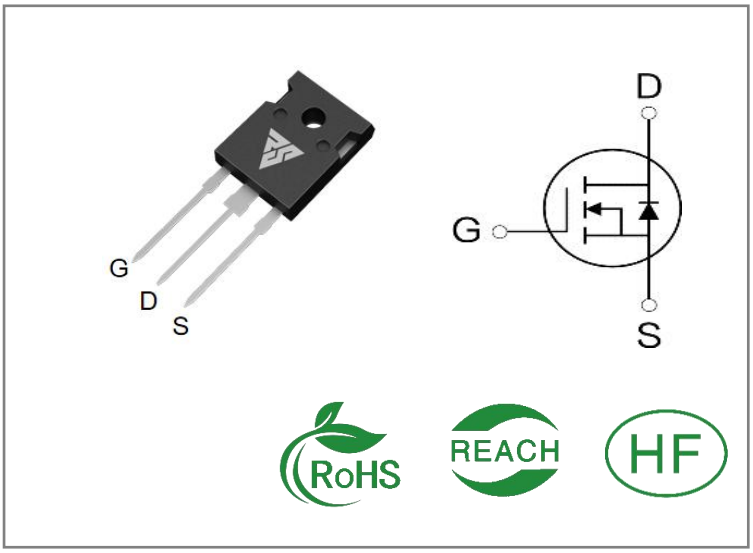
| ID | $R_{DS}$(ON)(Typ ) | VDSS |
|---|---|---|
| 70A | 35mΩ | 600V |




## Applications:

- Switch Mode Power Supply(SMPS)
- Uninterruptible Power Supply (UPS)
- Power Factor Correction (PFC)
- AC-DC Switching Power Supply

## Features:

- Fast switching speed
- 100% avalanche tested
- Improved dv/dt capability
- Fast Recovery Time

## Ordering Information

| Part Number | Package | Marking | Packing | Qty. |
|---|---|---|---|---|
| RSF60R041W | T0-247 | RSF60R041W | Tube | 30 PCS |

## Absolute Maximun Ratings Tc= 2 5℃ unless otherwise specified

| Symbol | Parameter | RSF60R041W | Units |
|---|---|---|---|
| VDSS | Drain-to-Source Voltage | 600 | V |
| ID | Continuous Drain Current TC=25℃ | 70 | A |
| ID | Continuous Drain Current TC=100℃ | 43.5 | |
| IDM | Pulsed Drain Current (Note*1) | 210 | |
| PD | Power Dissipation | 417 | W |
| VGS | Gate- to- Source Voltage | ±20 | V |
| EAS | Single Pulse Avalanche Engergy IAS=4.9A,VDD = 100V, RG = 25 Ω， TC=25℃ | 1152 | mJ |
| dv/dt | MOSFET dv/ dt ruggedness VDS = 0...400V | 50 | V/ns |
| dv/dt | Reverse diode dv/dt VDS = 0...400V, Tj = 25℃, ISD≤ID | 15 | V/ns |
| VESD(G-S) | Gate source ESD(HBM-C=100pF, R=1.5KΩ) | 2000 | V |
| TL TPKG | Maximum Temperature for Soldering | 300 | ℃ |
| | Leads at 0.063in(1.6mm)from Case for 10 seconds<br>Package Body for 10 seconds | 260 | |
| TJ and TSTG | Operating Junction and Storage Temperature Range | -55 to 150 | |

* Drain Current Limited by Maximum Junction Temperature

Caution: Stresses greater than those listed in the“ Absolute Maximum Ratings” Table may cause permanent damage to the device.

## Thermal Resistance

| Symbol | Parameter | RSF60R041W | Units | Test Conditions |
|---|---|---|---|---|
| RθJC | Junction-to-Case | 0.3 | ℃/ W | Drain lead soldered to water cooled heatsink, PD adjusted for a peak junction temperature of + 1 5 0 ℃ |
| RθJA | Junction-to-Ambient | 62.5 | | 1 cubic foot chamber,free air. |

## OFF Characteristics TJ= 25℃ unless otherwise specified

| Symbol | Parameter | Min. | Typ. | Max. | Units | Test Conditions |
|---|---|---|---|---|---|---|
| BVDSS | Drain- to- source Breakdown Voltage | 600 | -- | -- | V | VGS=0V,ID=1mA |
| IDSS | Drain- to- Source Leakage Current | -- | -- | 5 | μA | VDS=600V,VGS=0 V |
| IGSS | Gate- to- Source Forward Leakage | -- | -- | 1 | μA | VGS=20V ,VDS=0V |
| | Gate- to- Source Reverse Leakage | -- | -- | -1 | | VGS=-20V ,VDS=0 V |

