

Excellent Integrated System Limited

Stocking Distributor

Click to view price, real time Inventory, Delivery & Lifecycle Information:

[Alpha & Omega Semiconductor Inc.](#)
[AOD496](#)

For any questions, you can email us directly:

sales@integrated-circuit.com



AOD496

N-Channel Enhancement Mode Field Effect Transistor

General Description

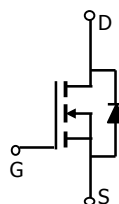
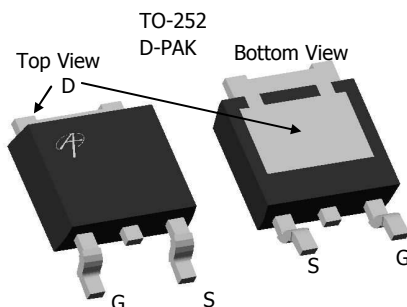
The AOD496 uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge. This device is suitable for use as a high side switch in SMPS and general purpose applications.

- RoHS Compliant
- Halogen Free*

Features

- V_{DS} (V) = 30V
- I_D = 62A (V_{GS} = 10V)
- $R_{DS(ON)} < 9.5m\Omega$ (V_{GS} = 10V)
- $R_{DS(ON)} < 16m\Omega$ (V_{GS} = 4.5V)

100% UIS Tested!
100% Rg Tested!



Absolute Maximum Ratings $T_A=25^\circ\text{C}$ unless otherwise noted

| Parameter | Symbol | Maximum | Units |
|---|-------------------------|------------|------------------|
| Drain-Source Voltage | V_{DS} | 30 | V |
| Gate-Source Voltage | V_{GS} | ± 20 | V |
| Continuous Drain Current ^B | $T_C=25^\circ\text{C}$ | 62 | A |
| | $T_C=100^\circ\text{C}$ | 44 | |
| Pulsed Drain Current | I_{DM} | 120 | |
| Avalanche Current ^C | I_{AR} | 30 | A |
| Repetitive avalanche energy $L=0.3\text{mH}$ ^C | E_{AR} | 135 | mJ |
| Power Dissipation ^B | $T_C=25^\circ\text{C}$ | 62.5 | W |
| | $T_C=100^\circ\text{C}$ | 31 | |
| Power Dissipation ^A | $T_A=25^\circ\text{C}$ | 2.5 | W |
| | $T_A=70^\circ\text{C}$ | 1.6 | |
| Junction and Storage Temperature Range | T_J, T_{STG} | -55 to 175 | $^\circ\text{C}$ |

Thermal Characteristics

| Parameter | Symbol | Typ | Max | Units |
|--|-----------------|--------------|-----|--------------------|
| Maximum Junction-to-Ambient ^A | $R_{\theta JA}$ | 15 | 20 | $^\circ\text{C/W}$ |
| Maximum Junction-to-Ambient ^A | | Steady-State | 41 | |
| Maximum Junction-to-Case ^C | $R_{\theta JC}$ | 2 | 2.4 | $^\circ\text{C/W}$ |

AOD496
Electrical Characteristics (T_J=25°C unless otherwise noted)

