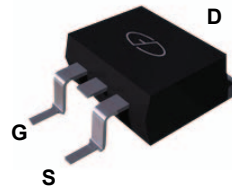
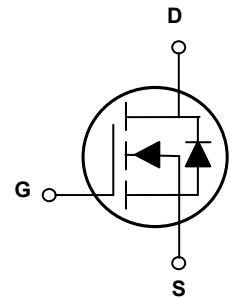


## Main Product Characteristics

|              |       |
|--------------|-------|
| $V_{DS}$     | 60V   |
| $R_{DS(ON)}$ | 4.0mΩ |
| $I_D$        | 150A  |



TO-263(D²PAK)



Schematic Diagram

## Features and Benefits

- Advanced MOSFET process technology
- Ideal for high efficiency switched mode power supplies
- Low on-resistance with low gate charge
- Fast switching and reverse body recovery



## Description

The GSFT06150 utilizes the latest techniques to achieve high cell density and low on-resistance. These features make this device extremely efficient and reliable for use in high efficiency switch mode power supply and a wide variety of other applications.

## Absolute Maximum Ratings ( $T_C=25^{\circ}\text{C}$ unless otherwise specified)

| Parameter                                             | Symbol                       | Max.        | Unit                        |
|-------------------------------------------------------|------------------------------|-------------|-----------------------------|
| Drain-Source Voltage                                  | $V_{DS}$                     | 60          | V                           |
| Gate-Source Voltage                                   | $V_{GS}$                     | $\pm 20$    | V                           |
| Drain Current-Continuous                              | $I_D$                        | 150         | A                           |
| Drain Current-Continuous( $T_C=100^{\circ}\text{C}$ ) | $I_{D(100^{\circ}\text{C})}$ | 105         | A                           |
| Pulsed Drain Current                                  | $I_{DM}$                     | 600         | A                           |
| Maximum Power Dissipation                             | $P_D$                        | 220         | W                           |
| Derating Factor                                       |                              | 1.47        | W/ $^{\circ}\text{C}$       |
| Single Pulse Avalanche Energy <sup>5</sup>            | $E_{AS}$                     | 900         | mJ                          |
| Thermal Resistance, Junction-to-Case <sup>2</sup>     | $R_{\theta JC}$              | 0.68        | $^{\circ}\text{C}/\text{W}$ |
| Operating Junction Temperature Range                  | $T_J$                        | -55 To +175 | $^{\circ}\text{C}$          |
| Storage Temperature Range                             | $T_{STG}$                    | -55 To +175 | $^{\circ}\text{C}$          |

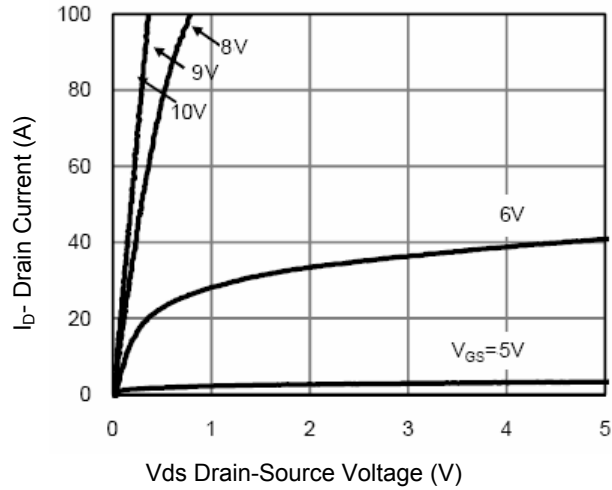
**Electrical Characteristics** ( $T_C=25^{\circ}\text{C}$  unless otherwise specified)

