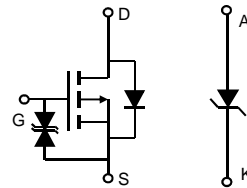
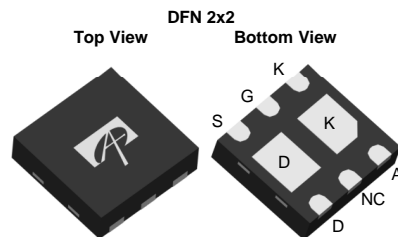


General Description

The AON2705 uses advanced trench technology to provide excellent $R_{DS(ON)}$ and low gate charge. A Schottky diode is provided to facilitate the implementation of a bidirectional blocking switch, or for DC-DC conversion applications.

Product Summary

| | |
|-------------------------------------|---------------------|
| V_{DS} | -30V |
| I_D (at $V_{GS}=-10V$) | -3.0A |
| $R_{DS(ON)}$ (at $V_{GS}=-10V$) | < 108m Ω |
| $R_{DS(ON)}$ (at $V_{GS} = -4.5V$) | < 165m Ω |
| Typical ESD protection | HBM Class 3A |
| V_{KA} | 20V |
| I_F | 2A |
| V_F (at $I_F=1A$) | <0.45V |



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

| Parameter | Symbol | MOSFET | Schottky | Units |
|---|----------------|------------------------|------------|------------------|
| Drain-Source Voltage | V_{DS} | -30 | | V |
| Gate-Source Voltage | V_{GS} | ± 20 | | V |
| Continuous Drain Current ^A | I_D | $T_A=25^\circ\text{C}$ | -3 | A |
| | | $T_A=70^\circ\text{C}$ | -2.4 | |
| Pulsed Drain Current ^B | I_{DM} | -16 | | |
| Schottky reverse voltage | V_{KA} | | 20 | V |
| Continuous Forward Current ^A | I_F | $T_A=25^\circ\text{C}$ | 2.5 | A |
| | | $T_A=70^\circ\text{C}$ | 1.5 | |
| Pulsed Forward Current ^B | I_{FM} | | 15 | |
| Power Dissipation ^A | P_D | $T_A=25^\circ\text{C}$ | 1.5 | W |
| | | $T_A=70^\circ\text{C}$ | 0.95 | |
| Junction and Storage Temperature Range | T_J, T_{STG} | -55 to 150 | -55 to 150 | $^\circ\text{C}$ |

Thermal Characteristics

| Parameter: MOSFET | Symbol | Typ | Max | Units |
|---|-----------------|-----|-----|--------------------|
| Maximum Junction-to-Ambient ^A $t \leq 10s$ | $R_{\theta JA}$ | 35 | 45 | $^\circ\text{C/W}$ |
| Maximum Junction-to-Ambient ^A Steady-State | | 65 | 85 | $^\circ\text{C/W}$ |
| Parameter: Schottky | | | | |
| Maximum Junction-to-Ambient ^A $t \leq 10s$ | $R_{\theta JA}$ | 36 | 47 | $^\circ\text{C/W}$ |
| Maximum Junction-to-Ambient ^A Steady-State | | 67 | 87 | $^\circ\text{C/W}$ |

