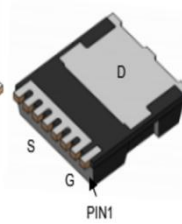
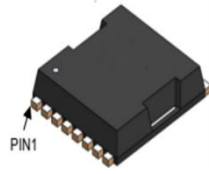
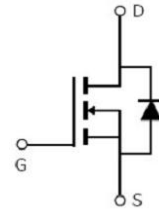


Main Product Characteristics:

V_{DS}	100V
$R_{DS(on)}$	1.8m Ω (typ.)
I_D	224A


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	224	A
$I_D @ T_C = 100^\circ\text{C}$	Continuous Drain Current, $V_{GS} @ 10\text{V}$ ①	141	
I_{DM}	Pulsed Drain Current ②	896	
$P_D @ T_C = 25^\circ\text{C}$	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 @ $L=0.5\text{mH}$	795	mJ
$T_J \quad T_{STG}$	Operating Junction and Storage Temperature Range	-55 to +150	$^\circ\text{C}$

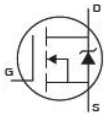
Thermal Resistance

Symbol	Characterizes	Typ.	Max.	Units
$R_{\theta JC}$	Junction-to-case ③	—	0.6	$^{\circ}\text{C}/\text{W}$
$R_{\theta JA}$	Junction-to-ambient ($t \leq 10\text{s}$)④	—	62	$^{\circ}\text{C}/\text{W}$

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

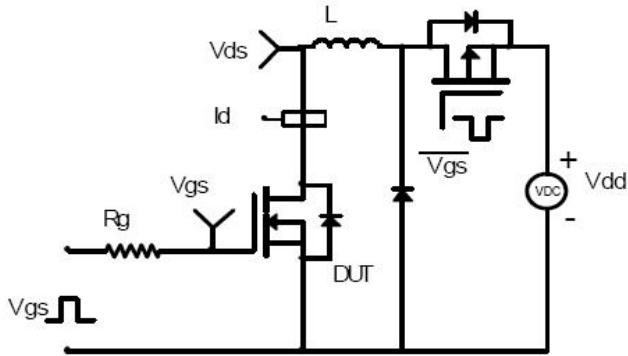
Symbol	Parameter	Min.	Typ.	Max.	Units	Conditions
$V_{(BR)DSS}$	Drain-to-Source breakdown voltage	100	—	—	V	$V_{GS} = 0\text{V}$, $I_D = 250\mu\text{A}$
$R_{DS(on)}$	Static Drain-to-Source on-resistance	—	1.8	3	$\text{m}\Omega$	$V_{GS}=10\text{V}$, $I_D = 50\text{A}$
$V_{GS(th)}$	Gate threshold voltage	2	—	4	V	$V_{DS} = V_{GS}$, $I_D = 250\mu\text{A}$
I_{DSS}	Drain-to-Source leakage current	—	—	1	μA	$V_{DS} = 100\text{V}$, $V_{GS} = 0\text{V}$
I_{GSS}	Gate-to-Source forward leakage	—	—	100	nA	$V_{GS} = 20\text{V}$
		—	—	-100		$V_{GS} = -20\text{V}$
C_{iss}	Input capacitance	—	6209	—	pF	$V_{GS} = 0\text{V}$
C_{oss}	Output capacitance	—	2570	—		$V_{DS} = 50\text{V}$
C_{rss}	Reverse transfer capacitance	—	67	—		$f = 100\text{kHz}$
Q_g	Total gate charge	—	106	—	nC	$I_D = 100\text{A}$, $V_{DS}=50\text{V}$, $V_{GS} = 10\text{V}$
Q_{gs}	Gate-to-Source charge	—	41	—		
Q_{gd}	Gate-to-Drain("Miller") charge	—	30	—		
$t_{d(on)}$	Turn-on delay time	—	39	—	ns	$V_{GS}=10\text{V}$, $V_{DD} = 50\text{V}$, $R_{GEN}=2.2\Omega$, $R_L = 1\Omega$
t_r	Rise time	—	15	—		
$t_{d(off)}$	Turn-Off delay time	—	50	—		
t_f	Fall time	—	16	—		