| Parameter                              | Symbol              | Conditions                                                                             | Min. | Typ.  | Max. | Unit |
|----------------------------------------|---------------------|----------------------------------------------------------------------------------------|------|-------|------|------|
| Off Characteristics                    |                     |                                                                                        |      |       |      |      |
| Drain-Source Breakdown Voltage         | BV <sub>DSS</sub>   | V <sub>GS</sub> =0V, I <sub>D</sub> =250μA                                             | 60   | -     | -    | V    |
| Zero Gate Voltage Drain Current        | I <sub>DSS</sub>    | V <sub>DS</sub> =60V, V <sub>GS</sub> =0V                                              | -    | -     | 1    | μA   |
| Gate-Body Leakage Current              | I <sub>GSS</sub>    | V <sub>GS</sub> =±20V, V <sub>DS</sub> =0V                                             | -    | -     | ±100 | nA   |
| On Characteristics <sup>3</sup>        |                     |                                                                                        |      |       |      |      |
| Gate Threshold Voltage                 | V <sub>GS(th)</sub> | V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250μA                               | 2    | 3     | 4    | V    |
| Drain-Source On-State Resistance       | R <sub>DS(ON)</sub> | V <sub>GS</sub> =10V, I <sub>D</sub> =75A                                              | -    | 3.1   | 4.0  | mΩ   |
| Forward Transconductance               | g <sub>FS</sub>     | V <sub>DS</sub> =10V, I <sub>D</sub> =75A                                              | -    | 80    | -    | S    |
| Dynamic Characteristics <sup>4</sup>   |                     |                                                                                        |      |       |      |      |
| Input Capacitance                      | C <sub>iss</sub>    | V <sub>DS</sub> =30V, V <sub>GS</sub> =0V, F=1.0MHz                                    | -    | 5451  | -    | PF   |
| Output Capacitance                     | C <sub>oss</sub>    |                                                                                        | -    | 609   | -    |      |
| Reverse Transfer Capacitance           | C <sub>rss</sub>    |                                                                                        | -    | 488   | -    |      |
| Switching Characteristics <sup>4</sup> |                     |                                                                                        |      |       |      |      |
| Total Gate Charge                      | Q <sub>g</sub>      | V <sub>DS</sub> =30V, I <sub>D</sub> =75A, V <sub>GS</sub> =10V                        | -    | 130.8 | -    | nC   |
| Gate-Source Charge                     | Q <sub>gs</sub>     |                                                                                        | -    | 22.8  | -    |      |
| Gate-Drain Charge                      | Q <sub>gd</sub>     |                                                                                        | -    | 56.9  | -    |      |
| Turn-On Delay Time                     | t <sub>d(on)</sub>  | V <sub>DD</sub> =30V, R <sub>L</sub> =0.4Ω, V <sub>GS</sub> =10V, R <sub>G</sub> =2.5Ω | -    | 25    | -    | nS   |
| Turn-On Rise Time                      | t <sub>r</sub>      |                                                                                        | -    | 23    | -    |      |
| Turn-Off Delay Time                    | t <sub>d(off)</sub> |                                                                                        | -    | 90    | -    |      |
| Turn-Off Fall Time                     | t <sub>f</sub>      |                                                                                        | -    | 38    | -    |      |
| Drain-Source Diode Characteristics     |                     |                                                                                        |      |       |      |      |
| Diode Forward Current <sup>2</sup>     | I <sub>S</sub>      |                                                                                        | -    | -     | 150  | A    |
| Diode Forward Voltage <sup>3</sup>     | V <sub>SD</sub>     | I <sub>S</sub> =75A, V <sub>GS</sub> =0V                                               | -    | -     | 1.2  | V    |
| Reverse Recovery Time                  | t <sub>rr</sub>     | T <sub>J</sub> =25°C, I <sub>F</sub> =75A di/dt=-100A/μs <sup>3</sup>                  | -    | 60    | -    | nS   |
| Reverse Recovery Charge                | Q <sub>rr</sub>     |                                                                                        | -    | 80    | -    | nC   |
| Forward Turn-On Time                   | t <sub>on</sub>     | Intrinsic turn-on is negligible(turn-on is dominated by LS+LD)                         |      |       |      |      |

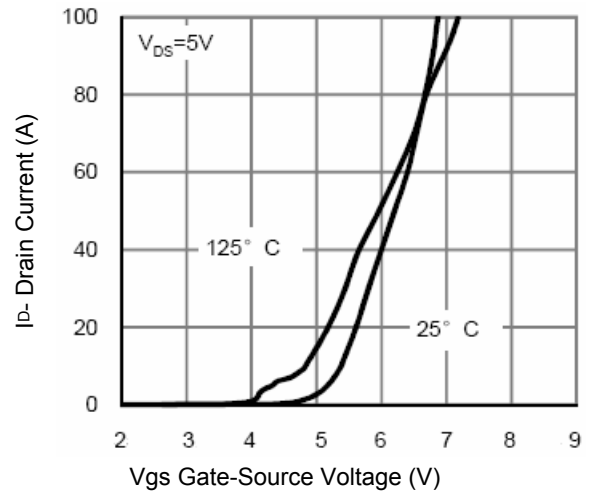
**Notes:**

1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. Surface Mounted on FR4 Board,  $t \leq 10$  sec.
3. Pulse Test: Pulse Width  $\leq 300\mu s$ , Duty Cycle  $\leq 2\%$ .
4. Guaranteed by design, not subject to production
5. EAS condition:  $T_J=25^{\circ}\text{C}, V_{DD}=30V, V_G=10V, L=0.5mH, R_G=25\Omega$

