P-Channel Enhancement Mode Field Effect Transistor

Features

V_{DS} = -30V,

I_D = -4A

$R_{DS(ON)}$ @V_{GS}= -10V, TYP 46mΩ

$R_{DS(ON)}$ @V_{GS}= -4.5V, TYP 50mΩ

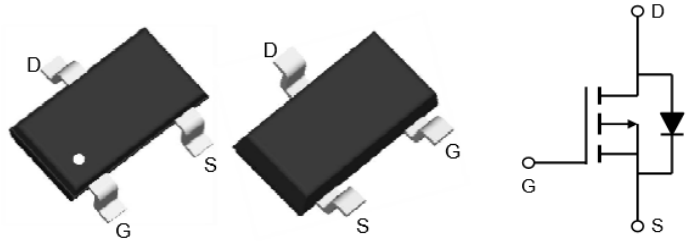
$R_{DS(ON)}$ @V_{GS}= -2.5V, TYP 63mΩ

General Description

• Load Switch

• PWM

Pin Configurations



SOT-23

Absolute Maximum Ratings @T_A=25℃ unless otherwise noted

Parameter		Symbol	Ratings	Unit
Drain-Source Voltage		V_{DSS}	-30	V
Gate-Source Voltage		V_{GSS}	±12	V
Drain Current (Continuous) *AC	T_A=25°C	I_D	-4	A
	T_A=70°C		-3.2	
Drain Current (Pulse) *B		I_{DM}	-15	A
Power Dissipation	T_A=25°C	P_D	1.25	W
Operating Temperature/ Storage Temperature		T_J/T_{STG}	-55~150	℃

Thermal Resistance Ratings

Parameter		Symbol	Typical	Maximum	Unit
Maximum Junction-to-Ambient	t ≤ 5s	R_{thJA}	80	100	℃/W

- **Electrical Characteristics** @T_A=25℃ unless otherwise noted

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Static						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS} = 0V, I_D = -250μA	-30	--	--	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = -30V, V_{GS} = 0V	--	--	-1	μA
Gate Threshold Voltage	$V_{GS(TH)}$	V_{GS} = V_{DS}, I_{DS} = -250μA	-0.5	-0.9	-1.5	V
Gate Leakage Current	I_{GSS}	V_{GS} = ±12V, V_{DS} = 0V	--	--	±100	nA
Drain-Source On-state Resistance	$R_{DS(on)}$	V_{GS} = -10V, I_D = -4A	--	46	58	mΩ
	$R_{DS(on)}$	V_{GS} = -4.5V, I_D = -3.5A	--	50	72	mΩ
	$R_{DS(on)}$	V_{GS} = -2.5V, I_D = -1A	--	63	86	mΩ
Diode Forward Voltage	V_{SD}	I_{SD} = -1A , V_{GS} = 0V	--	--	-1.2	V
Diode Forward Current	I_S	T_A = 25°C	--	--	-2	A
Switching						
Total Gate Charge	Q_g	V_{GS} = -4.5V, V_{DS} = -15V, I_D = -4A	--	9	--	nC
Gate-Source Charge	Q_{gs}		--	1	--	nC
Gate-Drain Charge	Q_{gd}		--	3	--	nC
Turn-on Delay Time	$t_{d(on)}$	V_{DD} = -15V, R_G = 6Ω, I_D = -4A, V_{GS} = -10V	--	9	--	ns
Turn-on Rise Time	t_r		--	3	--	ns
Turn-off Delay Time	$t_{d(off)}$		--	66	--	ns
Turn-Off Fall Time	t_f		--	16	--	ns
Dynamic						
Input Capacitance	C_{iss}	V_{GS}=0V,V_{DS}= -15V,f= 1.0MHz	--	945	--	pF
Output Capacitance	C_{oss}		--	120	--	pF
Reverse Transfer Capacitance	C_{rss}		--	80	--	pF

A: The value of $R_{\theta JA}$ is measured with the device mounted on 1in^2 FR-4 board with 2oz. Copper, in a still air environment with T_A=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≤ 10s junction to ambient thermal resistance rating.