| Symbol | Parameter | Conditions | Min | Typ | Max | Units |
|-----------------------------|---------------------------------------|--|-----|-------------|--------|-------|
| STATIC PARAMETERS | | | | | | |
| BV _{DSS} | Drain-Source Breakdown Voltage | I _D =250μA, V _{GS} =0V | 30 | | | V |
| I _{DSS} | Zero Gate Voltage Drain Current | V _{DS} =24V, V _{GS} =0V T _J =55°C | | | 1 5 | μA |
| I _{GSS} | Gate-Body leakage current | V _{DS} =0V, V _{GS} = ±20V | | | 0.1 | μA |
| V _{GS(th)} | Gate Threshold Voltage | V _{DS} =V _{GS} I _D =250μA | 1 | 1.9 | 2.5 | V |
| I _{D(ON)} | On state drain current | V _{GS} =10V, V _{DS} =5V | 120 | | | A |
| R _{DS(ON)} | Static Drain-Source On-Resistance | V _{GS} =10V, I _D =20A T _J =125°C | | 7.7 11.0 | 9.5 | mΩ |
| | | V _{GS} =4.5V, I _D =20A | | 13 | 16.0 | mΩ |
| g _{FS} | Forward Transconductance | V _{DS} =5V, I _D =20A | | 40 | | S |
| V _{SD} | Diode Forward Voltage | I _S =1A, V _{GS} =0V | | 0.73 | 1.0 | V |
| I _S | Maximum Body-Diode Continuous Current | | | | 46 | A |
| DYNAMIC PARAMETERS | | | | | | |
| C _{iss} | Input Capacitance | V _{GS} =0V, V _{DS} =15V, f=1MHz | | 1000 | 1200 | pF |
| C _{oss} | Output Capacitance | | | 340 | | pF |
| C _{rss} | Reverse Transfer Capacitance | | | 100 | | pF |
| R _g | Gate resistance | V _{GS} =0V, V _{DS} =0V, f=1MHz | | 1.3 | 2.0 | Ω |
| SWITCHING PARAMETERS | | | | | | |
| Q _{g(10V)} | Total Gate Charge | V _{GS} =10V, V _{DS} =15V, I _D =20A | | 18 | 23 | nC |
| Q _{g(4.5V)} | Total Gate Charge | | | 8.5 | | nC |
| Q _{gs} | Gate Source Charge | | | 3.1 | | nC |
| Q _{gd} | Gate Drain Charge | | | 4.8 | | nC |
| t _{D(on)} | Turn-On DelayTime | V _{GS} =10V, V _{DS} =15V, R _L =0.75Ω, R _{GEN} =3Ω | | 5.6 | | ns |
| t _r | Turn-On Rise Time | | | 5.5 | | ns |
| t _{D(off)} | Turn-Off DelayTime | | | 18.5 | | ns |
| t _f | Turn-Off Fall Time | | | 5 | | ns |
| t _{rr} | Body Diode Reverse Recovery Time | I _F =20A, dI/dt=100A/μs | | 29 | | ns |
| Q _{rr} | Body Diode Reverse Recovery Charge | I _F =20A, dI/dt=100A/μs | | 24 | | nC |

A: The value of R_{θJA} is measured with the device in a still air environment with T_A=25°C.

B: The power dissipation P_D is based on T_{J(MAX)}=175°C, using junction-to-case thermal resistance, and is more useful in setting the upper dissipation limit for cases where additional heatsinking is used.

C: Repetitive rating, pulse width limited by junction temperature T_{J(MAX)}=175°C.

D: The R_{θJA} is the sum of the thermal impedance from junction to case R_{θJC} and case to ambient.

E: The static characteristics in Figures 1 to 6 are obtained using <300 ms pulses, duty cycle 0.5% max.

F: These curves are based on the junction-to-case thermal impedance which is measured with the device mounted to a large heatsink, assuming a maximum junction temperature of T_{J(MAX)}=175°C.

G: These tests are performed with the device mounted on 1 in 2 FR-4 board with 2oz. Copper, in a still air environment with T_A=25°C. The SOA curve provides a single pulse rating.

H: Surface mounted on a 1 in 2 FR-4 board with 2oz. Copper.

*This device is guaranteed green after data code 8X11 (Sep 1ST 2008).

Rev1: Sep. 2008

THIS PRODUCT HAS BEEN DESIGNED AND QUALIFIED FOR THE CONSUMER MARKET. APPLICATIONS OR USES AS CRITICAL COMPONENTS IN LIFE SUPPORT DEVICES OR SYSTEMS ARE NOT AUTHORIZED. AOS DOES NOT ASSUME ANY LIABILITY ARISING OUT OF SUCH APPLICATIONS OR USES OF ITS PRODUCTS. AOS RESERVES THE RIGHT TO IMPROVE PRODUCT DESIGN, FUNCTIONS AND RELIABILITY WITHOUT NOTICE.

