onsemi

MOSFET – N-Channel, POWERTRENCH[®]

V _{DSS}	R _{DS(ON)} MAX	I _D MAX				
150 V	7.5 m Ω @ 10 V	130 A				
*Package limitation current is 120 A.						

150 V, 130 A, 7.5 m Ω

FDP075N15A, FDB075N15A

Description

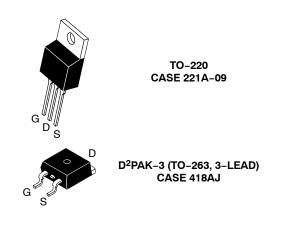
This N-Channel MOSFET is produced using **onsemi** advanced POWERTRENCH process that has been tailored to minimize the on-state resistance while maintaining superior switching performance.

Features

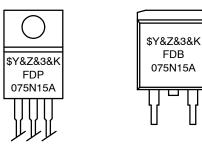
- $R_{DS(on)} = 6.25 \text{ m}\Omega \text{ (Typ.)} @ V_{GS} = 10 \text{ V}, I_D = 100 \text{ A}$
- Fast Switching
- Low Gate Charge
- High Performance Trench Technology for Extremely Low R_{DS(on)}
- High Power and Current Handling Capability
- RoHS Compliant

Applications

- Synchronous Rectification for ATX / Server / Telecom PSU
- Battery Protection Circuit
- Motor Drives and Uninterruptible Power Supplies
- Micro Solar Inverter



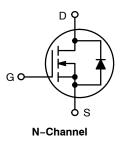
MARKING DIAGRAM



\$Y= onsemi logoFDP075N15A= Device CodeFDB075N15A&Z= Assembly Plant Code&3= 3-Digit Date Code Format

&K

= 2-Digits Lot Run Traceability Code



ORDERING INFORMATION

See detailed ordering and shipping information on page 9 of this data sheet.

MOSFET MAXIMUM RATINGS (T_C = 25° C unless otherwise noted)

Symbol	Para	FDP075N15A-F102 FDB075N15A	Unit	
V _{DSS}	Drain to Source Voltage		150	V
V _{GSS}	Gate to Source Voltage	– DC	±20	V
		– AC (f > 1 Hz)	±30	
I _D	Drain Current	– Continuous (T _C = 25°C)	130*	А
		– Continuous (T _C = 100°C)	92	
I _{DM}	Drain Current	- Pulsed (Note 1)	522	А
E _{AS}	Single Pulsed Avalanche Energy (Note 2)	588	mJ	
dv/dt	Peak Diode Recovery dv/dt (Note 3)		6.0	V/ns
PD	Power Dissipation	(T _C = 25°C)	333	W
		– Derate Above 25°C	2.22	W/°C
T _J , T _{STG}	Operating and Storage Temperature Range	–55 to +175	°C	
TL	Maximum Lead Temperature for Soldering, 7	300	°C	

Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.
*Package limitation current is 120 A.
1. Repetitive rating: pulse-width limited by maximum junction temperature.
2. Starting T_J = 25°C, L = 3 mH, I_{AS} = 19.8 A.
3. I_{SD} ≤ 100 A, di/dt ≤ 200 A/µs, V_{DD} ≤ BV_{DSS}, starting T_J = 25°C.

THERMAL CHARACTERISTICS

Symbol	Parameter	FDP075N15A-F102 FDB075N15A	Unit
$R_{\theta JC}$	Thermal Resistance, Junction to Case, Max.	0.45	°C/W
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient (Minimum Pad of 2-oz Copper), Max.	62.5	
	Thermal Resistance, Junction to Ambient, D2-PAK (1 in ² Pad of 2-oz Copper), Max.	40	

