

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

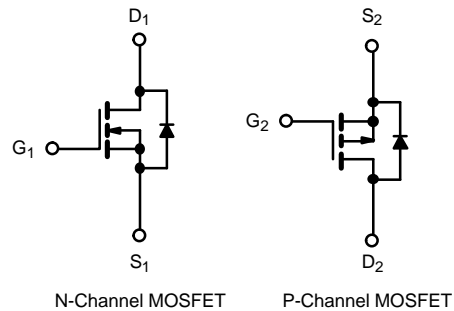
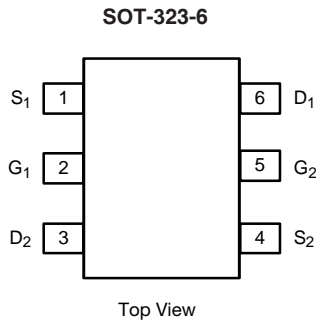
- DT-Trench Power MOSFET
- 100 % R_g tested
- PWM Optimized
- Compliant to RoHS Directive 2002/95/EC



RoHS
COMPLIANT

APPLICATIONS

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



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	I _D	T _C = 25 °C	- 0.3	A
		T _C = 70 °C	- 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	P _D	T _C = 25 °C	0.3	W
		T _C = 70 °C	0.192	
Operating Junction and Storage Temperature Range	T _J , T _{stg}	- 55 to 150		°C

Notes:

- Surface mounted on FR4 board.
- Pulse width limited by maximum junction temperature.

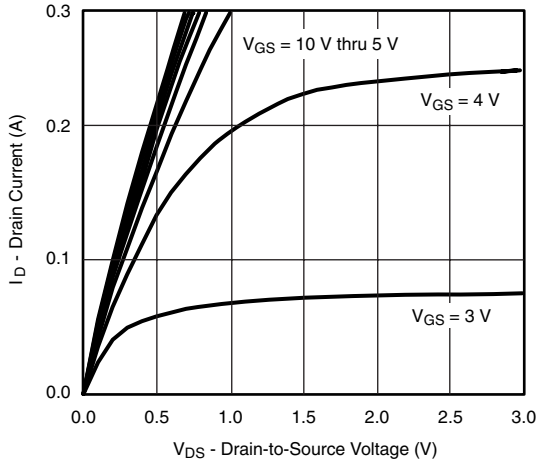
SPECIFICATIONS ($T_J = 25\text{ }^\circ\text{C}$, unless otherwise noted)							
Parameter	Symbol	Test Conditions		Min.	Typ.	Max.	Unit
Static							
Drain-Source Breakdown Voltage	V_{DS}	$V_{GS} = 0\text{ V}, I_D = 10\text{ }\mu\text{A}$	N-Ch	60			V
		$V_{GS} = 0\text{ V}, I_D = -10\text{ }\mu\text{A}$	P-Ch	-60			
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\text{ }\mu\text{A}$	N-Ch	1		3.0	
		$V_{DS} = V_{GS}, I_D = -250\text{ }\mu\text{A}$	P-Ch	-1		-3.0	
Gate-Body Leakage	I_{GSS}	$V_{DS} = 0\text{ V}, V_{GS} = \pm 10\text{ V}$	N-Ch			± 100	nA
			P-Ch			± 100	
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 60\text{ V}, V_{GS} = 0\text{ V}$	N-Ch			1	μA
			P-Ch			-1	
			N-Ch			10	
			P-Ch			-10	
On-State Drain Current ^a	$I_{D(on)}$	$V_{DS} = 10\text{ V}, V_{GS} = 4.5\text{ V}$	N-Ch	0.55			A
		$V_{DS} = -10\text{ V}, V_{GS} = -4.5\text{ V}$	P-Ch	-0.3			
Drain-Source On-State Resistance ^a	$R_{DS(on)}$	$V_{GS} = 4.5\text{ V}, I_D = 0.2\text{ A}$	N-Ch		1.4	2.0	Ω
		$V_{GS} = -4.5\text{ V}, I_D = -0.1\text{ A}$	P-Ch		3.0	4.0	
		$V_{GS} = 10\text{ V}, I_D = 0.2\text{ A}$	N-Ch		1.0	1.5	
		$V_{GS} = -10\text{ V}, I_D = -0.1\text{ A}$	P-Ch		2.5	3.0	
Forward Transconductance ^a	g_{fs}	$V_{DS} = 10\text{ V}, I_D = 0.2\text{ A}$	N-Ch		195		ms
		$V_{DS} = -10\text{ V}, I_D = -0.1\text{ A}$	P-Ch		150		
Diode Forward Voltage ^a	V_{SD}	$I_S = 0.2\text{ A}, V_{GS} = 0\text{ V}$	N-Ch		0.8	1.2	V
		$I_S = -0.1\text{ A}, V_{GS} = 0\text{ V}$	P-Ch		-0.8	-1.2	
Dynamic^b							
Total Gate Charge	Q_g	N-Channel $V_{DS} = 30\text{ V}, V_{GS} = 4.5\text{ V}, I_D = 0.2\text{ A}$	N-Ch		1.5		nC
Gate-Source Charge	Q_{gs}		P-Ch		1.6		
Gate-Drain Charge	Q_{gd}	P-Channel $V_{DS} = -30\text{ V}, V_{GS} = -4.5\text{ V}, I_D = -0.1\text{ A}$	N-Ch		0.3		
			P-Ch		0.36		
Input Capacitance	C_{iss}	N-Channel $V_{DS} = 30\text{ V}, V_{GS} = 0\text{ V}, f = 1\text{ MHz}$	N-Ch		48.5		
			P-Ch		49		
Output Capacitance	C_{oss}	P-Channel $V_{DS} = -30\text{ V}, V_{GS} = 0\text{ V}, f = 1\text{ MHz}$	N-Ch		16		μF
			P-Ch		16		
Reverse Transfer Capacitance	C_{rss}		N-Ch		8		
			P-Ch		8		
Turn-On Time ^c	t_{ON}	N-Channel $V_{DD} = 30\text{ V}, R_L = 100\text{ }\Omega$ $I_D \cong 0.2\text{ A}, V_{GEN} = 10\text{ V}, R_g = 1\text{ }\Omega$	N-Ch		6.5		ns
			P-Ch		3		
Turn-Off Time ^c	t_{OFF}	P-Channel $V_{DD} = -30\text{ V}, R_L = 100\text{ }\Omega$ $I_D \cong -0.1\text{ A}, V_{GEN} = -10\text{ V}, R_g = 1\text{ }\Omega$	N-Ch		13		
			P-Ch		13		