## ON Characteristics TJ=25℃ unless otherwise specified

| Symbol | Parameter | Min. | Typ. | Max. | Units | Test Conditions |
|---|---|---|---|---|---|---|
| RDS(on) | Static Drain- to- Source On-Resistance(Note*2) | -- | 35 | 41 | mΩ | VGS=10V,ID=35A |
| VGS(TH) | Gate Threshold Voltage | 2.5 | -- | 5 | V | VGS=VDS,ID=3.18 mA |

## Resistive Switching Characteristics Essentially independent of operating temperature

| Symbol | Parameter | Min. | Typ. | Max. | Units | Test Conditions |
|---|---|---|---|---|---|---|
| td(ON) | Turn- on Delay Time | -- | 110 | -- | nS | VDS=300V ID=40A RG=25Ω |
| trise | Rise Time | -- | 28 | -- | | |
| td(OFF) | Turn- OFF Delay Time | -- | 560 | -- | | |
| tfall | Fall Time | -- | 23 | -- | | |

**Dynamic Characteristics** Essentially independent of operating temperature

| Symbol | Parameter | Min. | Typ. | Max. | Units | Test Conditions |
|---|---|---|---|---|---|---|
| Ciss | Input Capacitance | -- | 8162 | -- | pF | VGS=0V<br>VDS=400V<br>f=1.0MHz |
| Coss | Output Capacitance | -- | 160 | -- | | |
| Crss | Reverse Transfer Capacitance | -- | 4 | -- | | |
| Qg | Total Gate Charge | -- | 186 | -- | nC | VDS=480V<br>ID=40A<br>VGS=10V |
| Qgs | Gate- to- Source Charge | -- | 34 | -- | | |
| Qgd | Gate-to-Drain(" Miller") Charge | -- | 48 | -- | | |

**Source- Drain Diode Characteristics**

| Symbol | Parameter | Min. | Typ. | Max. | Units | Test Conditions |
|---|---|---|---|---|---|---|
| IS | Continuous Source Current | -- | -- | 70 | A | Integral pn- diode in MOSFET |
| ISM | Maximum Pulsed Current | -- | -- | 210 | A | |
| VSD | Diode Forward Voltage | -- | -- | 1.3 | V | IS=40A,VGS=0V |
| trr | Reverse Recovery Time | -- | 190 | -- | nS | VR=400V<br>IS=40A,di/dt=100A/μs |
| Qrr | Reverse Recovery Charge | -- | 1.3 | -- | μC | |

**Notes:**

* 1. Repetitive rating, pulse width limited by maximum junction temperature.
* 2. Pulse Test: Pulse width ≤ 300μs, Duty Cycle ≤ 2%

