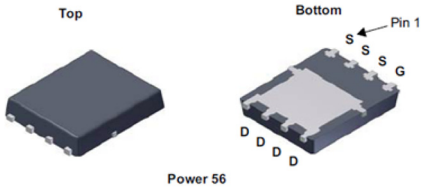
ON Semiconductor®

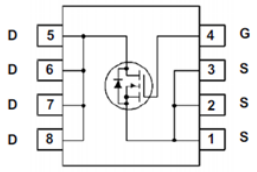
FDMS86569-F085

N-Channel PowerTrench® MOSFET

60 V, 65 A, 5.6 mΩ



Power 56



Features

- Typical $R_{DS(on)}$ = 4.3 mΩ at V_{GS} = 10V, I_D = 65 A
- Typical $Q_{g(tot)}$ = 36 nC at V_{GS} = 10V, I_D = 65 A
- UIS Capability
- RoHS Compliant
- Qualified to AEC Q101

Applications

- Automotive Engine Control
- PowerTrain Management
- Solenoid and Motor Drivers
- Electronic Steering
- Integrated Starter/Alternator
- Distributed Power Architectures and VRM
- Primary Switch for 12V Systems

MOSFET Maximum Ratings T_J = 25°C unless otherwise noted.

Symbol	Parameter		Ratings	Units
V_{DSS}	Drain-to-Source Voltage		60	V
V_{GS}	Gate-to-Source Voltage		±20	V
I_D	Drain Current - Continuous (V_{GS}=10) (Note 1)	T_C = 25°C	65	A
	Pulsed Drain Current	T_C = 25°C	See Figure 4	
E_{AS}	Single Pulse Avalanche Energy	(Note 2)	41	mJ
P_D	Power Dissipation		100	W
	Derate Above 25°C		0.67	W/°C
T_J, T_{STG}	Operating and Storage Temperature		-55 to + 175	°C
$R_{\theta JC}$	Thermal Resistance, Junction to Case		1.5	°C/W
$R_{\theta JA}$	Maximum Thermal Resistance, Junction to Ambient	(Note 3)	50	°C/W

Notes:

1: Current is limited by bondwire configuration.

2: Starting T_J = 25°C, L = 30uH, I_{AS} = 52A, V_{DD} = 60V during inductor charging and V_{DD} = 0V during time in avalanche.

3: $R_{\theta JA}$ is the sum of the junction-to-case and case-to-ambient thermal resistance, where the case thermal reference is defined as the solder mounting surface of the drain pins. $R_{\theta JC}$ is guaranteed by design, while $R_{\theta JA}$is determined by the board design. The maximum rating presented here is based on mounting on a 1 in^2 pad of 2oz copper.

Package Marking and Ordering Information

Device Marking	Device	Package	Reel Size	Tape Width	Quantity
FDMS86569	FDMS86569-F085	Power56	13”	12mm	3000units

Electrical Characteristics T_J = 25°C unless otherwise noted.

Symbol	Parameter	Test Conditions		Min.	Typ.	Max.	Units
Off Characteristics							
B_{VDSS}	Drain-to-Source Breakdown Voltage	I_D = 250μA, V_{GS} = 0V		60	-	-	V
I_{DSS}	Drain-to-Source Leakage Current	V_{DS}=60V,	T_J = 25°C	-	-	1	μA
		V_{GS} = 0V	T_J = 175°C (Note 4)	-	-	1	mA
I_{GSS}	Gate-to-Source Leakage Current	V_{GS} = ±20V		-	-	±100	nA
On Characteristics							
$V_{GS(th)}$	Gate to Source Threshold Voltage	V_{GS} = V_{DS}, I_D = 250μA		2.0	2.8	4.0	V
$R_{DS(on)}$	Drain to Source On Resistance	I_D = 65A, V_{GS}= 10V	T_J = 25°C	-	4.3	5.6	mΩ
			T_J = 175°C (Note 4)	-	8.3	10.8	mΩ
Dynamic Characteristics							
C_{iss}	Input Capacitance	V_{DS} = 30V, V_{GS} = 0V, f = 1MHz		-	2560	-	pF
C_{oss}	Output Capacitance			-	740	-	pF
C_{rss}	Reverse Transfer Capacitance			-	40	-	pF
R_g	Gate Resistance	f = 1MHz		-	2.0	-	Ω
$Q_{g(ToT)}$	Total Gate Charge	V_{GS} = 0 to 10V	V_{DD} = 30V, I_D = 65A	-	36	54	nC
$Q_{g(th)}$	Threshold Gate Charge	V_{GS} = 0 to 2V		-	4.8	-	nC
Q_{gs}	Gate-to-Source Gate Charge			-	14	-	nC
Q_{gd}	Gate-to-Drain “Miller“ Charge			-	7	-	nC
Switching Characteristics							
t_{on}	Turn-On Time	V_{DD} = 30V, I_D = 65A, V_{GS} = 10V, R_{GEN} = 6Ω		-	-	36	ns
$t_{d(on)}$	Turn-On Delay			-	16	-	ns
t_r	Rise Time			-	11	-	ns
$t_{d(off)}$	Turn-Off Delay			-	23	-	ns
t_f	Fall Time			-	8	-	ns
t_{off}	Turn-Off Time			-	-	41	ns
Drain-Source Diode Characteristics							
V_{SD}	Source-to-Drain Diode Voltage	I_{SD} =65A, V_{GS} = 0V		-	-	1.25	V
		I_{SD} = 32.5A, V_{GS} = 0V		-	-	1.2	V
t_{rr}	Reverse-Recovery Time	I_F = 65A, dI_{SD}/dt = 100A/μs, V_{DD} = 48V		-	55	72	ns
Q_{rr}	Reverse-Recovery Charge			-	45	59	nC

