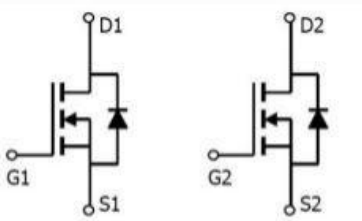
# AP4812

**N-Channel Enhancement Mosfet**

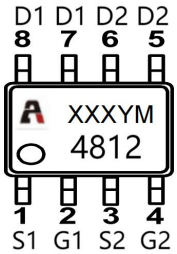
**DATA SHEET**

## Features

- 30V,8A
  $R_{DS(ON)}$ <20mΩ @$V_{GS}$=10V TYP:15mΩ
  $R_{DS(ON)}$ <26mΩ @$V_{GS}$=4.5V TYP:20mΩ
- Advanced Trench Technology
- Excellent $R_{DS(ON)}$ and Low Gate Charge
- Lead free product is acquired




**Schematic diagram**




**SOP-8**

**Marking and pin Assignment**

## Applications

- PWM Applications
- Load Switch
- Power Management

## Package Marking and Ordering Information

| Device Marking | Device | Device Package | Reel Size | Tape width | Quantity (PCS) |
|---|---|---|---|---|---|
| 4812 | AP4812 | SOP-8 | - | - | 4000 |

## ABSOLUTE MAXIMUM RATINGS ($T_J$=25℃ unless otherwise noted)

| Parameter | Symbol | Value | Unit |
|---|---|---|---|
| Drain-Source Voltage | $V_{DS}$ | 30 | V |
| Gate-Source Voltage | $V_{GS}$ | ±20 | V |
| Continuous Drain Current ($T_A$=25℃) (1) | $I_D$ | 8 | A |
| Continuous Drain Current ($T_A$=100℃) | $I_D$ | 5 | A |
| Pulsed Drain Current (1) | $I_{DM}$ | 30 | A |
| Drain Power Dissipation | $P_D$ | 2.5 | W |
| Single Pulsed Avalanche Energy (2) | $E_{AS}$ | 42.2 | mJ |
| Thermal Resistance from Junction to Ambient | $R_{\theta JA}$ | 50 | ℃/W |
| Junction Temperature | $T_J$ | -55~ +150 | ℃ |
| Storage Temperature | $T_{STG}$ | -55~ +150 | ℃ |

**Notes:**

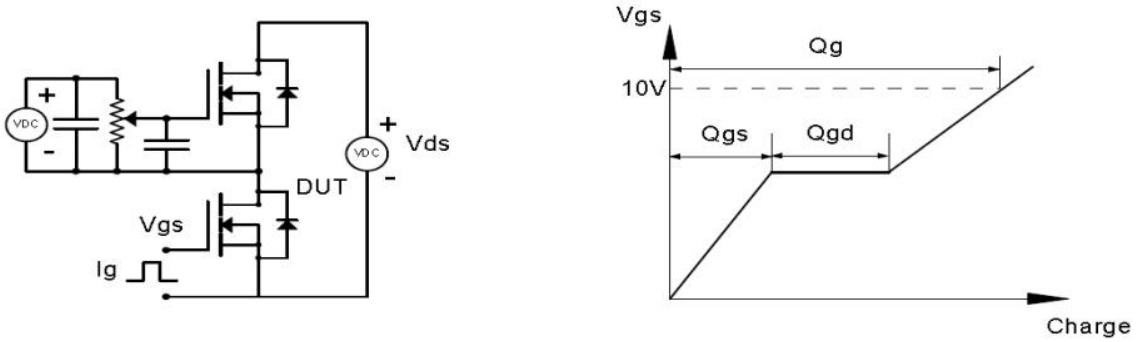
1) Repetitive Rating: pulse width limited by maximum junction temperature
2) EAS condition : $T_J$=25℃, $V_{DD}$=20V, $V_G$=10V, L=0.5mH, $R_g$=25Ω, $I_{AS}$=13A

