

N-Channel 30 V (D-S) MOSFET


RoHS
 COMPLIANT

PRODUCT SUMMARY

V_{DS} (V)	$R_{DS(on)}$ (m Ω) (Typ.)	I_D (mA) ^a	Q_g (Typ.)
30	465 at $V_{GS} = 4.5$ V	400	2.6 nC
	575 at $V_{GS} = 2.5$ V		

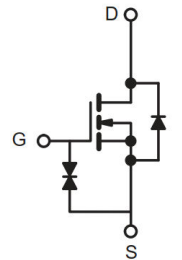
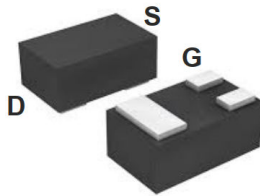
FEATURES

- DT-Trench Power MOSFET
- Worldwide Smallest Package
- Fast switching
- 2KV HBM ESD Capability

APPLICATIONS

- Notebook
- Battery Applications
- Hand-held Instruments

SOT-883 Pin Configuration



N-Channel MOSFET

ABSOLUTE MAXIMUM RATINGS ($T_C = 25^\circ\text{C}$, unless otherwise noted)

PARAMETER	SYMBOL	LIMIT	UNIT
Drain-Source Voltage	V_{DS}	30	V
Gate-Source Voltage	V_{GS}	± 12	
Continuous Drain Current ($T_J = 150^\circ\text{C}$)	I_D	400	mA
		250	
Pulsed Drain Current	I_{DM}	1600	
Power Dissipation ($T_C = 25^\circ\text{C}$)	P_D	155 ^{b,c}	mW
Power Dissipation - Derate above 25°C		1.25	mW/ $^\circ\text{C}$
Operating Junction and Storage Temperature Range	T_J, T_{stg}	-55 to +150	$^\circ\text{C}$
Soldering Recommendations (Peak Temperature)		260	

THERMAL RESISTANCE RATINGS

PARAMETER	SYMBOL	LIMIT	UNIT
Junction-to-Ambient (PCB Mount) ^{b,d}	R_{thJA}	800	$^\circ\text{C}/\text{W}$

Notes:

a. $T_C = 25^\circ\text{C}$.

b. Surface mounted on 1" x 1" FR4 board.

c. $t = 10$ s.

d. Maximum under steady state conditions is $900^\circ\text{C}/\text{W}$.

SPECIFICATIONS ($T_J = 25\text{ }^{\circ}\text{C}$, unless otherwise noted)

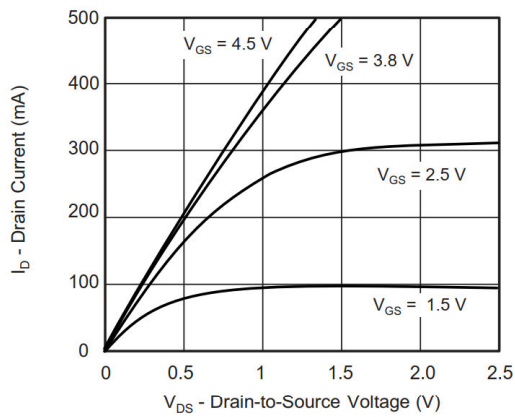
PARAMETER	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
Static						
Drain-Source Breakdown Voltage	V _{DS}	V _{GS} = 0 V, I _D = 250 μA	30	-	-	V
Gate Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = 250 μA	0.5	-	1.5	
Gate-Body Leakage	I _{GSS}	V _{DS} = 0 V, V _{GS} = ± 12 V	-	-	± 20	μA
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = 30 V, V _{GS} = 0 V	-	-	1	μA
		V _{DS} = 24 V, V _{GS} = 0 V, T _J = 125 °C	-	-	10	
On-State Drain Current ^a	I _{D(on)}	V _{DS} ≥ 10 V, V _{GS} = 10 V	400	-	-	mA
Drain-Source On-State Resistance ^a	R _{DS(on)}	V _{GS} = 4.5 V, I _D = 0.2 A	-	465	560	mΩ
		V _{GS} = 2.5 V, I _D = 0.1 A	-	575	750	
Forward Transconductance ^a	g _{fs}	V _{DS} = 5 V, I _D = 0.3 A	-	1	-	S
Dynamic ^b						
Input Capacitance	C _{iss}	V _{GS} = 0 V, V _{DS} = 15 V, f = 1 MHz	-	73	-	pF
Output Capacitance	C _{oss}		-	18	-	
Reverse Transfer Capacitance	C _{rss}		-	7.5	-	
Total Gate Charge ^c	Q _g	V _{DS} = 15 V, V _{GS} = 4.5 V, I _D = 0.3 A	-	2.6	-	nC
Gate-Source Charge ^c	Q _{gs}		-	0.9	-	
Gate-Drain Charge ^c	Q _{gd}		-	0.6	-	
Turn-On Delay Time ^c	t _{d(on)}	V _{DD} = 15 V, I _b = 0.3 A, R _g = 10 Ω V _{GS} = 4.5 V	-	5.5	-	ns
Rise Time ^c	t _r		-	4	-	
Turn-Off Delay Time ^c	t _{d(off)}		-	15	-	
Fall Time ^c	t _f		-	6.5	-	
Drain-Source Body Diode Ratings and Characteristics ^b (T _C = 25 °C)						
Continuous Source-Drain Diode Current	I _S	T _C = 25 °C	-	-	400	mA
Pulsed Current (t = 100 μs)	I _{SM}		-	-	1600	mA
Forward Voltage ^a	V _{SD}	I _S = 0.2 A, V _{GS} = 0 V	-	-	1	V
Reverse Recovery Time	t _{rr}	I _S = 0.3 A, di/dt = 100 A/μs	-	13	-	ns
Reverse Recovery Charge	Q _{rr}		-	6	-	nC