Note:

4: The maximum value is specified by design at T_J = 175°C. Product is not tested to this condition in production.

Typical Characteristics

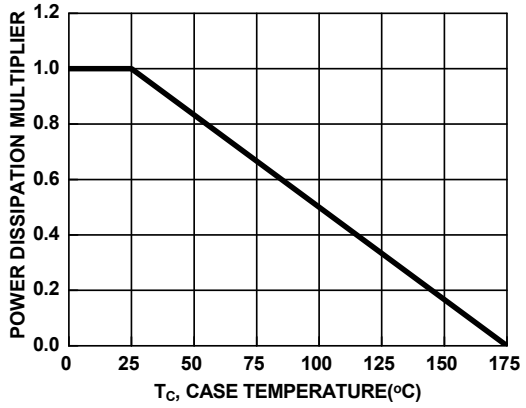


Figure 1. Normalized Power Dissipation vs. Case Temperature

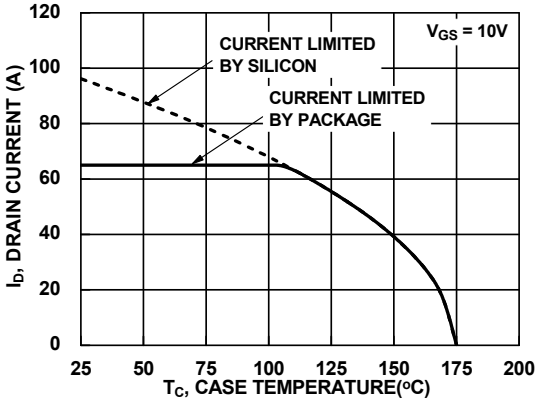


