

N-Channel 30 V (D-S) MOSFET

PRODUCT SUMMARY			
V _{DS} (V)	R _{DS(on)} (mΩ) (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

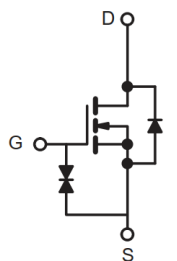
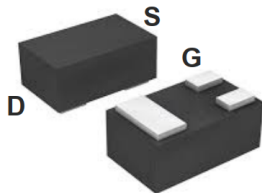
- DT-Trench Power MOSFET
- Worldwide Smallest Package
- Fast switching
- 2KV HBM ESD Capability



APPLICATIONS

- Notebook
- Battery Applications
- Hand-held Instruments

SOT-883 Pin Configuration



N-Channel MOSFET

ABSOLUTE MAXIMUM RATINGS (T _C = 25 °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 °C)	I _D	T _C = 25 °C	400
		T _C = 100 °C	250
Pulsed Drain Current	I _{DM}	1600	mA
Power Dissipation (T _C = 25 °C)	P _D	155 ^{b,c}	
Power Dissipation - Derate above 25°C		1.25	mW/°C
Operating Junction and Storage Temperature Range	T _J , T _{stg}	-55 to +150	°C
Soldering Recommendations (Peak Temperature)		260	

THERMAL RESISTANCE RATINGS			
PARAMETER	SYMBOL	LIMIT	UNIT
Junction-to-Ambient (PCB Mount) ^{b,d}	R _{thJA}	800	°C/W

Notes:

a. T_C = 25 °C.

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

c. t = 10 s.

d. Maximum under steady state conditions is 900 °C/W.

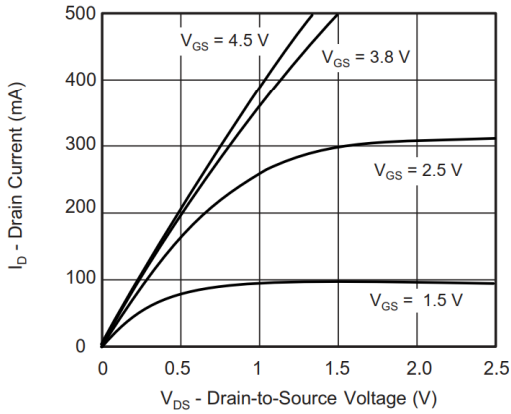
SPECIFICATIONS ($T_J = 25\text{ }^\circ\text{C}$, unless otherwise noted)						
PARAMETER	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
Static						
Drain-Source Breakdown Voltage	V_{DS}	$V_{GS} = 0\text{ V}, I_D = 250\text{ }\mu\text{A}$	30	-	-	V
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\text{ }\mu\text{A}$	0.5	-	1.5	
Gate-Body Leakage	I_{GSS}	$V_{DS} = 0\text{ V}, V_{GS} = \pm 12\text{ V}$	-	-	± 20	μA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 30\text{ V}, V_{GS} = 0\text{ V}$	-	-	1	μA
		$V_{DS} = 24\text{ V}, V_{GS} = 0\text{ V}, T_J = 125\text{ }^\circ\text{C}$	-	-	10	
On-State Drain Current ^a	$I_{D(on)}$	$V_{DS} \geq 10\text{ V}, V_{GS} = 10\text{ V}$	400	-	-	mA
Drain-Source On-State Resistance ^a	$R_{DS(on)}$	$V_{GS} = 4.5\text{ V}, I_D = 0.2\text{ A}$	-	465	560	m Ω
		$V_{GS} = 2.5\text{ V}, I_D = 0.1\text{ A}$	-	575	750	
Forward Transconductance ^a	g_{fs}	$V_{DS} = 5\text{ V}, I_D = 0.3\text{ A}$	-	1	-	S
Dynamic ^b						
Input Capacitance	C_{iss}	$V_{GS} = 0\text{ V}, V_{DS} = 15\text{ V}, f = 1\text{ MHz}$	-	73	-	pF
Output Capacitance	C_{oss}		-	18	-	
Reverse Transfer Capacitance	C_{rss}		-	7.5	-	
Total Gate Charge ^c	Q_g	$V_{DS} = 15\text{ V}, V_{GS} = 4.5\text{ V}, I_D = 0.3\text{ A}$	-	2.6	-	nC
Gate-Source Charge ^c	Q_{gs}		-	0.9	-	
Gate-Drain Charge ^c	Q_{gd}		-	0.6	-	
Turn-On Delay Time ^c	$t_{d(on)}$	$V_{DD} = 15\text{ V}, I_D = 0.3\text{ A}, R_g = 10\text{ }\Omega$ $V_{GS} = 4.5\text{ V}$	-	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 ($T_C = 25\text{ }^\circ\text{C}$)						
Continuous Source-Drain Diode Current	I_S	$T_C = 25\text{ }^\circ\text{C}$	-	-	400	mA
Pulsed Current ($t = 100\text{ }\mu\text{s}$)	I_{SM}		-	-	1600	mA
Forward Voltage ^a	V_{SD}	$I_S = 0.2\text{ A}, V_{GS} = 0\text{ V}$	-	-	1	V
Reverse Recovery Time	t_{rr}	$I_S = 0.3\text{ A}, di/dt = 100\text{ A}/\mu\text{s}$	-	13	-	ns
Reverse Recovery Charge	Q_{rr}		-	6	-	nC

