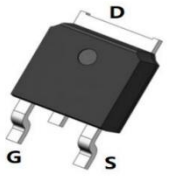
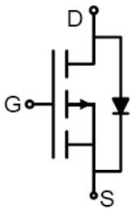
Main Product Characteristics:

V_{DSS}	-40V
R_{DS}(on)	10.2mΩ (typ.)
I_D	-57A



TO-252



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	-57	A
I_D @ T_C = 100°C	Continuous Drain Current, V_{GS} @ 10V ①	-40	
I_{DM}	Pulsed Drain Current ②	-228	
P_D @T_C = 25°C	Power Dissipation ③	79	W
V_{DS}	Drain-Source Voltage	-40	V
V_{GS}	Gate-to-Source Voltage	± 20	V
T_J T_{STG}	Operating Junction and Storage Temperature Range	-55 to +150	°C

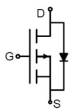
Thermal Resistance

Symbol	Characterizes	Typ.	Max.	Units
$R_{\theta JC}$	Junction-to-Case ③	—	1.9	°C/W

Electrical Characteristics @T_A=25°C unless otherwise specified

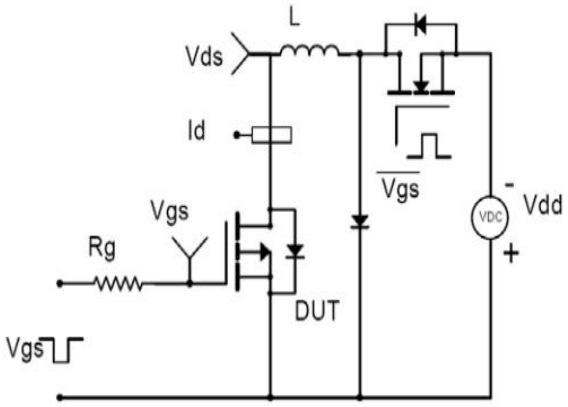
Symbol	Parameter	Min.	Typ.	Max.	Units	Conditions
$V_{(BR)DSS}$	Drain-to-Source breakdown voltage	-40	—	—	V	V_{GS} = 0V, I_D = -250μA
$R_{DS(on)}$	Static Drain-to-Source on-resistance	—	10.2	13.2	mΩ	V_{GS}= -10V,I_D = -15A
		—	13.7	18.2		V_{GS}= -4.5V,I_D = -10A
$V_{GS(th)}$	Gate threshold voltage	-1	—	-2.5	V	V_{DS} = V_{GS}, I_D = -250μA
I_{DSS}	Drain-to-Source leakage current	—	—	-1	μA	V_{DS} = -40V,V_{GS} = 0V
I_{GSS}	Gate-to-Source forward leakage	—	—	100	nA	V_{GS} =20V
		—	—	-100		V_{GS} = -20V
C_{iss}	Input capacitance	—	3240	—	pF	V_{GS} = 0V
C_{oss}	Output capacitance	—	225	—		V_{DS} = -25V
C_{rss}	Reverse transfer capacitance	—	200	—		f = 1MHz
Q_g	Total gate charge	—	60	—	nC	I_D = -3A,
Q_{gs}	Gate-to-Source charge	—	8.5	—		V_{DS}= -20V,
Q_{gd}	Gate-to-Drain("Miller") charge	—	14	—		V_{GS} = -10V
$t_{d(on)}$	Turn-on delay time	—	18	—	ns	V_{GS}= -10V, V_{DS} = -20V, R_{GEN}=3Ω,R_L=16Ω
t_r	Rise time	—	5	—		
$t_{d(off)}$	Turn-Off delay time	—	89	—		
t_f	Fall time	—	26	—		

