



ON Semiconductor®

## FDS8449-F085

### N-Channel PowerTrench® MOSFET 40V, 7.6A, 29mΩ

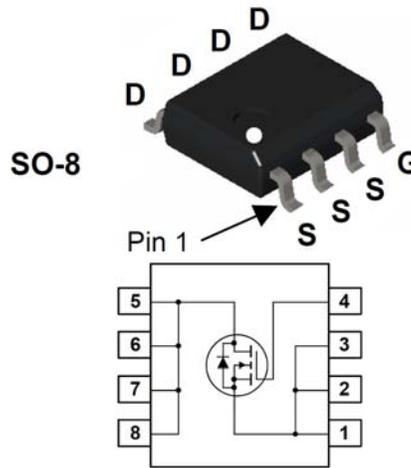
#### Features

- Typ  $R_{DS(on)} = 21m\Omega$  at  $V_{GS} = 10V$ ,  $I_D = 7.6A$
- Typ  $R_{DS(on)} = 26m\Omega$  at  $V_{GS} = 4.5V$ ,  $I_D = 6.8A$
- Typ  $Q_{g(5)} = 7.7nC$  at  $V_{GS} = 5V$ ,  $I_D = 7.6A$
- RoHS Compliant
- Qualified to AEC Q101



#### Applications

- Inverter
- Power Supplies



#### MOSFET Maximum Ratings $T_A = 25^\circ C$ unless otherwise noted

Symbol	Parameter	Ratings	Units
$V_{DSS}$	Drain to Source Voltage	40	V
$V_{GS}$	Gate to Source Voltage	$\pm 20$	V
$I_D$	Drain Current Continuous ( $V_{GS} = 10V$ )	7.6	A
	Pulsed	50	
$E_{AS}$	Single Pulse Avalanche Energy (Note 1)	27	mJ
$P_D$	Power Dissipation	5	W
	Derate above $25^\circ C$	0.04	W/ $^\circ C$
$T_J, T_{STG}$	Operating and Storage Temperature	-55 to +150	$^\circ C$
$R_{\theta JC}$	Thermal Resistance Junction to Case	25	$^\circ C/W$
$R_{\theta JA}$	Thermal Resistance Junction to Ambient, $1in^2$ copper pad area	50	$^\circ C/W$

#### Package Marking and Ordering Information

Device Marking	Device	Package	Reel Size	Tape Width	Quantity
FDS8449	FDS8449-F085	SO-8	13"	12mm	2500 units

#### Notes:

1: Starting  $T_J = 25^\circ C$ ,  $L = 1mH$ ,  $I_{AS} = 7.3A$ ,  $V_{DD} = 40V$ .

2: A suffix as "...F085P" has been temporarily introduced in order to manage a double source strategy as ON Semiconductor has officially announced in Aug 2014.

FDS8449-F085 N-Channel PowerTrench® MOSFET

**Electrical Characteristics**  $T_A = 25^\circ\text{C}$  unless otherwise noted

Symbol	Parameter	Test Conditions	Min	Typ	Max	Units
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**Off Characteristics**

$B_{VDSS}$	Drain to Source Breakdown Voltage	$I_D = 250\mu\text{A}, V_{GS} = 0\text{V}$	40	-	-	V
$I_{DSS}$	Zero Gate Voltage Drain Current	$V_{DS} = 32\text{V},$ $V_{GS} = 0\text{V}$	-	-	1	$\mu\text{A}$
		$T_A = 150^\circ\text{C}$	-	-	250	
$I_{GSS}$	Gate to Source Leakage Current	$V_{GS} = \pm 20\text{V}$	-	-	$\pm 100$	nA

**On Characteristics**

$V_{GS(th)}$	Gate to Source Threshold Voltage	$V_{GS} = V_{DS}, I_D = 250\mu\text{A}$	1	1.9	3	V
$r_{DS(on)}$	Drain to Source On Resistance	$I_D = 7.6\text{A}, V_{GS} = 10\text{V}$	-	21	29	$\text{m}\Omega$
		$I_D = 6.8\text{A}, V_{GS} = 4.5\text{V}$	-	26	36	
		$I_D = 7.6\text{A}, V_{GS} = 10\text{V}$ $T_J = 125^\circ\text{C}$	-	29	43	
$g_{FS}$	Forward Transconductance	$V_{DS} = 10\text{V}, I_D = 7.6\text{A}$	-	21	-	S

