

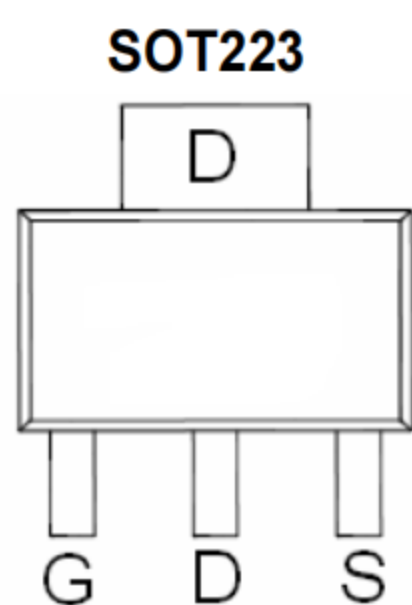
GENERAL FEATURES

- 60V, 4A, $R_{DS(ON)} = 85m\Omega$ @ $V_{GS} = 10V$.
 $R_{DS(ON)} = 100m\Omega$ @ $V_{GS} = 4.5V$.
- High dense cell design for extremely low $R_{DS(ON)}$.
- Rugged and reliable.
- Lead free product is acquired.
- SOT-223 package.

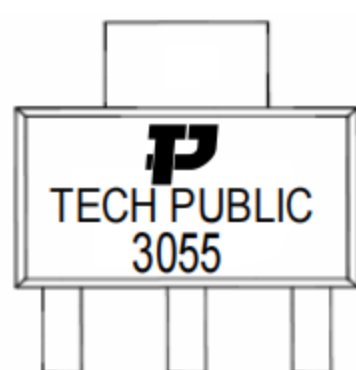
Application

- Load/Power Switching
- Interfacing Switching
- Logic Level Shift

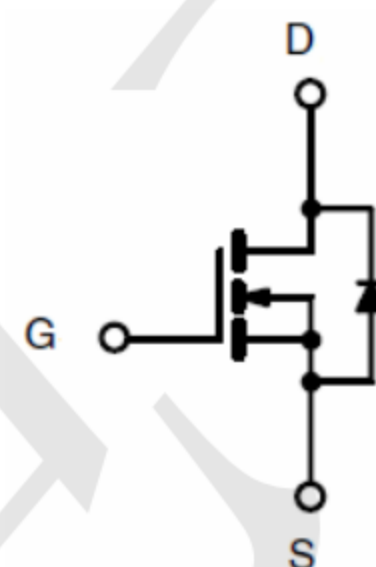
Package and Pin Configuration



Marking:



Circuit diagram



ABSOLUTE MAXIMUM RATINGS $T_A = 25^\circ C$ unless otherwise noted

Parameter	Symbol	Limit	Units
Drain-Source Voltage	V_{DS}	60	V
Gate-Source Voltage	V_{GS}	± 20	V
Drain Current-Continuous	I_D	4	A
Drain Current-Pulsed ^a	I_{DM}	20	A
Maximum Power Dissipation	P_D	3	W
Operating and Store Temperature Range	T_J, T_{stg}	-55 to 150	$^\circ C$

Thermal Characteristics

Parameter	Symbol	Limit	Units
Thermal Resistance, Junction-to-Ambient ^b	$R_{\theta JA}$	42	$^\circ C/W$

Electrical Characteristics $T_A = 25^\circ\text{C}$ unless otherwise noted

Parameter	Symbol	Test Condition	Min	Typ	Max	Units
Off Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS} = 0V, I_D = 250\mu A$	60			V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 60V, V_{GS} = 0V$			1	μA
Gate Body Leakage Current, Forward	I_{GSSF}	$V_{GS} = 20V, V_{DS} = 0V$			100	nA
Gate Body Leakage Current, Reverse	I_{GSSR}	$V_{GS} = -20V, V_{DS} = 0V$			-100	nA
On Characteristics						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{GS} = V_{DS}, I_D = 250\mu A$	1		3	V
Static Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS} = 10V, I_D = 2A$			85	$m\Omega$
		$V_{GS} = 4.5V, I_D = 1.5A$			100	$m\Omega$
Dynamic Characteristics^d						
Input Capacitance	C_{iss}	$V_{DS} = 25V, V_{GS} = 0V, f = 1.0\text{ MHz}$		530		pF
Output Capacitance	C_{oss}			70		pF
Reverse Transfer Capacitance	C_{rss}			50		pF
Switching Characteristics^d						
Turn-On Delay Time	$t_{d(on)}$	$V_{DD} = 30V, I_D = 1A, V_{GS} = 10V, R_{GEN} = 6\Omega$		9	18	ns
Turn-On Rise Time	t_r			4	8	ns
Turn-Off Delay Time	$t_{d(off)}$			28	56	ns
Turn-Off Fall Time	t_f			3	6	ns
Total Gate Charge	Q_g	$V_{DS} = 30V, I_D = 4.5A, V_{GS} = 10V$		13	17	nC
Gate-Source Charge	Q_{gs}			1		nC
Gate-Drain Charge	Q_{gd}			4		nC
Drain-Source Diode Characteristics and Maximun Ratings						
Drain-Source Diode Forward Current ^b	I_S				2.5	A
Drain-Source Diode Forward Voltage ^c	V_{SD}	$V_{GS} = 0V, I_S = 2.5A$			1.1	V

