N-Channel 25 V (D-S) MOSFET

PRODUCT SUMMARY			
V_{DS} (V)	$R_{DS(on)}$ (Ω)(TYP.)	I_D (A) [c]	Q_g (TYP.)
25	0.225 at V_{GS} = 10 V	0.7	1.4 nC
	0.265 at V_{GS} = 4.5 V	0.6	
	0.369 at V_{GS} = 2.5 V	0.4	

FEATURES

- DT-Trench Power MOSFET
- 100 % R_g Tested
- Compliant to RoHS Directive 2002/95/EC

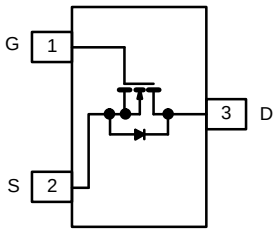
Pb-free

RoHS COMPLIANT

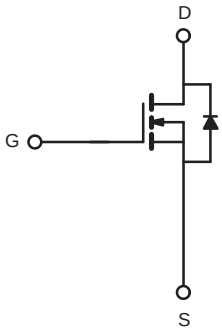
APPLICATIONS

- Smart phones, tablet PC's
  - DC/DC converters
    - Boost converters
  - Load switch, OVP switch

SOT-323



Top View



N-Channel MOSFET

ABSOLUTE MAXIMUM RATINGS (T_A = 25 °C, unless otherwise noted)				
PARAMETER		SYMBOL	LIMIT	UNIT
Drain-Source Voltage		V_{DS}	25	V
Gate-Source Voltage		V_{GS}	± 10	
Continuous Drain Current (T_J = 150 °C)	T_C = 25 °C	I_D	0.7	A
	T_C = 70 °C		0.5	
	T_A = 25 °C		0.65 [a, b]	
	T_A = 70 °C		0.46 [a, b]	
Pulsed Drain Current (t = 300 µs)		I_{DM}	2.8	
Continuous Source-Drain Diode Current	T_C = 25 °C	I_S	0.7	
	T_A = 25 °C		0.3	
Maximum Power Dissipation	T_C = 25 °C	P_D	0.27	W
	T_C = 70 °C		0.15	
	T_A = 25 °C		0.2 [a, b]	
	T_A = 70 °C		0.11 [a, b]	
Operating Junction and Storage Temperature Range		T_J, T_{stg}	-55 to +150	°C
Soldering Recommendations (Peak Temperature)			260	

Notes

a. Surface mounted on 1" x 1" FR4 board.
b. t = 10 s.
c. Based on T_C = 25 °C.