## MOSFET ELECTRICAL CHARACTERISTICS($T_J$=25℃ unless otherwise noted)

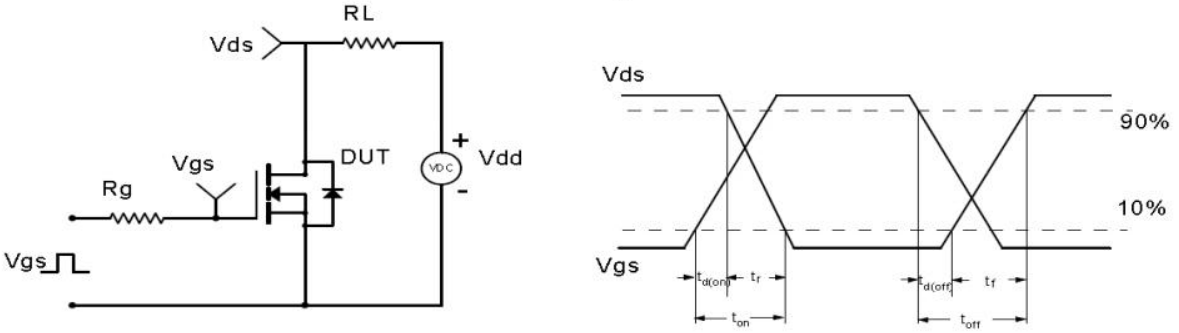
| Parameter | Symbol | Test Condition | Min | Type | Max | Unit |
|---|---|---|---|---|---|---|
| **Static Characteristics** | | | | | | |
| Drain-source breakdown voltage | $V_{(BR)DSS}$ | $V_{GS}$=0V, $I_D$=250μA | 30 | - | - | V |
| Zero gate voltage drain current | $I_{DSS}$ | $V_{DS}$=30V, $V_{GS}$=0V | - | - | 1 | μA |
| Gate-body leakage current | $I_{GSS}$ | $V_{GS}$=±20V, $V_{DS}$=0V | - | - | ±100 | nA |
| Gate threshold voltage | $V_{GS(th)}$ | $V_{DS}$=$V_{GS}$, $I_D$=250μA | 1 | 1.5 | 2.0 | V |
| Drain-source on-resistance | $R_{DS(on)}$ | $V_{GS}$=10V, $I_D$=4A | - | 15 | 20 | mΩ |
| | | $V_{GS}$=4.5V, $I_D$=3A | - | 20 | 26 | mΩ |
| Forward trans conductance | $R_g$ | $V_{GS}$=0V, $V_{DS}$=0V, f=1.0MHz | - | 3.2 | - | Ω |
| **Dynamic characteristics** | | | | | | |
| Input Capacitance | $C_{iss}$ | $V_{DS}$=15V,$V_{GS}$=0V, f=1MHz | - | 580 | - | pF |
| Output Capacitance | $C_{oss}$ | | - | 98 | - | |
| Reverse Transfer Capacitance | $C_{rss}$ | | - | 74 | - | |
| **Switching characteristics** | | | | | | |
| Turn-on delay time | $t_{d(on)}$ | $V_{GS}$=10V,$V_{DS}$=15V RG=3Ω, $I_D$=4A | - | 8 | - | ns |
| Turn-on rise time | $t_r$ | | - | 7 | - | |
| Turn-off delay time | $t_{d(off)}$ | | - | 15 | - | |
| Turn-off fall time | $t_f$ | | - | 5 | - | |
| Total Gate Charge | Qg | $V_{DS}$=15V, $I_D$=4A, $V_{GS}$=10V | - | 5.1 | - | nC |
| Gate-Source Charge | Qgs | | - | 1.1 | - | |
| Gate-Drain Charge | Qgd | | - | 2.5 | - | |
| **Source-Drain Diode characteristics** | | | | | | |
| Diode Forward voltage | $V_{SD}$ | $T_J$=25℃, $V_{GS}$=0V, $I_D$=4A | - | 0.8 | 1.2 | V |
| Diode Forward current | $I_S$ | $T_a$=25℃ | - | - | 8 | A |
| Body Diode Reverse Recovery Time | trr | $T_J$=25℃, $I_F$=4A,di/dt=100A/us | - | 15 | - | ns |
| Body Diode Reverse Recovery Charge | Qrr | | - | 14 | - | nC |

