

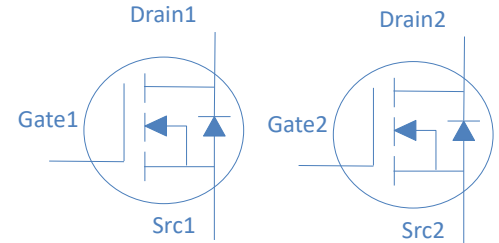
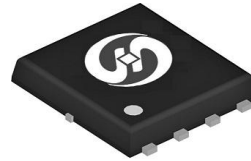
65V N-Ch Power MOSFET
Feature

- ◇ High Speed Power Switching, Logic level
- ◇ Enhanced Body diode dv/dt capability
- ◇ Enhanced Avalanche Ruggedness
- ◇ 100% UIS Tested, 100% Rg Tested
- ◇ Lead Free, Halogen Free

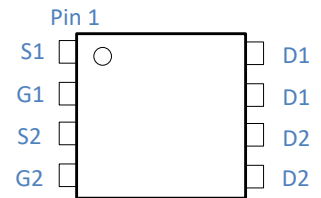
| | | | |
|-------------------------|---------------|------|------------|
| V_{DS} | | 65 | V |
| $R_{DS(on),typ}$ | $V_{GS}=10V$ | 8 | m Ω |
| $R_{DS(on),typ}$ | $V_{GS}=4.5V$ | 11.4 | m Ω |
| I_D (Silicon Limited) | | 42 | A |
| I_D (Package Limited) | | 28 | A |

Application

- ◇ Synchronous Rectification in SMPS
- ◇ Hard Switching and High Speed Circuit
- ◇ DC/DC in Telecoms and Industrial


DFN5*6


| Part Number | Package | Marking |
|-------------|---------|------------|
| HGN090AE6AL | DFN5*6 | GN090AE6AL |


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

| Parameter | Symbol | Conditions | Value | Unit |
|--|----------------|--|------------|------------------|
| Continuous Drain Current (Silicon Limited) | I_D | $T_C=25^\circ\text{C}$ | 42 | A |
| | | $T_C=100^\circ\text{C}$ | 27 | |
| | | $T_C=25^\circ\text{C}$ | 28 | |
| Continuous Drain Current (Package Limited) | | $T_C=25^\circ\text{C}$ | 28 | |
| Drain to Source Voltage | V_{DS} | - | 65 | V |
| Gate to Source Voltage | V_{GS} | - | ± 20 | V |
| Pulsed Drain Current | I_{DM} | - | 270 | A |
| Avalanche Energy, Single Pulse | E_{AS} | $L=0.4\text{mH}, T_C=25^\circ\text{C}$ | 45 | mJ |
| Power Dissipation | P_D | $T_C=25^\circ\text{C}$ | 31 | W |
| Operating and Storage Temperature | T_J, T_{stg} | - | -55 to 150 | $^\circ\text{C}$ |

Absolute Maximum Ratings

| Parameter | Symbol | Max | Unit |
|-------------------------------------|-----------------|-----|---------------------------|
| Thermal Resistance Junction-Ambient | $R_{\theta JA}$ | 55 | $^\circ\text{C}/\text{W}$ |
| Thermal Resistance Junction-Case | $R_{\theta JC}$ | 4 | $^\circ\text{C}/\text{W}$ |

Electrical Characteristics at $T_j=25^\circ\text{C}$ (unless otherwise specified)
Static Characteristics

| Parameter | Symbol | Conditions | Value | | | Unit |
|-----------------------------------|---------------|--|-------|------|-----------|-----------|
| | | | min | typ | max | |
| Drain to Source Breakdown Voltage | $V_{(BR)DSS}$ | $V_{GS}=0V, I_D=250\mu A$ | 65 | - | - | V |
| Gate Threshold Voltage | $V_{GS(th)}$ | $V_{GS}=V_{DS}, I_D=250\mu A$ | 1.0 | 1.6 | 2.4 | |
| Zero Gate Voltage Drain Current | I_{DSS} | $V_{GS}=0V, V_{DS}=60V, T_j=25^\circ\text{C}$ | - | - | 1 | μA |
| | | $V_{GS}=0V, V_{DS}=60V, T_j=100^\circ\text{C}$ | - | - | 100 | |
| Gate to Source Leakage Current | I_{GSS} | $V_{GS}=\pm 20V, V_{DS}=0V$ | - | - | ± 100 | nA |
| Drain to Source on Resistance | $R_{DS(on)}$ | $V_{GS}=10V, I_D=10A$ | - | 8 | 9.5 | $m\Omega$ |
| Drain to Source on Resistance | $R_{DS(on)}$ | $V_{GS}=4.5V, I_D=5A$ | - | 11.4 | 14 | $m\Omega$ |
| Transconductance | g_{fs} | $V_{DS}=5V, I_D=10A$ | - | 29 | - | S |
| Gate Resistance | R_G | $V_{GS}=0V, V_{DS}$ Open, $f=1\text{MHz}$ | - | 1.4 | - | Ω |

