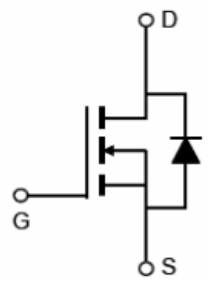
## Main Product Characteristics:

| | |
|---|---|
| $V_{DSS}$ | 60V |
| $R_{DS}$(on) | 7mΩ (typ.) |
| $I_D$ | 80A |

TO-252 (DPAK)


Marking and pin Assignment




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
- 175℃ 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 |
|---|---|---|---|
| $I_D$ @ TC = 25°C | Continuous Drain Current, $V_{GS}$ @ 10V ① | 80 | A |
| $I_{DM}$ | Pulsed Drain Current ② | 180 | |
| $P_D$ @TC = 25°C | Power Dissipation ③ | 110 | W |
| $V_{DS}$ | Drain-Source Voltage | 60 | V |
| $V_{GS}$ | Gate-to-Source Voltage | ± 20 | V |
| $E_{AS}$ | Single Pulse Avalanche Energy @ L=0.5mH | 390 | mJ |
| $T_J$ $T_{STG}$ | Operating Junction and Storage Temperature Range | -55 to +175 | °C |

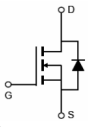
## Thermal Resistance

| Symbol | Characterizes | Typ. | Max. | Units |
|---|---|---|---|---|
| $R_{\theta JC}$ | Junction-to-case ③ | — | 1.36 | ℃/W |

## Electrical Characterizes @$T_A$=25℃ unless otherwise specified

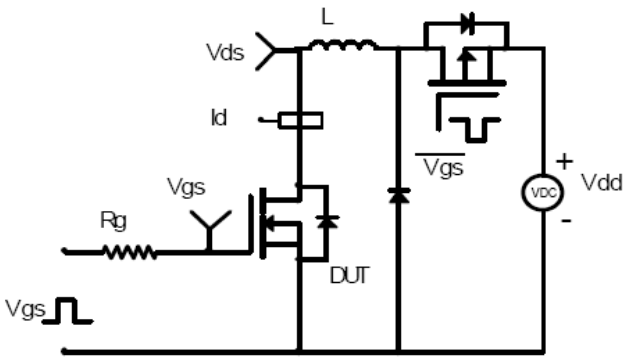
| Symbol | Parameter | Min. | Typ. | Max. | Units | Conditions |
|---|---|---|---|---|---|---|
| $V_{(BR)DSS}$ | Drain-to-Source breakdown voltage | 60 | — | — | V | $V_{GS}$ = 0V, $I_D$ = 250μA |
| $R_{DS(on)}$ | Static Drain-to-Source on-resistance | — | 7 | 8.5 | mΩ | $V_{GS}$=10V,$I_D$ =20A |
| $V_{GS(th)}$ | Gate threshold voltage | 2 | 2.8 | 4 | V | $V_{DS}$ = $V_{GS}$, $I_D$ =250μA |
| $I_{DSS}$ | Drain-to-Source leakage current | — | — | 1 | μA | $V_{DS}$ =60V,$V_{GS}$ = 0V |
| $I_{GSS}$ | Gate-to-Source forward leakage | — | — | 100 | nA | $V_{GS}$ =20V |
| | | — | — | -100 | | $V_{GS}$ = -20V |
| $Q_g$ | Total gate charge | — | 90 | — | nC | $I_D$ = 10A, |
| $Q_{gs}$ | Gate-to-Source charge | — | 9 | — | | $V_{DS}$=75V, |
| $Q_{gd}$ | Gate-to-Drain("Miller") charge | — | 18 | — | | $V_{GS}$ = 10V |
| $t_{d(on)}$ | Turn-on delay time | — | 8.5 | — | ns | $V_{GS}$=10V, $V_{DS}$=30V, |
| $t_r$ | Rise time | — | 7 | — | | $R_{GEN}$=3Ω |
| $t_{d(off)}$ | Turn-Off delay time | — | 40 | — | | $R_L$=1Ω |
| $t_f$ | Fall time | — | 15 | — | | |
| $C_{iss}$ | Input capacitance | — | 4000 | — | pF | $V_{GS}$ = 0V |
| $C_{oss}$ | Output capacitance | — | 290 | — | | $V_{DS}$ = 30V |
| $C_{rss}$ | Reverse transfer capacitance | — | 210 | — | | $f$ = 1MHz |

