P-Channel Enhancement Mode MOSFET

GENERAL DESCRIPTION

The PW2307 uses advanced trench technology to provide excellent RDS(ON), low gate charge and operation with gate voltages as low as 4.5V. This device is suitable for use as a Battery protection or in other Switching application

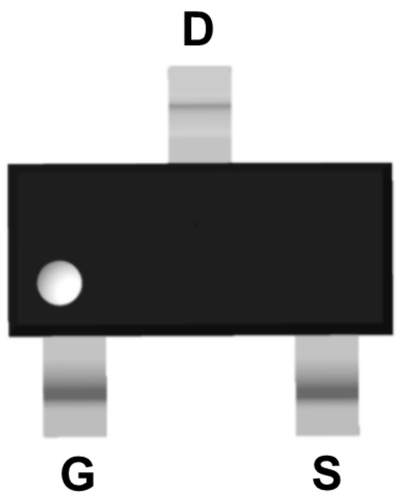
FEATURES

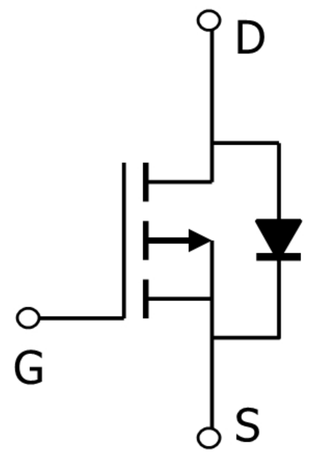
VDS = -20V ID =-7A

RDS(ON) < 20mΩ @ VGS=-4.5V

Available in a 3-Pin SOT23-3 Package

SOT-23-3L
(TOP VIEW)





Absolute Maximum Ratings (TA=25℃ unless otherwise noted)

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	-20	V
V_{GS}	Gate-Source Voltage	±12	V
I_D@T_A=25℃	Continuous Drain Current, V_{GS} @ -4.5V[1]	-7.1	A
I_D@T_A=70℃	Continuous Drain Current, V_{GS} @ -4.5V[1]	-4.8	A
I_{DM}	Pulsed Drain Current[2]	-23.8	A
P_D@T_A=25℃	Total Power Dissipation[3]	1	W
T_{STG}	Storage Temperature Range	-55 to 150	℃
T_J	Operating Junction Temperature Range	-55 to 150	℃
$R_{\theta JA}$	Thermal Resistance Junction-Ambient [1]	125	℃/W
$R_{\theta JAC}$	Thermal Resistance Junction-Case [1] (t ≤10s)	80	℃/W

ELECTRICAL CHARACTERISTICS

(TA = 25°C, unless otherwise noted.)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BVDSS	Drain-Source Breakdown Voltage	V_{GS}=0V , I_D=-250uA	-20	-22	---	V
△BVDSS/△TJ	BVDSS Temperature Coefficient	Reference to 25℃ , I_D=-1mA	---	-0.01	---	V/℃
RDS(ON)	Static Drain-Source On-Resistance[2]	V_{GS}=-4.5V , I_D=-4A	---	16	21	mΩ
		V_{GS}=-2.5V , I_D=-3A	---	20	28	
		V_{GS}=-1.8V , I_D=-1.5A		28	35	
VGS(th)	Gate Threshold Voltage	V_{GS}=V_{DS} , I_D =-250uA	-0.4	-0.7	-1.0	V
△$V_{GS(th)}$	$V_{GS(th)}$ Temperature Coefficient		---	2.96	---	mV/℃
IDSS	Drain-Source Leakage Current	V_{DS}=-16V , V_{GS}=0V , T_J=25℃	---	---	-1	uA
		V_{DS}=-16V , V_{GS}=0V , T_J=55℃	---	---	-5	
IGSS	Gate-Source Leakage Current	V_{GS}=±12V , V_{DS}=0V	---	---	±100	nA
gfs	Forward Transconductance	V_{DS}=-5V , I_D=-4A	---	21	---	S
Q_g	Total Gate Charge (-4.5V)	V_{DS}=-15V , V_{GS}=-4.5V , I_D=-4A	---	27.3	38.2	nC
Q_{gs}	Gate-Source Charge		---	3.6	5.0	
Q_{gd}	Gate-Drain Charge		---	6.5	9.1	
Td(on)	Turn-On Delay Time	V_{DD}=-10V, V_{GS}=-4.5V , R_G=3.3Ω I_D=-4A	---	9.2	18.4	ns
T_r	Rise Time		---	59	106	
Td(off)	Turn-Off Delay Time		---	99	198	
T_f	Fall Time		---	71	142	
C_{iss}	Input Capacitance	V_{DS}=-15V , V_{GS}=0V , f=1MHz	---	2280	3192	pF
Coss	Output Capacitance		---	220	308	
Crss	Reverse Transfer Capacitance		---	187	262	
I_S	Continuous Source Current[1,4]	V_G=V_D=0V , Force Current	---	---	-4.7	A
I_{SM}	Pulsed Source Current[2,4]		---	---	-18.8	A
V_{SD}	Diode Forward Voltage[2]	V_{GS}=0V , I_S=-1A , T_J=25°C	---	---	-1	V
t_{rr}	Reverse Recovery Time	I_F=-4A , dI/dt=100A/μs , T_J=25°C	---	52	---	nS
Q_{rr}	Reverse Recovery Charge		---	28	---	nC