Dynamic Characteristics

| | | | | | | |
|-------------------------------|--------------|---|---|------|---|----|
| Input Capacitance | C_{iss} | $V_{GS}=0V, V_{DS}=30V, f=1\text{MHz}$ | - | 1170 | - | pF |
| Output Capacitance | C_{oss} | | - | 518 | - | |
| Reverse Transfer Capacitance | C_{riss} | | - | 31 | - | |
| Total Gate Charge | $Q_g(10V)$ | $V_{DD}=30V, I_D=10A, V_{GS}=10V$ | - | 20.5 | - | nC |
| Total Gate Charge | $Q_g(4.5V)$ | | - | 10.5 | - | |
| Gate to Source Charge | Q_{gs} | | - | 2.5 | - | |
| Gate to Drain (Miller) Charge | Q_{gd} | | - | 5.5 | - | |
| Turn on Delay Time | $t_{d(on)}$ | $V_{DD}=30V, I_D=10A, V_{GS}=10V,$ $R_G=10\Omega,$ | - | 7 | - | ns |
| Rise time | t_r | | - | 4 | - | |
| Turn off Delay Time | $t_{d(off)}$ | | - | 22 | - | |
| Fall Time | t_f | | - | 5 | - | |

Reverse Diode Characteristics

| | | | | | | |
|-------------------------|----------|--|---|-----|-----|----|
| Diode Forward Voltage | V_{SD} | $V_{GS}=0V, I_F=20A$ | - | 0.9 | 1.2 | V |
| Reverse Recovery Time | t_{rr} | $V_R=30V, I_F=10A, di_F/dt=100A/\mu s$ | - | 33 | - | ns |
| Reverse Recovery Charge | Q_{rr} | | - | 24 | - | nC |