## Source-Drain Ratings and Characteristics

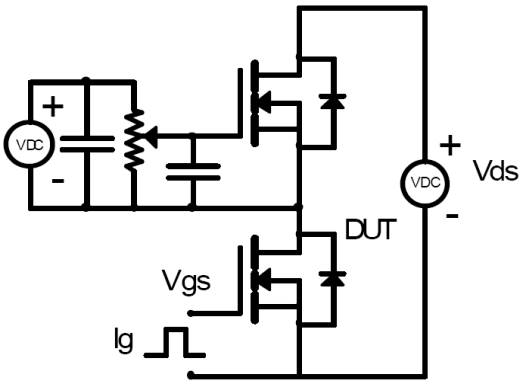
| Symbol | Parameter | Min. | Typ. | Max. | Units | Conditions |
|---|---|---|---|---|---|---|
| $I_S$ | Continuous Source Current (Body Diode) | — | — | 80 | A | MOSFET symbol showing the integral reverse p-n junction diode.  |
| $V_{sd}$ | Diode Forward Voltage | — | — | 1.2 | V | $I_S$=20A, $V_{GS}$=0V |
| trr | Reverse Recovery Time | — | 32 | — | ns | $I_S$=20A,di/dt=100A/us |
| Qrr | Reverse Recovery Charge | — | 45 | — | nC | |