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} =-30V, V _{GS} =0V T _J =55°C | | | -1 -5 | μA |
| I _{GSS} | Gate-Body leakage current | V _{DS} =0V, V _{GS} =±16V | | | ±10 | μA |
| V _{GS(th)} | Gate Threshold Voltage | V _{DS} =V _{GS} , I _D =-250μA | -1.3 | -1.8 | -2.3 | V |
| I _{D(ON)} | On state drain current | V _{GS} =-10V, V _{DS} =-5V | -16 | | | A |
| R _{DS(ON)} | Static Drain-Source On-Resistance | V _{GS} =-10V, I _D =-3A T _J =125°C | | 89 | 108 | mΩ |
| | | V _{GS} =-4.5V, I _D =-2.5A | | 123 | 150 | |
| g _{FS} | Forward Transconductance | V _{DS} =-5V, I _D =-3A | | 6 | | S |
| V _{SD} | Diode Forward Voltage | I _S =-1A, V _{GS} =0V | | -0.8 | -1 | V |
| I _S | Maximum Body-Diode Continuous Current | | | | -1.25 | A |
| DYNAMIC PARAMETERS | | | | | | |
| C _{iss} | Input Capacitance | V _{GS} =0V, V _{DS} =-15V, f=1MHz | | 180 | | pF |
| C _{oss} | Output Capacitance | | | 44 | | pF |
| C _{rss} | Reverse Transfer Capacitance | | | 25 | | pF |
| R _g | Gate resistance | V _{GS} =0V, V _{DS} =0V, f=1MHz | | 18.5 | 37 | Ω |
| SWITCHING PARAMETERS | | | | | | |
| Q _{g(10V)} | Total Gate Charge | V _{GS} =-10V, V _{DS} =-15V, I _D =-3A | | 4 | 6 | nC |
| Q _{g(4.5V)} | Total Gate Charge | | | 2 | 3.5 | nC |
| Q _{gs} | Gate Source Charge | | | 0.6 | | nC |
| Q _{gd} | Gate Drain Charge | | | 1 | | nC |
| t _{D(on)} | Turn-On DelayTime | V _{GS} =-10V, V _{DS} =-15V, R _L =5Ω, R _{GEN} =3Ω | | 8 | | ns |
| t _r | Turn-On Rise Time | | | 5 | | ns |
| t _{D(off)} | Turn-Off DelayTime | | | 18 | | ns |
| t _f | Turn-Off Fall Time | | | 7 | | ns |
| t _{rr} | Body Diode Reverse Recovery Time | | I _F =-3A, dI/dt=100A/μs | | 10.5 | |
| Q _{rr} | Body Diode Reverse Recovery Charge | I _F =-3A, dI/dt=100A/μs | | 3.5 | | nC |
| SCHOTTKY PARAMETERS | | | | | | |
| V _F | Forward Voltage Drop | I _F =1A | | 0.4 | 0.45 | V |
| I _{rm} | Maximum reverse leakage current | V _R =5V | | | 0.05 | mA |
| | | V _R =5V, T _J =125°C | | | 10 | |
| I _{rm} | Maximum reverse leakage current | V _R =16V | | | 0.1 | mA |
| | | V _R =16V, T _J =125°C | | | 20 | |
| C _T | Junction Capacitance | V _R =10V | | 34 | | pF |
| t _{rr} | Schottky Reverse Recovery Time | I _F =1A, dI/dt=100A/μs | | 11 | 14 | ns |
| Q _{rr} | Schottky Reverse Recovery Charge | I _F =1A, dI/dt=100A/μs | | 0.8 | | nC |

A: The value of R_{θJA} is measured with the device mounted on 1in² FR-4 board with 2oz. Copper, in a still air environment with T_A=25° C. The value in any given application depends on the user's specific board design. The current rating is based on the t ≤ 10s thermal resistance rating.

B: Repetitive rating, pulse width limited by junction temperature.

C: The R_{θJA} is the sum of the thermal impedance from junction to lead R_{θJL} and lead to ambient.

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

E: These tests are performed with the device mounted on 1 in² FR-4 board with 2oz. Copper, in a still air environment with T_A=25° C. The SOA curve provides a single pulse rating.

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TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

