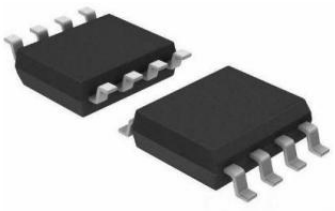
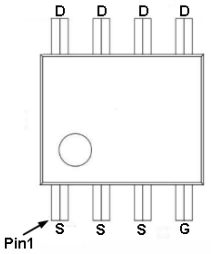
Main Product Characteristics

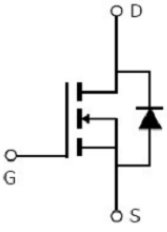
V_{DSS}	100V
R_{DS}(on)	8mΩ (typ.)
I_D	60A ①



SOP-8



Pin Assignment



Schematic Diagram

Features and Benefits

- Advanced 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_A = 25°C	Continuous Drain Current, V_{GS} @ 10V ①	60	A
I_D @ T_A = 70°C	Continuous Drain Current, V_{GS} @ 10V ①	42	
I_{DM}	Pulsed Drain Current ②	20	
P_D @T_A = 25°C	Power Dissipation ③	3.1	W
V_{DS}	Drain-Source Voltage	100	V
V_{GS}	Gate-to-Source Voltage	± 20	V
E_{AS}	Single Pulse Avalanche Energy @ L=0.3mH	12	mJ
I_{AS}	Avalanche Current	9	A
T_J T_{STG}	Operating Junction and Storage Temperature Range	-55 to +150	°C

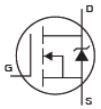
Thermal Resistance

Symbol	Characterizes	Typ.	Max.	Units
$R_{\theta JC}$	Junction-to-case ③	—	24	°C/W
$R_{\theta JA}$	Junction-to-ambient (t ≤ 10s) ④	—	40	°C/W

Electrical Characterizes @T_A=25℃ unless otherwise specified

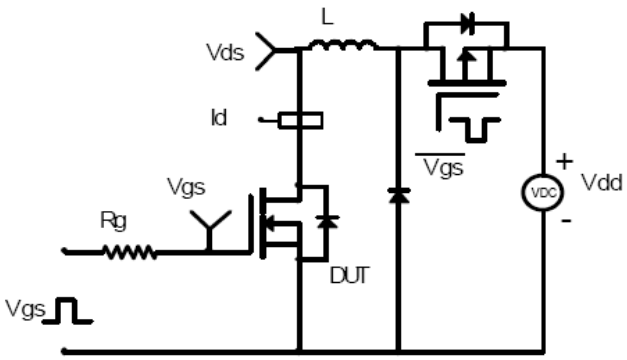
Symbol	Parameter	Min.	Typ.	Max.	Units	Conditions
$V_{(BR)DSS}$	Drain-to-Source breakdown voltage	100	—	—	V	V_{GS} = 0V, I_D= 250uA
$R_{DS(on)}$	Static Drain-to-Source on-resistance	—	8	12	mΩ	V_{GS}=10V,I_D =11.5A
		—	12	15.5		V_{GS}=4.5V,I_D =9.5A
$V_{GS(th)}$	Gate threshold voltage	1.2	—	2.5	V	V_{DS} = V_{GS}, I_D =250μA
I_{DSS}	Drain-to-Source leakage current	—	—	1	μA	V_{DS} =80V,V_{GS} = 0V
I_{GSS}	Gate-to-Source forward leakage	—	—	100	nA	V_{GS} =20V
		—	—	-100		V_{GS} = -20V
Q_g	Total gate charge	—	35	—	nC	I_D = 11.5A,
Q_{gs}	Gate-to-Source charge	—	7.8	—		V_{DS}=50V,
Q_{gd}	Gate-to-Drain("Miller") charge	—	3.9	—		V_{GS} = 10V
$t_{d(on)}$	Turn-on delay time	—	8.8	—	nS	V_{GS}=10V, V_{DD} =50V,
t_r	Rise time	—	4.4	—		R_{GEN}=3Ω
$t_{d(off)}$	Turn-Off delay time	—	34.8	—		I_D =11.5A
t_f	Fall time	—	5.3	—		
C_{iss}	Input capacitance	—	2550	—	pF	V_{GS} = 0V
C_{oss}	Output capacitance	—	306	—		V_{DS} = 50V
C_{rss}	Reverse transfer capacitance	—	13	—		f = 1MHz

