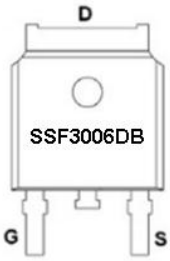
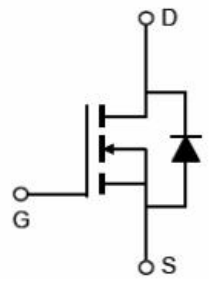
Main Product Characteristics:

V_{DSS}	30V
R_{DS}(on)	4.2mΩ(Typ.)
I_D	100A

TO-252 (DPAK)



Marking and Pin Assignments



Schematic Diagram

Features and Benefits:

- Advanced MOSFET process technology
- Special designed for PWM, load switching and general purpose applications
- Ultra low on-resistance with low gate charge
- Fast switching and reverse body recovery
- 150℃ operating temperature

Description:

It utilizes the latest processing techniques to achieve the high cell density and reduces the on-resistance with high repetitive avalanche rating. These features combine to make this design an extremely efficient and reliable device for use in power switching application and a wide variety of other applications.

Absolute Max Rating:

Symbol	Parameter	Max.	Units
I_D @ T_C = 25°C	Continuous Drain Current, V_{GS} @ 10V ①	100	A
I_{DM}	Pulsed Drain Current ②	400	
P_D @T_C = 25°C	Power Dissipation ③	73	W
V_{DS}	Drain-Source Voltage	30	V
V_{GS}	Gate-to-Source Voltage	± 20	V
E_{AS}	Single Pulse Avalanche Energy @ L=0.5mH	137	mJ
I_{AS}	Avalanche Current	23	A
T_J T_{STG}	Operating Junction and Storage Temperature Range	-55 to +150	°C

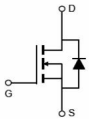
Thermal Resistance

Symbol	Characteristics	Typ.	Max.	Units
$R_{\theta JC}$	Junction-to-case ③	—	1.72	℃/W
$R_{\theta JA}$	Junction-to-Ambient ④	—	62	℃/W

Electrical Characterizes @T_A=25℃unless otherwise specified

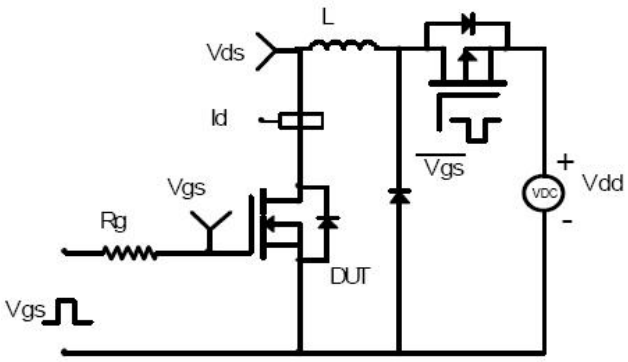
Symbol	Parameter	Min.	Typ.	Max.	Units	Conditions
$V_{(BR)DSS}$	Drain-to-Source breakdown voltage	30	—	—	V	V_{GS} = 0V, I_D = 250μA
$R_{DS(on)}$	Static Drain-to-Source on-resistance	—	4.2	6	mΩ	V_{GS}=10V,I_D =30A
$V_{GS(th)}$	Gate threshold voltage	1	—	2.5	V	V_{DS} = V_{GS}, I_D =250μA
I_{DSS}	Drain-to-Source leakage current	—	—	1	μA	V_{DS} =30V,V_{GS} = 0V
I_{GSS}	Gate-to-Source forward leakage	—	—	100	nA	V_{GS} =20V
		—	—	-100		V_{GS} = -20V
Q_g	Total gate charge	—	21	—	nC	I_D = 30A, V_{DS}=15V, V_{GS} = 4.5V
Q_{gs}	Gate-to-Source charge	—	5	—		
Q_{gd}	Gate-to-Drain("Miller") charge	—	7	—		
$t_{d(on)}$	Turn-on delay time	—	22	—	ns	V_{GS}=10V, V_{DS}=15V, R_{GEN}=3Ω I_D = 30A
t_r	Rise time	—	18	—		
$t_{d(off)}$	Turn-Off delay time	—	50	—		
t_f	Fall time	—	26	—		
C_{iss}	Input capacitance	—	2048	—	pF	V_{GS} = 0V V_{DS} = 30V f = 1MHz
C_{oss}	Output capacitance	—	176	—		
C_{rss}	Reverse transfer capacitance	—	161	—		

