

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

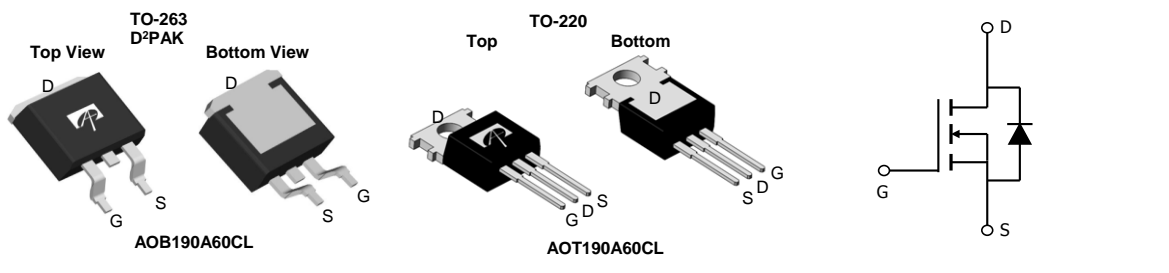
Applications

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

Product Summary

$V_{DS} @ T_{j,max}$	700V
I_{DM}	80A
$R_{DS(ON),max}$	< 0.19 Ω
$Q_{g,typ}$	34nC
$E_{oss} @ 400V$	4.3 μ J

100% UIS Tested
 100% R_g Tested



Orderable Part Number	Package Type	Form	Minimum Order Quantity
AOB190A60CL	TO-263 Green	Tape&Reel	800
AOT190A60CL	TO-220 Green	Tube	1000

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

Parameter	Symbol	AOB190A60CL	AOT190A60CL	Units
Drain-Source Voltage	V_{DS}	600		V
Gate-Source Voltage	V_{GS}	± 20		V
Continuous Drain Current	I_D	$T_C=25^\circ\text{C}$	20	A
		$T_C=100^\circ\text{C}$	12	
Pulsed Drain Current ^C	I_{DM}	80		
Avalanche Current ^C	I_{AR}	5		A
Repetitive avalanche energy ^C	E_{AR}	12.5		mJ
Single pulsed avalanche energy ^G	E_{AS}	410		mJ
MOSFET dv/dt ruggedness	dv/dt	100		V/ns
Peak diode recovery dv/dt		20		
Power Dissipation ^B	P_D	$T_C=25^\circ\text{C}$	208	W
		Derate above 25 $^\circ\text{C}$	1.66	
Junction and Storage Temperature Range	T_J, T_{STG}	-55 to 150		$^\circ\text{C}$
Maximum lead temperature for soldering purpose, 1/8" from case for 5 seconds	T_L	300		$^\circ\text{C}$

Thermal Characteristics

Parameter	Symbol	AOB190A60CL	AOT190A60CL	Units
Maximum Junction-to-Ambient ^{A,D}	$R_{\theta JA}$	65		$^\circ\text{C}/\text{W}$
Maximum Junction-to-Case	$R_{\theta JC}$	0.6		$^\circ\text{C}/\text{W}$

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, 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		0.59		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	3.2	4	4.6	V
R _{DS(on)}	Static Drain-Source On-Resistance	V _{GS} =10V, I _D =7.6A		0.17	0.19	Ω
g _{FS}	Forward Transconductance	V _{DS} =10V, I _D =10A		16		S
V _{SD}	Diode Forward Voltage	I _S =10A, V _{GS} =0V		0.85	1.2	V
I _S	Maximum Body-Diode Continuous Current				20	A
I _{SM}	Maximum Body-Diode Pulsed Current ^C				80	A
DYNAMIC PARAMETERS						
C _{iss}	Input Capacitance	V _{GS} =0V, V _{DS} =100V, f=1MHz		1935		pF
C _{oss}	Output Capacitance			55		pF
C _{o(er)}	Effective output capacitance, energy related ^H	V _{GS} =0V, V _{DS} =0 to 480V, f=1MHz		49		pF
C _{o(tr)}	Effective output capacitance, time related ^I			213		pF
C _{rss}	Reverse Transfer Capacitance	V _{GS} =0V, V _{DS} =100V, f=1MHz		1.25		pF
R _g	Gate resistance	f=1MHz		5		Ω
SWITCHING PARAMETERS						
Q _g	Total Gate Charge	V _{GS} =10V, V _{DS} =480V, I _D =10A		34		nC
Q _{gs}	Gate Source Charge			12		nC
Q _{gd}	Gate Drain Charge			8		nC
t _{D(on)}	Turn-On DelayTime	V _{GS} =10V, V _{DS} =400V, I _D =10A, R _G =25Ω		80		ns
t _r	Turn-On Rise Time			70		ns
t _{D(off)}	Turn-Off DelayTime			80		ns
t _f	Turn-Off Fall Time			20		ns
t _{rr}	Body Diode Reverse Recovery Time			341		ns
I _{rm}	Peak Reverse Recovery Current	I _F =10A, di/dt=100A/μs, V _{DS} =400V		28		A
Q _{rr}	Body Diode Reverse Recovery Charge			6.8		μC