Notes

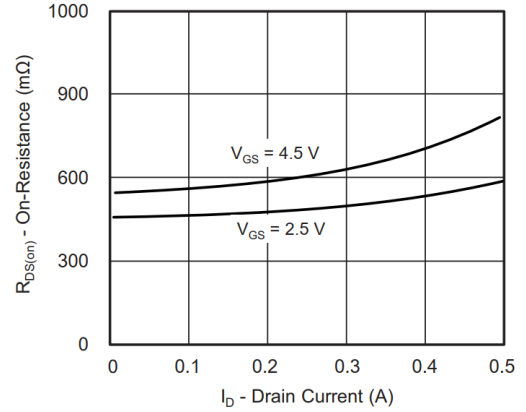
- Pulse test; pulse width $\leq 300\text{ }\mu\text{s}$, duty cycle $\leq 2\%$.
- Guaranteed by design, not subject to production testing.
- Independent of operating temperature.

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.

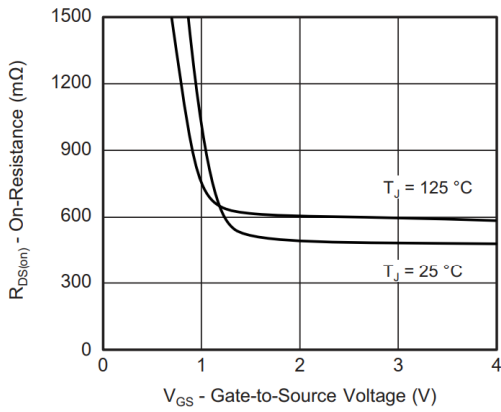
TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



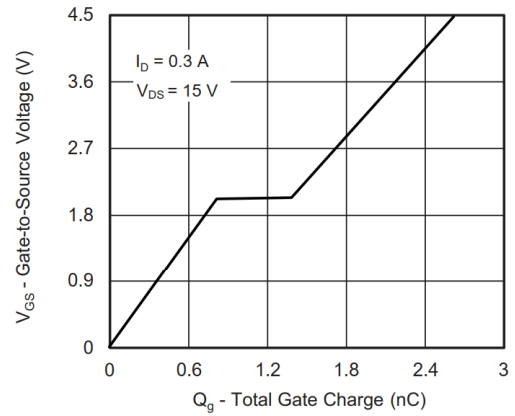
Output Characteristics



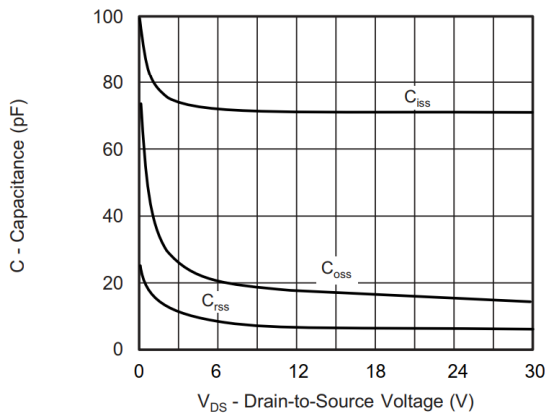
On-Resistance vs. Drain Current



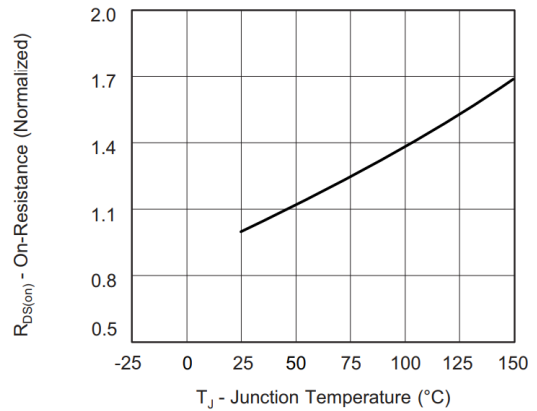
On-Resistance vs. Gate-to-Source Voltage