Note :

1、 The data tested by surface mounted on a 1 inch^2 FR-4 board with 2OZ copper.

2、 The data tested by pulsed , pulse width ≦ 300us , duty cycle ≦ 2%

3、 The power dissipation is limited by 150℃ junction temperature

4、 The data is theoretically the same as I_D and I_{DM} , in real applications , should be limited by total power dissipation.

Typical Characteristics

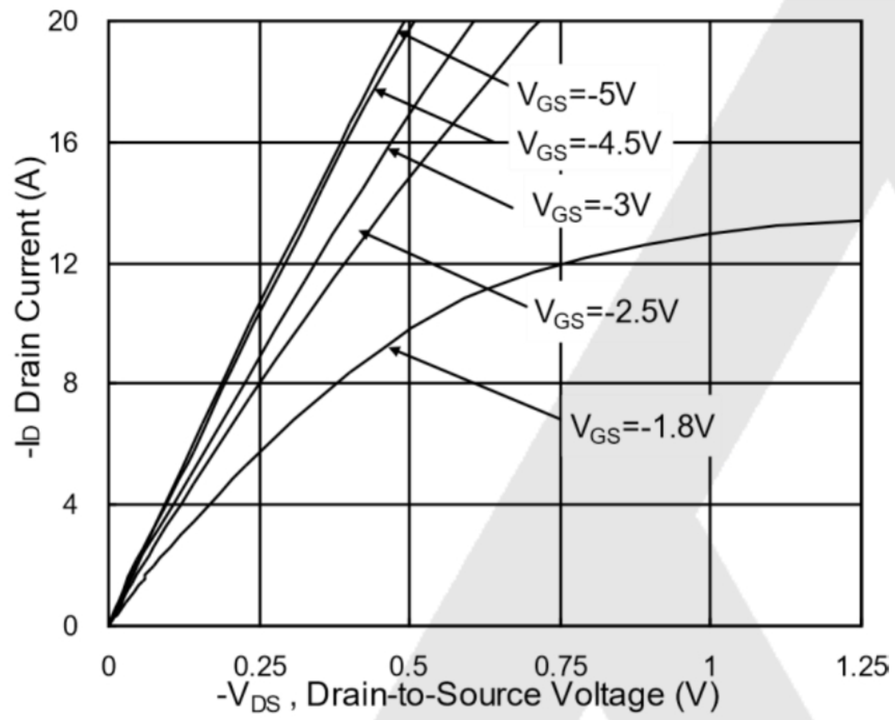


Fig.1 Typical Output Characteristics

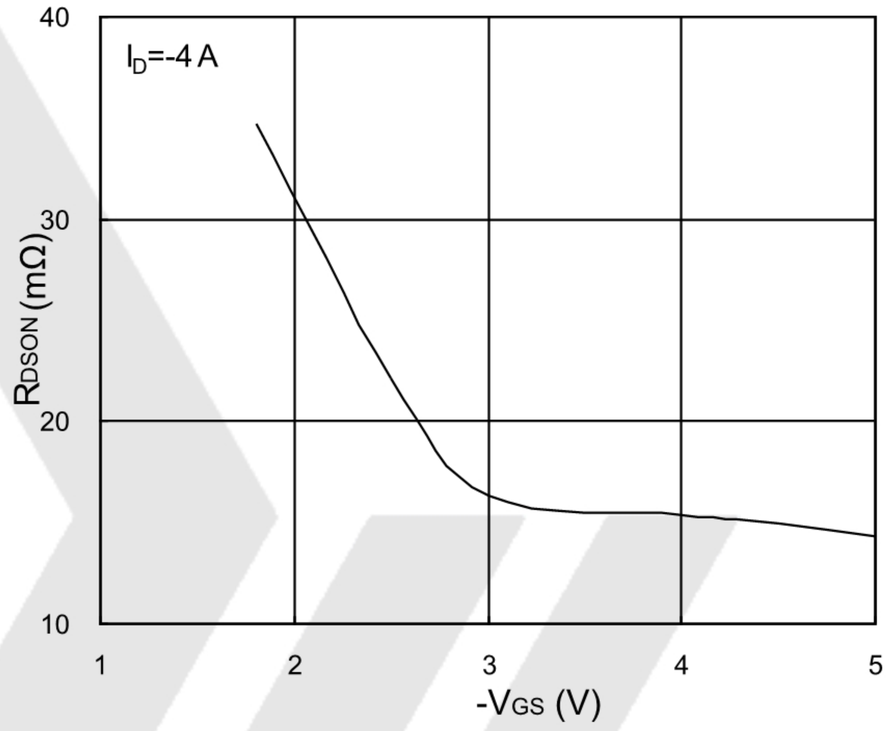