D: Pulse Test：Pulse Width≤ 300us，Duty Cycle ≤ 2%.

- **Typical Performance Characteristics（(TJ = 25 °C, unless otherwise noted)）**

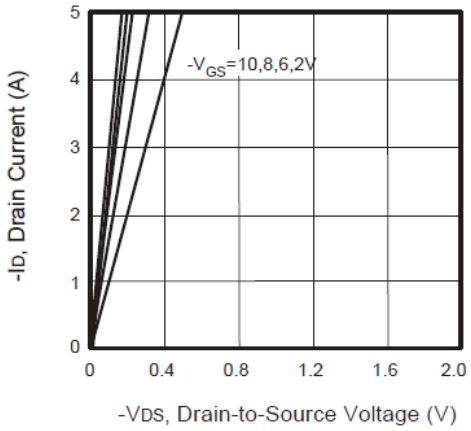


Figure 1. Output Characteristics

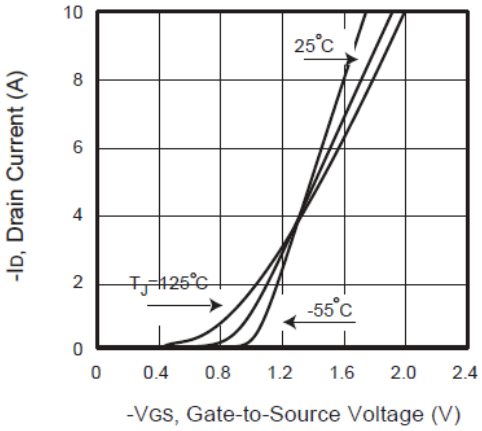


Figure 2. Transfer Characteristics

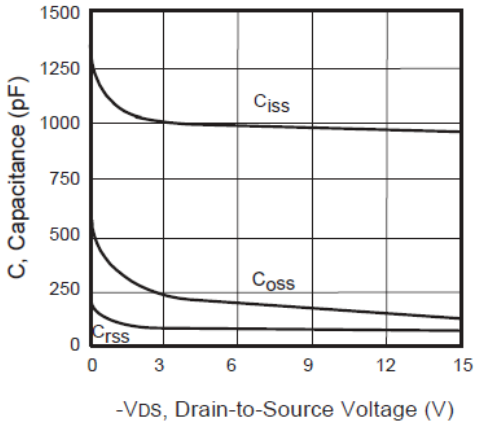


Figure 3. Capacitance

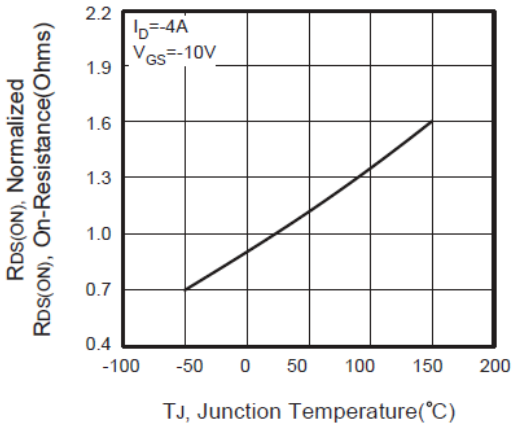


Figure 4. On-Resistance Variation with Temperature

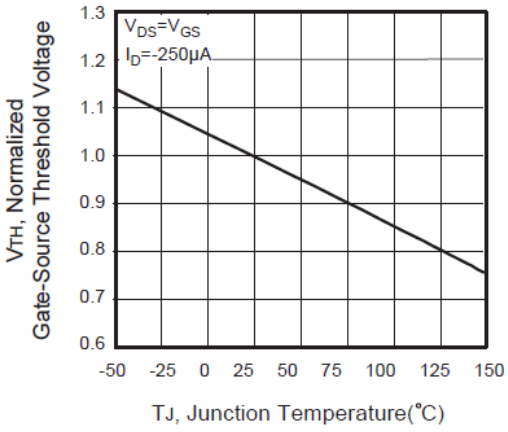