Gate Charge

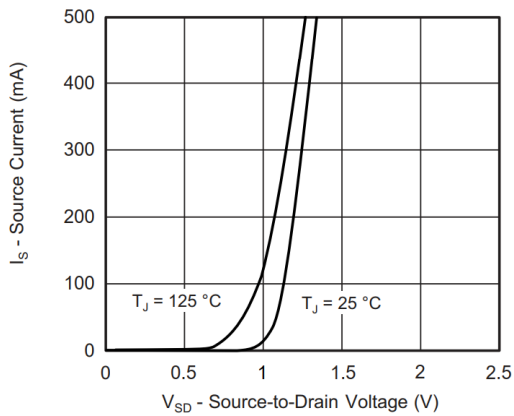


Capacitance

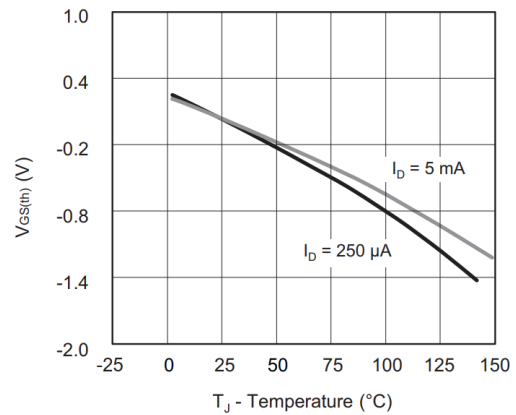


On-Resistance vs. Junction Temperature

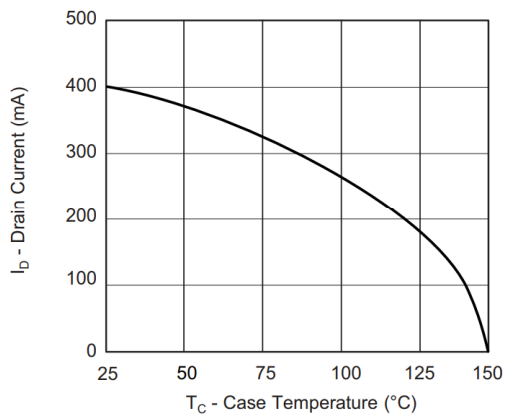
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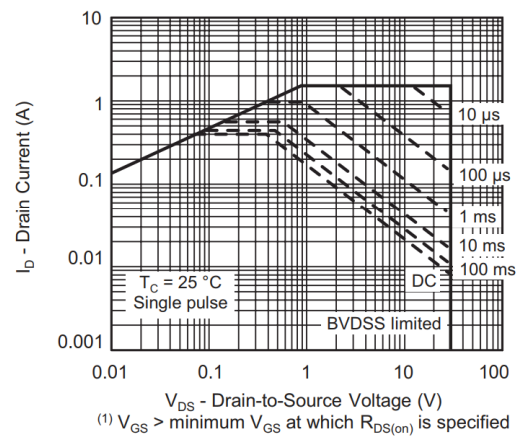
Source Drain Diode Forward Voltage



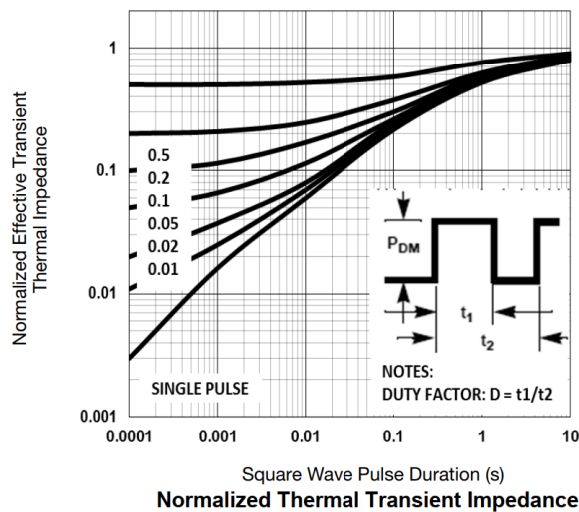
Threshold Voltage



Current De-Rating



Safe Operating Area



Normalized Thermal Transient Impedance

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