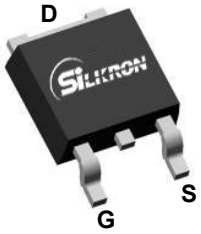
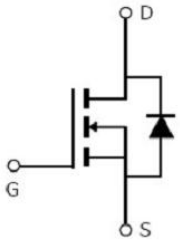
Main Product Characteristics:

V_{DSS}	40V
R_{DS}(on)	3.9mΩ (typ.)
I_D	96A



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	96	A
I_D @ T_C = 100°C	Continuous Drain Current, V_{GS} @ 10V ①	68	
I_{DM}	Pulsed Drain Current ②	384	
P_D @T_C = 25°C	Power Dissipation ③	93	W
V_{DS}	Drain-Source Voltage	40	V
V_{GS}	Gate-to-Source Voltage	± 20	V
E_{AS}	Single Pulse Avalanche Energy @ L=0.5mH	324	mJ
T_J T_{STG}	Operating Junction and Storage Temperature Range	-55 to +150	°C

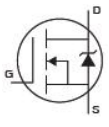
Thermal Resistance

Symbol	Characterizes	Typ.	Max.	Units
$R_{\theta JC}$	Junction-to-case ③	—	1.6	℃/W

Electrical Characterizes @T_A=25℃ unless otherwise specified

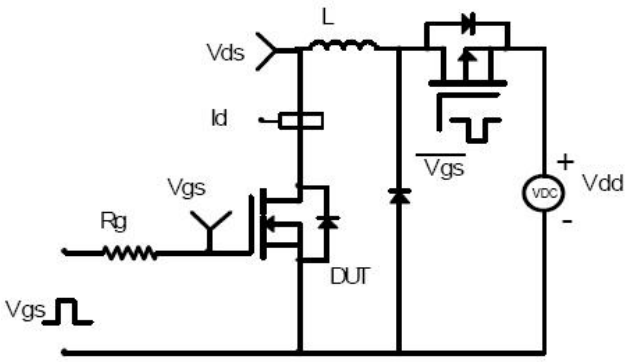
Symbol	Parameter	Min.	Typ.	Max.	Units	Conditions
$V_{(BR)DSS}$	Drain-to-Source breakdown voltage	40	—	—	V	V_{GS} = 0V, I_D = 250μA
$R_{DS(on)}$	Static Drain-to-Source on-resistance	—	3.9	5.1	mΩ	V_{GS}=10V,I_D = 20A
		—	5	6.6		V_{GS}=4.5V,I_D = 20A
$V_{GS(th)}$	Gate threshold voltage	1	—	2.5	V	V_{DS} = 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	—	3760	—	pF	V_{GS} = 0V
C_{oss}	Output capacitance	—	265	—		V_{DS} = 25V
C_{rss}	Reverse transfer capacitance	—	220	—		f = 1MHz
Q_g	Total gate charge	—	72	—	nC	I_D = 20A,
Q_{gs}	Gate-to-Source charge	—	9	—		V_{DS}=30V,
Q_{gd}	Gate-to-Drain("Miller") charge	—	16	—		V_{GS} = 10V
$t_{d(on)}$	Turn-on delay time	—	20	—	ns	V_{GS}=10V, V_{DS} =30V, R_{GEN}=6Ω,R_L=1.5Ω
t_r	Rise time	—	55	—		
$t_{d(off)}$	Turn-Off delay time	—	62	—		
t_f	Fall time	—	12	—		

Source-Drain Ratings and Characteristics

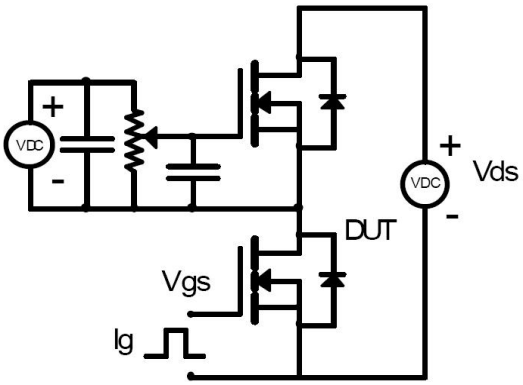
Symbol	Parameter	Min.	Typ.	Max.	Units	Conditions
I_S	Continuous Source Current (Body Diode)	—	—	96	A	MOSFET symbol showing the integral reverse p-n junction diode. 
I_{SM}	Pulsed Source Current (Body Diode)	—	—	384	A	
V_{SD}	Diode Forward Voltage	—	—	1.2	V	I_S=20A, V_{GS}=0V
t_{rr}	Reverse Recovery Time	—	22	—	ns	T_J = 25°C, I_F =20A, di/dt = 100A/μs
Q_{rr}	Reverse Recovery Charge	—	13	—	nC	

