N- and P-Channel 60 V (D-S) MOSFET

PRODUCT SUMMARY			
	V_{DS} (V)	$R_{DS(on)}$ (Ω)	I_D (A)
N-Channel	60	1.0 at V_{GS} = 10 V	0.55
		1.4 at V_{GS} = 4.5 V	0.37
P-Channel	- 60	2.5 at V_{GS} = - 10 V	- 0.3
		3 at V_{GS} = - 4.5 V	- 0.2

FEATURES

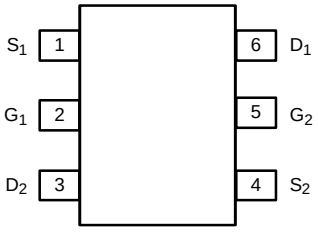
- DT-Trench Power MOSFET
- 100 % R_g tested
- PWM Optimized
- Compliant to RoHS Directive 2002/95/EC

Pb-free
RoHS COMPLIANT

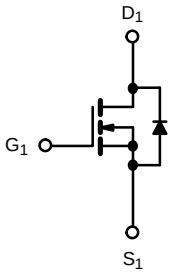
APPLICATIONS

- LED Inverter Circuits
- DC/DC Conversion Circuits
- Motor drives
- Low power load switch

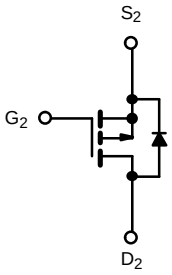
SOT-323-6



Top View



N-Channel MOSFET



P-Channel MOSFET

ABSOLUTE MAXIMUM RATINGS (T_A = 25 °C, unless otherwise noted)					
Parameter		Symbol	N-Channel	P-Channel	Unit
Drain-Source Voltage		V_{DS}	60	- 60	V
Gate-Source Voltage		V_{GS}	± 20		
Continuous Drain Current (T_J = 150 °C)[a]	T_C = 25 °C	I_D	0.55	- 0.3	A
	T_C = 70 °C		0.42	- 0.21	
Pulsed Drain Current[b]		I_{DM}	1.7	- 0.9	
Continuous Source Current (Diode Conduction)[a]		I_S	0.55	- 0.3	
Maximum Power Dissipation[a]	T_C = 25 °C	P_D	0.73	0.3	W
	T_C = 70 °C		0.47	0.192	
Operating Junction and Storage Temperature Range		T_J, T_{stg}	- 55 to 150		°C

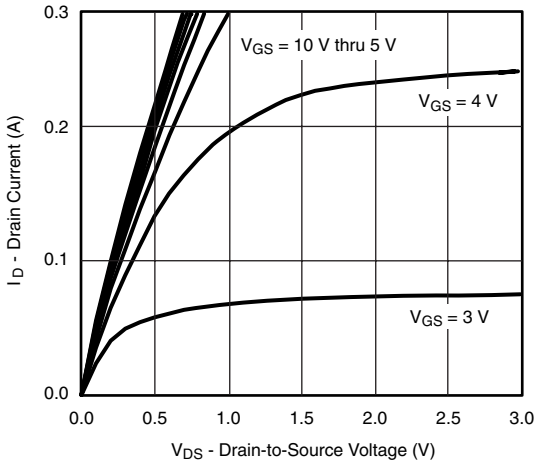
Notes:
a. Surface mounted on FR4 board.
b. Pulse width limited by maximum junction temperature.

