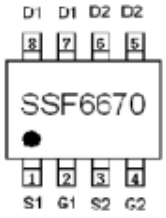
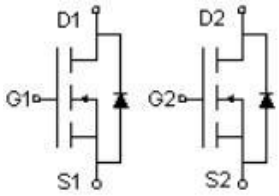
Main Product Characteristics:

V_{DSS}	60V
R_{DS}(on)	65mΩ (typ.)
I_D	3.5A ①

SOP-8



Marking and Pin Assignments



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_A = 25°C	Continuous Drain Current ①	3.5	A
I_D @ T_A= 70°C	Continuous Drain Current ①	2.8	
I_{DM}	Pulsed Drain Current ②	20	
P_D @T_A = 25°C	Power Dissipation ③	2.4	W
V_{DS}	Drain- Source Voltage	60	V
V_{GS}	Gate- to- Source Voltage	± 25	V
T_J T_{STG}	Operating Junction and Storage Temperature Range	-55 to +150	°C

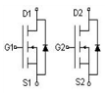
Thermal Resistance

Symbol	Characterizes	Typ.	Max.	Units
$R_{\theta JA}$	Junction-to-ambient (t ≤ 10s) ④	—	62.5	C/ W

Electrical Characterizes @T_A=25C unless otherwise specified

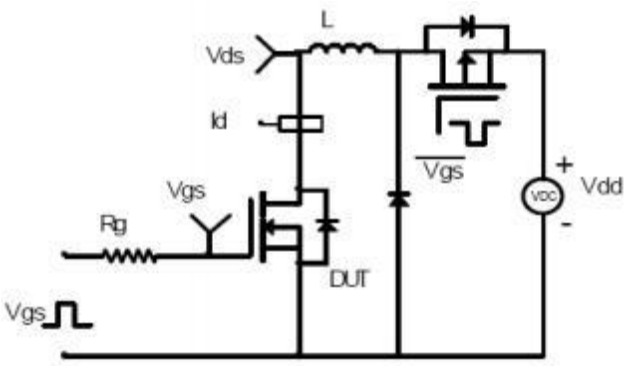
Symbol	Parameter	Min.	Typ.	Max.	Units	Conditions
$V_{(BR)DSS}$	Drain-to-Source breakdown voltage	60	—	—	V	V_{GS} = 0V, I_D = 250μA
$R_{DS(on)}$	Static Drain-to-Source on-resistance	—	65	90	mΩ	V_{GS}=10V,I_D = 3A
		—	80	120	mΩ	V_{GS}=4.5V,I_D =2A
$V_{GS(th)}$	Gate threshold voltage	1	—	3	V	V_{DS} = V_{GS} , I_D = 250μA
I_{DSS}	Drain-to-Source leakage current	—	—	10	μA	V_{DS} = 60V,V_{GS} = 0V
I_{GSS}	Gate-to-Source forward leakage	—	—	100	nA	V_{GS} = 25V
		—	—	-100		V_{GS} = -25V
Q_g	Total gate charge	—	7	—	nC	I_D = 3A,
Q_{gs}	Gate-to-Source charge	—	2	—		V_{DS}=48V,
Q_{gd}	Gate-to-Drain("Miller") charge	—	3	—		V_{GS} = 4.5V
$t_{d(on)}$	Turn-on delay time	—	6	—	ns	V_{GS}=10V, V_{DS} =30V, R_{GEN}=3Ω,I_D =1A
t_r	Rise time	—	5	—		
$t_{d(off)}$	Turn-Off delay time	—	16	—		
t_f	Fall time	—	3	—		
C_{iss}	Input capacitance	—	500	—	pF	V_{GS} = 0V
C_{oss}	Output capacitance	—	50	—		V_{DS} = 25V
C_{rss}	Reverse transfer capacitance	—	40	—		f = 1MHz