## Typical Feature Curve

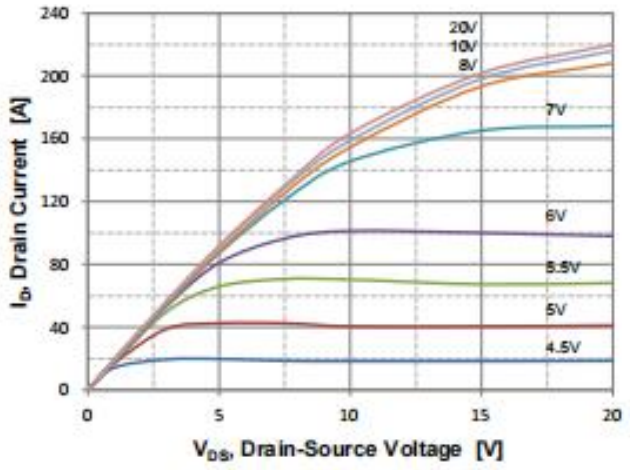



Figure 1. On Region Characteristics

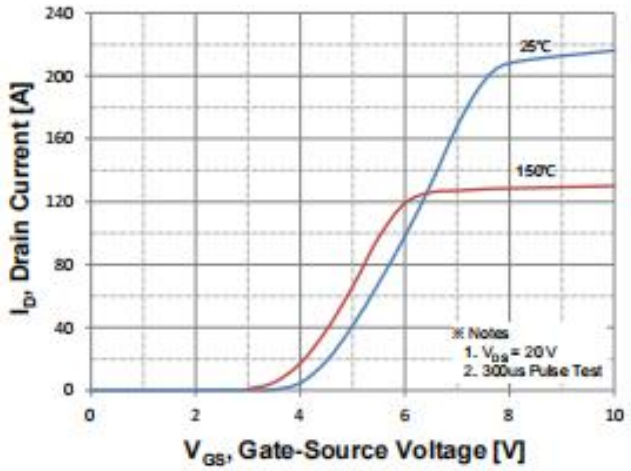



Figure 2. Transfer Characteristics

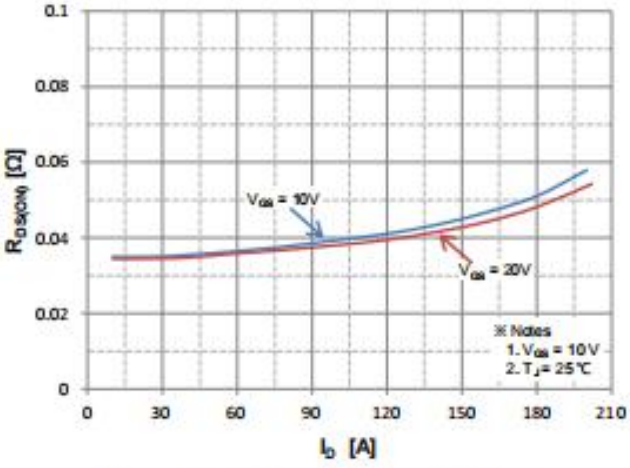



Figure 3. On Resistance Variation vs Drain Current and Gate Voltage

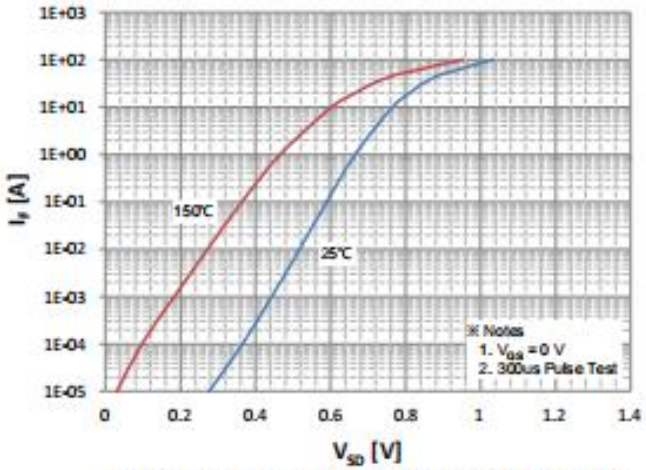



Figure 4. Body Diode Forward Voltage Variation with Source Current and Temperature