Fig 1. Typical Output Characteristics

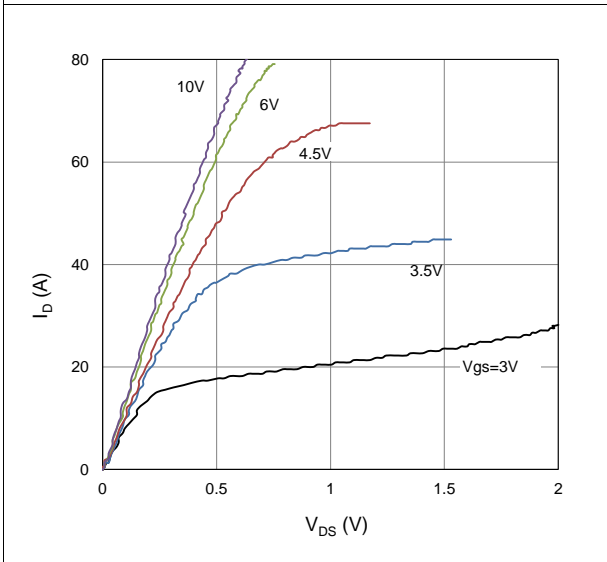


Figure 2. On-Resistance vs. Gate-Source Voltage

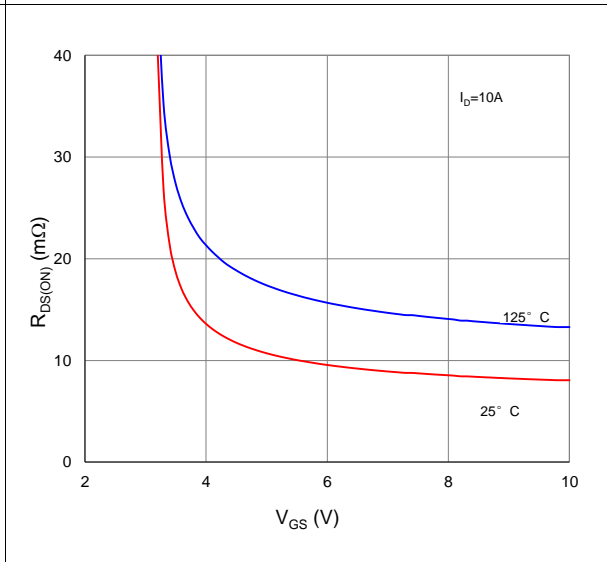


Figure 3. On-Resistance vs. Drain Current and Gate Voltage

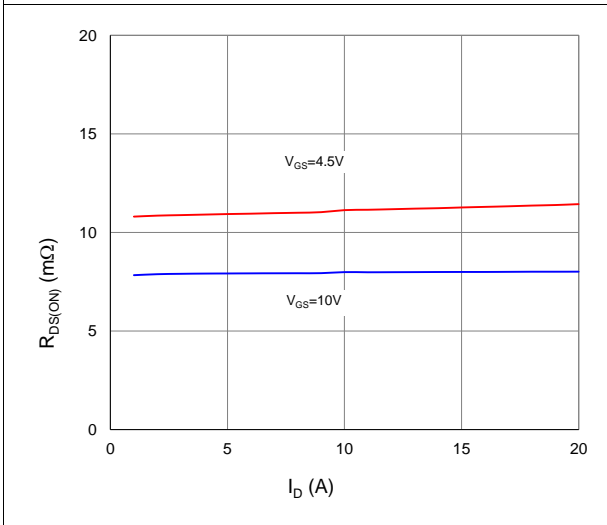


Figure 4. Normalized On-Resistance vs. Junction Temperature

