



ALPHA & OMEGA
SEMICONDUCTOR

AON6482

100V N-Channel MOSFET

General Description

The AON6482 combines advanced trench MOSFET technology with a low resistance package to provide extremely low $R_{DS(ON)}$. This device is ideal for boost converters and synchronous rectifiers for consumer, telecom, industrial power supplies and LED backlighting.

Product Summary

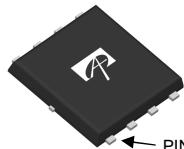
V_{DS}	100V
I_D (at $V_{GS}=10V$)	28A
$R_{DS(ON)}$ (at $V_{GS}=10V$)	< 37mΩ
$R_{DS(ON)}$ (at $V_{GS} = 4.5V$)	< 42mΩ

100% UIS Tested
100% R_g Tested

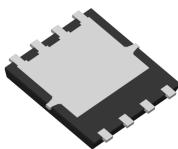


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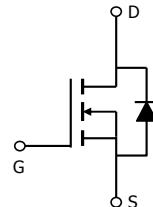
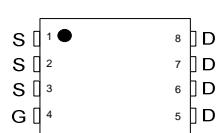
Top View



Bottom View



Top View



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

Parameter	Symbol	Maximum	Units
Drain-Source Voltage	V_{DS}	100	V
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current <small>$T_C=25^\circ C$</small>	I_D	28	A
		18	
Pulsed Drain Current ^C	I_{DM}	70	
Continuous Drain Current <small>$T_A=25^\circ C$</small>	I_{DSM}	5.5	A
		4.4	
Avalanche Current ^C	I_{AS}, I_{AR}	35	A
Avalanche energy L=0.1mH ^C	E_{AS}, E_{AR}	61	mJ
Power Dissipation ^B <small>$T_C=25^\circ C$</small>	P_D	63	W
		25	
Power Dissipation ^A <small>$T_A=25^\circ C$</small>	P_{DSM}	2.5	W
		1.6	
Junction and Storage Temperature Range	T_J, T_{STG}	-55 to 150	°C

Thermal Characteristics

Parameter	Symbol	Typ	Max	Units
Maximum Junction-to-Ambient ^A <small>$t \leq 10s$</small>	$R_{\theta JA}$	14.2	20	°C/W
Maximum Junction-to-Ambient ^{A,D} <small>Steady-State</small>		42	50	°C/W
Maximum Junction-to-Case <small>Steady-State</small>	$R_{\theta JC}$	1.2	2	°C/W

