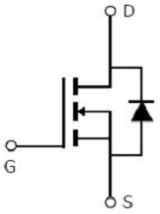
Main Product Characteristics

V_{DSS}	100V
R_{DS}(on)	3.5mΩ (typ.)
I_D	150A 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	150	A
I_{DM}	Pulsed Drain Current ②	600	
P_D @TC = 25°C	Power Dissipation ③	208	W
V_{DS}	Drain-Source Voltage	100	V
V_{GS}	Gate-to-Source Voltage	± 20	V
E_{AS}	Single Pulse Avalanche Energy	609	mJ
I_{AS}	Single Pulse Avalanche Current	28	A
T_J T_{STG}	Operating Junction and Storage Temperature Range	-55 to +150	°C

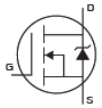
Thermal Resistance

Symbol	Characterizes	Value	Units
$R_{\theta JC}$	Junction-to-case ③	0.6	°C/W
$R_{\theta JA}$	Junction-to-ambient ④	60	°C/W

Electrical Characterizes @T_A=25℃ unless otherwise specified

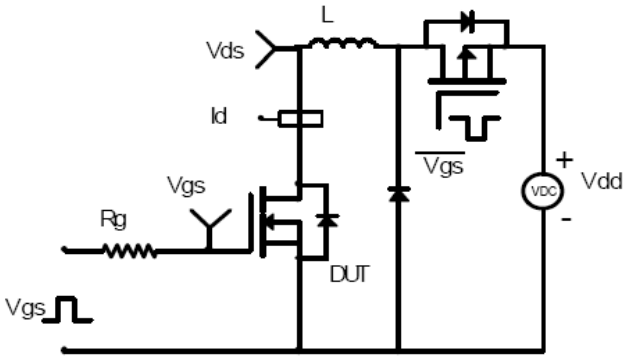
Symbol	Parameter	Min.	Typ.	Max.	Units	Conditions
$V_{(BR)DSS}$	Drain-to-Source breakdown voltage	100	—	—	V	V_{GS} = 0V, I_D= 250uA
$R_{DS(on)}$	Static Drain-to-Source on-resistance	—	3.5	4.2	mΩ	V_{GS}=10V,I_D =50A
$V_{GS(th)}$	Gate threshold voltage	2.0	—	4.0	V	V_{DS} = V_{GS}, I_D =250μA
I_{DSS}	Drain-to-Source leakage current	—	—	1	μA	V_{DS} =100V,V_{GS} = 0V
I_{GSS}	Gate-to-Source forward leakage	—	—	100	nA	V_{GS} =20V
		—	—	-100		V_{GS} = -20V
Q_g	Total gate charge	—	138	—	nC	I_D = 50A, V_{DS}=50V, V_{GS} = 10V
Q_{gs}	Gate-to-Source charge	—	37	—		
Q_{gd}	Gate-to-Drain("Miller") charge	—	35.5	—		
$t_{d(on)}$	Turn-on delay time	—	35	—	ns	V_{GS}=10V, V_{DD} =50V, R_{GEN}=25Ω I_D =50A
t_r	Rise time	—	22	—		
$t_{d(off)}$	Turn-Off delay time	—	105	—		
t_f	Fall time	—	45	—		
C_{iss}	Input capacitance	—	7700	—	pF	V_{GS} = 0V V_{DS} = 50V f = 1MHz
C_{oss}	Output capacitance	—	470	—		
C_{rss}	Reverse transfer capacitance	—	28	—		

Source-Drain Ratings and Characteristics

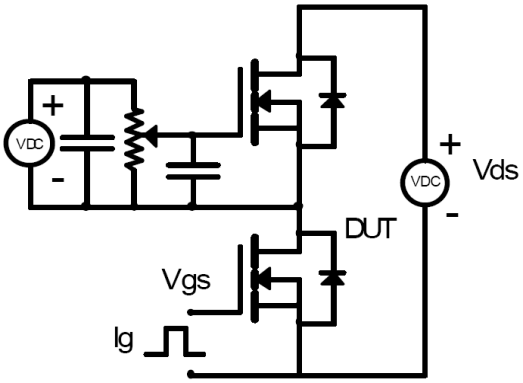
Symbol	Parameter	Min.	Typ.	Max.	Units	Conditions
I_S	Continuous Source Current (Body Diode) ①	—	—	50	A	MOSFET symbol showing the integral reverse p-n junction diode. 
I_{SM}	Pulsed Source Current (Body Diode)	—	—	150	A	
V_{sd}	Diode Forward Voltage	—	0.9	1.2	V	I_S=50A, V_{GS}=0V, T_J = 25°C
trr	Reverse Recovery Time	—	50	—	ns	I_S=50A,di/dt=500A/us
Qrr	Reverse Recovery Charge	—	110	—	nC	