Notes

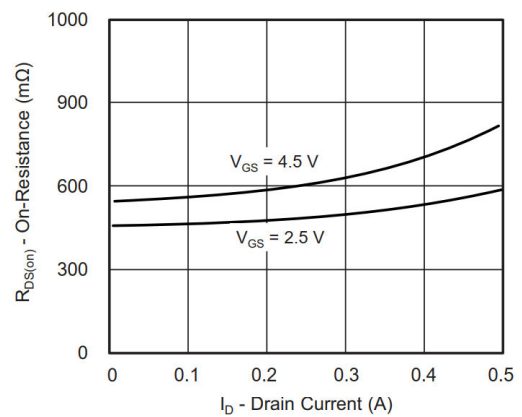
- a. Pulse test; pulse width $\leq 300\text{ }\mu\text{s}$, duty cycle $\leq 2\%$.
 b. Guaranteed by design, not subject to production testing.
 c. Independent of operating temperature.

Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

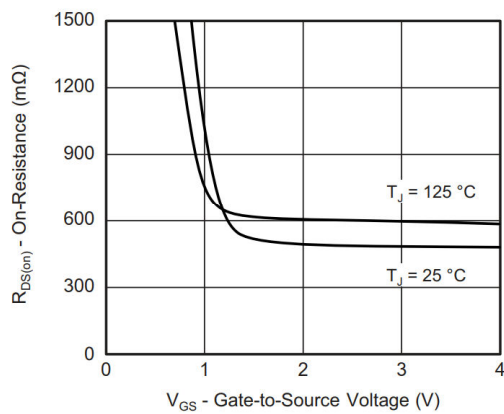
TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



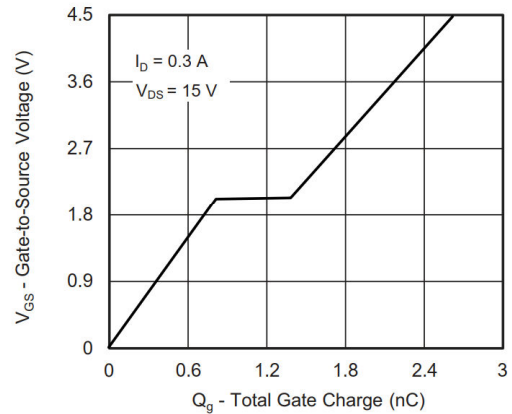
Output Characteristics



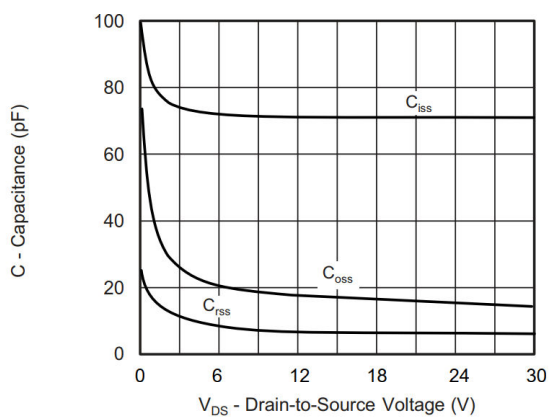
On-Resistance vs. Drain Current



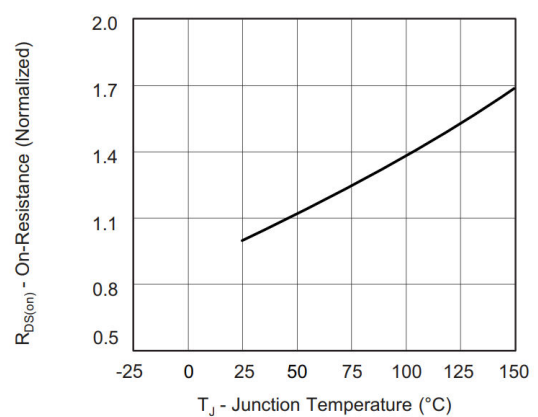
On-Resistance vs. Gate-to-Source Voltage