Notes:

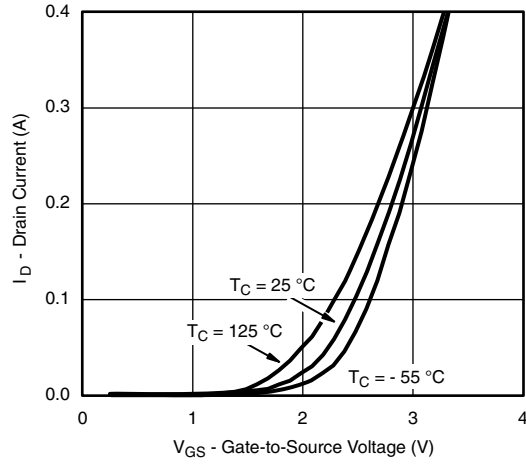
- a. Pulse test; pulse width $\leq 300\text{ }\mu\text{s}$, duty cycle $\leq 2\%$.
- b. Guaranteed by design, not subject to production testing.
- c. Switching time is essentially independent of operating temperature.

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.

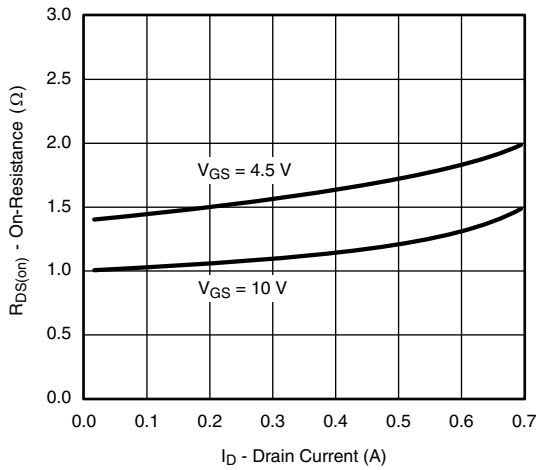
N-CHANNEL TYPICAL CHARACTERISTICS ($T_A = 25\text{ }^\circ\text{C}$, unless otherwise noted)



