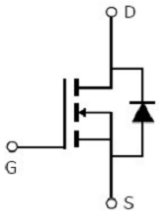
Main Product Characteristics

V_{DSS}	60V
R_{DS}(on)	5.2mΩ (typ.)
I_D	80A ①

TO-263

Marking and Pin Assignment



Schematic Diagram

Features and Benefits

- Advanced 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 @ TC = 25°C	Continuous Drain Current, V_{GS} @ 10V ①	80	A
I_D @ TC = 100°C	Continuous Drain Current, V_{GS} @ 10V ①	52	
I_{DM}	Pulsed Drain Current ②	320	
P_D @TC = 25°C	Power Dissipation ③	108	W
V_{DS}	Drain-Source Voltage	60	V
V_{GS}	Gate-to-Source Voltage	± 20	V
E_{AS}	Single Pulse Avalanche Energy @ L=0.3mH	216.6	mJ
I_{AS}	Single Pulse Avalanche Current @ L=0.3mH	38	A
T_J T_{STG}	Operating Junction and Storage Temperature Range	-55 to +150	°C

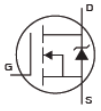
Thermal Resistance

Symbol	Characterizes	Value	Units
$R_{\theta JC}$	Junction-to-case ③	1.4	°C/W

Electrical Characterizes @T_A=25℃ unless otherwise specified

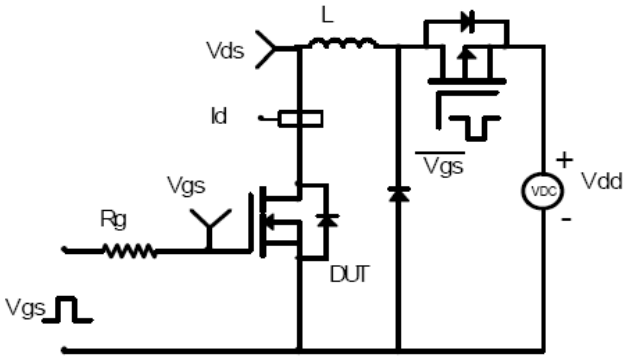
Symbol	Parameter	Min.	Typ.	Max.	Units	Conditions
$V_{(BR)DSS}$	Drain-to-Source breakdown voltage	60	—	—	V	V_{GS} = 0V, I_D= 250uA
$R_{DS(on)}$	Static Drain-to-Source on-resistance	—	5.2	7	mΩ	V_{GS}=10V,I_D =30A
$V_{GS(th)}$	Gate threshold voltage	2.0	2.8	4.0	V	V_{DS} = V_{GS}, I_D =250μA
I_{DSS}	Drain-to-Source leakage current	—	—	1	μA	V_{DS} =60V,V_{GS} = 0V
I_{GSS}	Gate-to-Source forward leakage	—	—	100	nA	V_{GS} =20V
		—	—	-100		V_{GS} = -20V
Q_g	Total gate charge	—	90	—	nC	I_D = 30A,
Q_{gs}	Gate-to-Source charge	—	7	—		V_{DS}=30V,
Q_{gd}	Gate-to-Drain("Miller") charge	—	16	—		V_{GS} = 10V
$t_{d(on)}$	Turn-on delay time	—	17.7	—	nS	V_{GS}=10V, V_{DD} =33V,
t_r	Rise time	—	22.1	—		R_{GEN}=2.2Ω
$t_{d(off)}$	Turn-Off delay time	—	37.9	—		I_D =30A
t_f	Fall time	—	9.5	—		
C_{iss}	Input capacitance	—	3942	—	pF	V_{GS} = 0V
C_{oss}	Output capacitance	—	218	—		V_{DS} = 50V
C_{rss}	Reverse transfer capacitance	—	195	—		f = 1MHz