AOD496

TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

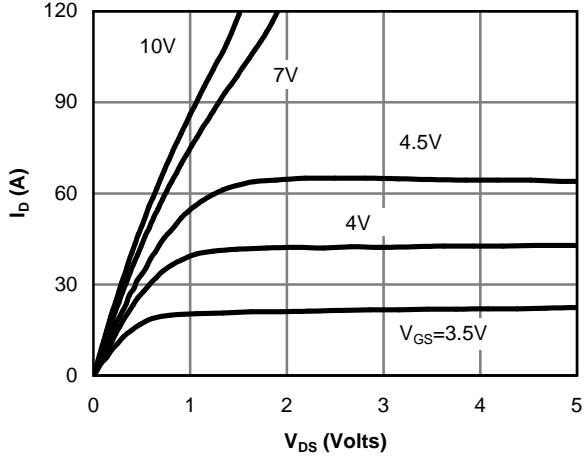


Figure 1: On-Region Characteristics

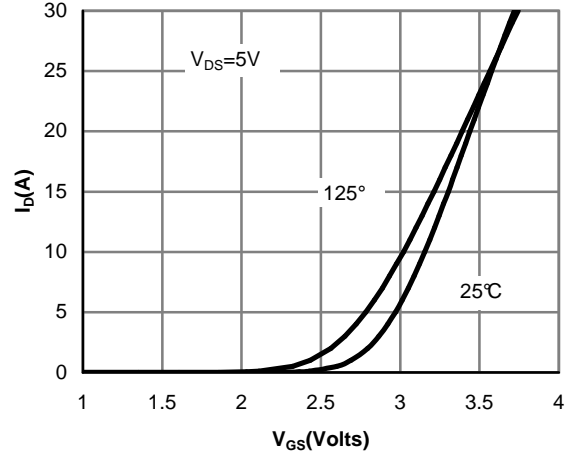


Figure 2: Transfer Characteristics

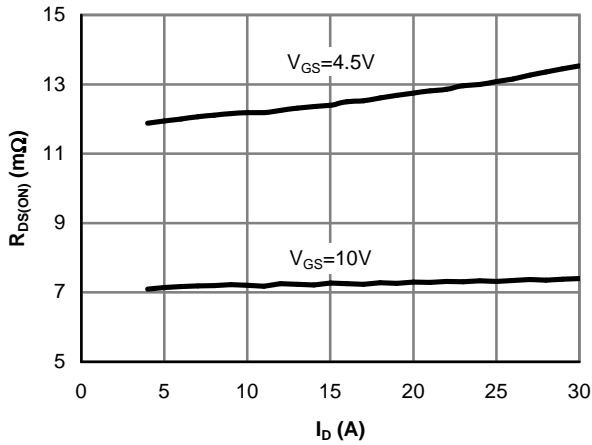


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

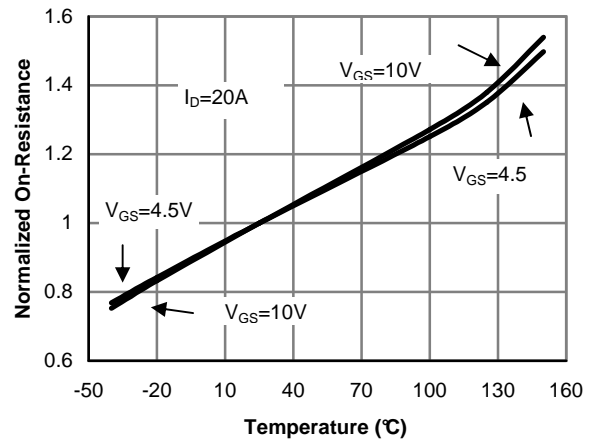


Figure 4: On-Resistance vs. Junction Temperature

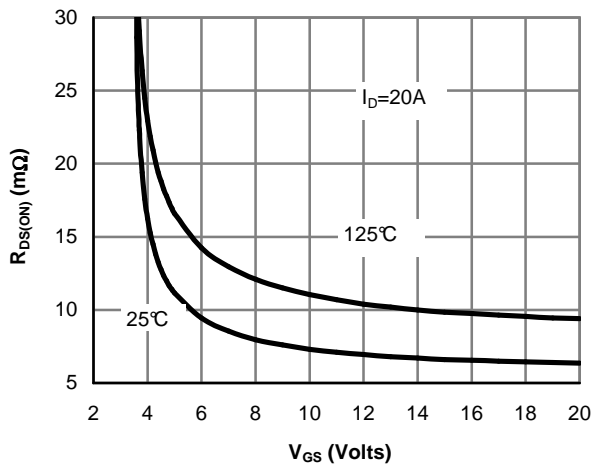


