



ALPHA & OMEGA
SEMICONDUCTOR

AOD380A60C/AOI380A60C
600V α MOS5™ N-Channel Power Transistor

General Description

- Proprietary α MOS5™ technology
- Low $R_{DS(ON)}$
- Optimized switching parameters for better EMI performance
- Enhanced body diode for robustness and fast reverse recovery

Applications

- SMPS with PFC, Flyback and LLC topologies
- Silver ATX, adapter, TV, lighting, Server power

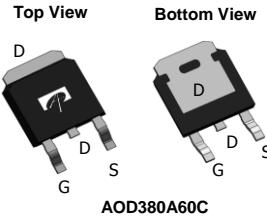
Product Summary

V_{DS} @ $T_{j,max}$	700V
I_{DM}	44A
$R_{DS(ON),max}$	< 0.38Ω
$Q_{g,typ}$	20nC
E_{oss} @ 400V	2.6μJ

100% UIS Tested
100% R_g Tested

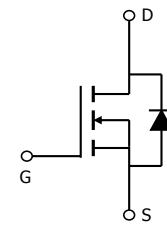
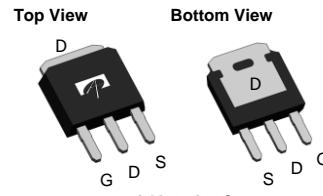


TO252
DPAK



AOD380A60C

TO-251A
IPAK



Orderable Part Number

Orderable Part Number	Package Type	Form	Minimum Order Quantity
AOD380A60C	TO252	Tape&Reel	2500
AOI380A60C	TO251A	Tube	3500

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

Parameter	Symbol	Maximum	Units
Drain-Source Voltage	V_{DS}	600	V
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current ^A $T_C=25^\circ\text{C}$	I_D	11	A
		7.2	
Pulsed Drain Current ^C	I_{DM}	44	
Avalanche Current ^C	I_{AR}	2.5	A
Repetitive avalanche energy ^C	E_{AR}	3.1	mJ
Single pulsed avalanche energy ^G ($T_J=25^\circ\text{C}$, $V_{GS}=10\text{V}$, $I_L=2\text{Apk}$, $L=105\text{mH}$, $R_{GS}=25\Omega$)	E_{AS}	210	mJ
MOSFET dv/dt ruggedness	dv/dt	100	V/ns
Peak diode recovery dv/dt		20	
Power Dissipation ^B $T_C=25^\circ\text{C}$	P_D	125	W
		1.0	W/C
Junction and Storage Temperature Range	T_J , T_{STG}	-55 to 150	°C
Maximum lead temperature for soldering purpose, 1/8" from case for 5 seconds	T_L	300	°C

Thermal Characteristics

Parameter	Symbol	Typical	Maximum	Units
Maximum Junction-to-Ambient ^{A,D}	$R_{\theta JA}$	45	55	°C/W
Maximum Case-to-sink ^A	$R_{\theta CS}$	--	0.5	°C/W
Maximum Junction-to-Case	$R_{\theta JC}$	0.8	1	°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 =250μA, V _{GS} =0V, T _J =25°C	600			V
		I _D =250μA, V _{GS} =0V, T _J =150°C		700		
BV _{DSS} /ΔT _J	Breakdown Voltage Temperature Coefficient	I _D =250μA, V _{GS} =0V		0.44		V/°C
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =600V, V _{GS} =0V		1		μA
		V _{DS} =480V, T _J =125°C		10		
I _{GSS}	Gate-Body leakage current	V _{DS} =0V, V _{GS} =±20V			±100	nA
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =5V, I _D =250μA	2.6	3.2	3.8	V
R _{DS(ON)}	Static Drain-Source On-Resistance	V _{GS} =10V, I _D =5.5A		0.33	0.38	Ω
g _{FS}	Forward Transconductance	V _{DS} =10V, I _D =5.5A		10		S
V _{SD}	Diode Forward Voltage	I _S =5.5A, V _{GS} =0V		0.85	1.2	V
I _S	Maximum Body-Diode Continuous Current				11	A
I _{SM}	Maximum Body-Diode Pulsed Current ^c				44	A
DYNAMIC PARAMETERS						
C _{iss}	Input Capacitance	V _{GS} =0V, V _{DS} =100V, f=1MHz		955		pF
C _{oss}	Output Capacitance			29		pF
C _{o(er)}	Effective output capacitance, energy related ^H	V _{GS} =0V, V _{DS} =0 to 480V, f=1MHz		30		pF
C _{o(tr)}	Effective output capacitance, time related ^I			122		pF
C _{rss}	Reverse Transfer Capacitance	V _{GS} =0V, V _{DS} =100V, f=1MHz		2.4		pF
R _g	Gate resistance	f=1MHz		4.8		Ω
SWITCHING PARAMETERS						
Q _g	Total Gate Charge	V _{GS} =10V, V _{DS} =480V, I _D =5.5A		20		nC
Q _{gs}	Gate Source Charge			4.6		nC
Q _{gd}	Gate Drain Charge			6.6		nC
t _{D(on)}	Turn-On Delay Time	V _{GS} =10V, V _{DS} =400V, I _D =5.5A, R _G =5Ω		20		ns
t _r	Turn-On Rise Time			13		ns
t _{D(off)}	Turn-Off Delay Time			43		ns
t _f	Turn-Off Fall Time			16		ns
t _{rr}	Body Diode Reverse Recovery Time	I _F =5.5A, dI/dt=100A/μs, V _{DS} =400V		251		ns
I _{rm}	Peak Reverse Recovery Current			19		A
Q _{rr}	Body Diode Reverse Recovery Charge			3.1		μC