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 = 10 µA	N-Ch	60			V
		V_{GS} = 0 V, I_D = - 10 µA	P-Ch	- 60			
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250 µA	N-Ch	1		3.0	
		V_{DS} = V_{GS}, I_D = - 250 µA	P-Ch	- 1		- 3.0	
Gate-Body Leakage	I_{GSS}	V_{DS} = 0 V, V_{GS} = ± 10 V	N-Ch			± 100	nA
			P-Ch			± 100	
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 60 V, V_{GS} = 0 V	N-Ch			1	µA
		V_{DS} = - 60 V, V_{GS} = 0 V	P-Ch			- 1	
		V_{DS} = 48 V, V_{GS} = 0 V, T_J = 85 °C	N-Ch			10	
		V_{DS} = - 48 V, V_{GS} = 0 V, T_J = 85 °C	P-Ch			- 10	
On-State Drain Current[a]	$I_{D(on)}$	V_{DS} = 10 V, V_{GS} = 4.5 V	N-Ch	0.55			A
		V_{DS} = - 10 V, V_{GS} = - 4.5 V	P-Ch	- 0.3			
Drain-Source On-State Resistance[a]	$R_{DS(on)}$	V_{GS} = 4.5 V, I_D = 0.2 A	N-Ch		1.4	2.0	Ω
		V_{GS} = - 4.5 V, I_D = - 0.1 A	P-Ch		3.0	4.0	
		V_{GS} = 10 V, I_D = 0.2 A	N-Ch		1.0	1.5	
		V_{GS} = - 10 V, I_D = - 0.1 A	P-Ch		2.5	3.0	
Forward Transconductance[a]	g_{fs}	V_{DS} = 10 V, I_D = 0.2 A	N-Ch		195		ms
		V_{DS} = - 10 V, I_D = - 0.1A	P-Ch		150		
Diode Forward Voltage[a]	V_{SD}	I_S = 0.2 A, V_{GS} = 0 V	N-Ch		0.8	1.2	V
		I_S = - 0.1 A, V_{GS} = 0 V	P-Ch		- 0.8	- 1.2	
Dynamic[b]							
Total Gate Charge	Q_g	N-Channel V_{DS} = 30 V, V_{GS} = 4.5 V, I_D = 0.2 A P-Channel V_{DS} = - 30 V, V_{GS} = - 4.5 V, I_D = - 0.1 A	N-Ch		1.5		nC
			P-Ch		1.6		
Gate-Source Charge	Q_{gs}		N-Ch		0.3		
			P-Ch		0.36		
Gate-Drain Charge	Q_{gd}		N-Ch		0.25		
			P-Ch		0.33		
Input Capacitance	C_{iss}	N-Channel V_{DS} = 30 V, V_{GS} = 0 V, f = 1 MHz P-Channel V_{DS} = - 30 V, V_{GS} = 0 V, f = 1 MHz	N-Ch		48.5		pF
			P-Ch		49		
Output Capacitance	C_{oss}		N-Ch		16		
			P-Ch		16		
Reverse Transfer Capacitance	C_{rss}		N-Ch		8		
			P-Ch		8		
Turn-On Time[c]	t_{ON}	N-Channel V_{DD} = 30 V, R_L = 100 Ω I_D ≅ 0.2 A, V_{GEN} = 10 V, R_g = 1 Ω P-Channel V_{DD} = - 30 V, R_L = 100 Ω I_D ≅ - 0.1 A, V_{GEN} = - 10 V, R_g = 1 Ω	N-Ch		6.5		ns
			P-Ch		3		
Turn-Off Time[c]	t_{OFF}		N-Ch		13		
			P-Ch		13		

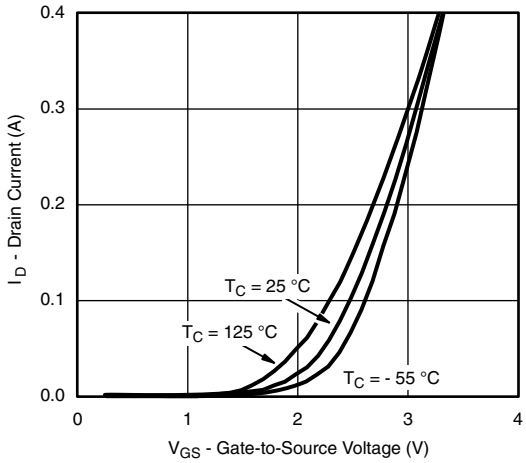
Notes:
a. Pulse test; pulse width ≤ 300 µs, duty cycle ≤ 2 %.
b. Guaranteed by design, not subject to production testing.
c. Switching time is essentially independent of operating temperature.

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.