SPECIFICATIONS (T_J = 25 °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	25	-	-	V
V_{DS} Temperature Coefficient	$\Delta V_{DS}/T_J$	I_D = 250 µA	-	32	-	mV/°C
$V_{GS(th)}$ Temperature Coefficient	$\Delta V_{GS(th)}/T_J$		-	-3	-	
Gate-Source Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250 µA	0.4	-	1.5	V
Gate-Source Leakage	I_{GSS}	V_{DS} = 0 V, V_{GS} = 4.5 V	-	-	1	µA
		V_{DS} = 0 V, V_{GS} = ± 12 V	-	-	± 20	
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 20 V, V_{GS} = 0 V	-	-	1	
		V_{DS} = 20 V, V_{GS} = 0 V, T_J = 55 °C	-	-	10	
On-State Drain Current [a]	$I_{D(on)}$	V_{DS} ≥ 5 V, V_{GS} = 10 V	0.7	-	-	A
Drain-Source On-State Resistance [a]	$R_{DS(on)}$	V_{GS} = 10 V, I_D = 0.5 A	-	0.225	0.252	Ω
		V_{GS} = 4.5 V, I_D = 0.3 A	-	0.265	0.344	
		V_{GS} = 2.5 V, I_D = 0.3 A	-	0.369	0.485	
Forward Transconductance [a]	g_{fs}	V_{DS} = 10 V, I_D = 0.5 A	-	5	-	S
Dynamic [b]						
Input Capacitance	C_{iss}	V_{DS} = 20 V, V_{GS} = 0 V, f = 1 MHz	-	185	-	pF
Output Capacitance	C_{oss}		-	43	-	
Reverse Transfer Capacitance	C_{rss}		-	11	-	
Total Gate Charge	Q_g	V_{DS} = 20 V, V_{GS} = 10 V, I_D = 0.5 A	-	2.7	4.1	nC
		V_{DS} = 20 V, V_{GS} = 4.5 V, I_D = 0.3 A	-	1.4	2.1	
Gate-Source Charge	Q_{gs}		-	0.3	-	
Gate-Drain Charge	Q_{gd}		-	0.5	-	
Gate Resistance	R_g	f = 1 MHz	-	7	-	Ω
Turn-On Delay Time	$t_{d(on)}$	V_{DD} = 20 V, R_L = 13.6 Ω I_D ≅0.7 A, V_{GEN} = 10 V, R_g = 1 Ω	-	2	-	ns
Rise Time	t_r		-	9	-	
Turn-Off Delay Time	$t_{d(off)}$		-	8	-	
Fall Time	t_f		-	8	-	
Turn-On Delay Time	$t_{d(on)}$	V_{DD} = 20 V, R_L = 13.6 Ω I_D ≅ 0.3 A, V_{GEN} = 4.5 V, R_g = 1 Ω	-	8	-	
Rise Time	t_r		-	13	-	
Turn-Off Delay Time	$t_{d(off)}$		-	15	-	
Fall Time	t_f		-	6	-	
Drain-Source Body Diode Characteristics						
Continuous Source-Drain Diode Current	I_S	T_C = 25 °C	-	-	0.7	A
Pulse Diode Forward Current [a]	I_{SM}		-	-	2.8	
Body Diode Voltage	V_{SD}	I_F = 0.5 A	-	0.7	1.2	V
Body Diode Reverse Recovery Time	t_{rr}	I_F = 0.5 A, dI/dt = 100 A/µs, T_J = 25 °C	-	8	16	ns
Body Diode Reverse Recovery Charge	Q_{rr}		-	3	6	nC
Reverse Recovery Fall Time	t_a		-	5	-	ns
Reverse Recovery Rise Time	t_b		-	3	-	

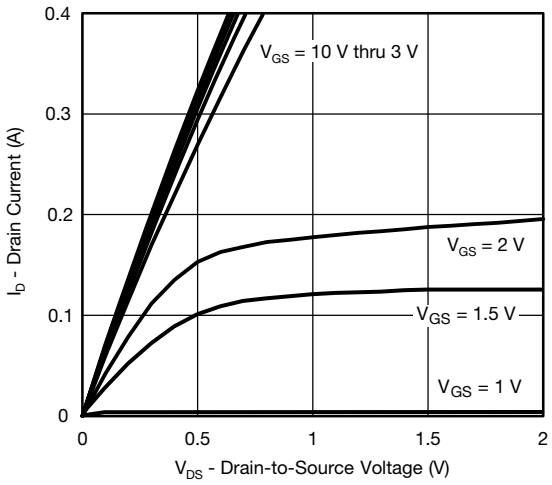
Notes

a. Pulse test; pulse width ≤ 300 µs, duty cycle ≤ 2 %.

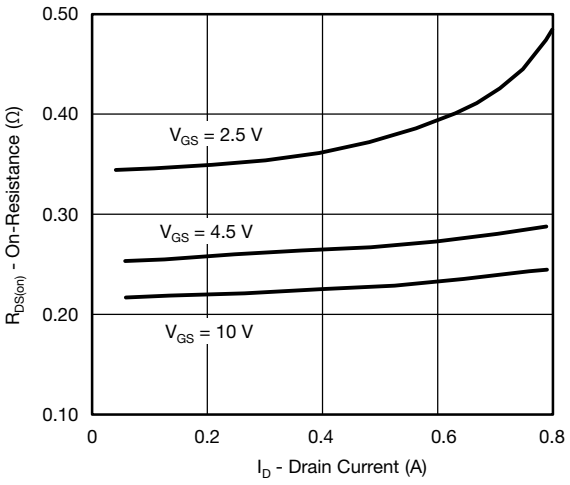
b. Guaranteed by design, not subject to production testing.