Symbol	Parameter Test Conditions			Тур	Max	Unit
OFF CHAR	ACTERISTICS	•				
BV _{DSS}	Drain to Source Breakdown Voltage	$I_D = 250 \ \mu A, \ V_{GS} = 0 \ V$	150	_	_	V
$\frac{\Delta BV_{DSS}}{\Delta T_{J}}/$	Breakdown Voltage Temperature Coefficient	I_D = 250 $\mu A,$ Referenced to 25°C	-	0.1	-	V/∘C
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} = 120 V, V _{GS} = 0 V	-	-	1 500	μΑ
		V _{DS} = 120 V, T _C = 150°C	-	-		
I _{GSS}	Gate to Body Leakage Current	$V_{GS} = \pm 20 \text{ V}, V_{DS} = 0 \text{ V}$	-	-	±100	nA
ON CHARA	CTERISTICS					
V _{GS(th)}	Gate Threshold Voltage	$V_{GS} = V_{DS}, I_D = 250 \ \mu A$	2.0	-	4.0	V
R _{DS(on)}	Static Drain to Source On Resistance	V _{GS} = 10 V, I _D = 100 A	-	6.25	7.5	mΩ
9 _{FS}	Forward Transconductance	V _{DS} = 10 V, I _D = 100 A	-	164	-	S
DYNAMIC (CHARACTERISTICS	•				
C _{iss}	Input Capacitance	$V_{DS} = 75 \text{ V}, V_{GS} = 0 \text{ V}, f = 1 \text{ MHz}$	-	5525	7350	pF
C _{oss}	Output Capacitance	1	-	516	685	pF
C _{rss}	Reverse Transfer Capacitance	1	-	21	-	pF
C _{oss(er)}	Energy Related Output Capacitance	V _{DS} = 75 V, V _{GS} = 0 V	-	909	-	pF
Q _{g(tot)}	Total Gate Charge at 10 V	$V_{DS} = 75 \text{ V}, \text{ I}_{D} = 100 \text{ A}, \text{ V}_{GS} = 10 \text{ V}$	-	77	100	nC
Q _{gs}	Gate to Source Gate Charge	(Note 4)	-	26	-	nC
Q _{gs2}	Gate Charge Threshold to Plateau	1	-	11	-	nC
Q _{gd}	Gate to Drain "Miller" Charge	1	-	16	-	nC
ESR	Equivalent Series Resistance (G-S)	f = 1 MHz	-	2.29	-	Ω
SWITCHING	G CHARACTERISTICS	•				
t _{d(on)}	Turn-On Delay Time	$V_{DD} = 75 \text{ V}, \text{ I}_{D} = 100 \text{ A}, \text{ V}_{GS} = 10 \text{ V},$	-	28	66	ns
t _r	Turn-On Rise Time	R _G = 4.7 Ω (Note 4)	-	37	84	ns
t _{d(off)}	Turn-Off Delay Time	1	-	62	134	ns
t _f	Turn-Off Fall Time	1	-	21	52	ns
DRAIN-SO	URCE DIODE CHARACTERISTICS	•		-	-	-
۱ _S	Maximum Continuous Drain to Source Diode Forward Current			_	130*	Α
I _{SM}	Maximum Pulsed Drain to Source Diode Forward Current		-	_	520	Α
V_{SD}	Drain to Source Diode Forward Voltage	V _{GS} = 0 V, I _{SD} = 100 A	-	-	1.25	V
t _{rr}	Reverse Recovery Time	$V_{GS} = 0 V, V_{DD} = 75 V, I_{SD} = 100 A,$	-	97	-	ns
Q _{rr}	Reverse Recovery Charge	dI _F /dt = 100 A/µs	_	264	-	nC

Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions. 4. Essentially independent of operating temperature typical characteristics.