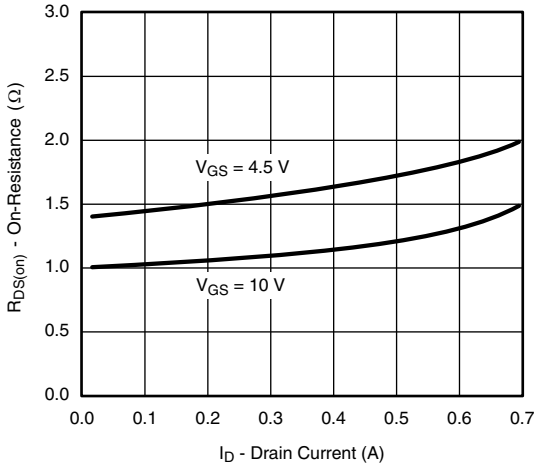
N-CHANNEL TYPICAL CHARACTERISTICS (T_A = 25 °C, unless otherwise noted)



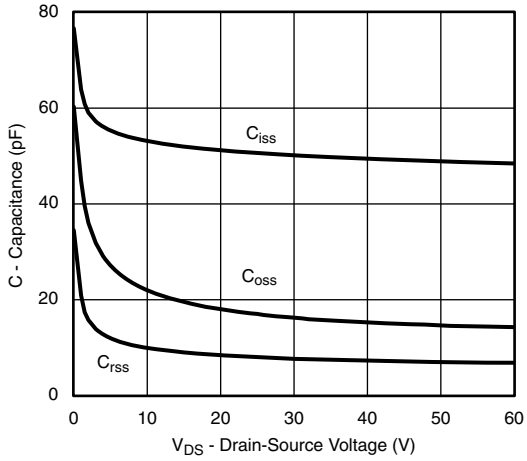
Output Characteristics



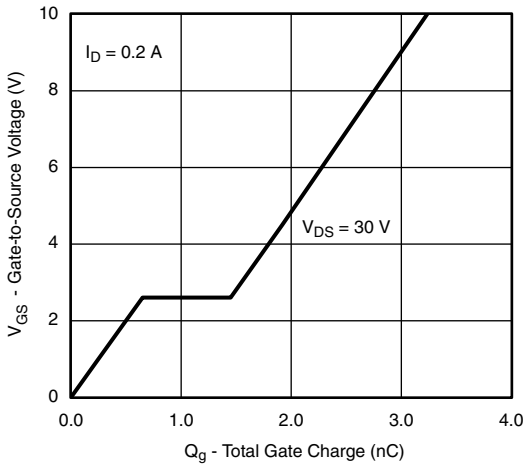
Transfer Characteristics Curves vs. Temperature



