ON Semiconductor®

FDS8958B

Dual N & P-Channel PowerTrench® MOSFET
Q1-N-Channel: 30 V, 6.4 A, 26 mΩ Q2-P-Channel: -30 V, -4.5 A, 51 mΩ

Features

Q1: N-Channel

- Max $r_{DS(on)}$ = 26 mΩ at V_{GS} = 10 V, I_D = 6.4 A
- Max $r_{DS(on)}$ = 39 mΩ at V_{GS} = 4.5 V, I_D = 5.2 A

Q2: P-Channel

- Max $r_{DS(on)}$ = 51 mΩ at V_{GS} = -10 V, I_D = -4.5 A
- Max $r_{DS(on)}$ = 80 mΩ at V_{GS} = -4.5 V, I_D = -3.3 A
- HBM ESD protection level > 3.5 kV (Note 3)
- RoHS Compliant

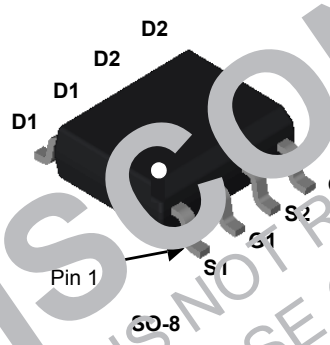
General Description

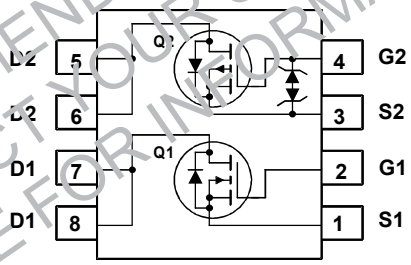
These dual N- and P-Channel enhancement mode power field effect transistors are produced using ON Semiconductor's advanced PowerTrench® process that has been especially tailored to minimize on-state resistance and yet maintain superior switching performance.

These devices are well suited for low voltage and battery powered applications where low inline power loss and fast switching are required.

Applications

- DC-DC Conversion
- Brush and motor drive inverter





MOSFET Maximum Ratings T_A = 25 °C unless otherwise noted

Symbol	Parameter			Q1	Q2	Units
V_{DS}	Drain to Source Voltage			30	-30	V
V_{GS}	Gate to Source Voltage			±20	±25	V
I_D	Drain Current - Continuous	T_A = 25 °C		6.4	-4.5	A
	- Pulsed			30	-30	
P_D	Power Dissipation for Dual Operation			2.0		W
	Power Dissipation for Single Operation	T_A = 25 °C	(Note 1a)	1.6		
		T_A = 25 °C	(Note 1b)	0.9		
E_{AS}	Single Pulse Avalanche Energy		(Note 4)	18	5	mJ
T_J, T_{STG}	Operating and Storage Junction Temperature Range			-55 to +150		°C

Thermal Characteristics

$R_{\theta JC}$	Thermal Resistance, Junction to Case	(Note 1)	40	°C/W
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient	(Note 1a)	78	

Package Marking and Ordering Information

Device Marking	Device	Package	Reel Size	Tape Width	Quantity
FDS8958B	FDS8958B	SO-8	13 ”	12 mm	2500 units

DISCONTINUED
THIS DEVICE IS NOT RECOMMENDED FOR NEW DESIGN
PLEASE CONTACT YOUR onsemi
REPRESENTATIVE FOR INFORMATION

©2008 Semiconductor Components Industries, LLC.