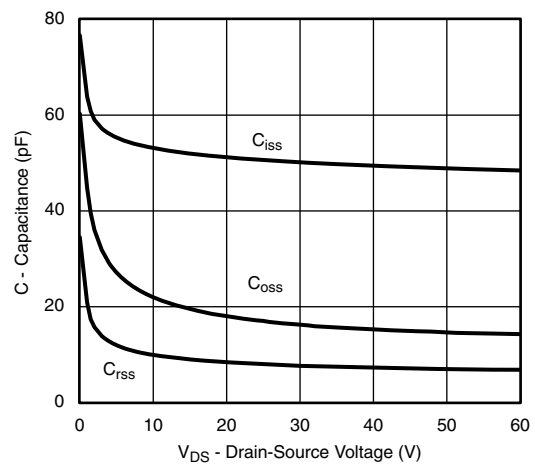
Output Characteristics



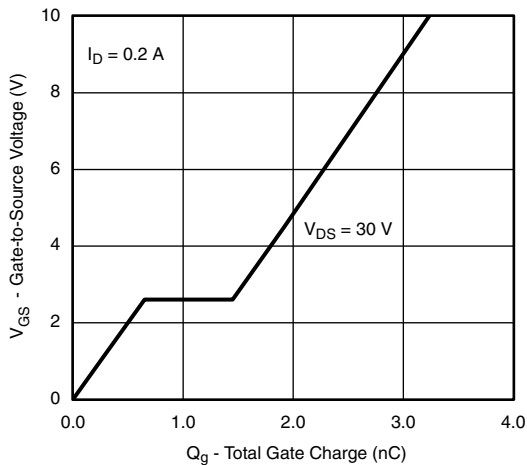
Transfer Characteristics Curves vs. Temperature