Figure 5. Gate Threshold Variation with Temperature

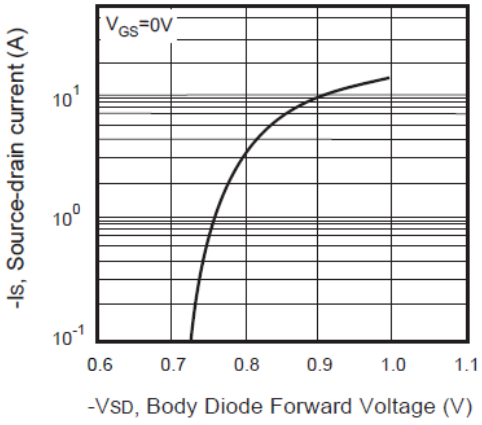


Figure 6. Body Diode Forward Voltage Variation with Source Current

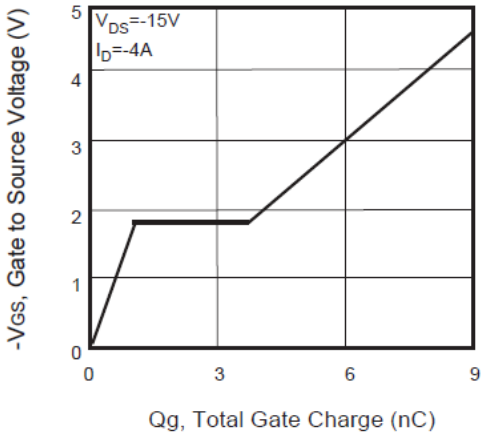


Figure 7. Gate Charge

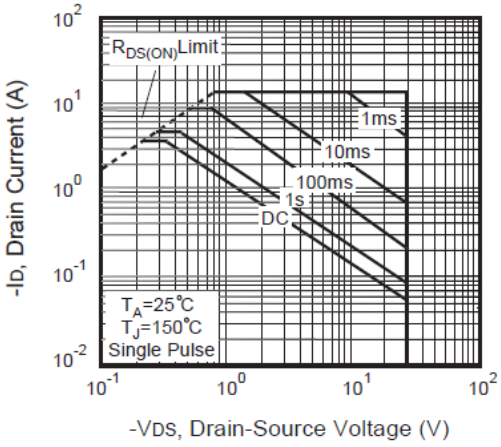


Figure 8. Maximum Safe Operating Area

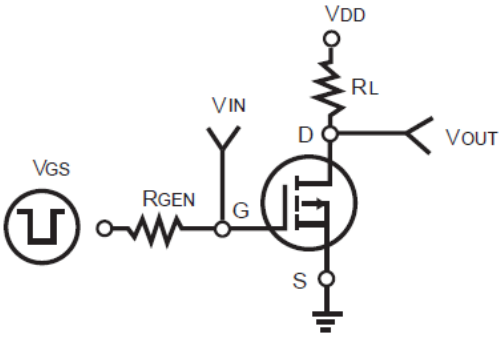


Figure 9. Switching Test Circuit

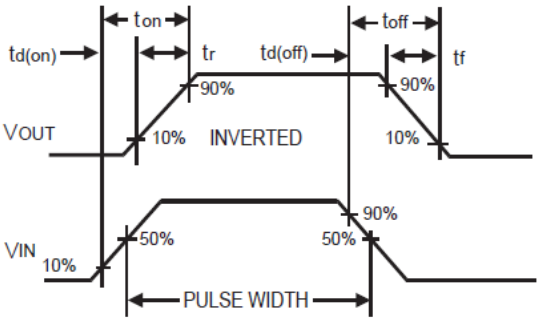


Figure 10. Switching Waveforms

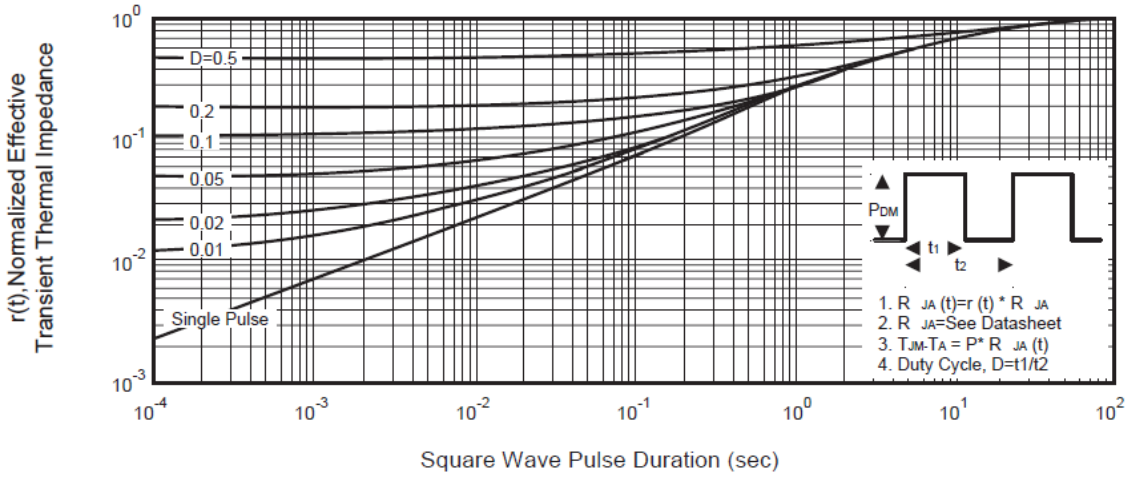