Figure 2. Maximum Continuous Drain Current vs. Case Temperature

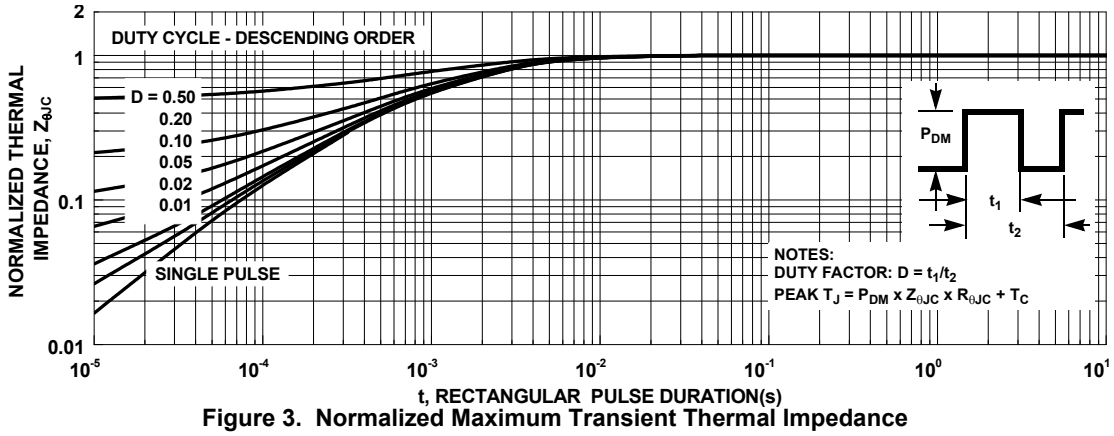


Figure 3. Normalized Maximum Transient Thermal Impedance

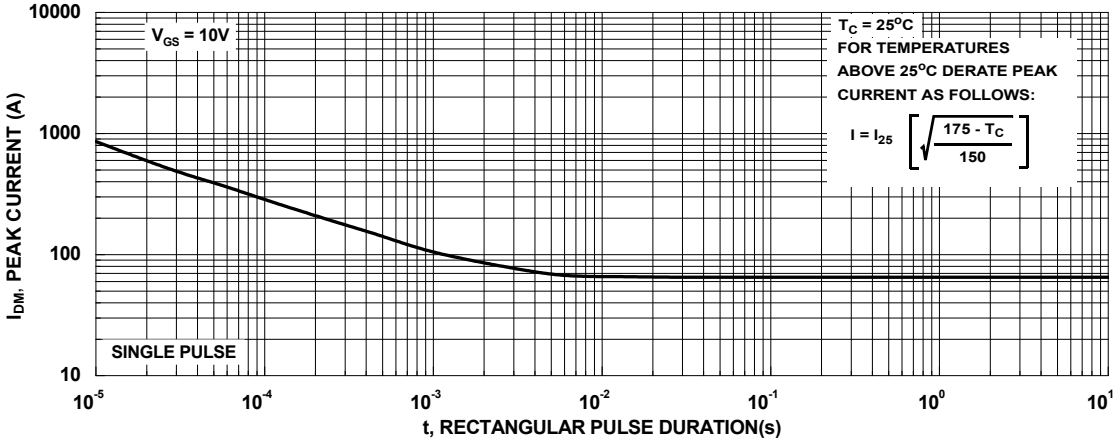


Figure 4. Peak Current Capability

Typical Characteristics

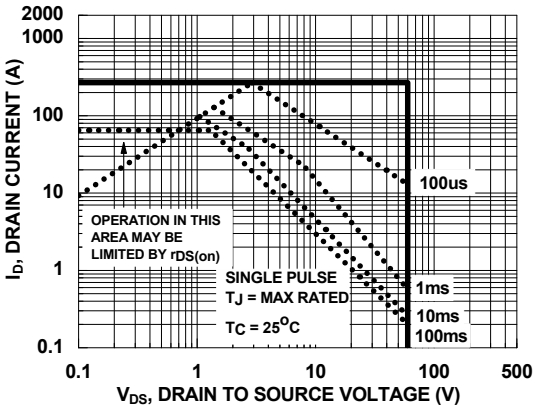
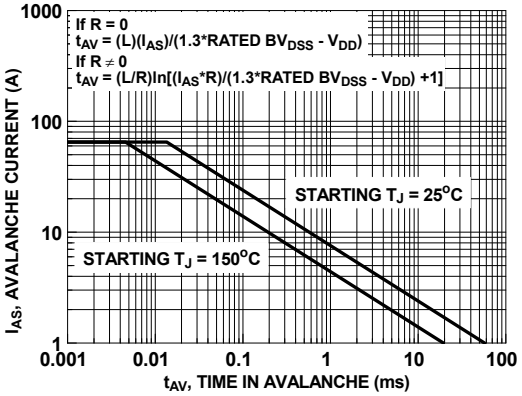