A. The value of R_{0JA} 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)}=150°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)}=150°C. Ratings are based on low frequency and duty cycles to keep initial T_J=25°C.

D. The R_{0JA} is the sum of the thermal impedance from junction to case R_{0JC} and case to ambient.

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

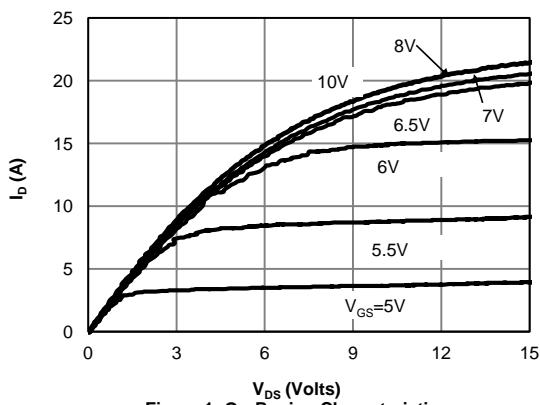
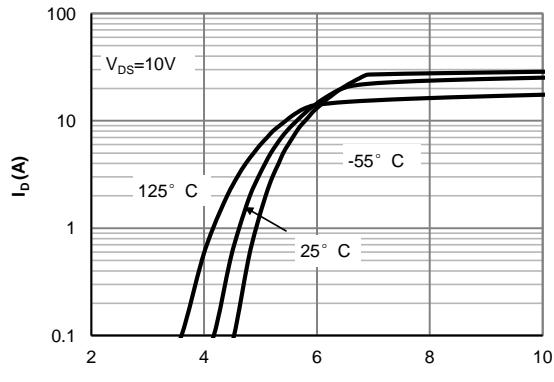
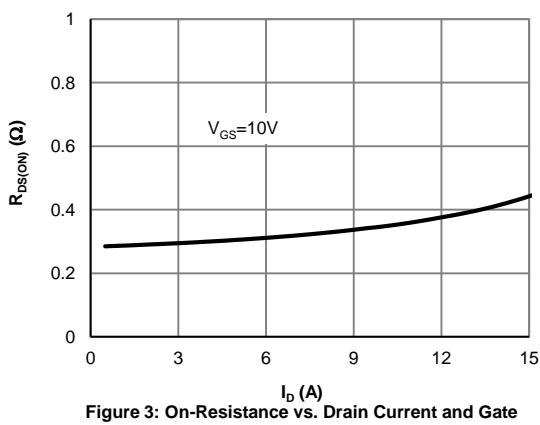
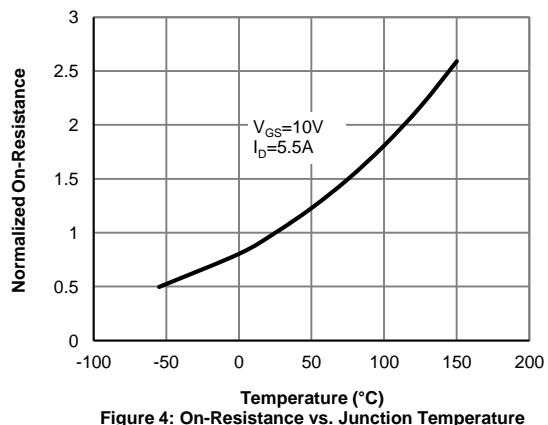
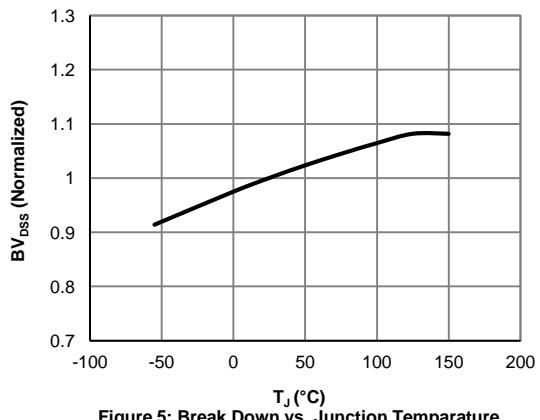
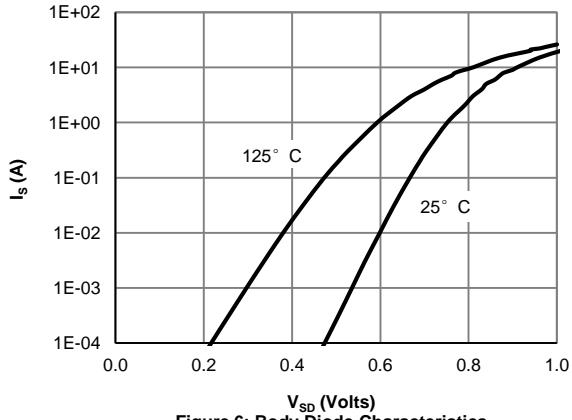
F. These curves are based on the junction-to-case thermal impedance which is measured with the device mounted to a large heatsink, assuming a maximum junction temperature of T_{J(MAX)}=150°C. The SOA curve provides a single pulse rating.