Source-Drain Ratings and Characteristics

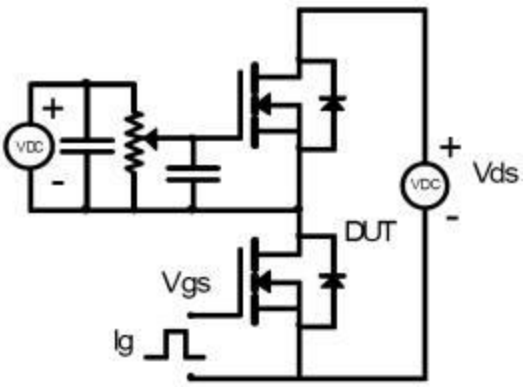
Symbol	Parameter	Min.	Typ.	Max.	Units	Conditions
I_S	Continuous Source Current (Body Diode) ①	—	—	3.5	A	MOSFET symbol showing the integral reverse p-n junction diode. 
I_{SM}	Pulsed Source Current (Body Diode) ①	—	—	20	A	
V_{sd}	Diode Forward Voltage	—	—	1.2	V	I_S=1.7A, V_{GS}=0V
t_{rr}	Reverse Recovery Time	—	27	—	ns	T_J = 25°C, I_F =4A, di/dt = 100A/μs
Q_{rr}	Reverse Recovery Charge	—	32	—	nC	

Test Circuits and Waveforms

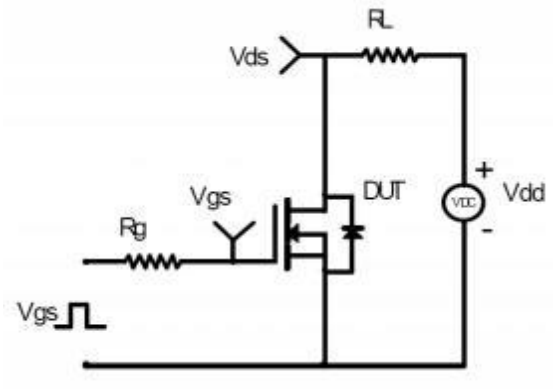
EAS Test Circuit:



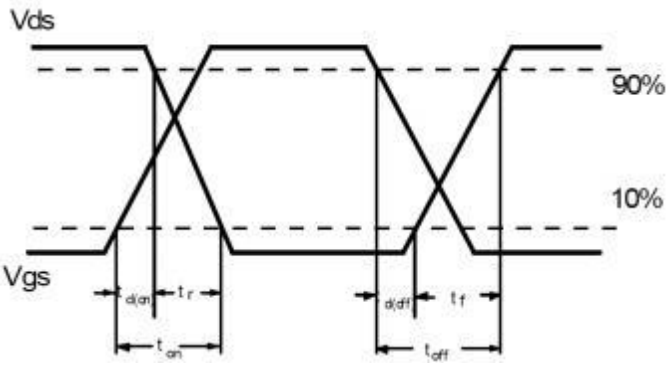
Gate Charge Test Circuit:



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.