Typical Electrical and Thermal Characteristics

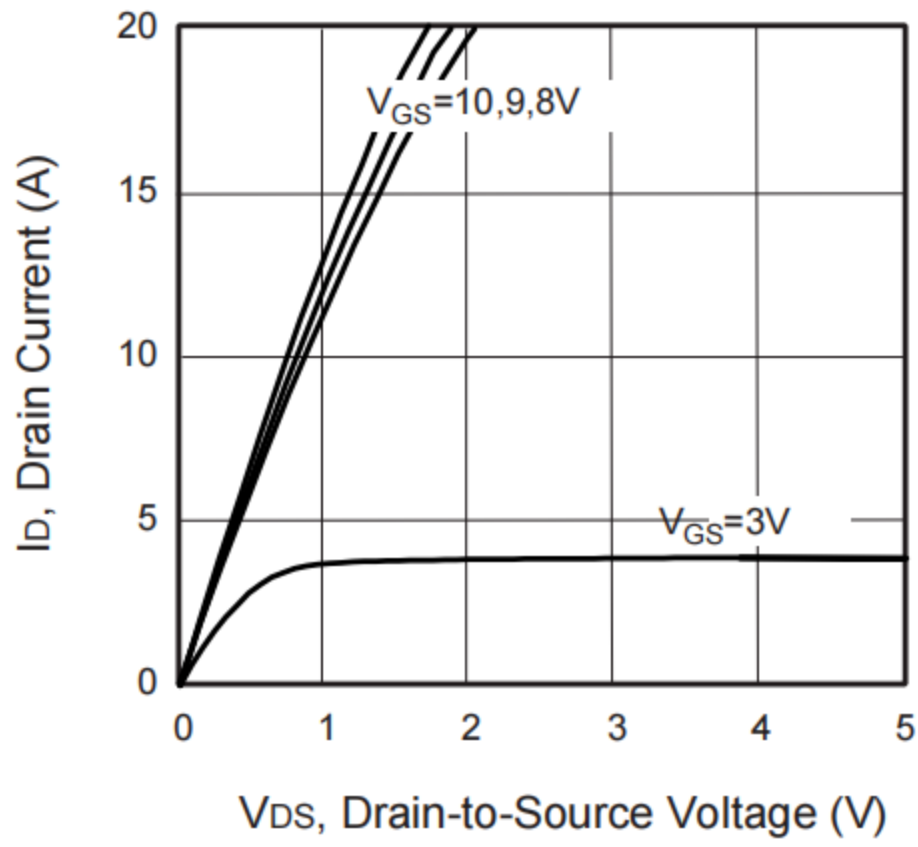


Figure 1. Output Characteristics

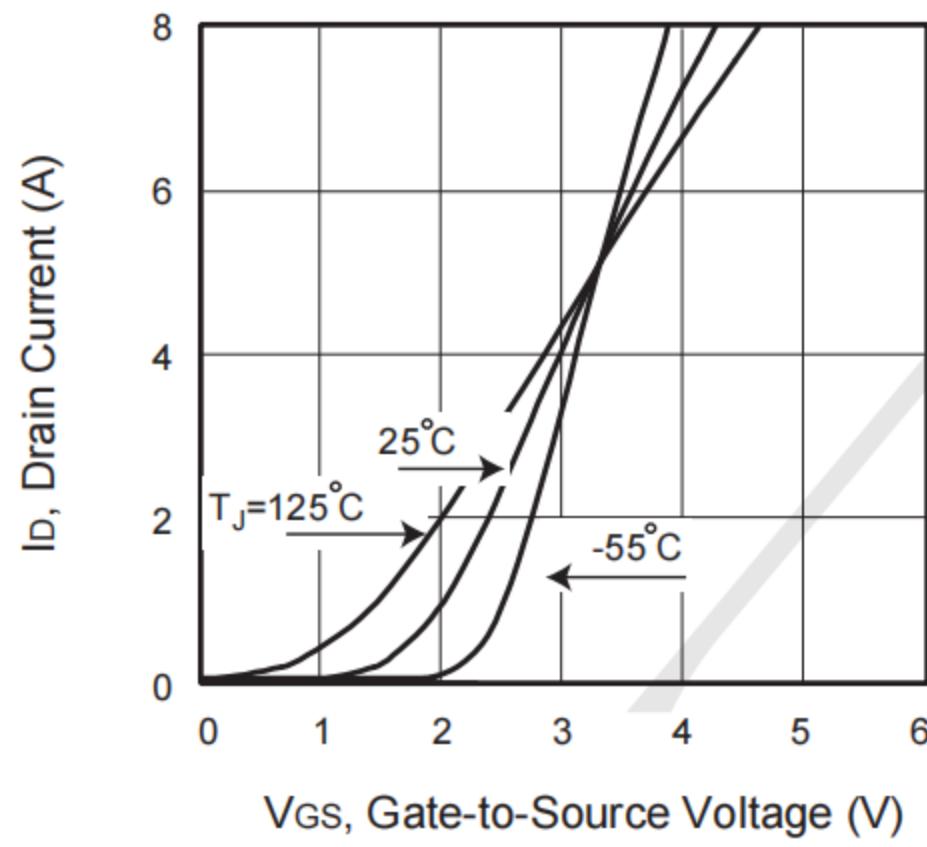


Figure 2. Transfer Characteristics