## Test circuits and Waveforms

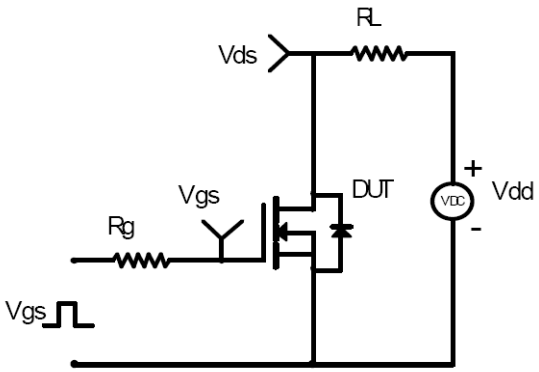
**EAS Test Circuit:**



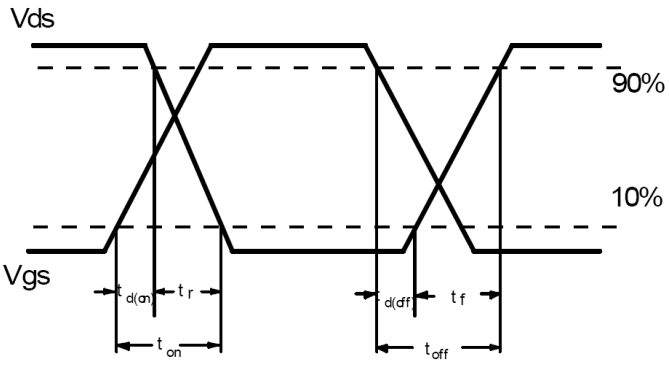

**Gate charge test circuit:**




**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.

## Typical electrical and thermal characteristics

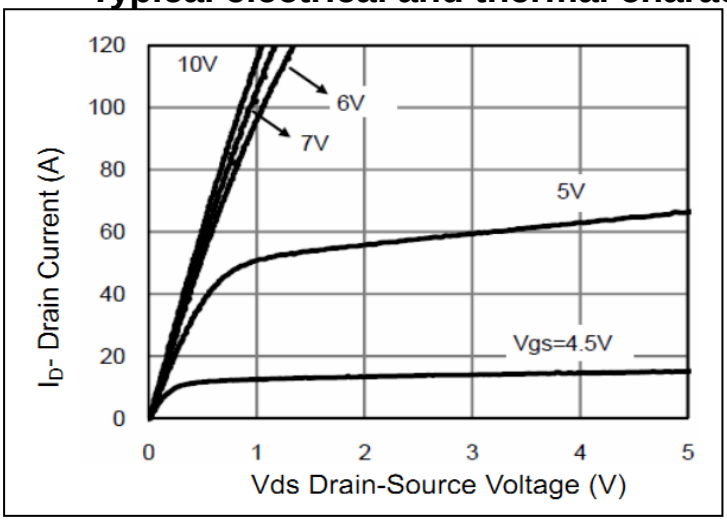



