

## N-Channel Enhancement Mode Power MOSFET

- Features**

$V_{DS} = 30V,$

$I_D = 4.3A$

$R_{DS(ON)} @V_{GS} = 10V, TYP 28m\Omega$

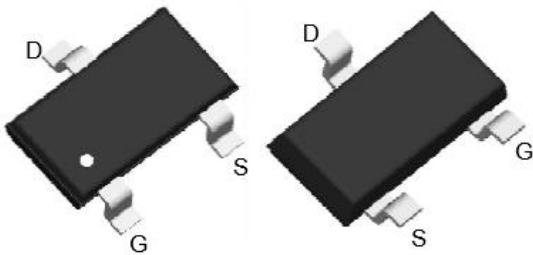
$R_{DS(ON)} @V_{GS} = 4.5V, TYP 32 m\Omega$

$R_{DS(ON)} @V_{GS} = 2.5V, TYP 47 m\Omega$

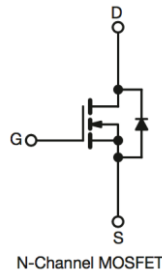
- General Description**

- load switch
- PWM applications

- Pin Configurations**



SOT23



- Absolute Maximum Ratings @ $T_A=25^\circ C$  unless otherwise noted**

Parameter	Symbol	Ratings	Unit
Drain-Source Voltage	$V_{DSS}$	30	V
Gate-Source Voltage	$V_{GSS}$	$\pm 12$	V
Drain Current (Continuous) *AC	$I_D$	$T_A=25^\circ C$	4.3
		$T_A=70^\circ C$	3.5
Drain Current (Pulse) *B	$I_{DM}$	17	A
Power Dissipation	$P_D$	1.25	W
Operating Temperature/ Storage Temperature	$T_J/T_{STG}$	-55~150	$^\circ C$

- Thermal Resistance Ratings**

Parameter	Symbol	Maximum	Unit
Maximum Junction-to-Ambient	$R_{thJA}$	100	$^\circ C/W$

**● Electrical Characteristics @T<sub>A</sub>=25°C unless otherwise noted**

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
<b>Static</b>						
Drain-Source Breakdown Voltage	V <sub>(BR)DSS</sub>	V <sub>GS</sub> = 0V, I <sub>D</sub> = 250μA	30	--	--	V
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> = 30 V, V <sub>GS</sub> = 0V	--	--	1	μA
Gate Threshold Voltage	V <sub>GS(TH)</sub>	V <sub>GS</sub> = V <sub>DS</sub> , I <sub>DS</sub> = 250μA	0.5	--	1.5	V
Gate Leakage Current	I <sub>GSS</sub>	V <sub>GS</sub> = ±12V, V <sub>DS</sub> = 0V	--	--	±100	nA
Drain-Source On-state Resistance	R <sub>DS(on)</sub>	V <sub>GS</sub> = 10V, I <sub>D</sub> = 5A	--	28	36	mΩ
	R <sub>DS(on)</sub>	V <sub>GS</sub> = 4.5V, I <sub>D</sub> = 5A	--	32	42	mΩ
	R <sub>DS(on)</sub>	V <sub>GS</sub> = 2.5V, I <sub>D</sub> = 4A	--	47	61	mΩ
Diode Forward Voltage	V <sub>SD</sub>	I <sub>SD</sub> = 1A, V <sub>GS</sub> = 0V	--	--	1	V
Diode Forward Current	I <sub>S</sub>	T <sub>A</sub> = 25°C	--	--	4.9	A
<b>Switching</b>						
Total Gate Charge	Q <sub>g</sub>	V <sub>DS</sub> = 15V, I <sub>D</sub> = 4.8A, V <sub>GS</sub> = 4.5V	--	9	--	nC
Gate-Source Charge	Q <sub>gs</sub>		--	1	--	nC
Gate-Drain Charge	Q <sub>gd</sub>		--	2	--	nC
Turn-on Delay Time	t <sub>d(on)</sub>	V <sub>DD</sub> = 15V, I <sub>D</sub> = 4.8A, V <sub>GS</sub> = 10V, R <sub>GEN</sub> = 3Ω	--	10	--	ns
Turn-on Rise Time	t <sub>r</sub>		--	3	--	ns
Turn-off Delay Time	t <sub>d(off)</sub>		--	40	--	ns
Turn-Off Fall Time	t <sub>f</sub>		--	2	--	ns
<b>Dynamic</b>						
Input Capacitance	C <sub>iss</sub>	V <sub>DS</sub> = 15V, V <sub>GS</sub> = 0V, f = 1.0 MHz	--	735	--	pF
Output Capacitance	C <sub>oss</sub>		--	90	--	pF
Reverse Transfer Capacitance	C <sub>rss</sub>		--	65	--	pF

A: The value of R<sub>θJA</sub> is measured with the device mounted on 1in<sup>2</sup> FR-4 board with 2oz. Copper, in a still air environment with T<sub>A</sub>=25°C. The value in any given application depends on the user's specific board design.