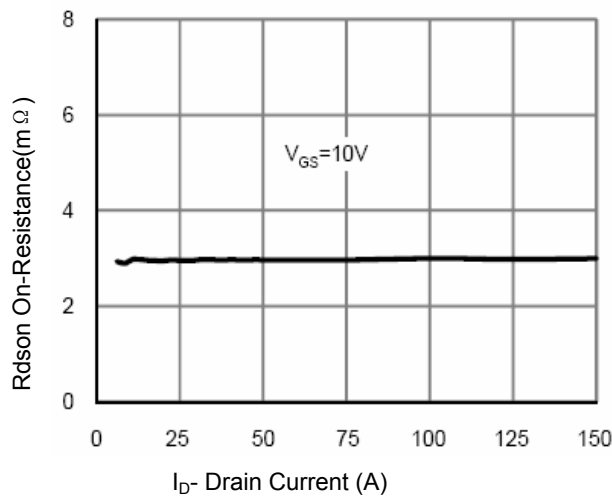
## Typical Electrical and Thermal Characteristic Curves



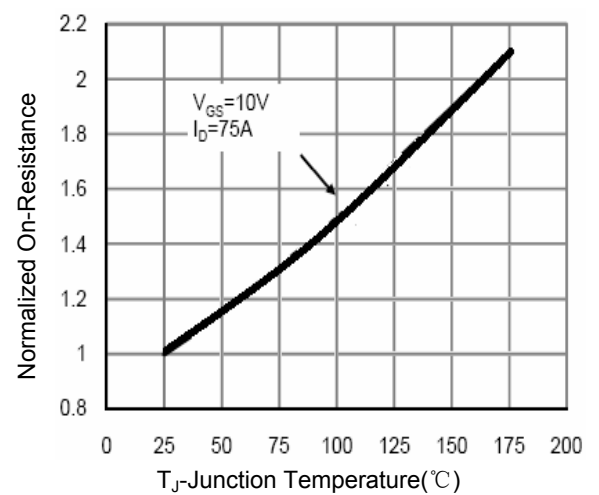
**Figure 1. Output Characteristics**



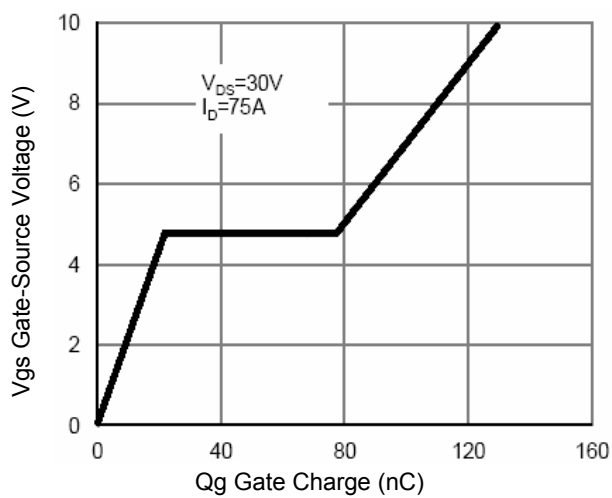
**Figure 2. Transfer Characteristics**



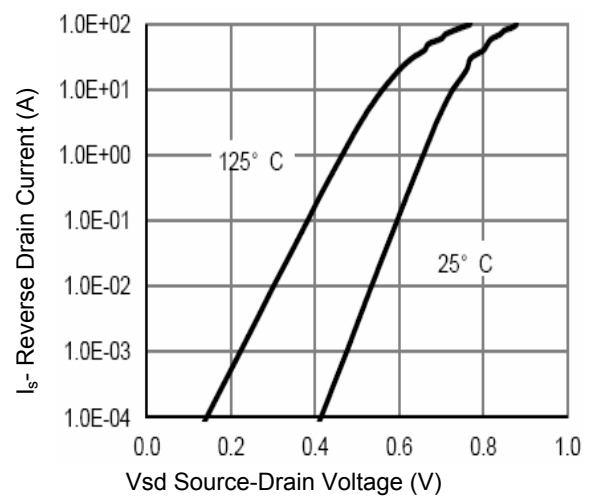
**Figure 3. Rdson- Drain Current**



**Figure 4. Rdson-Junction Temperature**



**Figure 5. Gate Charge**



**Figure 6. Source- Drain Diode Forward**

## Typical Electrical and Thermal Characteristic Curves

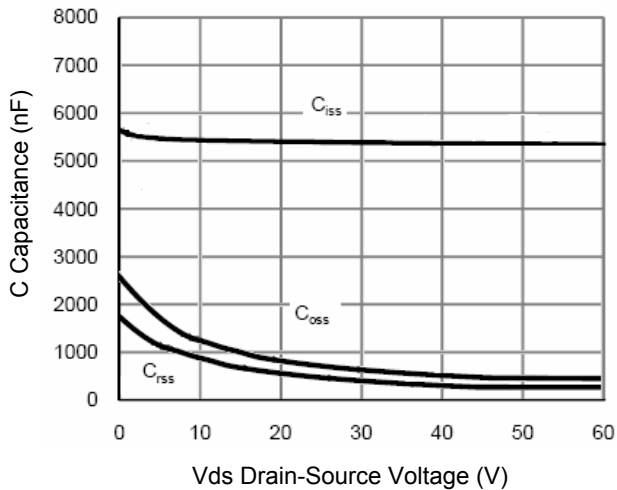


Figure 7. Capacitance vs Vds

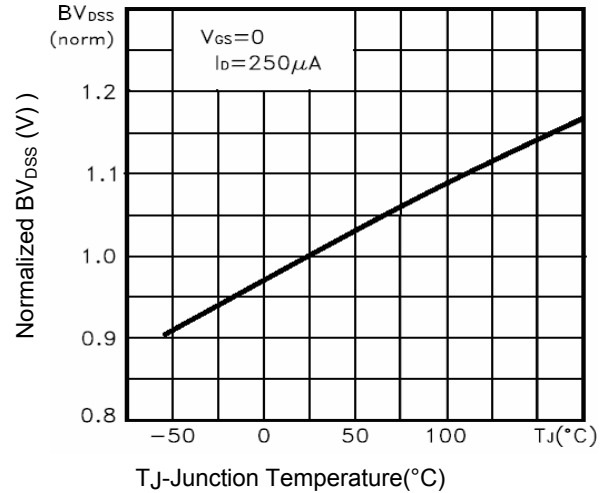