Figure 1: Typical Output Characteristics

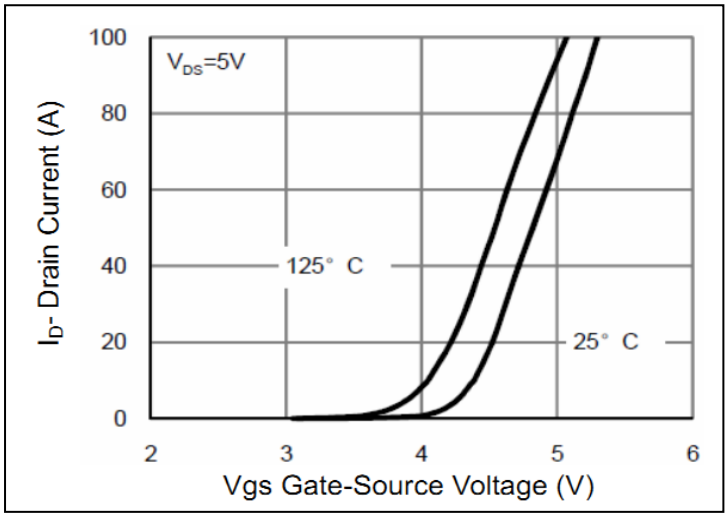



Figure 2: Transfer Characteristics

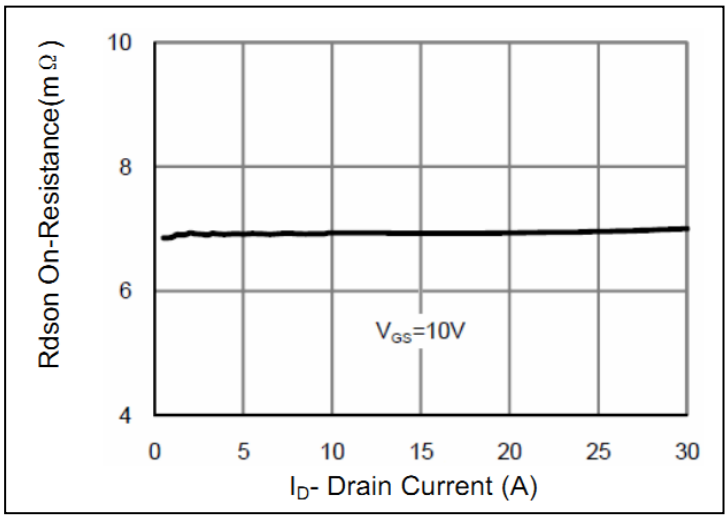



Figure 3: Rdson-Drain Current

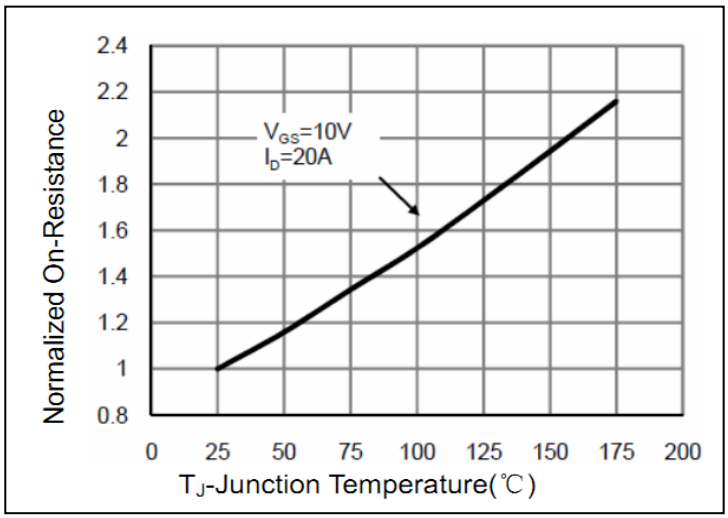



Figure 4: Rdson-Junction Temperature

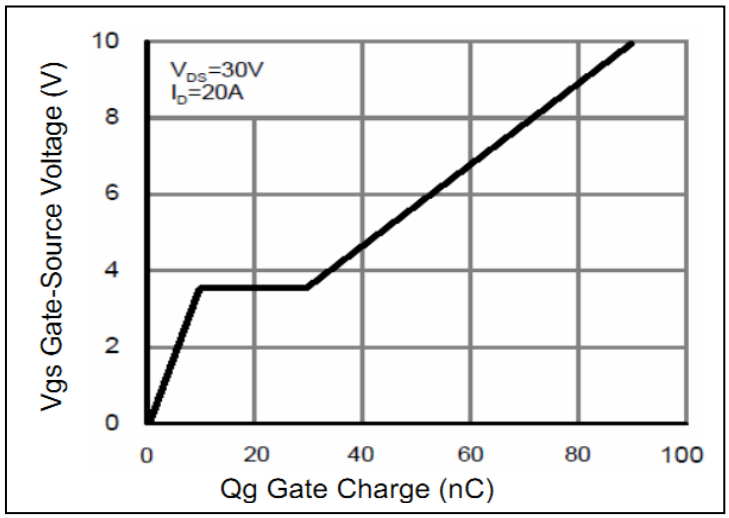