Source-Drain Ratings and Characteristics

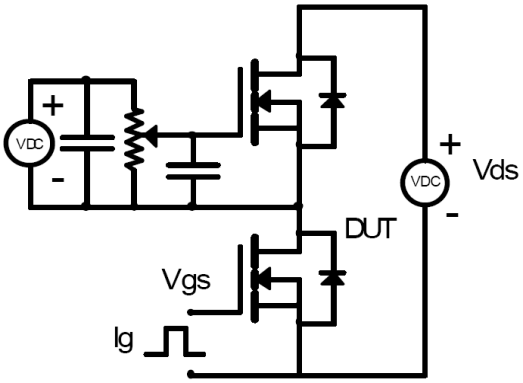
Symbol	Parameter	Min.	Typ.	Max.	Units	Conditions
I_S	Continuous Source Current (Body Diode) ①	—	—	80	A	MOSFET symbol showing the integral reverse p-n junction diode. 
I_{SM}	Pulsed Source Current (Body Diode) ①	—	—	320		
V_{sd}	Diode Forward Voltage	—	0.85	1.3	V	I_S=30A, V_{GS}=0V, T_J = 25°C
trr	Reverse Recovery Time	—	33	—	ns	I_S=30A,di/dt=100A/us
Qrr	Reverse Recovery Charge	—	46	—	nC	

Test circuits and Waveforms

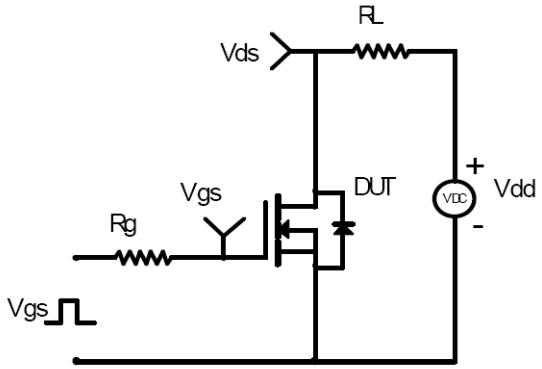
EAS Test Circuit:



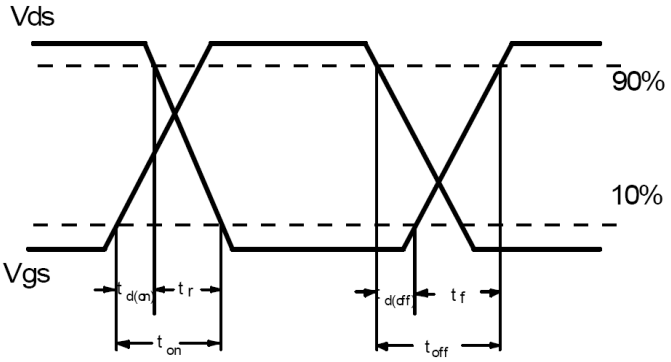
Gate charge test circuit:



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 PD is based on max. junction temperature, using junction-to-case thermal resistance.