B: Repetitive rating, pulse width limited by junction temperature.

C: The current rating is based on the t<sub>s</sub> 10s junction to ambient thermal resistance rating.

● Typical Performance Characteristics ((T<sub>J</sub> = 25 °C, unless otherwise noted))

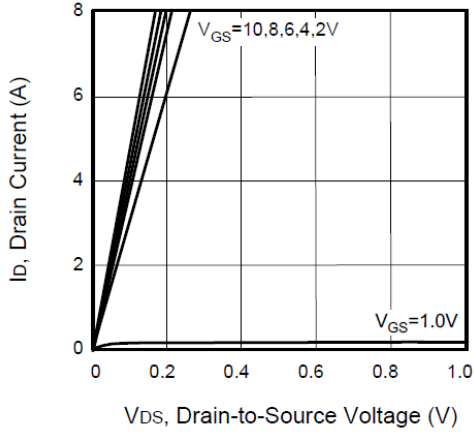


Figure 1. Output Characteristics

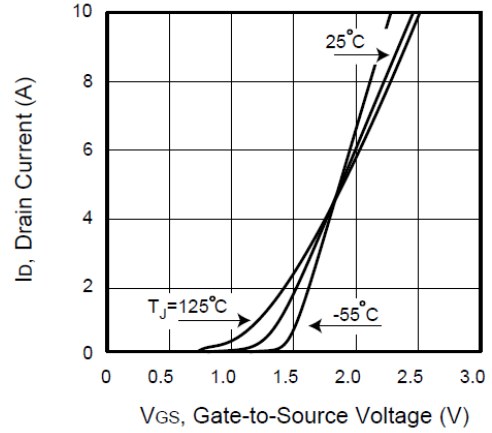


Figure 2. Transfer Characteristics

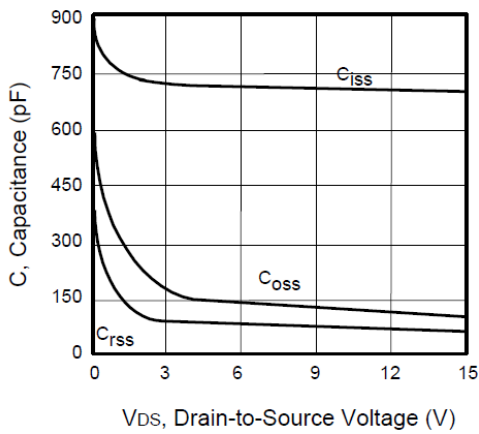


Figure 3. Capacitance

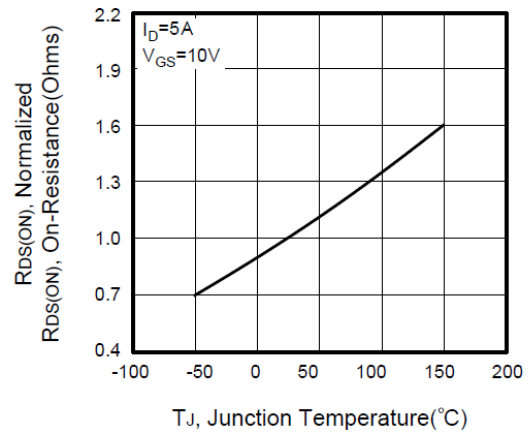


Figure 4. On-Resistance Variation with Temperature

