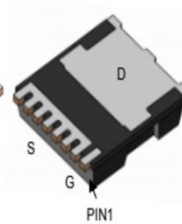
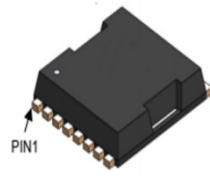
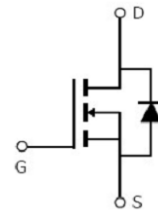


Main Product Characteristics:

V_{DS}	100V
$R_{DS(on)}$	1.4m Ω (typ.)
I_D	351A


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°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
$I_D @ T_c = 25^\circ\text{C}$	Continuous Drain Current, $V_{GS} @ 10\text{V}$ ①	351	A
$I_D @ T_c = 100^\circ\text{C}$	Continuous Drain Current, $V_{GS} @ 10\text{V}$ ①	249	
I_{DM}	Pulsed Drain Current ②	1406	
$P_D @ T_c = 25^\circ\text{C}$	Power Dissipation ③	429	W
V_{DS}	Drain-Source Voltage	100	V
V_{GS}	Gate-to-Source Voltage	± 20	V
E_{AS}	Single Pulse Avalanche Energy @ $L=0.5\text{mH}$	1211	mJ
$T_J \quad T_{STG}$	Operating Junction and Storage Temperature Range	-55 to +175	$^\circ\text{C}$

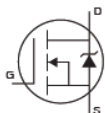
Thermal Resistance

Symbol	Characterizes	Typ.	Max.	Units
$R_{\theta JC}$	Junction-to-case ③	—	0.35	°C/W

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

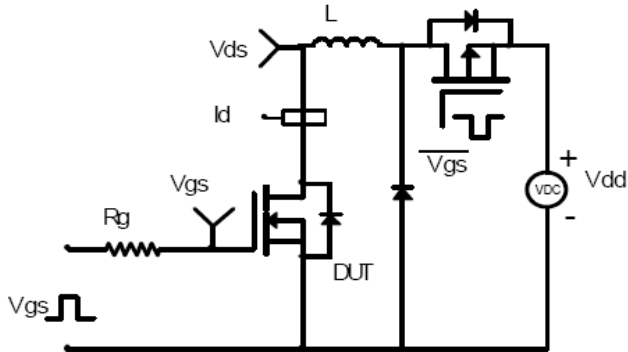
Symbol	Parameter	Min.	Typ.	Max.	Units	Conditions
$V_{(BR)DSS}$	Drain-to-Source breakdown voltage	100	—	—	V	$V_{GS} = 0V, I_D = 250\mu A$
$R_{DS(on)}$	Static Drain-to-Source on-resistance	—	1.4	2	m Ω	$V_{GS}=10V, I_D = 20A$
$V_{GS(th)}$	Gate threshold voltage	2	—	4	V	$V_{DS} = V_{GS}, I_D = 250\mu A$
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		$V_{GS} = -20V$
C_{iss}	Input capacitance	—	16400	—	pF	$V_{GS} = 0V$
C_{oss}	Output capacitance	—	2310	—		$V_{DS} = 50V$
C_{rss}	Reverse transfer capacitance	—	57	—		$f = 1MHz$
Q_g	Total gate charge	—	135	—	nC	$I_D = 20A,$ $V_{DS}=50V,$ $V_{GS} = 10V$
Q_{gs}	Gate-to-Source charge	—	35	—		
Q_{gd}	Gate-to-Drain("Miller") charge	—	27	—		
$t_{d(on)}$	Turn-on delay time	—	65	—	ns	$V_{GS}=10V, V_{DD} = 50V,$ $R_{GEN}=3.6\Omega, R_L=2.2\Omega$
t_r	Rise time	—	108	—		
$t_{d(off)}$	Turn-Off delay time	—	80	—		
t_f	Fall time	—	23	—		