**Dynamic Characteristics**

$C_{iss}$	Input Capacitance	$V_{DS} = 20\text{V}, V_{GS} = 0\text{V},$ $f = 1\text{MHz}$	-	760	-	pF
$C_{oss}$	Output Capacitance		-	100	-	pF
$C_{rss}$	Reverse Transfer Capacitance		-	60	-	pF
$R_G$	Gate Resistance	$f = 1\text{MHz}$	-	1.2	-	$\Omega$
$Q_{g(TOT)}$	Total Gate Charge at 10V	$V_{GS} = 0$ to 5V	-	7.7	11	nC
$Q_{gs}$	Gate to Source Gate Charge	$V_{DD} = 20\text{V}$ $I_D = 7.6\text{A}$	-	2.4	-	nC
$Q_{gd}$	Gate to Drain "Miller" Charge		-	2.8	-	nC

**Switching Characteristics**

$t_{on}$	Turn-On Time	$V_{DD} = 20\text{V}, I_D = 1\text{A}$ $V_{GS} = 10\text{V}, R_{GEN} = 6\Omega$	-	-	21	ns
$t_{d(on)}$	Turn-On Delay Time		-	9	-	ns
$t_r$	Rise Time		-	5	-	ns
$t_{d(off)}$	Turn-Off Delay Time		-	23	-	ns
$t_f$	Fall Time		-	3	-	ns
$t_{off}$	Turn-Off Time		-	-	39	ns

**Drain-Source Diode Characteristics**

$V_{SD}$	Source to Drain Diode Voltage	$I_{SD} = 2.1\text{A}$	-	0.76	1.2	V
$t_{rr}$	Reverse Recovery Time	$I_{SD} = 7.6\text{A}, dI_{SD}/dt = 100\text{A}/\mu\text{s}$	-	17	-	ns
$Q_{rr}$	Reverse Recovery Charge		-	7	-	nC

