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FDD8447L-F085 N-Channel PowerTrench[®] MOSFET 40V, 50A, 11.0mΩ

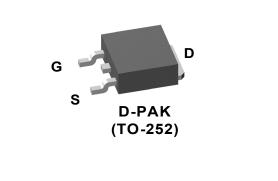
Features

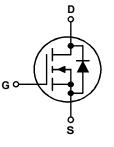
- Typ $r_{DS(on)}$ = 7.0m Ω at V_{GS} = 10V, I_D = 14A
- Typ $r_{DS(on)}$ = 8.5m Ω at V_{GS} = 4.5V, I_D = 11A
- Fast Switching
- Qualified to AEC Q101
- RoHS Compliant

Applications

- Inverter
- Power Supplies
- Automotive Engine Control
- Power Train Management
- Solenoid and Motor Drivers
- Electronic Transmission
- Primary Switch for 12V and 24V Systems







MOSFET Maximum Ratings $T_C = 25^{\circ}C$ unless otherwise noted

Symbol	Parameter		Ratings	Units
V _{DSS}	Drain to Source Voltage	(Note 1)	40	V
V _{GS}	Gate to Source Voltage		±20	V
$I_{D} = \frac{\text{Drain Current Continuous (T_{C} < 80^{\circ}\text{C}, V_{GS} = 10\text{V})}{\text{Dubod}}$		50	٨	
D	Pulsed		See Figure 4	— A
E _{AS}	Single Pulse Avalanche Energy	(Note 2)	40	mJ
D	Power Dissipation		65	W
P _D	Dreate above 25°C		0.43	W/ºC
T _J , T _{STG}	Operating and Storage Temperature		-55 to + 175	°C

Thermal Characteristics

$R_{\theta JC}$	Maximum Thermal Resistance Junction to Case	2.3	°C/W
R_{\thetaJA}	Thermal Resistance Junction to Ambient TO-252, 1in ² copper pad area	40	°C/W

Package Marking and Ordering Information

Device Marking	Device	Package	Reel Size	Tape Width	Quantity
FDD8447L	FDD8447L-F085	D-PAK(TO-252)	13"	12mm	2500 units

Electrical Characteristics $T_C = 25^{\circ}C$ unless otherwise noted

Symbol	Parameter	Test Conditions	Min	Тур	Max	Units

Off Characteristics

B _{VDSS}	Drain to Source Breakdown Voltage	$I_D = 250 \mu A, V_{GS} = 0V$	40	-	-	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} = 32V, V _{GS} = 0V	-	-	1	μA
I _{GSS}	Gate to Source Leakage Current	V_{GS} = ±20V, V_{GS} = 0V	-	-	±100	nA

On Characteristics

V _{GS(th)}	Gate to Source Threshold Voltage	$V_{GS} = V_{DS}, I_D = 250 \mu A$	1.0	1.9	3.0	V
		I _D = 14A, V _{GS} = 10V	-	7.0	8.5	
r _{DS(on)}	Drain to Source On Resistance	I _D = 11A, V _{GS} = 4.5V	-	8.5	11.0	mΩ
		I _D = 14A, V _{GS} = 10V, T _J = 125°C	-	10.4	14.0	
9 _{FS}	Forward Transconductance	I _D = 14A, V _{DS} = 5V	-	58	-	S

