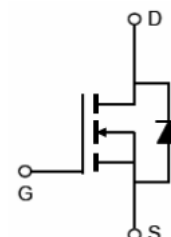


Main Product Characteristics:

V_{DSS}	60V
$R_{DS(on)}$	6.5m Ω (typ.)
I_D	80A


TO-263 (D2PAK)

Marking

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°C 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_{DM}	Pulsed Drain Current ②	320	
P_D @TC = 25°C	Power Dissipation ③	192	W
V_{DS}	Drain-Source Voltage	60	V
V_{GS}	Gate-to-Source Voltage	± 20	V
E_{AS}	Single Pulse Avalanche Energy @ L=0.5mH	274	mJ
T_J T_{STG}	Operating Junction and Storage Temperature Range	-55 to +150	°C

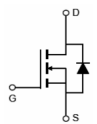
Thermal Resistance

Symbol	Characterizes	Typ.	Max.	Units
$R_{\theta JC}$	Junction-to-case ③	—	0.65	$^{\circ}\text{C}/\text{W}$

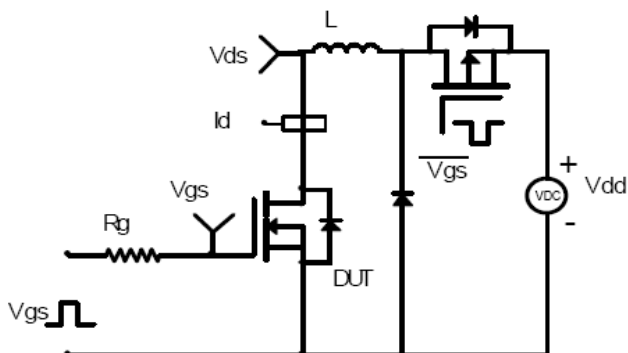
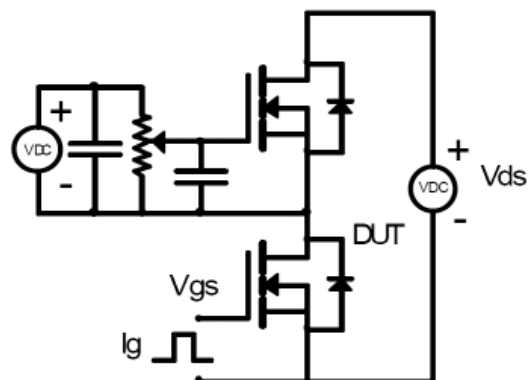
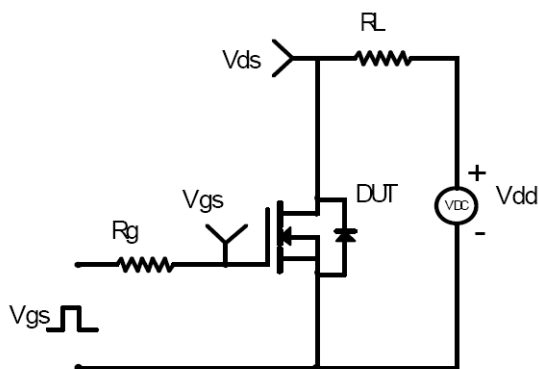
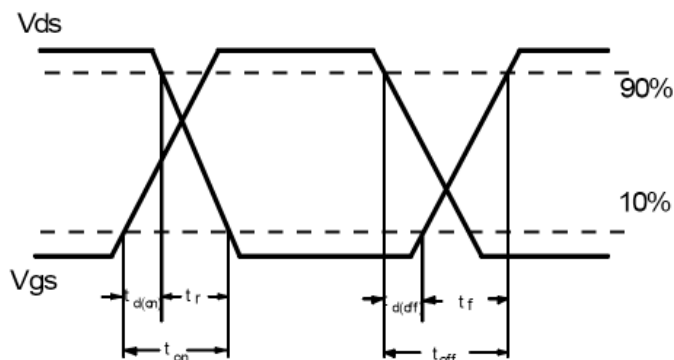
Electrical Characterizes @ $T_A=25^{\circ}\text{C}$ unless otherwise specified