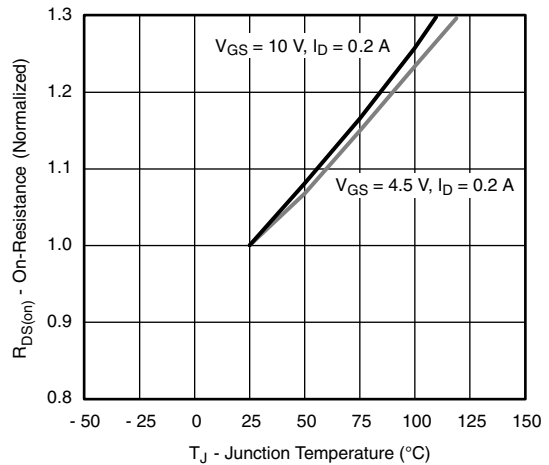
On-Resistance vs. Drain Current



Capacitance

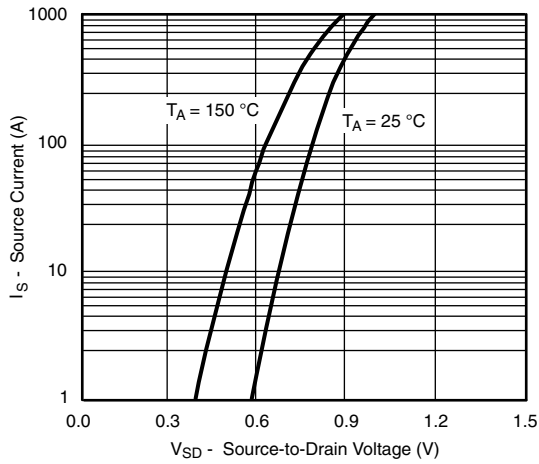


Gate Charge

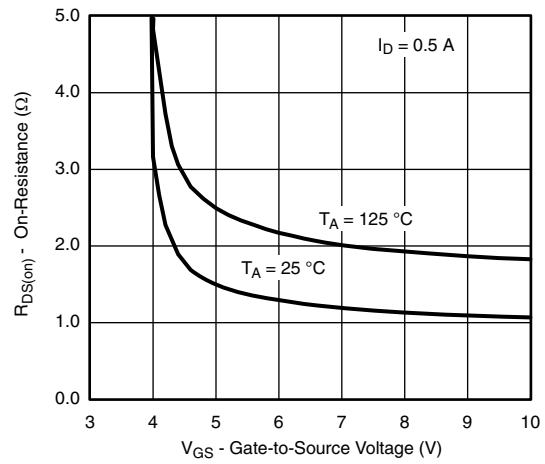


On-Resistance vs. Junction Temperature

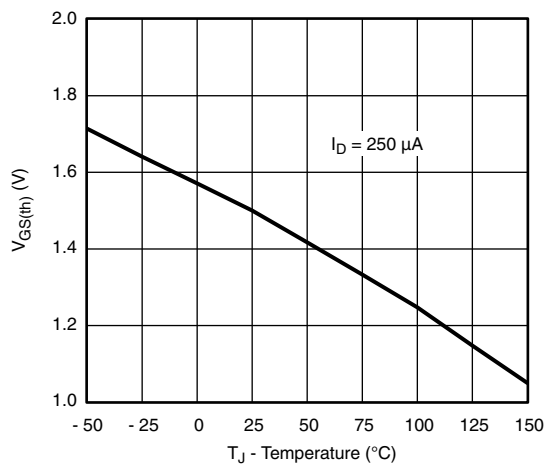
N-CHANNEL TYPICAL CHARACTERISTICS ($T_A = 25\text{ }^\circ\text{C}$, unless otherwise noted)