Fig.2 On-Resistance vs. Gate-Source

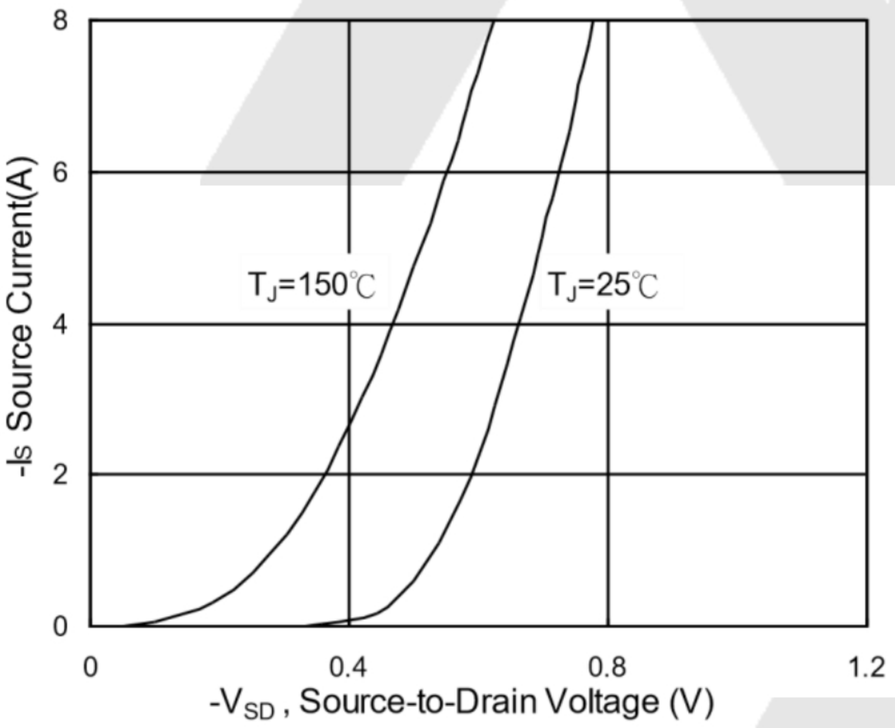


Fig.3 Forward Characteristics Of Reverse

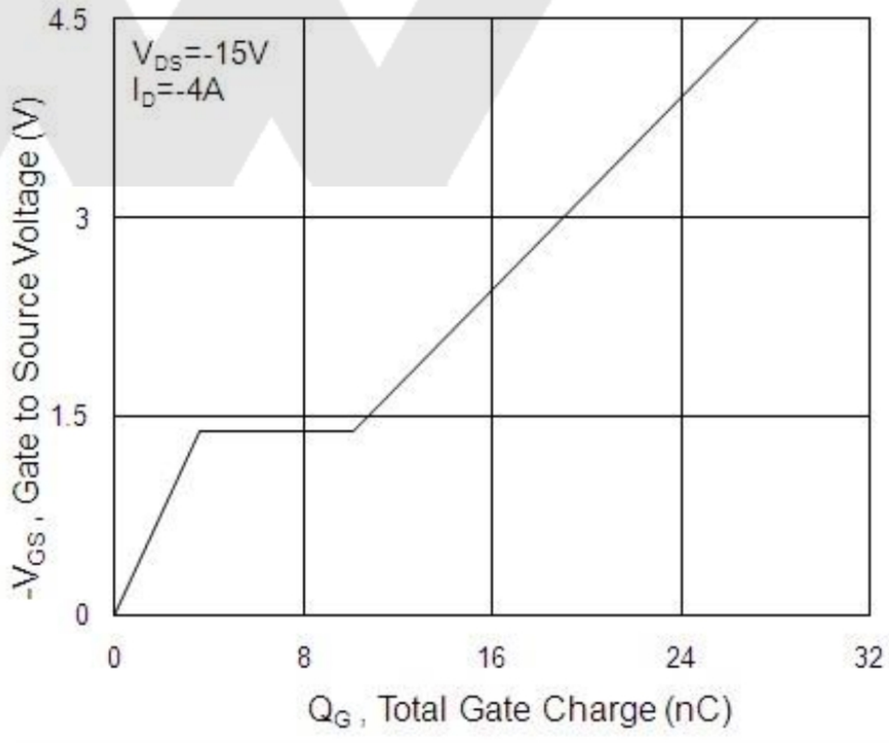


Fig.4 Gate-Charge Characteristics

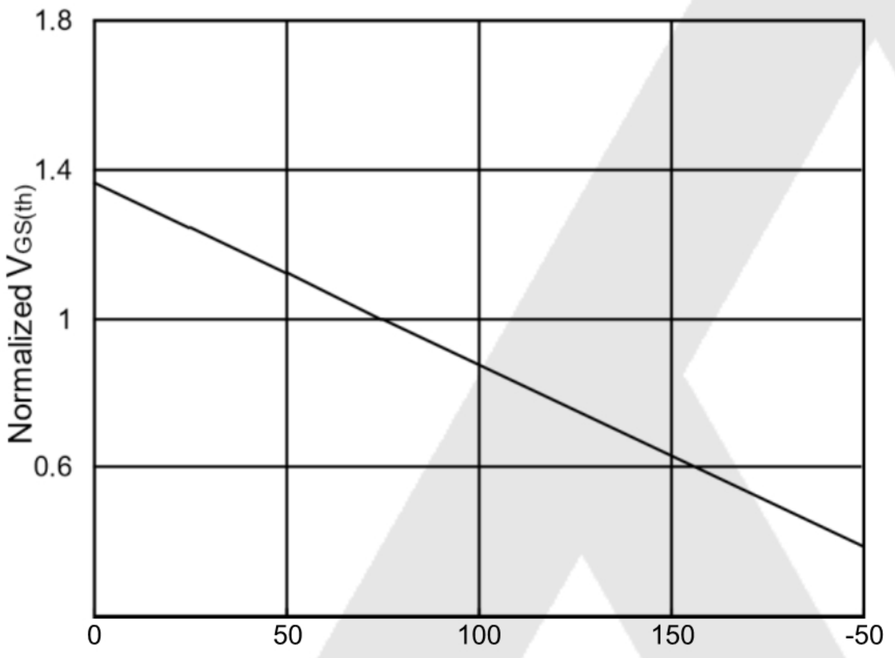