Electrical Characteristics ($T_J=25^\circ\text{C}$ unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Units
STATIC PARAMETERS						
BV_{DSS}	Drain-Source Breakdown Voltage	$I_D=250\mu\text{A}$, $V_{GS}=0\text{V}$	100			V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS}=100\text{V}$, $V_{GS}=0\text{V}$ $T_J=55^\circ\text{C}$			1 5	μA
I_{GSS}	Gate-Body leakage current	$V_{DS}=0\text{V}$, $V_{GS}=\pm 20\text{V}$			100	nA
$V_{\text{GS(th)}}$	Gate Threshold Voltage	$V_{DS}=V_{GS}$ $I_D=250\mu\text{A}$	1.6	2.1	2.7	V
$I_{\text{D(ON)}}$	On state drain current	$V_{GS}=10\text{V}$, $V_{DS}=5\text{V}$	70			A
$R_{\text{DS(ON)}}$	Static Drain-Source On-Resistance	$V_{GS}=10\text{V}$, $I_D=10\text{A}$ $T_J=125^\circ\text{C}$		29	37	$\text{m}\Omega$
		$V_{GS}=4.5\text{V}$, $I_D=10\text{A}$		59	71	
g_{FS}	Forward Transconductance	$V_{DS}=5\text{V}$, $I_D=10\text{A}$		45		S
V_{SD}	Diode Forward Voltage	$I_S=1\text{A}$, $V_{GS}=0\text{V}$		0.7	1	V
I_S	Maximum Body-Diode Continuous Current ^G				60	A
DYNAMIC PARAMETERS						
C_{iss}	Input Capacitance	$V_{GS}=0\text{V}$, $V_{DS}=50\text{V}$, $f=1\text{MHz}$	1300	1630	2000	pF
C_{oss}	Output Capacitance		70	100	130	pF
C_{rss}	Reverse Transfer Capacitance		30	50	70	pF
R_g	Gate resistance	$V_{GS}=0\text{V}$, $V_{DS}=0\text{V}$, $f=1\text{MHz}$	0.3	0.75	1.1	Ω
SWITCHING PARAMETERS						
$Q_g(10\text{V})$	Total Gate Charge	$V_{GS}=10\text{V}$, $V_{DS}=50\text{V}$, $I_D=10\text{A}$	26	34	44	nC
$Q_g(4.5\text{V})$	Total Gate Charge		14	18	22	nC
Q_{gs}	Gate Source Charge		4	6	8	nC
Q_{gd}	Gate Drain Charge		5	9	13	nC
$t_{\text{D(on)}}$	Turn-On Delay Time	$V_{GS}=10\text{V}$, $V_{DS}=50\text{V}$, $R_L=5\Omega$, $R_{\text{GEN}}=3\Omega$		7		ns
t_r	Turn-On Rise Time			7		ns
$t_{\text{D(off)}}$	Turn-Off Delay Time			29		ns
t_f	Turn-Off Fall Time			7		ns
t_{rr}	Body Diode Reverse Recovery Time	$I_F=10\text{A}$, $dI/dt=500\text{A}/\mu\text{s}$	22	32	42	ns
Q_{rr}	Body Diode Reverse Recovery Charge	$I_F=10\text{A}$, $dI/dt=500\text{A}/\mu\text{s}$	140	200	260	nC

A. The value of $R_{\theta JA}$ is measured with the device mounted on 1in² FR-4 board with 2oz. Copper, in a still air environment with $T_A=25^\circ\text{C}$. The Power dissipation P_{DSM} is based on $R_{\theta JA}$ and the maximum allowed junction temperature of 150°C . The value in any given application depends on the user's specific board design, and the maximum temperature of 175°C may be used if the PCB allows it.

B. The power dissipation P_D is based on $T_{J(\text{MAX})}=175^\circ\text{C}$, 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 $T_{J(\text{MAX})}=175^\circ\text{C}$. Ratings are based on low frequency and duty cycles to keep initial $T_J=25^\circ\text{C}$.