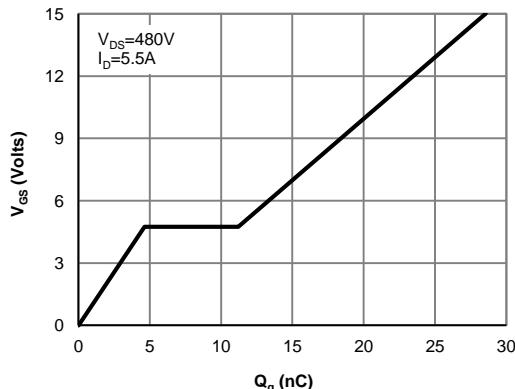
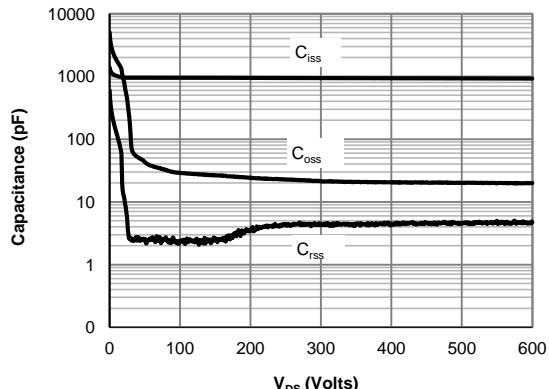
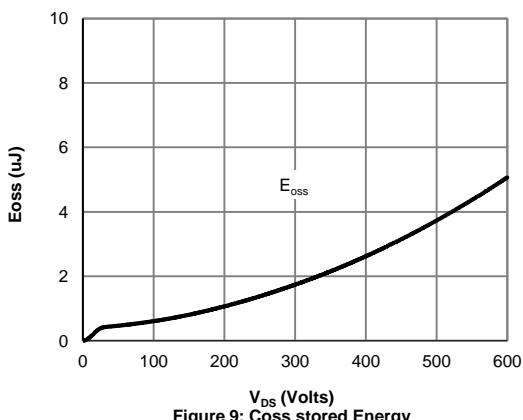
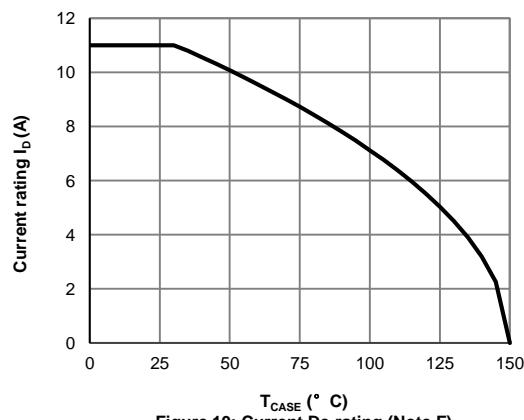
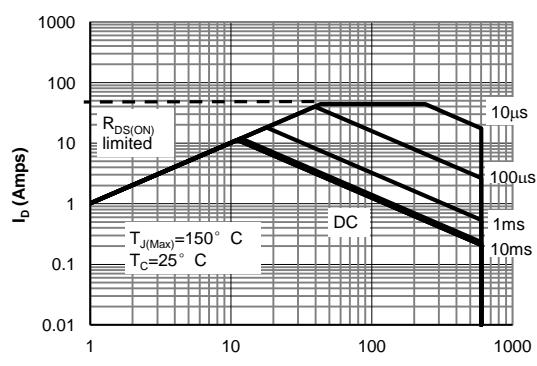
G. This is the absolute maximum rating. Parts are 100% tested at T_J=25°C, L=60mH, I_{AS}=1A, V_{DD}=150V, R_G=25Ω.