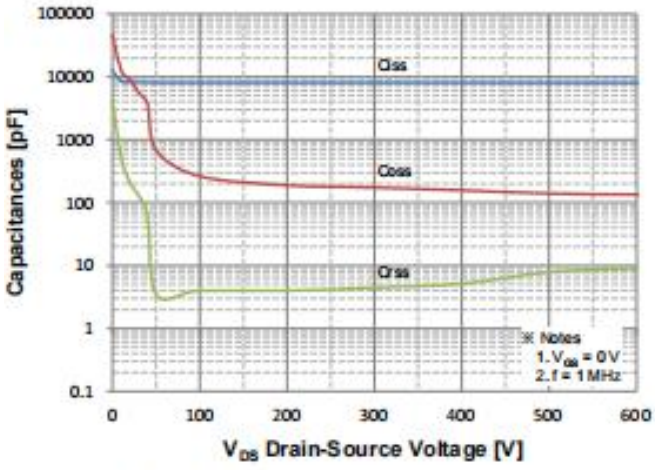



Figure 5. Capacitance Characteristics

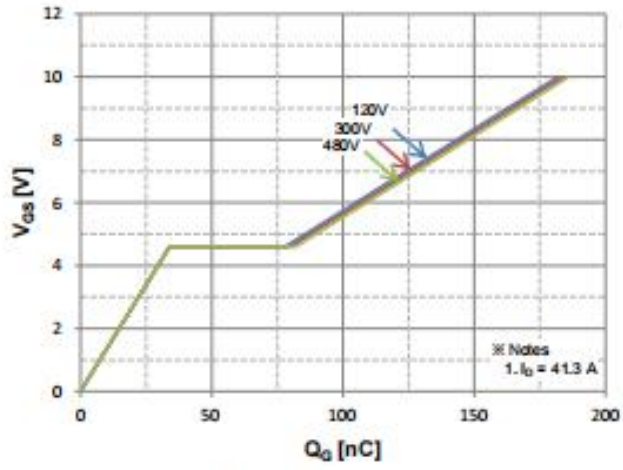



Figure 6. Gate Charge Characteristics

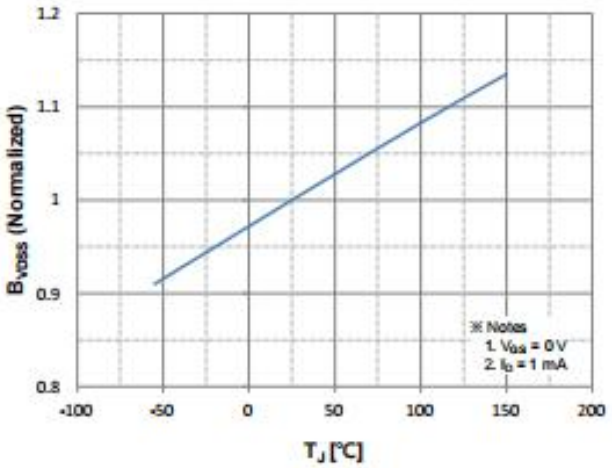



Figure 7. Breakdown Voltage Variation vs. Temperature

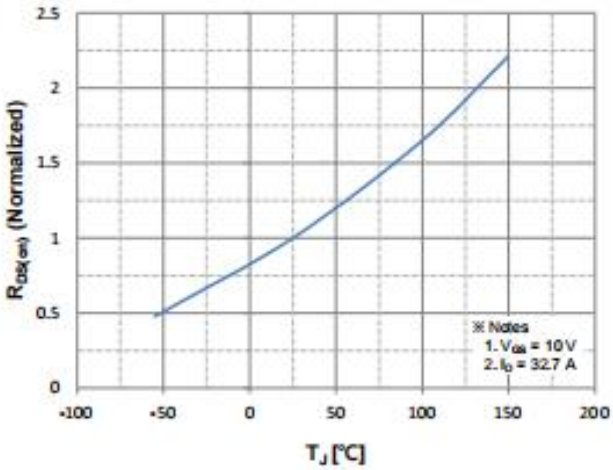



