

ON Semiconductor

Is Now



To learn more about onsemi™, please visit our website at
www.onsemi.com

onsemi and onsemi. and other names, marks, and brands are registered and/or common law trademarks of Semiconductor Components Industries, LLC dba "onsemi" or its affiliates and/or subsidiaries in the United States and/or other countries. onsemi owns the rights to a number of patents, trademarks, copyrights, trade secrets, and other intellectual property. A listing of onsemi product/patent coverage may be accessed at www.onsemi.com/site/pdf/Patent-Marking.pdf. onsemi reserves the right to make changes at any time to any products or information herein, without notice. The information herein is provided "as-is" and onsemi makes no warranty, representation or guarantee regarding the accuracy of the information, product features, availability, functionality, or suitability of its products for any particular purpose, nor does onsemi assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation special, consequential or incidental damages. Buyer is responsible for its products and applications using onsemi products, including compliance with all laws, regulations and safety requirements or standards, regardless of any support or applications information provided by onsemi. "Typical" parameters which may be provided in onsemi data sheets and/or specifications can and do vary in different applications and actual performance may vary over time. All operating parameters, including "Typicals" must be validated for each customer application by customer's technical experts. onsemi does not convey any license under any of its intellectual property rights nor the rights of others. onsemi products are not designed, intended, or authorized for use as a critical component in life support systems or any FDA Class 3 medical devices or medical devices with a same or similar classification in a foreign jurisdiction or any devices intended for implantation in the human body. Should Buyer purchase or use onsemi products for any such unintended or unauthorized application, Buyer shall indemnify and hold onsemi and its officers, employees, subsidiaries, affiliates, and distributors harmless against all claims, costs, damages, and expenses, and reasonable attorney fees arising out of, directly or indirectly, any claim of personal injury or death associated with such unintended or unauthorized use, even if such claim alleges that onsemi was negligent regarding the design or manufacture of the part. onsemi is an Equal Opportunity/Affirmative Action Employer. This literature is subject to all applicable copyright laws and is not for resale in any manner. Other names and brands may be claimed as the property of others.



ON Semiconductor®

FDS2672-F085

N-Channel UltraFET Trench® MOSFET

200V, 3.9A, 70mΩ

General Description

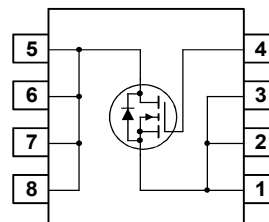
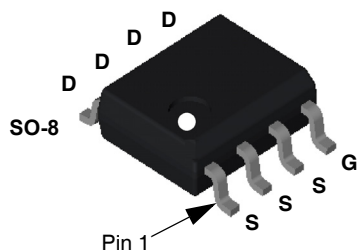
This single N-Channel MOSFET is produced using ON Semiconductor's advanced UltraFET Trench® process that has been especially tailored to minimize the on-state resistance and yet maintain superior switching performance.

Features

- Max $r_{DS(on)}$ = 70mΩ at V_{GS} = 10V, I_D = 3.9A
- Max $r_{DS(on)}$ = 80mΩ at V_{GS} = 6V, I_D = 3.5A
- Fast switching speed
- High performance trench technology for extremely low $r_{DS(on)}$
- Qualified to AEC Q101
- RoHS compliant

Application

- DC-DC conversion



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

Symbol	Parameter	Ratings	Units
V_{DS}	Drain to Source Voltage	200	V
V_{GS}	Gate to Source Voltage	±20	V
I_D	Drain Current -Continuous (Note 1a)	3.9	A
	-Pulsed	50	
E_{AS}	Single Pulse Avalanche Energy (Note 3)	37.5	mJ
P_D	Power Dissipation (Note 1a)	2.5	W
	Power Dissipation (Note 1b)	1.0	
T_J, T_{STG}	Operating and Storage Temperature	-55 to 150	°C

Thermal Characteristics

$R_{\theta JC}$	Thermal Resistance, Junction to Case (Note 1)	25	°C/W
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient (Note 1a)	50	
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient (Note 1b)	125	

Package Marking and Ordering Information

Device Marking	Device	Reel Size	Tape Width	Quantity
FDS2672	FDS2672-F085	13"	12mm	2500 units

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

Symbol	Parameter	Test Conditions	Min	Typ	Max	Units
--------	-----------	-----------------	-----	-----	-----	-------