Electrical Characteristics T_J = 25 °C unless otherwise noted

Symbol	Parameter	Test Conditions	Type	Min	Typ	Max	Units
Off Characteristics							
BV_{DSS}	Drain to Source Breakdown Voltage	I_D = 250 μA, V_{GS} = 0 V I_D = -250 μA, V_{GS} = 0 V	Q1 Q2	30 -30			V
$\frac{\Delta BV_{DSS}}{\Delta T_J}$	Breakdown Voltage Temperature Coefficient	I_D = 250 μA, referenced to 25 °C I_D = -250 μA, referenced to 25 °C	Q1 Q2		24 -21		mV/°C
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS} = 24 V, V_{GS} = 0 V V_{DS} = -24 V, V_{GS} = 0 V	Q1 Q2			1 -1	μA
I_{GSS}	Gate to Source Leakage Current	V_{GS} = ±20 V, V_{DS} = 0 V V_{GS} = ±25 V, V_{DS} = 0 V	Q1 Q2			±100 ±10	nA μA
On Characteristics							
$V_{GS(th)}$	Gate to Source Threshold Voltage	V_{GS} = V_{DS}, I_D = 250 μA V_{GS} = V_{DS}, I_D = -250 μA	Q1 Q2	1.0 -1.0	2.0 -1.9	3.0 -3.0	V
$\frac{\Delta V_{GS(th)}}{\Delta T_J}$	Gate to Source Threshold Voltage Temperature Coefficient	I_D = 250 μA, referenced to 25 °C I_D = -250 μA, referenced to 25 °C	Q1 Q2		5		mV/°C
$r_{DS(on)}$	Static Drain to Source On Resistance	V_{GS} = 10 V, I_D = 6.4 A V_{GS} = 4.5 V, I_D = 5.2 A V_{GS} = 10 V, I_D = 6.4 A, T_J = 125 °C	Q1		21 29 31	26 39 39	mΩ
		V_{GS} = -10 V, I_D = -6.4 A V_{GS} = -4.5 V, I_D = -5.2 A V_{GS} = -10 V, I_D = -6.4 A, T_J = 125 °C	Q2		38 60 53	51 80 72	
g_{FS}	Forward Transconductance	V_{DD} = 5 V, I_D = 6.4 A V_{DD} = -5 V, I_D = -4.5 A	Q1 Q2		20 10		S
Dynamic Characteristics							
C_{iss}	Input Capacitance	Q1 V_{DS} = 15 V, V_{GS} = 0 V, f = 1 MHZ Q2 V_{DS} = -15 V, V_{GS} = 0 V, f = 1 MHZ	Q1 Q2		405 570	540 760	pF
C_{oss}	Output Capacitance		Q1 Q2		75 115	100 155	pF
C_{rss}	Reverse Transfer Capacitance		Q1 Q2		55 100	80 150	pF
R_g	Gate Resistance		Q1 Q2		2.4 4.4		Ω
Switching Characteristics							
$t_{d(on)}$	Turn-On Delay Time	Q1 V_{DD} = 15 V, I_D = 6.4 A, V_{GS} = 10 V, R_{GEN} = 6 Ω Q2 V_{DD} = -15 V, I_D = -4.5 A, V_{GS} = -10 V, R_{GEN} = 6 Ω	Q1 Q2		4.3 6.0	10 12	ns
t_r	Rise Time		Q1 Q2		2.0 6.0	10 12	ns
$t_{d(off)}$	Turn-Off Delay Time		Q1 Q2		12 17	22 30	ns
t_f	Fall Time		Q1 Q2		2.0 7.0	10 14	ns
$Q_{g(TOT)}$	Total Gate Charge	V_{GS} = 10 V V_{GS} = -10 V Q1 V_{DD} = 15 V, I_D = 6.4 A	Q1 Q2		8.3 14	12 19	nC
$Q_{g(TOT)}$	Total Gate Charge	V_{GS} = 4.5 V V_{GS} = -4.5 V	Q1 Q2		4.1 7.0	5.8 9.6	nC
Q_{gs}	Gate to Source Charge	Q2 V_{DD} = -15 V, I_D = -4.5 A	Q1 Q2		1.3 1.9		nC
Q_{gd}	Gate to Drain “Miller” Charge		Q1 Q2		1.7 3.6		nC

DISCONTINUED
THIS DEVICE IS NOT RECOMMENDED FOR NEW DESIGN
PLEASE CONTACT YOUR onsemi
REPRESENTATIVE FOR INFORMATION

Electrical Characteristics T_J = 25 °C unless otherwise noted

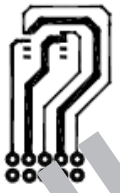
Symbol	Parameter	Test Conditions	Type	Min	Typ	Max	Units
Drain-Source Diode Characteristics							
V_{SD}	Source to Drain Diode Forward Voltage	V_{GS} = 0 V, I_S = 1.3 A (Note 2) V_{GS} = 0 V, I_S = -1.3 A (Note 2)	Q1 Q2		0.8 -0.8	1.2 -1.2	V
t_{rr}	Reverse Recovery Time	Q1 I_F = 6.4 A, di/dt = 100 A/μs	Q1 Q2		17 20	30 36	ns
Q_{rr}	Reverse Recovery Charge	Q2 I_F = -4.5 A, di/dt = 100 A/μs	Q1 Q2		6 8	12 16	nC

NOTES:

1. $R_{\theta JA}$ is determined with the device mounted on a 1 in^2 pad 2 oz copper pad on a 1.5 x 1.5 in. board of FR-4 material. $R_{\theta JC}$ is guaranteed by design while $R_{\theta CA}$ is determined by the user's board design.



a) 78 °C/W when mounted on a 1 in^2 pad of 2 oz copper



b) 135 °C/W when mounted on a minimum pad

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

3. The diode connected between the gate and source serves only as protection against ESD. No gate overvoltage rating is implied.

4. UIL condition: Starting T_J = 25 °C, L = 1 mH, I_{AS} = 6 A, V_{DD} = 27 V, V_{GS} = 10 V . (Q1)

Starting T_J = 25 °C, L = 1 mH, I_{AS} = -4 A, V_{DD} = -27 V, V_{GS} = -10 V. (Q2)