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 T_A =25°C

Typical Electrical and Thermal Characteristics

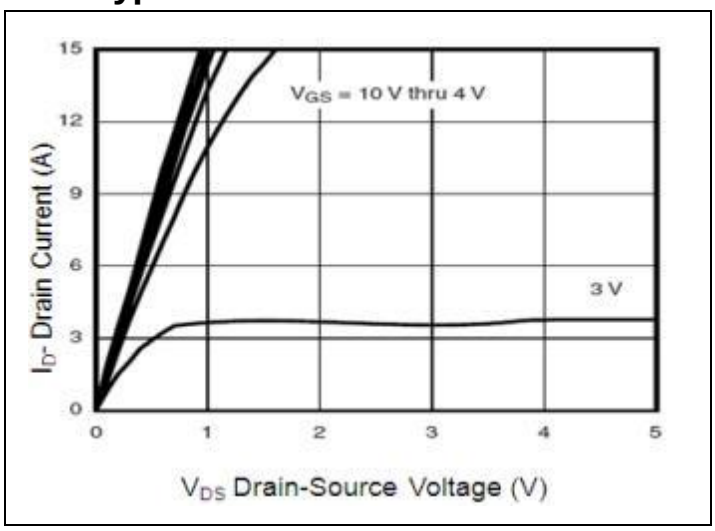


Figure1. Typical Output Characteristics

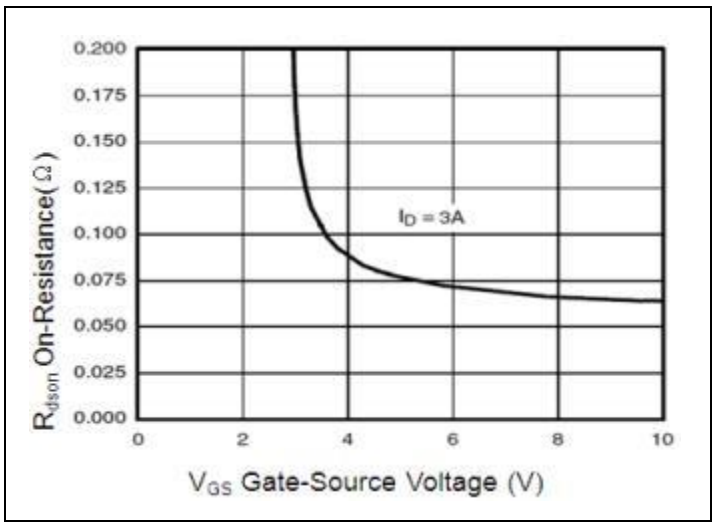


Figure2. Rdson vs. V_{GS}