Off Characteristics

BV_{DSS}	Drain to Source Breakdown Voltage	$I_D = 250\mu\text{A}$, $V_{GS} = 0\text{V}$	200			V
$\frac{\Delta BV_{DSS}}{\Delta T_J}$	Breakdown Voltage Temperature Coefficient	$I_D = 250\mu\text{A}$, referenced to 25°C		206		mV/ $^\circ\text{C}$
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS} = 160\text{V}$, $V_{GS} = 0\text{V}$ $V_{DS} = 160\text{V}$, $V_{GS} = 0\text{V}$, $T_J = 55^\circ\text{C}$			1 10	μA
I_{GSS}	Gate to Source Leakage Current	$V_{GS} = \pm 20\text{V}$			± 100	nA

On Characteristics (Note 2)

$V_{GS(th)}$	Gate to Source Threshold Voltage	$V_{GS} = V_{DS}$, $I_D = 250\mu\text{A}$	2	2.9	4	V
$\frac{\Delta V_{GS(th)}}{\Delta T_J}$	Gate to Source Threshold Voltage Temperature Coefficient	$I_D = 250\mu\text{A}$, referenced to 25°C		-11		mV/ $^\circ\text{C}$
$r_{DS(on)}$	Drain to Source On Resistance	$V_{GS} = 10\text{V}$, $I_D = 3.9\text{A}$		59	70	m Ω
		$V_{GS} = 6\text{V}$, $I_D = 3.5\text{A}$		63	80	
		$V_{GS} = 10\text{V}$, $I_D = 3.9\text{A}$, $T_J = 125^\circ\text{C}$		124	148	
g_{FS}	Forward Transconductance	$V_{DS} = 10\text{V}$, $I_D = 3.9\text{A}$		15		S

Dynamic Characteristics

C_{iss}	Input Capacitance	$V_{DS} = 100\text{V}$, $V_{GS} = 0\text{V}$, $f = 1\text{MHz}$		1905	2535	pF
C_{oss}	Output Capacitance			100	135	pF
C_{rss}	Reverse Transfer Capacitance			30	45	pF
R_g	Gate Resistance	$f = 1\text{MHz}$		0.7		Ω

Switching Characteristics

$t_{d(on)}$	Turn-On Delay Time	$V_{DD} = 100\text{V}$, $I_D = 3.9\text{A}$ $V_{GS} = 10\text{V}$, $R_{GEN} = 6\Omega$		22	35	ns
t_r	Rise Time			10	20	ns
$t_{d(off)}$	Turn-Off Delay Time			35	56	ns
t_f	Fall Time			10	20	ns
$Q_g(TOT)$	Total Gate Charge at 10V	$V_{DD} = 100\text{V}$, $I_D = 3.9\text{A}$		33	46	nC
Q_{gs}	Gate to Source Gate Charge			11		nC
Q_{gd}	Gate to Drain "Miller" Charge			7		nC

Drain-Source Diode Characteristics

V_{SD}	Source to Drain Diode Voltage	$V_{GS} = 0\text{V}$, $I_S = 3.9\text{A}$		0.75	1.2	V
t_{rr}	Reverse Recovery Time	$I_F = 3.9\text{A}$, $di/dt = 100\text{A}/\mu\text{s}$		67	101	ns
Q_{rr}	Reverse Recovery Charge	$I_F = 3.9\text{A}$, $di/dt = 100\text{A}/\mu\text{s}$		179	269	nC

Notes:

1: $R_{\theta JA}$ 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 $R_{\theta CA}$ is determined by the user's board design.



Scale 1:1 on letter size paper

a) $50^\circ\text{C}/\text{W}$ (10 sec)
 $62.5^\circ\text{C}/\text{W}$ steady state
 when mounted on a 1in^2
 pad of 2 oz copper



b) $125^\circ\text{C}/\text{W}$ when mounted on a
 minimum pad.

2: Pulse Test: Pulse Width < 300 μs , Duty Cycle < 2.0%.

3: Starting $T_J = 25^\circ\text{C}$, $L = 3\text{mH}$, $I_{AS} = 5\text{A}$, $V_{DD} = 100\text{V}$, $V_{GS} = 10\text{V}$