Source-Drain Ratings and Characteristics

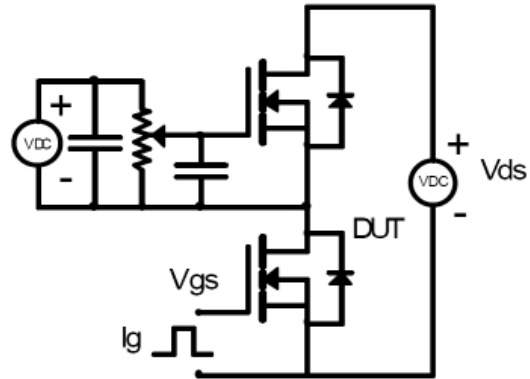
Symbol	Parameter	Min.	Typ.	Max.	Units	Conditions
I_S	Continuous Source Current (Body Diode)	—	—	351	A	MOSFET symbol showing the integral reverse p-n junction diode. 
I_{SM}	Pulsed Source Current (Body Diode)	—	—	1406	A	
V_{SD}	Diode Forward Voltage	—	—	1.2	V	$I_S=2A, V_{GS}=0V$
t_{rr}	Reverse Recovery Time	—	85	—	ns	$T_J = 25^{\circ}\text{C}, I_F = 20A, di/dt = 100A/\mu s$
Q_{rr}	Reverse Recovery Charge	—	251	—	nC	

Test Circuits and Waveforms

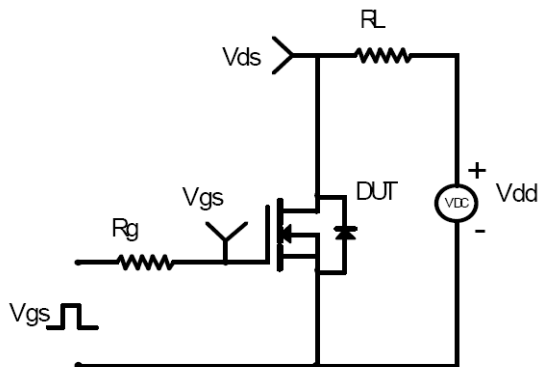
EAS Test Circuit:



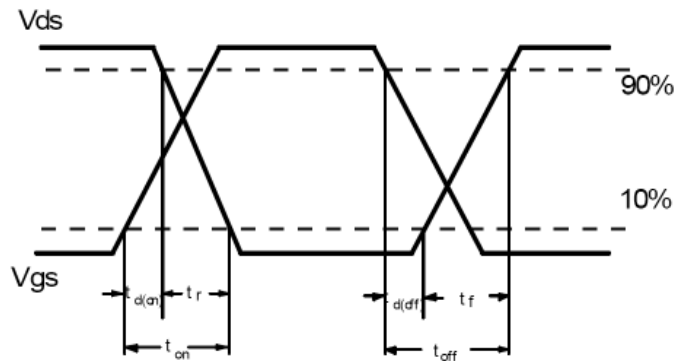
Gate Charge Test Circuit:



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

Typical Electrical and Thermal Characteristics

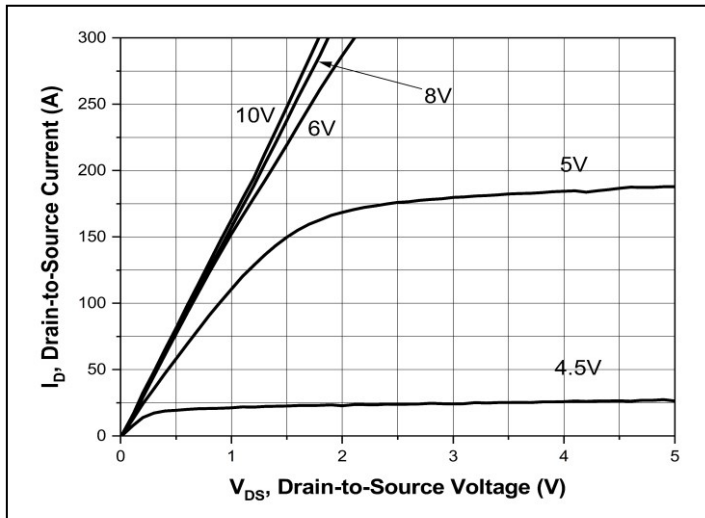


Figure1. Typical Output Characteristics

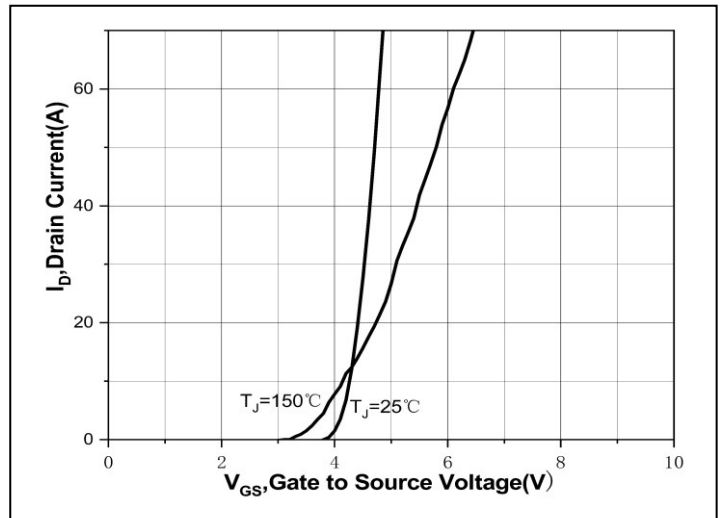


Figure2. Typical Transfer Characteristics

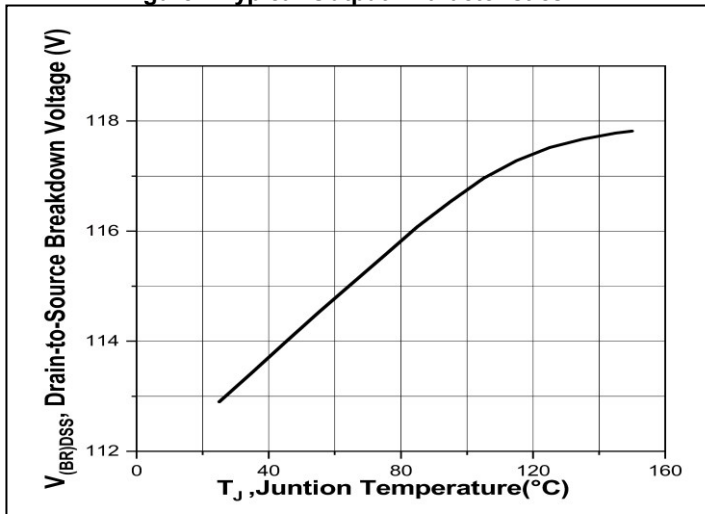


Figure3. Drain-to-Source Breakdown Voltage vs. Junction Temperature

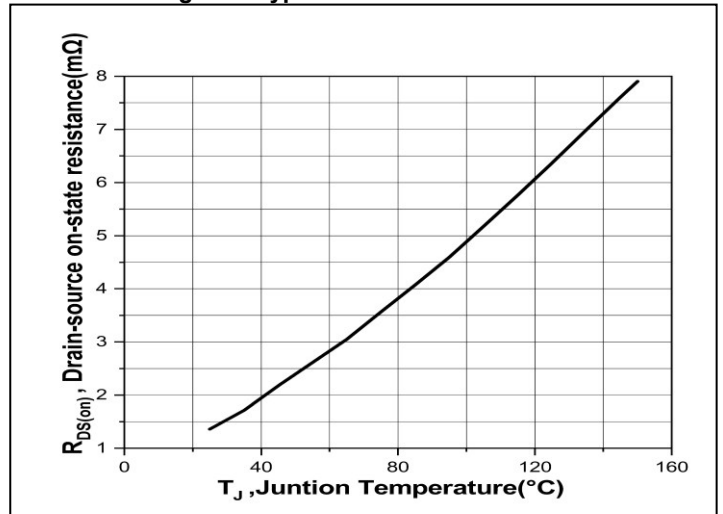