Typical Electrical and Thermal Characteristics

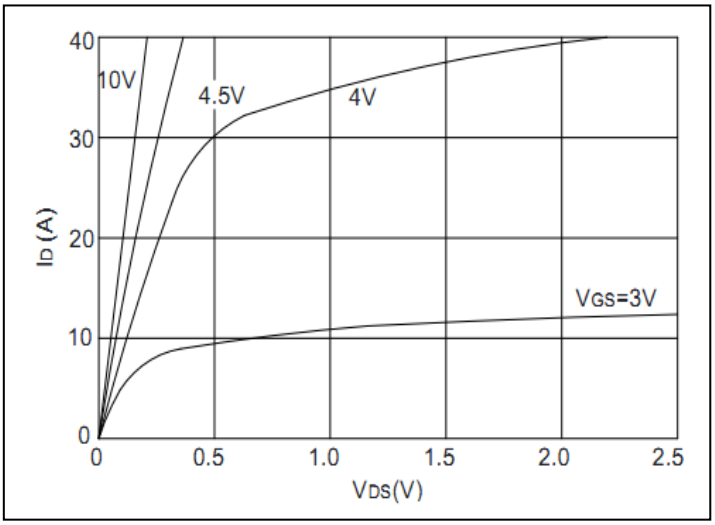


Figure 1: Typical Output Characteristics

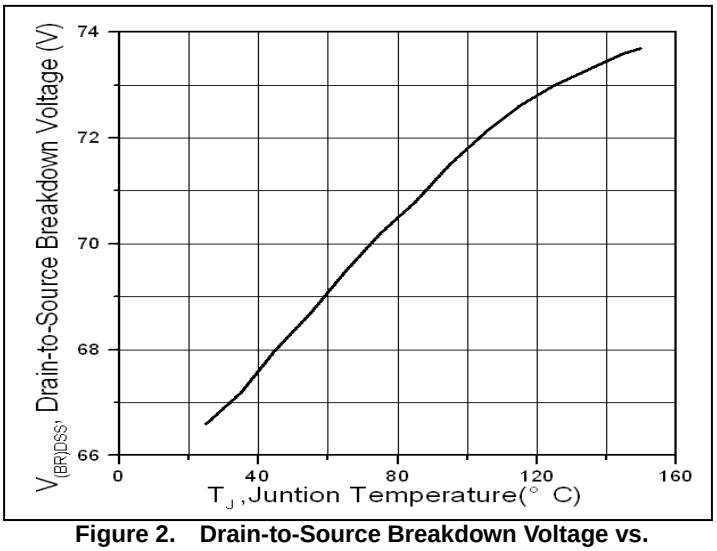


Figure 2. Drain-to-Source Breakdown Voltage vs. Temperature

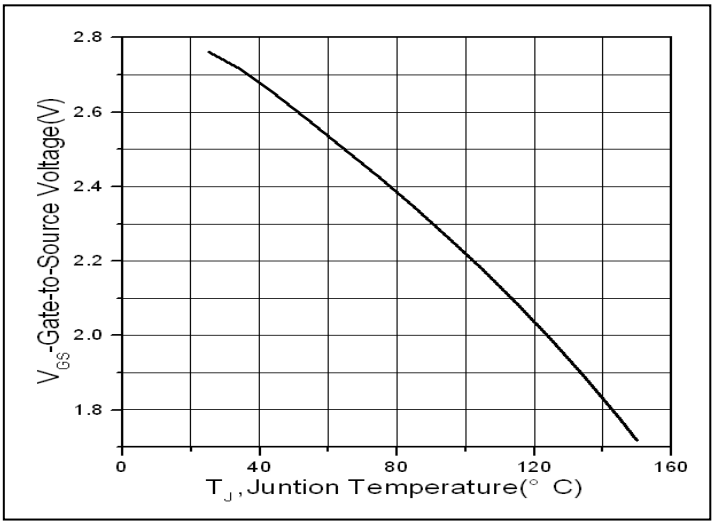


Figure 3. Gate to Source Cut-off Voltage

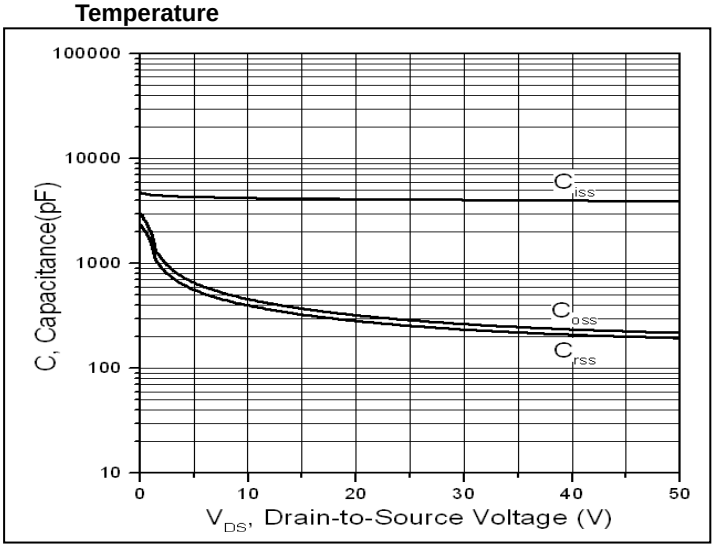