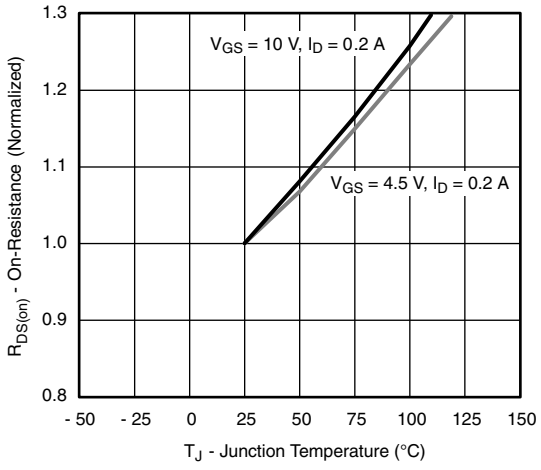
On-Resistance vs. Drain Current



Capacitance

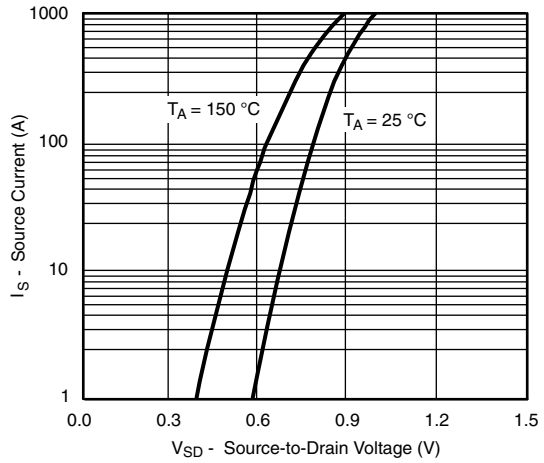


Gate Charge

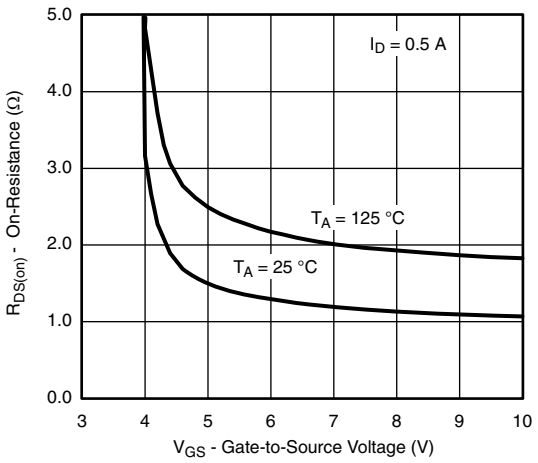


On-Resistance vs. Junction Temperature

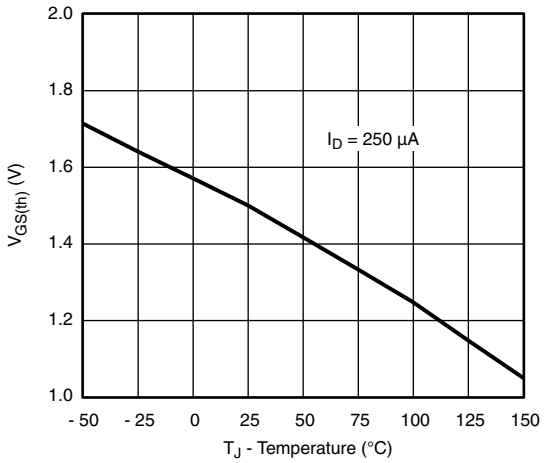
N-CHANNEL TYPICAL CHARACTERISTICS (T_A = 25 °C, unless otherwise noted)



