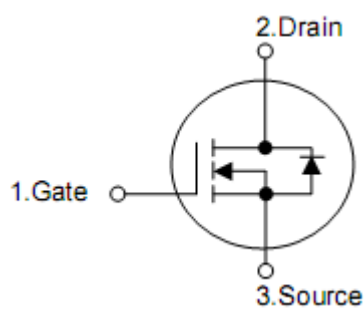


## 1. Features

- Advanced Trench technology
- $R_{DS(ON)}=2.4m\Omega$  (typ.) @  $V_{GS}=10V$
- Super Low Gate Charge
- Green Device Available
- Excellent  $CdV/dt$  effect decline
- 100%  $\Delta V_{ds}$  TESTED
- 100% UIS TESTED

## 2. Pin configuration



| Pin | Function |
|-----|----------|
| 1   | Gate     |
| 2   | Drain    |
| 3   | Source   |

### 3. Ordering Information

| Part Number | Package | Brand |
|-------------|---------|-------|
| KND2803T    | TO-252  | KIA   |

### 4. Absolute maximum ratings

$T_A=25^{\circ}\text{C}$  unless otherwise specified

| Parameter                                                          | Symbol                             | Ratings    | Unit               |
|--------------------------------------------------------------------|------------------------------------|------------|--------------------|
| Drain-to-Source Voltage ( $V_{GS}=0V$ )                            | $V_{DS}$                           | 30         | V                  |
| Gate-to-Source Voltage ( $V_{DS}=0V$ )                             | $V_{GS}$                           | $\pm 20$   | V                  |
| Continuous Drain Current <sup>1)</sup>                             | $T_C=25^{\circ}\text{C}$<br>$I_D$  | 150        | A                  |
|                                                                    | $T_C=100^{\circ}\text{C}$<br>$I_D$ | 95         | A                  |
| Pulsed Drain Current @ Current-Pulsed <sup>2)</sup>                | $I_{DM}$                           | 680        | A                  |
| Total Power Dissipation ( $T_C=25^{\circ}\text{C}$ ) <sup>4)</sup> | $P_D$                              | 143        | W                  |
| Avalanche Energy <sup>3)</sup>                                     | EAS                                | 529        | mJ                 |
| Operation Junction and Storage Temperature Range                   | $T_J, T_{STG}$                     | -55 to 150 | $^{\circ}\text{C}$ |

### 5. Thermal characteristics

| Parameter                                          | Symbol          | Max. | Unit                 |
|----------------------------------------------------|-----------------|------|----------------------|
| Thermal Resistance, Junction-to-Case <sup>1)</sup> | $R_{\theta JC}$ | 1.05 | $^{\circ}\text{C/W}$ |

## 6. Electrical characteristics

(T<sub>A</sub>=25°C, unless otherwise notes)