DISCONTINUED
THIS DEVICE IS NOT RECOMMENDED FOR NEW DESIGN
PLEASE CONTACT YOUR onsemi
REPRESENTATIVE FOR INFORMATION

Typical Characteristics (Q1 N-Channel) T_J = 25 °C unless otherwise noted

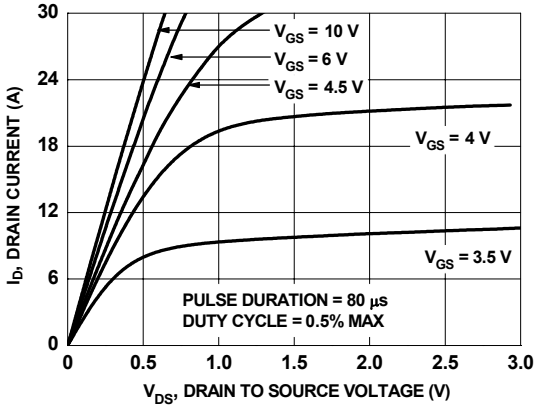


Figure 1. On Region Characteristics

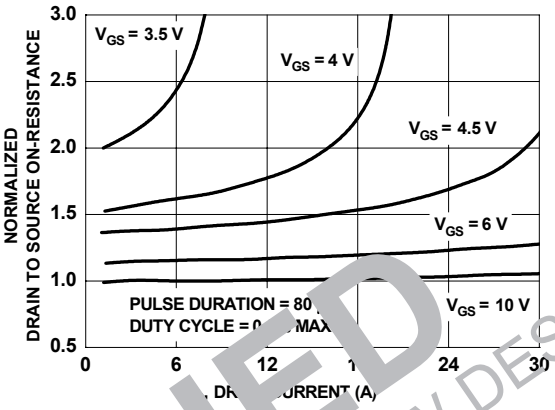


Figure 2. Normalized On-Resistance vs Drain Current and Gate Voltage

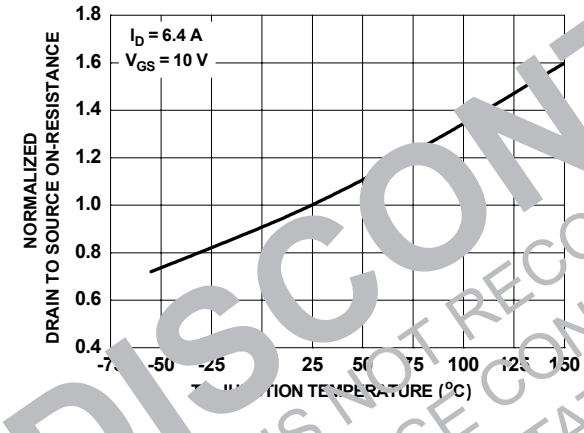


Figure 3. Normalized On-Resistance vs Junction Temperature

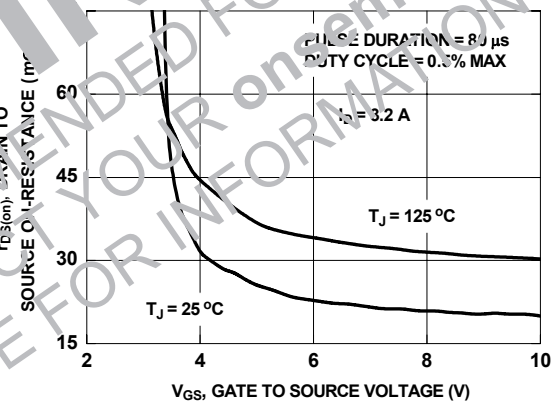


Figure 4. On-Resistance vs Gate to Source Voltage

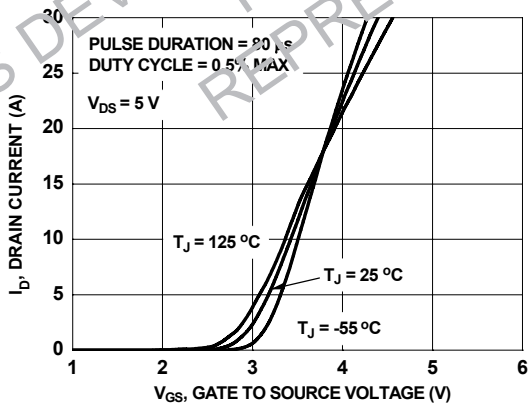


Figure 5. Transfer Characteristics

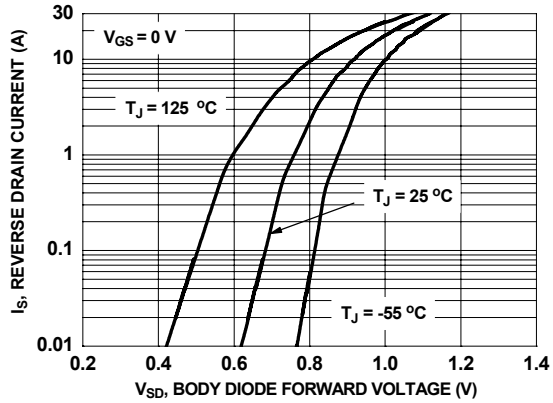


Figure 6. Source to Drain Diode Forward Voltage vs Source Current

DISCONTINUED
THIS DEVICE IS NOT RECOMMENDED FOR NEW DESIGN
PLEASE CONTACT YOUR onsemi
REPRESENTATIVE FOR INFORMATION

Typical Characteristics (Q1 N-Channel) T_J = 25 °C unless otherwise noted

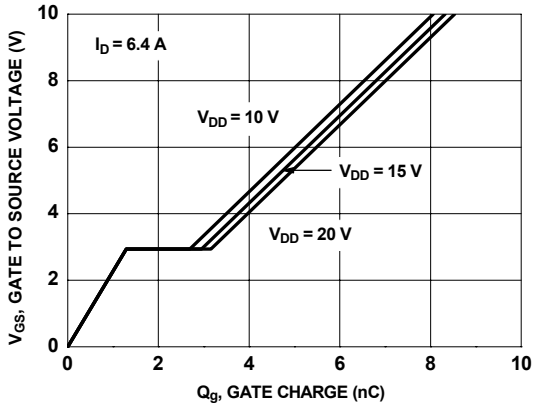


