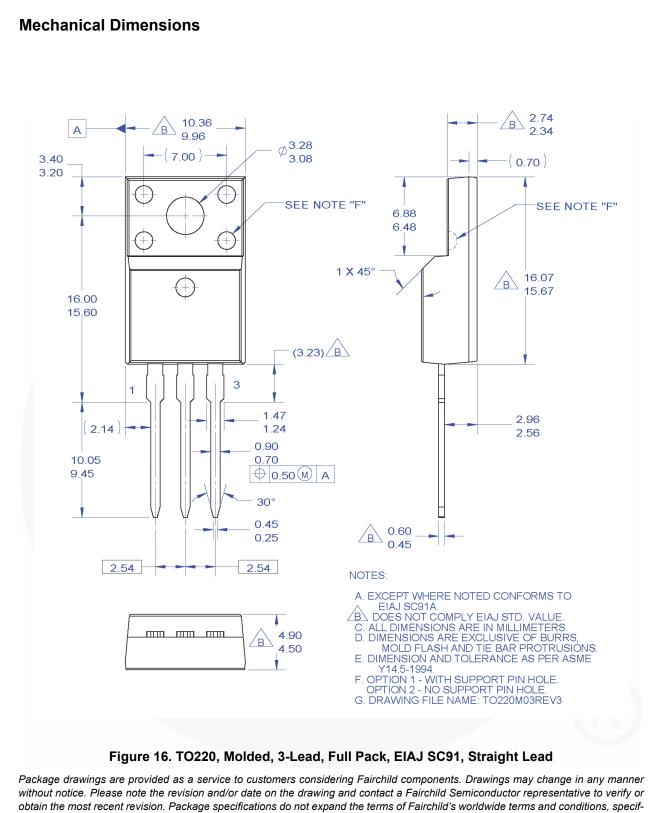
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