Typical Characteristics $T_J = 25^\circ\text{C}$ unless otherwise noted

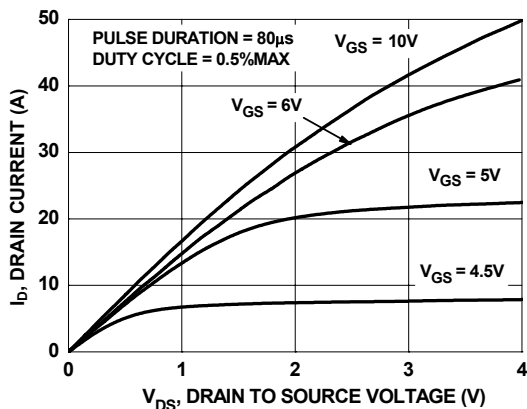


Figure 1. On Region Characteristics

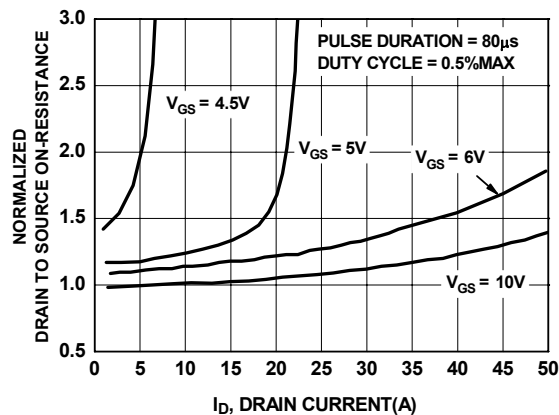


Figure 2. Normalized On-Resistance vs Drain Current and Gate Voltage

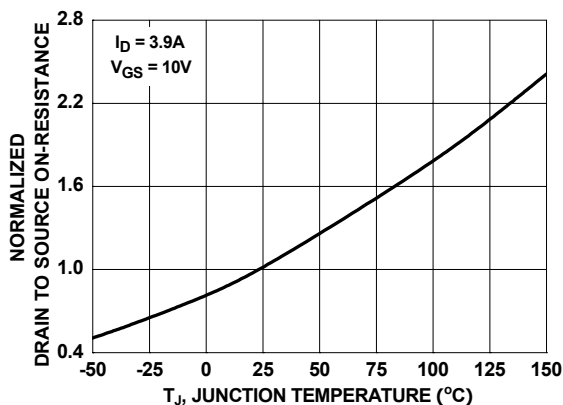


Figure 3. Normalized On Resistance vs Junction Temperature

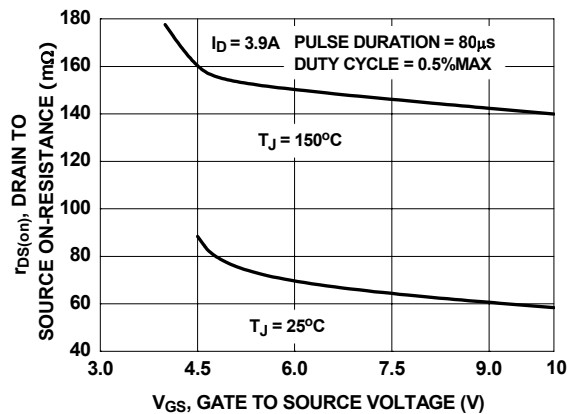


Figure 4. On-Resistance vs Gate to Source Voltage

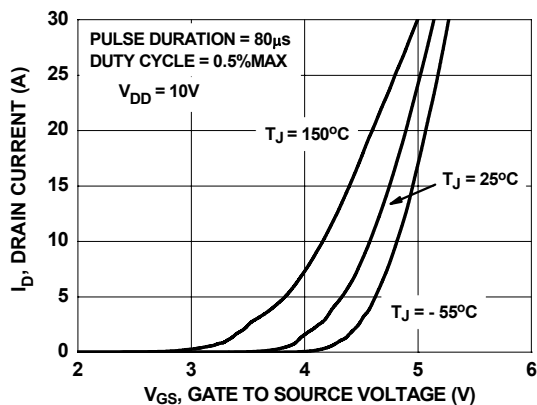


Figure 5. Transfer Characteristics

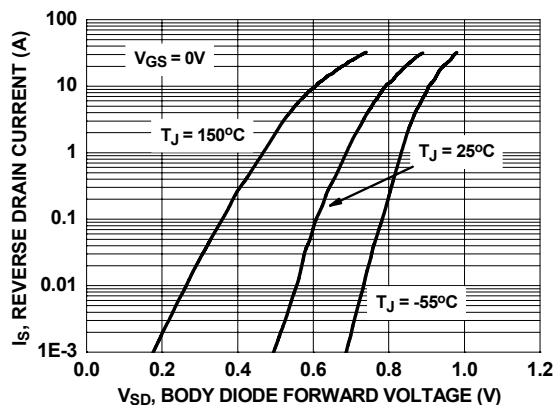


Figure 6. Source to Drain Diode Forward Voltage vs Source Current

Typical Characteristics $T_J = 25^\circ\text{C}$ unless otherwise noted

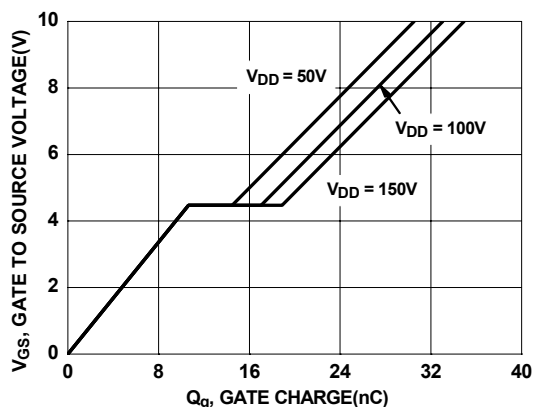


Figure 7. Gate Charge Characteristics

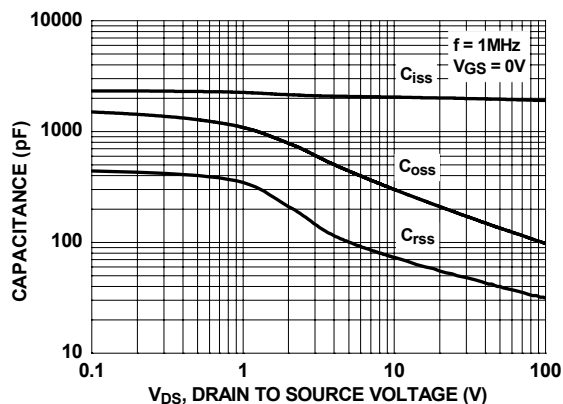


Figure 8. Capacitance vs Drain to Source Voltage

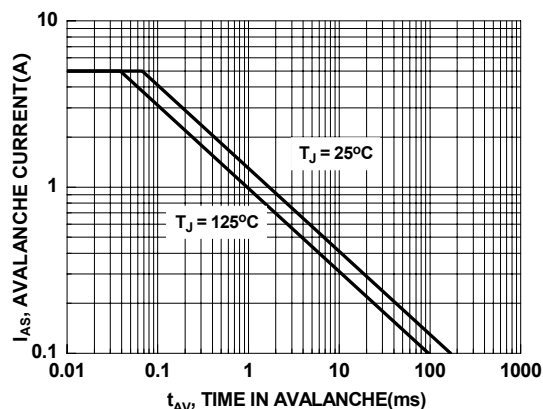


Figure 9. Unclamped Inductive Switching Capability

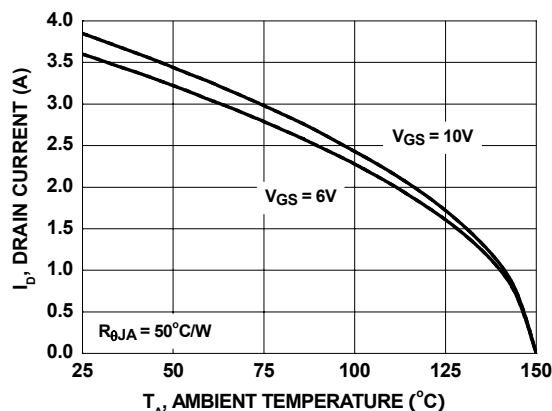


Figure 10. Ambient Continuous Drain Current vs Case Temperature

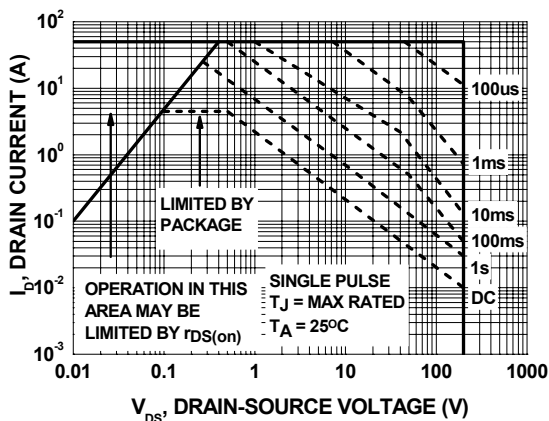


Figure 11. Forward Bias Safe Operating Area

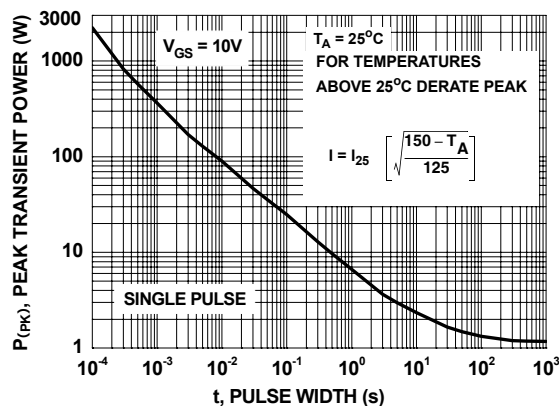
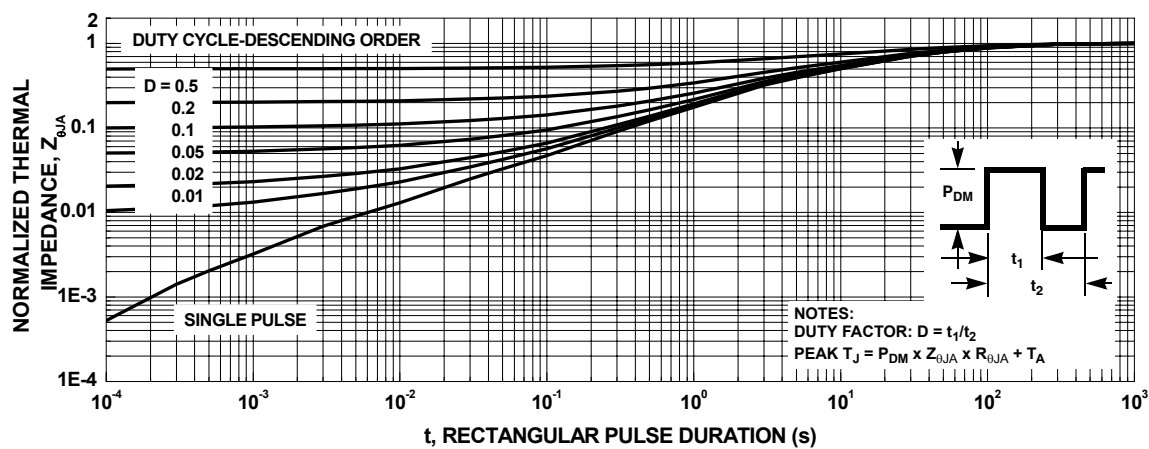


Figure 12. Single Pulse Maximum Power Dissipation