Source-Drain Ratings and Characteristics

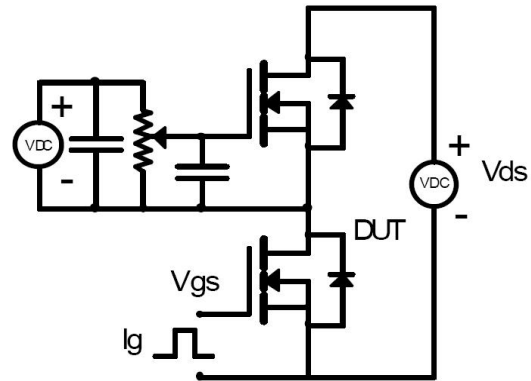
Symbol	Parameter	Min.	Typ.	Max.	Units	Conditions
I_S	Continuous Source Current (Body Diode)	—	—	224	A	MOSFET symbol showing the integral reverse p-n junction diode. 
I_{SM}	Pulsed Source Current (Body Diode)	—	—	896	A	
V_{SD}	Diode Forward Voltage	—	—	1.2	V	$I_S=50\text{A}$, $V_{GS}=0\text{V}$
t_{rr}	Reverse Recovery Time	—	75	—	ns	$V_R=50\text{V}$, $I_F=50\text{A}$, $di/dt= 100\text{A}/\mu\text{s}$
Q_{rr}	Reverse Recovery Charge	—	123	—	nC	

Test Circuits and Waveforms

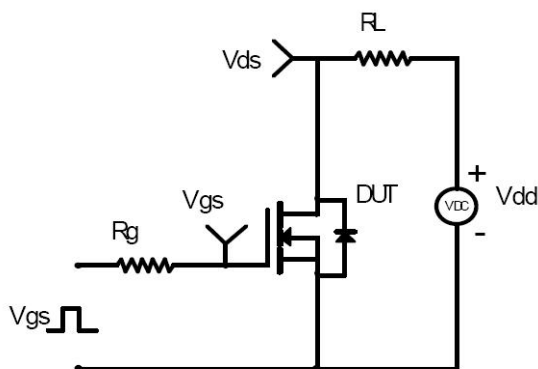
EAS Test Circuit:



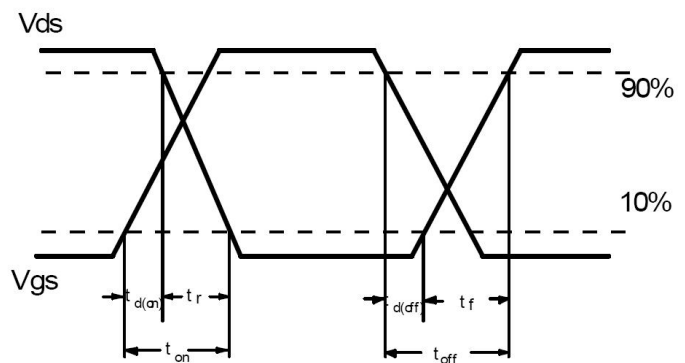
Gate Charge Test Circuit:



Switching Time Test Circuit:



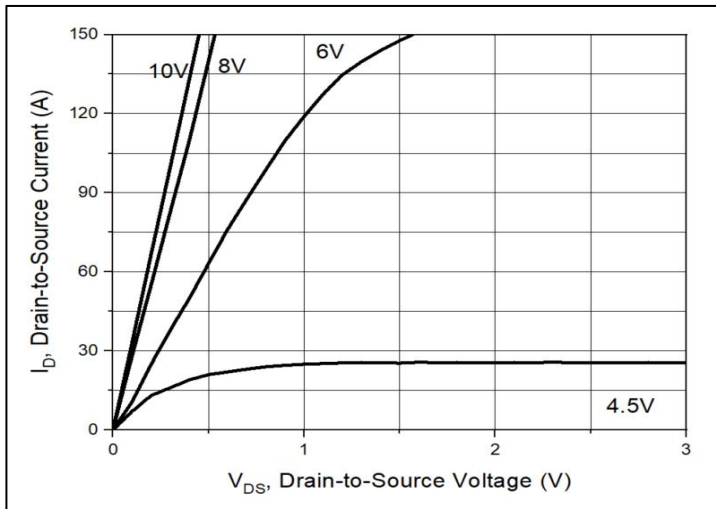
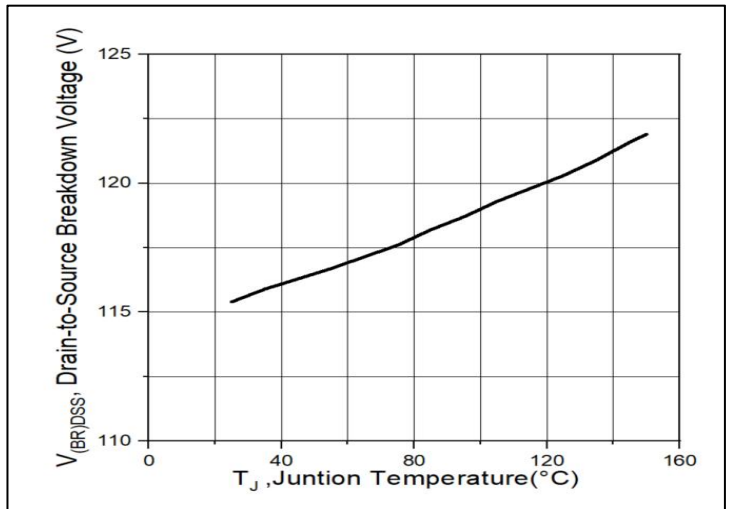
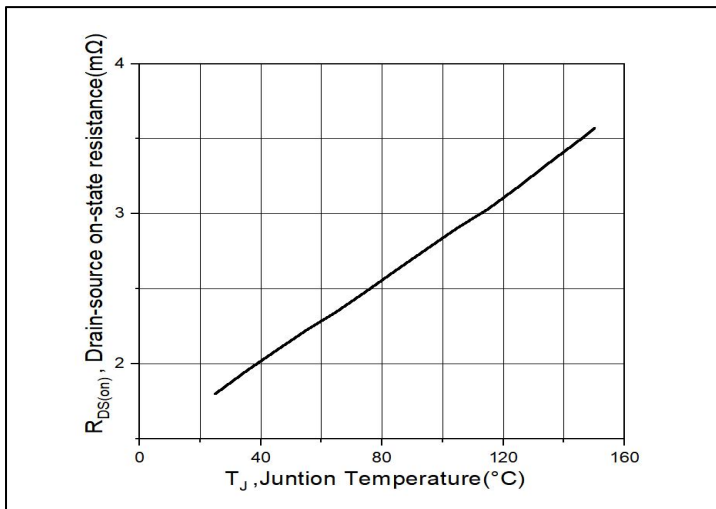