Symbol	Parameter	Min.	Typ.	Max.	Units	Conditions
$V_{(BR)DSS}$	Drain-to-Source breakdown voltage	60	—	—	V	$V_{GS} = 0\text{V}, I_D = 250\mu\text{A}$
$R_{DS(on)}$	Static Drain-to-Source on-resistance	—	6.5	8	m Ω	$V_{GS}=10\text{V}, I_D=20\text{A}$
$V_{GS(th)}$	Gate threshold voltage	2	—	4	V	$V_{DS} = V_{GS}, I_D = 250\mu\text{A}$
I_{DSS}	Drain-to-Source leakage current	—	—	1	μA	$V_{DS} = 60\text{V}, V_{GS} = 0\text{V}$
I_{GSS}	Gate-to-Source forward leakage	—	—	100	nA	$V_{GS} = 20\text{V}$
		—	—	-100		$V_{GS} = -20\text{V}$
Q_g	Total gate charge	—	70	—	nC	$I_D = 30\text{A},$ $V_{DS}=30\text{V},$ $V_{GS} = 15\text{V}$
Q_{gs}	Gate-to-Source charge	—	16	—		
Q_{gd}	Gate-to-Drain("Miller") charge	—	23	—		
$t_{d(on)}$	Turn-on delay time	—	17	—	ns	$V_{GS}=10\text{V}, V_{DS}=30\text{V},$ $R_{GEN}=3\Omega$ $I_D = 30\text{A}$
t_r	Rise time	—	31.9	—		
$t_{d(off)}$	Turn-Off delay time	—	45	—		
t_f	Fall time	—	14.4	—		
C_{iss}	Input capacitance	—	2940	—	pF	$V_{GS} = 0\text{V}$ $V_{DS} = 50\text{V}$ $f = 100\text{kHz}$
C_{oss}	Output capacitance	—	178	—		
C_{rss}	Reverse transfer capacitance	—	154	—		

Source-Drain Ratings and Characteristics

Symbol	Parameter	Min.	Typ.	Max.	Units	Conditions
I_S	Continuous Source Current (Body Diode)	—	—	80	A	MOSFET symbol showing the integral reverse p-n junction diode. 
I_{SM}	Pulsed Source Current (Body Diode)	—	—	320	A	
V_{SD}	Diode Forward Voltage	—	0.87	1.2	V	$I_S=30\text{A}, V_{GS}=0\text{V}$
t_{rr}	Reverse Recovery Time	—	30	—	ns	$I_S=30\text{A}, di/dt=100\text{A}/\mu\text{s}$
Q_{rr}	Reverse Recovery Charge	—	30	—	nC	

Test Circuits and Waveforms

EAS Test Circuit:

Gate Charge Test Circuit:

Switching Time Test Circuit:

Switching Waveforms:


Notes:

- ① Calculated continuous current based on maximum allowable junction temperature.
- ② Repetitive rating; pulse width limited by max. junction temperature.
- ③ The power dissipation PD is based on max. junction temperature, using junction-to-case thermal resistance.