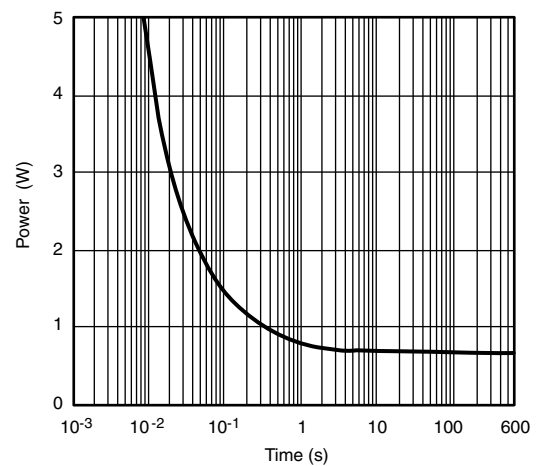
Source-Drain Diode Forward Voltage



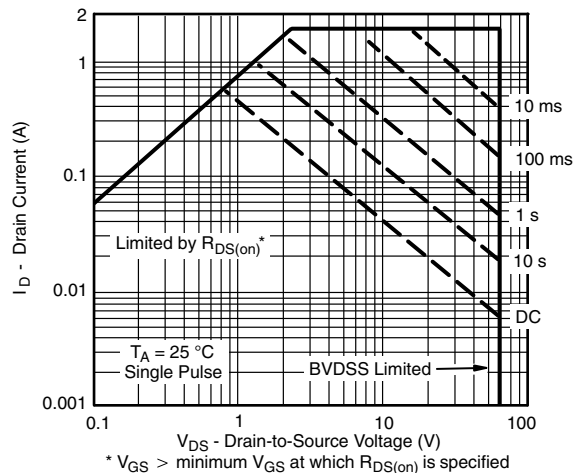
$R_{DS(on)}$ vs. V_{GS} vs. Temperature



Threshold Voltage

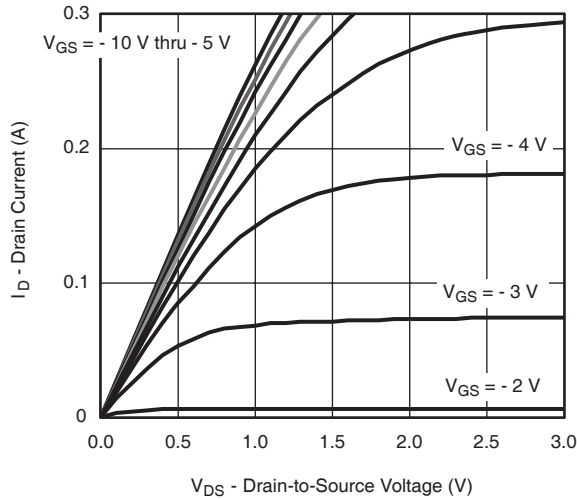


Single Pulse Power

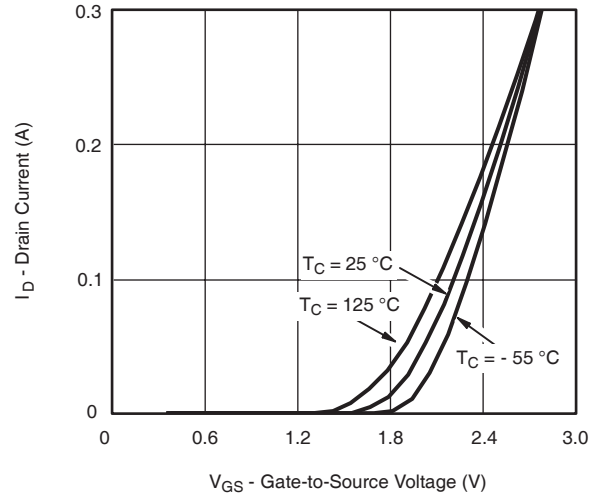


Safe Operating Area

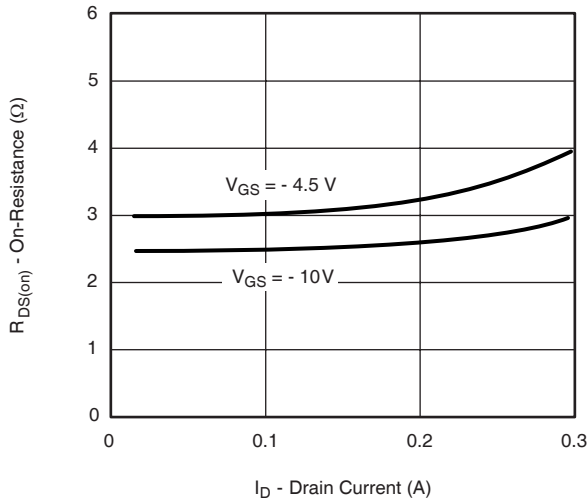
P-CHANNEL TYPICAL CHARACTERISTICS ($T_A = 25\text{ }^\circ\text{C}$, unless otherwise noted)