Fig.5 Normalized $V_{GS(th)}$ vs. T_J

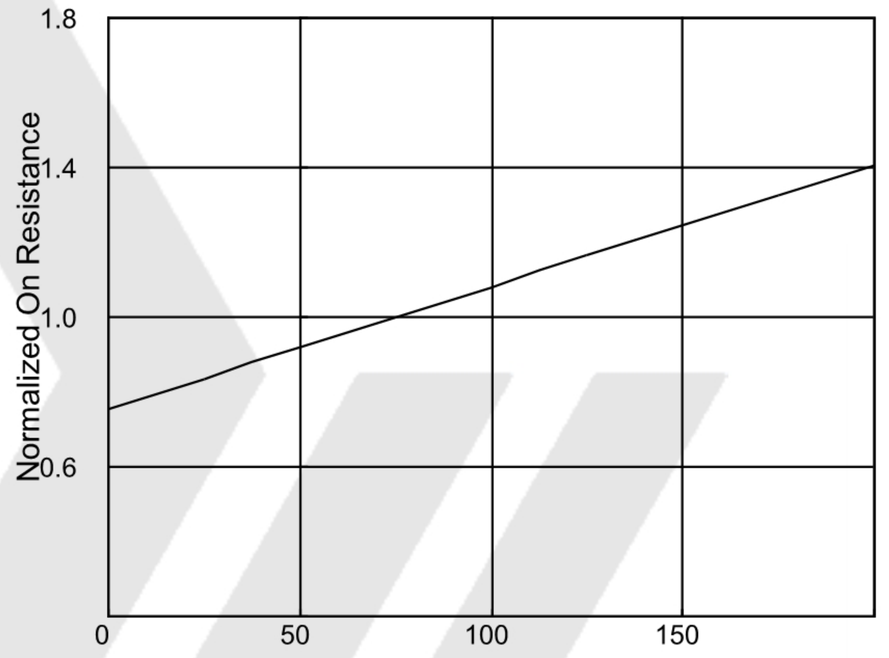


Fig.6 Normalized R_{DSON} vs. T_J

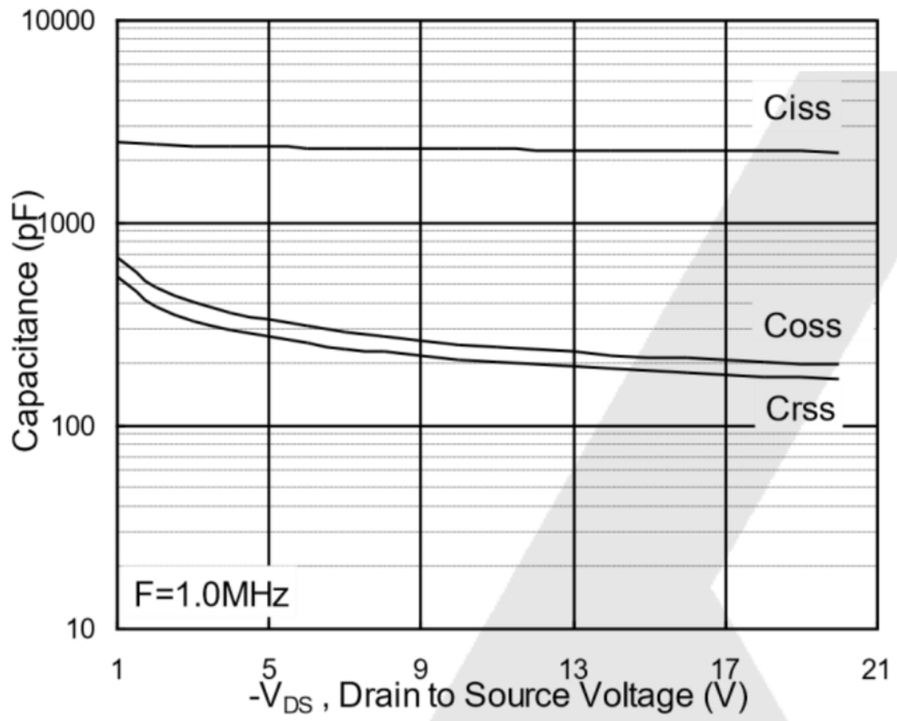


Fig.7 Capacitance

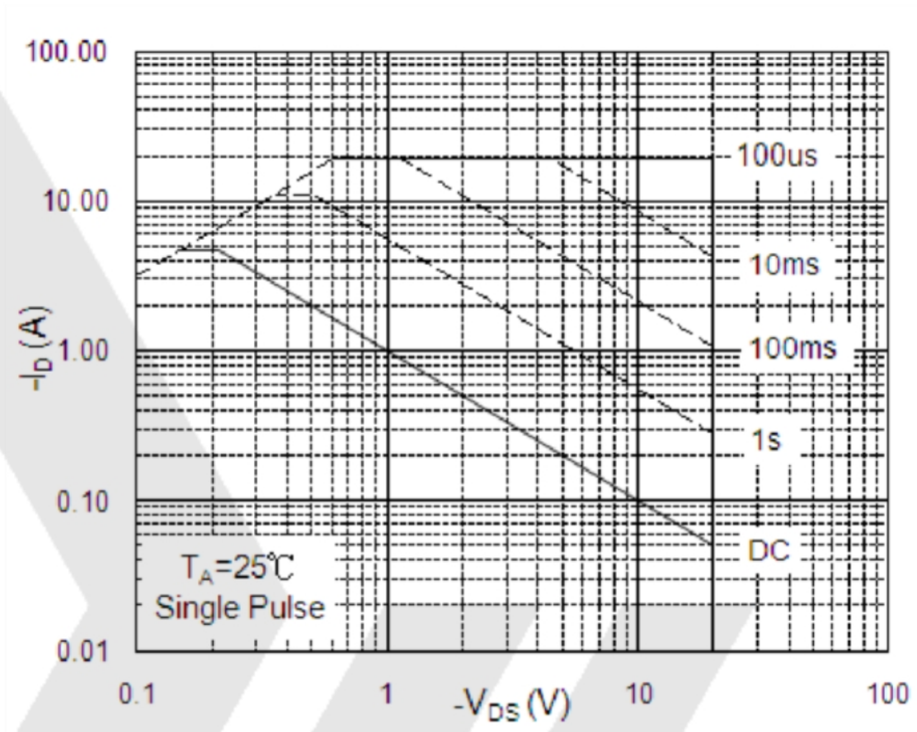


