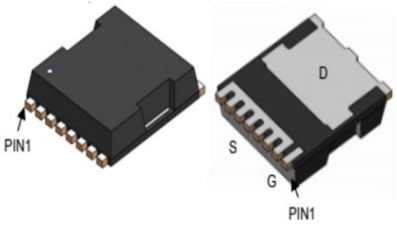
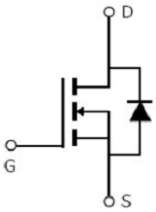
Main Product Characteristics:

V_{DSS}	40V
R_{DS}(on)	1.6mΩ (typ.)
I_D	180A



TOLL



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	180	A
I_D @ T_C = 100°C	Continuous Drain Current, V_{GS} @ 10V ①	107	
I_{DM}	Pulsed Drain Current ②	720	
P_D @T_C = 25°C	Power Dissipation ③	290	W
V_{DS}	Drain-Source Voltage	40	V
V_{GS}	Gate-to-Source Voltage	± 20	V
E_{AS}	Single Pulse Avalanche Energy @ L=0.3mH	590	mJ
T_J T_{STG}	Operating Junction and Storage Temperature Range	-55 to +150	°C

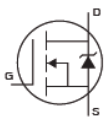
Thermal Resistance

Symbol	Characterizes	Typ.	Max.	Units
$R_{\theta JC}$	Junction-to-case ③	—	0.43	℃/W

Electrical Characteristics @T_A=25℃ unless otherwise specified

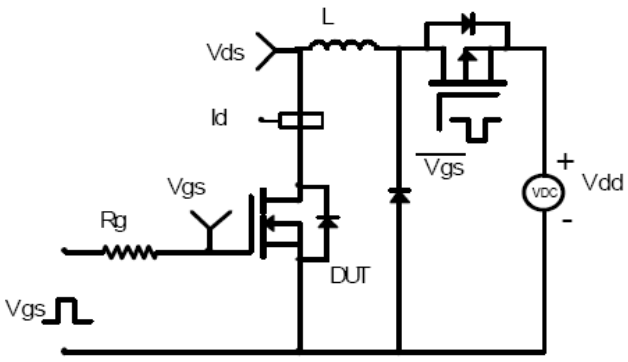
Symbol	Parameter	Min.	Typ.	Max.	Units	Conditions
$V_{(BR)DSS}$	Drain-to-Source breakdown voltage	40	—	—	V	V_{GS} = 0V, I_D = 250μA
$R_{DS(on)}$	Static Drain-to-Source on-resistance	—	1.6	3	mΩ	V_{GS}=10V,I_D = 40A
$V_{GS(th)}$	Gate threshold voltage	2	—	4	V	V_{DS} = V_{GS}, I_D = 250μA
I_{DSS}	Drain-to-Source 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	—	10547	—	pF	V_{GS} = 0V
C_{oss}	Output capacitance	—	654	—		V_{DS} = 30V
C_{rss}	Reverse transfer capacitance	—	553	—		f = 1MHz
Q_g	Total gate charge	—	135	—	nC	I_D = 20A,
Q_{gs}	Gate-to-Source charge	—	25	—		V_{DS}=20V,
Q_{gd}	Gate-to-Drain("Miller") charge	—	35	—		V_{GS} = 10V
$t_{d(on)}$	Turn-on delay time	—	32	—	ns	V_{GS}=10V, V_{DD} =20V, R_{GEN}=3.6Ω,R_L=1Ω
t_r	Rise time	—	31	—		
$t_{d(off)}$	Turn-Off delay time	—	68	—		
t_f	Fall time	—	23	—		

Source-Drain Ratings and Characteristics

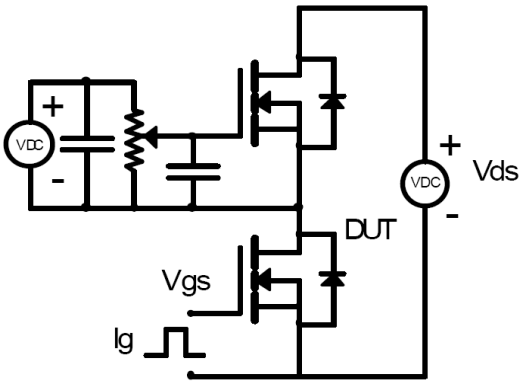
Symbol	Parameter	Min.	Typ.	Max.	Units	Conditions
I_S	Continuous Source Current (Body Diode)	—	—	180	A	MOSFET symbol showing the integral reverse p-n junction diode. 
I_{SM}	Pulsed Source Current (Body Diode)	—	—	720	A	
V_{sd}	Diode Forward Voltage	—	—	1.2	V	I_S=40A, V_{GS}=0V
t_{rr}	Reverse Recovery Time	—	50	—	ns	T_J = 25°C, I_F =20A, di/dt = 100A/μs
Q_{rr}	Reverse Recovery Charge	—	75	—	nC	