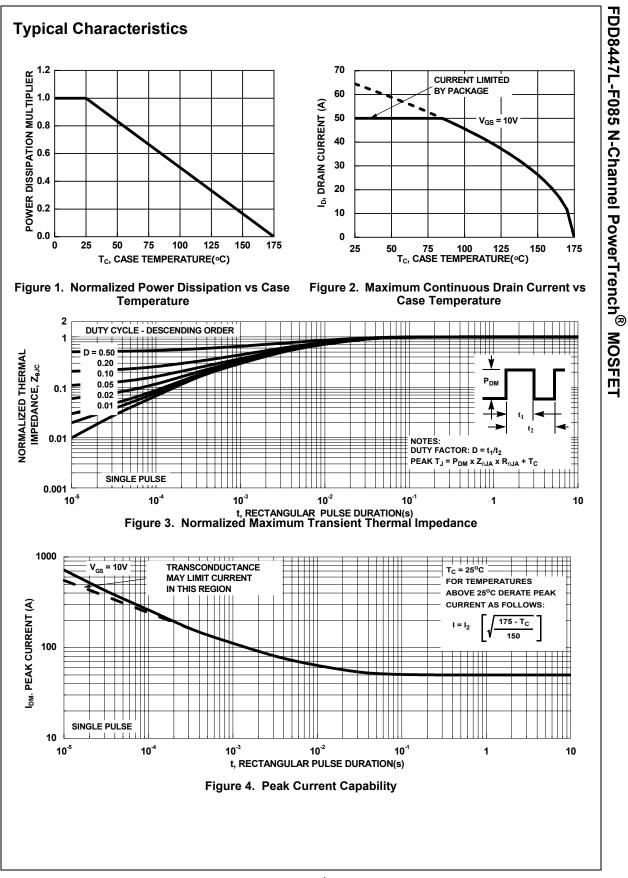
Dynamic Characteristics

C _{iss}	Input Capacitance	N 00X/ N			1970	-	pF
C _{oss}	Output Capacitance	V _{DS} = 20V, V _{GS} = f = 1MHz	· UV,	-	250	-	pF
C _{rss}	Reverse Transfer Capacitance			-	150	-	pF
Rg	Gate Resistance	f = 1MHz		-	1.27	-	Ω
Q _{g(TOT)}	Total Gate Charge at 10V	V _{GS} = 0 to 10V		-	37	52	nC
Q _{g(5)}	Total Gate Charge at 5V	V_{GS} = 0 to 5V	$V_{DD} = 20V$ $I_D = 14A$	-	20	28	nC
Q _{gs}	Gate to Source Gate Charge		$V_{GS} = 10V$	-	6	-	nC
Q _{gd}	Gate to Drain "Miller" Charge		.63 .01	-	7	-	nC

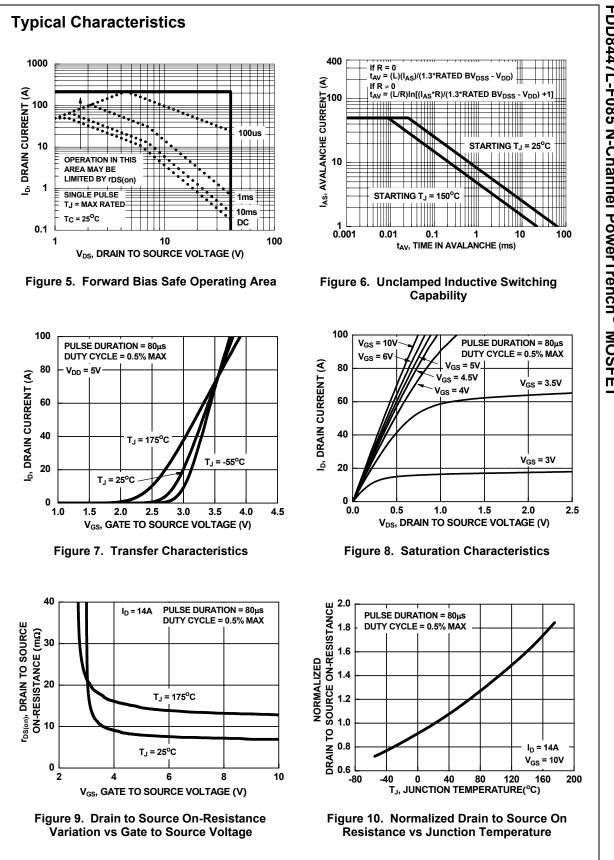
	Test Conditions	Min	Тур	Max	Units
ing Characteristics					
Turn-On Delay Time		-	12	21	ns
Rise Time	V _{DD} = 20 V, I _D = 1 A,	-	12	21	ns
Turn-Off Delay Time	V _{GS} = 10 V, R _{GEN} = 6 Ω	-	38	61	ns
Fall Time		-	9	18	ns
			0.8	12	V
0					ns
Reverse Recovery Charge	$I_{\rm E} = 14$ A, dI _{SD} /dt = 100A/µs	-	22	29	115
	Turn-On Delay Time Rise Time Turn-Off Delay Time Fall Time	Turn-On Delay Time $V_{DD} = 20 \text{ V}, \text{ I}_D = 1 \text{ A},$ Rise Time $V_{GS} = 10 \text{ V}, \text{ R}_{GEN} = 6 \Omega$ Fall Time Fall Time Durce Diode Characteristics Source to Drain Diode Voltage Isource Recovery Time	Turn-On Delay Time - Rise Time V _{DD} = 20 V, I _D = 1 A, - Turn-Off Delay Time V _{GS} = 10 V, R _{GEN} = 6 Ω - Fall Time - - Durce Diode Characteristics - - Source to Drain Diode Voltage I _{SD} = 14A - Reverse Recovery Time - -	Turn-On Delay Time-12Rise Time $V_{DD} = 20 \text{ V}, \text{ I}_D = 1 \text{ A},$ -12Turn-Off Delay Time $V_{GS} = 10 \text{ V}, \text{ R}_{GEN} = 6 \Omega$ -38Fall Time-9Durce Diode CharacteristicsSource to Drain Diode Voltage $I_{SD} = 14A$ -0.8Reverse Recovery Time-22	Turn-On Delay Time-1221Rise Time $V_{DD} = 20 \text{ V}, \text{ I}_D = 1 \text{ A},$ -1221Turn-Off Delay Time $V_{GS} = 10 \text{ V}, \text{ R}_{GEN} = 6 \Omega$ -3861Fall Time-918Durce Diode CharacteristicsSource to Drain Diode Voltage $I_{SD} = 14A$ -0.81.2Reverse Recovery Time