Figure 4. Capacitance

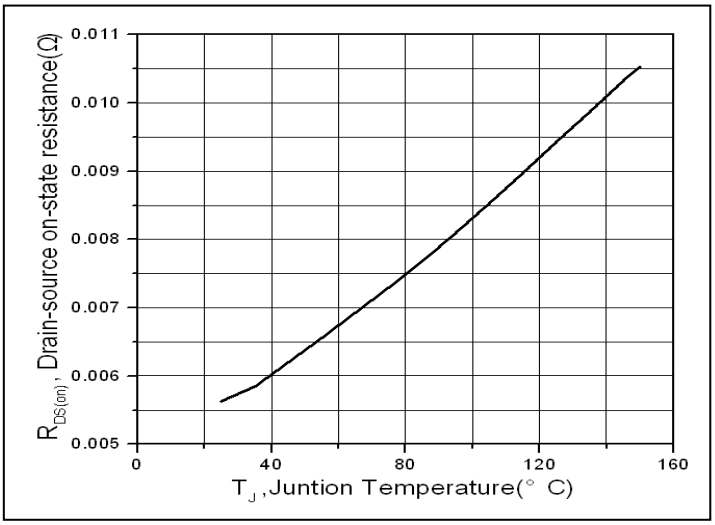


Figure 5. Normalized On-Resistance Vs. Case Temperature

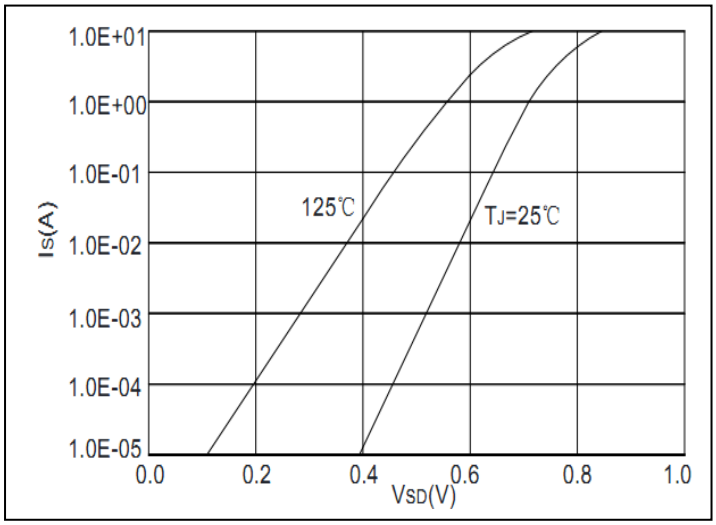


Figure 6. Body Diode Characteristics

Typical electrical and thermal characteristics

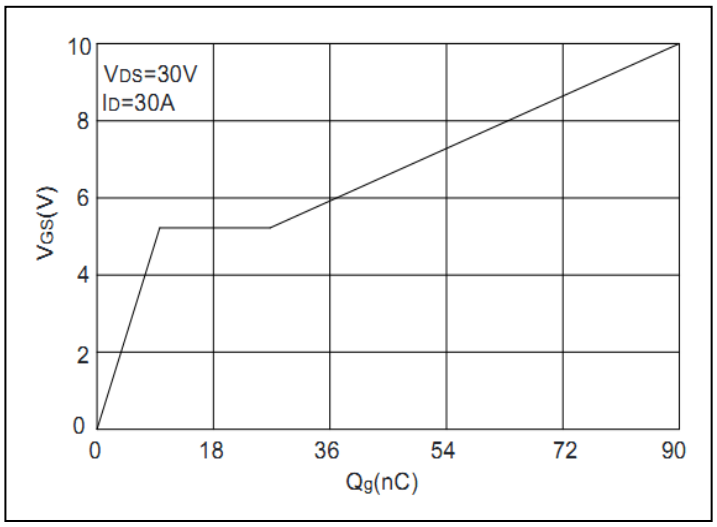


Figure 7. Gate Charge

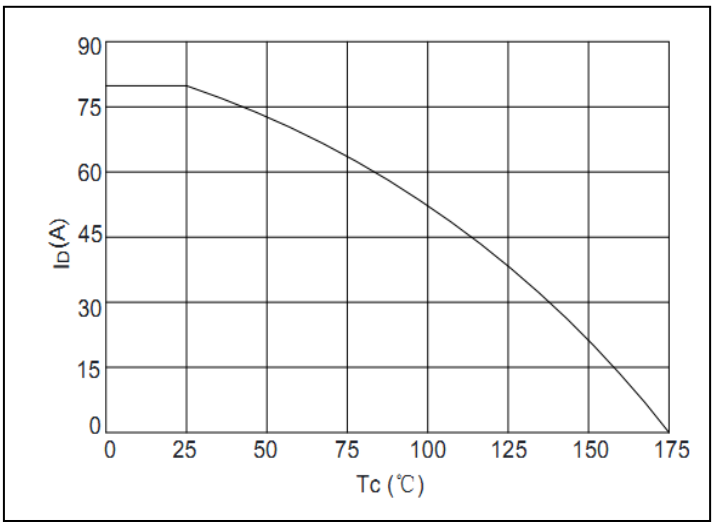