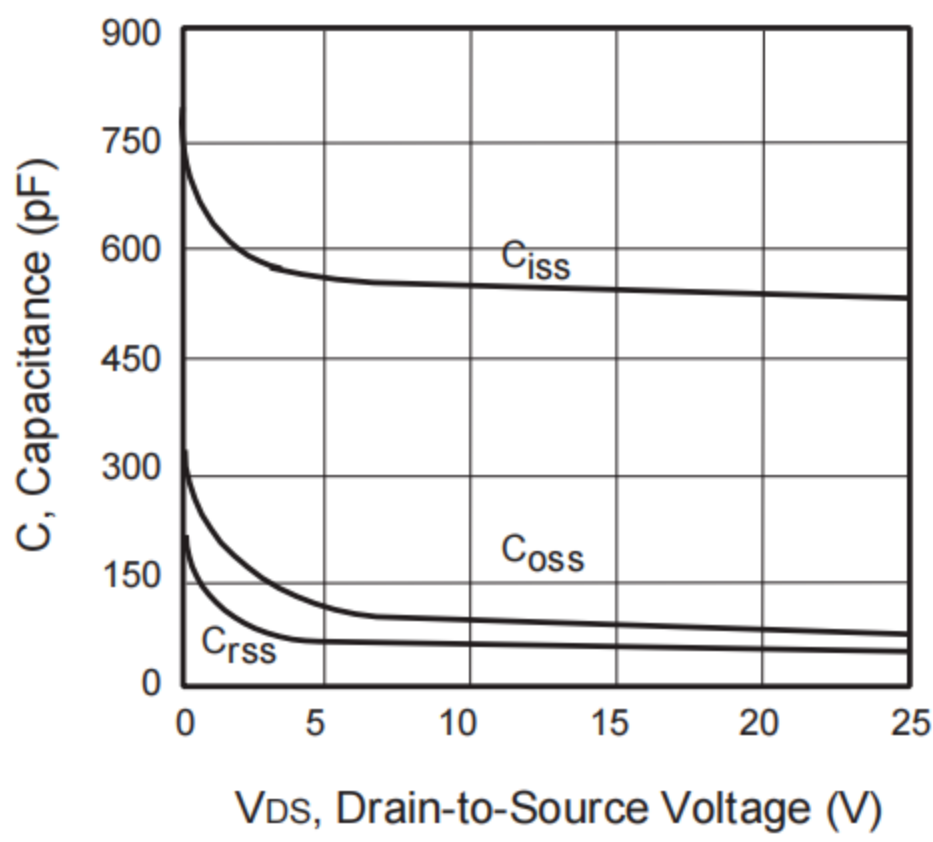


Figure 3. Capacitance

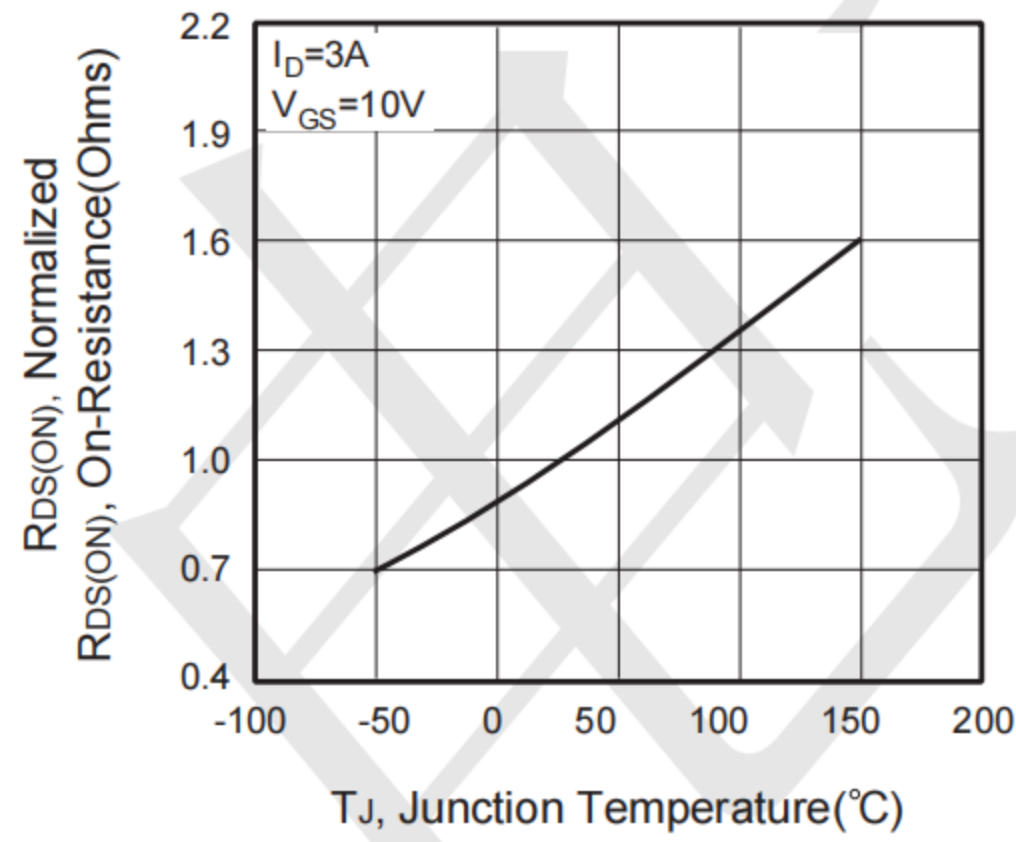


Figure 4. On-Resistance Variation with Temperature

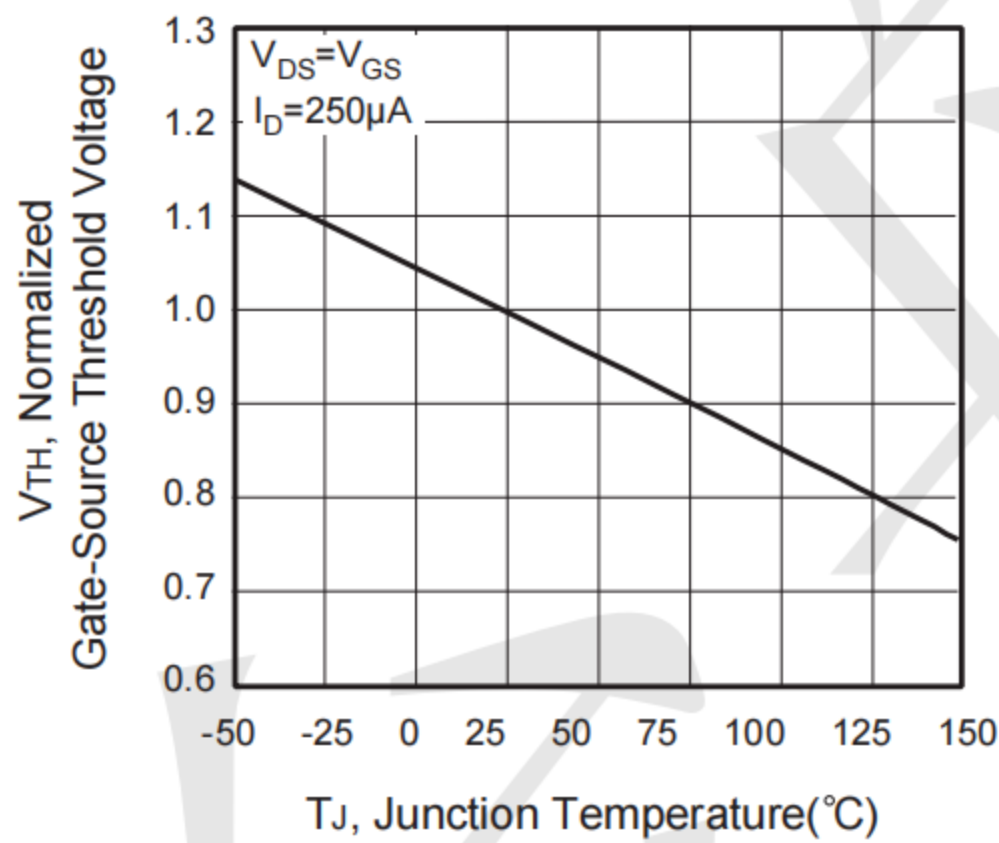