Gate Charge

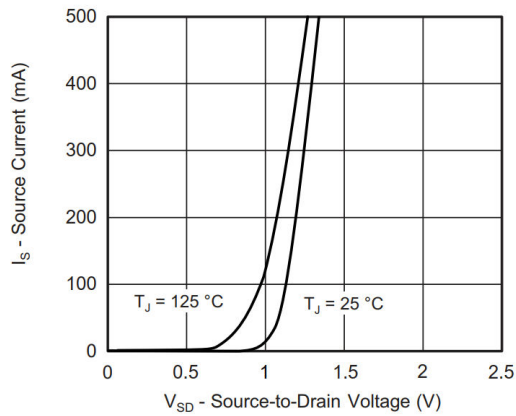


Capacitance

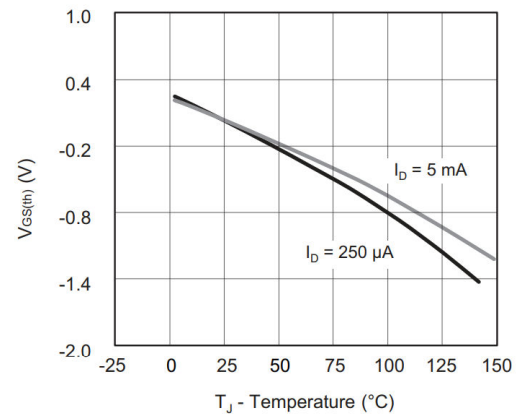


On-Resistance vs. Junction Temperature

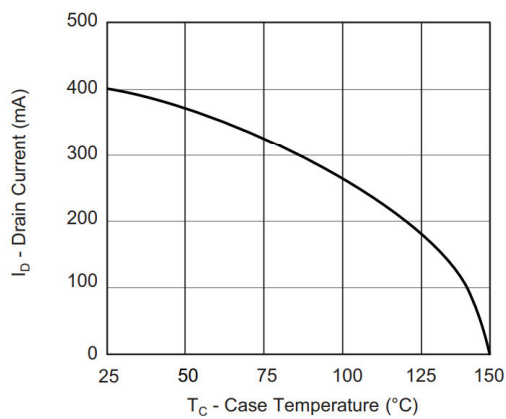
TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



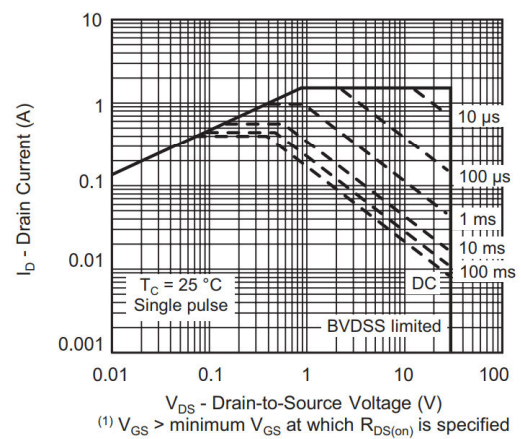
Source Drain Diode Forward Voltage



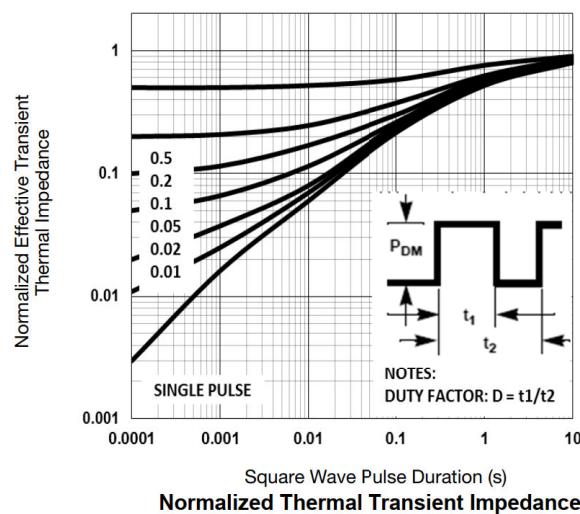
Threshold Voltage



Current De-Rating



Safe Operating Area



Normalized Thermal Transient Impedance

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