Figure 5. Forward Bias Safe Operating Area



NOTE: Refer to ON Semiconductor Application Notes AN7514 and AN7515

Figure 6. Unclamped Inductive Switching Capability

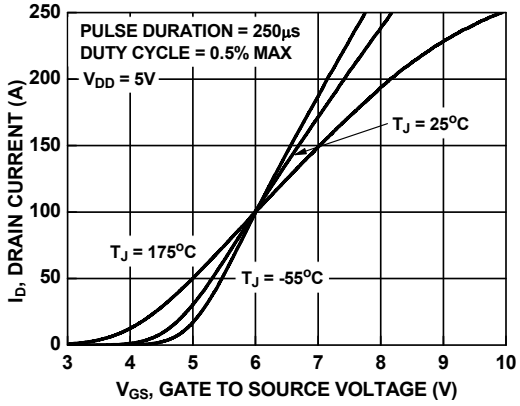


Figure 7. Transfer Characteristics

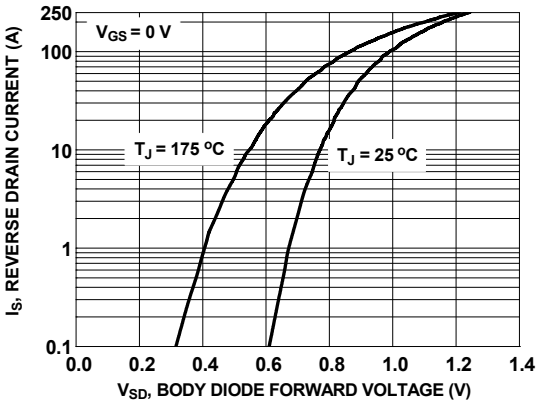


Figure 8. Forward Diode Characteristics

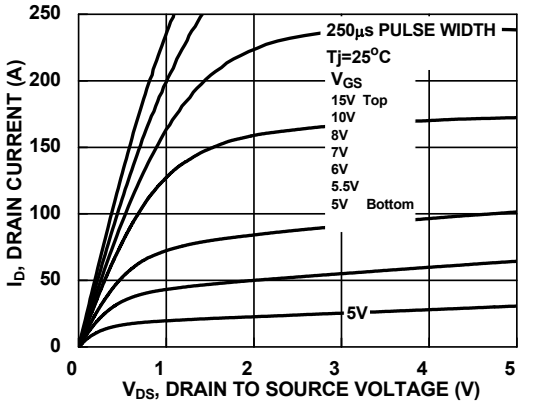


Figure 9. Saturation Characteristics

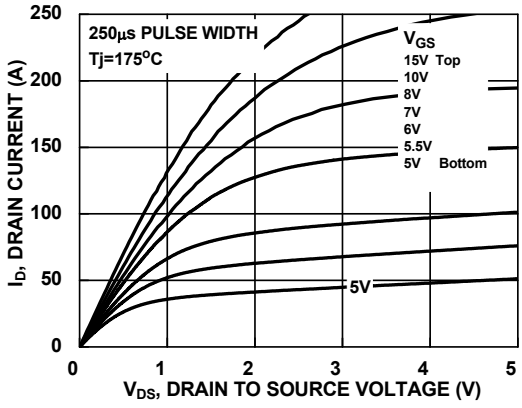


Figure 10. Saturation Characteristics

Typical Characteristics

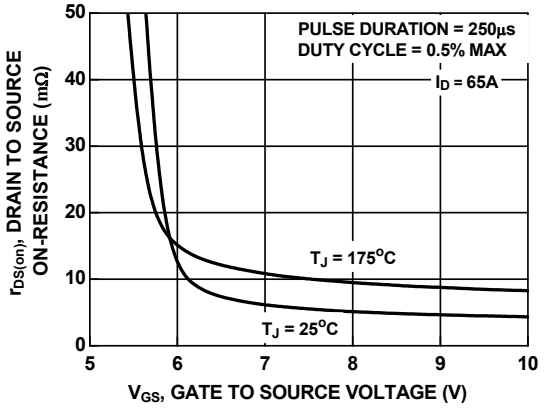


Figure 11. R_{DSON} vs. Gate Voltage

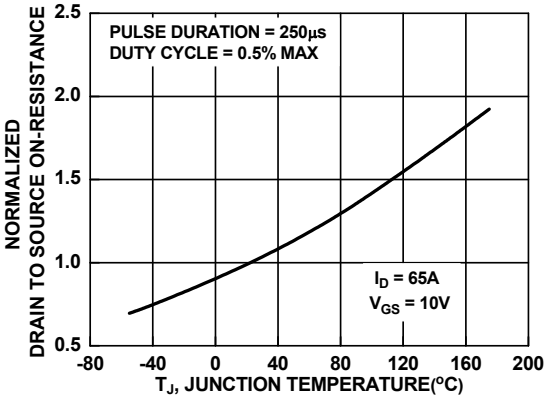


Figure 12. Normalized R_{DSON} vs. Junction Temperature

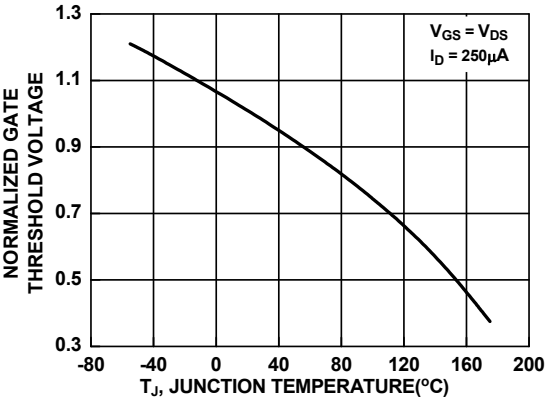


Figure 13. Normalized Gate Threshold Voltage vs. Temperature

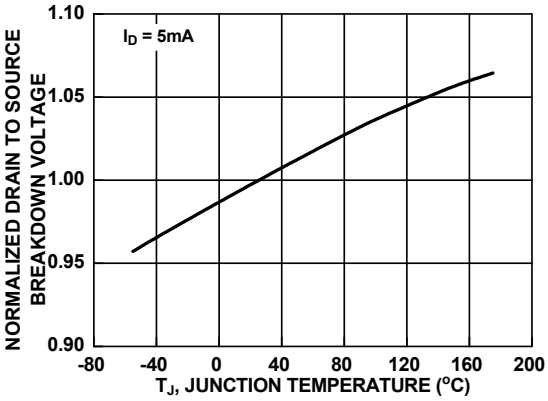


Figure 14. Normalized Drain to Source Breakdown Voltage vs. Junction Temperature

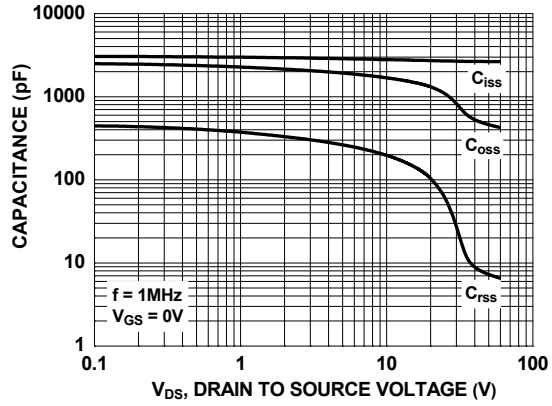


Figure 15. Capacitance vs. Drain to Source Voltage

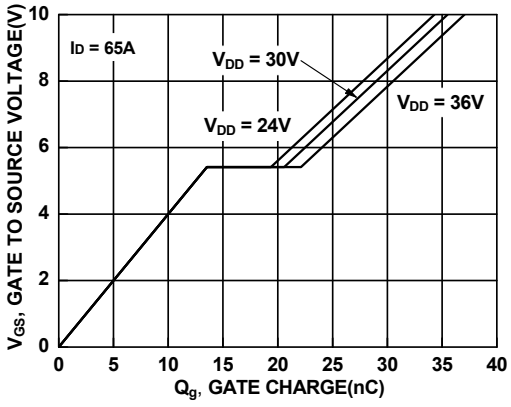


Figure 16. Gate Charge vs. Gate to Source Voltage

PUBLICATION ORDERING INFORMATION

LITERATURE FULFILLMENT:
Literature Distribution Center for ON Semiconductor
19521 E. 32nd Pkwy, Aurora, Colorado 80011 USA
Phone: 303−675−2175 or 800−344−3860 Toll Free USA/Canada