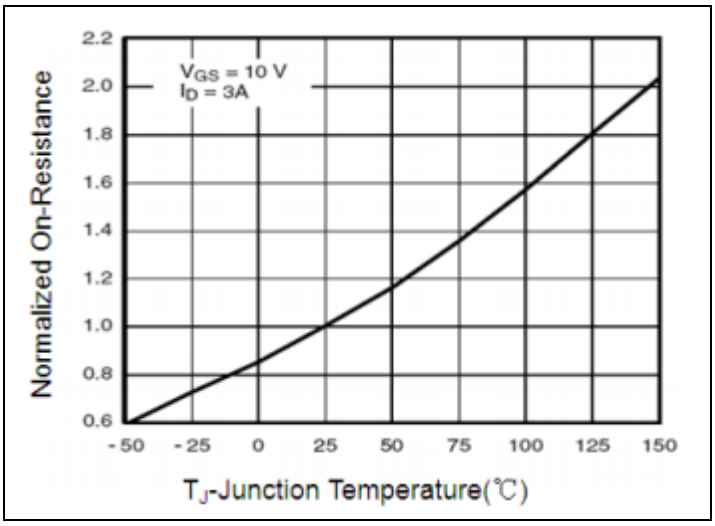


Figure3. Normalized On-Resistance vs. Junction Temperature

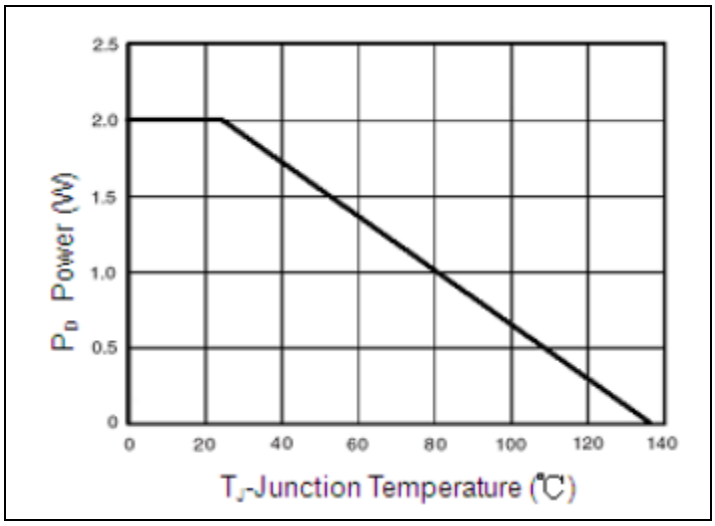


Figure4. Power Dissipation

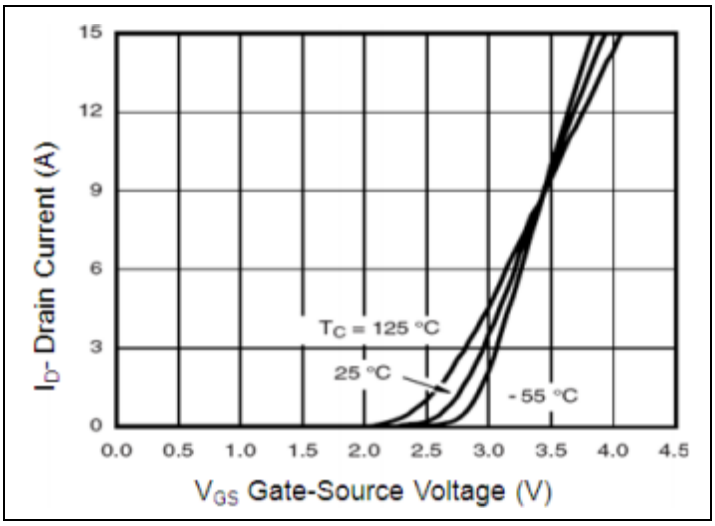


Figure5. Transfer Characteristics

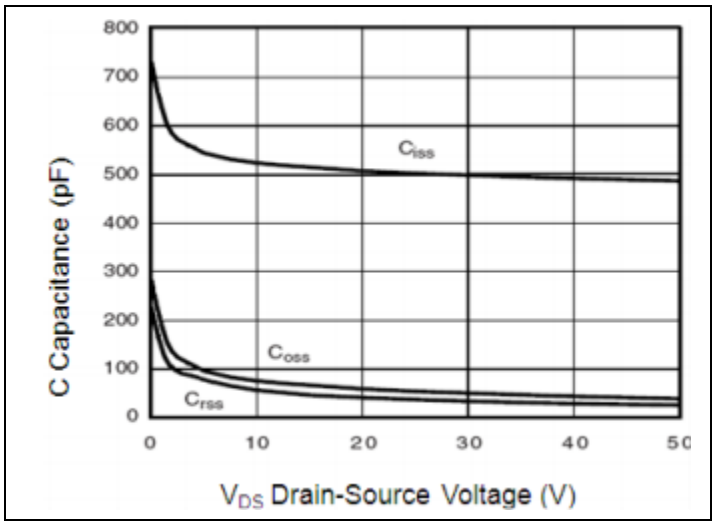