Source-Drain Ratings and Characteristics

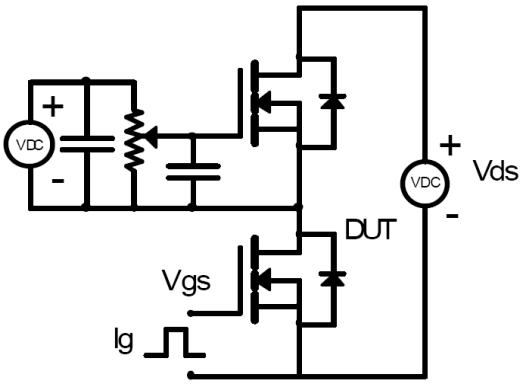
Symbol	Parameter	Min.	Typ.	Max.	Units	Conditions
I_S	Continuous Source Current (Body Diode) ①	—	—	4	A	MOSFET symbol showing the integral reverse p-n junction diode. 
V_{sd}	Diode Forward Voltage	—	—	1.1	V	I_S=1A, V_{GS}=0V, T_J = 25°C
t_{rr}	Reverse Recovery Time	—	30	—	nS	T_J = 25°C, I_F =11.5A,
Q_{rr}	Reverse Recovery Charge	—	120	—	nC	di/dt = 100A/μs

Test Circuits and Waveforms

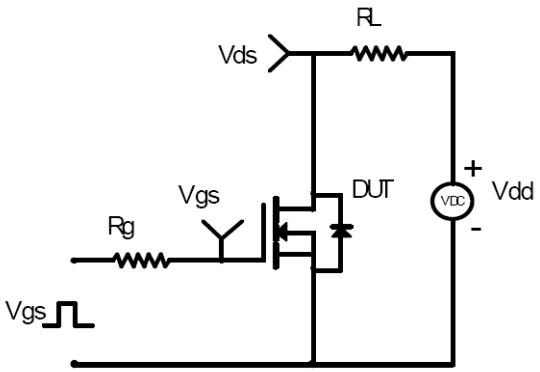
EAS Test Circuit:



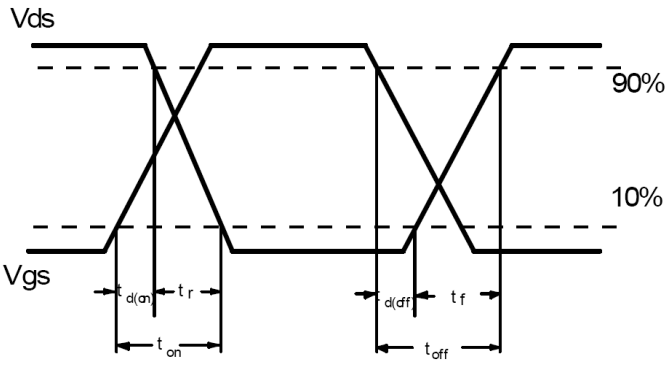
Gate Charge Test Circuit:



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.