## Test Circuit & Waveform

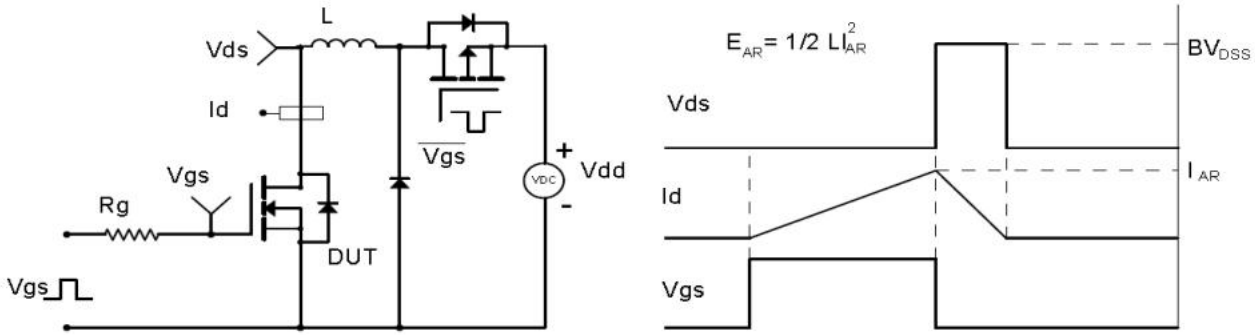
Gate Charge Test Circuit & Waveform



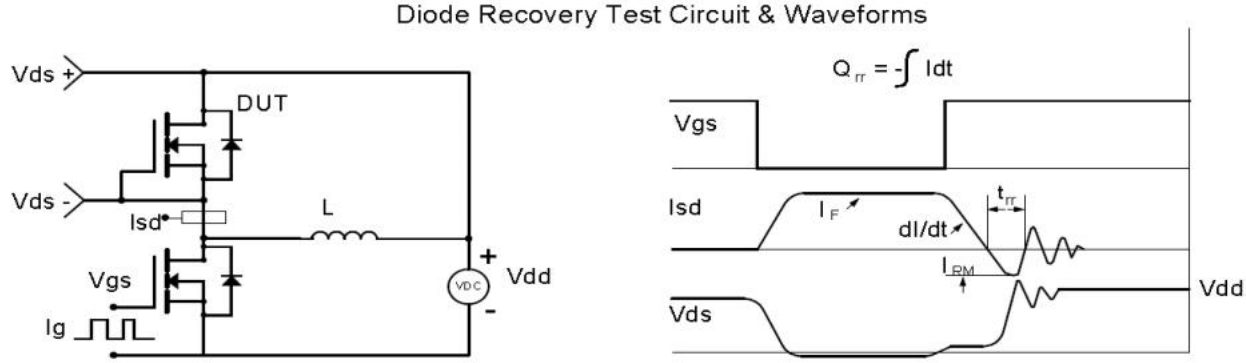

Resistive Switching Test Circuit & Waveforms




Unclamped Inductive Switching (UIS) Test Circuit & Waveforms




Diode Recovery Test Circuit & Waveforms



# Typical Characteristics

**Figure1:** Output Characteristics

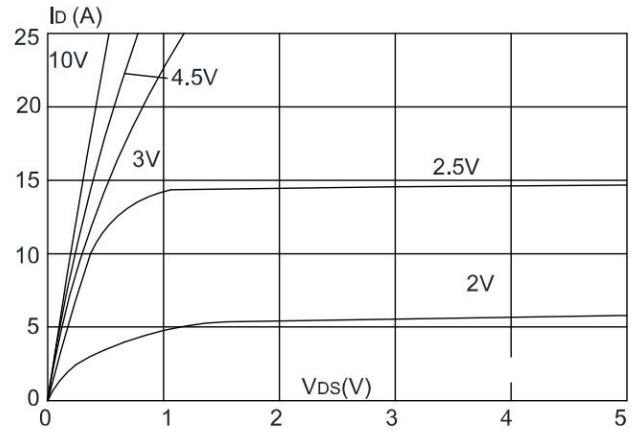