Figure6. Capacitance Characteristics

Typical Electrical and Thermal Characteristics

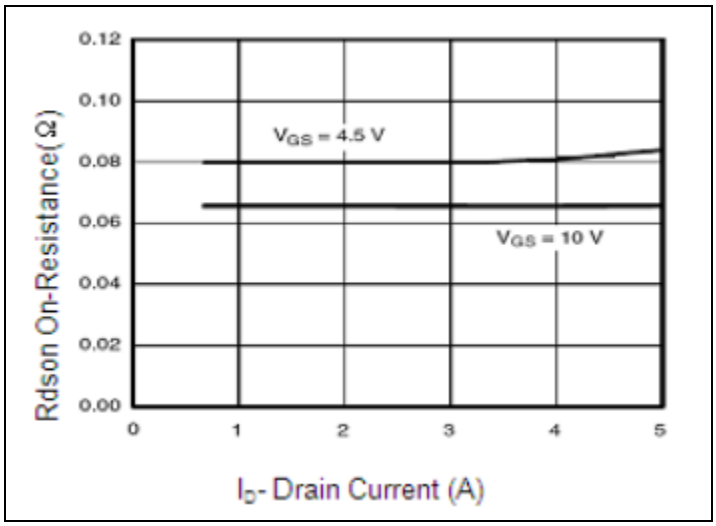


Figure7. Drain Current vs. On-Resistance

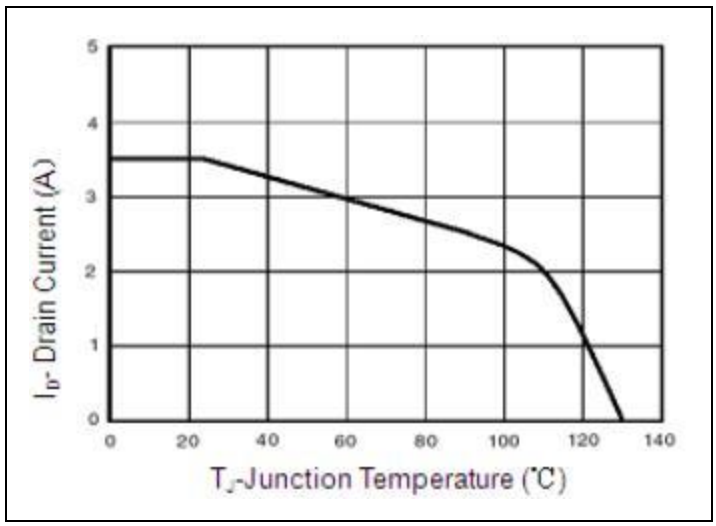


Figure8. Drain Current

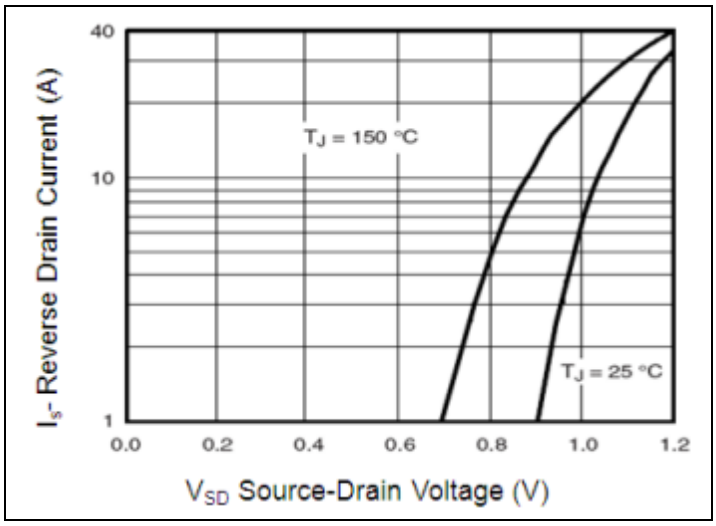