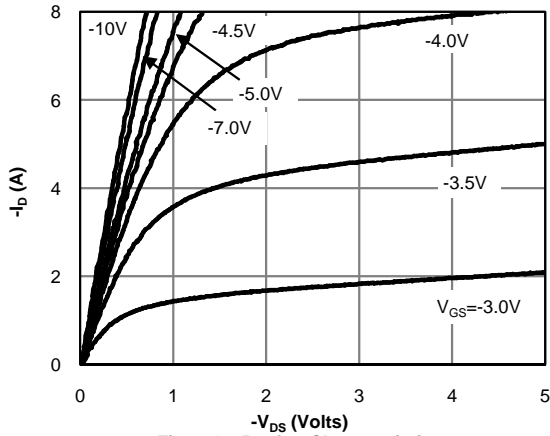


Fig 1: On-Region Characteristics

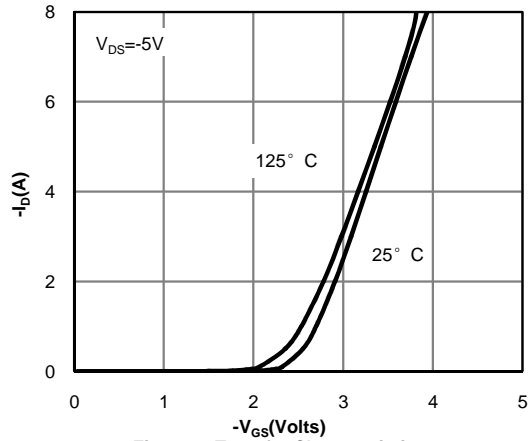


Figure 2: Transfer Characteristics

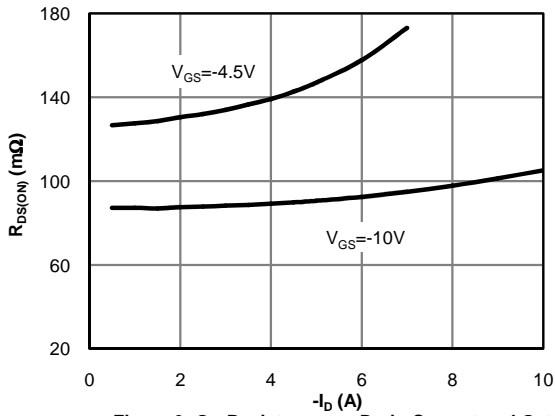


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

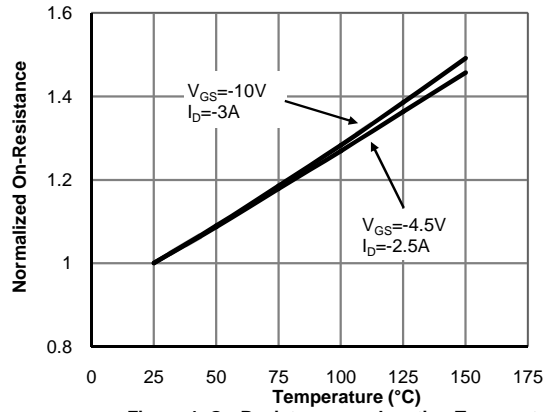


Figure 4: On-Resistance vs. Junction Temperature

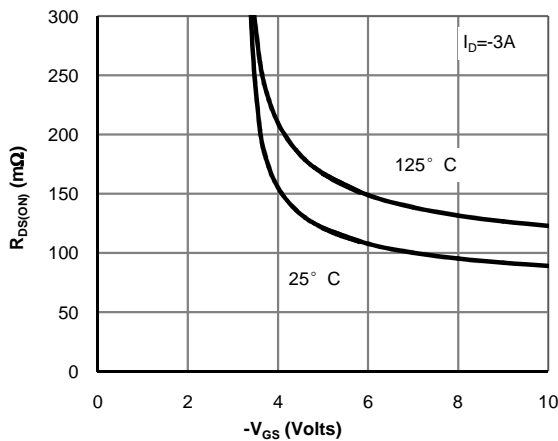


Figure 5: On-Resistance vs. Gate-Source Voltage

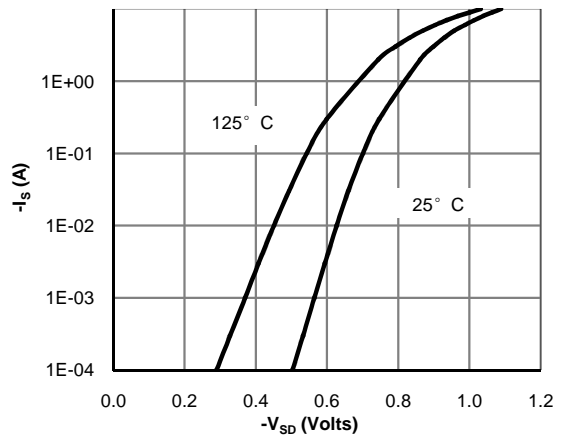