Figure 8.Drain Current vs Case Temperature

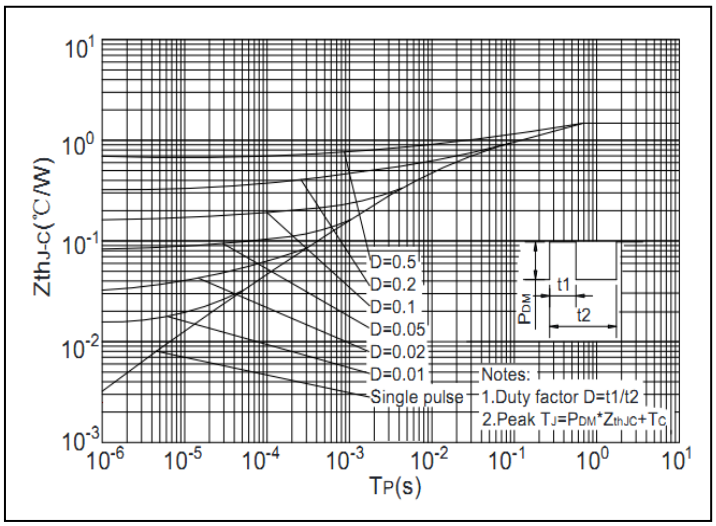


Figure 9. Normalized Maximum Transient Thermal Impedance

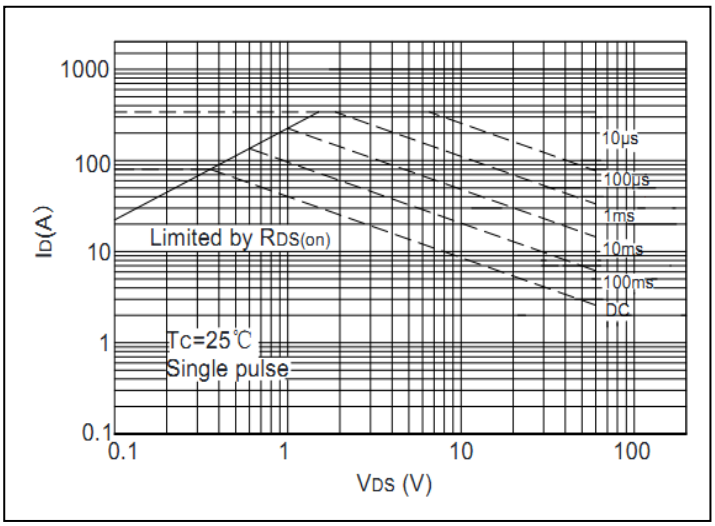
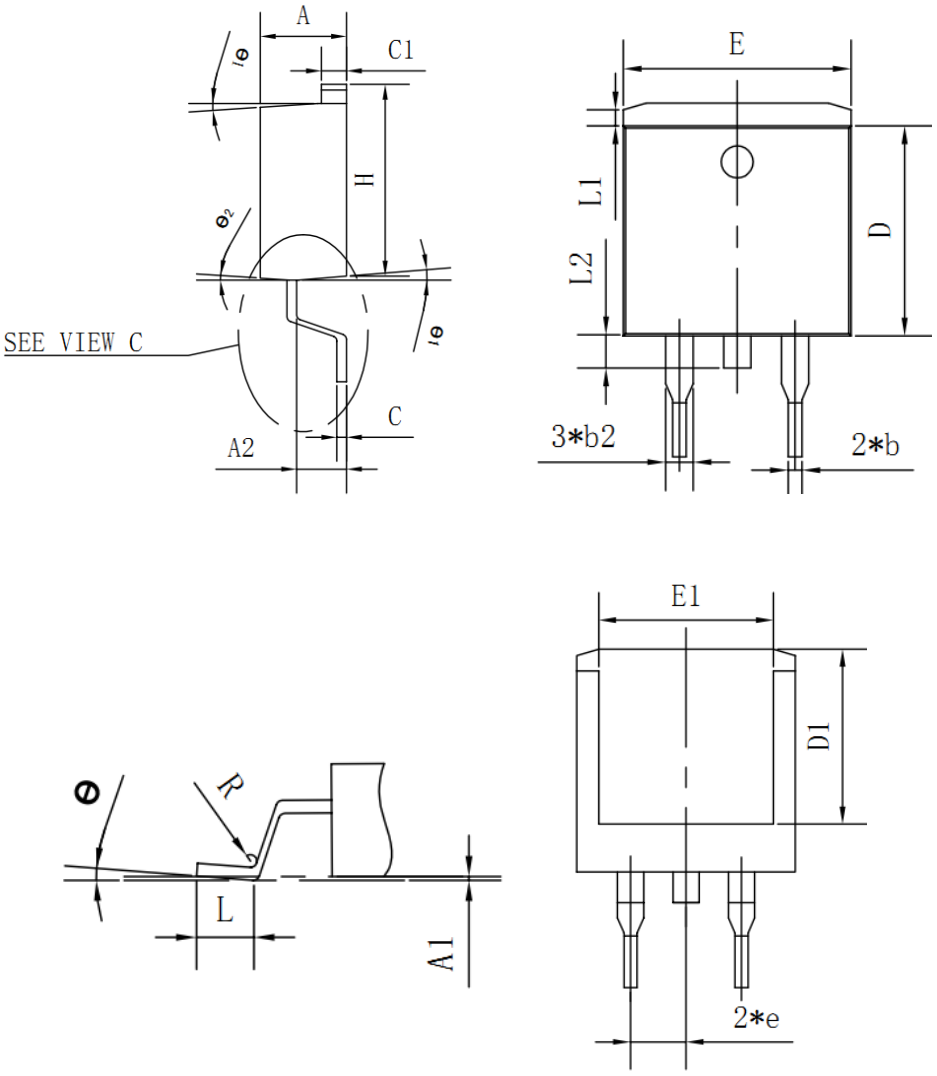


Figure10: Safe Operation Area

Mechanical Data：

TO263 Package Outline Dimension



SYMBOL	MIN	NOM	MAX
A	4.35	4.47	4.60
A1	0.09	0.10	0.11
A2	2.30	2.40	2.50
b	0.70	0.80	1.00
b2	1.25	1.36	1.38
C	0.45	0.50	0.55
C1	1.29	1.30	1.31
D	9.10	9.20	9.30
D1	7.90	8.00	8.10
E	9.85	10.00	10.20
E1	7.90	8.00	8.10
H	15.30	15.50	15.70
e	-	2.54	-
L	2.34	2.54	2.74
L1	1.00	1.10	1.20
L2	1.30	1.40	1.50
R	0.24	0.25	0.26
θ	0°	4°	8°
θ1	4°	7°	10°
θ2	0°	3°	6°

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