Test circuits and Waveforms

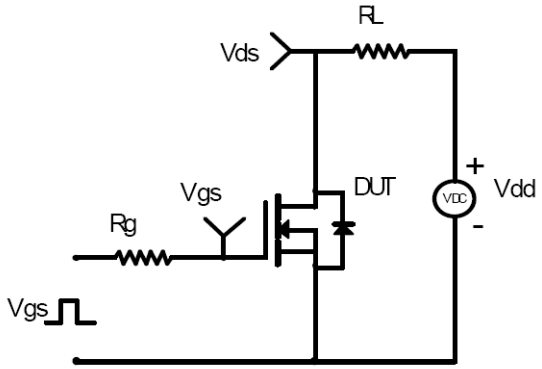
EAS Test Circuit:



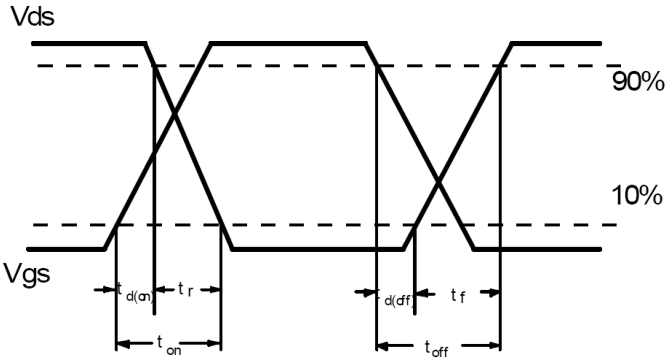
Gate charge test circuit:



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.