Figure9. Source-Drain Diode Forward

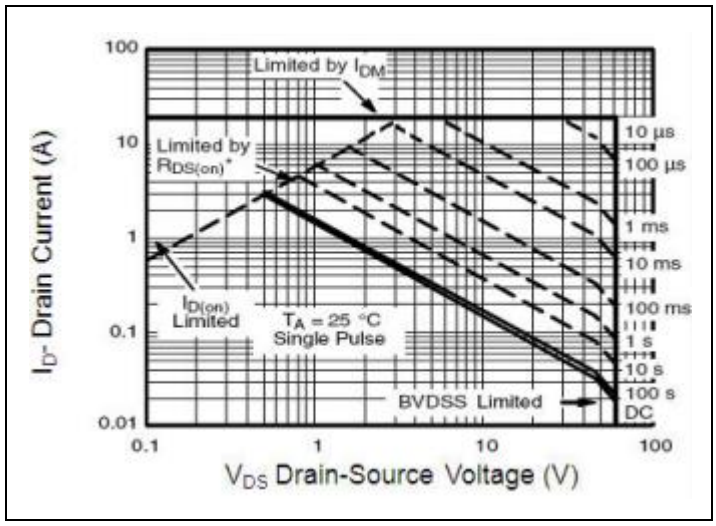


Figure10. Safe Operation Area

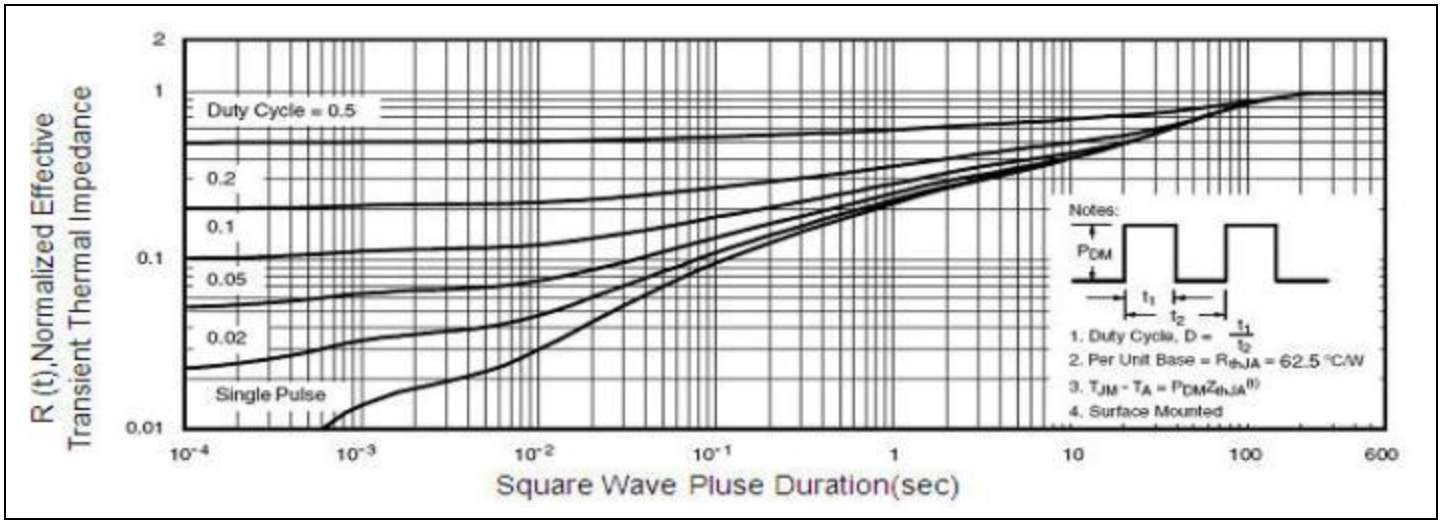
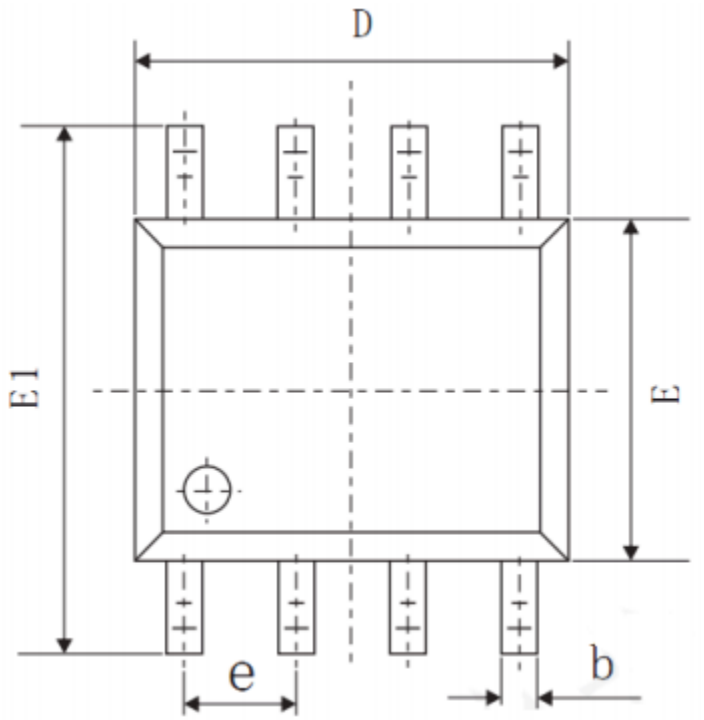


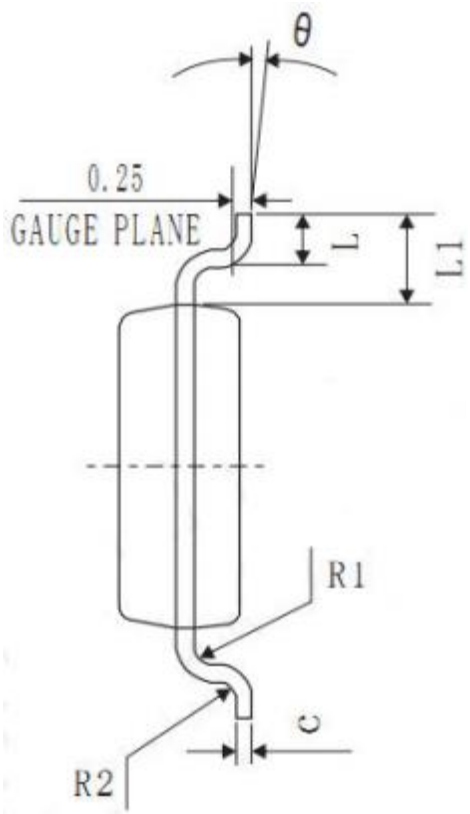
Figure 11. Normalized Maximum Transient Thermal Impedance