Figure 5: On-Resistance vs. Gate-Source Voltage

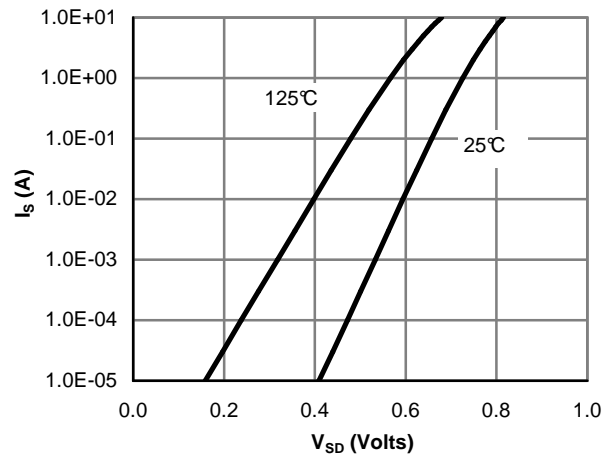


Figure 6: Body-Diode Characteristics

AOD496

TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

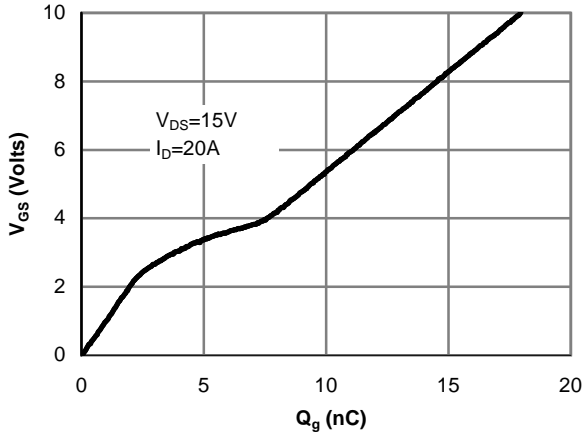


Figure 7: Gate-Charge Characteristics

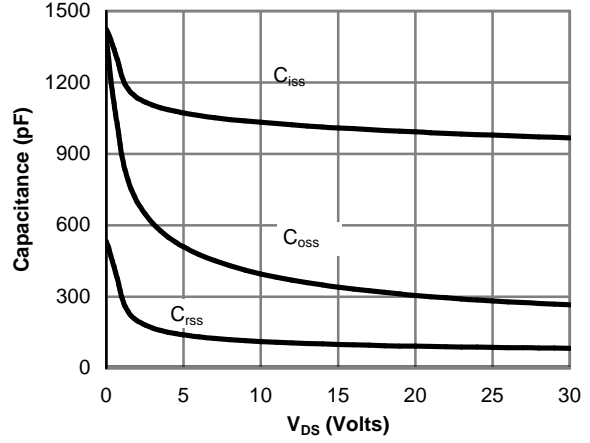


Figure 8: Capacitance Characteristics

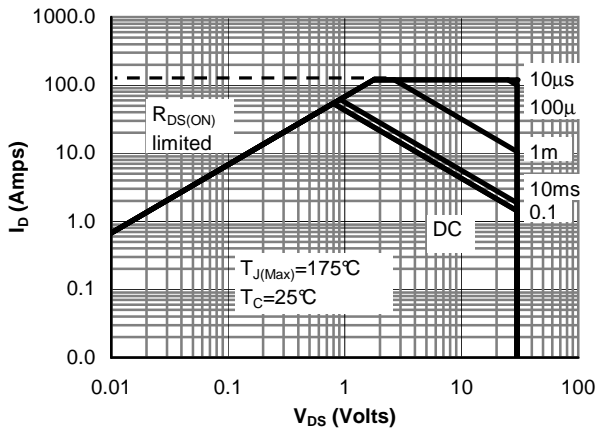


Figure 9: Maximum Forward Biased Safe Operating Area (Note F)