Figure 8.  $BV_{DSS}$  vs Junction Temperature

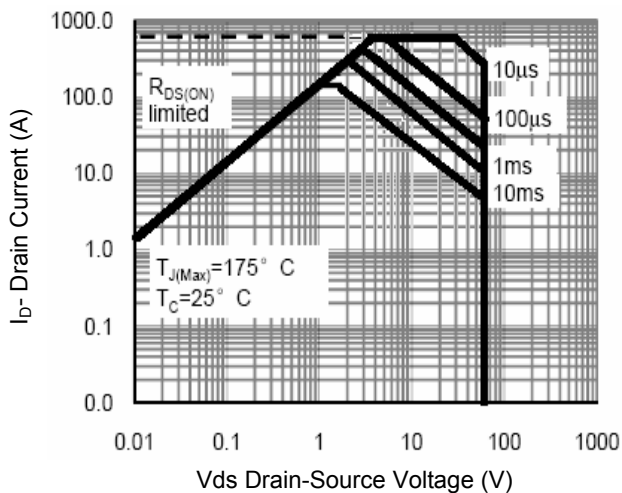


Figure 9. Safe Operation Area

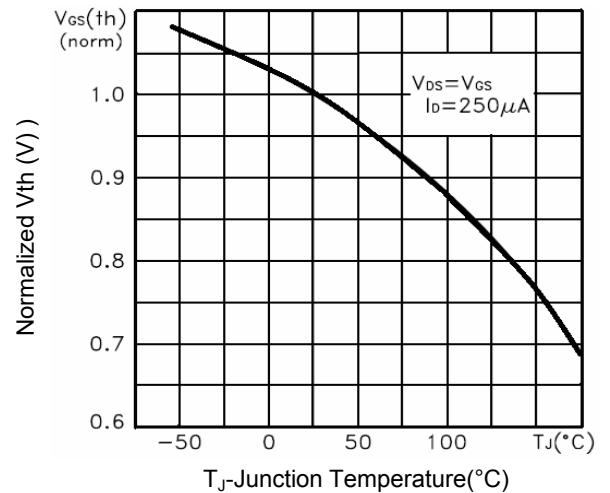


Figure 10.  $V_{th}$  vs Junction Temperature

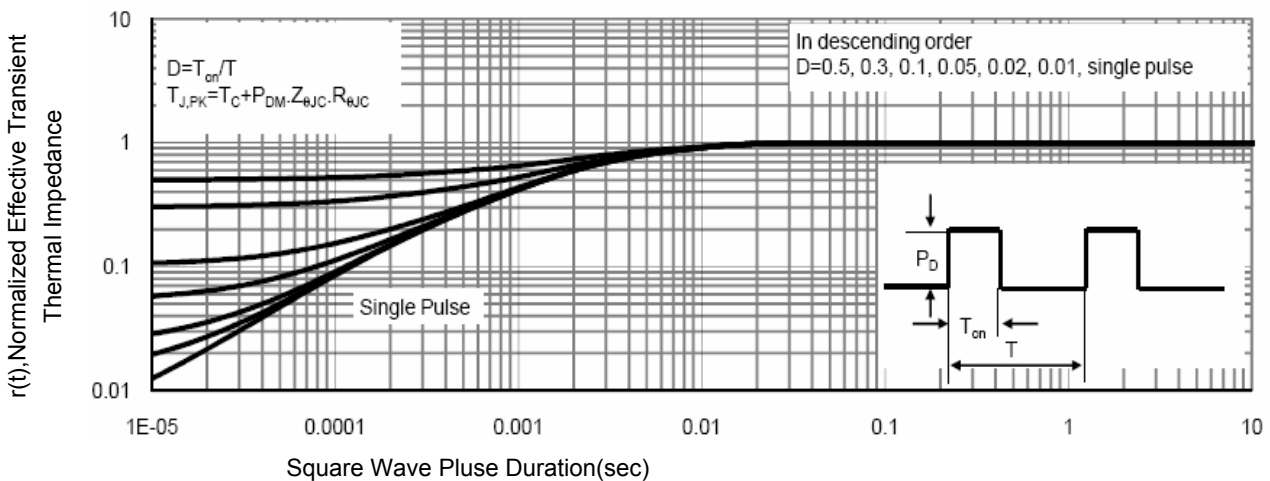


Figure 11. Normalized Maximum Transient Thermal Impedance

## Typical Electrical and Thermal Characteristic Curves

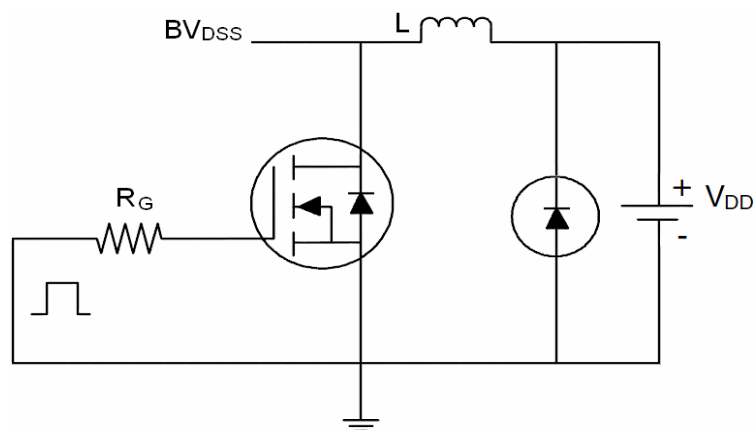


Figure 12.  $E_{AS}$  Test Circuit

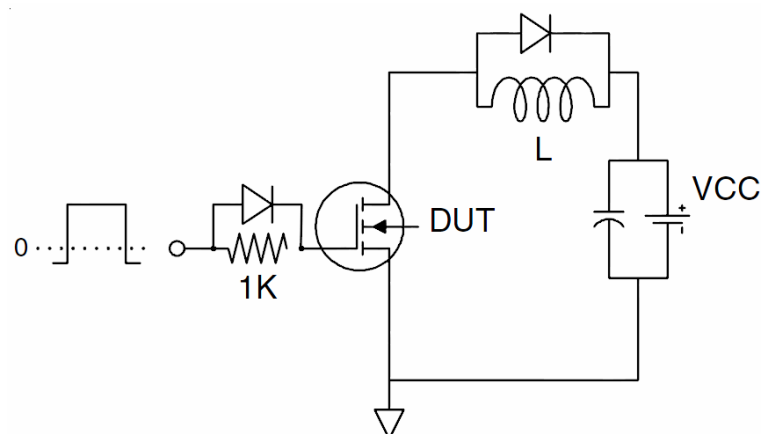


Figure 13. Gate Charge Test Circuit

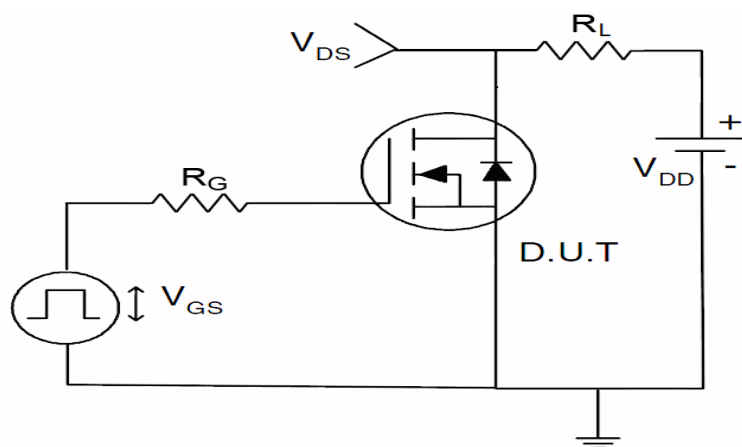
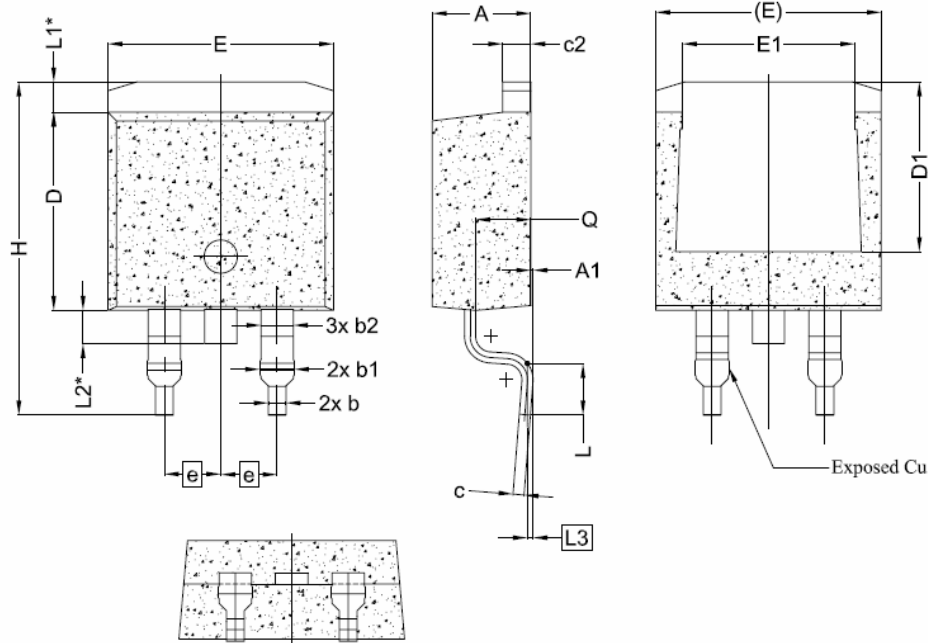