H. C_{o(er)} is a fixed capacitance that gives the same stored energy as C_{oss} while V_{DS} is rising from 0 to 80% V_{(BR)DSS}.

I. C_{o(tr)} is a fixed capacitance that gives the same charging time as C_{oss} while V_{DS} is rising from 0 to 80% V_{(BR)DSS}.

APPLICATIONS OR USE 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.

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: Break Down vs. Junction Temperature

Figure 6: Body-Diode Characteristics

TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

Figure 7: Gate-Charge Characteristics

Figure 8: Capacitance Characteristics

Figure 9: Coss stored Energy

Figure 10: Current De-rating (Note F)

Figure 11: Maximum Forward Biased Safe Operating Area for AOD380A60C (Note F)

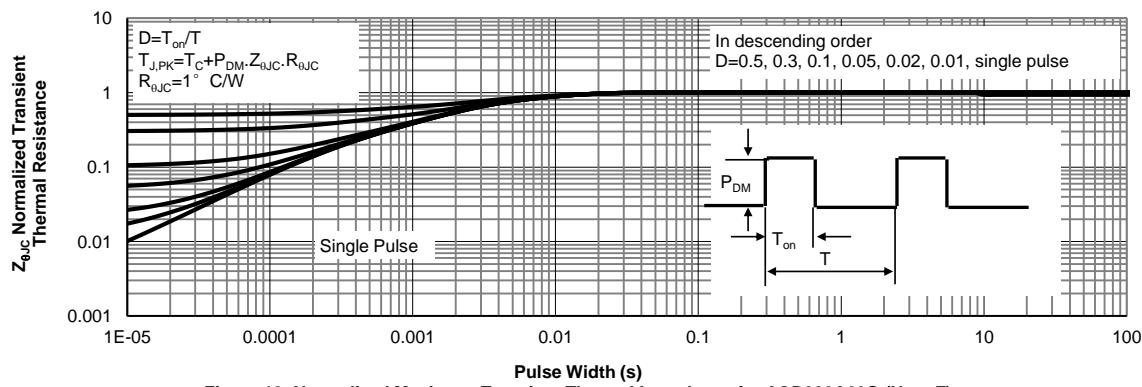
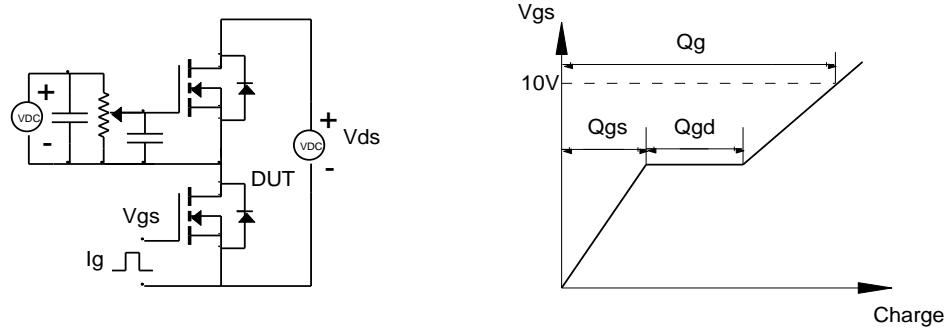
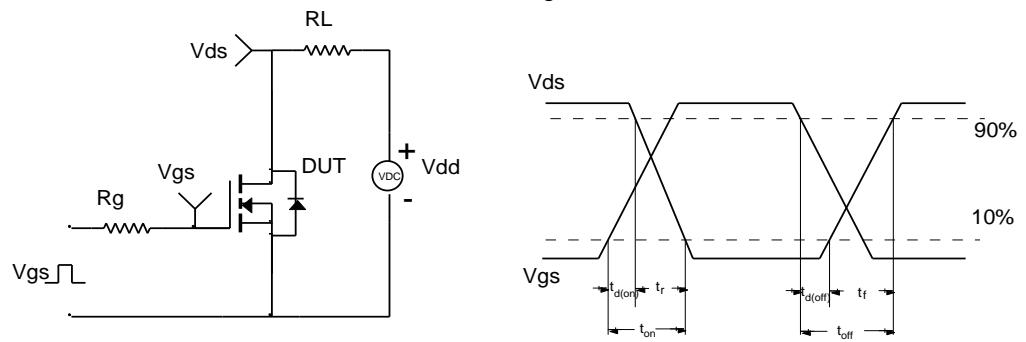
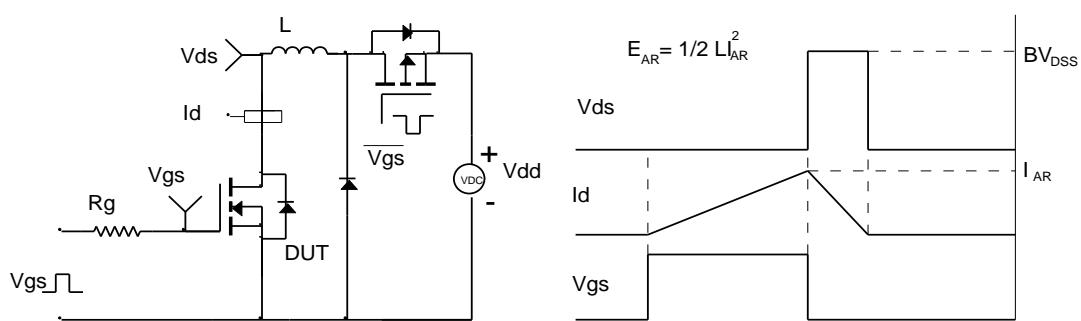
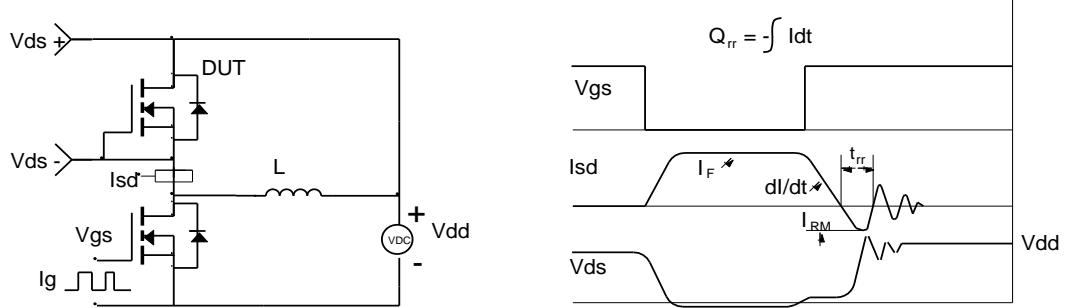
TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS


Figure 12: Normalized Maximum Transient Thermal Impedance for AOD380A60C (Note F)

Gate Charge Test Circuit & Waveform

Resistive Switching Test Circuit & Waveforms

Unclamped Inductive Switching (UIS) Test Circuit & Waveforms

Diode Recovery Test Circuit & Waveforms




电子元器件线上授权代理开拓者
原厂授权 · 正品现货 · 一件即发

单击下面可查看定价，库存，交付和生命周期等信息

[>>AOS\(万国半导体\)](#)