Test Circuits and Waveforms

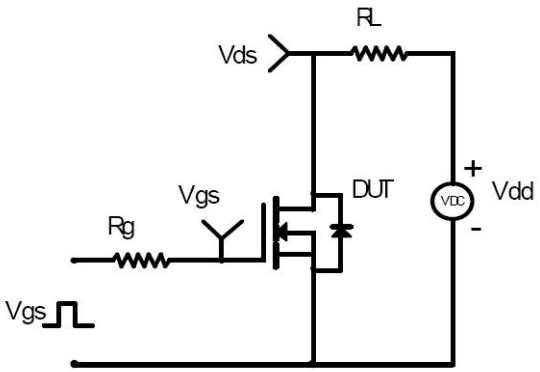
EAS Test Circuit:



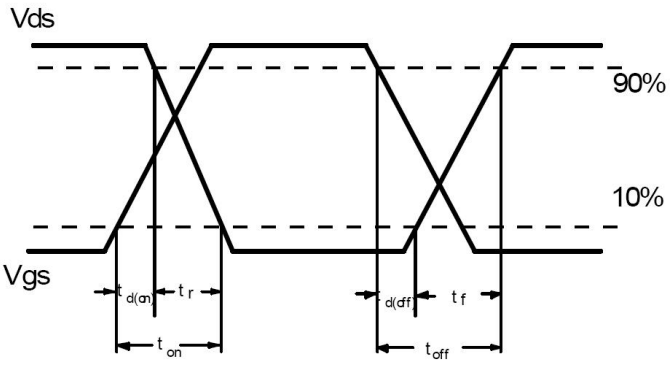
Gate Charge Test Circuit:



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

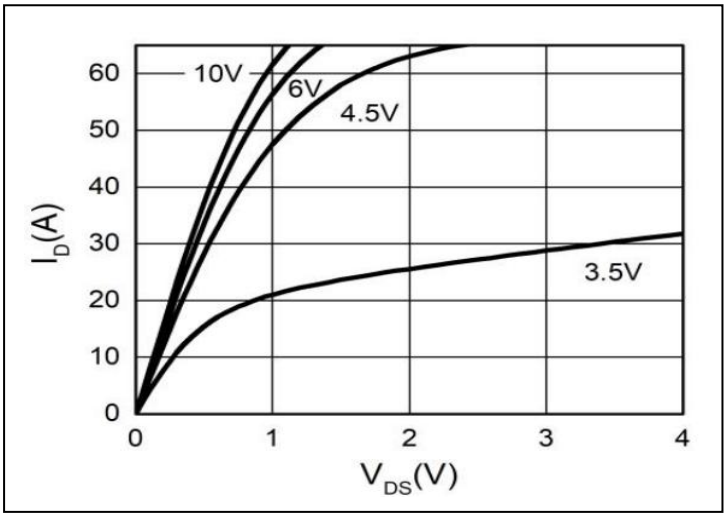


Figure1. Typical Output Characteristics

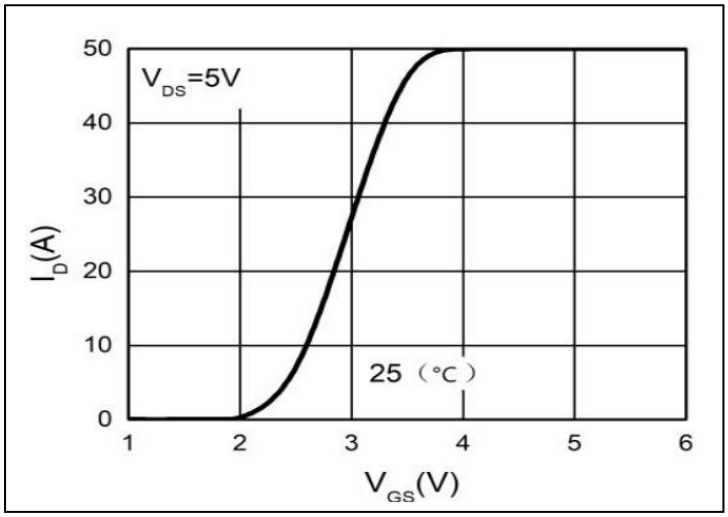


Figure2. Transfer Characteristics

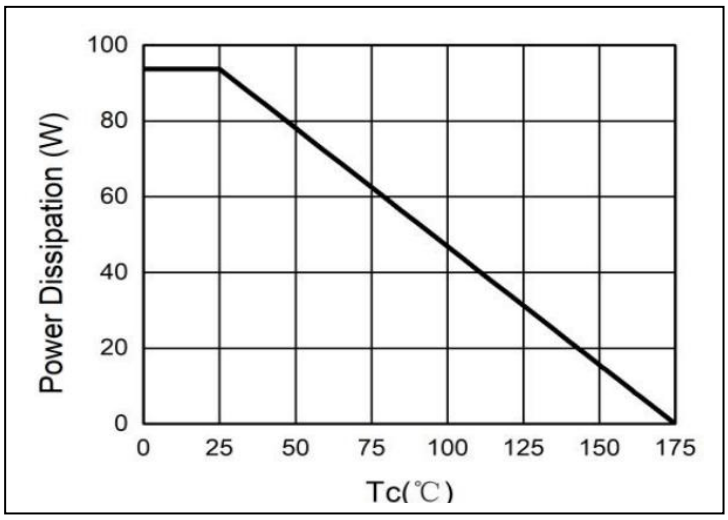


Figure3. Power Dissipation

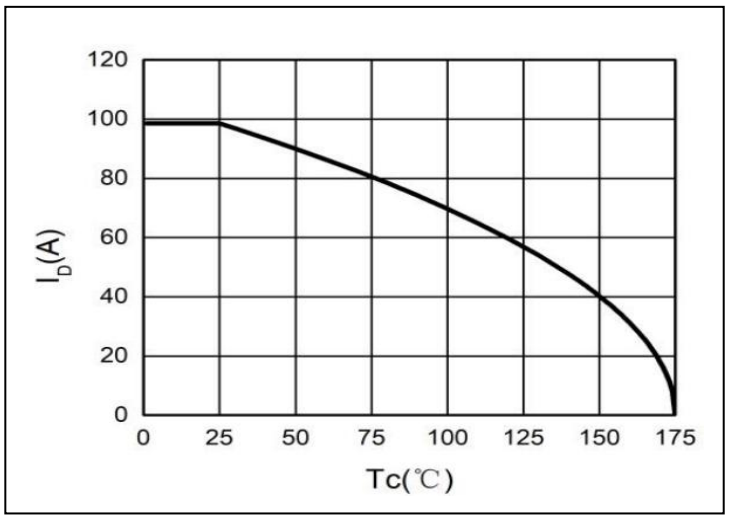