Source-Drain Ratings and Characteristics

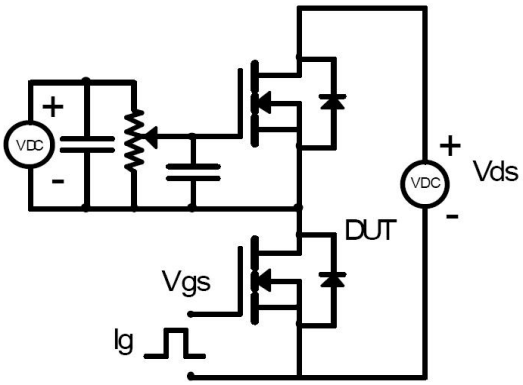
Symbol	Parameter	Min.	Typ.	Max.	Units	Conditions
I_S	Continuous Source Current (Body Diode)	—	—	100	A	MOSFET symbol showing the integral reverse p-n junction diode. 
I_{SM}	Pulsed Source Current (Body Diode)	—	—	400	A	
V_{SD}	Diode Forward Voltage	—	—	1.2	V	I_S=1A, V_{GS}=0V
trr	Reverse Recovery Time	—	17	—	ns	I_S=30A,di/dt=100A/us
Qrr	Reverse Recovery Charge	—	9	—	nC	

Test Circuits and Waveforms

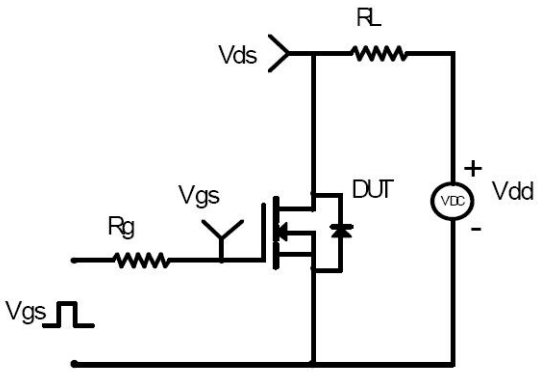
EAS Test Circuit:



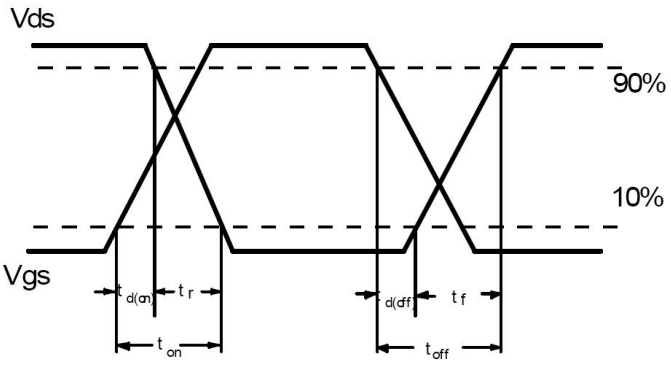
Gate Charge Test Circuit:



Switching Time Test Circuit:



Switching Waveforms:



Notes:

①Calculated continuous current based on maximum allowable junction temperature.

②Repetitive rating; pulse width limited by max. junction temperature.

③The power dissipation P_D is based on max. junction temperature, using junction-to-case thermal resistance.

④The value of $R_{\theta JA}$ is measured with the device mounted on 1 in 2 FR-4 board with 2oz. Copper, in a still air environment with T_A =25 ℃