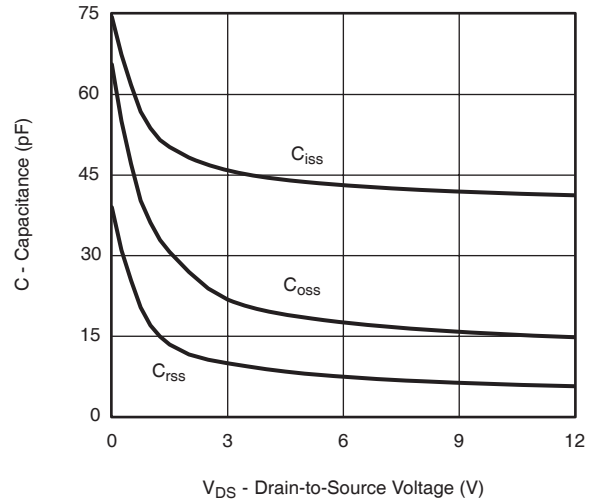
Output Characteristics



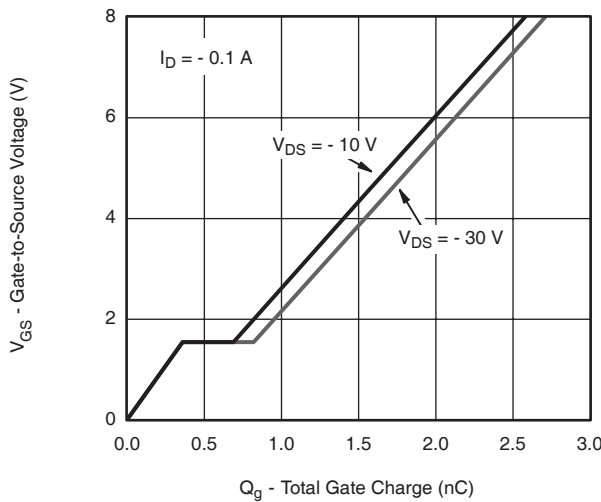
Transfer Characteristics



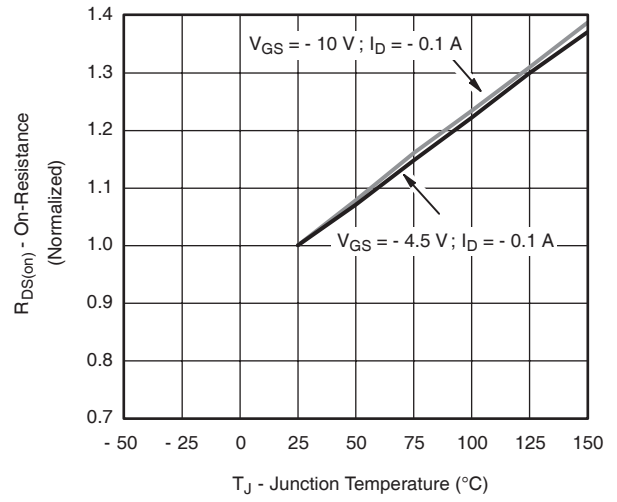
On-Resistance vs. Drain Current and Gate Voltage