Figure 8. On-Resistance Variation vs. Temperature

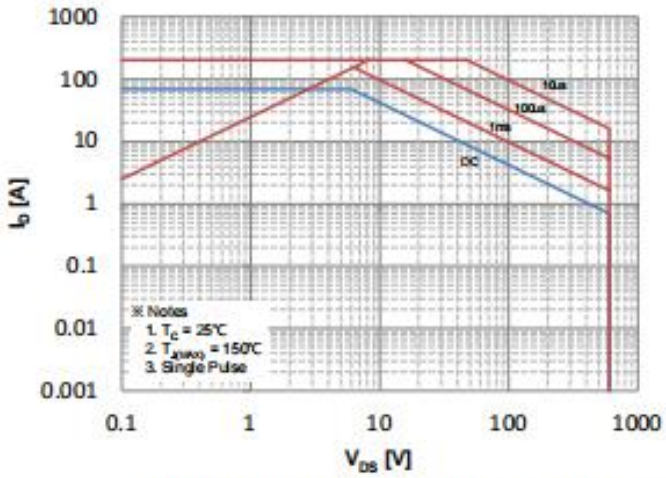



Figure 9. Maximum Safe Operating Area

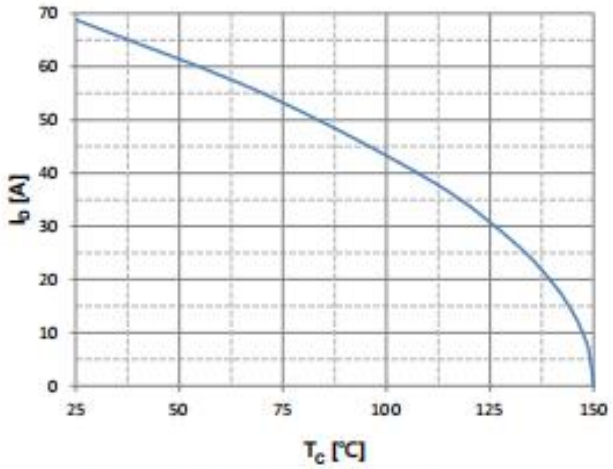



Figure 10. Maximum Drain Current vs. Case Temperature

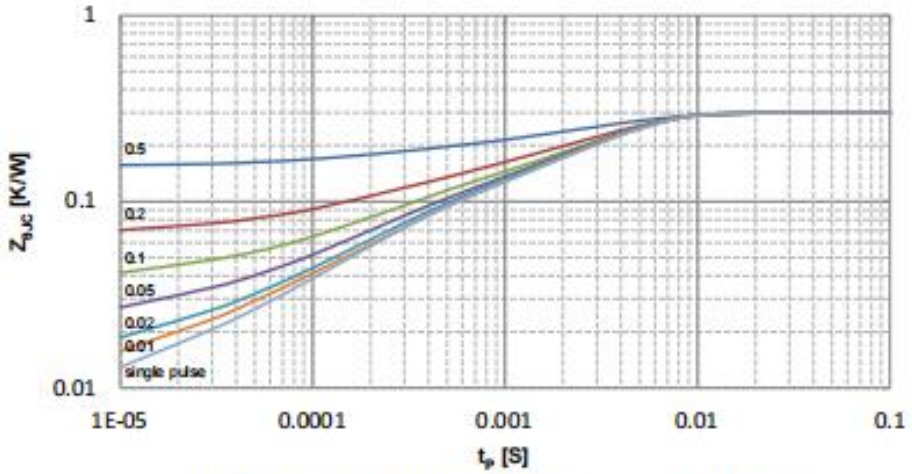



Figure 11. Transient Thermal Response Curve