Typical Electrical and Thermal Characteristics

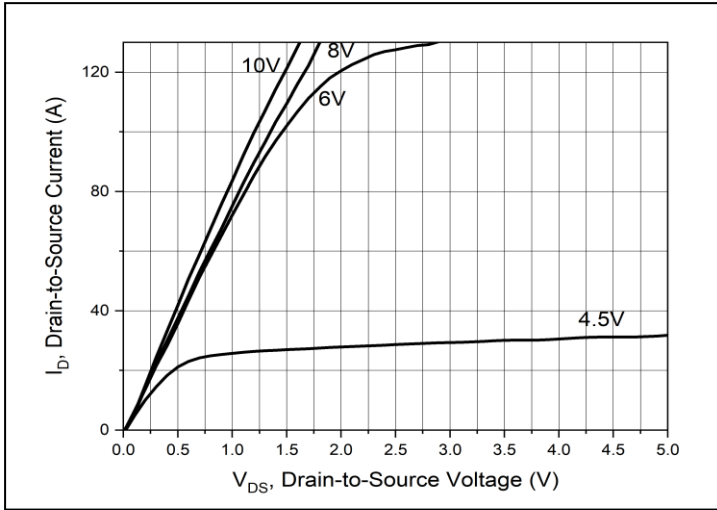


Figure1. Typical Output Characteristics

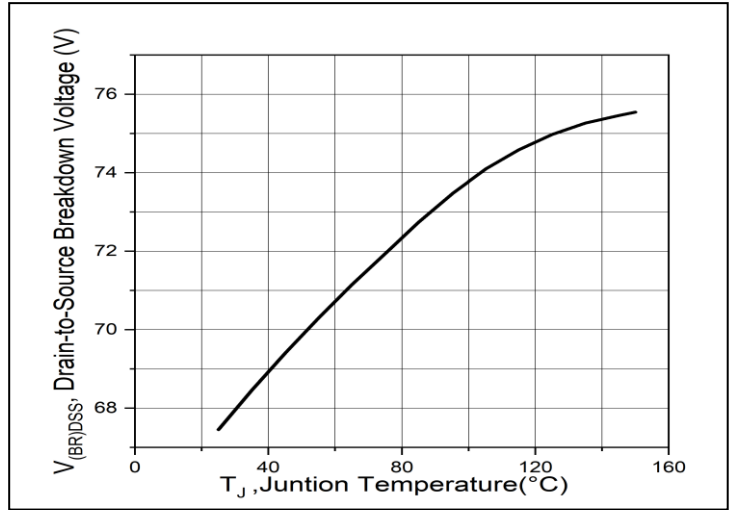


Figure2. Drain-to-Source Breakdown Voltage vs. Junction Temperature