Typical Electrical and Thermal Characteristics

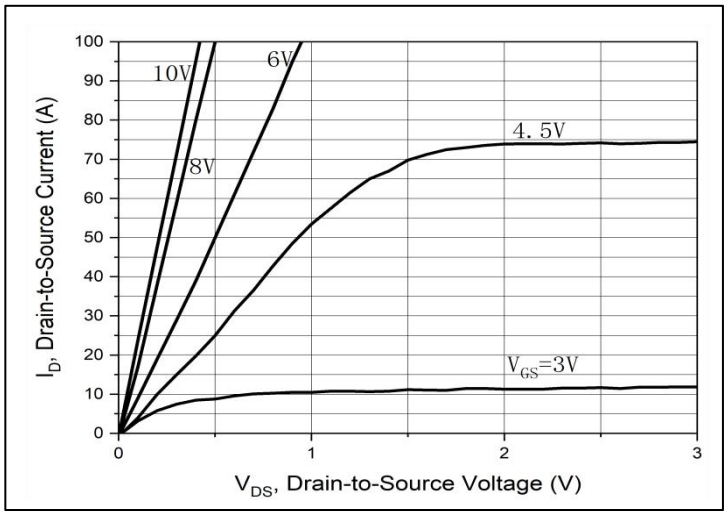


Figure1.Typical Output Characteristics

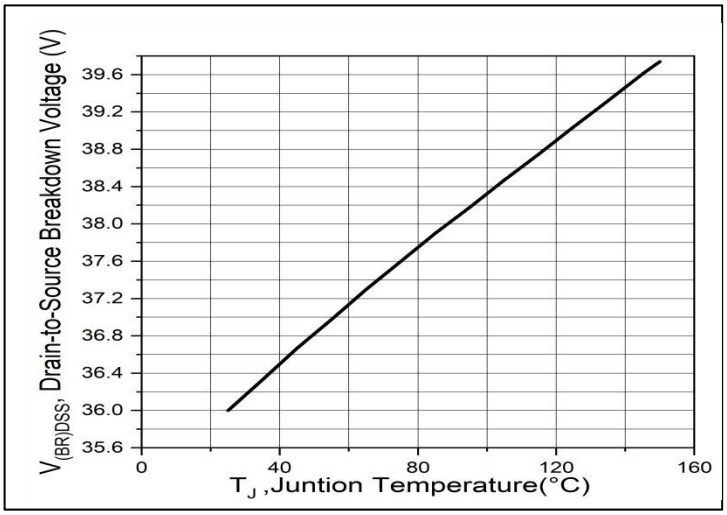


Figure2. Drain-to-Source Breakdown Voltage vs. Junction Temperature

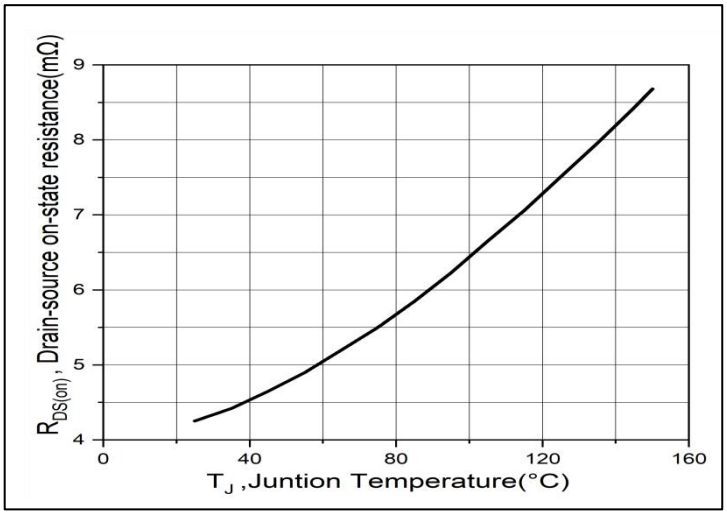