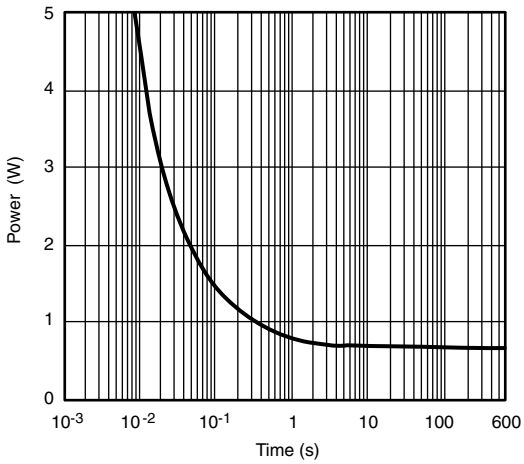
Source-Drain Diode Forward Voltage



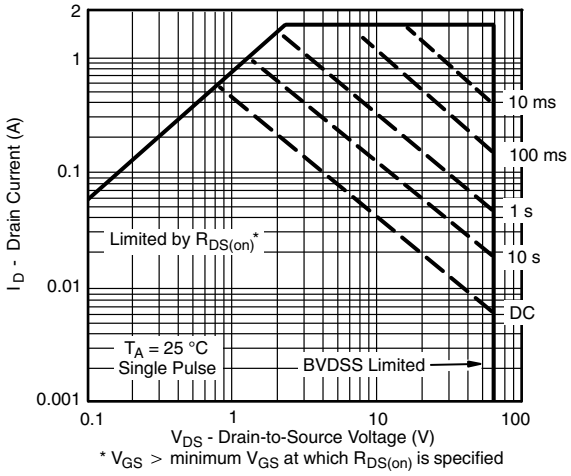
$R_{DS(on)}$ vs. V_{GS} vs. Temperature



Threshold Voltage

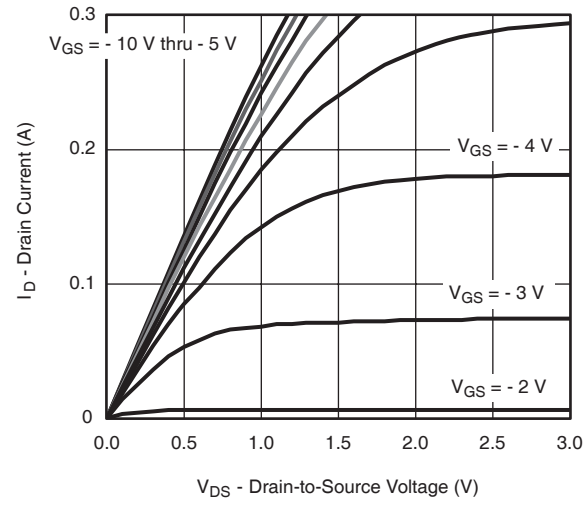


Single Pulse Power

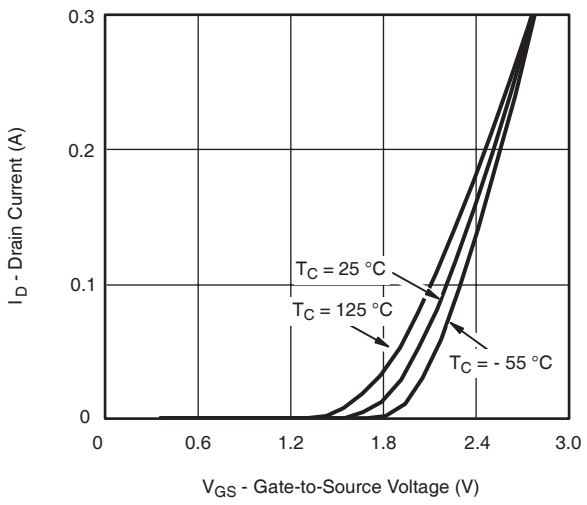


Safe Operating Area

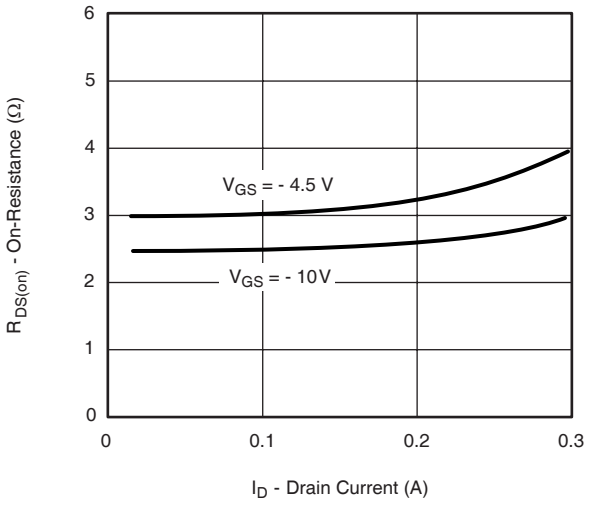
P-CHANNEL TYPICAL CHARACTERISTICS (T_A = 25 °C, unless otherwise noted)