Figure 5: Gate Charge

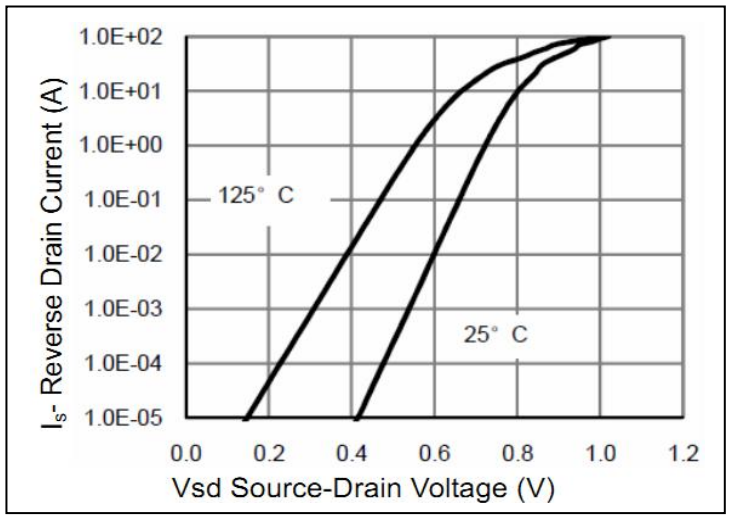



Figure 6: Source-Drain Diode Forward

## Typical electrical and thermal characteristics

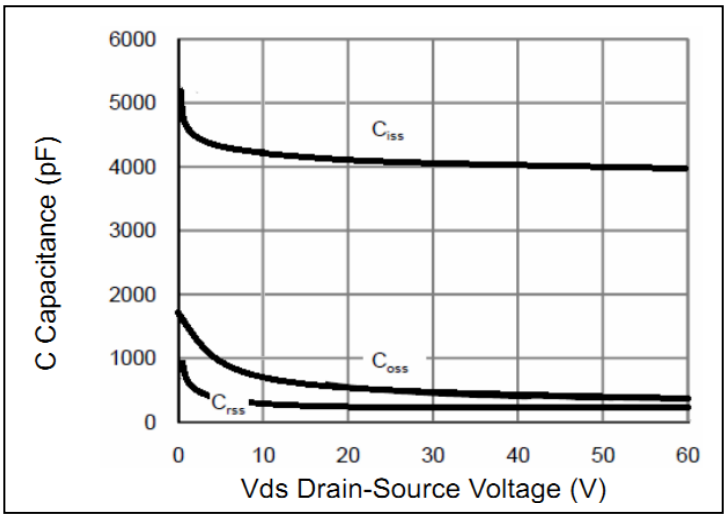



Figure 7: Capacitance vs Vds

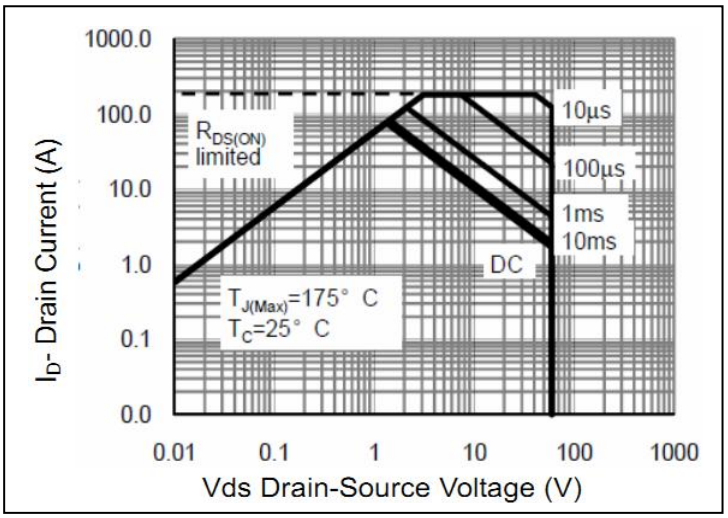



Figure 8: Safe Operation Area