Figure3. RDS(on) vs. Junction Temperature

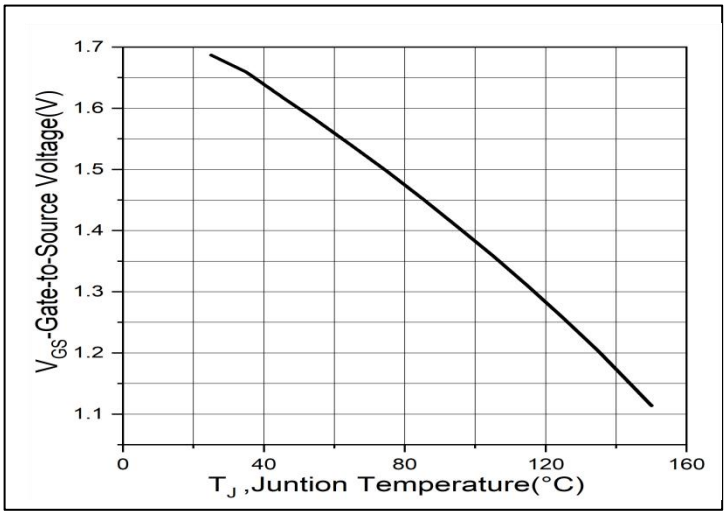


Figure4. Vth vs. Junction Temperature

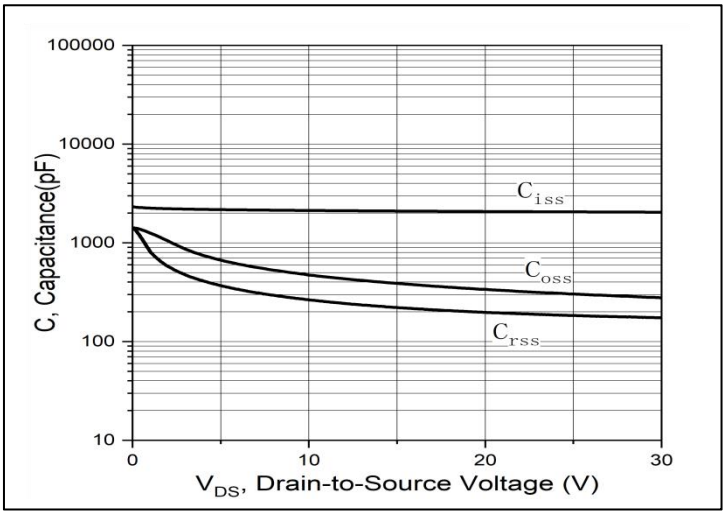


Figure5. Capacitance

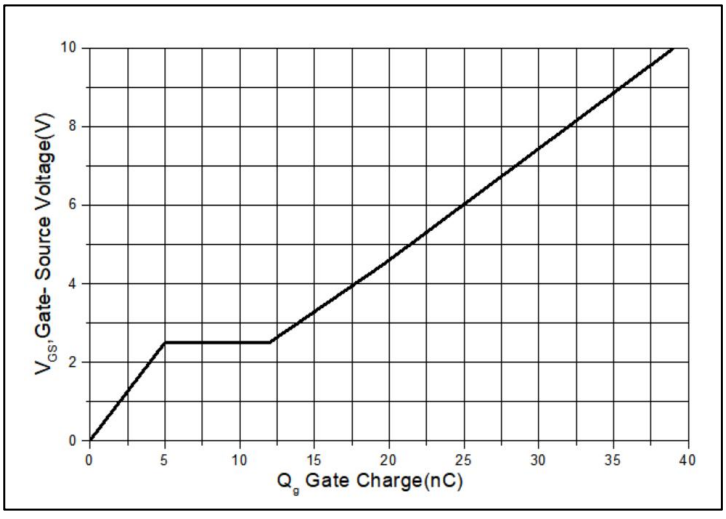
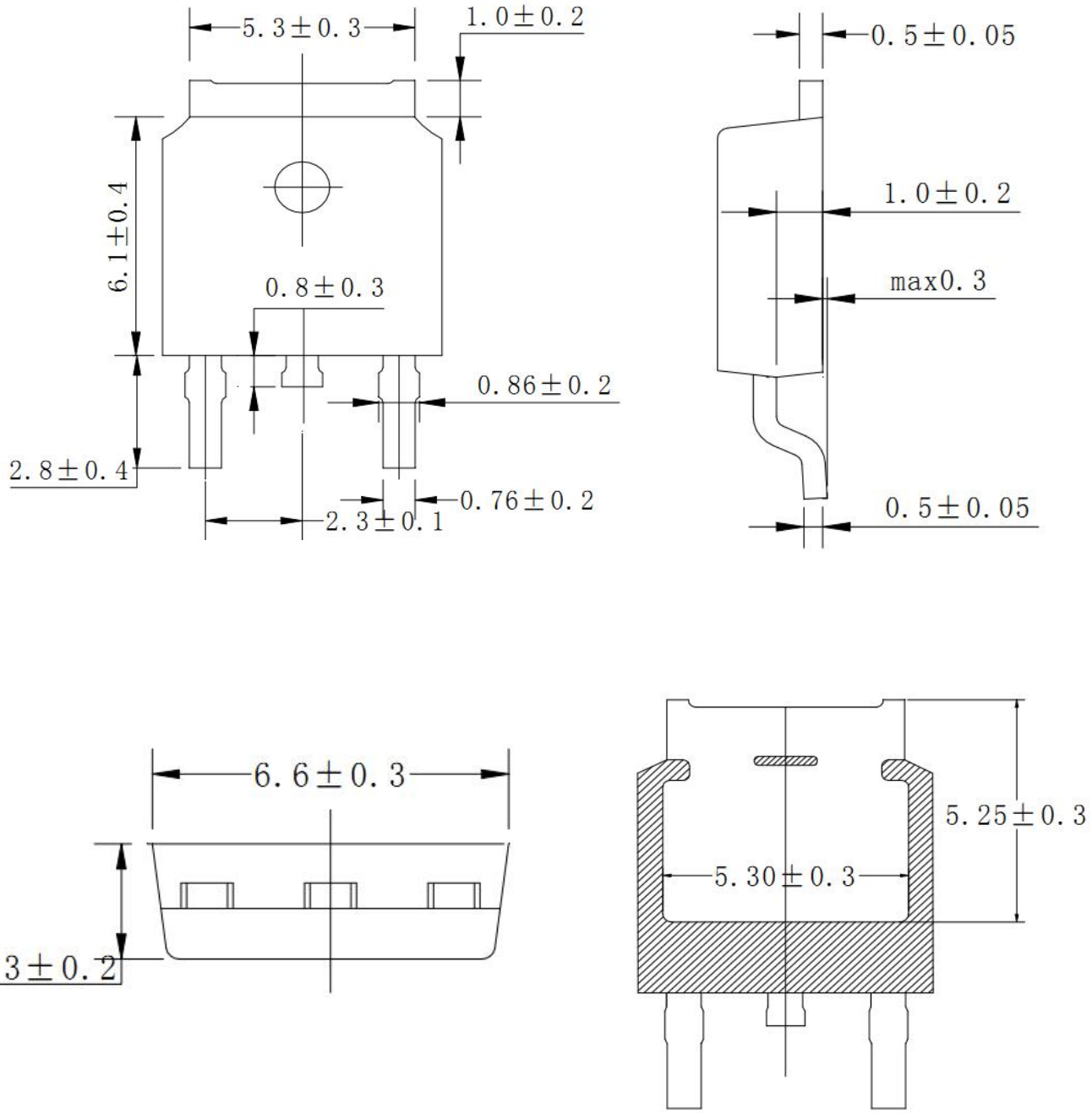