Figure 4. Drain Current

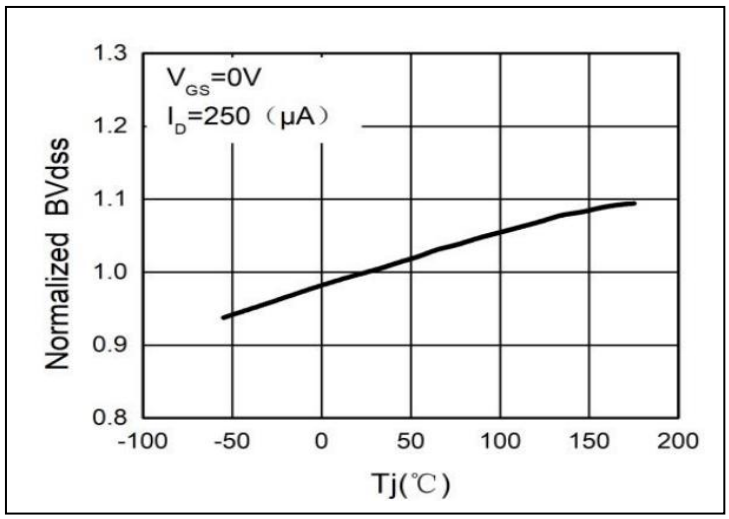


Figure5. BV_{DSS} vs Junction Temperature

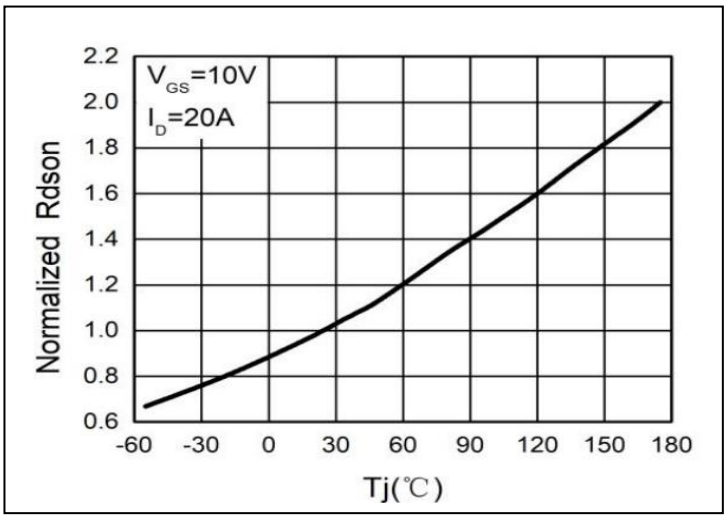


Figure6. $R_{DS(ON)}$ vs Junction Temperature

Typical Electrical and Thermal Characteristics

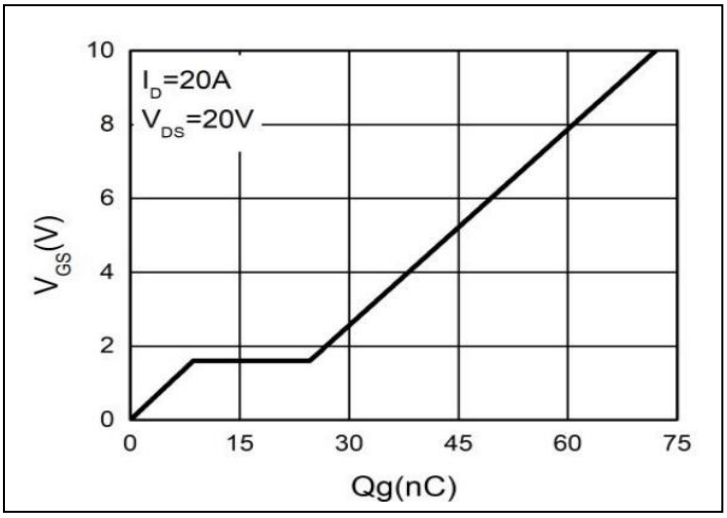


Figure7. Gate Charge Waveforms

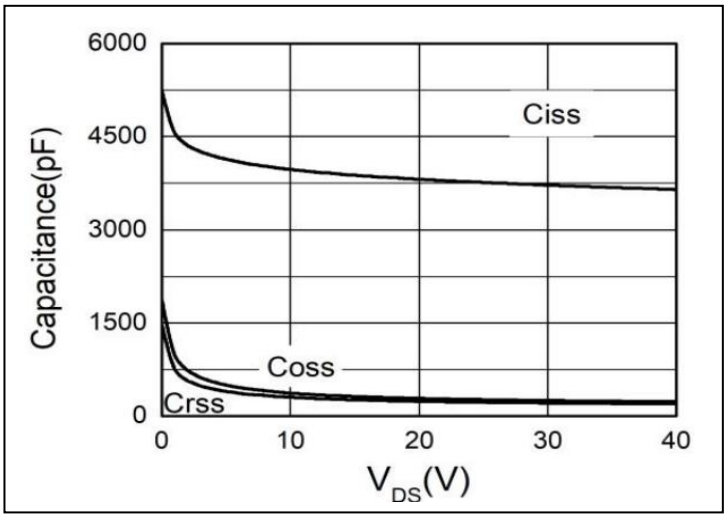