D. The $R_{\theta JA}$ is the sum of the thermal impedance from junction to case $R_{\theta JC}$ and case to ambient.

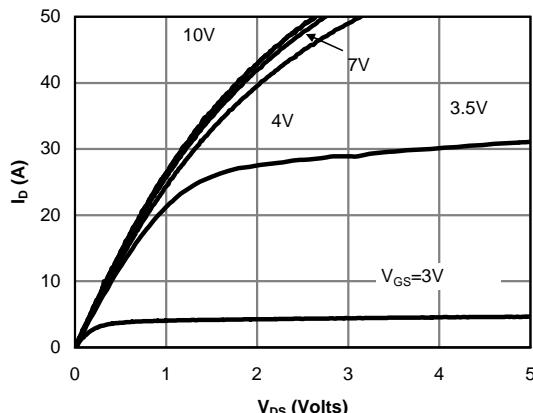
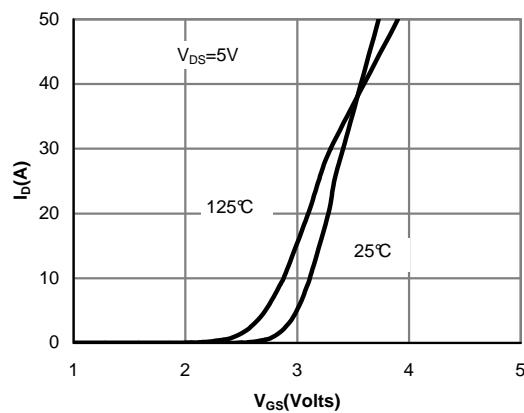
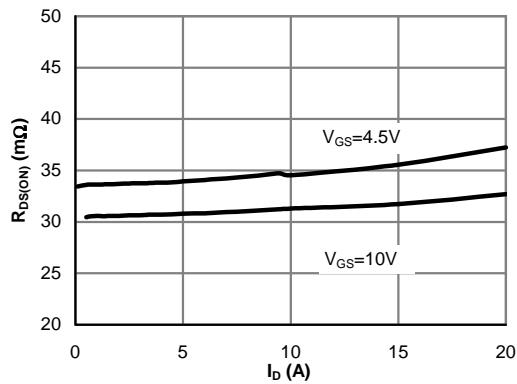
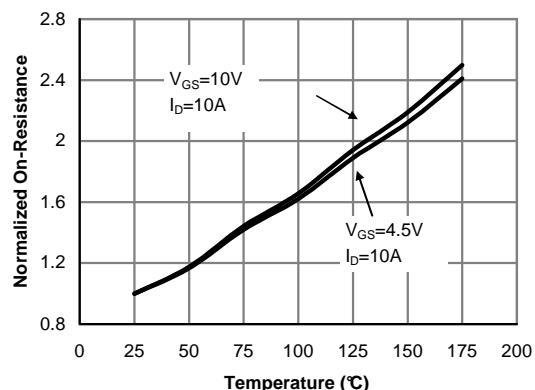
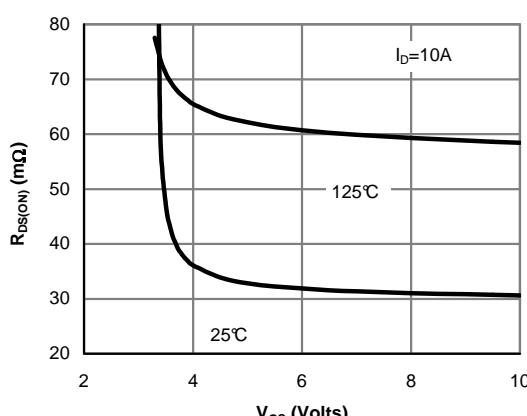
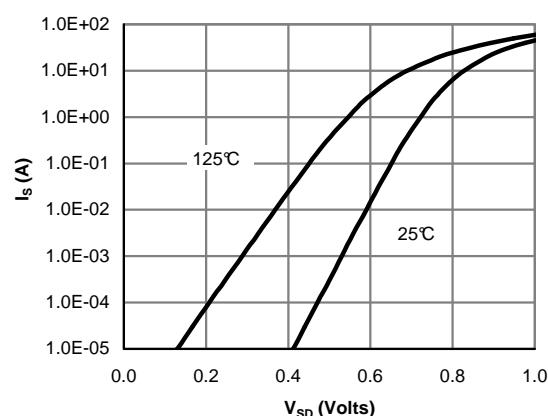
E. The static characteristics in Figures 1 to 6 are obtained using <300 μs pulses, duty cycle 0.5% max.