**Figure 2:** Typical Transfer Characteristics

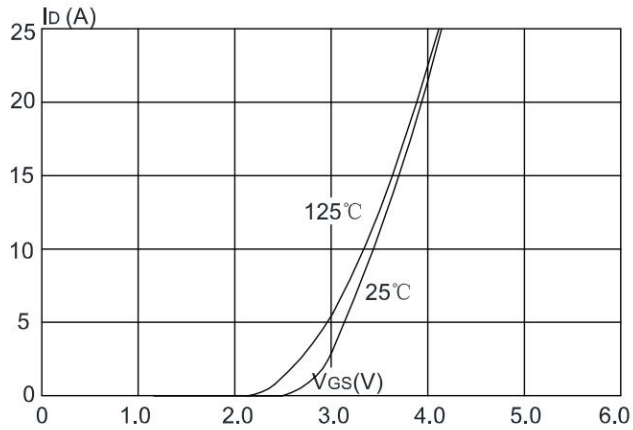



**Figure 3:**On-resistance vs. Drain Current

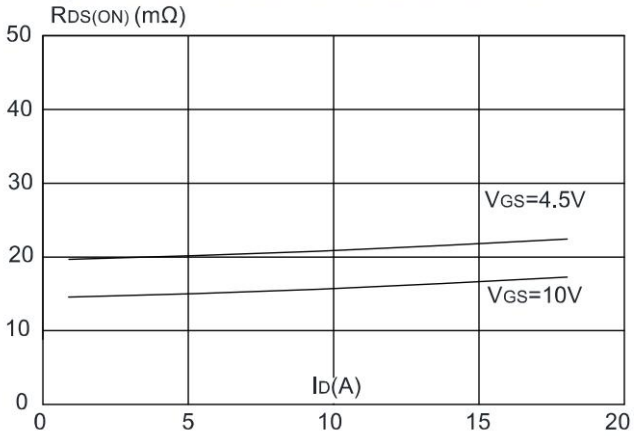



**Figure 4**: Body Diode Characteristics

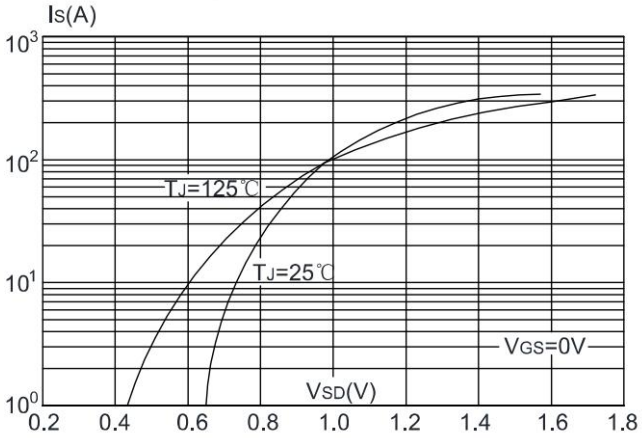



**Figure 5:** Gate Charge Characteristics

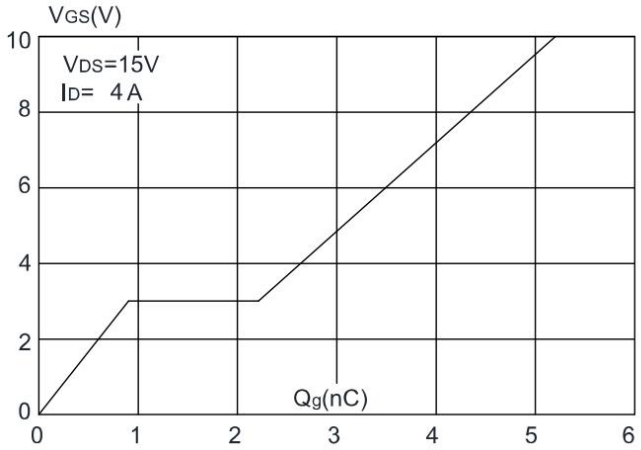
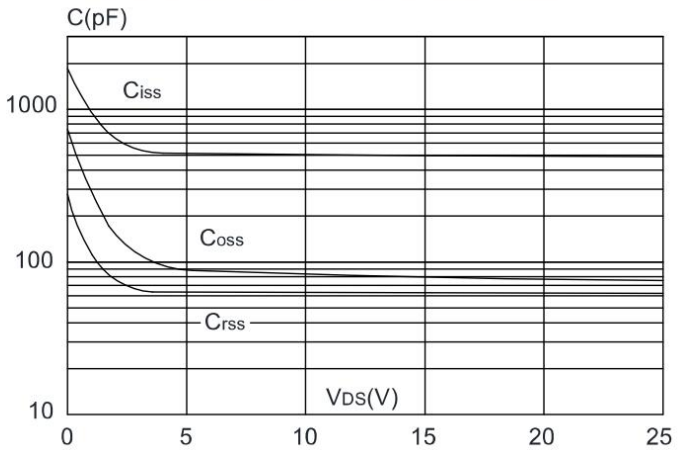