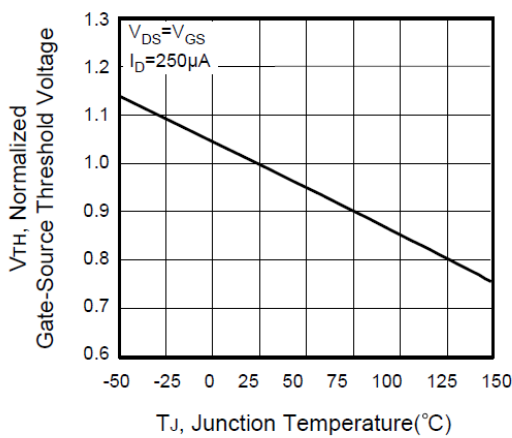


Figure 5. Gate Threshold Variation with Temperature

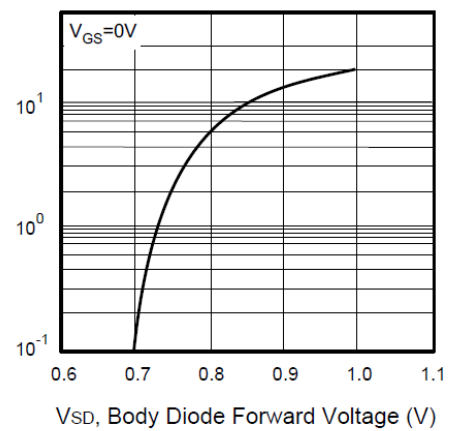


Figure 6. Body Diode Forward Voltage Variation with Source Current

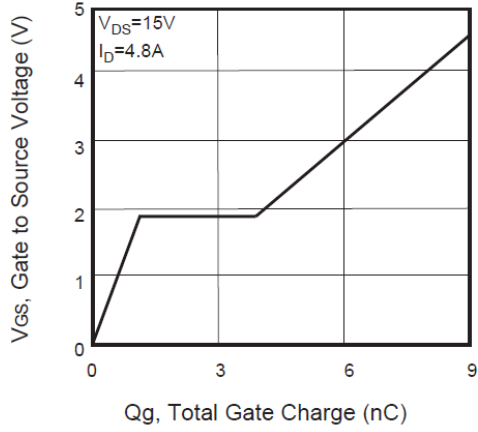


Figure 7. Gate Charge

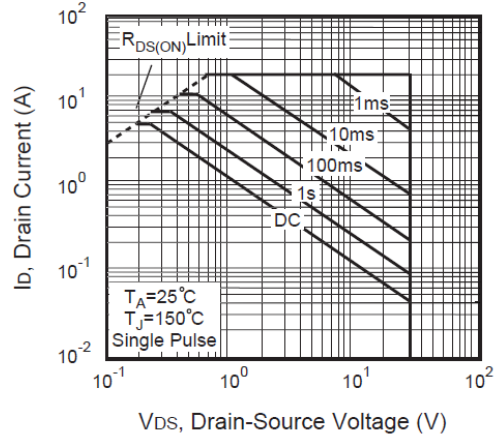


Figure 8. Maximum Safe Operating Area

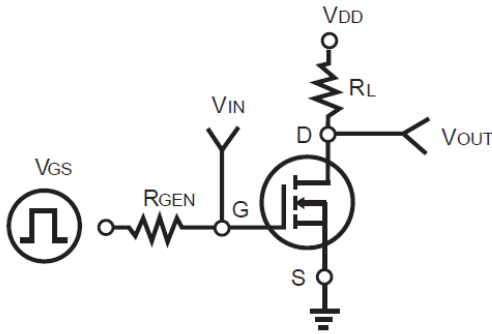


Figure 9. Switching Test Circuit

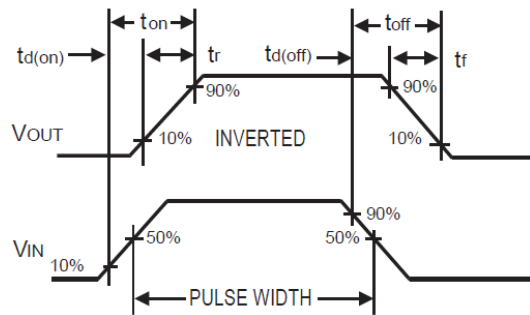


Figure 10. Switching Waveforms

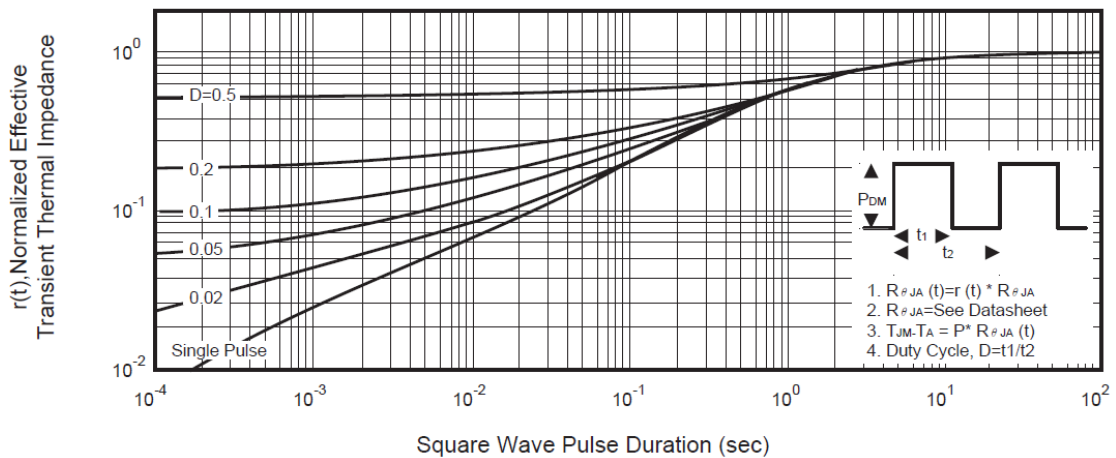