## Test Circuits and Waveforms

Fig 12. Gate Charge Test Circuit & Waveform

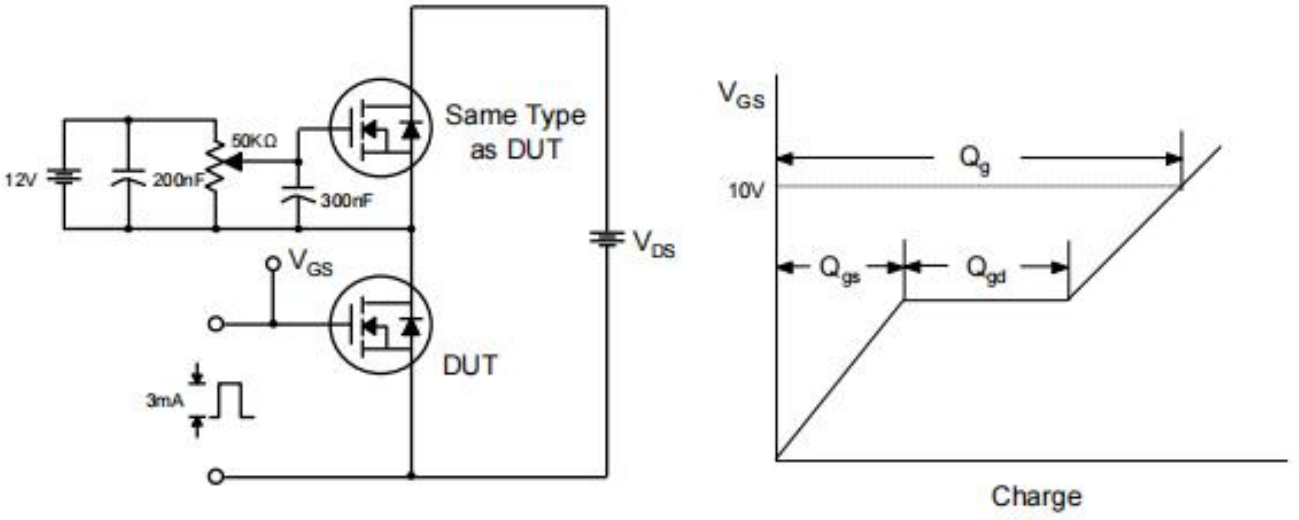



Fig 13. Resistive Switching Test Circuit & Waveforms

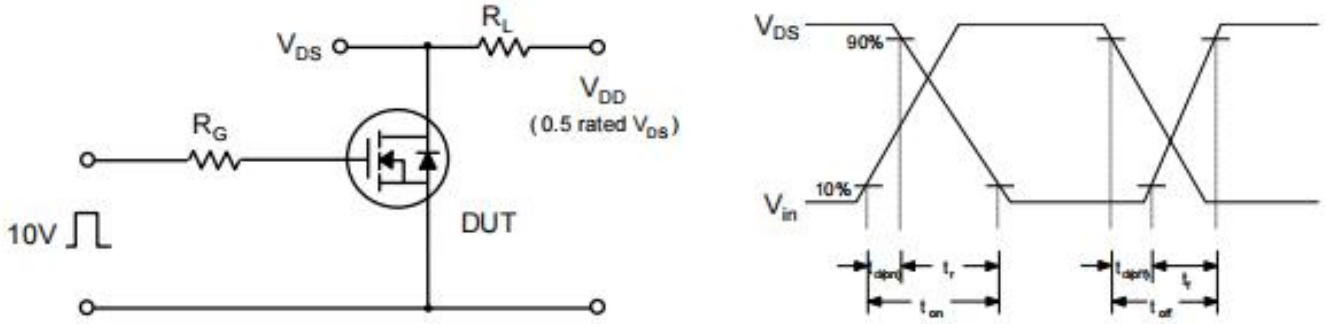
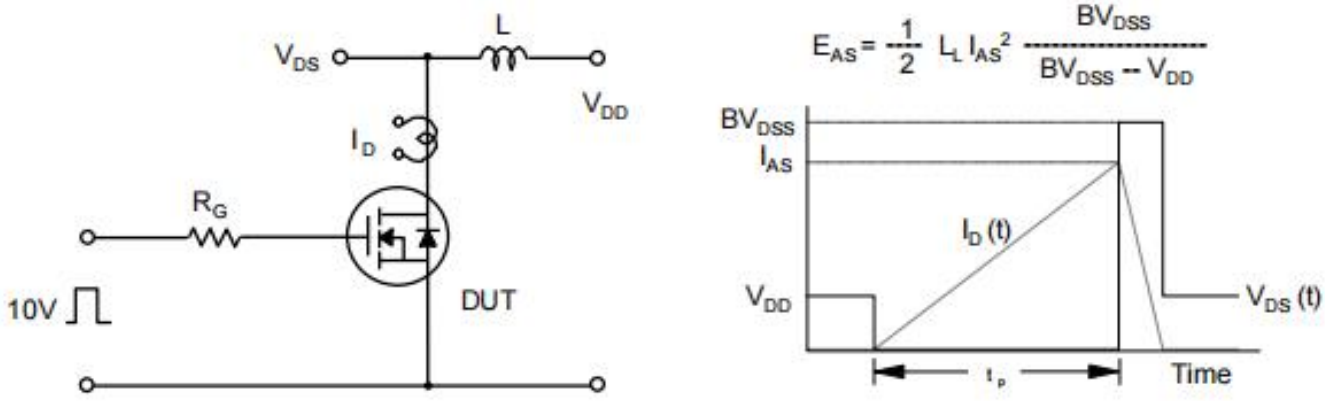
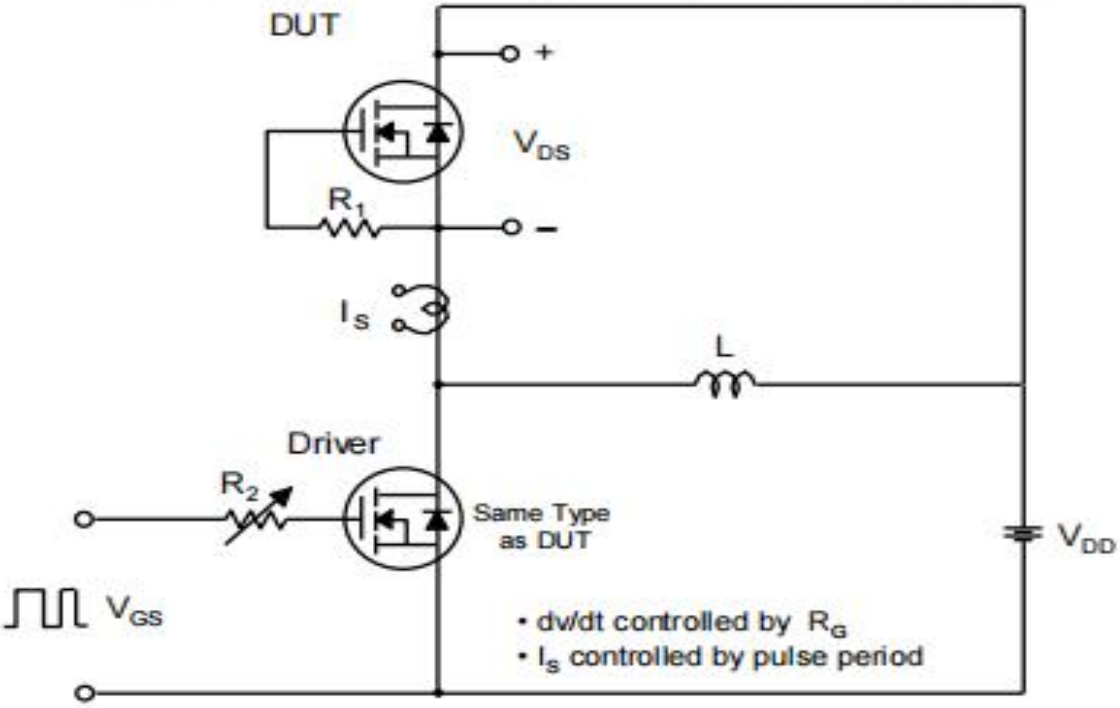