Fig.8 Safe Operating Area

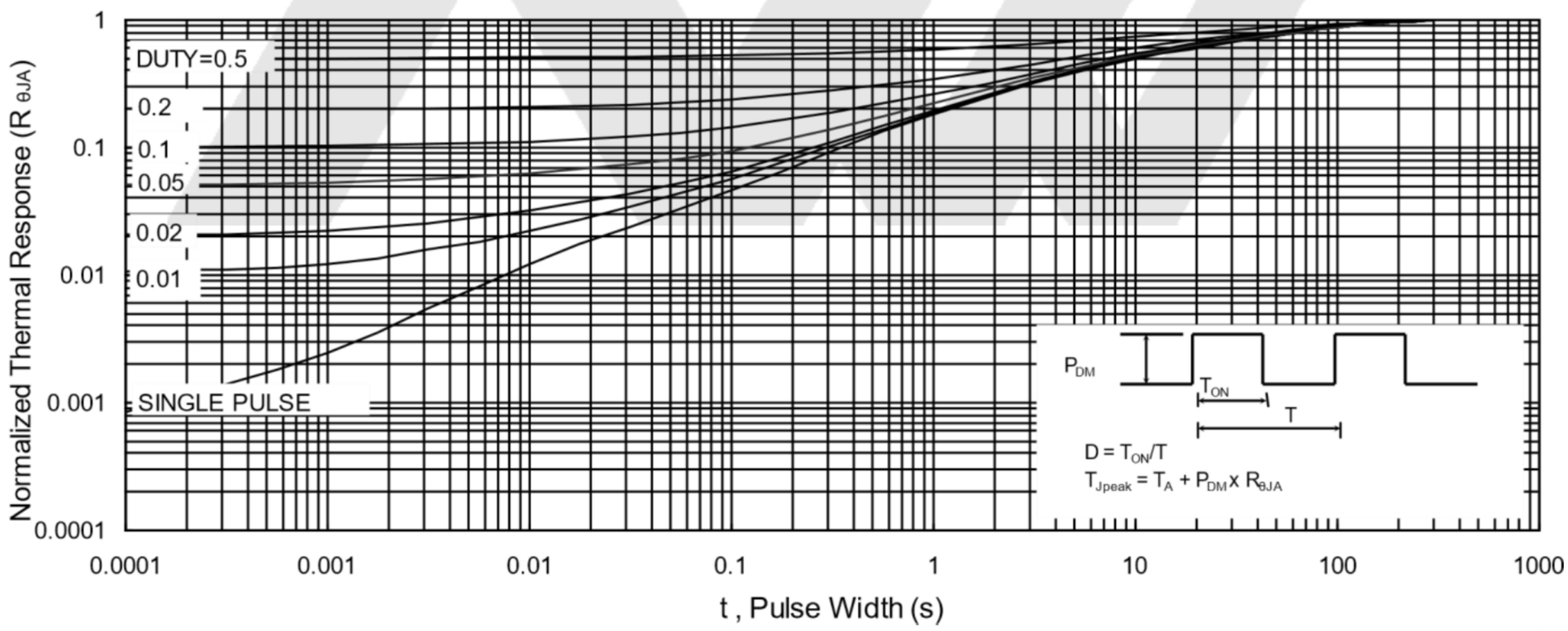


Fig.9 Normalized Maximum Transient Thermal Impedance

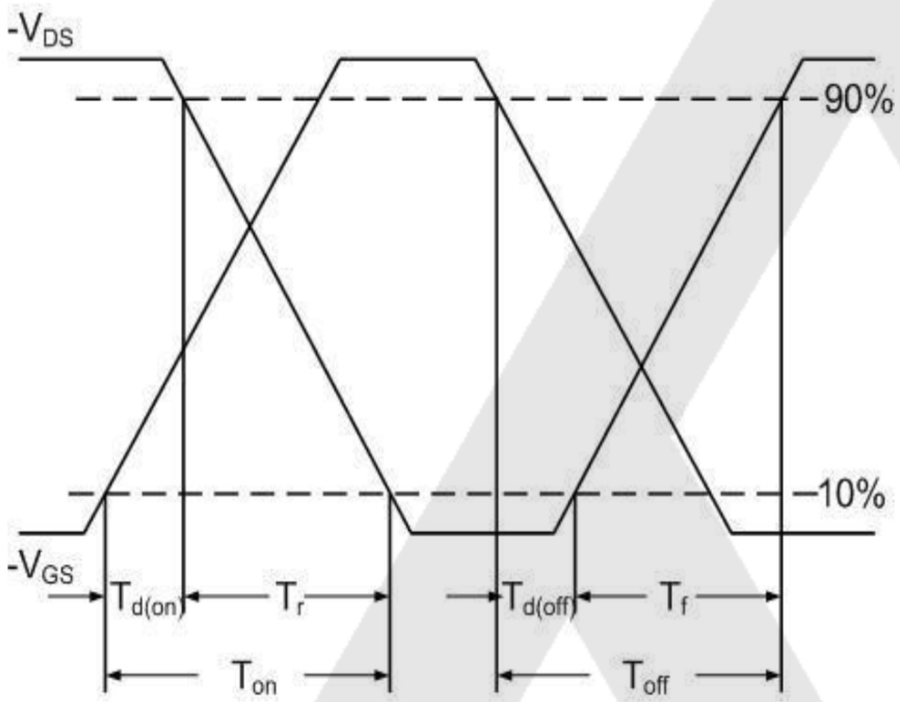


Fig.10 Switching Time Waveform

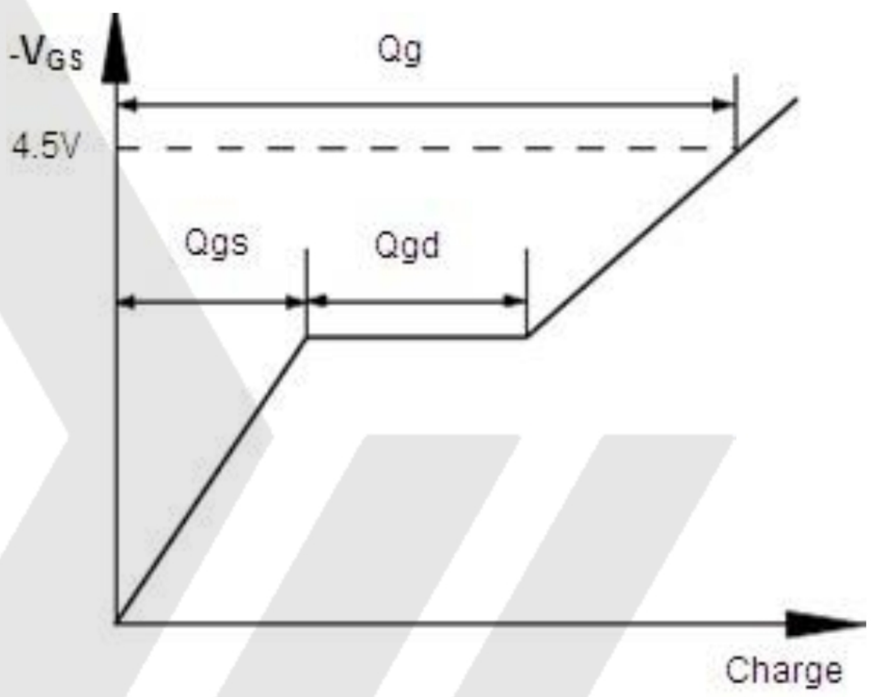