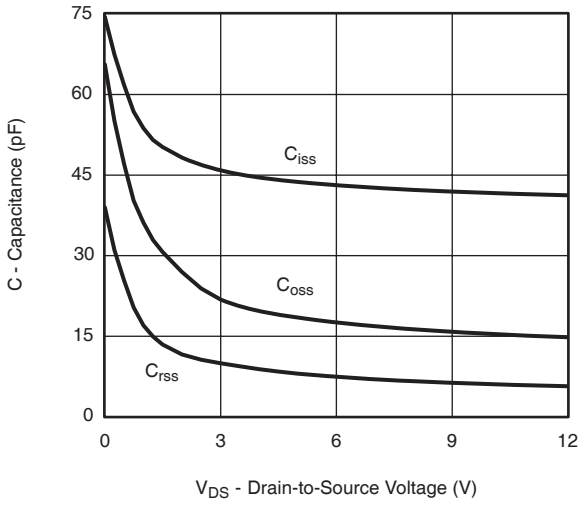
Output Characteristics



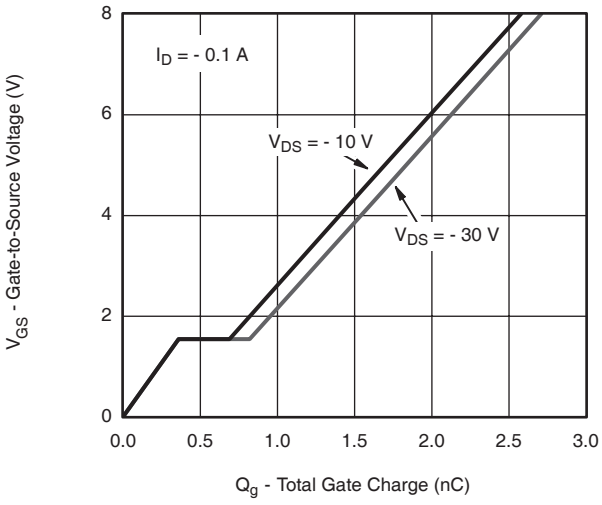
Transfer Characteristics



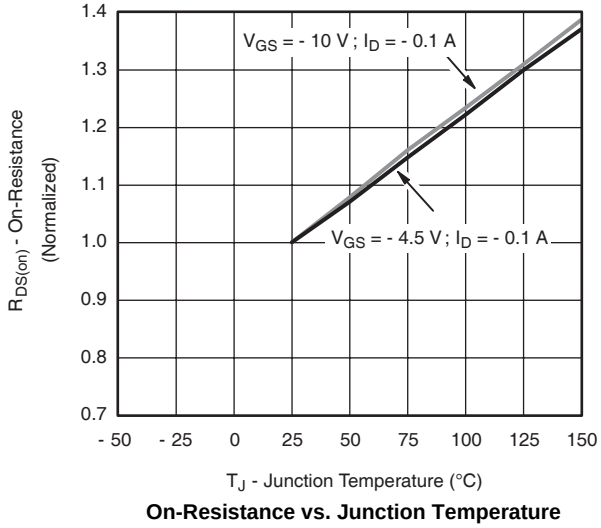
On-Resistance vs. Drain Current and Gate Voltage