## Typical Characteristics

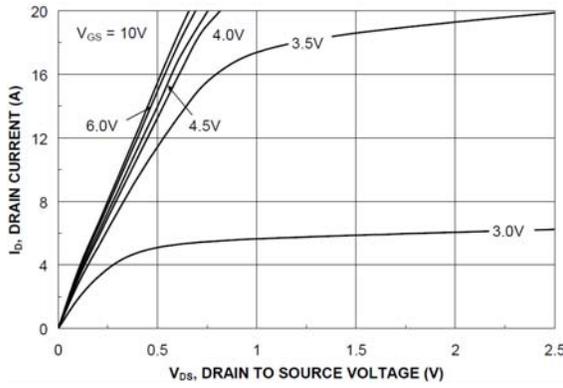


Figure 1. On-Region Characteristics

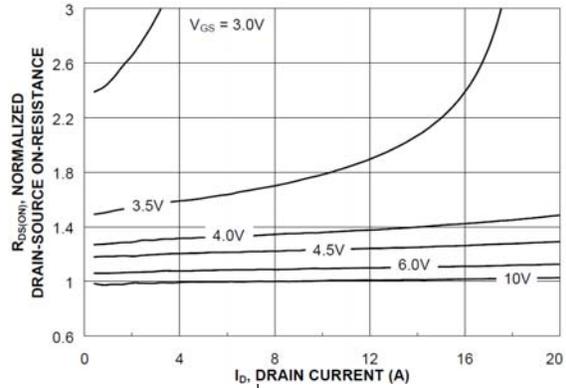


Figure 2. On-Resistance Variation with Drain Current and Gate Voltage

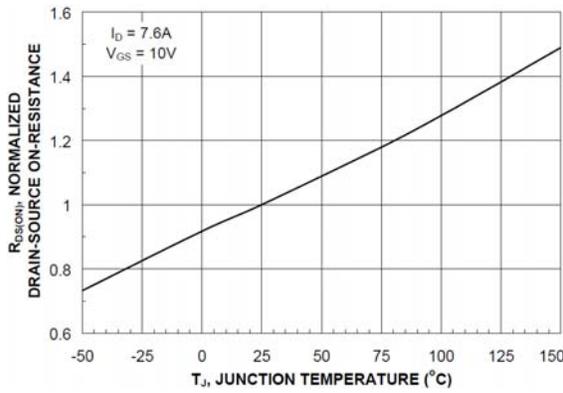


Figure 3. On-Resistance Variation with Temperature

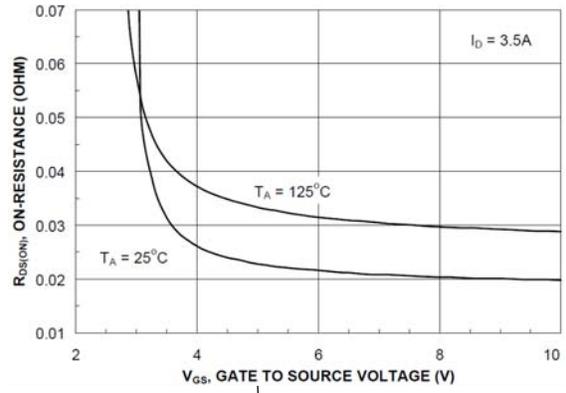


Figure 4. On-Resistance Variation with Gate-to-Source Voltage

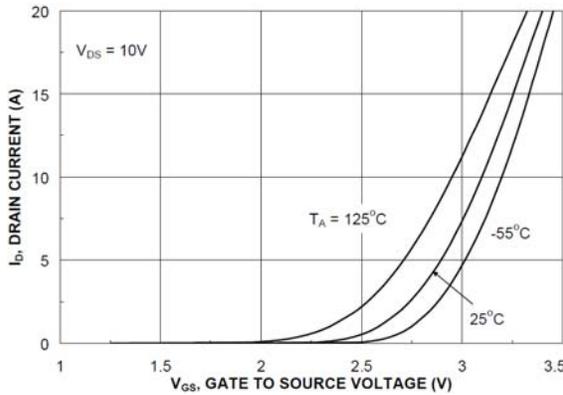


Figure 5. Transfer Characteristics

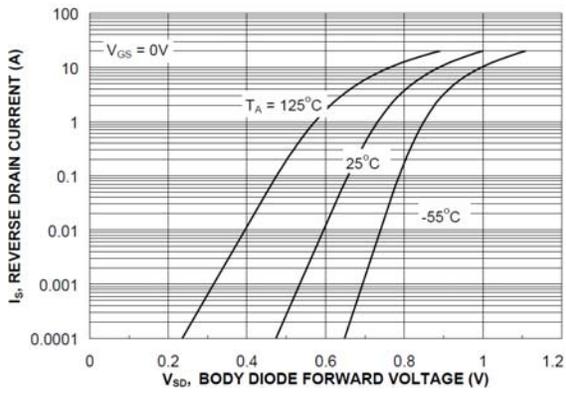


Figure 6. Body Diode Forward Voltage Variation with Source Current and Temperature