Figure 6: Body-Diode Characteristics

TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

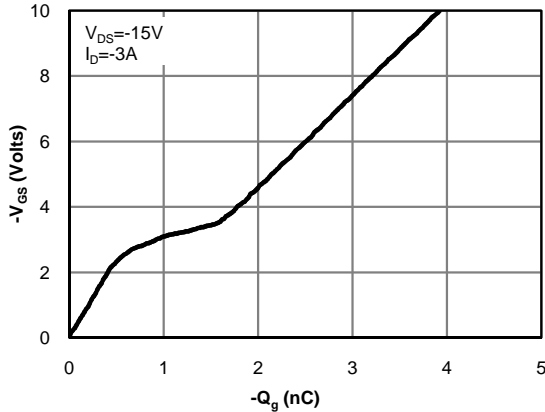


Figure 7: Gate-Charge Characteristics

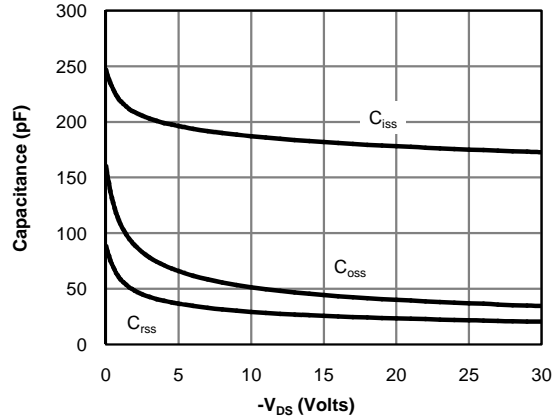


Figure 8: Capacitance Characteristics

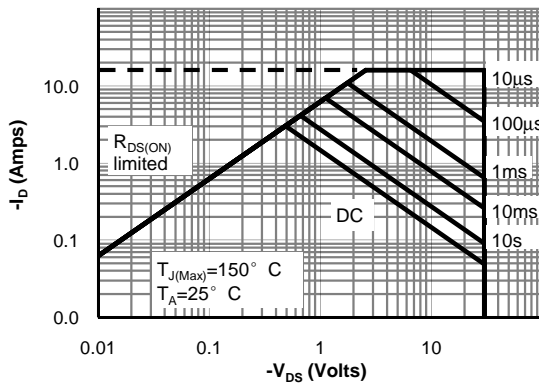


Figure 9: Maximum Forward Biased Safe Operating Area (Note E)

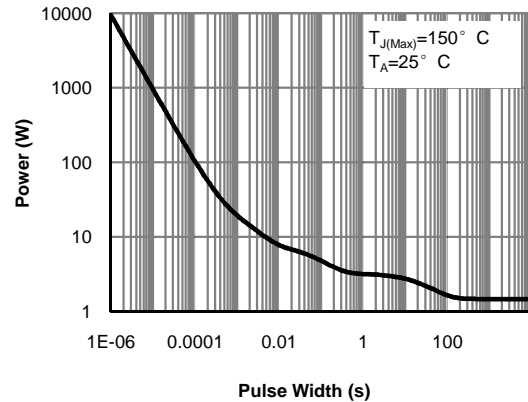


Figure 10: Single Pulse Power Rating Junction-to-Ambient (Note E)