Source-Drain Ratings and Characteristics

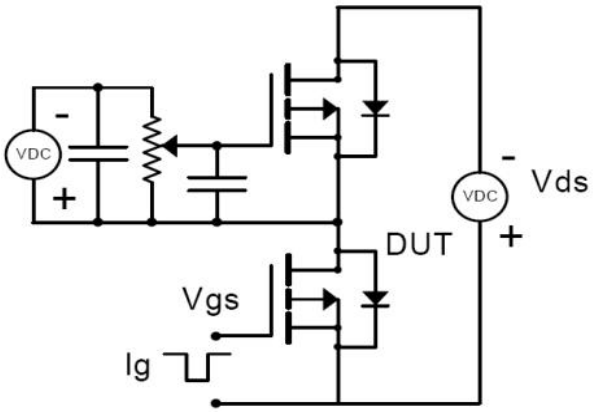
Symbol	Parameter	Min.	Typ.	Max.	Units	Conditions
I_S	Continuous Source Current (Body Diode)	—	—	-57	A	MOSFET symbol showing the integral reverse p-n junction diode. 
I_{SM}	Pulsed Source Current (Body Diode)	—	—	-228	A	
V_{SD}	Diode Forward Voltage	—	—	-1.2	V	I_S=-10A, V_{GS}=0V
t_{rr}	Reverse Recovery Time	—	17.3	—	ns	T_J = 25°C, I_F =-10A, di/dt = 100A/μs
Q_{rr}	Reverse Recovery Charge	—	9.5	—	nC	

Test Circuits and Waveforms

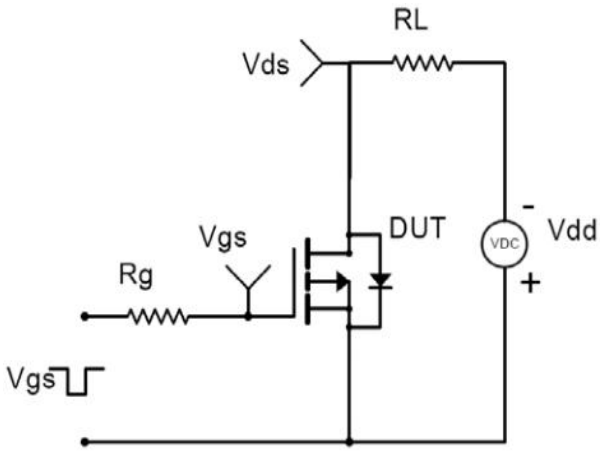
EAS Test Circuit:



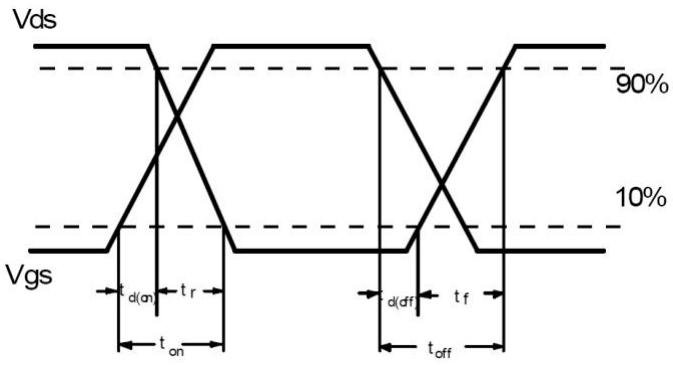
Gate Charge Test Circuit:



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

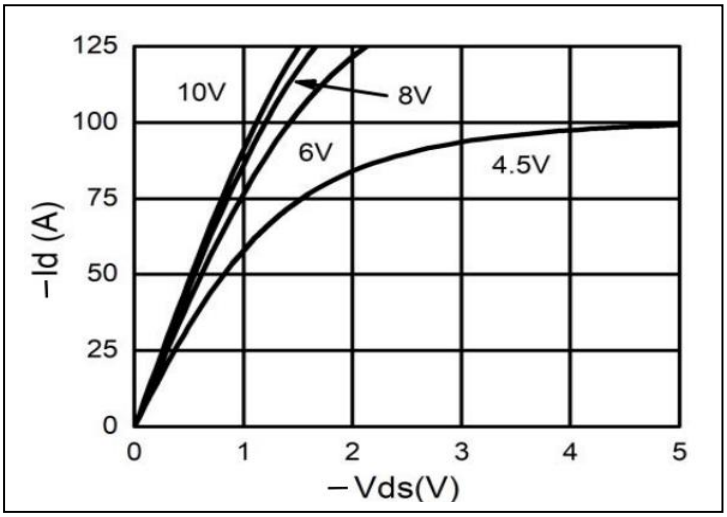


Figure1. Typical Output Characteristics

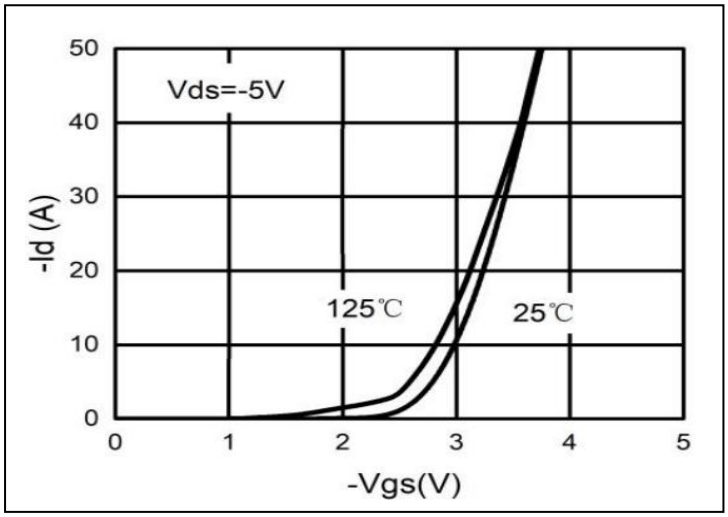


Figure2. Transfer Characteristics

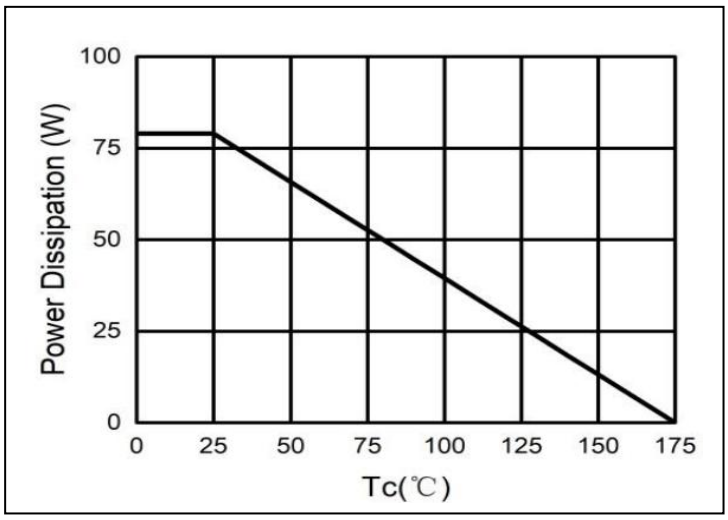


Figure3. Power Dissipation

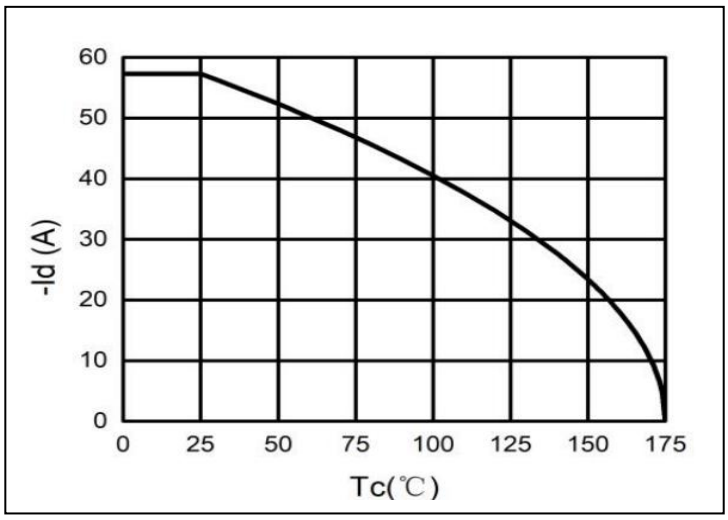


Figure 4. Drain Current