Fax: 303−675−2176 or 800−344−3867 Toll Free USA/Canada
Email: orderlit@onsemi.com

N. American Technical Support: 800−282−9855 Toll Free USA/Canada
Europe, Middle East and Africa Technical Support:
Phone: 421 33 790 2910
Japan Customer Focus Center
Phone: 81−3−5817−1050

ON Semiconductor Website: **www.onsemi.com**

Order Literature: http://www.onsemi.com/orderlit

For additional information, please contact your local Sales Representative

X-ON Electronics

Largest Supplier of Electrical and Electronic Components

Click to view similar products for ON Semiconductor ***manufacturer:***

Other Similar products are found below :

1.5SMC82AT3G 74LCX574WM STK621-068C-E KAF-0402-ABA-CD-B2 NBXSBA017LN1TAG KAF-3200-ABA-CP-B2 STK621-728S-E AMIS30621AUA STK531U340A-E STK760-304-E FJAF6810DTU DBD250G STK621-713-E TIP115 LB11847-E NBXHBA017LN1TAG LV8736V-MPB-H NCP694H12HT1G LA4631VC-XE CAT1025WI-25-G NDF04N60ZG-001 LA78040B-S-E NGTB30N120IHLWG LA6584M-MPB-E NVB60N06T4G LA6245P-CL-TLM-E STK621-043D-E BTA30H-600CW3G NBXHBA017LNHTAG P6SMB100AT3G NCP1129AP100G LV8406T-TLM-E MC100EL13DWG NGTB30N60SWG FW217A-TL-2WX FGPF4533 MC33201DG KA78L05AZTA KA378R33TU FST3126MX LV4904V-MPB-E STK672-400 SBM30-03-TR-E NCP1398BDR2G BTA25H-600CW3G LC89057W-VF4A-E NGB8206ANTF4G NB7VQ58MMNG CPH6531-TL-E NCP4683DSQ28T1G