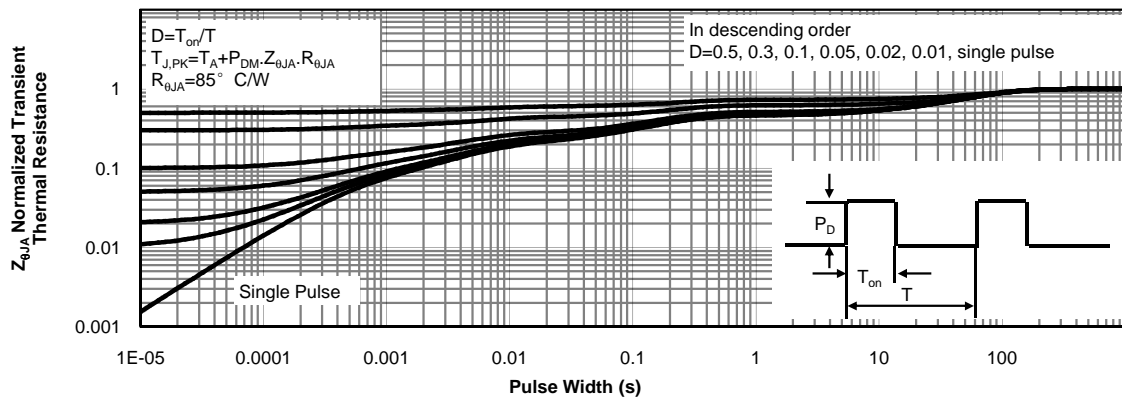


Figure 11: Normalized Maximum Transient Thermal Impedance (Note E)

TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

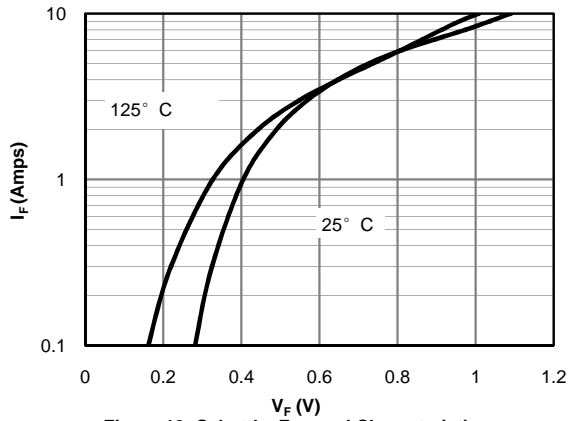


Figure 12: Schottky Forward Characteristics

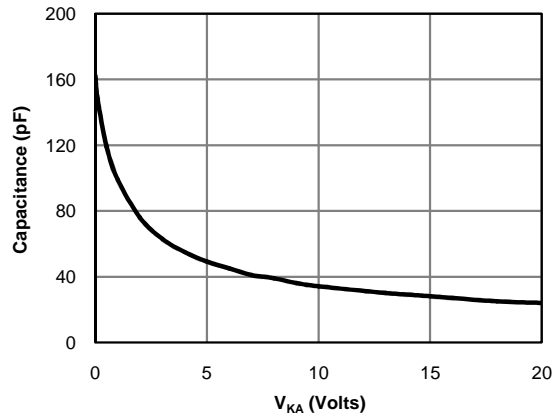


Figure 13: Schottky Capacitance Characteristics

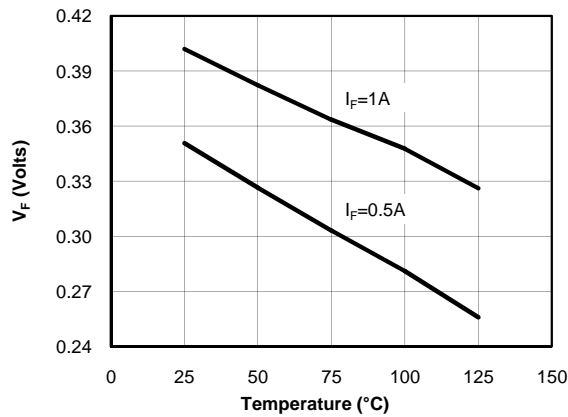


Figure 14: Schottky Forward Drop vs. Junction Temperature

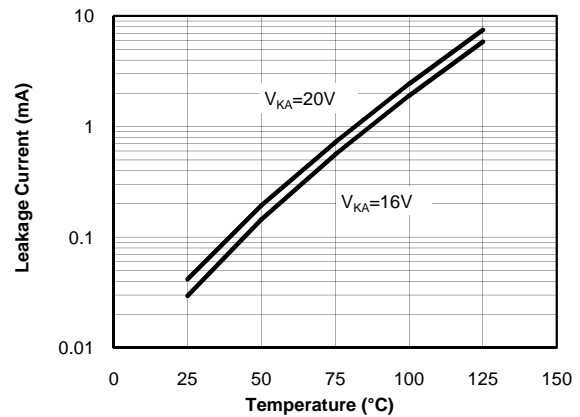


Figure 15: Schottky Leakage Current vs. Junction Temperature

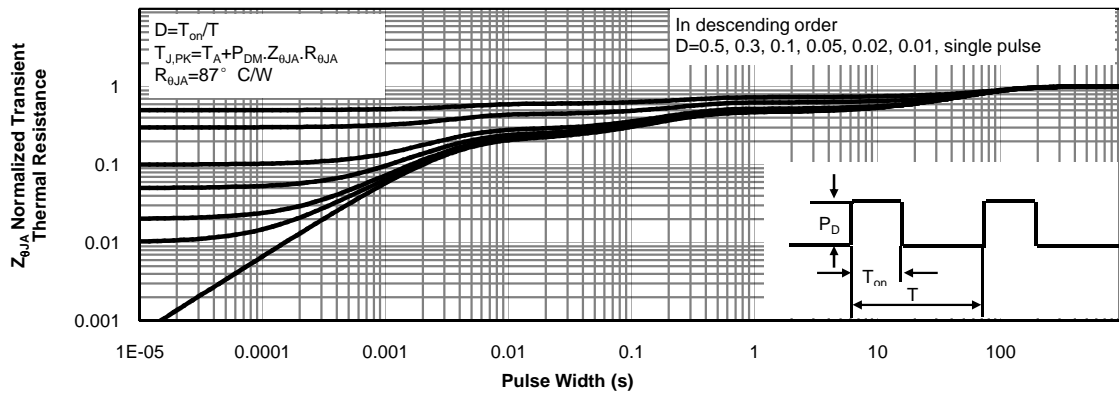
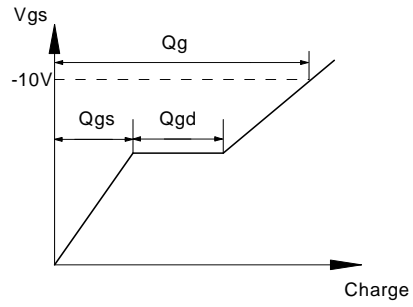
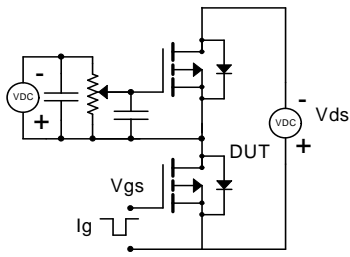
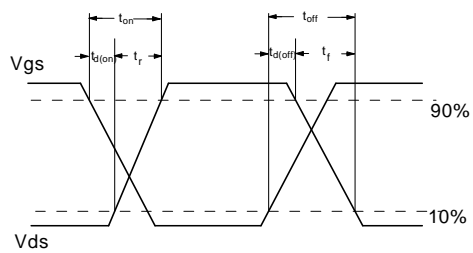
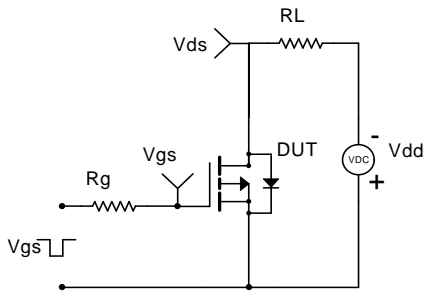


Figure 16: Schottky Normalized Maximum Transient Thermal Impedance (Note E)

Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveforms



Diode Recovery Test Circuit & Waveforms