Figure 5. Gate Threshold Variation with Temperature

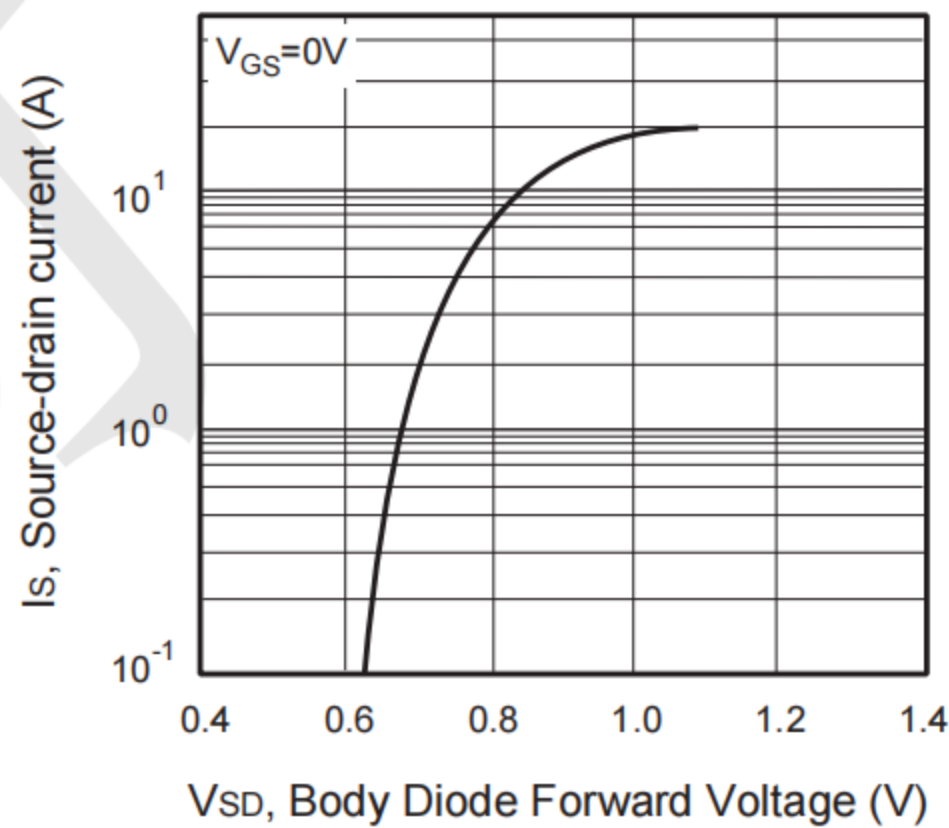


Figure 6. Body Diode Forward Voltage Variation with Source Current

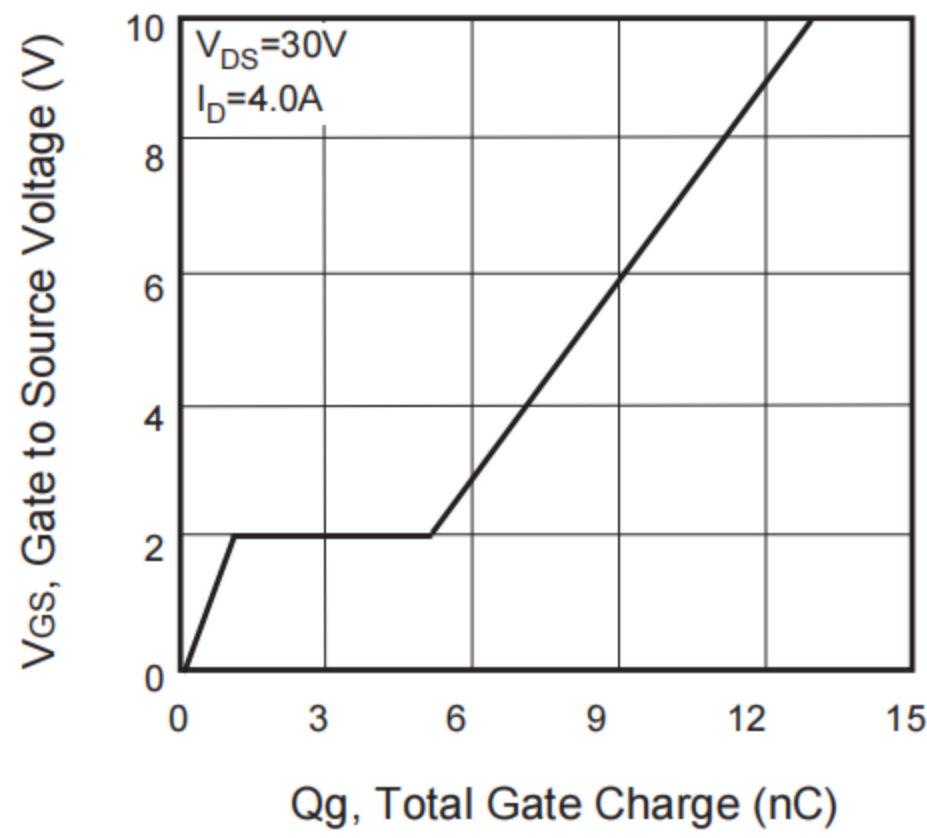