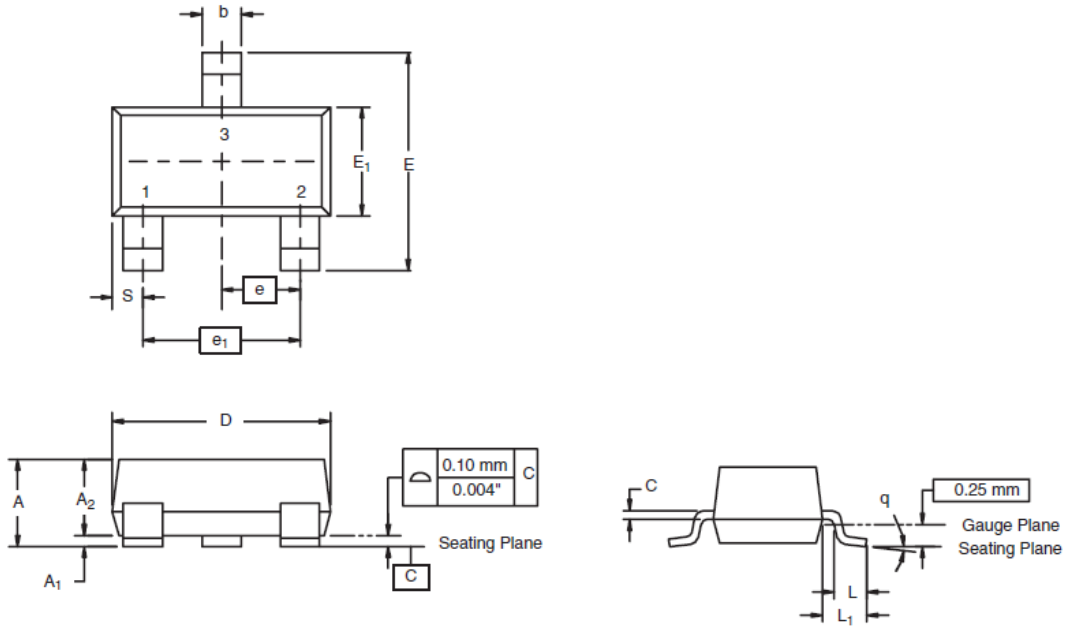


Figure 11. Normalized Thermal Transient Impedance Curve

● Package Information



Dim	MILLIMETERS		INCHES	
	Min	Max	Min	Max
A	0.89	1.12	0.035	0.044
A <sub>1</sub>	0.01	0.10	0.0004	0.004
A <sub>2</sub>	0.88	1.02	0.0346	0.040
b	0.35	0.50	0.014	0.020
c	0.085	0.18	0.003	0.007
D	2.80	3.04	0.110	0.120
E	2.10	2.64	0.083	0.104
E <sub>1</sub>	1.20	1.40	0.047	0.055
e	0.95 BSC		0.0374 Ref	
e <sub>1</sub>	1.90 BSC		0.0748 Ref	
L	0.40	0.60	0.016	0.024
L <sub>1</sub>	0.64 Ref		0.025 Ref	
S	0.50 Ref		0.020 Ref	
q	3°	8°	3°	8°