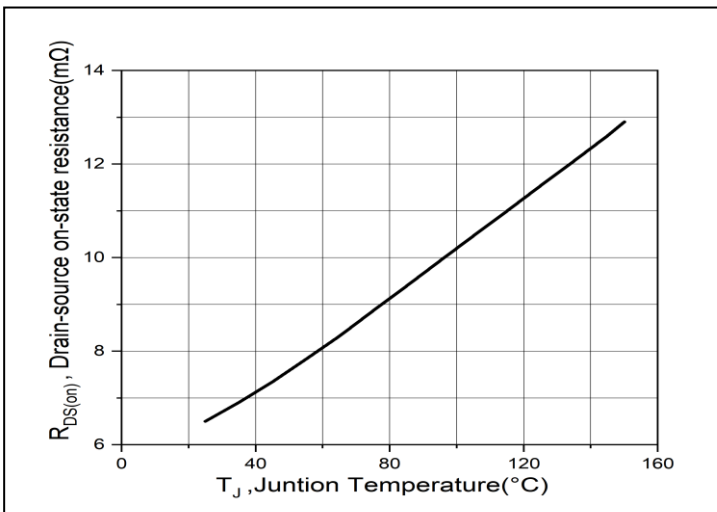


Figure 3. RDS(on) vs. Junction Temperature

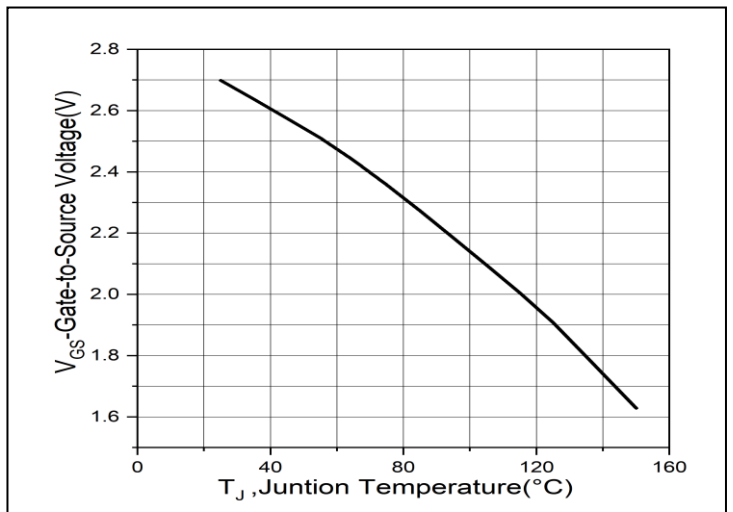


Figure 4. Vth vs. Junction Temperature

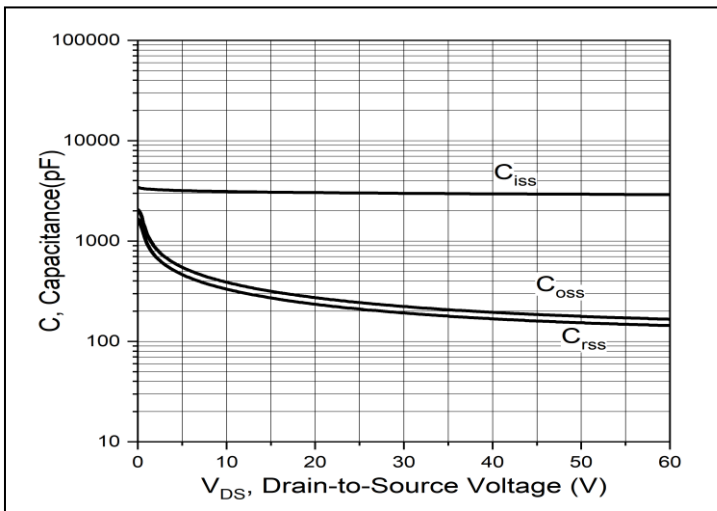


Figure5. Capacitance

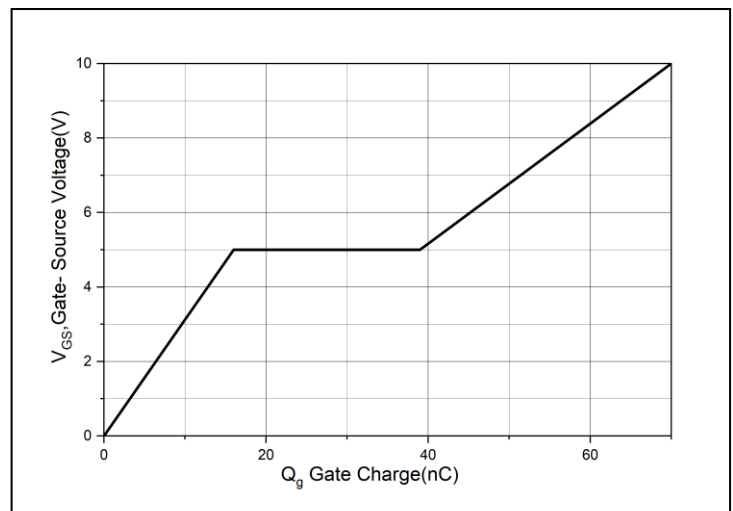