| Parameter                                          | Symbol              | Conditions                                                                            | Min. | Typ. | Max. | Unit |
|----------------------------------------------------|---------------------|---------------------------------------------------------------------------------------|------|------|------|------|
| Drain-Source Breakdown Voltage                     | BV <sub>DSS</sub>   | V <sub>GS</sub> =0V, I <sub>D</sub> =250uA                                            | 30   | -    | -    | V    |
| Drain-Source Leakage Current                       | I <sub>DSS</sub>    | V <sub>DS</sub> =30V, V <sub>GS</sub> =0V, T <sub>C</sub> =25°C                       | -    | -    | 1    | uA   |
| Gate-Source Leakage Current                        | I <sub>GSS</sub>    | V <sub>GS</sub> =±20V, V <sub>DS</sub> =0V                                            | -    | -    | ±100 | nA   |
| Gate Threshold Voltage                             | V <sub>GS(th)</sub> | V <sub>GS</sub> =V <sub>DS</sub> , I <sub>D</sub> =250uA                              | 1.0  | 1.8  | 2.5  | V    |
| Static Drain-Source On-Resistance <sup>2)</sup>    | R <sub>DS(on)</sub> | V <sub>GS</sub> =10V, I <sub>D</sub> =30A                                             | -    | 2.4  | 3.0  | mΩ   |
|                                                    |                     | V <sub>GS</sub> =4.5V, I <sub>D</sub> =15A                                            | -    | 3.2  | 4.2  | mΩ   |
| Gate Resistance                                    | R <sub>g</sub>      | V <sub>DS</sub> =0V, V <sub>GS</sub> =0V, f=1.0MHz                                    | -    | 0.65 | -    | Ω    |
| Input Capacitance                                  | C <sub>iss</sub>    | V <sub>DS</sub> =15V, V <sub>GS</sub> =0V, f=1.0MHz                                   | -    | 6000 | -    | pF   |
| Output Capacitance                                 | C <sub>oss</sub>    |                                                                                       | -    | 610  | -    | pF   |
| Reverse Transfer Capacitance                       | C <sub>rss</sub>    |                                                                                       | -    | 520  | -    | pF   |
| Turn-On Delay Time                                 | t <sub>d(on)</sub>  | V <sub>DS</sub> =15V, V <sub>GS</sub> =10V, R <sub>G</sub> =3.0Ω, I <sub>D</sub> =30A | -    | 12   | -    | ns   |
| Rise Time                                          | t <sub>r</sub>      |                                                                                       | -    | 26   | -    | ns   |
| Turn-Off DelayTime                                 | t <sub>d(off)</sub> |                                                                                       | -    | 80   | -    | ns   |
| Fall Time                                          | t <sub>f</sub>      |                                                                                       | -    | 45   | -    | ns   |
| TotalGate Charge                                   | Q <sub>g</sub>      | V <sub>DS</sub> =15V, V <sub>GS</sub> =10V, I <sub>D</sub> =30A                       | -    | 100  | -    | nC   |
| Gate-Source Charge                                 | Q <sub>gs</sub>     |                                                                                       | -    | 10   | -    | nC   |
| Gate-Drain Charge                                  | Q <sub>gd</sub>     |                                                                                       | -    | 18   | -    | nC   |
| Source-Drain Current (Body Diode) <sup>1),5)</sup> | I <sub>SD</sub>     | —                                                                                     | -    | -    | 150  | A    |
| Diode Forward Voltage <sup>2)</sup>                | V <sub>SD</sub>     | V <sub>GS</sub> =0V, I <sub>SD</sub> =30A, T <sub>J</sub> =25°C                       | -    | -    | 1.2  | V    |
| Reverse Recovery Time                              | t <sub>rr</sub>     | T <sub>J</sub> =25°C, I <sub>F</sub> =30A, di/dt=100A/μs                              | -    | 25   | -    | nS   |
| Reverse Recovery Charge                            | Q <sub>rr</sub>     |                                                                                       | -    | 15   | -    | nC   |
| Forward Turn-on Time                               | t <sub>on</sub>     | Intrinsic turn-on time is negligible (turn-on is dominated by LS +LD)                 |      |      |      |      |

Notes:

1) The data tested by surface mounted on a 1 inch<sup>2</sup> FR-4 board with 20Z copper.

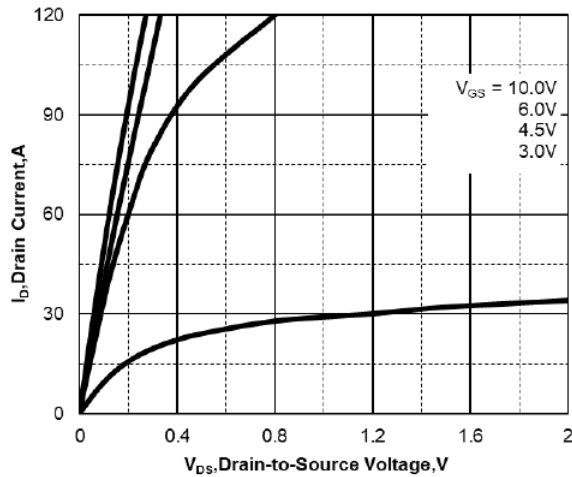
2) The data tested by pulsed, pulse width≤300us, duty cycle≤2%.

3) The test condition is V<sub>DD</sub>=20V, V<sub>GS</sub>=10V, L=0.5mH, I<sub>AS</sub>=46A.