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 TA =25°C

Typical electrical and thermal characteristics

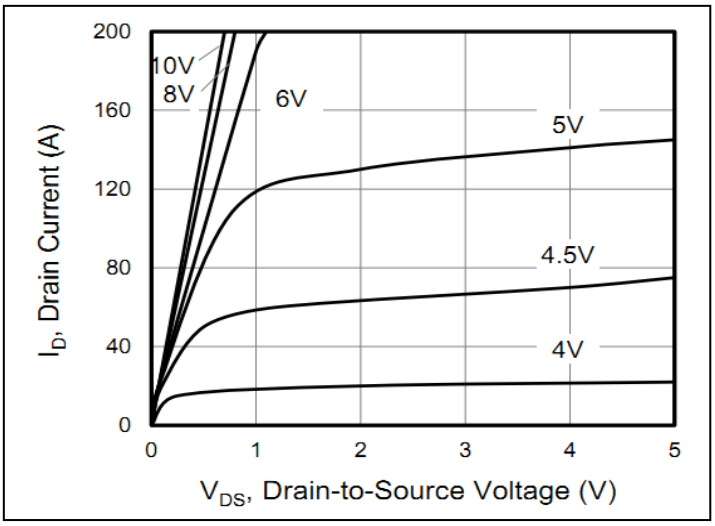


Figure 1.Typical Output Characteristics

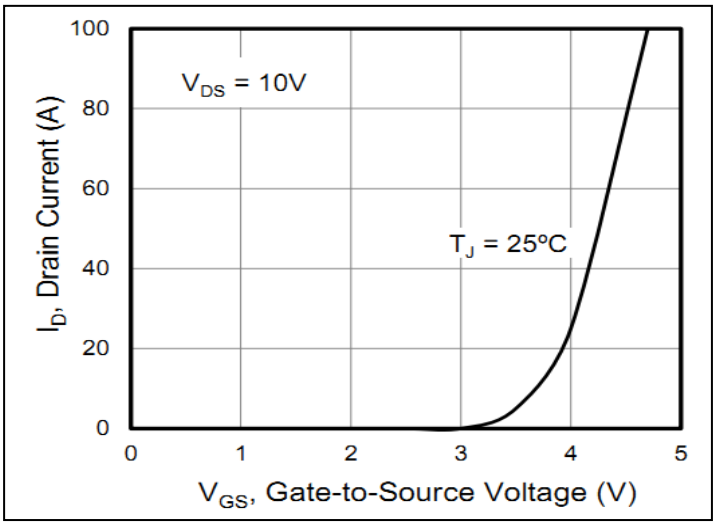


Figure 2. Typ. Transfer Characteristics

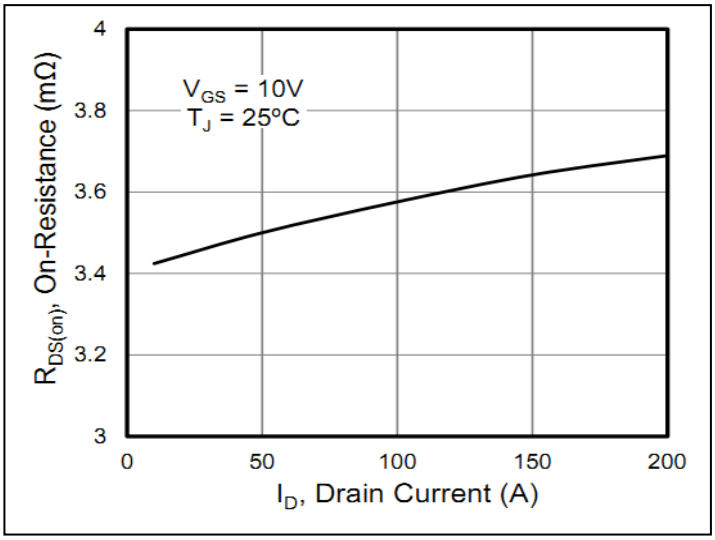


Figure 3. On-Resistance vs. Drain Current