Figure4. Normalized On-Resistance vs. Junction Temperature

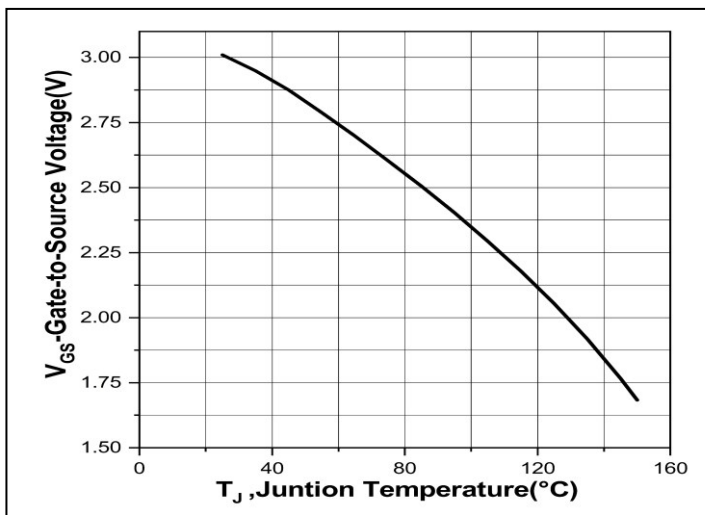


Figure5. Normalized $V_{GS(th)}$ vs. Junction Temperature

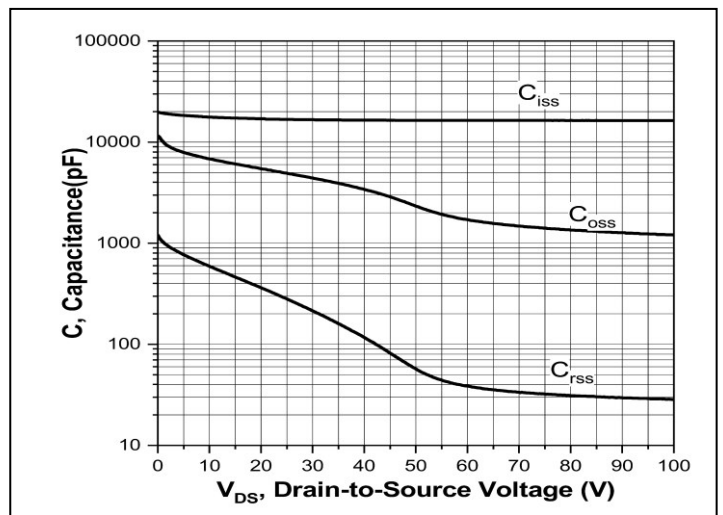


Figure6. Capacitance Characteristics

Typical Electrical and Thermal Characteristics

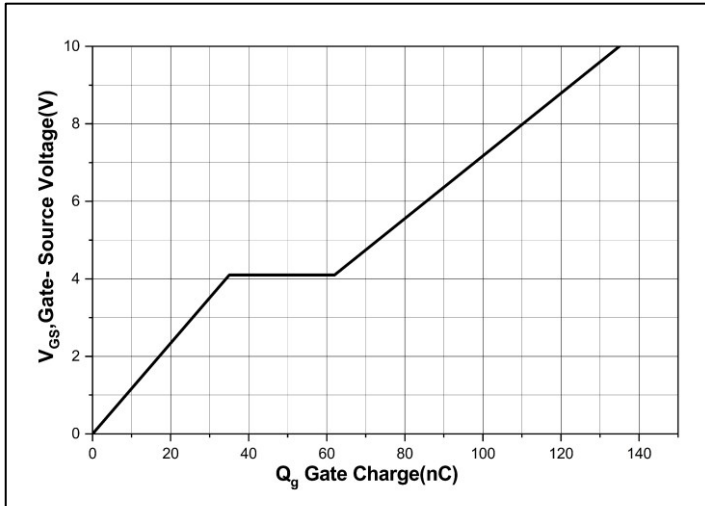


Figure7. Gate Charge

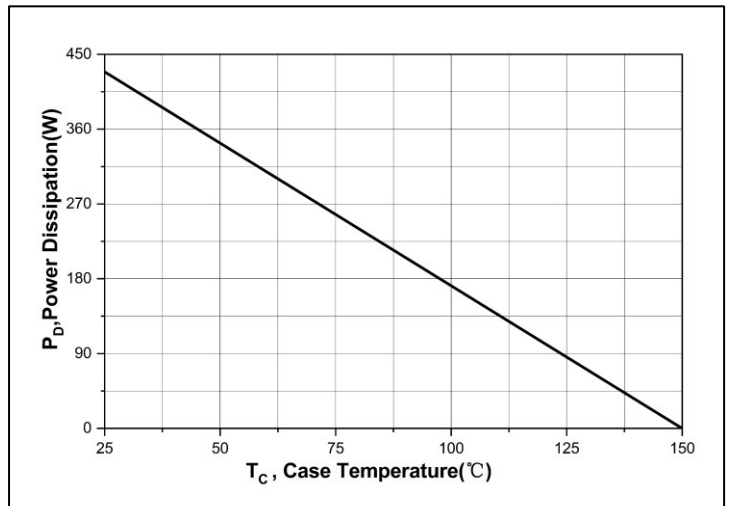