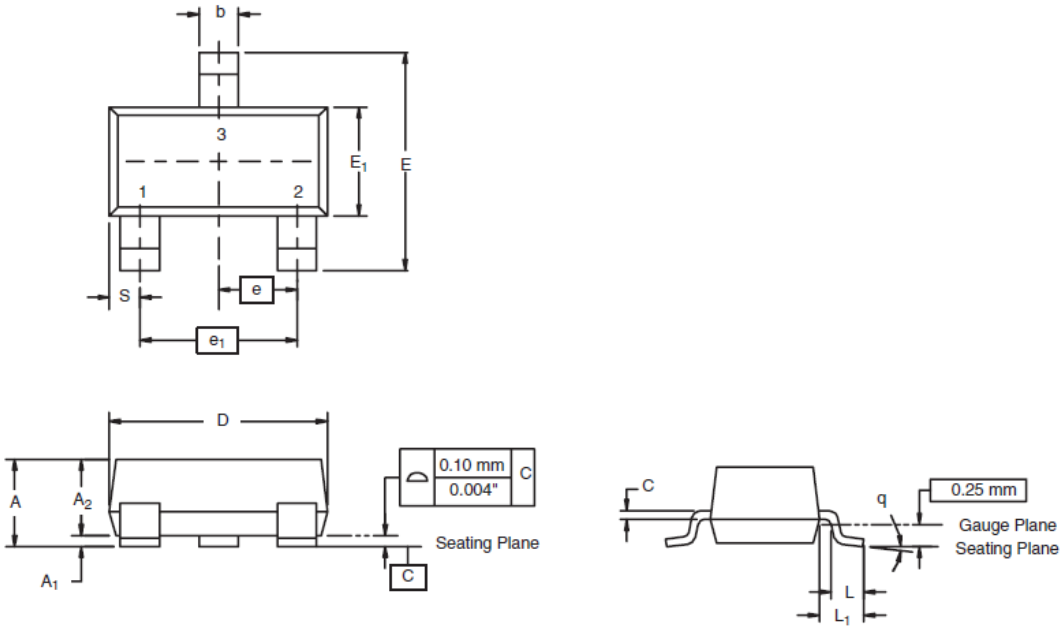


Figure 11. Normalized Thermal Transient Impedance Curve

- **Package Information**



Dim	MILLIMETERS		INCHES	
	Min	Max	Min	Max
A	0.89	1.12	0.035	0.044
A_1	0.01	0.10	0.0004	0.004
A_2	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_1	1.20	1.40	0.047	0.055
e	0.95 BSC		0.0374 Ref	
e_1	1.90 BSC		0.0748 Ref	
L	0.40	0.60	0.016	0.024
L_1	0.64 Ref		0.025 Ref	
S	0.50 Ref		0.020 Ref	
q	3°	8°	3°	8°

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