④The 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 TA =25°C

Typical Electrical and Thermal Characteristics

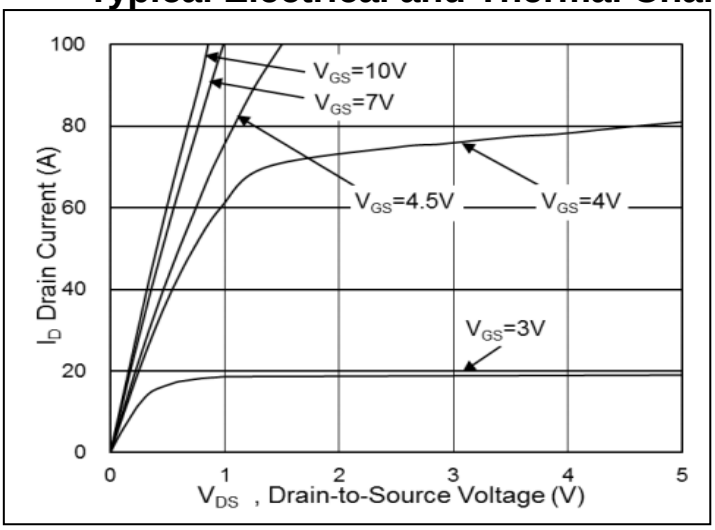


Figure1.Typical Output Characteristics

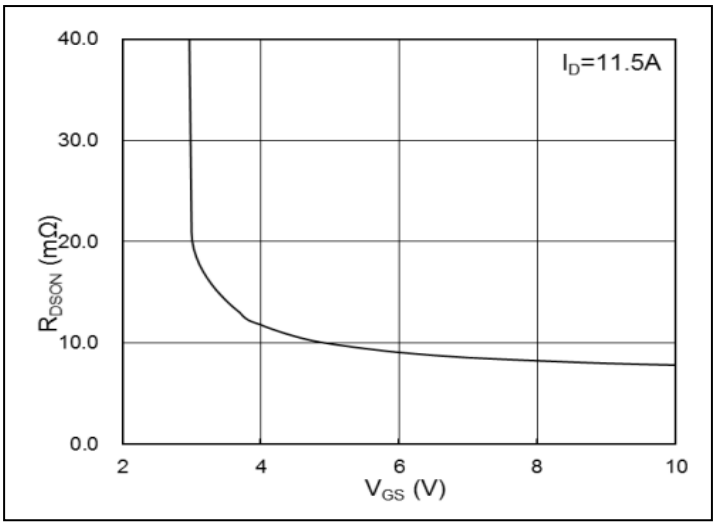


Figure2. On-Resistance vs. G-S Voltage

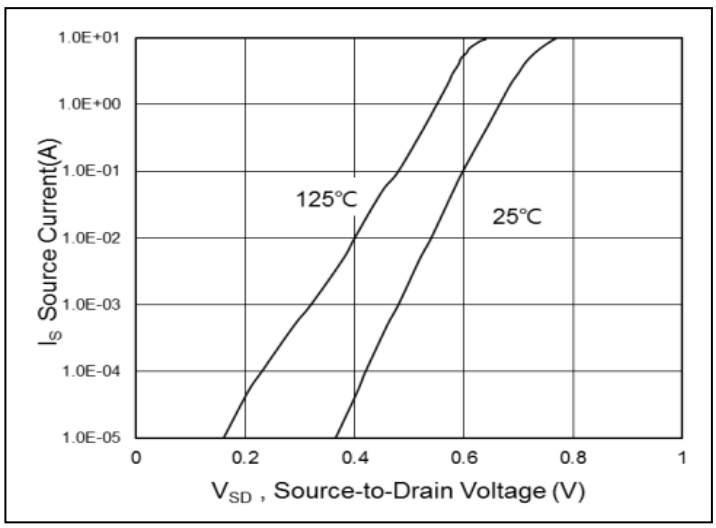


Figure3. Source- Drain Forward Characteristics

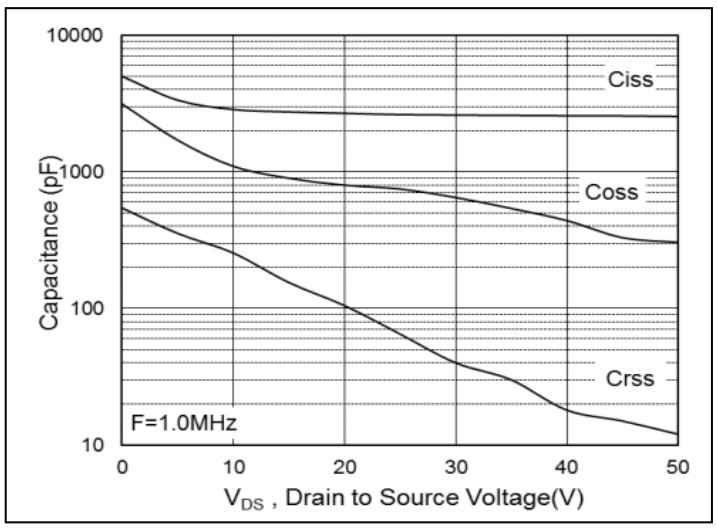


Figure4. Capacitance