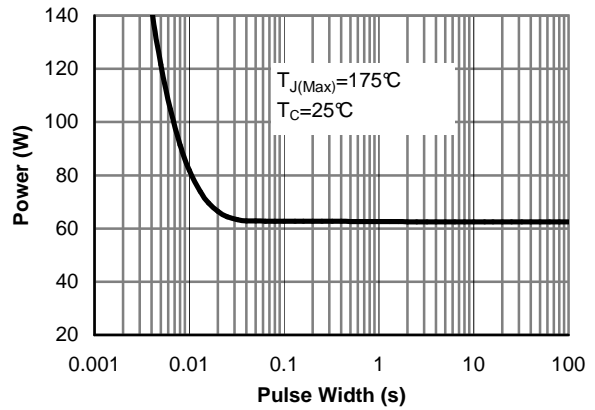


Figure 10: Single Pulse Power Rating Junction-to-Case (Note F)

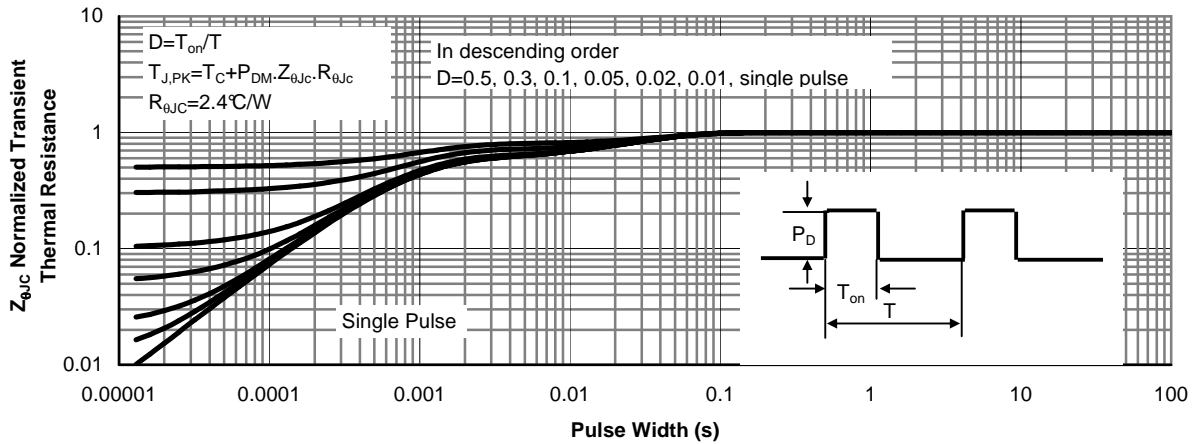
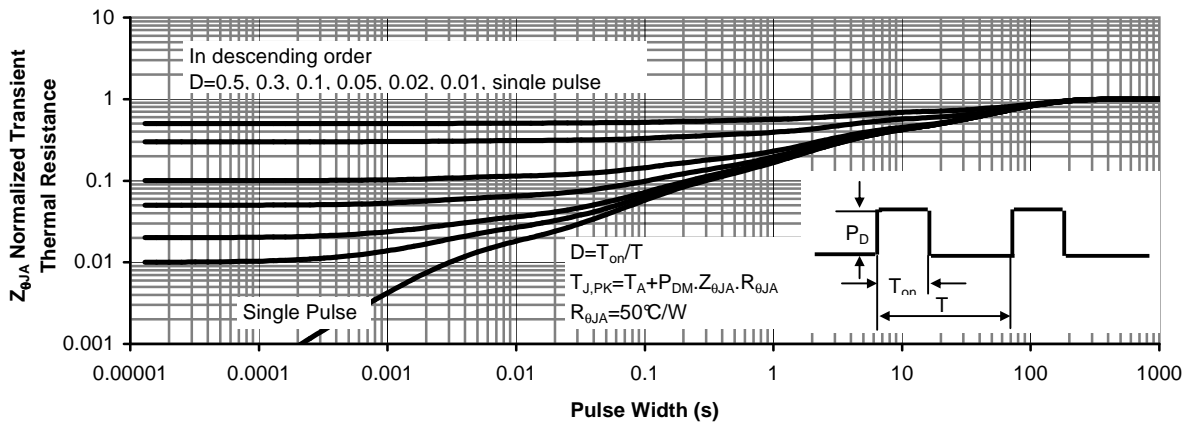