Figure 7. Gate Charge Characteristics

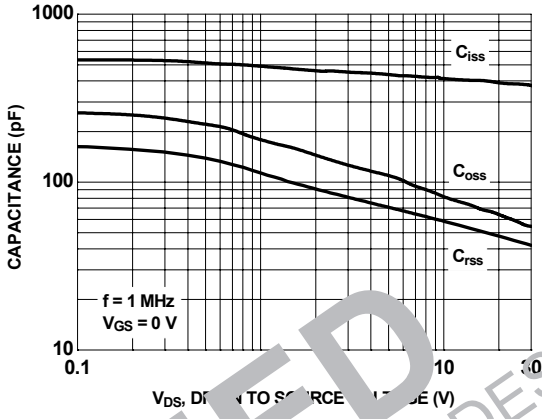


Figure 8. Capacitance vs Drain to Source Voltage

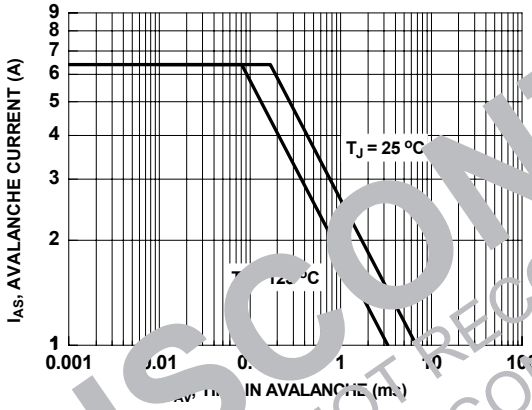


Figure 9. Unclamped Inductive Switching Capability

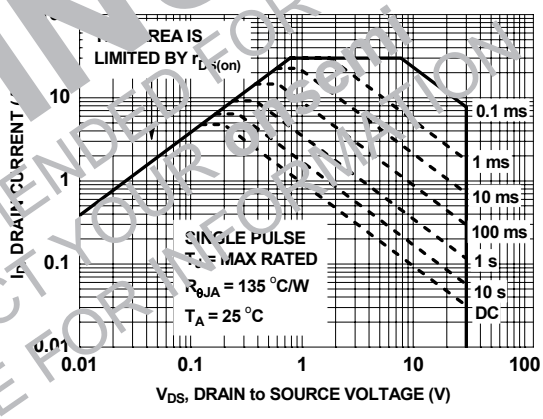


Figure 10. Forward Bias Safe Operating Area

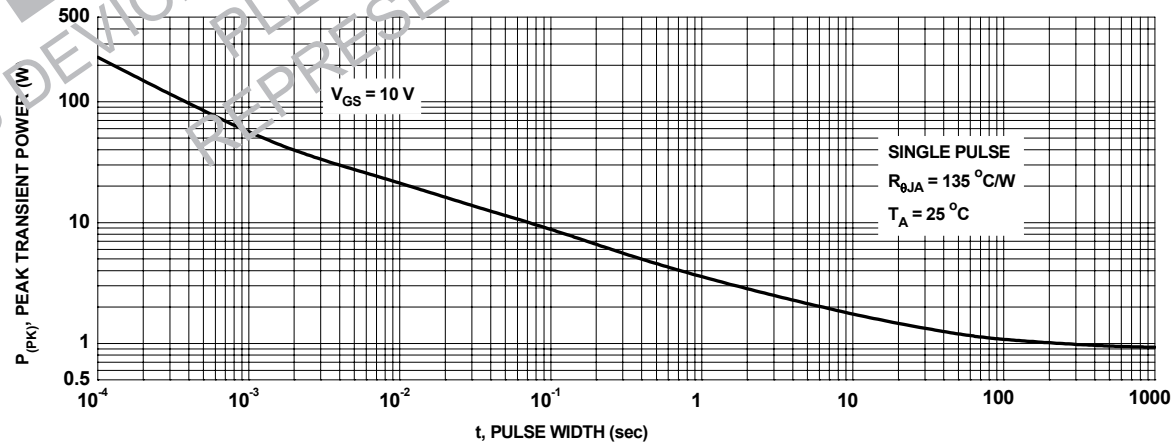


Figure 11. Single Pulse Maximum Power Dissipation

DISCONTINUED
THIS DEVICE IS NOT RECOMMENDED FOR NEW DESIGN
PLEASE CONTACT YOUR onsemi
REPRESENTATIVE FOR INFORMATION

Typical Characteristics (Q1 N-Channel) T_J = 25 °C unless otherwise noted

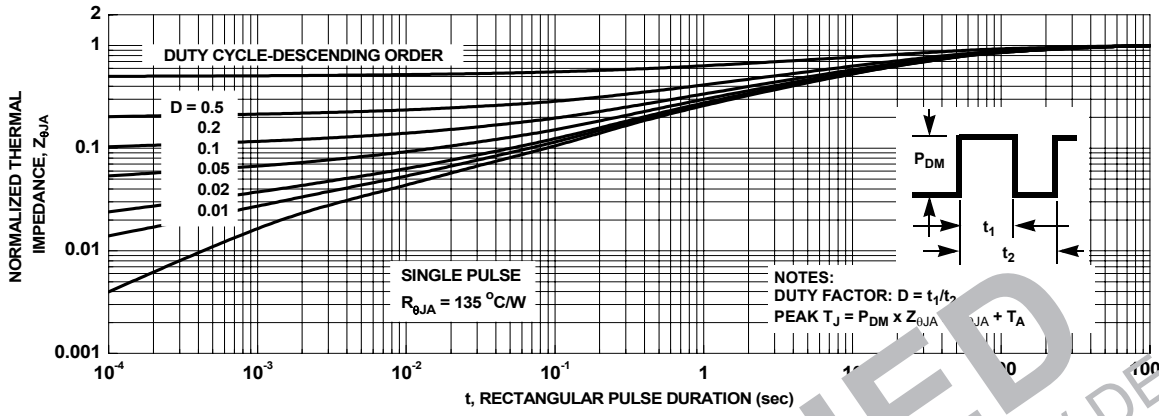


Figure 12. Junction-to-Ambient Transient Thermal Response Curve

DISCONTINUED
THIS DEVICE IS NOT RECOMMENDED FOR NEW DESIGN
PLEASE CONTACT YOUR onsemi
REPRESENTATIVE FOR INFORMATION

Typical Characteristics (Q2 P-Channel) T_J = 25 °C unless otherwise noted

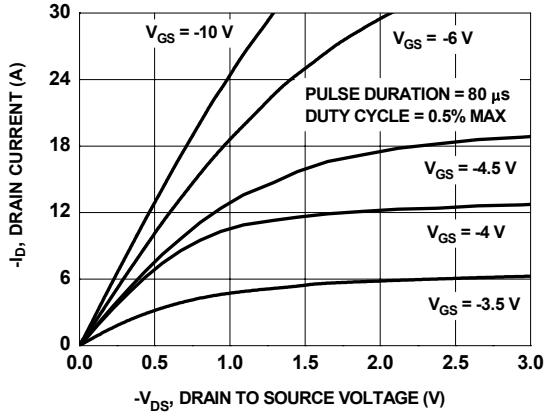


Figure 15. On- Region Characteristics