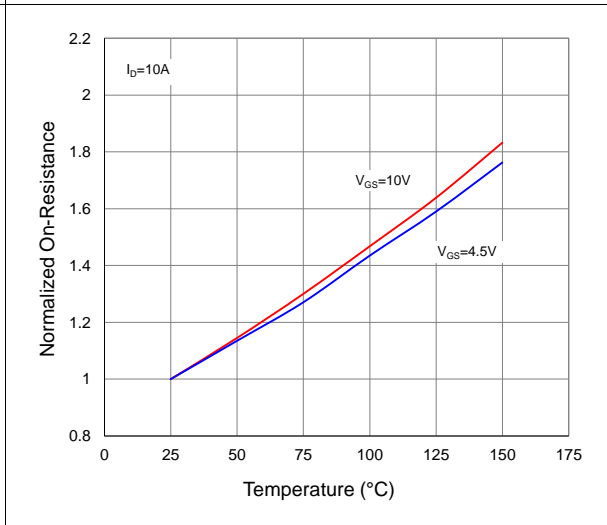


Figure 5. Typical Transfer Characteristics

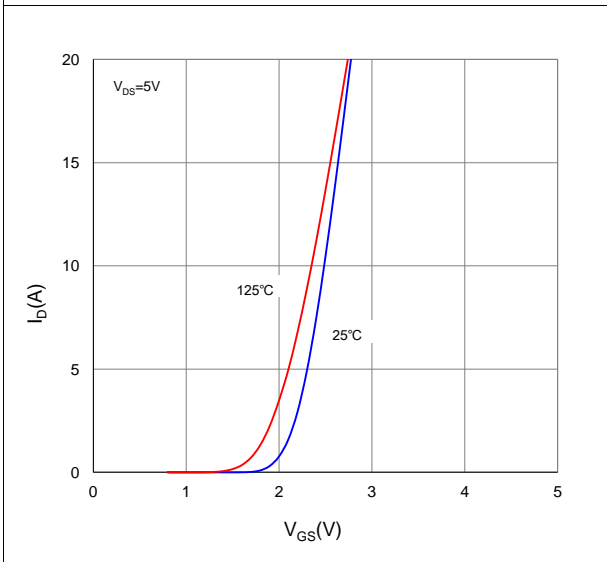


Figure 6. Typical Source-Drain Diode Forward Voltage

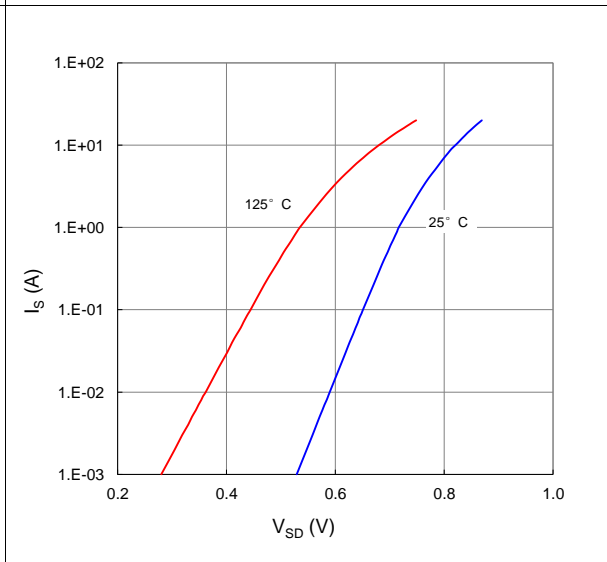


Figure 7. Typical Gate-Charge vs. Gate-to-Source Voltage

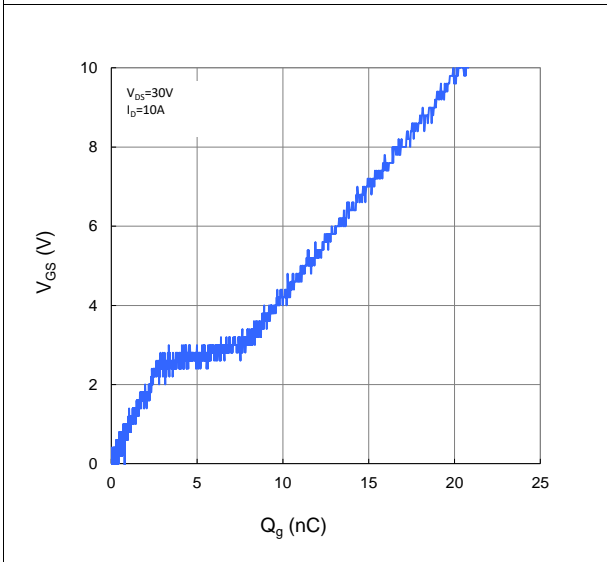