Capacitance

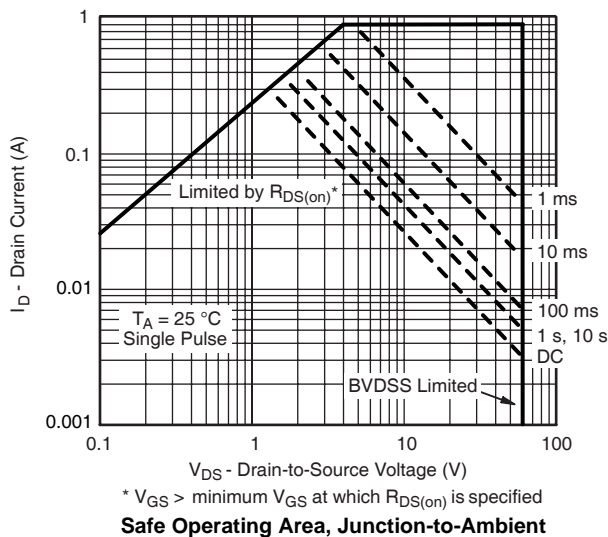
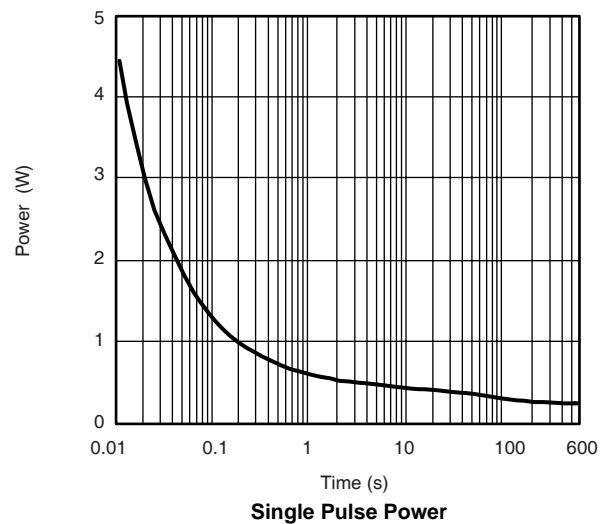
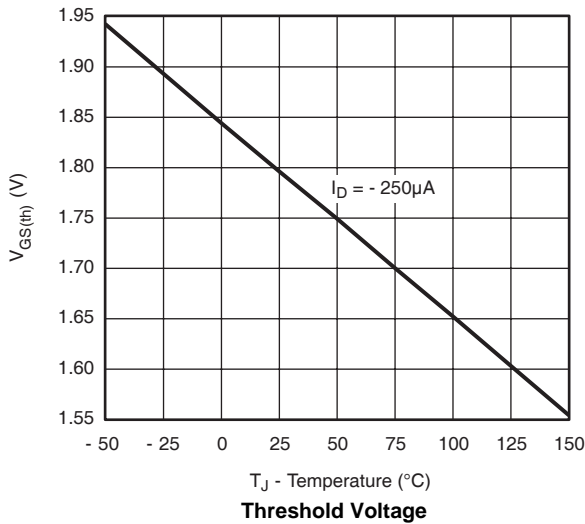
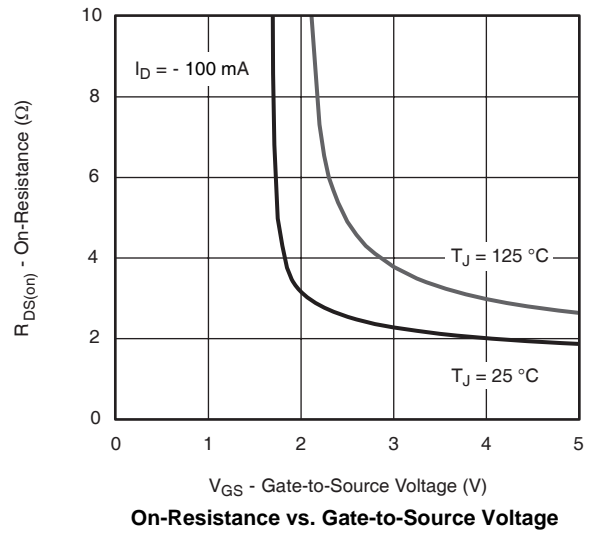
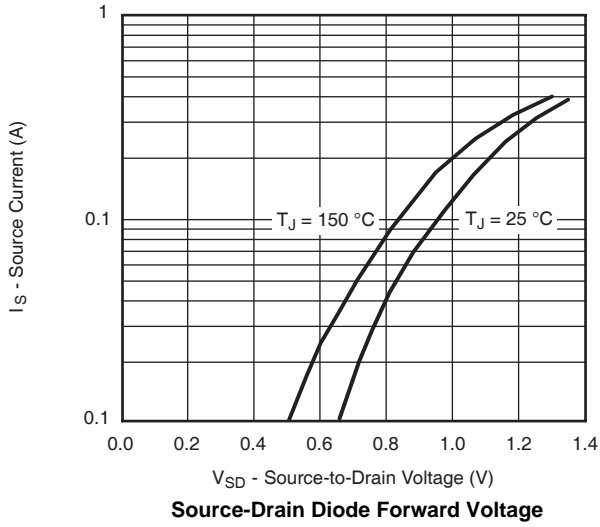