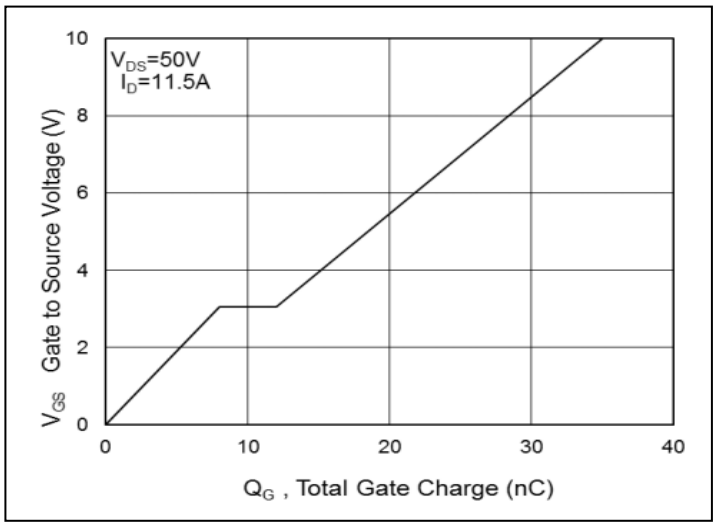


Figure5. Gate Charge

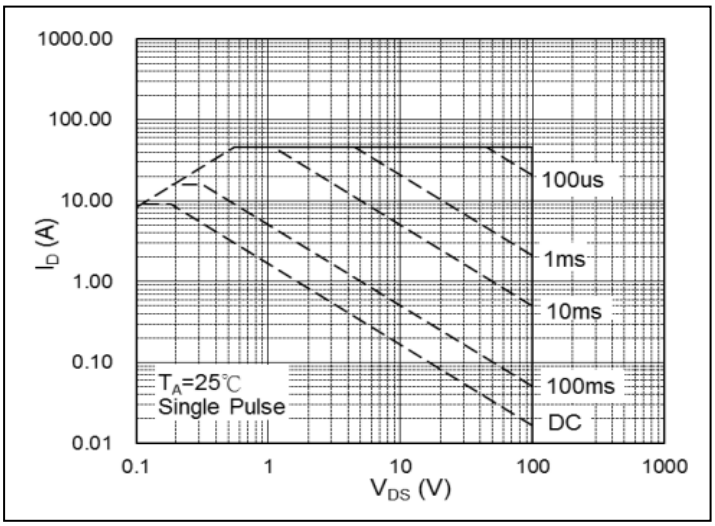


Figure6. Safe Operation Area

Typical Electrical and Thermal Characteristics

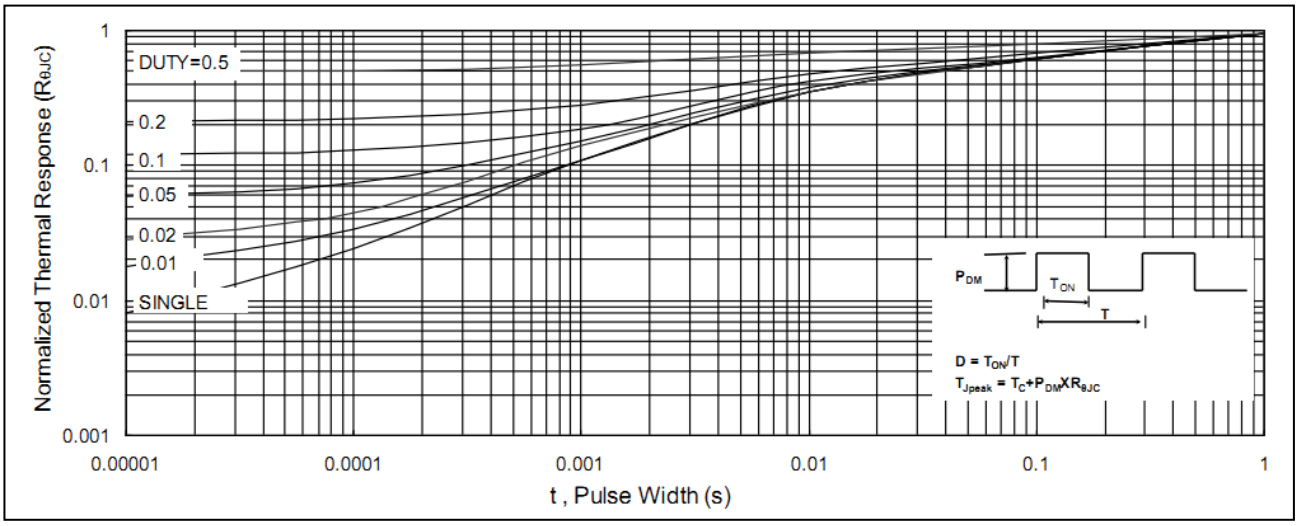
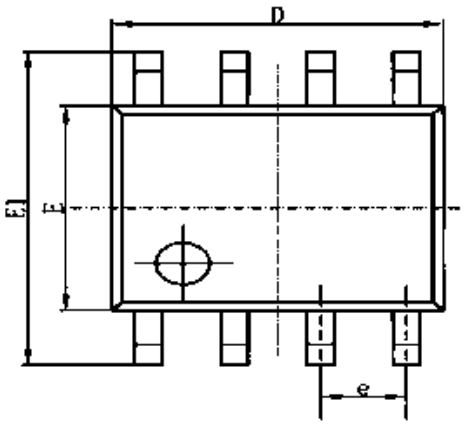
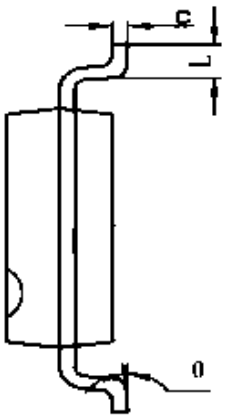
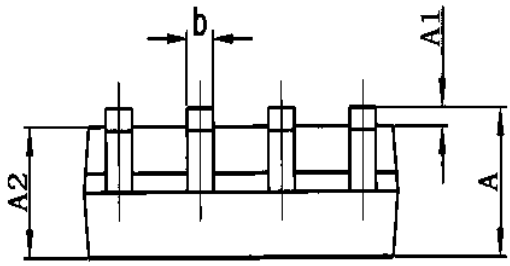


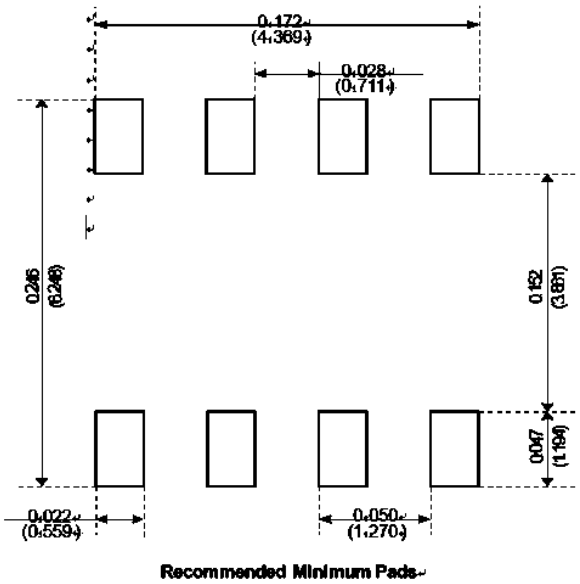
Figure7.Transient Thermal Impedance

Mechanical Data：









Recommended Minimum Pads

Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.350	1.750	0.053	0.069
A1	0.100	0.250	0.004	0.010
A2	1.350	1.550	0.053	0.061
b	0.330	0.510	0.013	0.020
c	0.170	0.250	0.006	0.010
D	4.700	5.100	0.185	0.200
E	3.800	4.000	0.150	0.157
E1	5.800	6.200	0.228	0.244
e	1.270 (BSC)		0.050 (BSC)	
L	0.400	1.270	0.016	0.050
θ	0°	8°	0°	8°

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