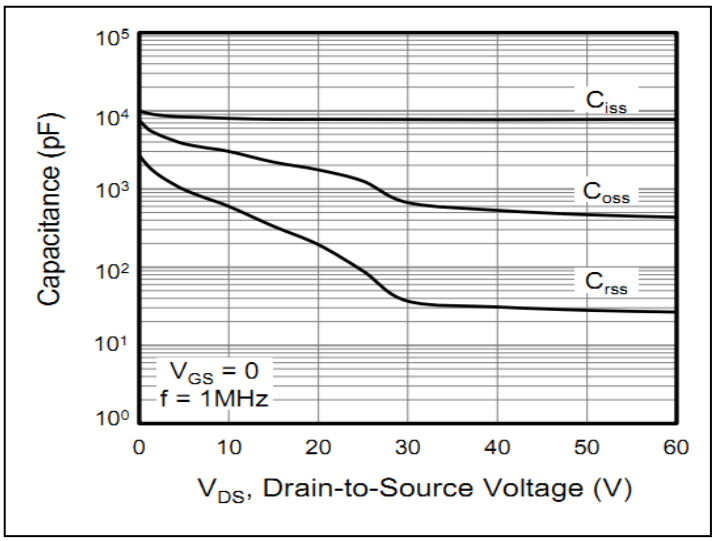


Figure 4. Capacitance

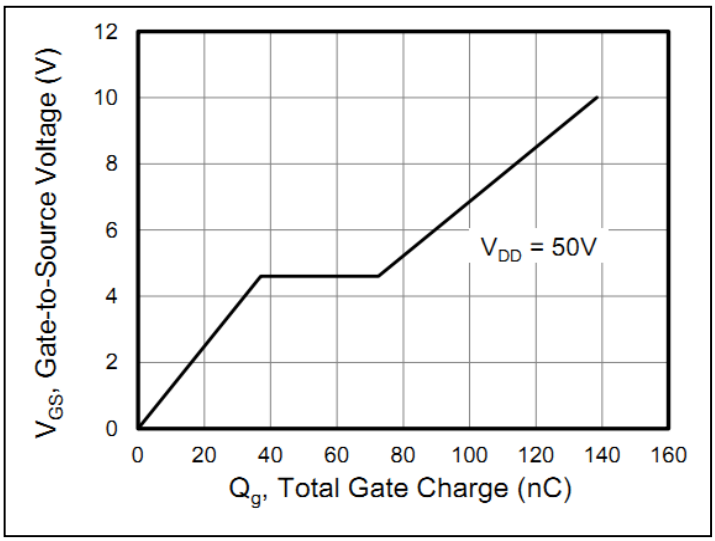


Figure 5. Gate Charge

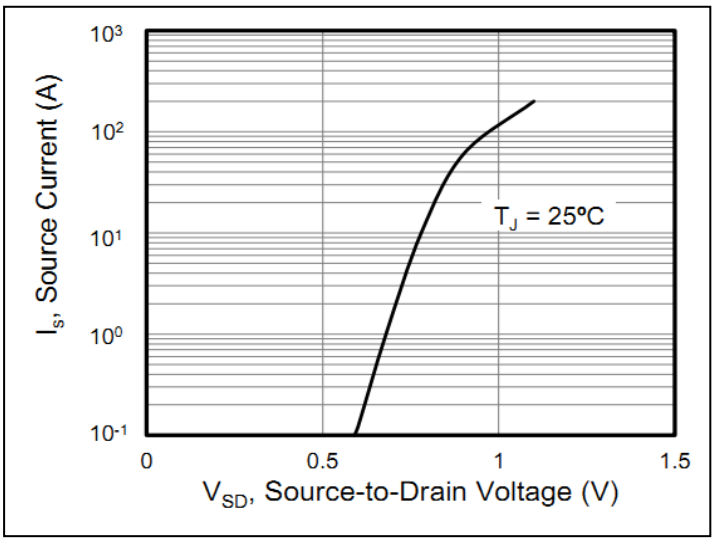


Figure 6. Body Diode Forward Voltage

Typical electrical and thermal characteristics

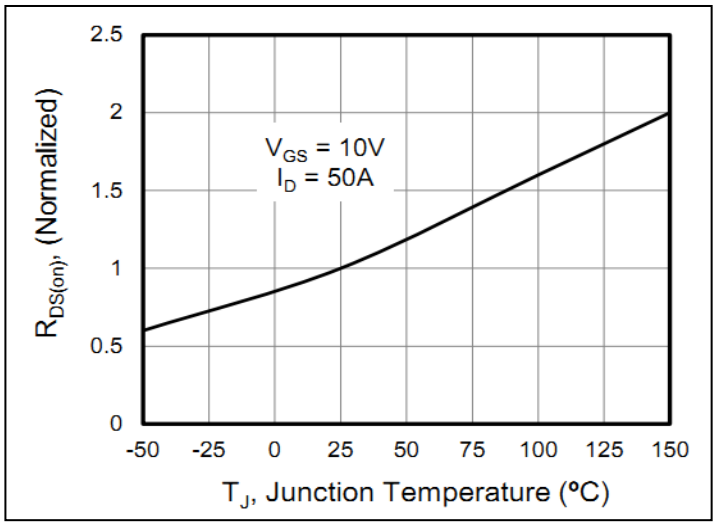


Figure 7. On-Resistance vs. Junction Temperature

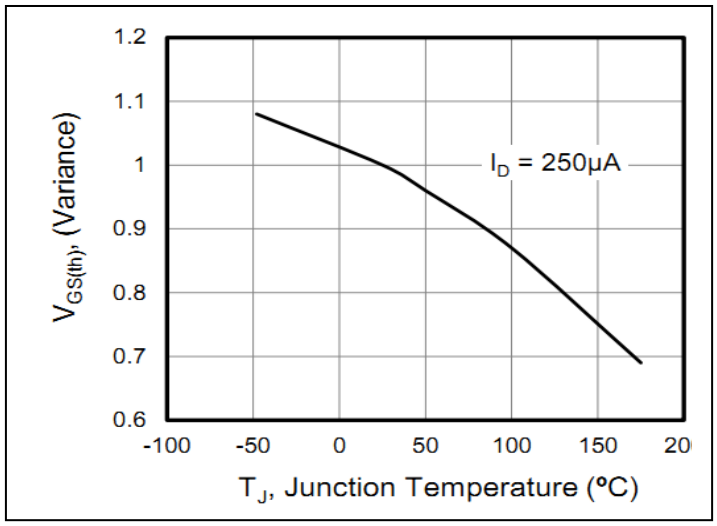