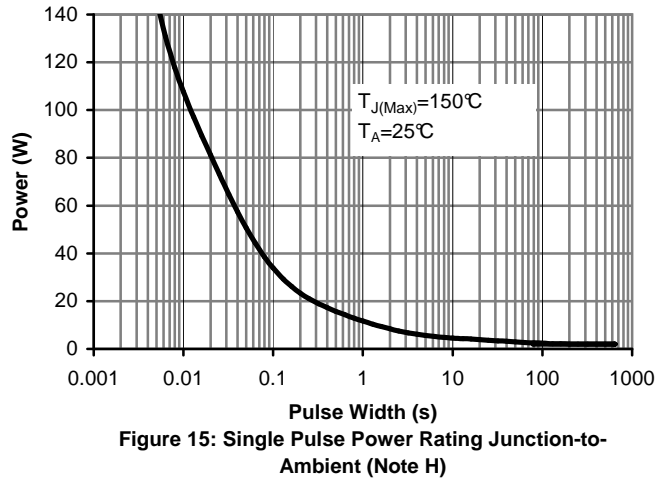
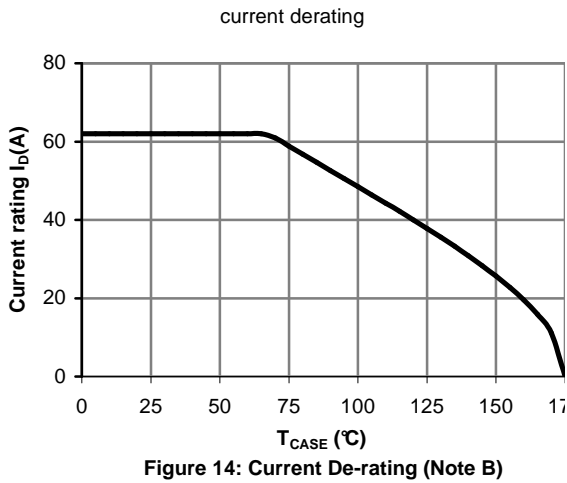
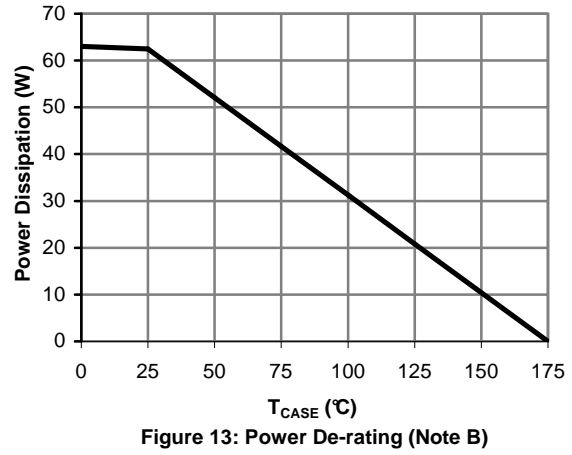
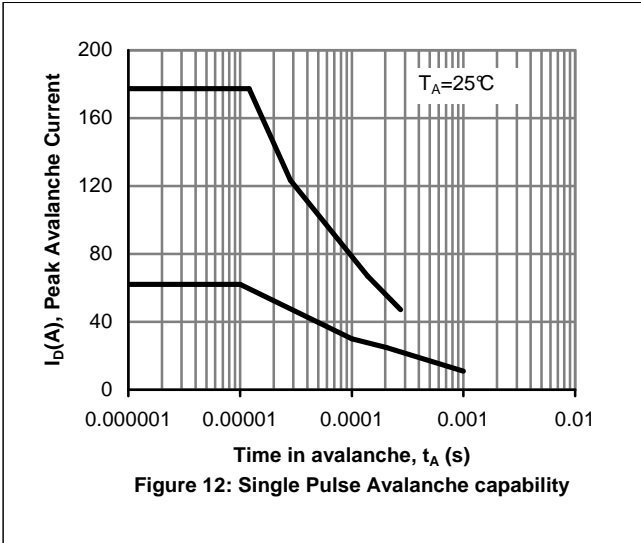