Figure 8. Typical Capacitance vs. Drain-to-Source Voltage

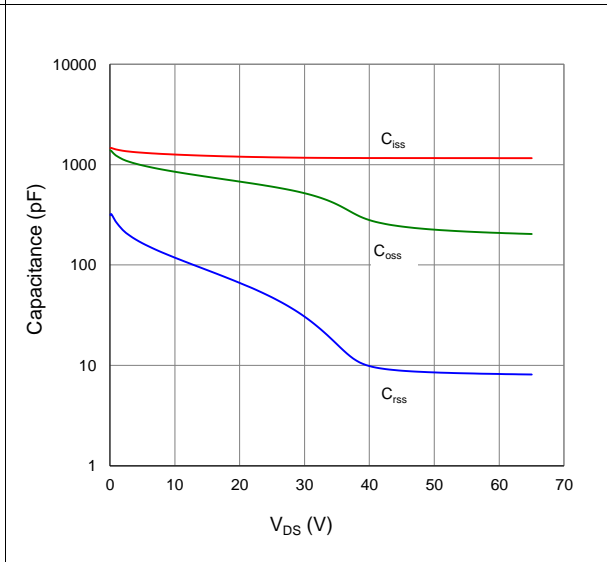


Figure 9. Maximum Safe Operating Area

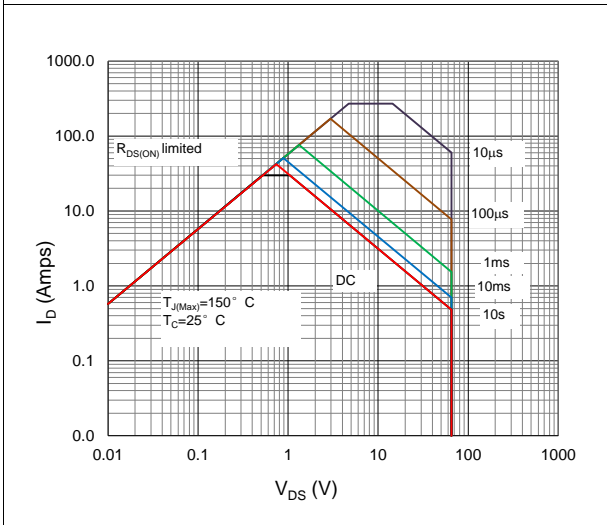


Figure 10. Maximum Drain Current vs. Case Temperature

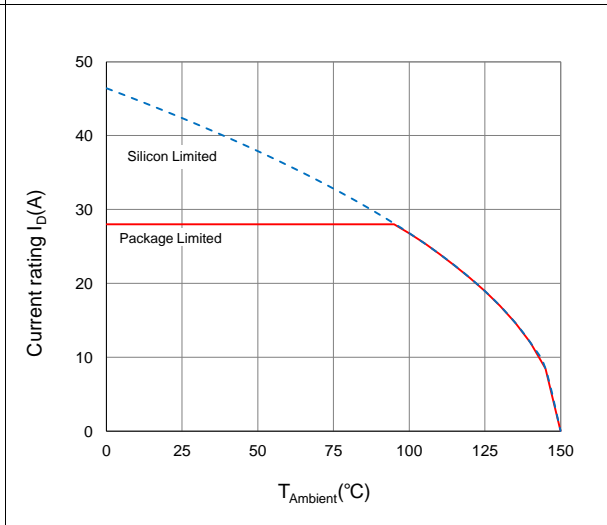
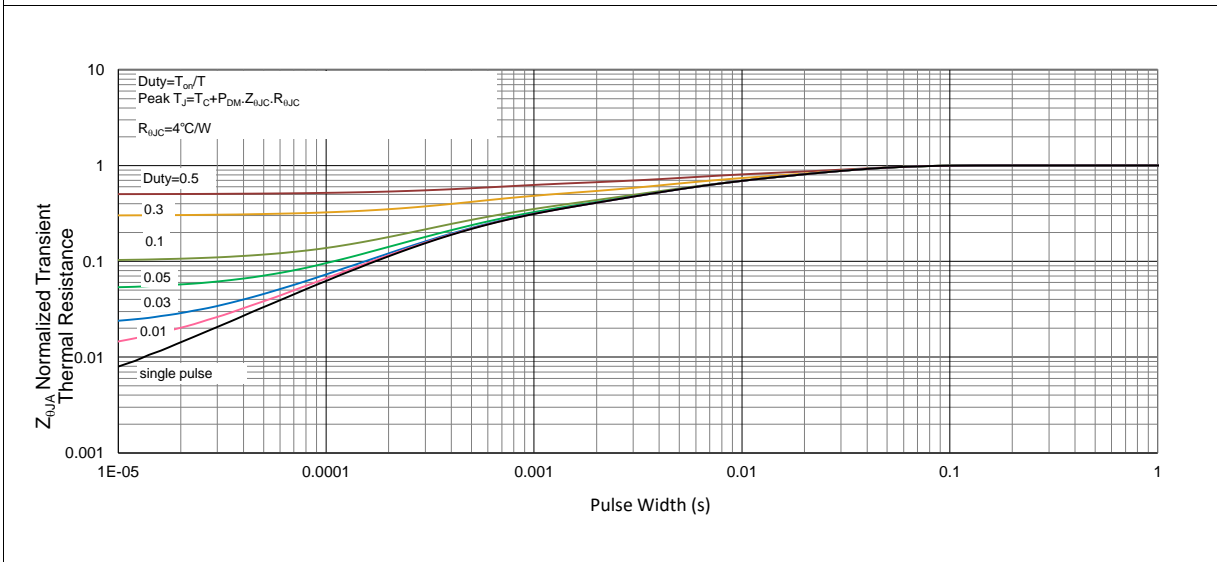
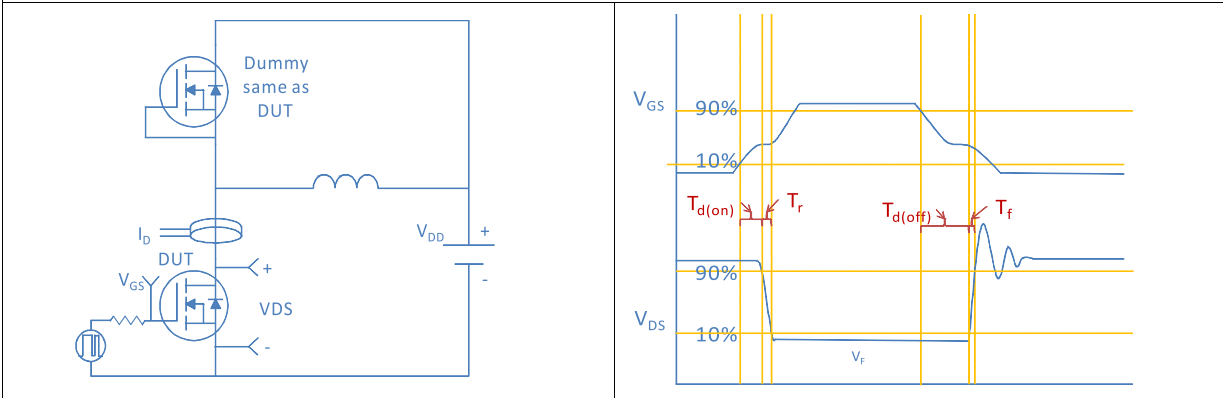