Test Circuits and Waveforms

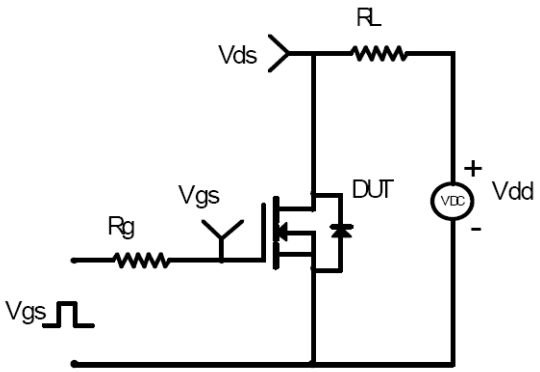
EAS Test Circuit:



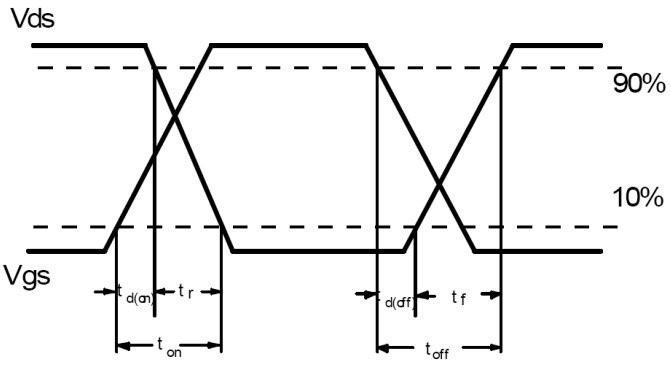
Gate Charge Test Circuit:



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

Typical Electrical and Thermal Characteristics

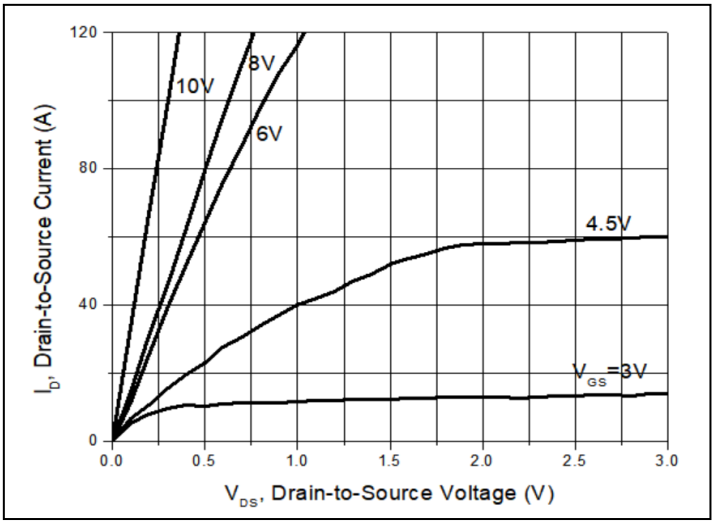


Figure1. Typical Output Characteristics

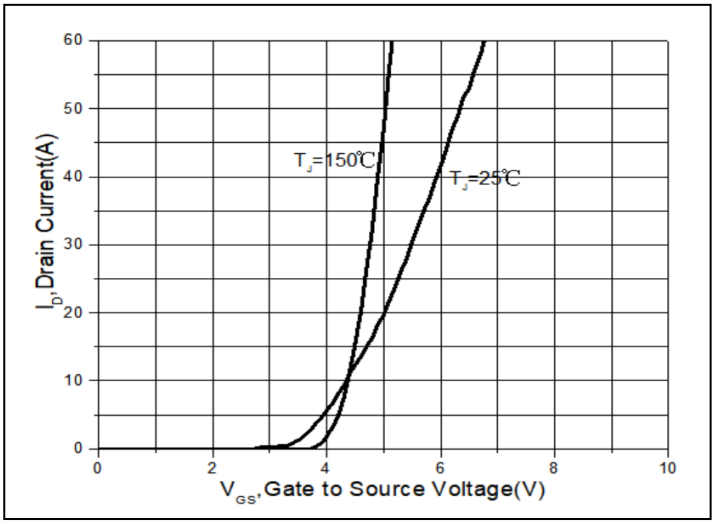


Figure2. Typical Transfer Characteristics

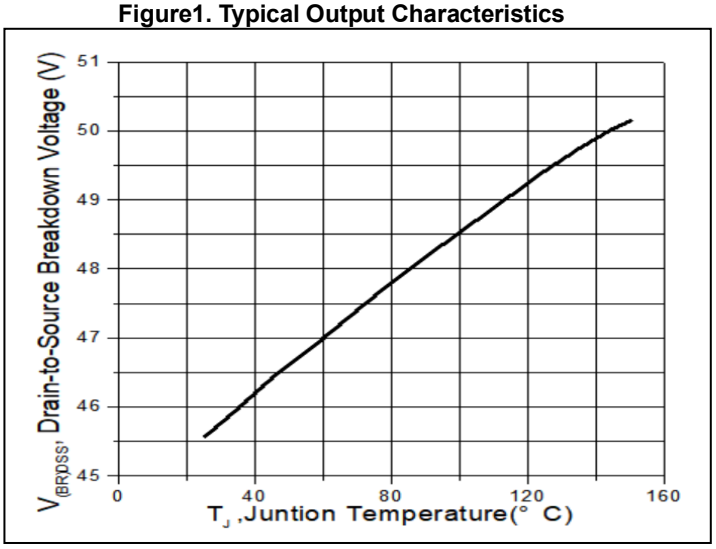


Figure3. Drain-to-Source Breakdown Voltage vs. Junction Temperature

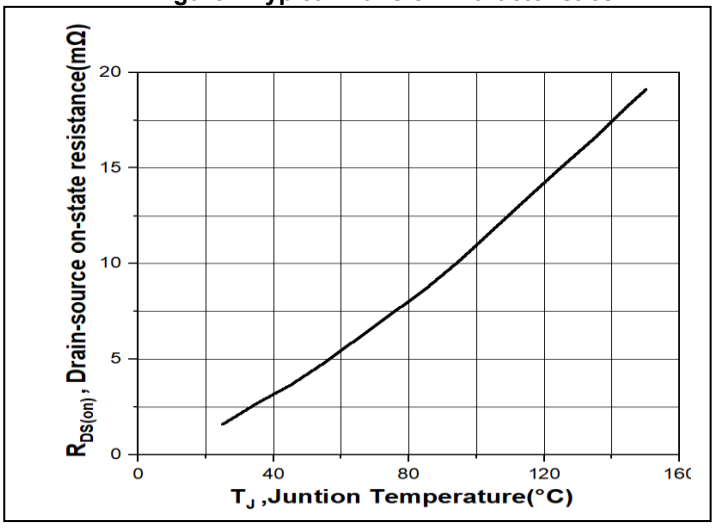


Figure4. Normalized On-Resistance vs. Junction Temperature

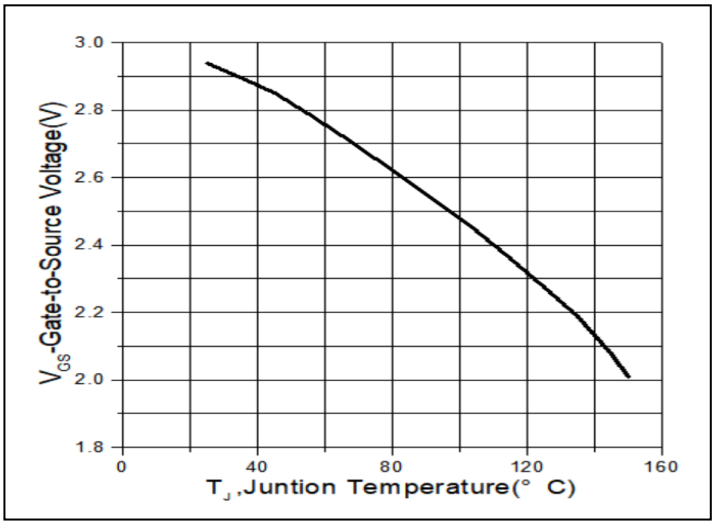


Figure5. Normalized V_{GS}(th) vs. Junction Temperature

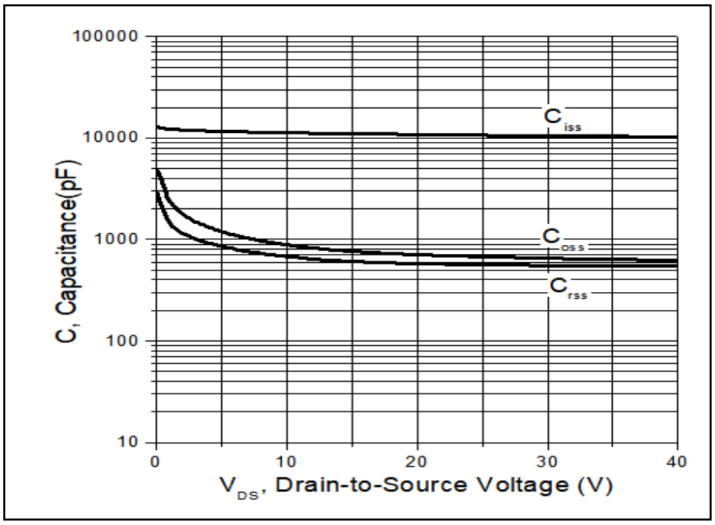
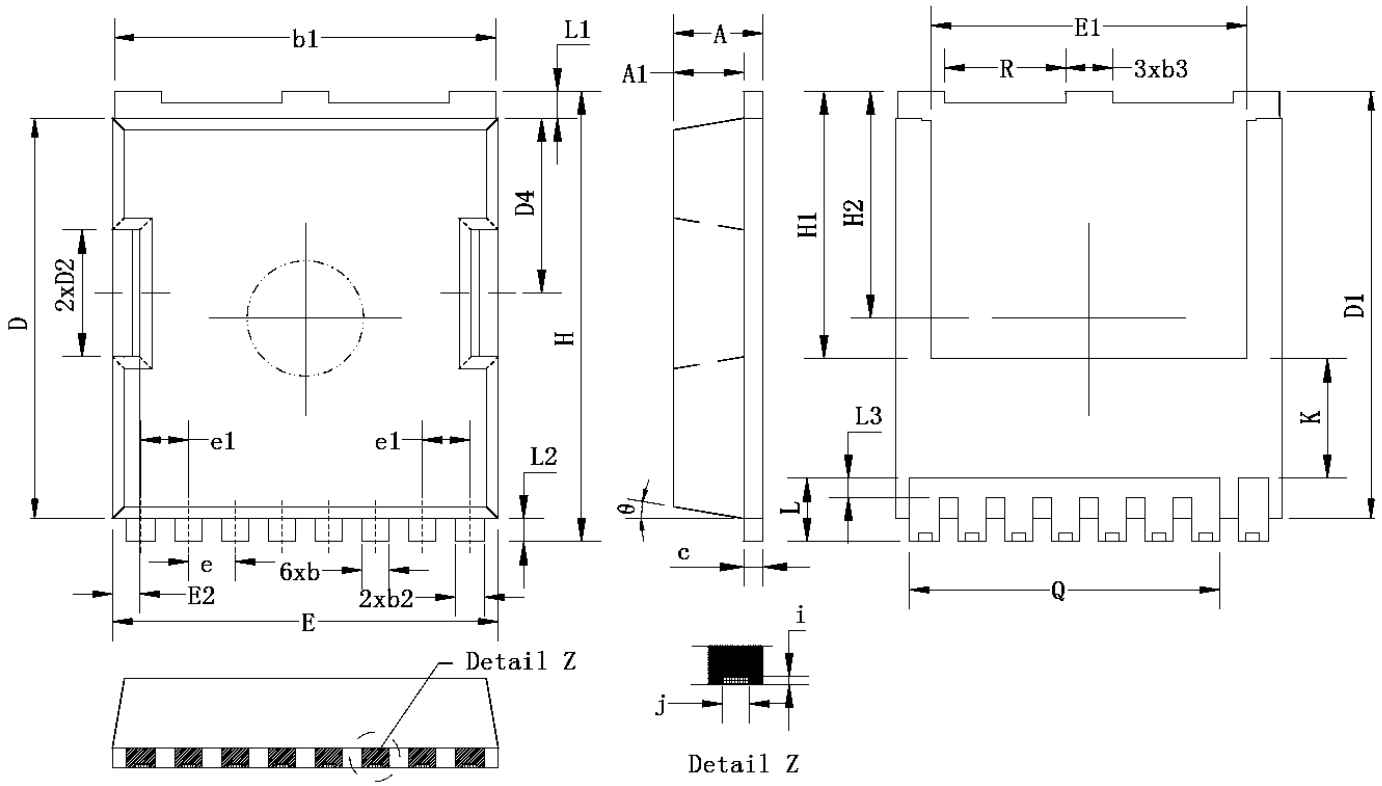


Figure6. Capacitance Characteristics

Mechanical Data：



Symbol	Min	Typ	Max		Symbol	Min	Typ	Max
A	2.25	2.30	2.35		E2	0.65	0.70	0.75
A1	1.75	1.80	1.85		H	11.60	11.70	11.80
b	0.65	0.70	0.75		H1	6.95 BSC		
b1	9.75	9.80	9.85		H2	5.90 BSC		
b2	0.70	0.75	0.80		i	0.10 REF		
b3	1.15	1.20	1.25		j	0.35 REF		
c	0.45	0.50	0.55		K	3.10 REF		
D	10.35	10.40	10.45		L	1.55	1.65	1.75
D1	11.00	11.10	11.20		L1	0.65	0.70	0.75
D2	3.25	3.30	3.35		L2	0.50	0.60	0.70
D4	4.50	4.55	4.60		L3	0.40	0.50	0.60
e	1.20 BSC				Q	7.95 REF		
e1	1.225 BSC				R	3.05	3.10	3.15
E	9.85	9.90	9.95		θ	10°REF		
E1	8.00	8.10	8.20					

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