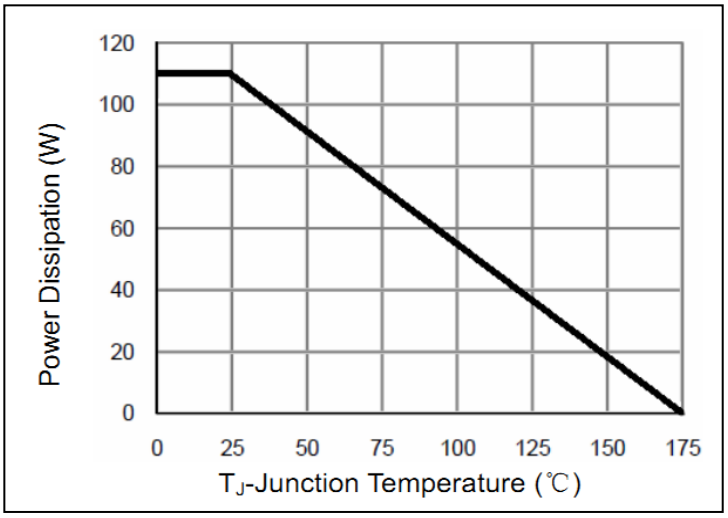



Figure 9: Power De-rating

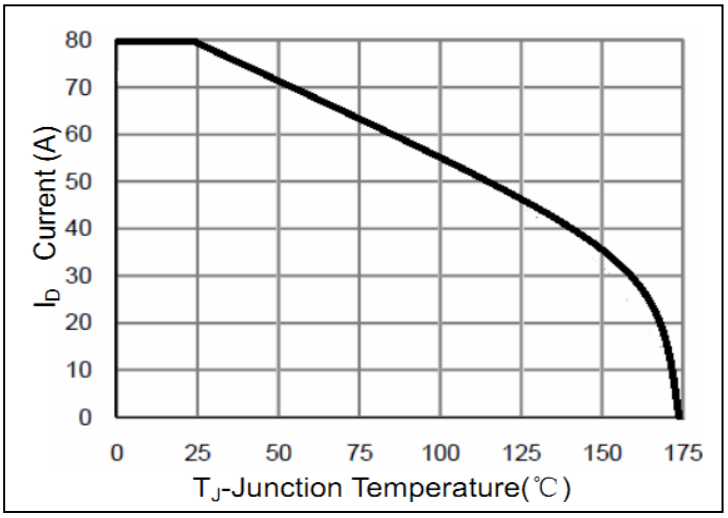



Figure 10: ID Current-Junction Temperature

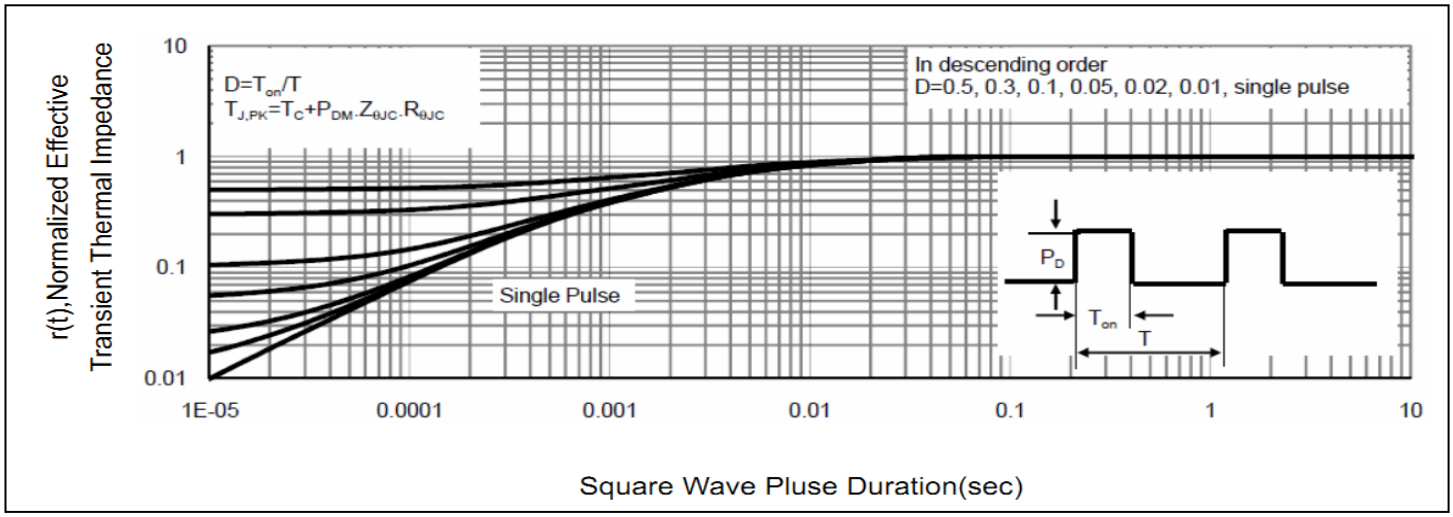
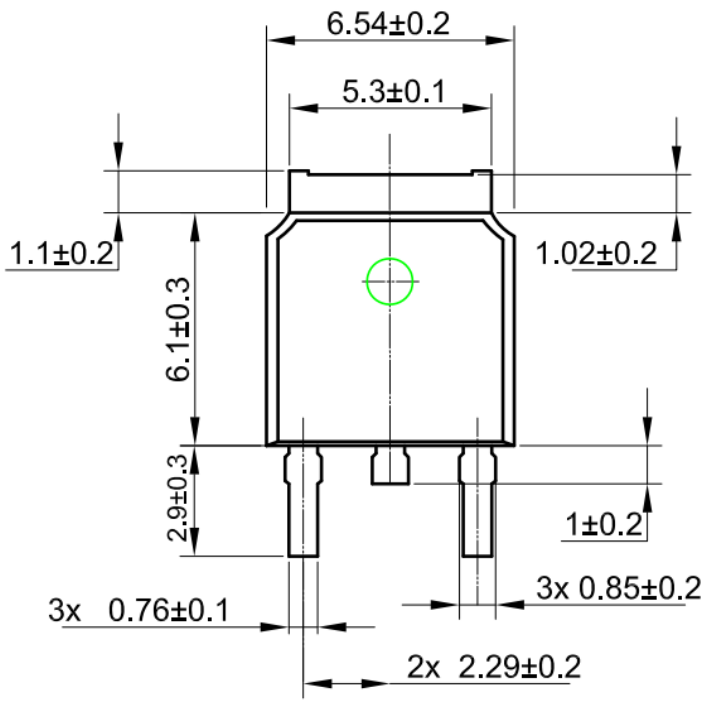
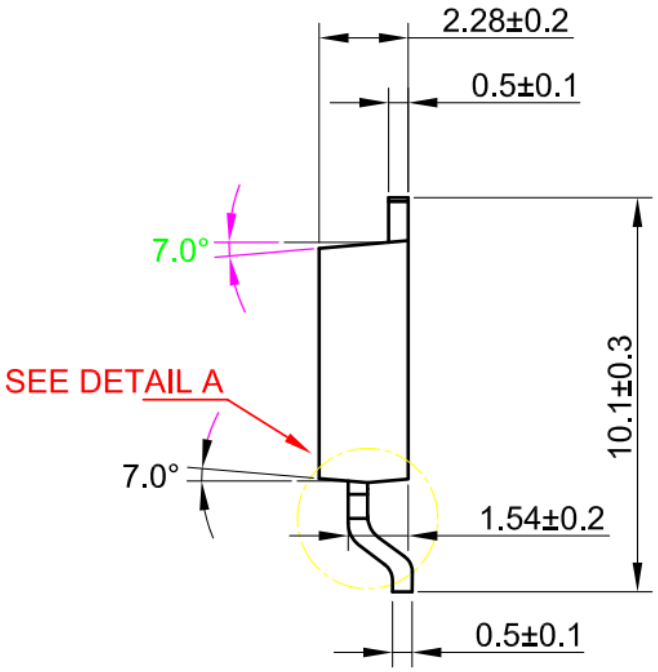
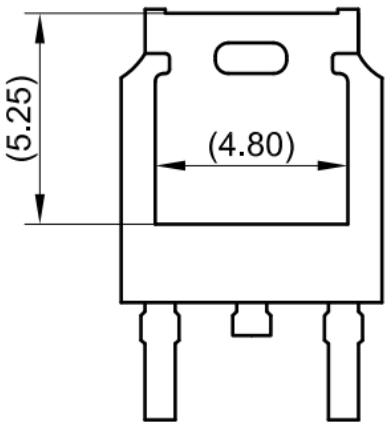