Figure 8.Threshold Voltage vs. Junction Temperature

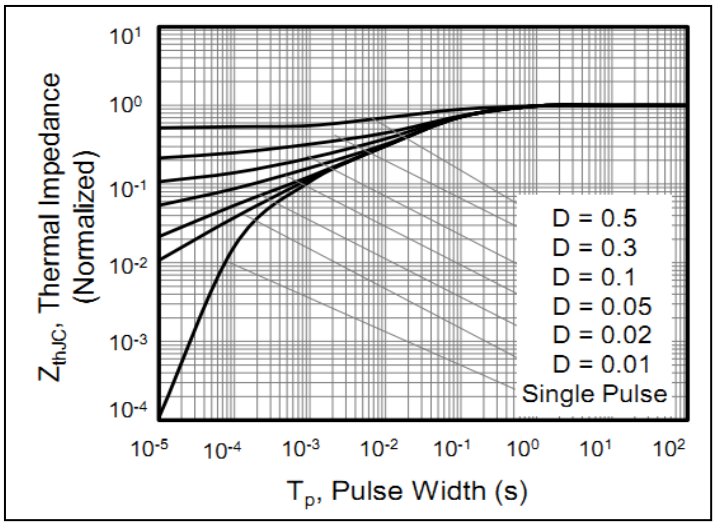
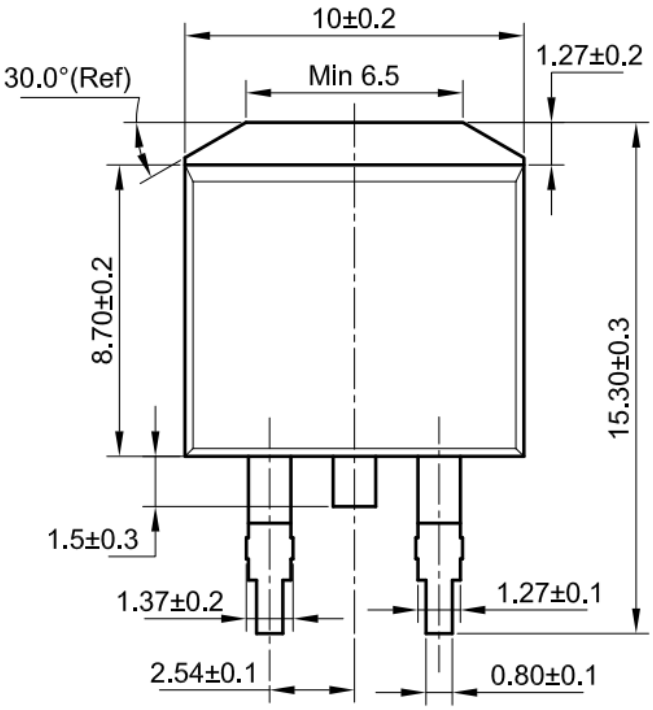
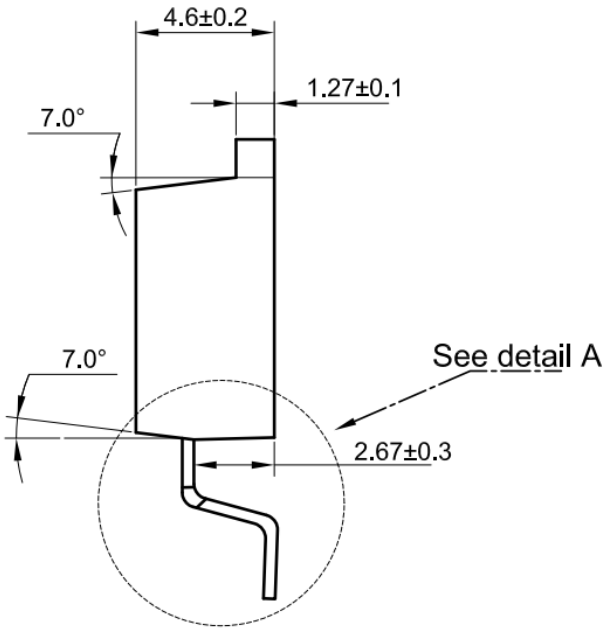


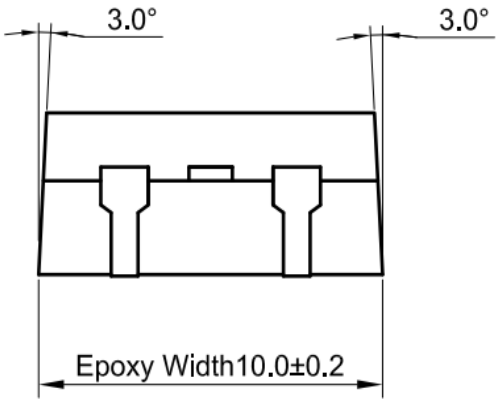
Figure9.Transient Thermal Impedance

Mechanical Data：

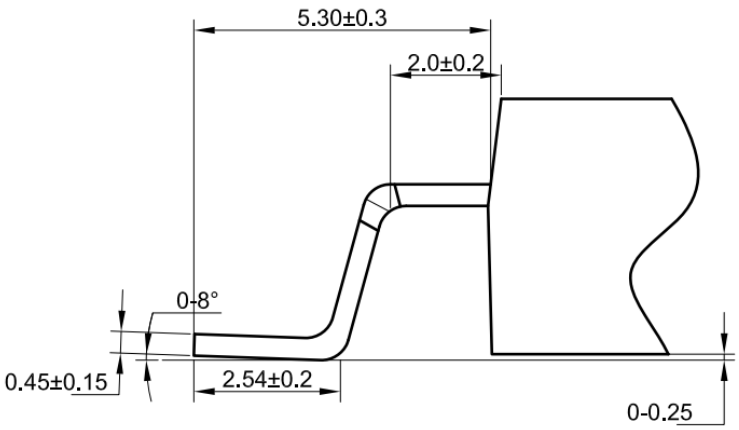
Unit:mm







Detail A



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