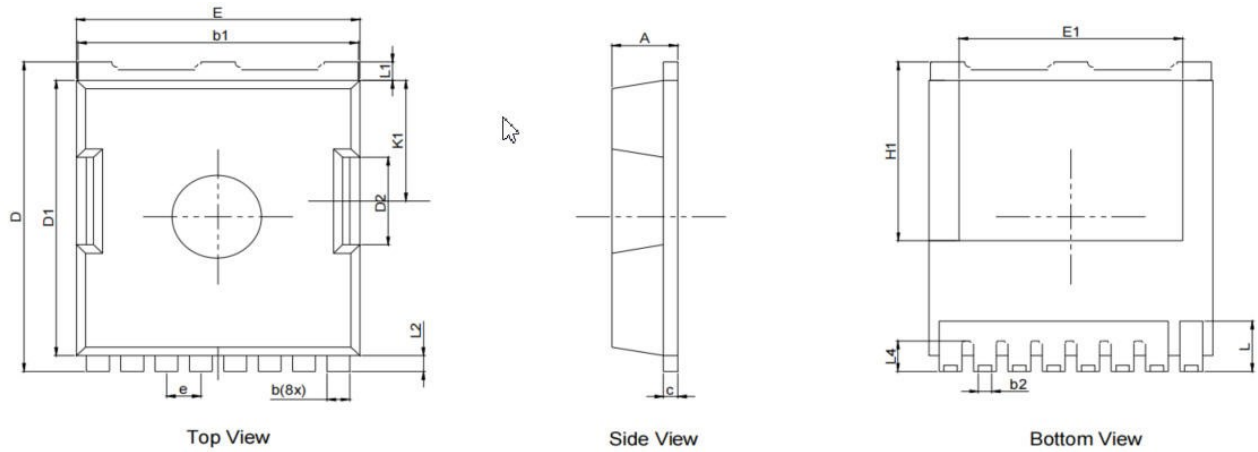


Figure8. Power Dissipation

Mechanical Data:
Unit:mm


DIM.	MILLIMETER		
	MIN.	NOM.	MAX.
A	2.20	2.30	2.40
b	0.70	0.80	0.90
b1	9.65	9.80	9.95
c	0.40	0.50	0.60
D	11.48	11.68	11.95
D1	10.28	--	10.70
D2	3.30		
E	9.70	9.90	10.10
E1	8.10		
e	1.20 (BSC)		
H1	6.70	7.00	7.30
K1	4.55		
L	1.35	--	2.10
L1	0.70		
L2	0.60		
L4	0.95	1.20	1.35

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