Figure6. Gate Charge

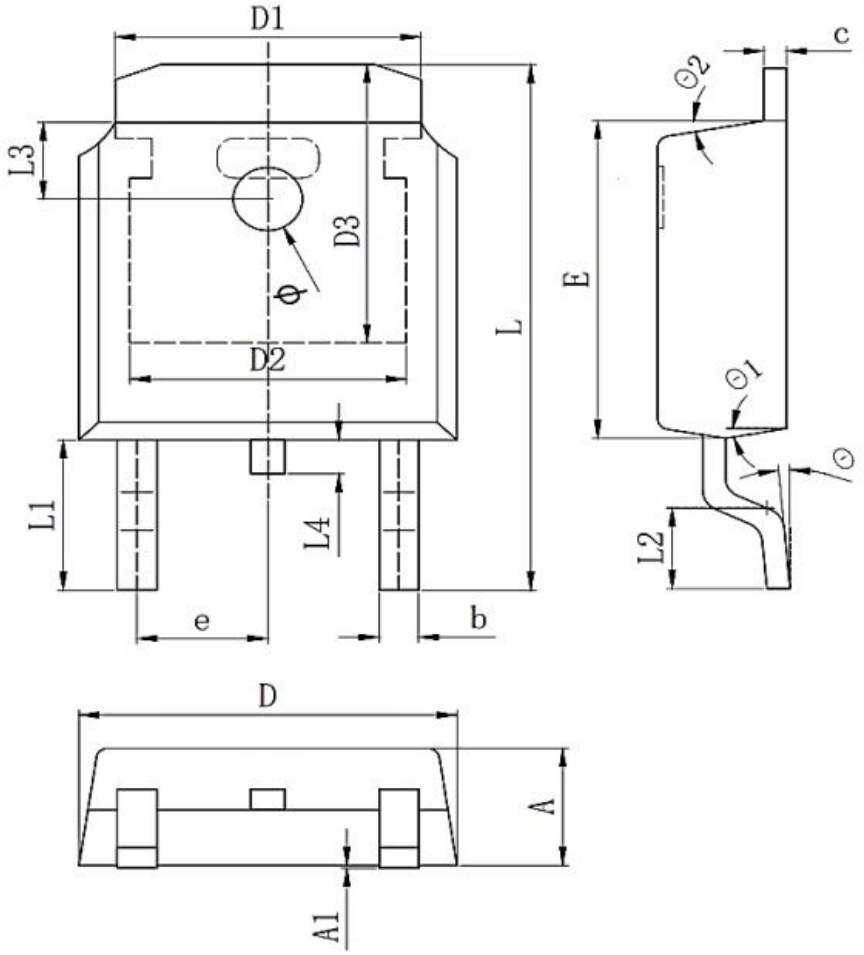
Mechanical Data：

Option1:

TO-252 Package Outline(Unit:mm)



Option2



Symbol	Dim in mm		
	Min	Typ	Max
A	2.1	2.3	2.5
A1	0	0.064	0.128
b	0.64	0.75	0.86
c	0.45	0.52	0.6
D	6.4	6.6	6.8
D1		5.33REF	
D2		4.83REF	
D3		5.25REF	
E	5.9	6.1	6.3
e		2.286TYP	
L	9.8	10.1	10.4
L1		2.888REF	
L2	1.4	1.5	1.7
L3		1.65REF	
L4	0.6	0.8	1
ϕ	1.1	1.2	1.3
θ	0°		10°
θ1	5°		10°
θ2	5°		10°

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