Figure 14. Switch Time Test Circuit

## Package Outline Dimensions (TO-263/D<sup>2</sup>PAK)



| Symbol | Dimensions In Millimeters |       |       |
|--------|---------------------------|-------|-------|
|        | Min.                      | Nom.  | Max.  |
| A      | 4.24                      | 4.44  | 4.64  |
| A1     | 0.00                      | 0.10  | 0.25  |
| b      | 0.70                      | 0.80  | 0.90  |
| b1     | 1.20                      | 1.55  | 1.75  |
| b2     | 1.20                      | 1.45  | 1.70  |
| c      | 0.40                      | 0.50  | 0.60  |
| c2     | 1.15                      | 1.27  | 1.40  |
| D      | 8.82                      | 8.92  | 9.02  |
| D1     | 6.86                      | 7.65  | -     |
| E      | 9.96                      | 10.16 | 10.36 |
| E1     | 6.89                      | 7.77  | 7.89  |
| e      | 2.54BS                    |       |       |
| H      | 14.61                     | 15.00 | 15.88 |
| L      | 1.78                      | 2.32  | 2.79  |
| L1     | 1.36 REF.                 |       |       |
| L2     | 1.50 REF.                 |       |       |
| L3     | 0.25 BSC                  |       |       |
| Q      | 2.30                      | 2.48  | 2.70  |