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.

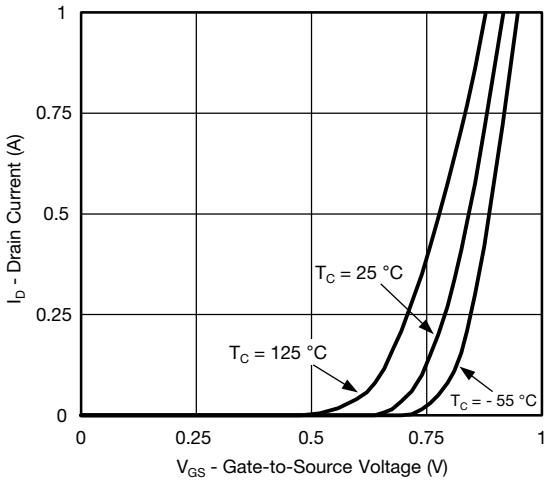
TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



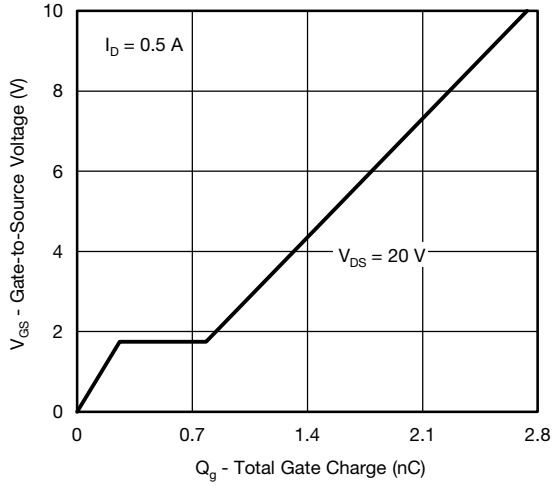
Output Characteristics



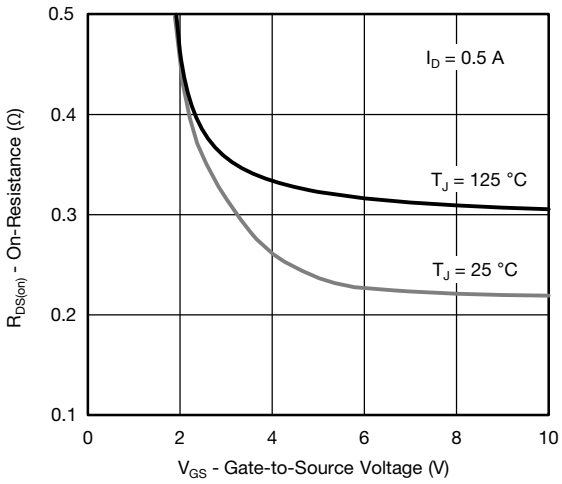
On-Resistance vs. Drain Current



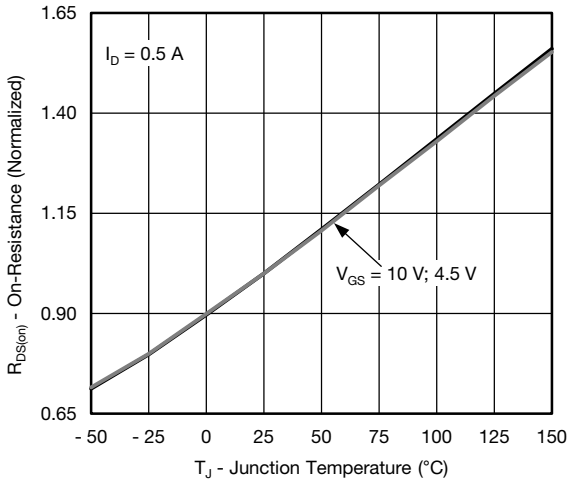