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)}=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_{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 <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}=2.7A, 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

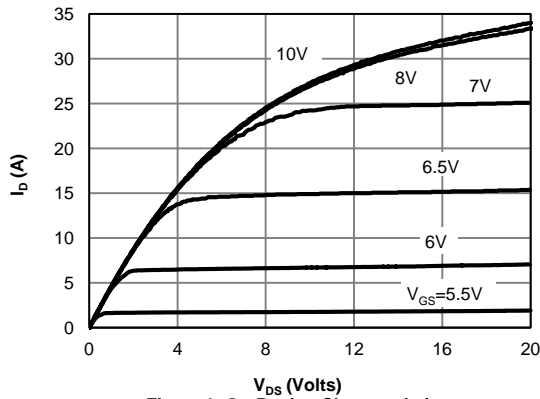


Figure 1: On-Region Characteristics

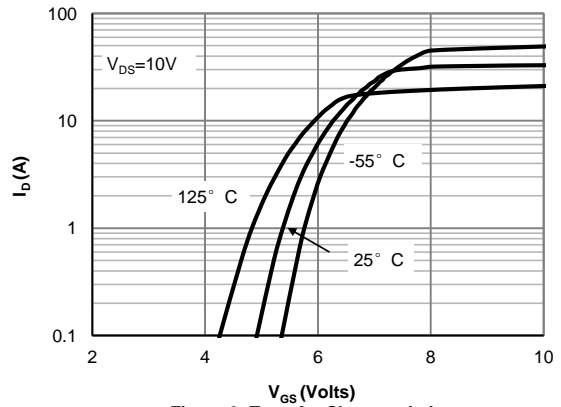


Figure 2: Transfer Characteristics

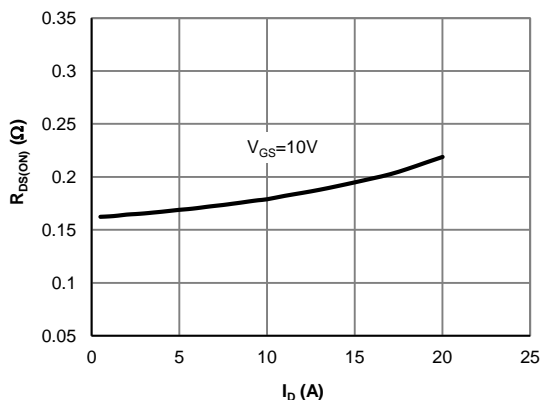


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

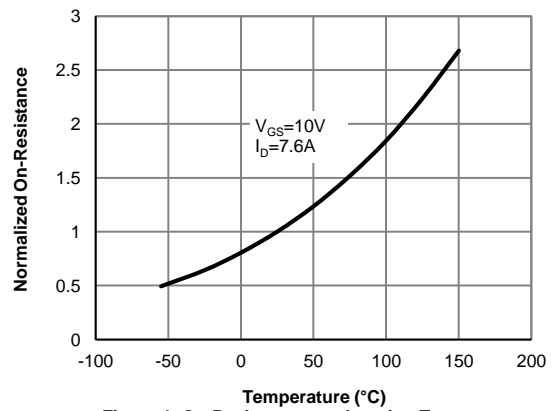