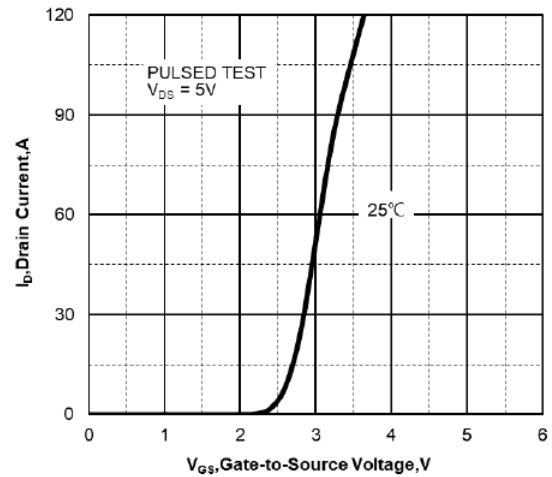
4) The power dissipation is limited by 175°C junction temperature.

5) The data is theoretically the same as I<sub>D</sub> and I<sub>DM</sub>, in real applications, should be limited by total power dissipation.

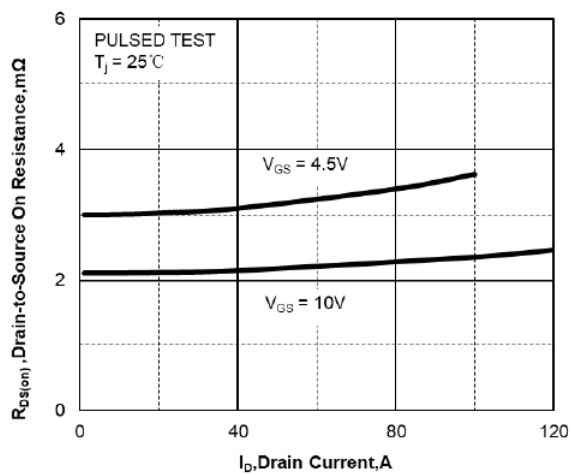
## 7. Typical Characteristics



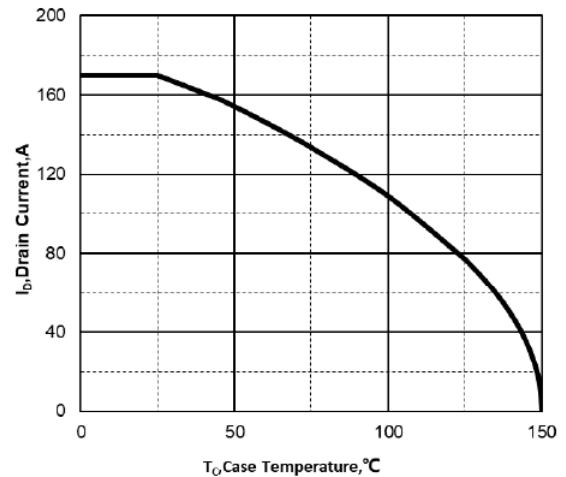
**Fig1: Typical Output Characteristics**



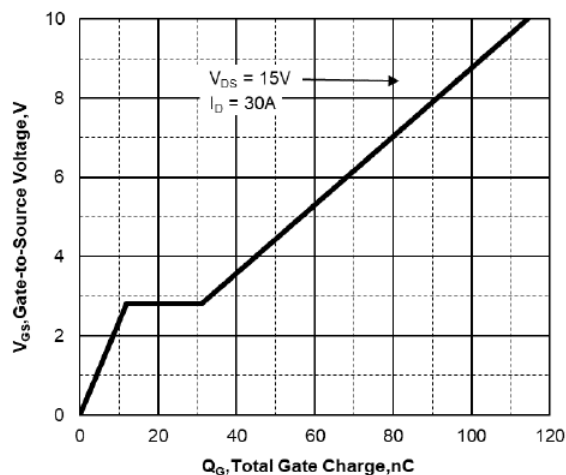
**Fig 2: Typical Transfer Characteristics**



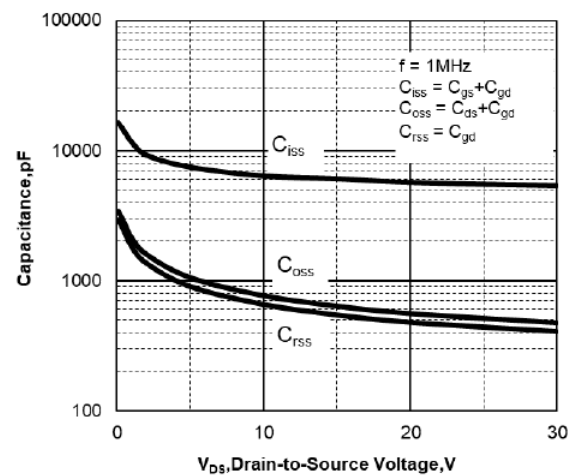
**Fig 3: On-Resistance VS. Drain Current**