Capacitance

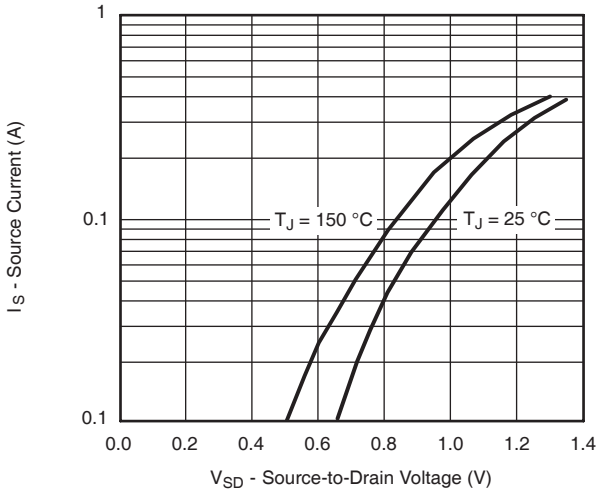


Gate Charge

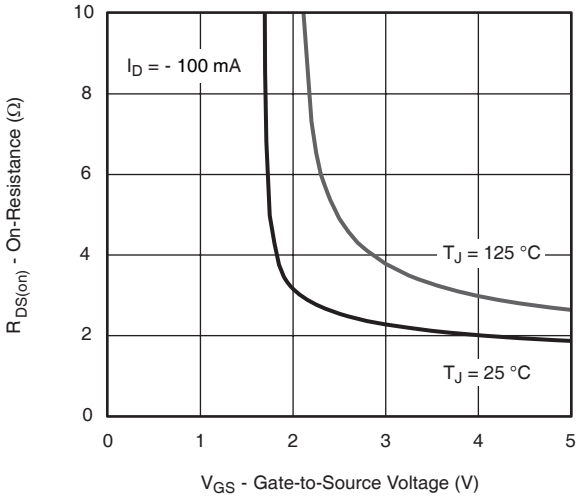


On-Resistance vs. Junction Temperature

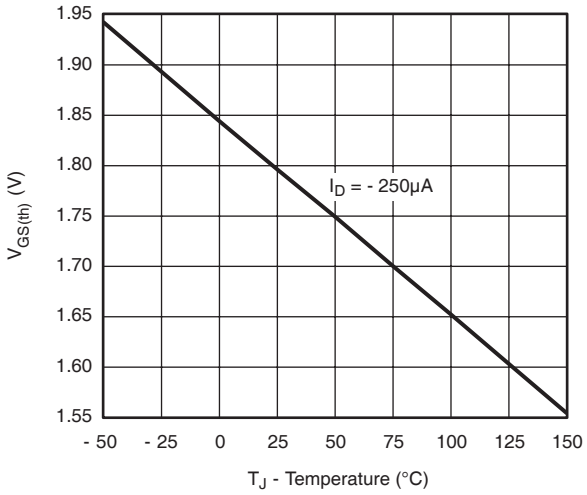
P-CHANNEL TYPICAL CHARACTERISTICS (T_A = 25 °C, unless otherwise noted)



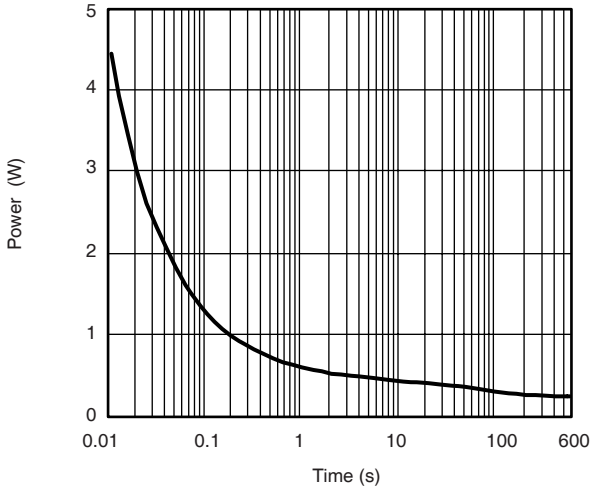
Source-Drain Diode Forward Voltage



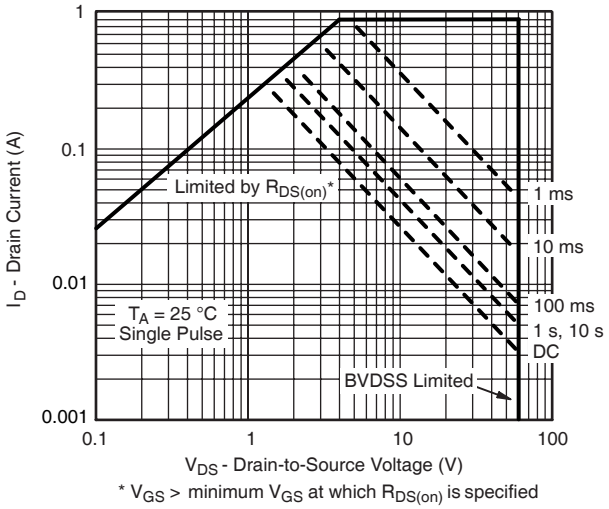
On-Resistance vs. Gate-to-Source Voltage