**Figure 6:** Capacitance Characteristics



# Typical Characteristics

**Figure 7:** Normalized Breakdown Voltage vs. Junction Temperature

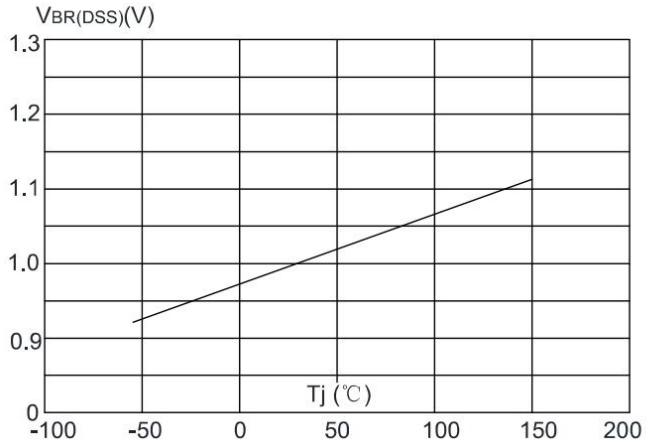



**Figure 8:** Normalized on Resistance vs. Junction Temperature

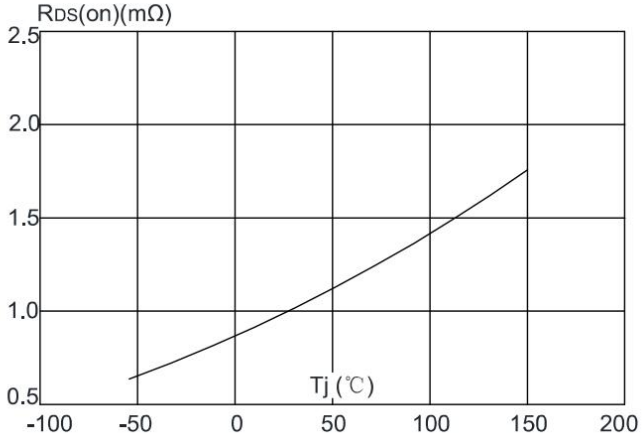



**Figure 9:** Maximum Continuous Drain Current vs. Ambient Temperature

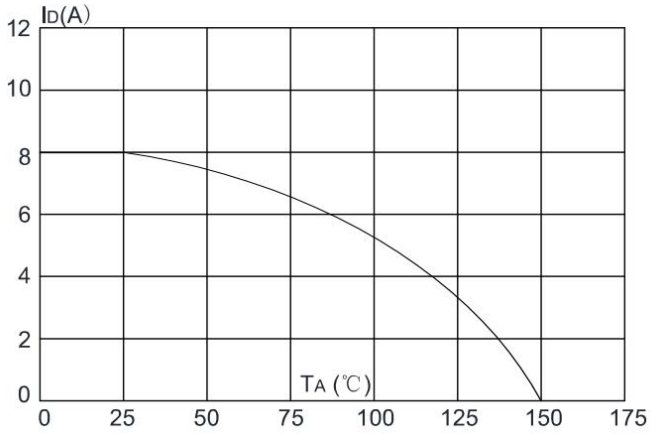



**Figure 10:** Maximum Safe Operating Area

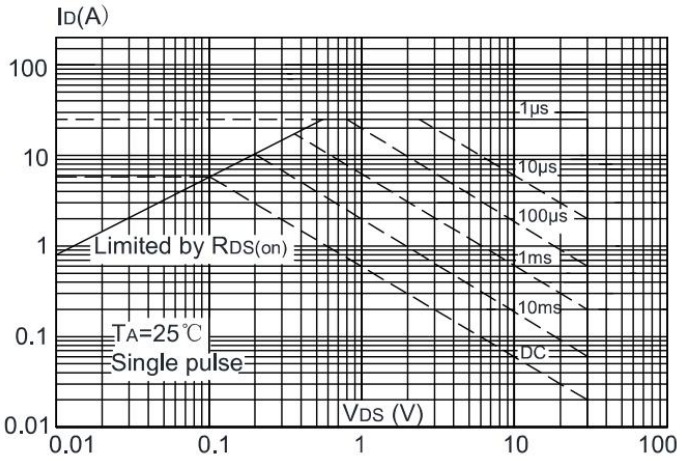
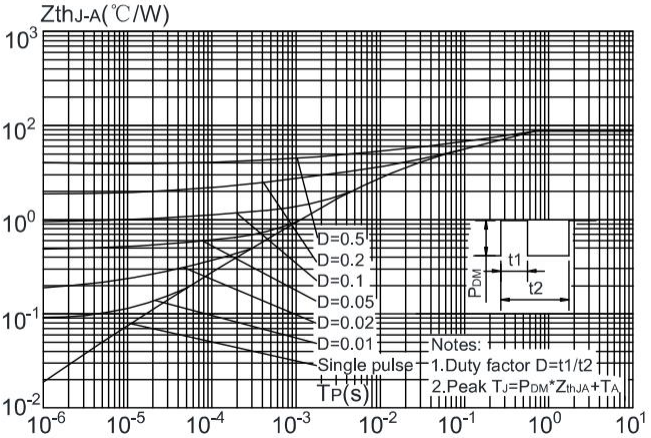
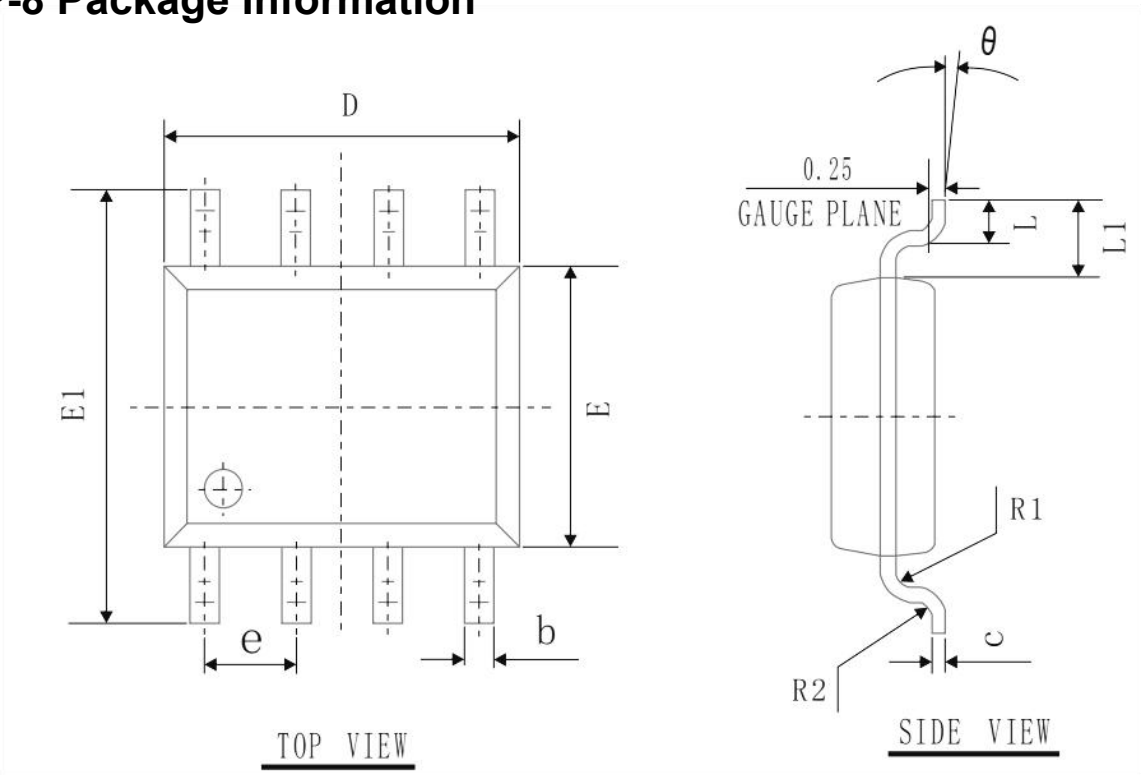
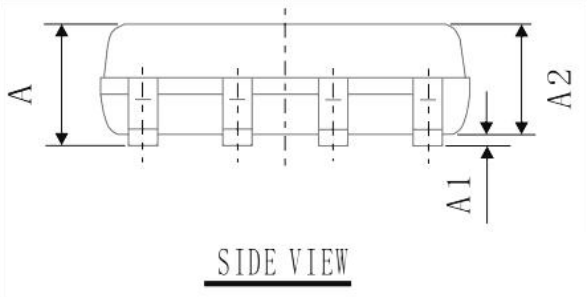



**Figure.11:** Maximum Effective Transient Thermal Impedance, Junction-to-Ambient



## SOP-8 Package Information




COMMON DIMENSIONS
(UNITS OF MEASURE=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 | 1.04 REF | | |
| e | 1.27 BSC | | |
| R1 | 0.07 TYP | | |
| R2 | 0.07 TYP | | |

## Revision History

| Revision | Release | Remark |
|---|---|---|
| V1.0 | 2024/12/26 | Reset |

## Disclaimer

The information given in this document describes the independent performance of the product,but similar performance is not guaranteed under other working conditions,and cannot be guaranteed when installed with other products or equipment.To achieve the required performance of the product in actual scenarios,the customer should conduct a complete application test to assess the functionality of the product.

Allpower assumes no responsibility for equipment failures result from using products at values that exceed the ratings,operating conditions,or other parameters listed in the product specifications. The product described in this specification is not applicable for aerospace or other applications which requires high reliability.Customers using or selling these products for use in medical,life-saving,or life-sustaining applications do so at their own risk and agree to fully indemnify.

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