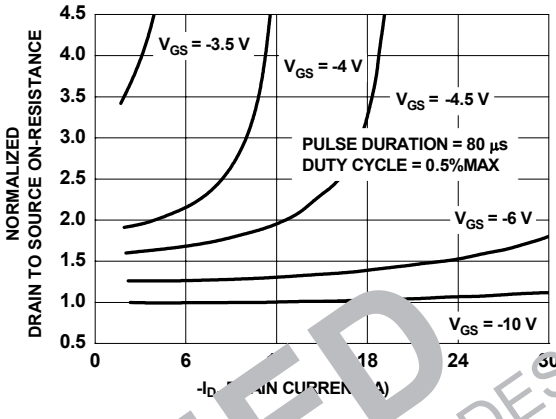


Figure 16. Normalized On-Resistance vs Drain Current and Gate Voltage

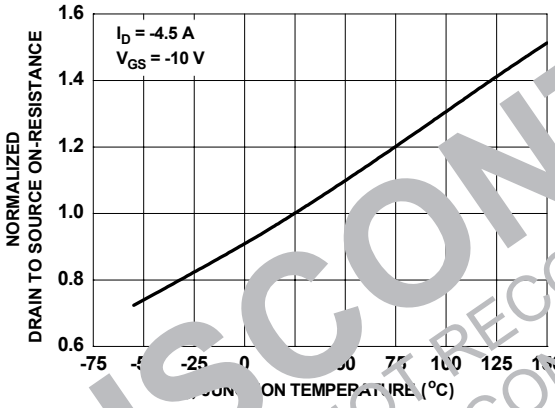


Figure 17. Normalized On-Resistance vs Junction Temperature

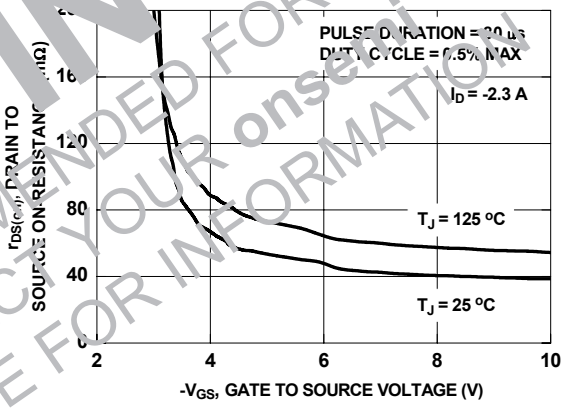


Figure 18. On-Resistance vs Gate to Source Voltage

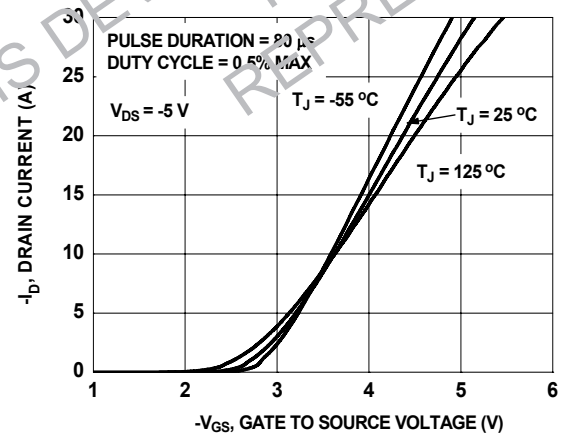


Figure 19. Transfer Characteristics

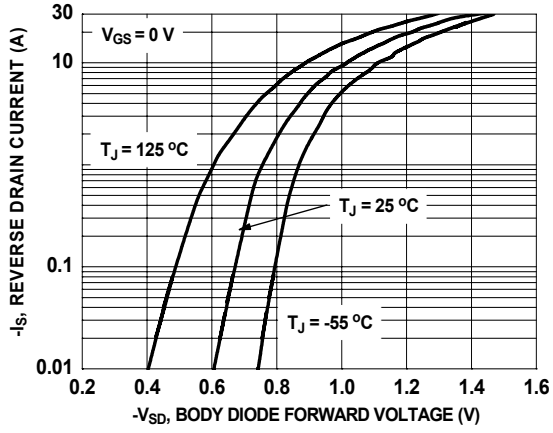


Figure 20. Source to Drain Diode Forward Voltage vs Source Current

DISCONTINUED
THIS DEVICE IS NOT RECOMMENDED FOR NEW DESIGN
PLEASE CONTACT YOUR onsemi
REPRESENTATIVE FOR INFORMATION

Typical Characteristics (Q2 P-Channel) T_J = 25 °C unless otherwise noted

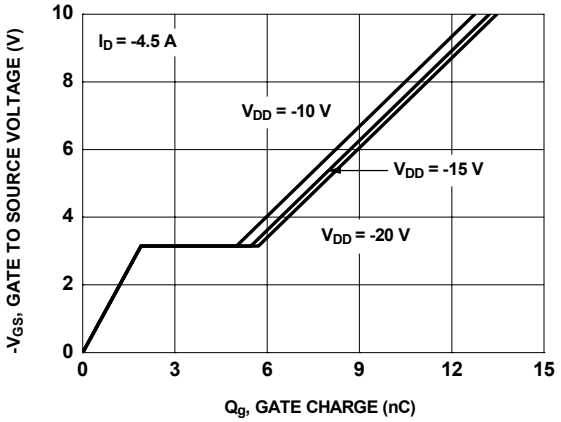


Figure 21. Gate Charge Characteristics

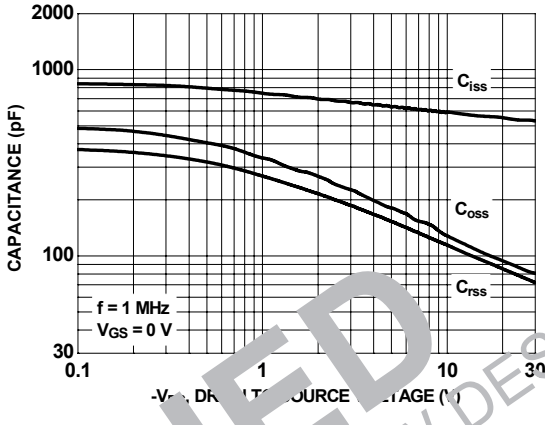


Figure 22. Capacitance vs Drain to Source Voltage

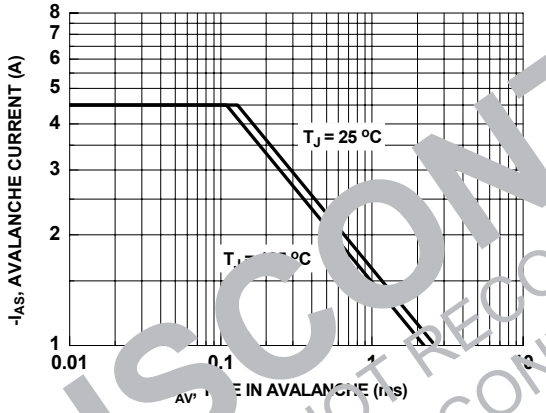


Figure 23. Unclamped Inductive Switching Capability