Transfer Characteristics



Gate Charge

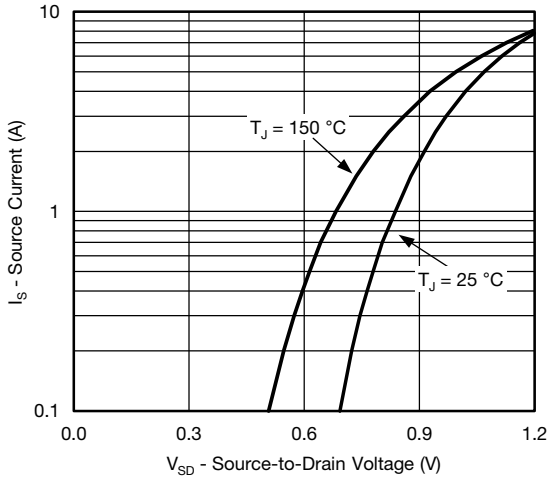


On-Resistance vs. Gate-to-Source Voltage

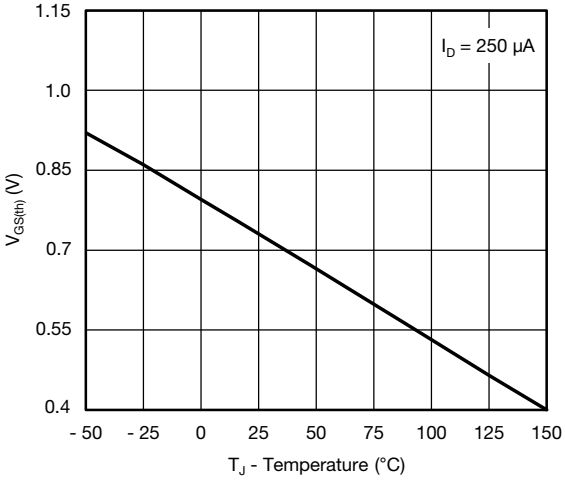


On-Resistance vs. Junction Temperature

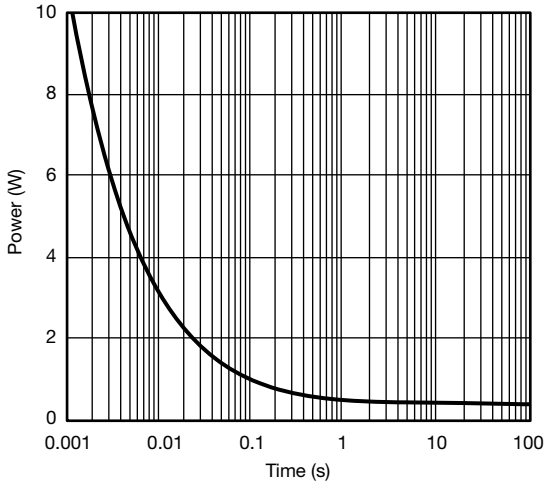
TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