Figure6. Gate Charge

Typical Electrical and Thermal Characteristics

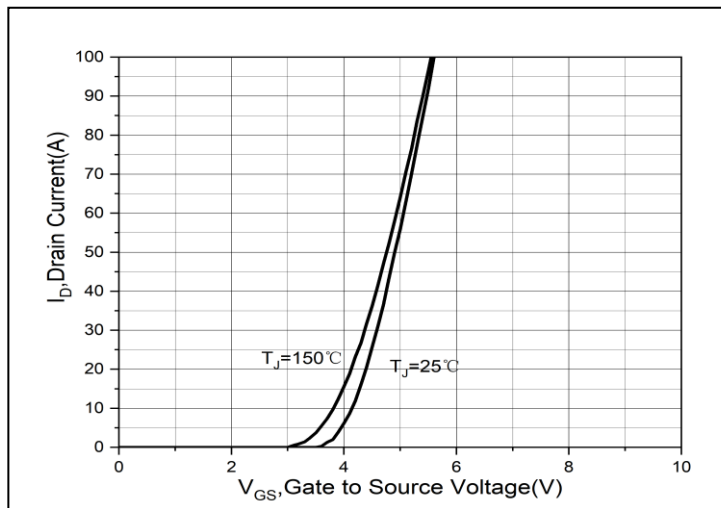


Figure7. Transfer Characteristics

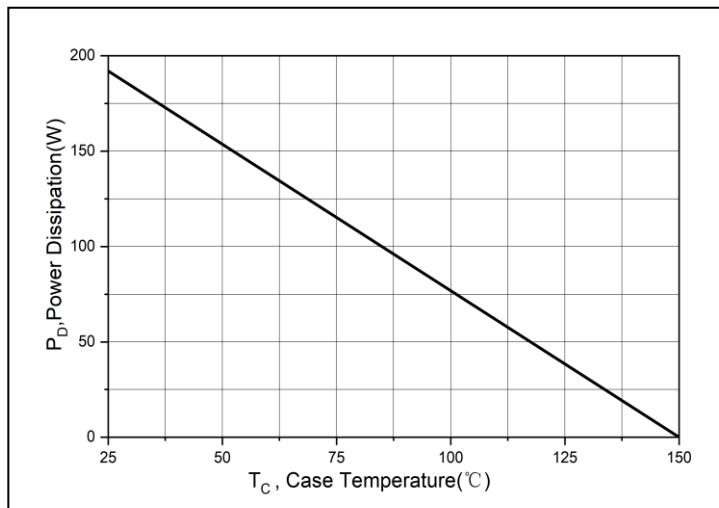
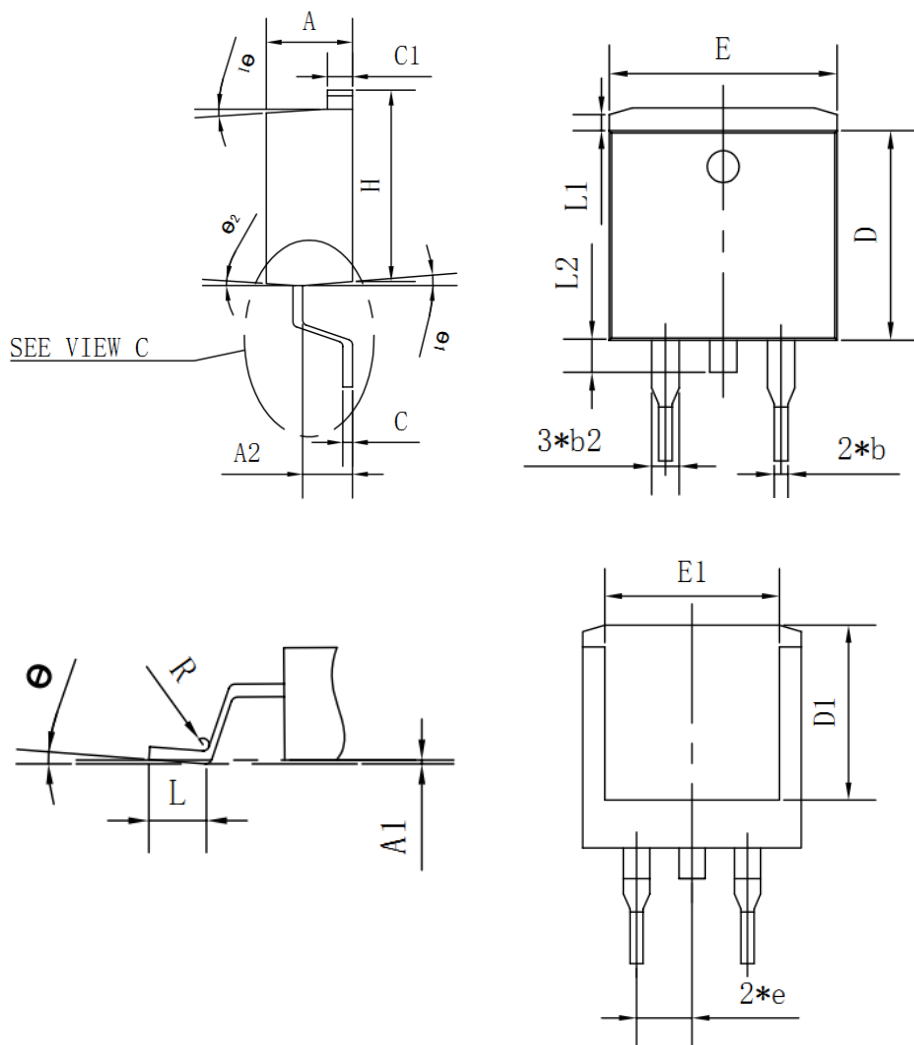