Notes:

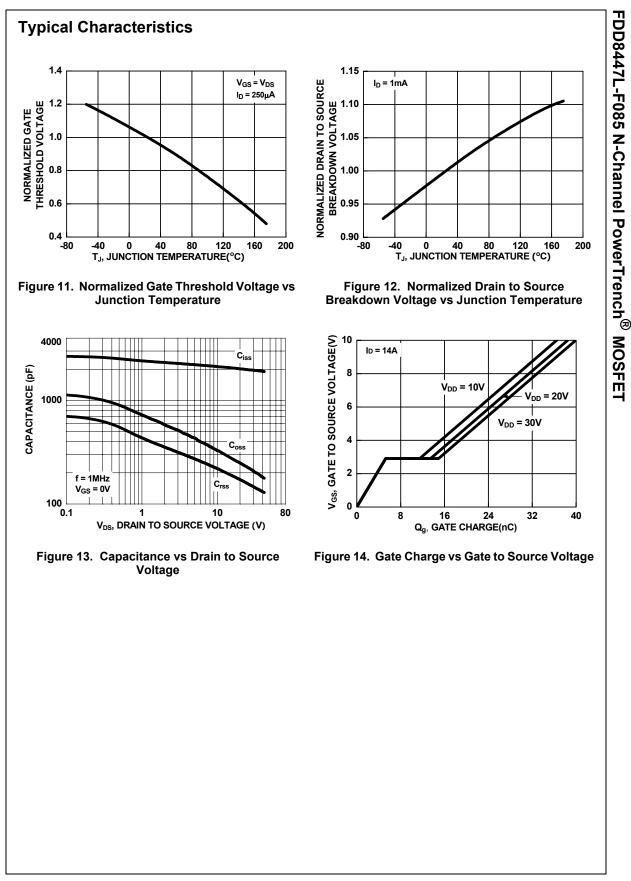
1: Starting $T_J = 25^{\circ}C$ to $175^{\circ}C$. 2: Starting $T_J = 25^{\circ}C$, L = 0.05mH, $I_{AS} = 40A$



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