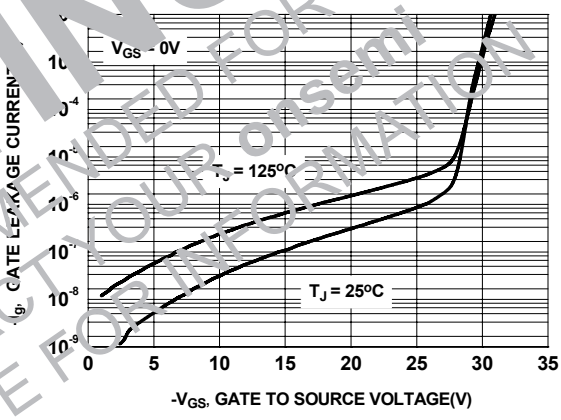


Figure 24. Ig vs Vgs

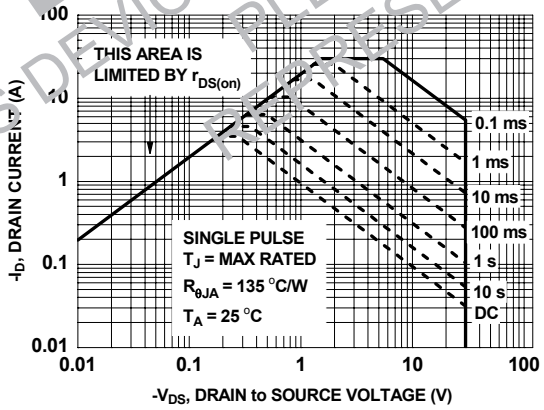


Figure 25. Forward Bias Safe Operating Area

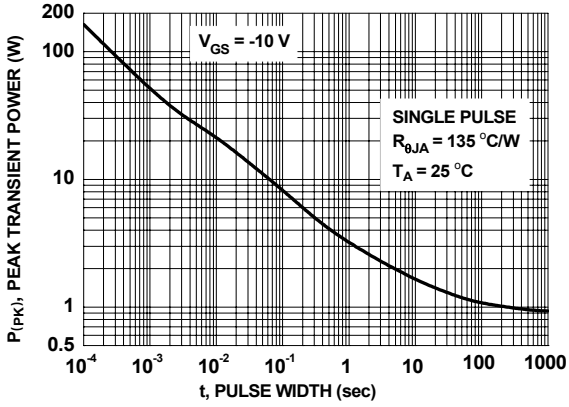


Figure 26. Single Pulse Maximum Power Dissipation

DISCONTINUED
THIS DEVICE IS NOT RECOMMENDED FOR NEW DESIGN
PLEASE CONTACT YOUR onsemi
REPRESENTATIVE FOR INFORMATION

Typical Characteristics (Q2 P-Channel) T_J = 25 °C unless otherwise noted

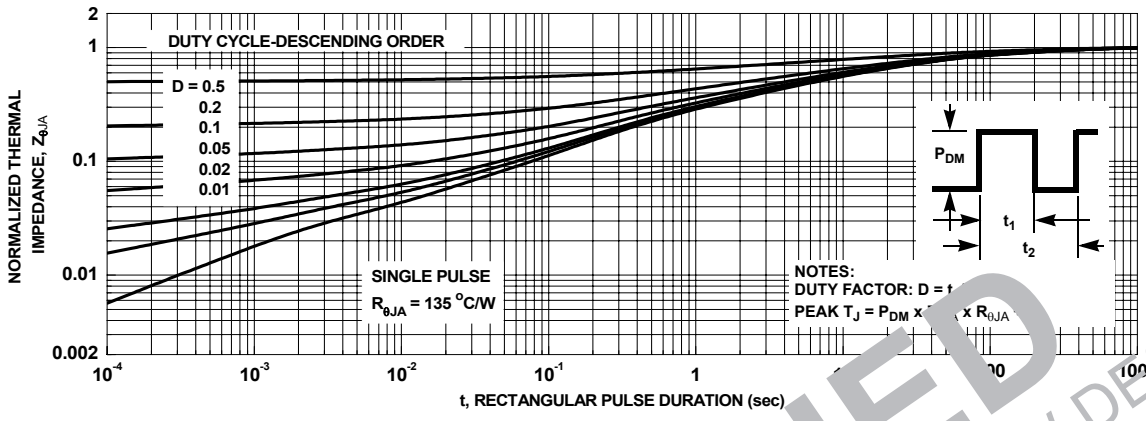


Figure 27. Junction-to-Ambient Transient Thermal Response Curve

DISCONTINUED
THIS DEVICE IS NOT RECOMMENDED FOR NEW DESIGN
PLEASE CONTACT YOUR onsemi
REPRESENTATIVE FOR INFORMATION

Physical Dimensions

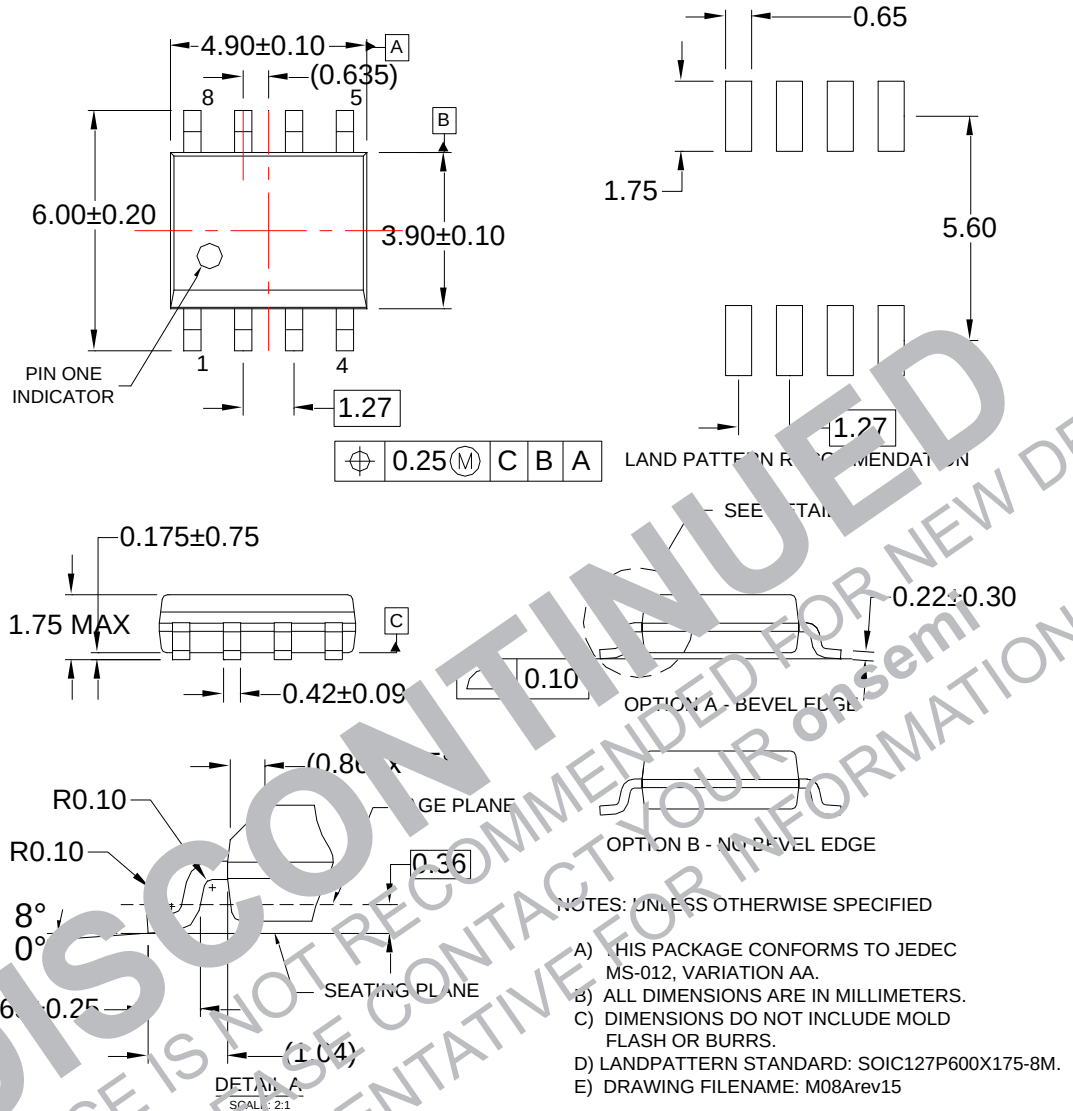


Figure 16. 8-Lead, SOIC,JEDEC MS-012, .150-inch Narrow Body

Package drawings are provided as a service to customers considering ON Semiconductor components. Drawings may change in any manner without notice. Please note the revision and/or date on the drawing