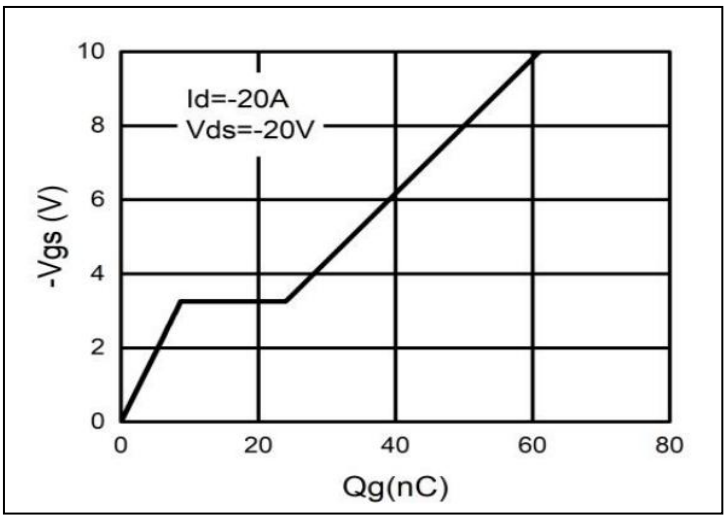


Figure5. Gate Charge

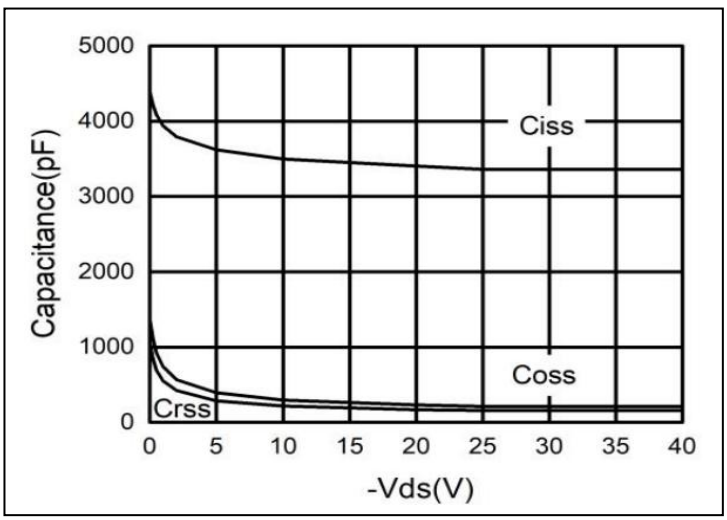


Figure6. Capacitance

Typical Electrical and Thermal Characteristics

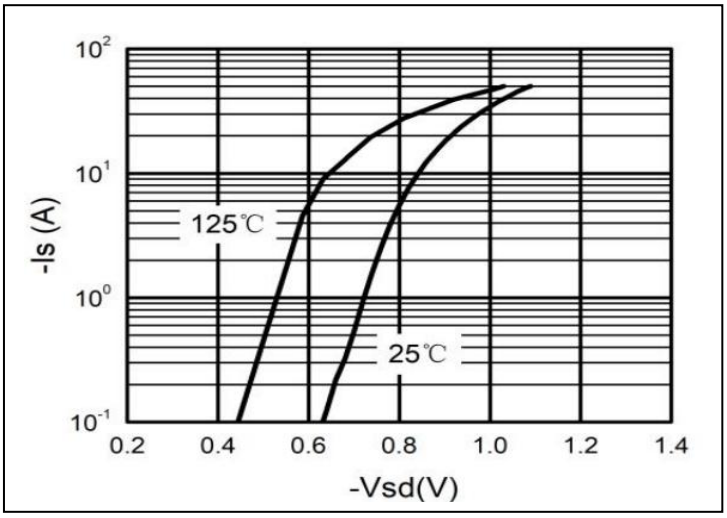


Figure7. Body-Diode Characteristics

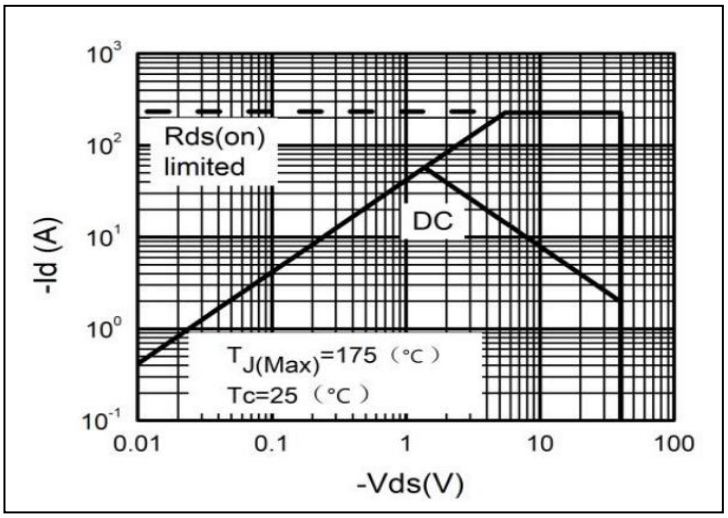
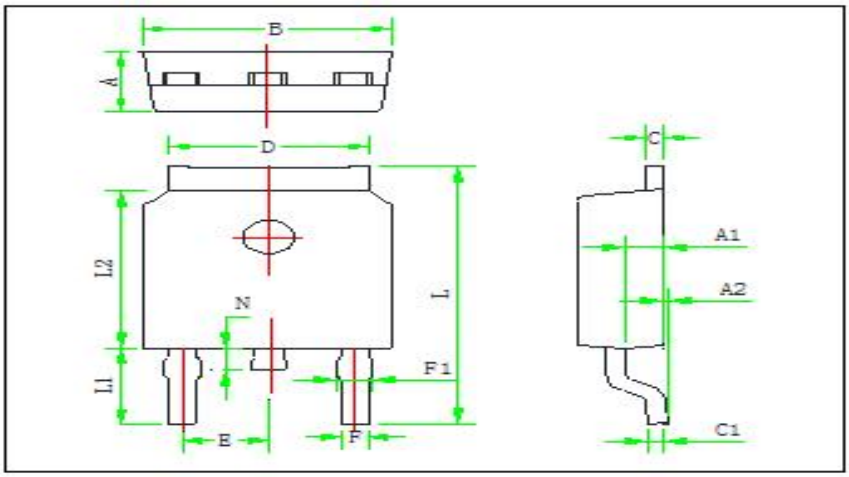


Figure8. Maximum Safe Operating Area

Mechanical Data：



Symbol	Min	Typ	Max
A	2.20	2.30	2.40
A1	0.91	1.01	1.11
A2	0.05	0.15	0.25
B	6.45	6.60	6.75
C	0.45	0.50	0.58
C1	0.45	0.50	0.58
D	5.12	5.32	5.52
E		2.286 TYP	
F	0.66	0.76	0.86
F1	0.66	0.86	1.06
L	9.60	9.90	10.20
L1	2.6	2.8	3.0
L2	5.95	6.10	6.25
N	0.60	0.80	1.00

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