Figure 7. Gate Charge

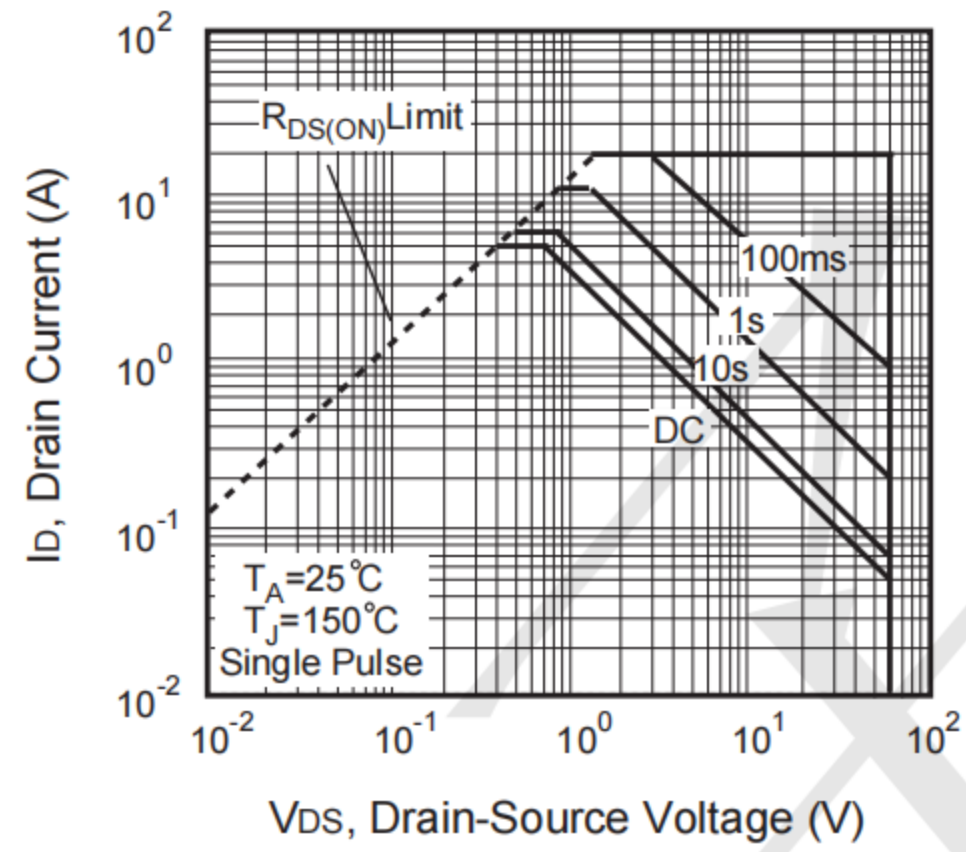


Figure 8. Maximum Safe Operating Area

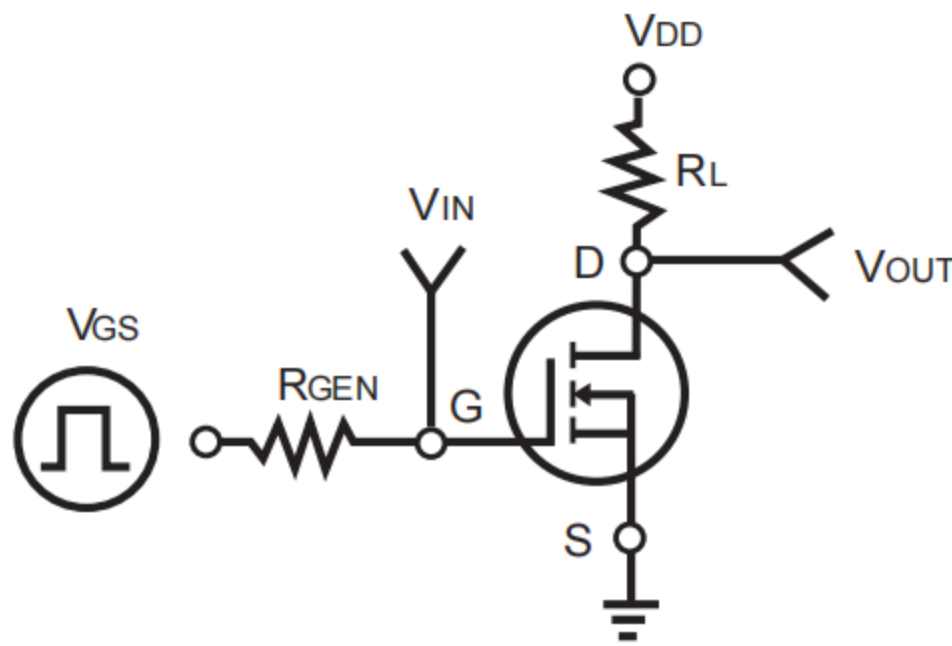


Figure 9. Switching Test Circuit