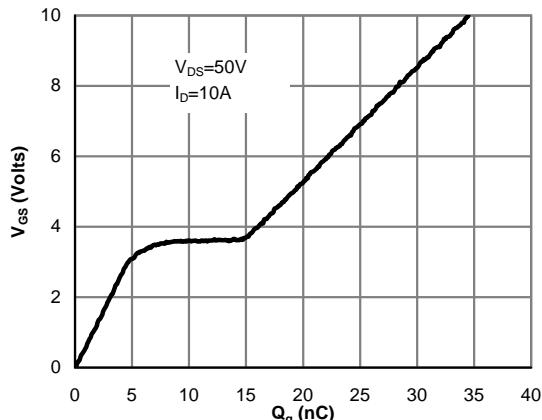
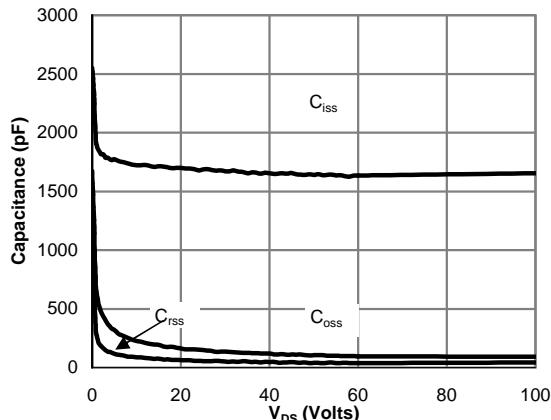
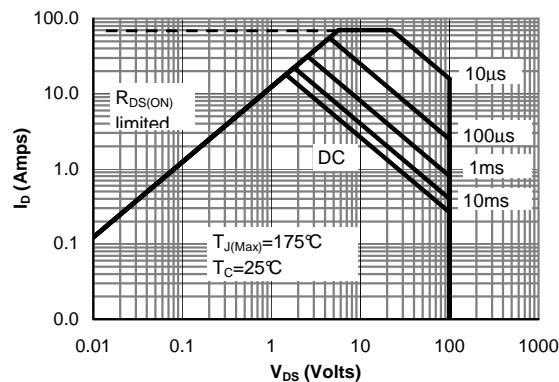
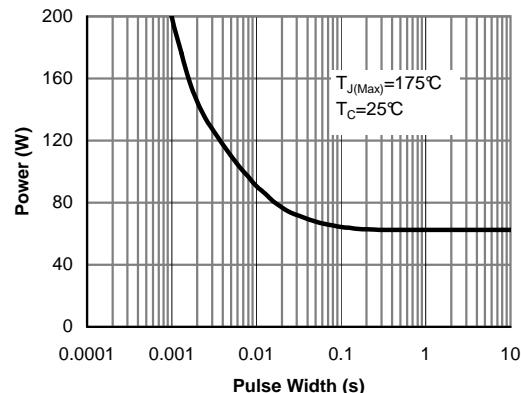
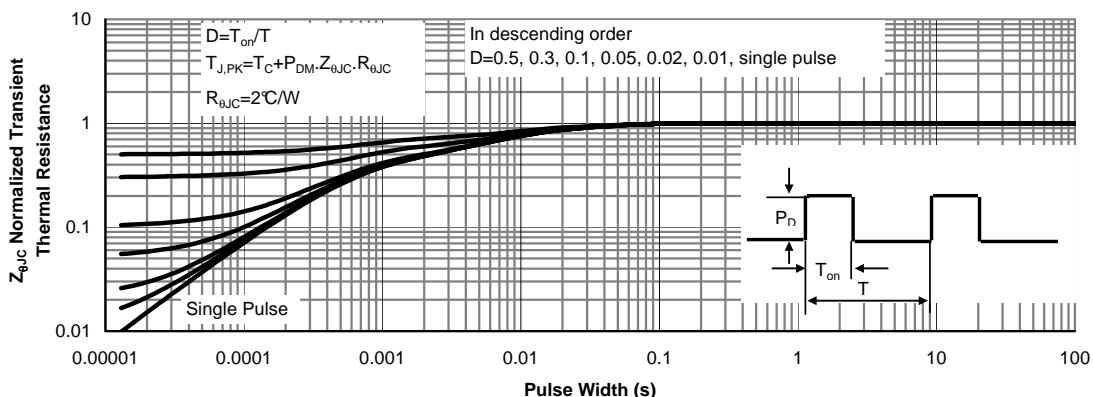
F. These curves are based on the junction-to-case thermal impedance which is measured with the device mounted to a large heatsink, assuming a maximum junction temperature of $T_{J(\text{MAX})}=175^\circ\text{C}$. The SOA curve provides a single pulse rating.