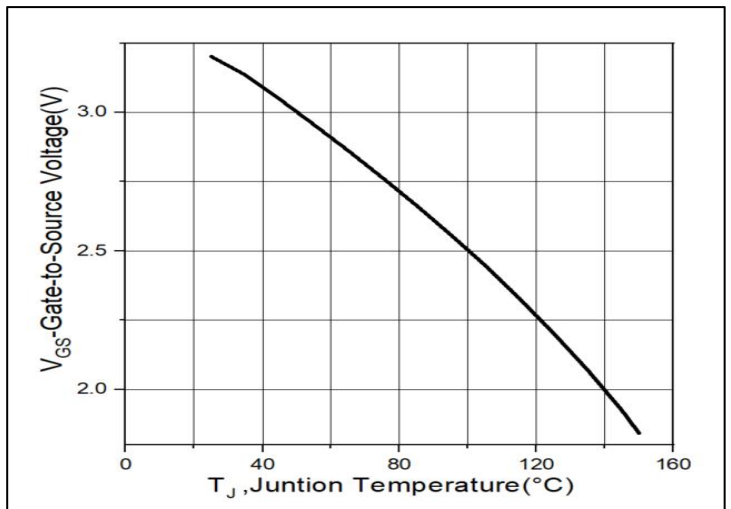
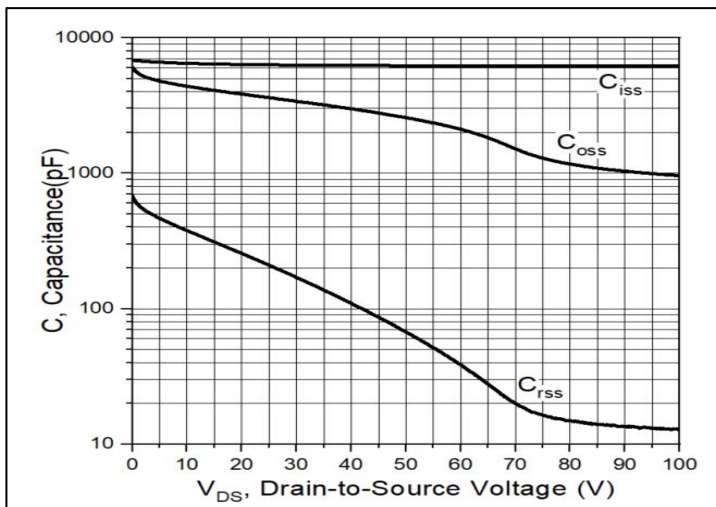
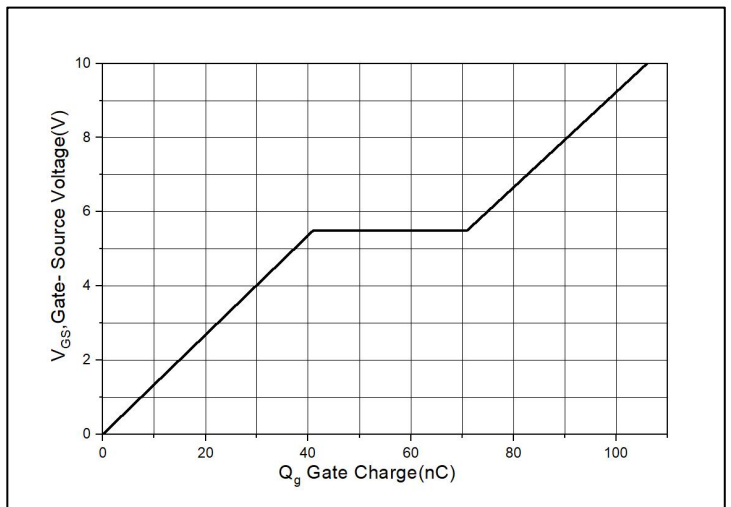
Switching Waveforms:



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.
- ④ The 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 $T_A = 25^\circ\text{C}$

Typical Electrical and Thermal Characteristics


Figure1. Typical Output Characteristics

Figure2. Drain-to-Source Breakdown Voltage vs. Junction Temperature

Figure3. $R_{DS(on)}$ vs. Junction Temperature

Figure4. V_{th} vs. Junction Temperature

Figure5. Capacitance

Figure6. Gate Charge

Typical Electrical and Thermal Characteristics

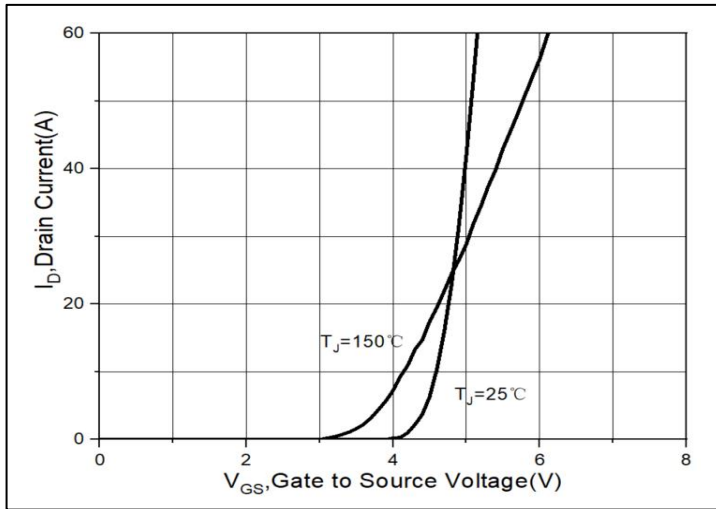


Figure7. Transfer Characteristics

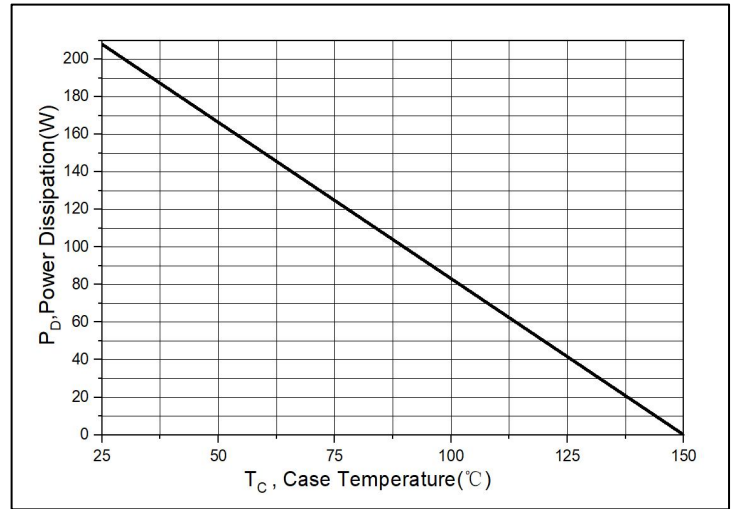
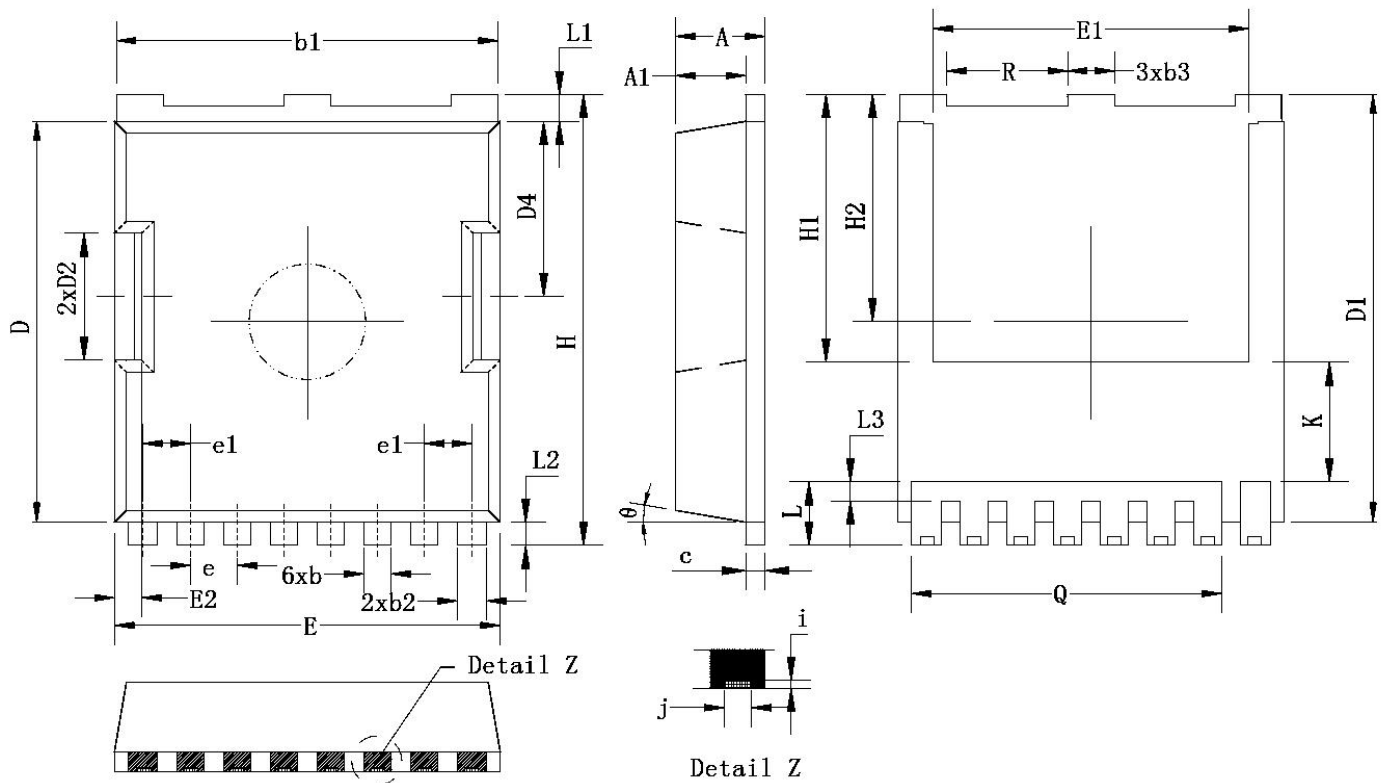


Figure8. Power Dissipation

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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