Typical Characteristics $T_J = 25^\circ\text{C}$ unless otherwise noted



ON Semiconductor and  are trademarks of Semiconductor Components Industries, LLC dba ON Semiconductor or its subsidiaries in the United States and/or other countries. ON Semiconductor owns the rights to a number of patents, trademarks, copyrights, trade secrets, and other intellectual property. A listing of ON Semiconductor's product/patent coverage may be accessed at www.onsemi.com/site/pdf/Patent-Marking.pdf. ON Semiconductor reserves the right to make changes without further notice to any products herein. ON Semiconductor makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does ON Semiconductor assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation special, consequential or incidental damages. Buyer is responsible for its products and applications using ON Semiconductor products, including compliance with all laws, regulations and safety requirements or standards, regardless of any support or applications information provided by ON Semiconductor. "Typical" parameters which may be provided in ON Semiconductor data sheets and/or specifications can and do vary in different applications and actual performance may vary over time. All operating parameters, including "Typicals" must be validated for each customer application by customer's technical experts. ON Semiconductor does not convey any license under its patent rights nor the rights of others. ON Semiconductor products are not designed, intended, or authorized for use as a critical component in life support systems or any FDA Class 3 medical devices or medical devices with a same or similar classification in a foreign jurisdiction or any devices intended for implantation in the human body. Should Buyer purchase or use ON Semiconductor products for any such unintended or unauthorized application, Buyer shall indemnify and hold ON Semiconductor and its officers, employees, subsidiaries, affiliates, and distributors harmless against all claims, costs, damages, and expenses, and reasonable attorney fees arising out of, directly or indirectly, any claim of personal injury or death associated with such unintended or unauthorized use, even if such claim alleges that ON Semiconductor was negligent regarding the design or manufacture of the part. ON Semiconductor is an Equal Opportunity/Affirmative Action Employer. This literature is subject to all applicable copyright laws and is not for resale in any manner.

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

Mouser Electronics

Authorized Distributor

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

[onsemi:](#)

[FDS2672-F085](#)