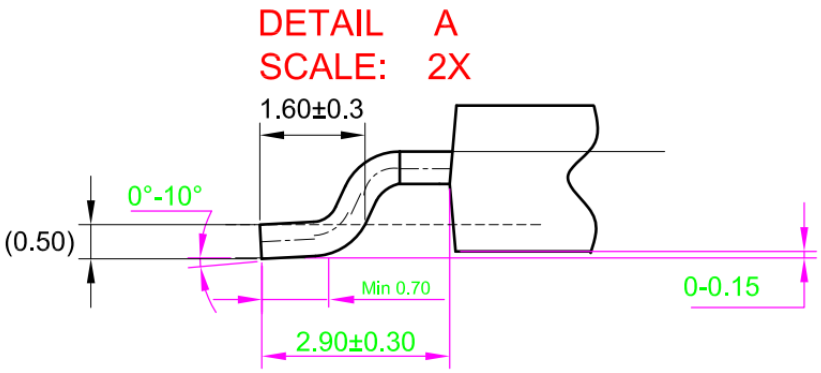

Figure 11: Normalized Maximum Transient Thermal Impedance

## Mechanical Data：



## Ordering and Marking Information

**Device Marking: SSF6808D2**

**Package (Available)**

**TO-252(DPAK)**

**Operating Temperature Range**

**C : -55 to 175 ºC**

## Devices per Unit

| Package Type | Units/Tape | Tapes/Inner Box | Units/Inner Box | Inner Boxes/Carton Box | Units/Carton Box |
|---|---|---|---|---|---|
| TO-252 | 2500 | 2 | 5000 | 7 | 35000 |
| TO-252 | 2500 | 1 | 2500 | 10 | 25000 |
| TO-252 | 800 | 5 | 4000 | 8 | 32000 |

## Reliability Test Program

| Test Item | Conditions | Duration | Sample Size |
|---|---|---|---|
| High Temperature Reverse Bias(HTRB) | $T_j$=125℃ to 150℃ @ 80% of Max $V_{DSS}/V_{CES}$/VR | 168 hours<br>500 hours<br>1000 hours | 3 lots x 77 devices |
| High Temperature Gate Bias(HTGB) | $T_j$=150℃ @ 100% of Max $V_{GSS}$ | 168 hours<br>500 hours<br>1000 hours | 3 lots x 77 devices |

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