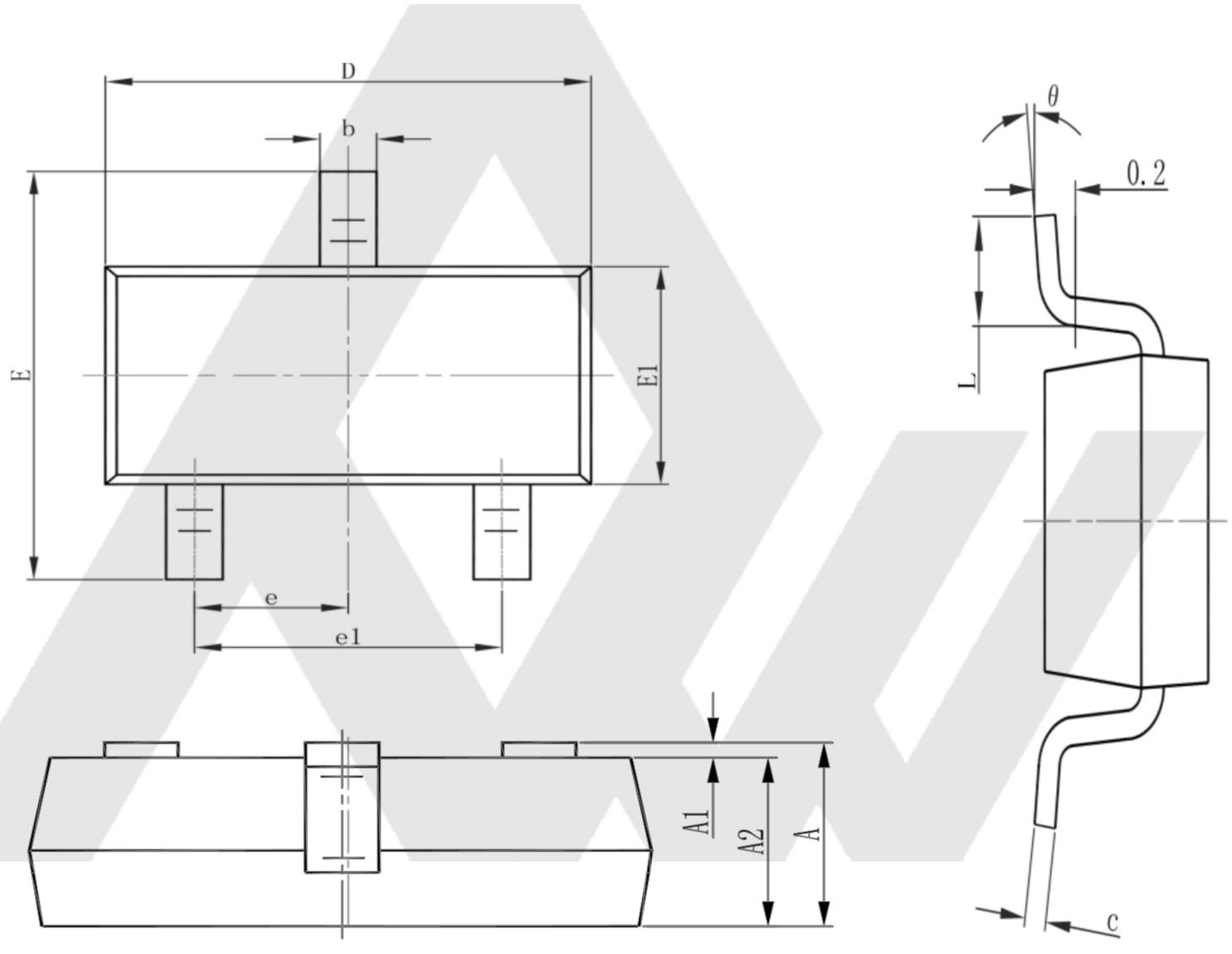


Fig.11 Gate Charge Waveform

PACKAGE DESCRIPTION



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	1.050	1.250	0.041	0.049
A1	0.000	0.100	0.000	0.004
A2	1.050	1.150	0.041	0.045
b	0.300	0.500	0.012	0.020
c	0.100	0.200	0.004	0.008
D	2.820	3.020	0.111	0.119
E1	1.500	1.700	0.059	0.067
E	2.650	2.950	0.104	0.116
e	0.950(BSC)		0.037(BSC)	
e1	1.800	2.000	0.071	0.079
L	0.300	0.600	0.012	0.024
θ	0°	8°	0°	8°

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