Gate Charge

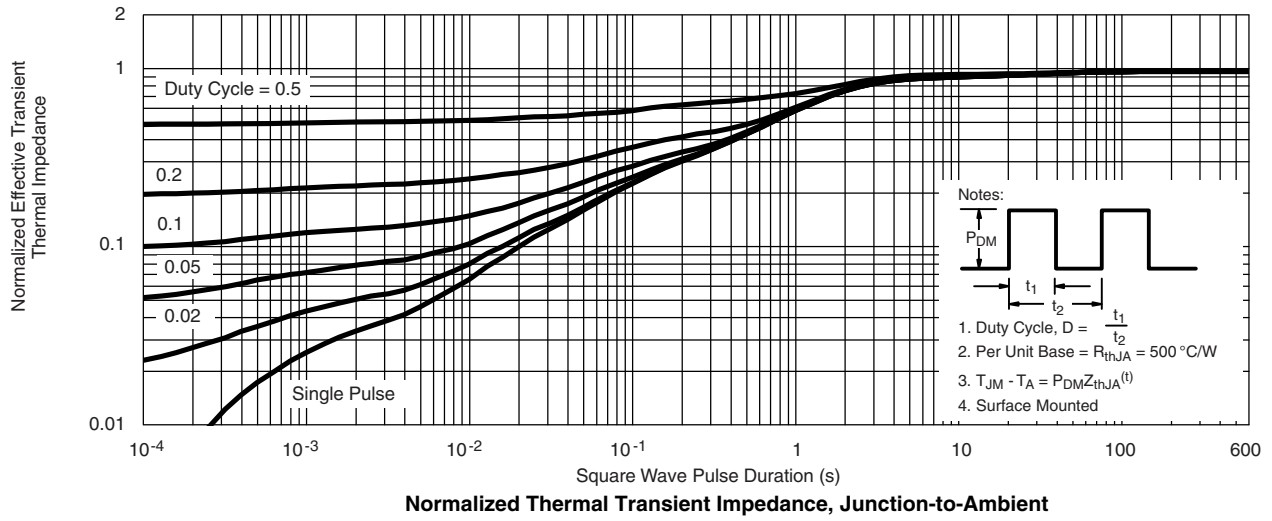


On-Resistance vs. Junction Temperature

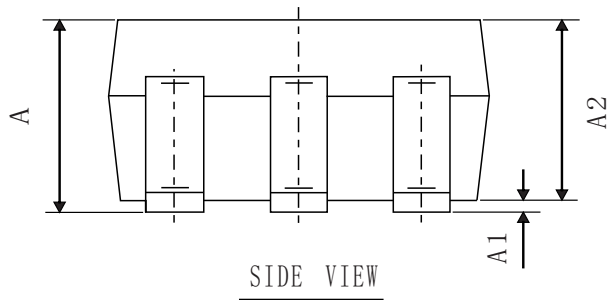
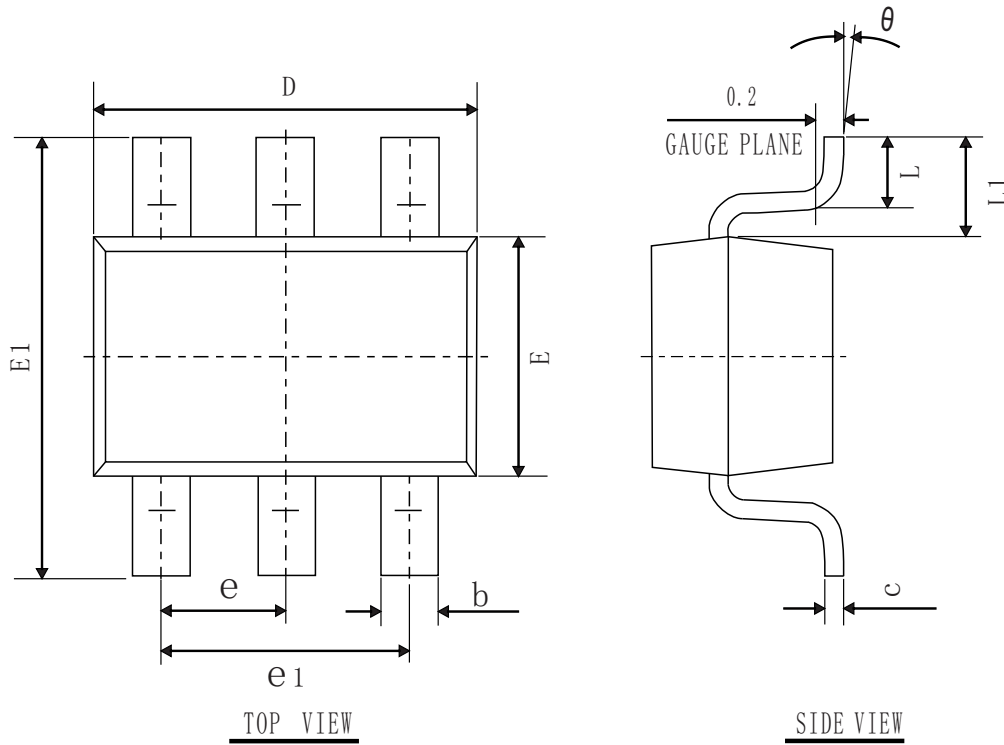
P-CHANNEL TYPICAL CHARACTERISTICS ($T_A = 25\text{ }^\circ\text{C}$, unless otherwise noted)



N- OR P-CHANNEL TYPICAL CHARACTERISTICS ($T_A = 25\text{ }^\circ\text{C}$, unless otherwise noted)



SOT-323-6L PACKAGE OUTLINE



COMMON DIMENSIONS
(UNITS OF MEASURE=mm)

SYMBOL	MIN	NOM	MAX
A	0.90	1.00	1.10
A1	0.00	0.05	0.10
A2	0.90	0.95	1.00
b	0.20	0.25	0.30
c	0.08	0.10	0.15
e1	1.20	1.30	1.40
D	2.00	2.10	2.20
E	1.15	1.25	1.35
E1	2.15	2.30	2.45
L	0.26	0.36	0.46
θ	0°	4°	8°
L1	0.525 REF		
e	0.65 TYP		

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