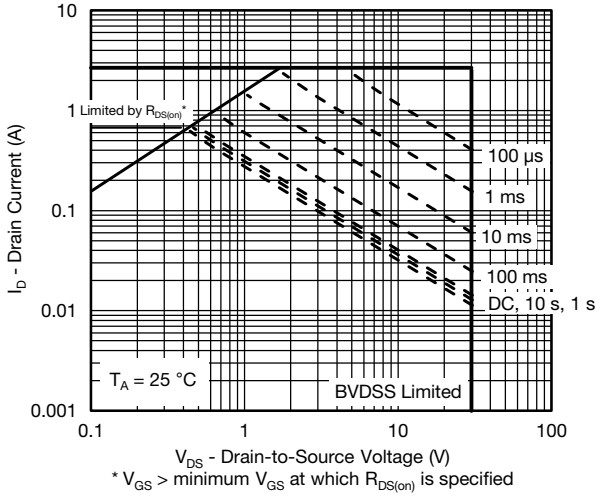
Source-Drain Diode Forward Voltage



Threshold Voltage

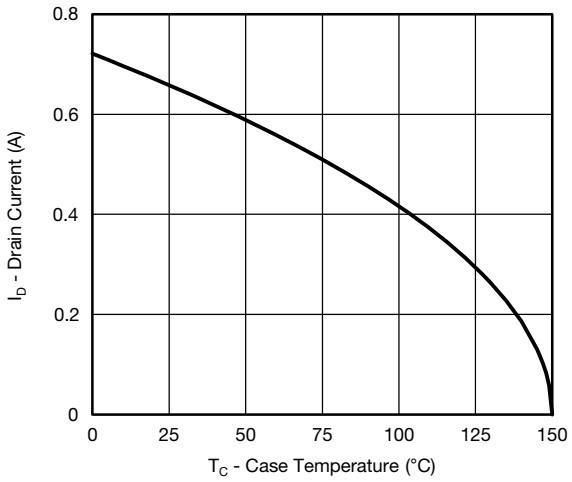


Single Pulse Power, Junction-to-Ambient

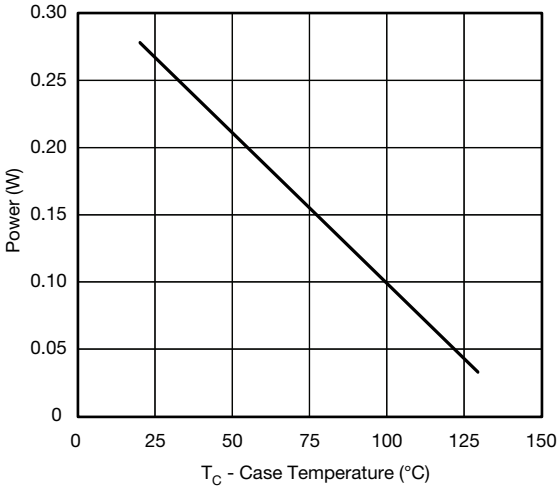


Safe Operating Area, Junction-to-Ambient

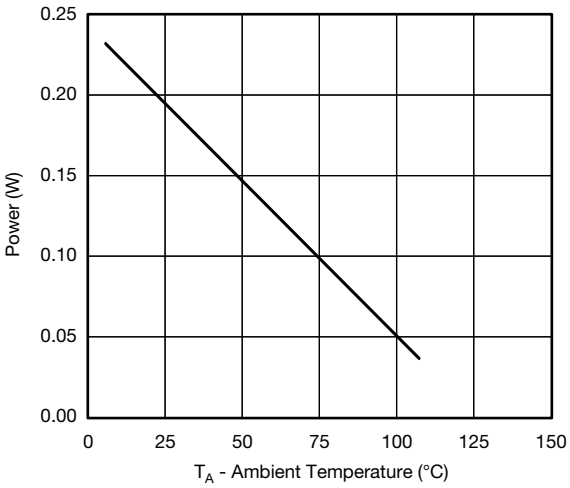
TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