and contact a ON Semiconductor representative to verify or obtain the most recent revision. Package specifications do not expand the terms of ON Semiconductor's worldwide terms and conditions, specifically the warranty therein, which covers ON Semicondutor products.

DISCONTINUED
THIS DEVICE IS NOT RECOMMENDED FOR NEW DESIGN
PLEASE CONTACT YOUR onsemi
REPRESENTATIVE FOR INFORMATION

DISCONTINUED
THIS DEVICE IS NOT RECOMMENDED FOR NEW DESIGN
PLEASE CONTACT YOUR onsemi
REPRESENTATIVE FOR INFORMATION

ON Semiconductor and ON 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

ENTEGRECİ

Bu belge www.entegreci.com üzerinden sunulmaktadır.

Elektronik komponent tedarikinde Entegreci

Entegreci, Eskişehir merkezli, Türkiye geneline satış yapan bir elektronik komponent mağazasıdır. Entegreler (IC), mikrodenetleyiciler, transistörler, diyotlar, pasif elemanlar, konnektörler, modüller ve geliştirme kartları tek adetten seri üretim adetlerine kadar satılır. Ürün sayfalarında güncel stok durumunu, fiyatı ve datasheet bağlantısını bulabilirsiniz.

Parça koduyla arama

Üretici parça numarasını yazın; stok ve fiyatı hemen görün.

www.entegreci.com

Ürün kategorileri

Entegreden kapasitöre tüm elektronik komponent kategorileri.

Kategorilere göz atın

Üreticiler

Aradığınız üreticinin ürünlerini tek sayfada inceleyin.

Üreticileri görün

Toplu alım ve teklif

Listede olmayan ya da yüksek adetli parçalar için teklif isteyin.

Teklif isteyin

www.entegreci.com | **destek@entegreci.com** | **0850 305 90 34**

Entegreci is an online electronic components store based in Türkiye. Search by manufacturer part number to see stock, prices and datasheets for integrated circuits, microcontrollers, transistors, passive components and connectors, or request a quote for parts that are not listed.

Bu sayfa Entegreci tarafından eklenmiştir. Belgenin önceki sayfaları asıl yayıncısına aittir ve içeriği değiştirilmemiştir; en güncel sürüm için belgenin yayıncısına başvurun.