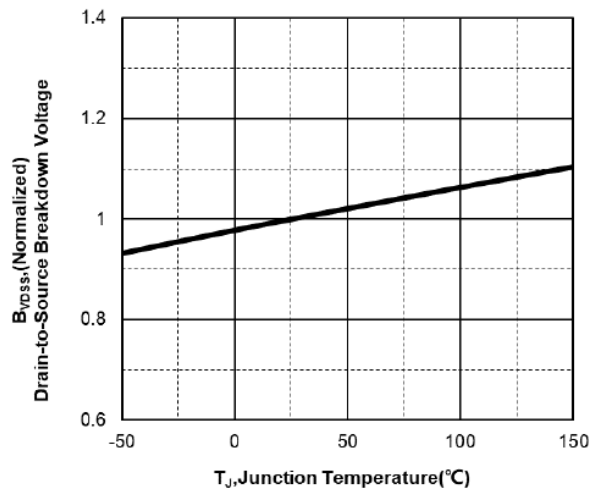
**Fig 4: Maximum Continuous Drain Current VS. Case Temperature**



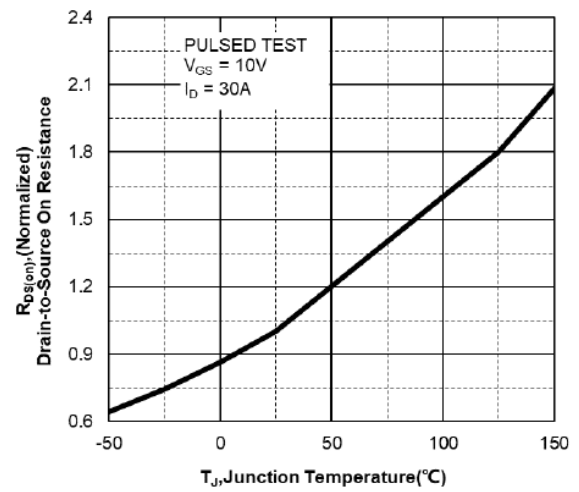
**Fig 5: Gate Charge Characteristics**



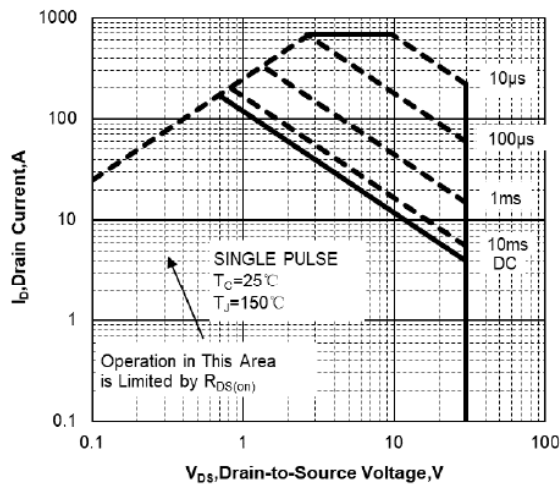
**Fig 6: Capacitance Characteristics**



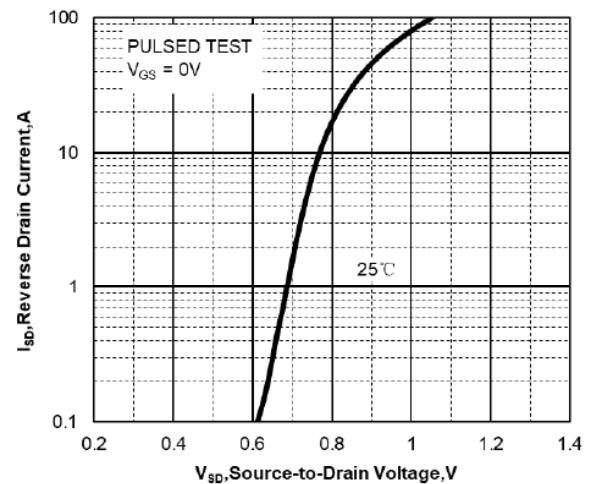
**Fig 7: Normalized Breakdown Voltage VS. Junction Temperature**