Figure 4: On-Resistance vs. Junction Temperature

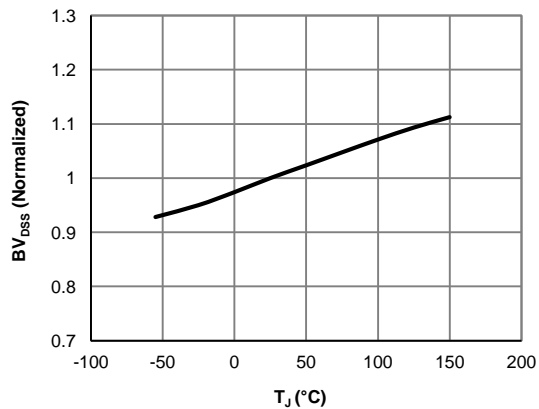


Figure 5: Break Down vs. Junction Temperature

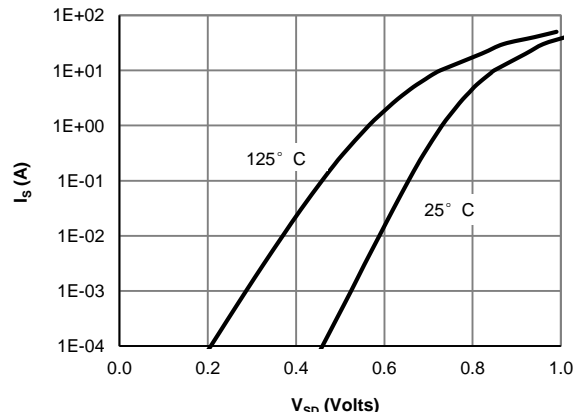


Figure 6: Body-Diode Characteristics

TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

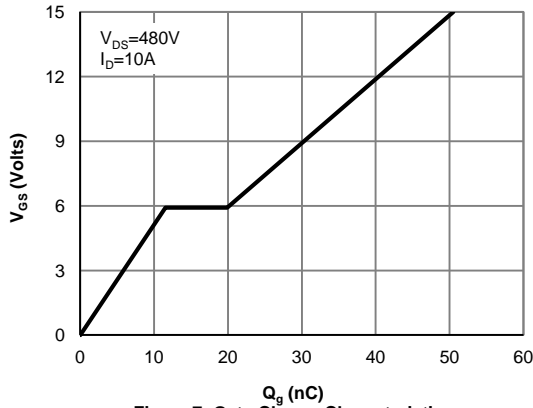


Figure 7: Gate-Charge Characteristics

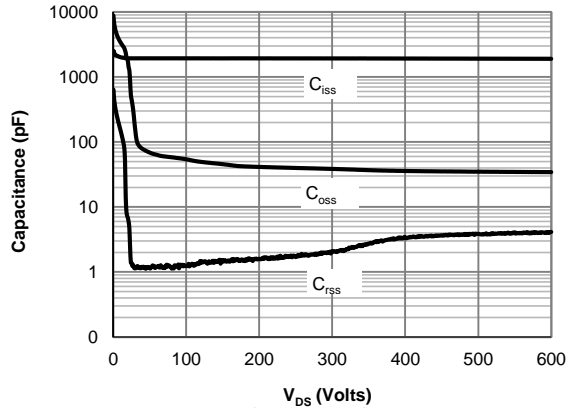


Figure 8: Capacitance Characteristics

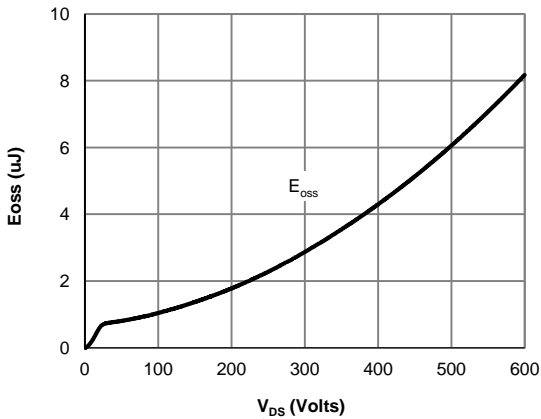


Figure 9: C_{oss} stored Energy

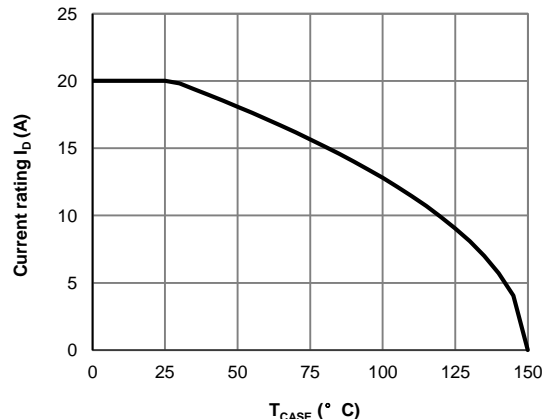