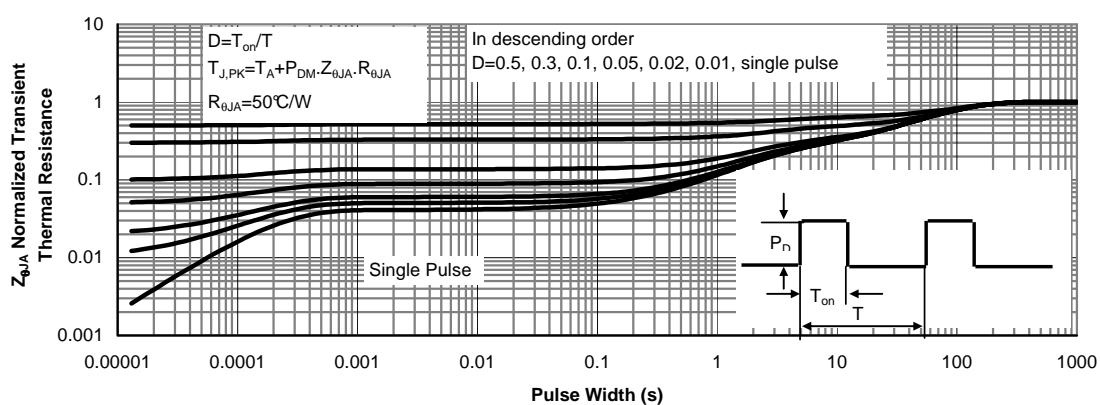
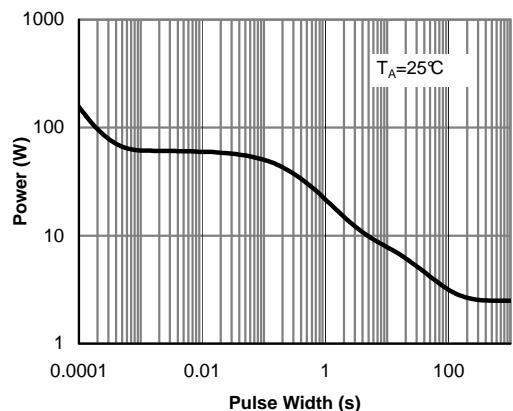
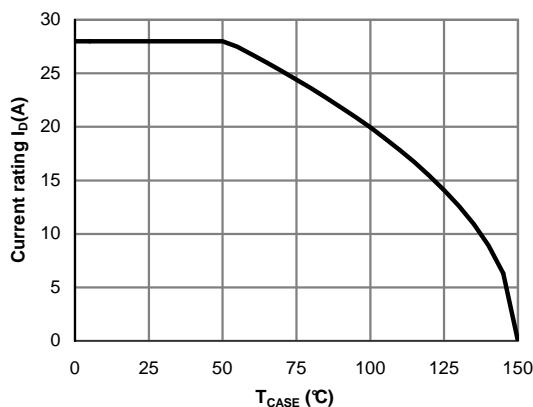
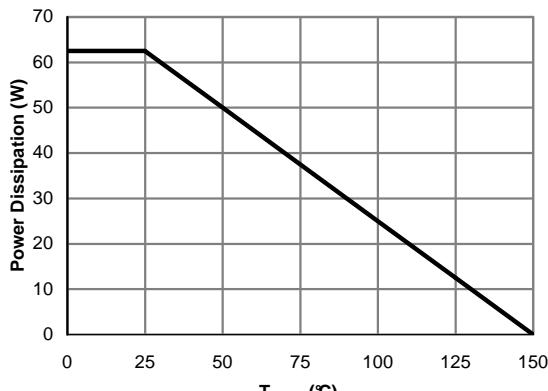
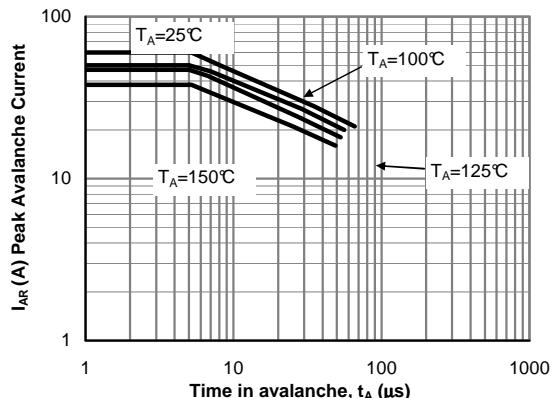
G. The maximum current rating is package limited.