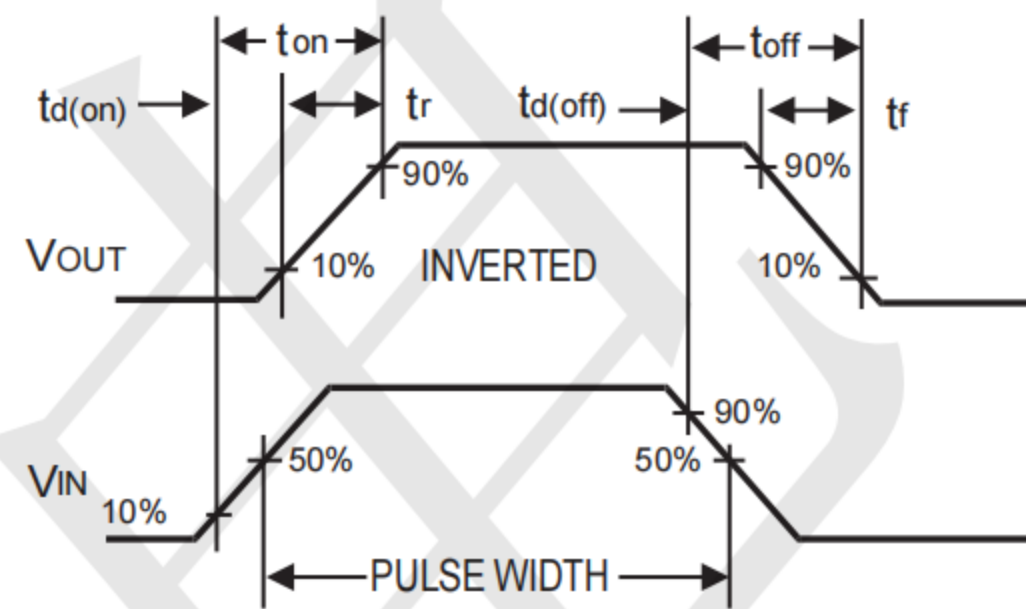


Figure 10. Switching Waveforms

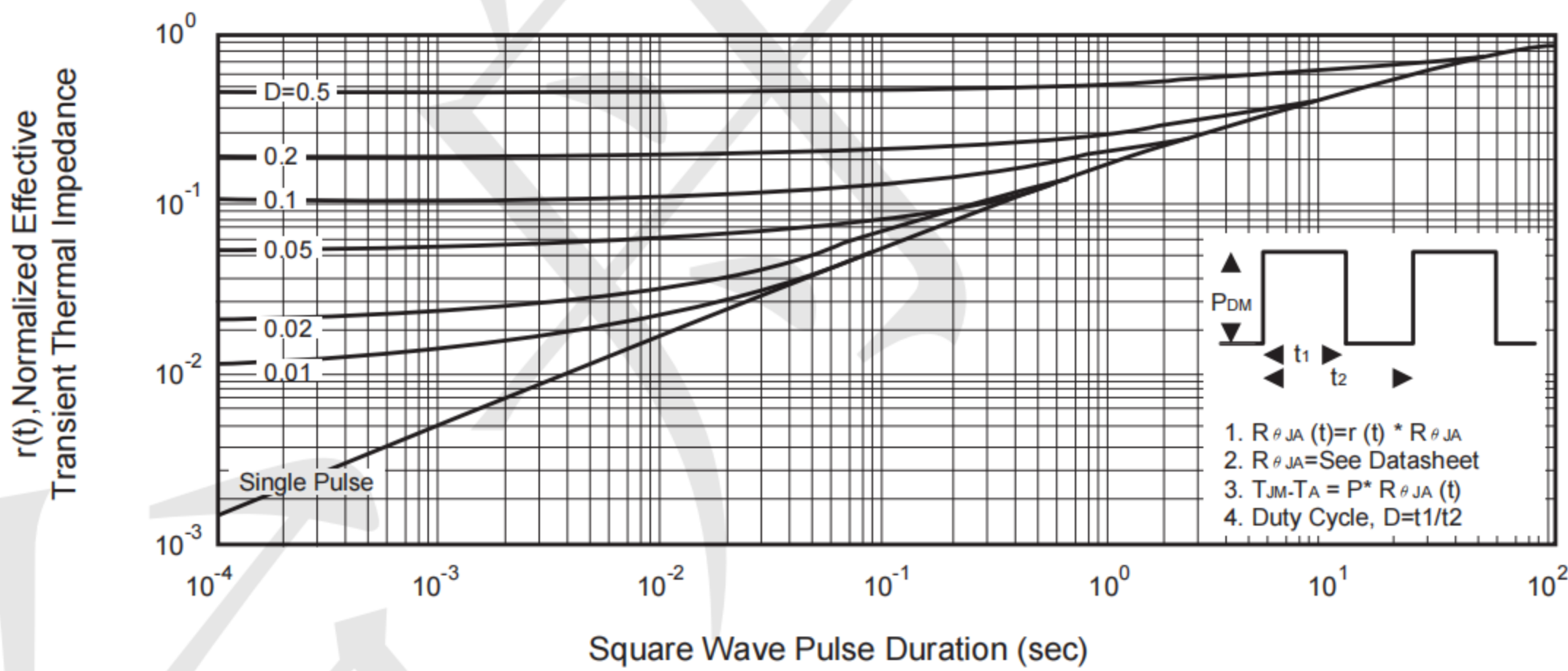
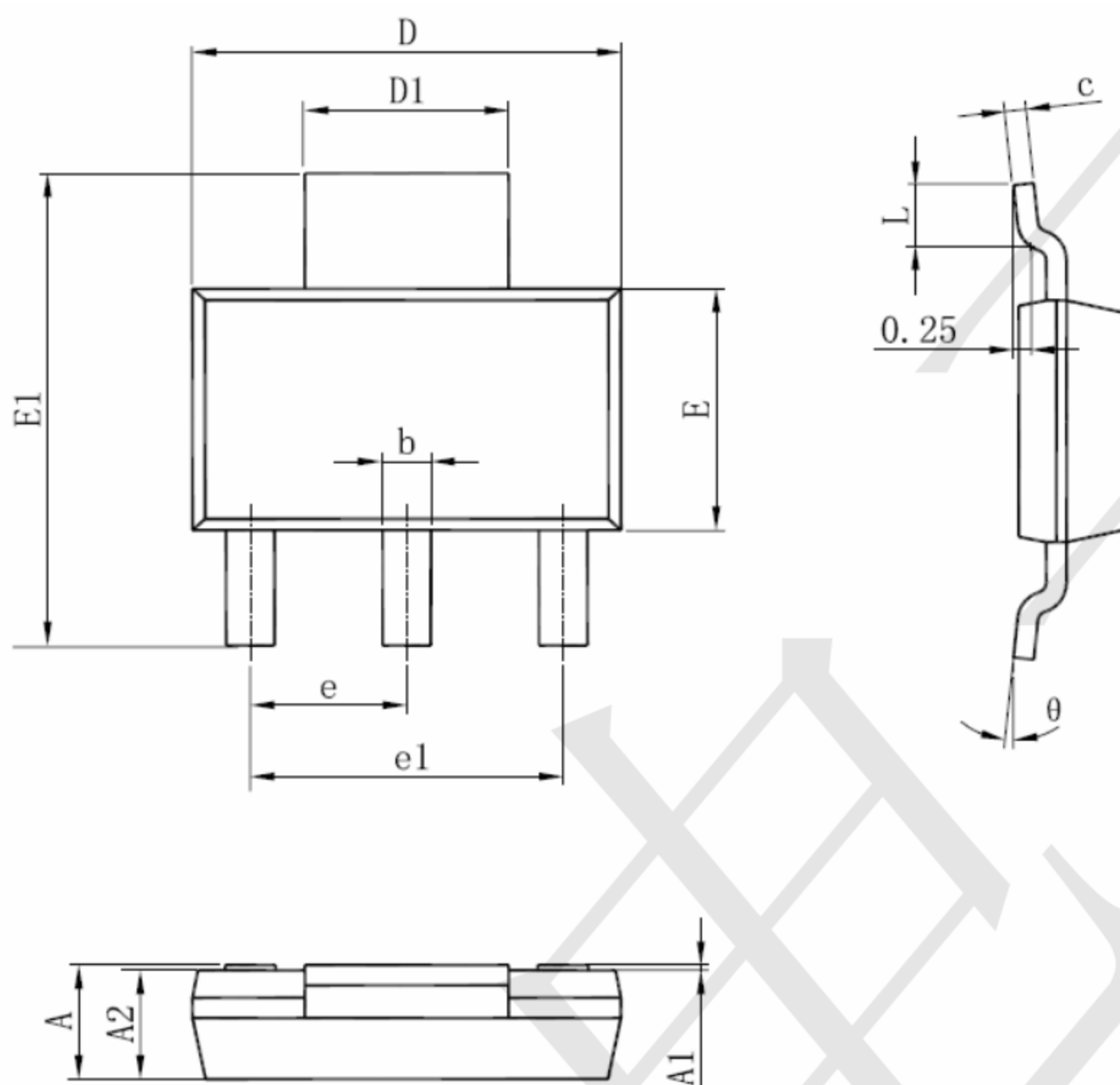


Figure 11. Normalized Thermal Transient Impedance Curve



SOT-223 Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.520	1.800	0.060	0.071
A1	0.000	0.100	0.000	0.004
A2	1.500	1.700	0.059	0.067
b	0.660	0.820	0.026	0.032
c	0.250	0.350	0.010	0.014
D	6.200	6.400	0.244	0.252
D1	2.900	3.100	0.114	0.122
E	3.300	3.700	0.130	0.146
E1	6.830	7.070	0.269	0.278
e	2.300(BSC)		0.091(BSC)	
e1	4.500	4.700	0.177	0.185
L	0.900	1.150	0.035	0.045
θ	0°	10°	0°	10°