## Typical Characteristics

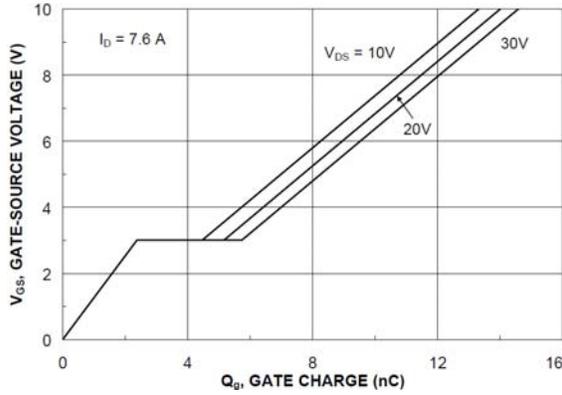


Figure 7. Gate Charge Characteristics

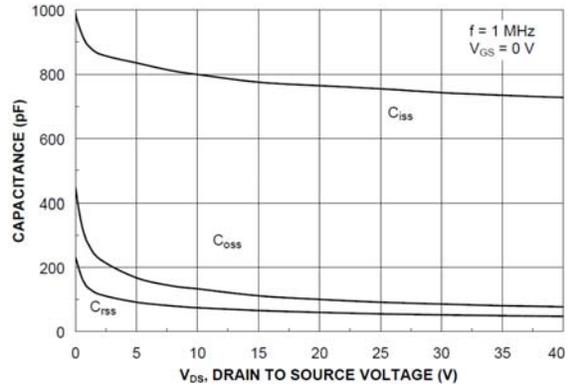


Figure 8. Capacitance Characteristics

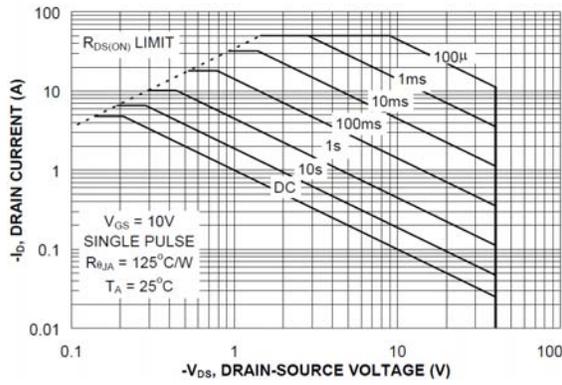


Figure 9. Maximum Safe Operating Area

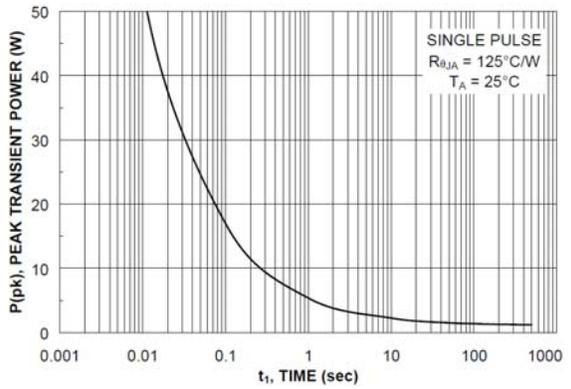


Figure 10. Single Pulse Maximum Power Dissipation

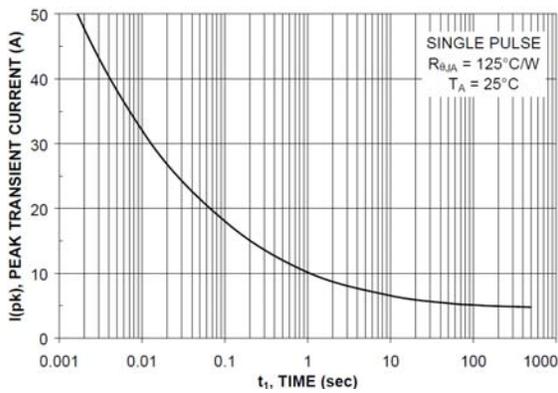


Figure 11. Single Pulse Maximum Peak Current

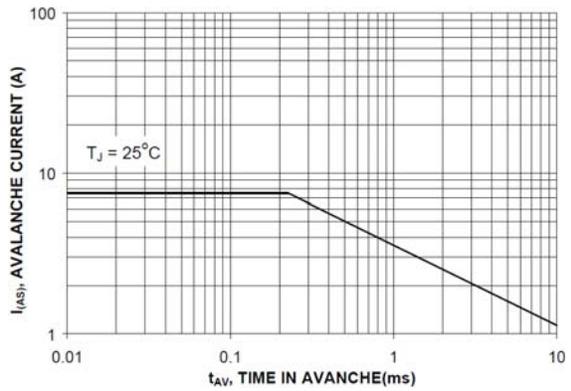


Figure 12. Unclamped Inductive Switching Capability

### Typical Characteristics

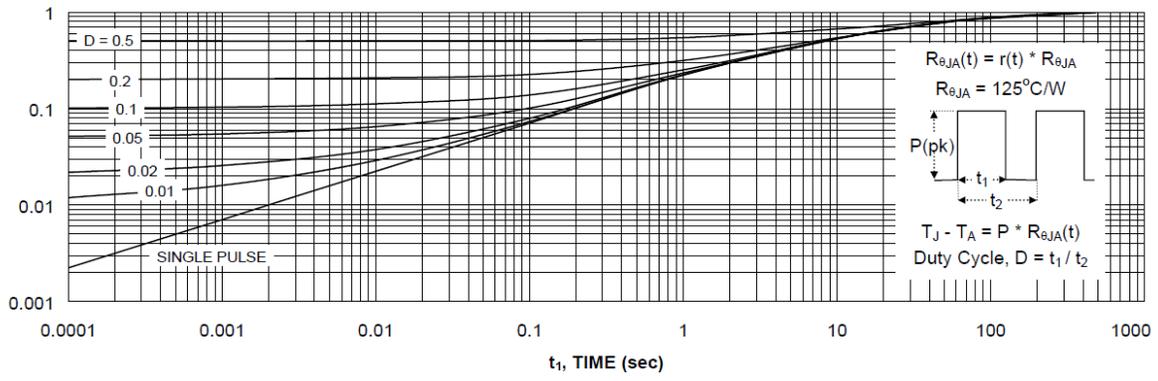


Figure 13. Transient Thermal Response Curve

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