Figure 10: Current De-rating (Note F)

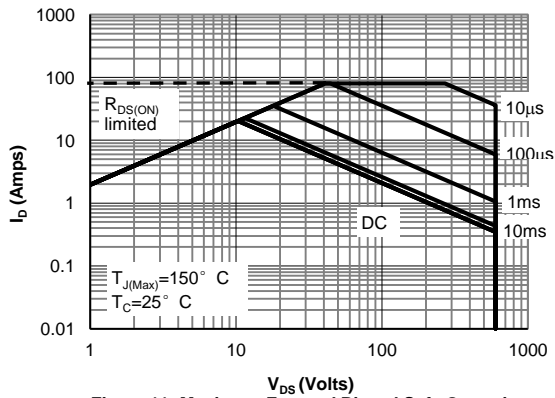


Figure 11: Maximum Forward Biased Safe Operating Area for AOT(B)190A60CL (Note F)

TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

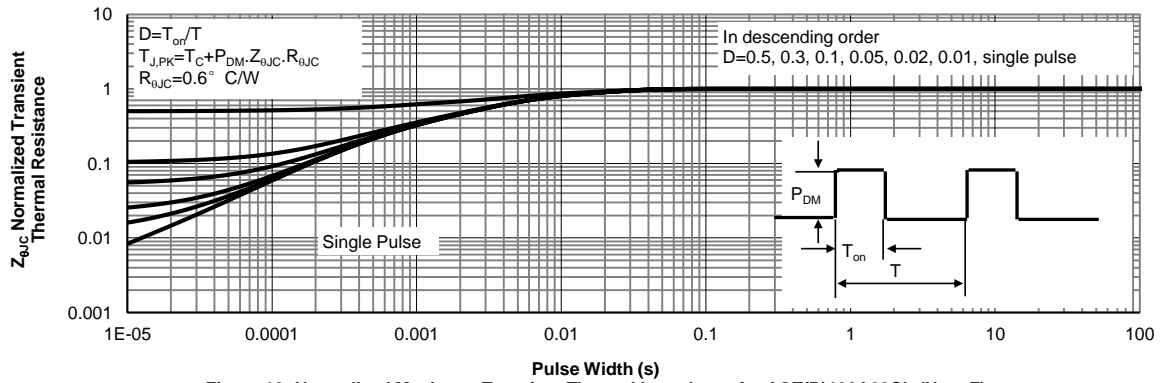
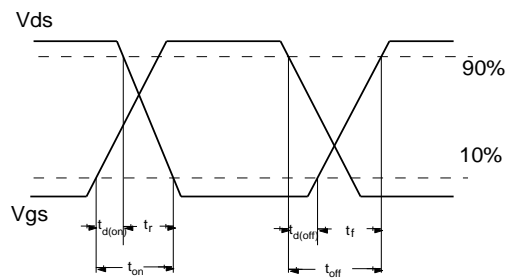


Figure 12: Normalized Maximum Transient Thermal Impedance for AOT(B)190A60CL (Note F)

Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveforms



Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



Diode Recovery Test Circuit & Waveforms