TYPICAL PERFORMANCE CHARACTERISTICS

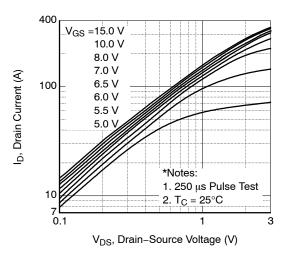


Figure 1. On–Region Characteristics

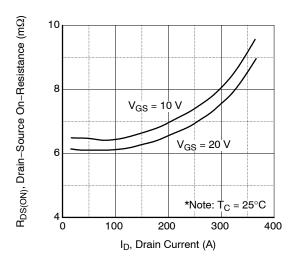


Figure 3. On–Resistance Variation vs. Drain Current and Gate Voltage

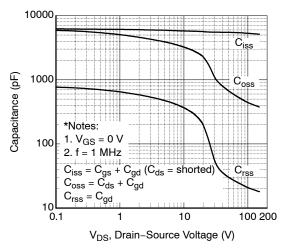


Figure 5. Capacitance Characteristics

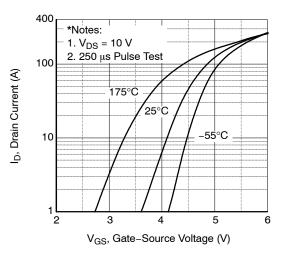


Figure 2. Transfer Characteristics

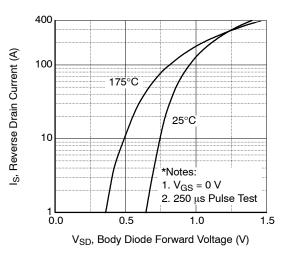


Figure 4. Body Diode Forward Voltage Variation vs. Source Current and Temperature

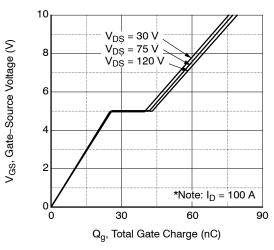
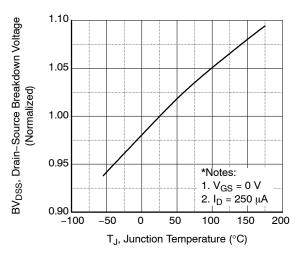
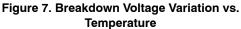


Figure 6. Gate Charge Characteristics

TYPICAL PERFORMANCE CHARACTERISTICS (Continued)





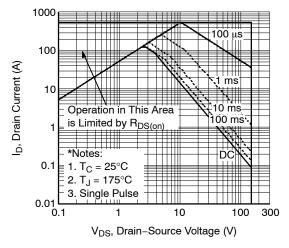
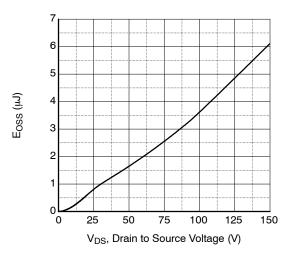


Figure 9. Maximum Safe Operating Area





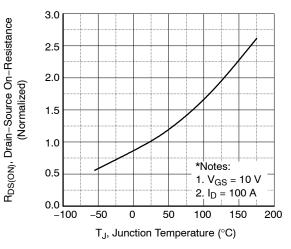


Figure 8. On–Resistance Variation vs. Temperature

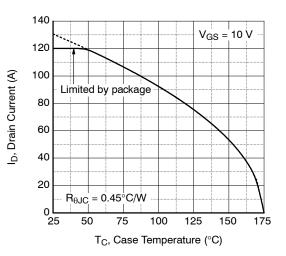


Figure 10. Maximum Drain Current vs. Case Temperature

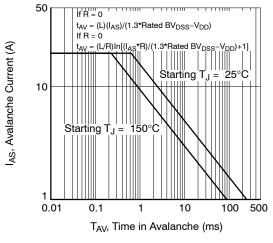


Figure 12. Unclamped Inductive Switching Capability

TYPICAL PERFORMANCE CHARACTERISTICS (Continued)