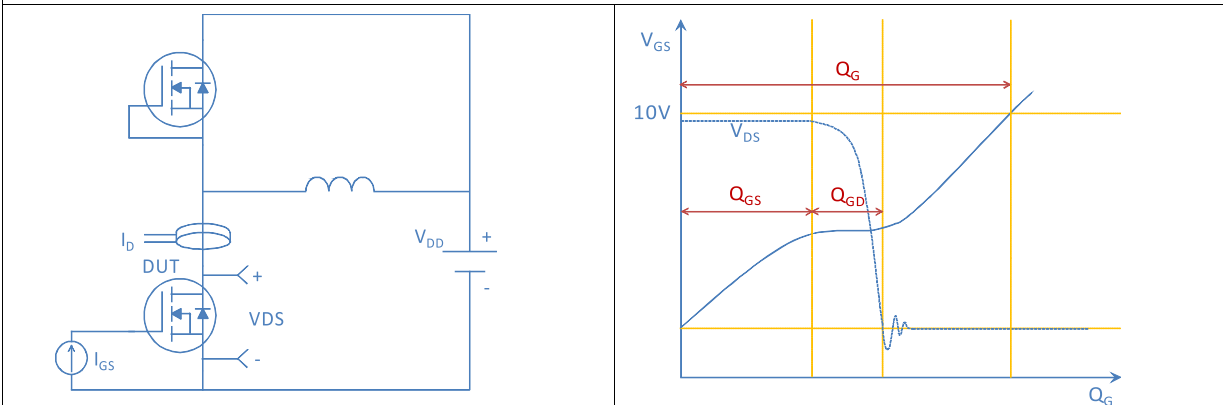
Figure 11. Normalized Maximum Transient Thermal Impedance, Junction-to-Ambient



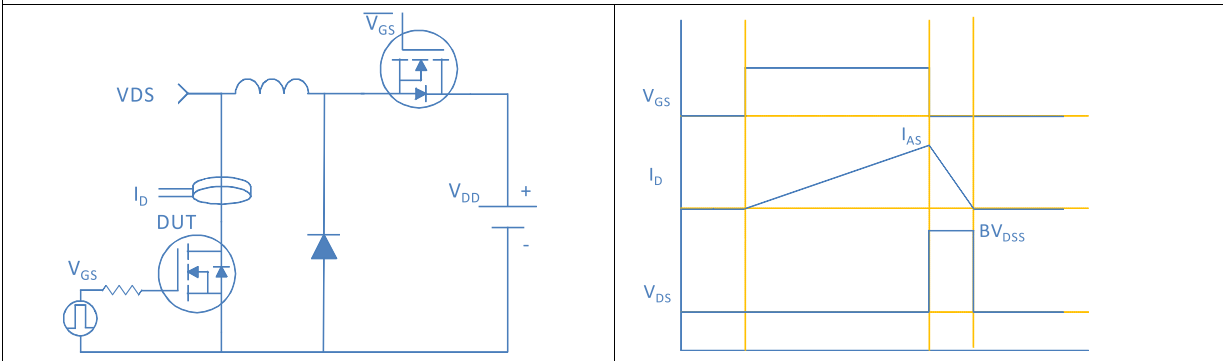
Inductive switching Test



Gate Charge Test



Uclamped Inductive Switching (UIS) Test



Diode Recovery Test