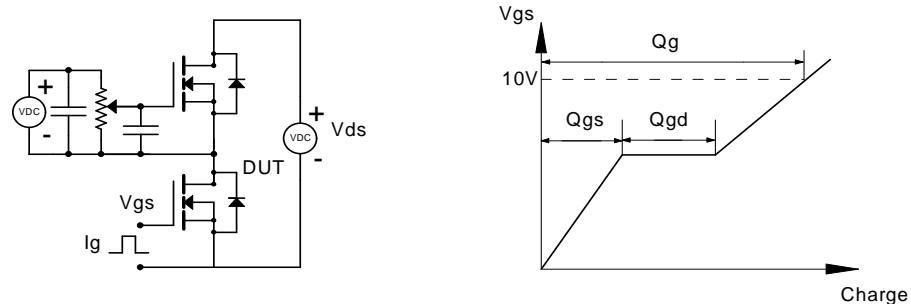
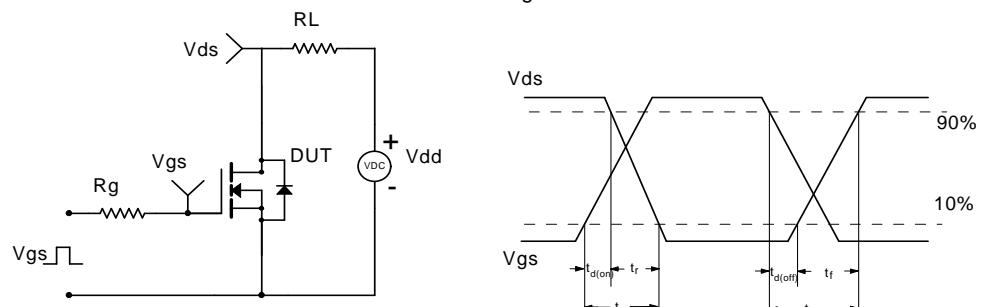
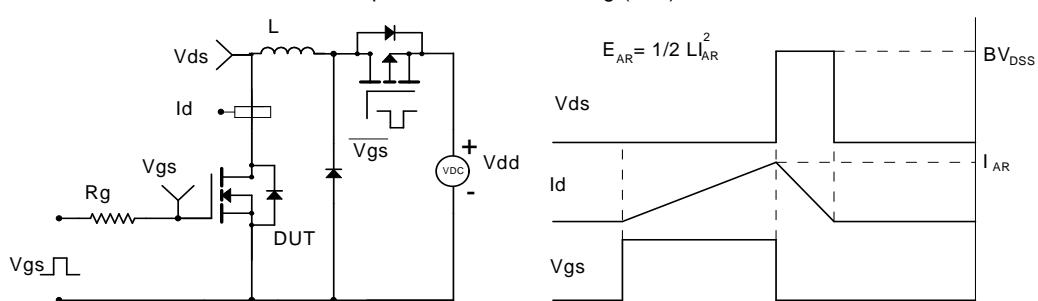
H. These tests are performed with the device mounted on 1 in² FR-4 board with 2oz. Copper, in a still air environment with $T_A=25^\circ\text{C}$.

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TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

Fig 1: On-Region Characteristics (Note E)

Figure 2: Transfer Characteristics (Note E)

Figure 3: On-Resistance vs. Drain Current and Gate Voltage (Note E)

Figure 4: On-Resistance vs. Junction Temperature (Note E)

Figure 5: On-Resistance vs. Gate-Source Voltage (Note E)

Figure 6: Body-Diode Characteristics (Note E)

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)

TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS


Gate Charge Test Circuit & Waveform

Resistive Switching Test Circuit & Waveforms

Unclamped Inductive Switching (UIS) Test Circuit & Waveforms

Diode Recovery Test Circuit & Waveforms