Figure8. Capacitance

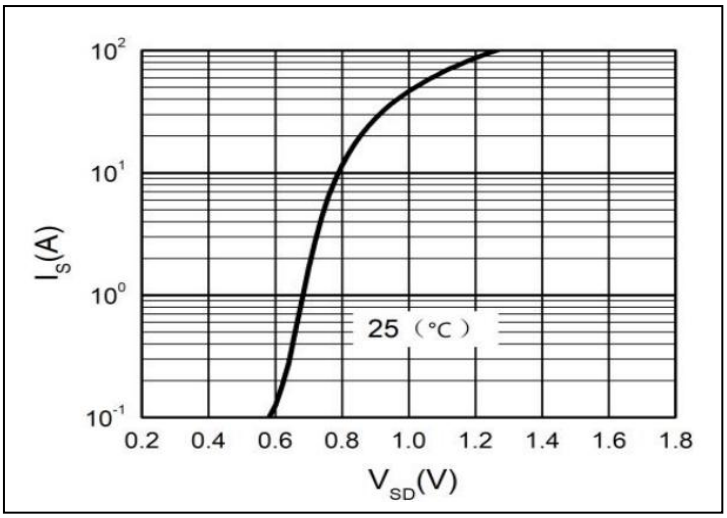


Figure9. Body-Diode Characteristics

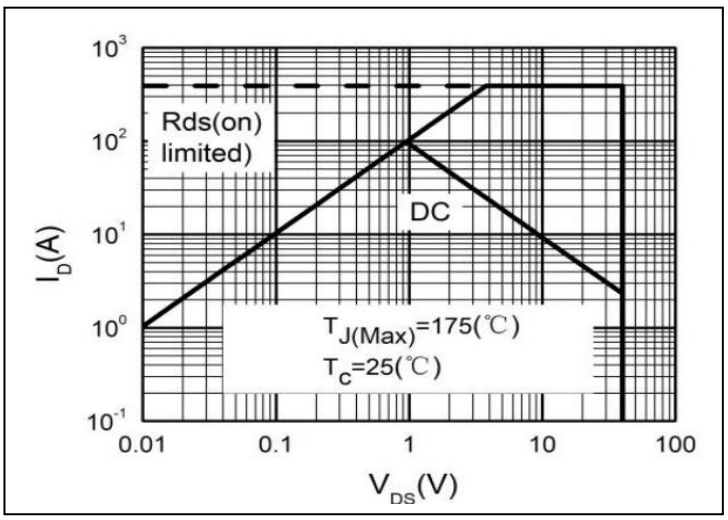
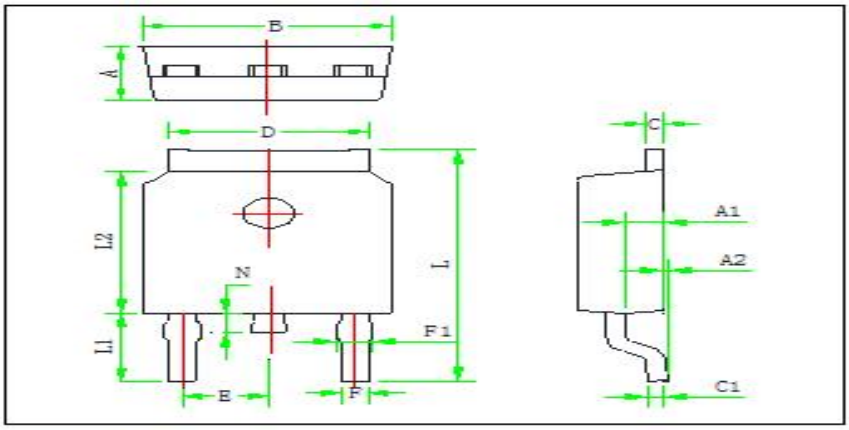


Figure10. Maximum Safe Operating Area

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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