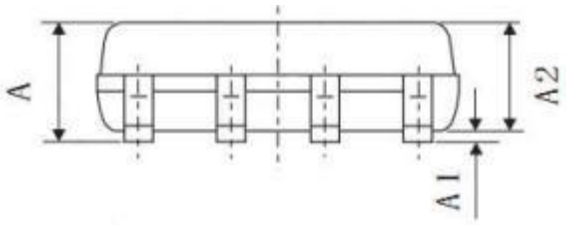
Mechanical Data:

Option 1

SOP-8 Package Outline (Unit: mm)





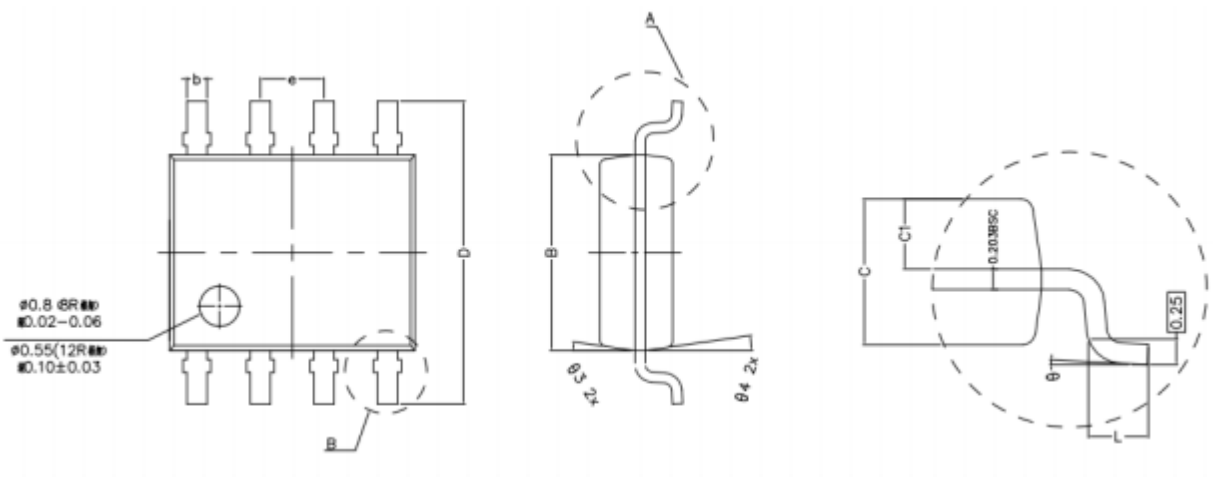


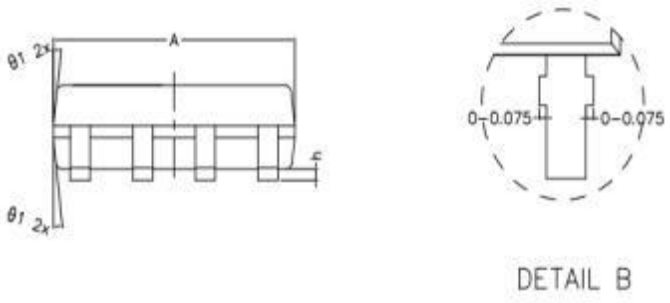
Symbol	Min	Nom	Max
A	1.40	1.60	1.80
A1	0.05	0.15	0.25
A2	1.35	1.45	1.55
b	0.30	0.40	0.50
c	0.153	0.203	0.253
D	4.80	4.90	5.00
E	3.80	3.90	4.00
E1	5.80	6.00	6.20
L	0.45	0.70	1.00
θ	2°	4°	6°
L1	1.04REF		
e	1.27REF		
R1	0.07 REF		
R2	0.07 REF		

Mechanical Data:

Option 2

SOP-8 Package Outline (Unit: mm)





Symbol	Min	Nom	Max
A	4.800	4.900	5.000
B	3.800	3.900	4.000
C	1.350	1.450	1.550
C1	0.650	0.700	0.750
D	5.840	6.040	6.240
L	0.400	0.600	0.800
b	0.350	0.400	0.450
h	0.020	0.100	0.250
e	1.270TYPE		
θ1	7°TYPE(8R)	12°TYPE(12R)	
θ2	7°TYPE(8R)	10°TYPE(12R)	
θ3	8°TYPE(8R)	12°TYPE(12R)	
θ4	8°TYPE(8R)	10°TYPE(12R)	
θ	0°~8°		

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