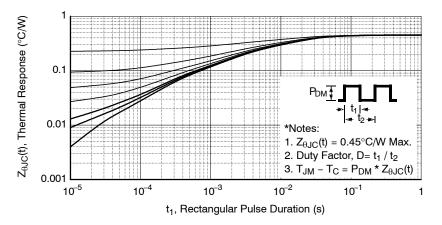


Figure 13. Transient Thermal Response Curve

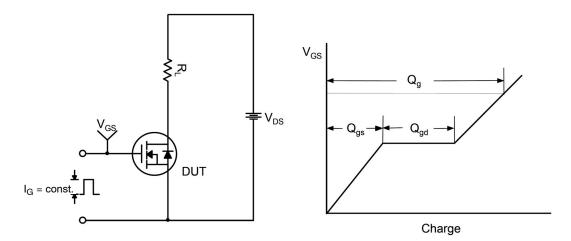


Figure 14. Gate Charge Test Circuit & Waveform

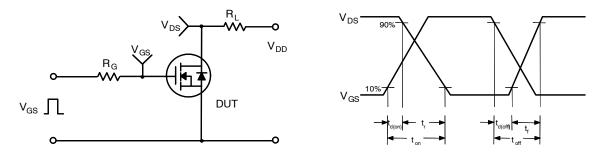


Figure 15. Resistive Switching Test Circuit & Waveforms

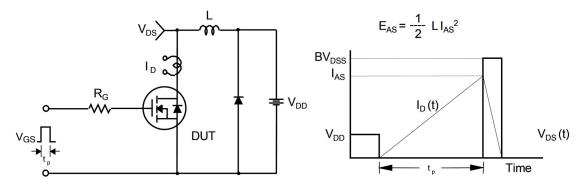


Figure 16. Unclamped Inductive Switching Test Circuit & Waveforms

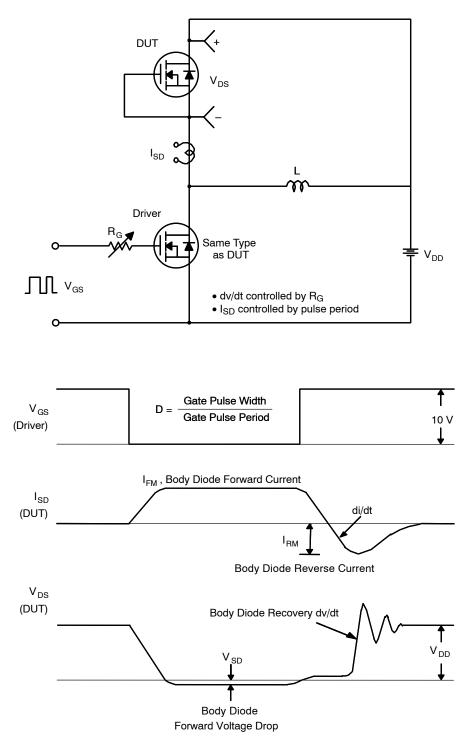


Figure 17. Peak Diode Recovery dv/dt Test Circuit & Waveforms

PACKAGE MARKING AND ORDERING INFORMATION

Part Number	Top Mark	Package	Reel Size	Tape Width	Shipping [†]	
FDP075N15A-F102	FDP075N15A	TO-220	N/A	N/A	50 units / Tube	
FDB075N15A	FDB075N15A	D ² -PAK	330 mm	24 mm	800 units / Tape & Reel	

+For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications Brochure, BRD8011/D.

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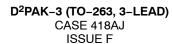
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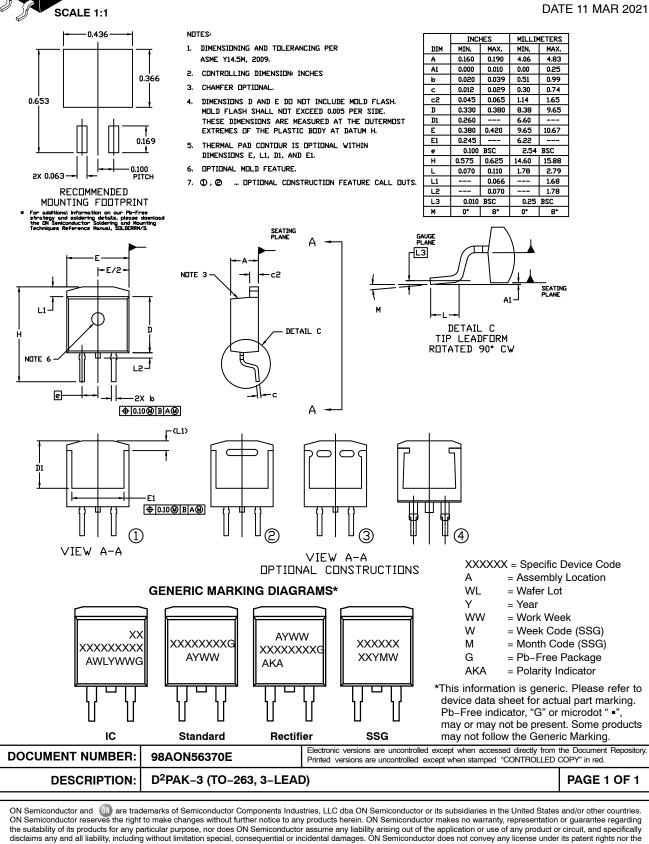
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