Current Derating*



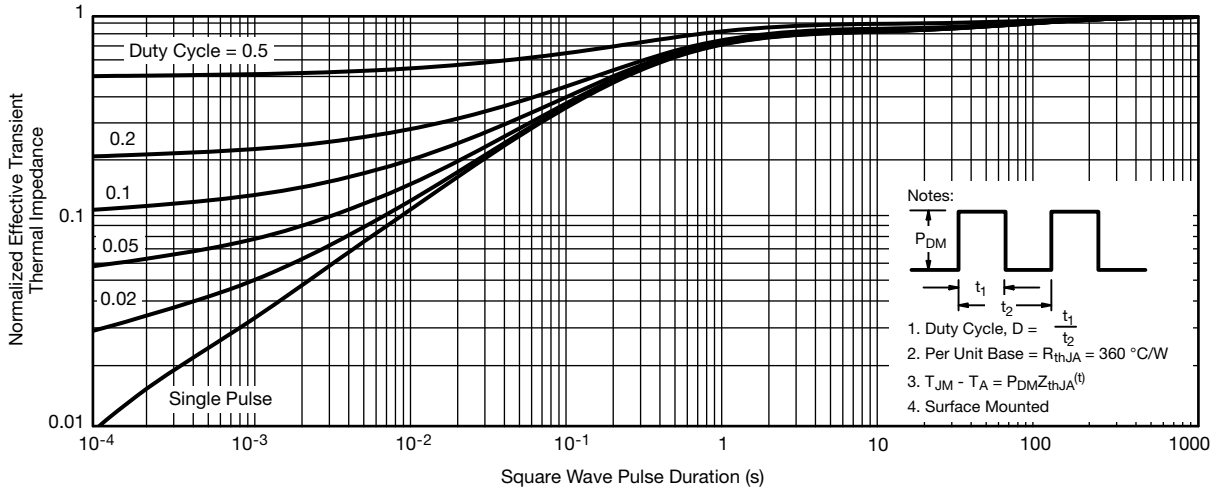
Power, Junction-to-Case



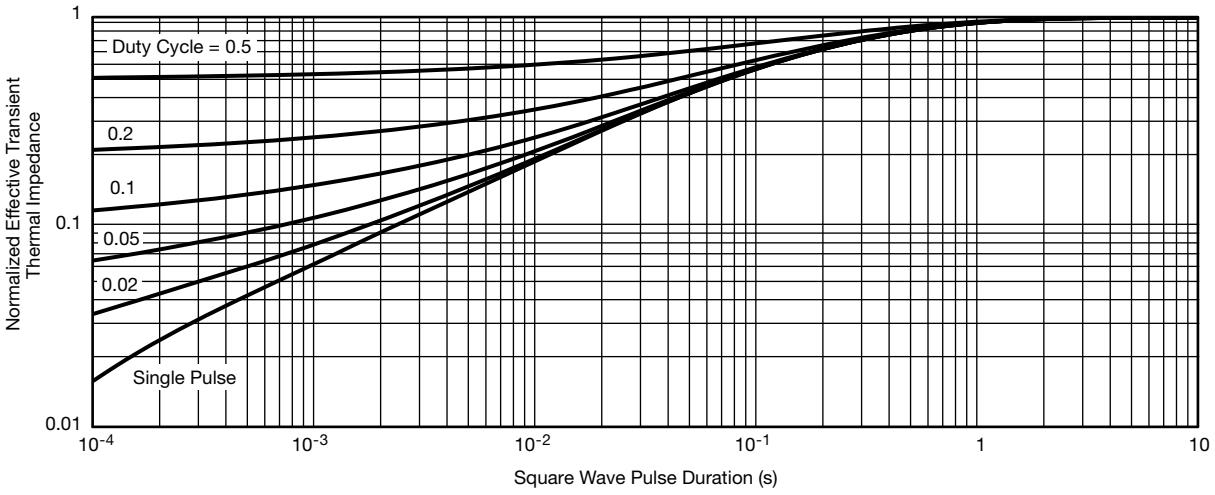
Power, Junction-to-Ambient

* The power dissipation P_D is based on $T_{J\ (max.)}$ = 150 °C, using junction-to-case thermal resistance, and is more useful in settling the upper dissipation limit for cases where additional heatsinking is used. It is used to determine the current rating, when this rating falls below the package limit.

TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



Normalized Thermal Transient Impedance, Junction-to-Ambient



Normalized Thermal Transient Impedance, Junction-to-Foot

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