Figure8. Power Dissipation

Mechanical Data:

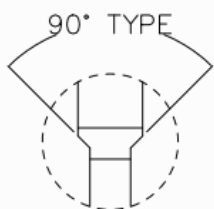
TO-263 Package Outline (Unit:mm)

Option 1

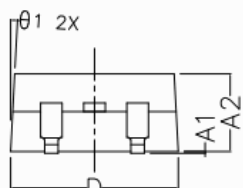


SYMBOL	MIN	NOM	MAX
A	4.35	4.47	4.60
A1	0.09	0.10	0.11
A2	2.30	2.40	2.50
b	0.70	0.80	1.00
b2	1.25	1.36	1.38
C	0.45	0.50	0.55
C1	1.29	1.30	1.31
D	9.10	9.20	9.30
D1	7.90	8.00	8.10
E	9.85	10.00	10.20
E1	7.90	8.00	8.10
H	15.30	15.50	15.70
e	-	2.54	-
L	2.34	2.54	2.74
L1	1.00	1.10	1.20
L2	1.30	1.40	1.50
R	0.24	0.25	0.26
θ	0°	4°	8°
θ_1	4°	7°	10°
θ_2	0°	3°	6°

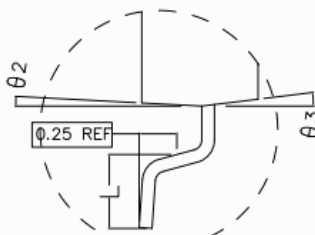
Option 2



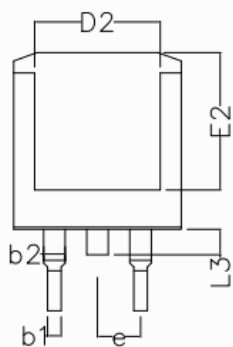
DETAIL F



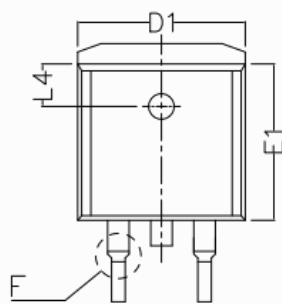
SIDE VIEW



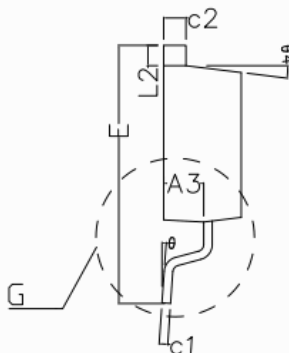
DETAIL G



BOTTOM VIEW



TOP VIEW



	MIN	NORMAL	MAX
A1	0.020	0.100	0.200
A2	4.470	4.570	4.670
A3	2.300	2.350	2.400
b1	0.750	0.800	0.850
b2	1.220	1.270	1.320
c1	0.450	0.500	0.550
c2	1.250	1.300	1.350
D	9.900	10.000	10.100
▲D1	9.780	9.880	9.980
▲D2	7.900	8.000	8.100
E	14.900	15.100	15.300
▲E1	9.000	9.100	9.200
▲E2	7.600	7.700	7.800
e	2.540TYPE		
L	2.100	2.300	2.500
L2	1.100	1.200	1.300
L3	1.300	1.500	1.700
▲L4	2.50 TYPE		
θ1	3° TYPE		
θ2	3° TYPE		
θ3	7° TYPE		
θ4	7° TYPE		
θ	0 ~ 8°		

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