Threshold Voltage



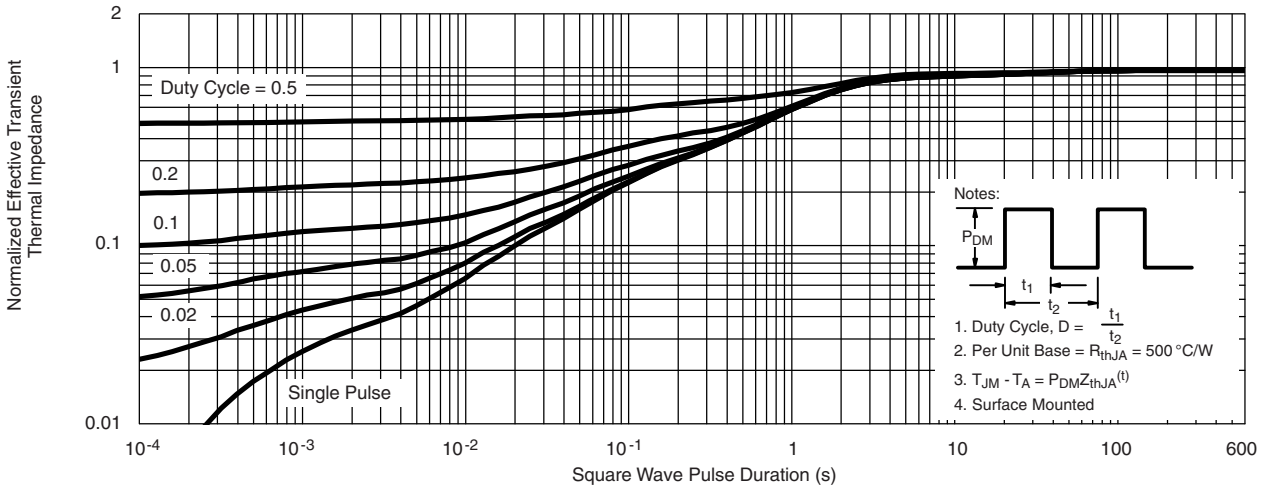
Single Pulse Power



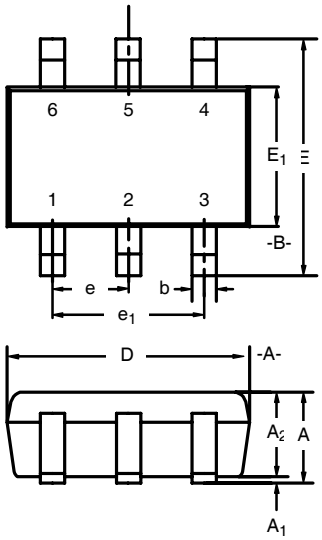
* V_{GS} > minimum V_{GS} at which $R_{DS(on)}$ is specified

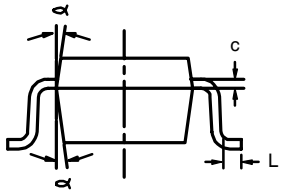
Safe Operating Area, Junction-to-Ambient

N- OR P-CHANNEL TYPICAL CHARACTERISTICS (T_A = 25 °C, unless otherwise noted)



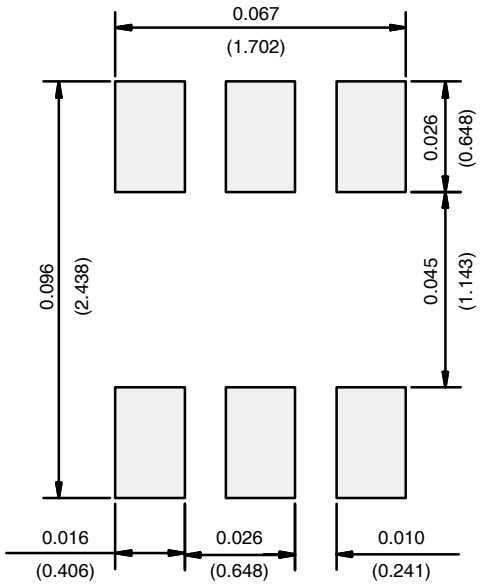
Normalized Thermal Transient Impedance, Junction-to-Ambient





Dim	MILLIMETERS			INCHES		
	Min	Nom	Max	Min	Nom	Max
A	0.90	–	1.10	0.035	–	0.043
A_1	–	–	0.10	–	–	0.004
A_2	0.80	–	1.00	0.031	–	0.039
b	0.15	–	0.30	0.006	–	0.012
c	0.10	–	0.25	0.004	–	0.010
D	1.80	2.00	2.20	0.071	0.079	0.087
E	1.80	2.10	2.40	0.071	0.083	0.094
E_1	1.15	1.25	1.35	0.045	0.049	0.053
e	0.65BSC			0.026BSC		
e_1	1.20	1.30	1.40	0.047	0.051	0.055
L	0.10	0.20	0.30	0.004	0.008	0.012
α	7°Nom			7°Nom		

RECOMMENDED MINIMUM PADS FOR SOT323: 6-Lead



Recommended Minimum Pads
Dimensions in Inches/(mm)

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