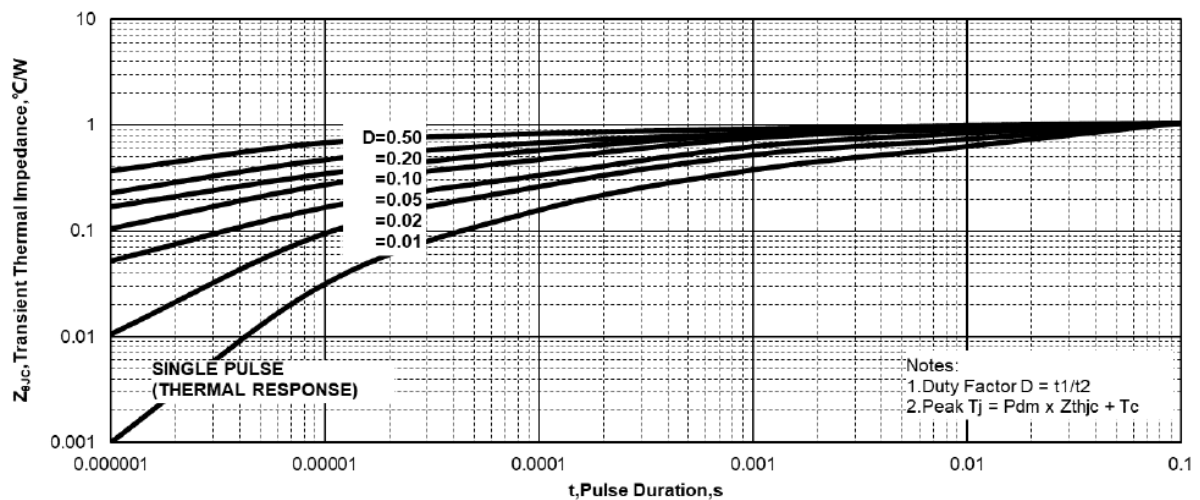
**Fig 8: Normalized on Resistance VS. Junction Temperature**