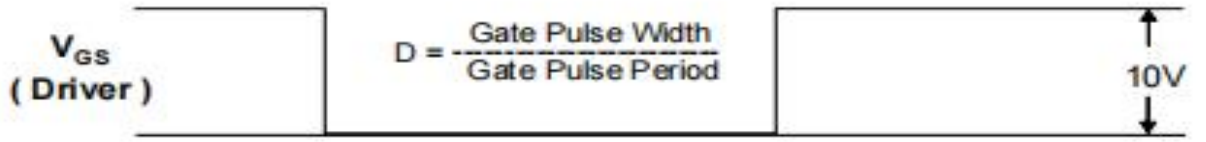

Fig 14. Unclamped Inductive Switching Test Circuit & Waveforms

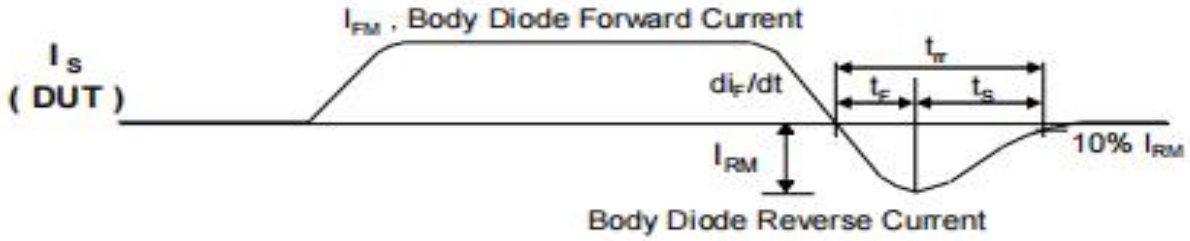


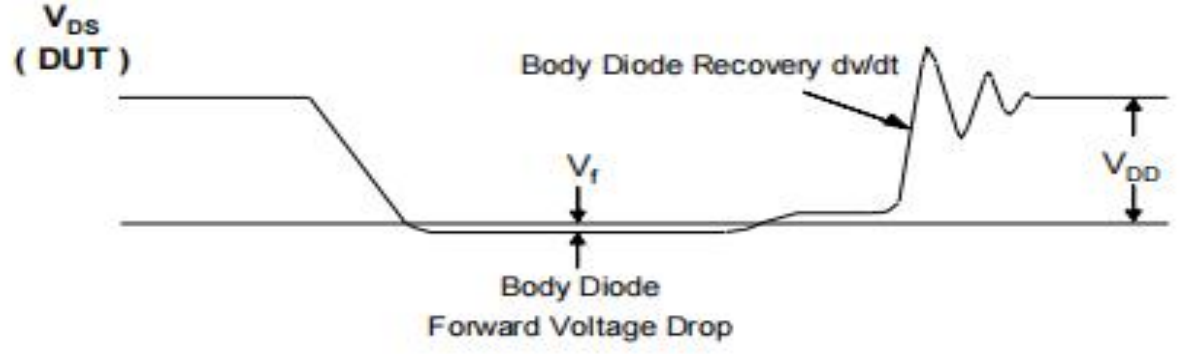
## Test Circuits and Waveforms

**Fig 15. Peak Diode Recovery dv/dt Test Circuit & Waveforms**



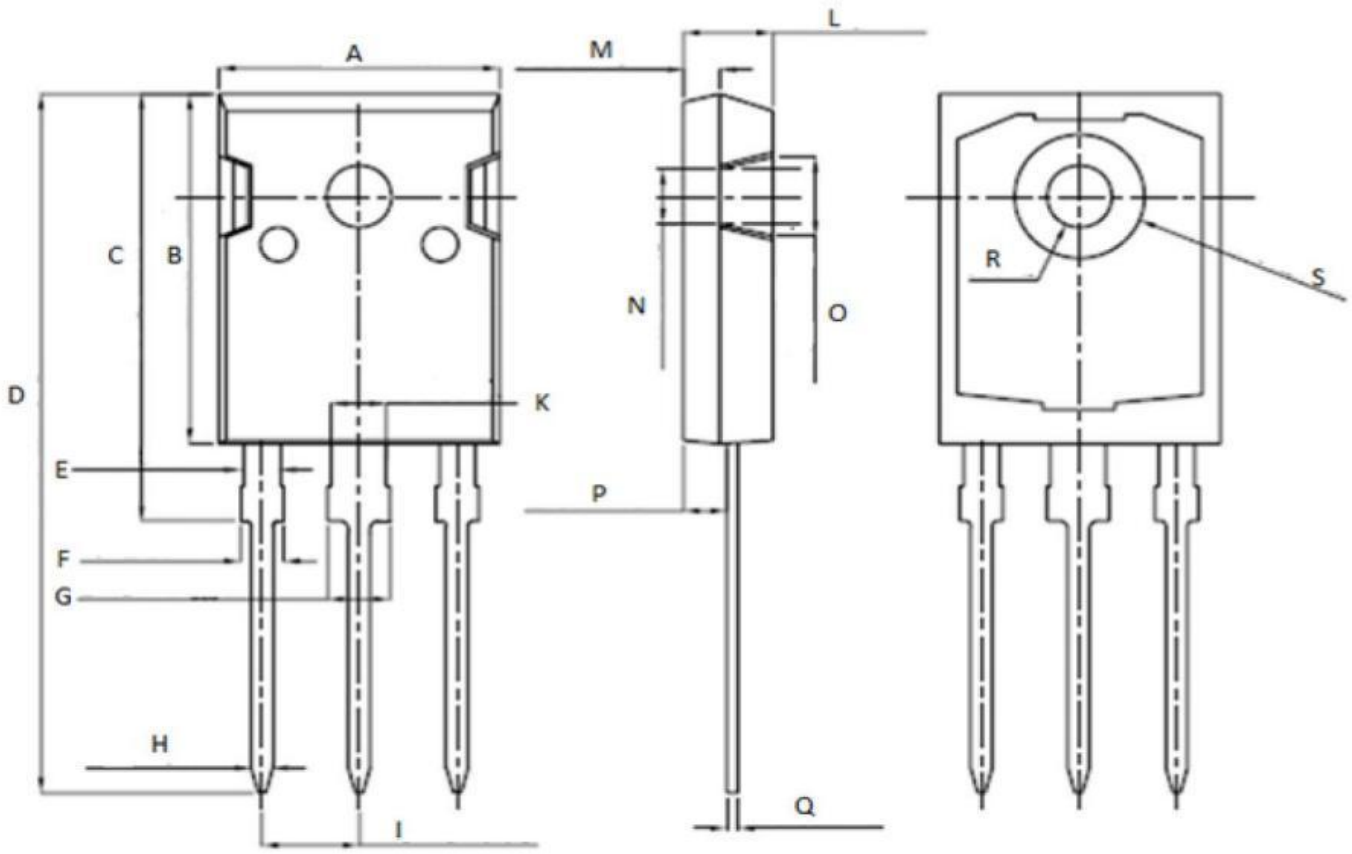



## Package outline drawing(TO-247 Unit: mm )

### TO-247




| Unit: mm | | |
|---|---|---|
| Symbol | Min. | Max. |
| A | 15.95 | 16.25 |
| B | 20.85 | 21.25 |
| C | 20.95 | 21.35 |
| D | 40.5 | 40.9 |
| E | 1.9 | 2.1 |
| F | 2.1 | 2.25 |
| G | 3.1 | 3.25 |
| H | 1.1 | 1.3 |
| I | 5.40 | 5.50 |

| Unit: mm | | |
|---|---|---|
| Symbol | Min. | Max. |
| K | 2.90 | 3.10 |
| L | 4.90 | 5.30 |
| M | 1.90 | 2.10 |
| N | 4.50 | 4.70 |
| O | 5.40 | 5.60 |
| P | 2.29 | 2.49 |
| Q | 0.51 | 0.71 |
| R | ϕ3.5 | ϕ3.7 |
| S | ϕ7.1 | ϕ7.3 |

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