Figure 11: Normalized Maximum Transient Thermal Impedance (Note F)

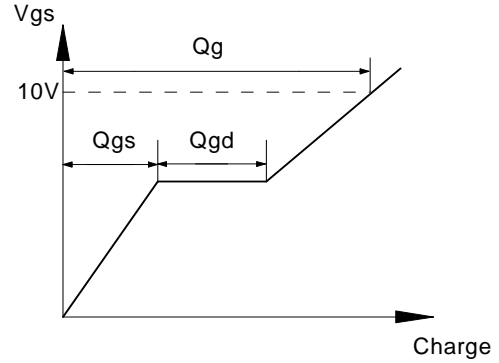
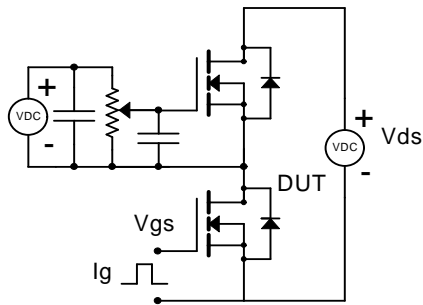
AOD496

TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

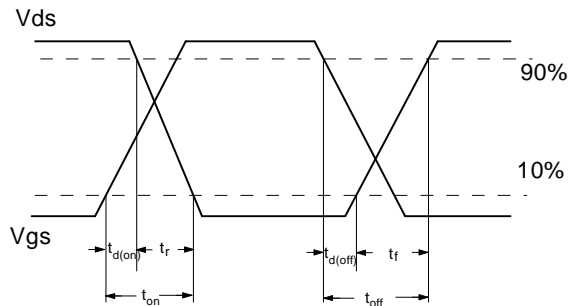
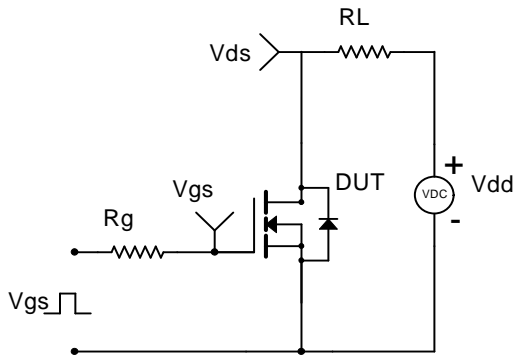


AOD490

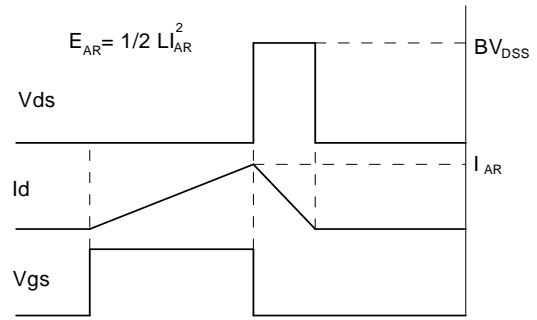
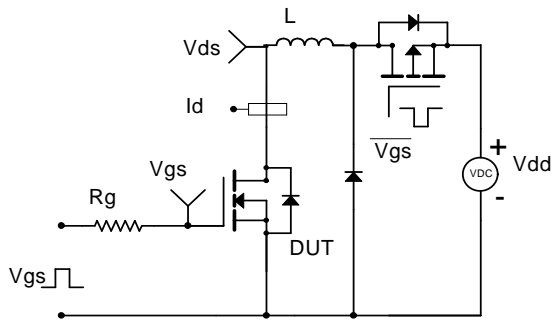
Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveforms



Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



Diode Recovery Test Circuit & Waveforms