**Fig 9: Maximum Safe Operating Area**

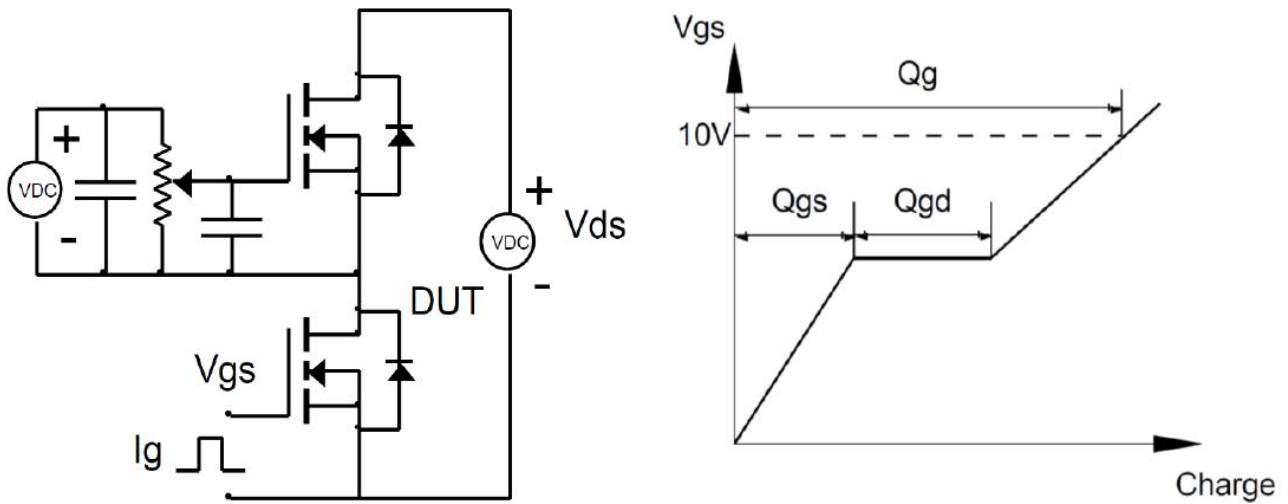


**Fig 10: Body Diode Forward Characteristics**

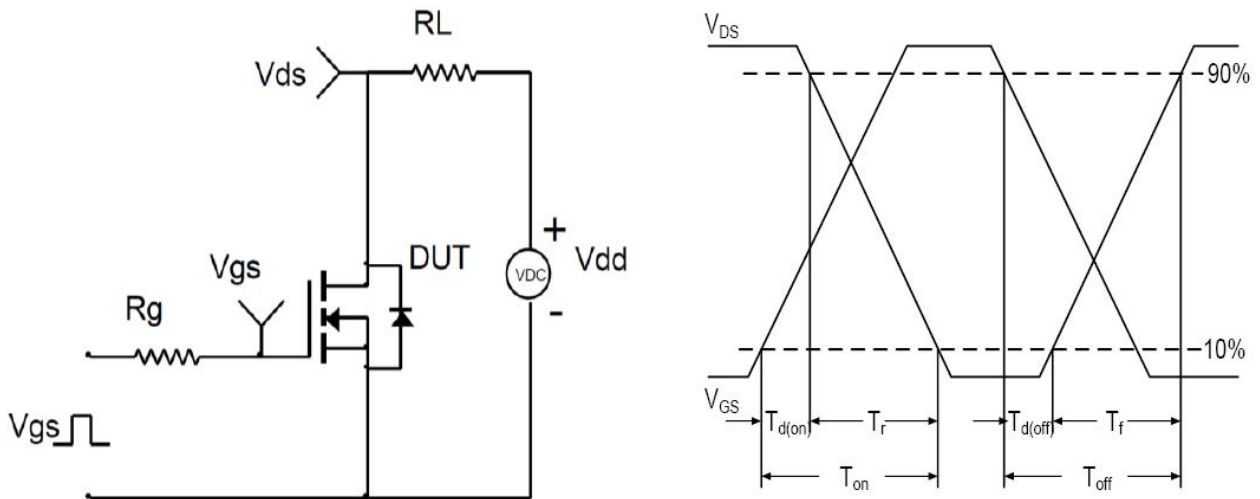


**Fig.11: Maximum Effective Transient Thermal Impedance, Junction-to-Case**

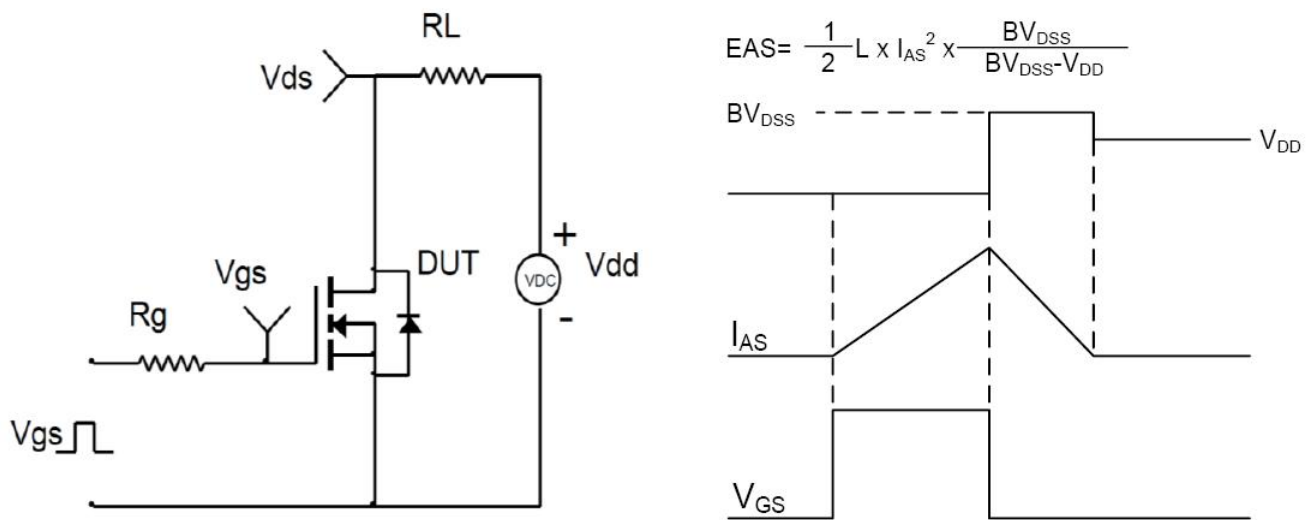
## 8. Test Circuit & Waveform



**Fig 12: Gate Charge Test Circuit and Waveforms**



**Fig 13: Resistive Switching Test Circuit and Waveforms**



**Fig 14: Unclamped Inductive Switching Test Circuit and Waveforms**