

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	650	700	-	
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =600V, V _{GS} =0V	-	-	1	μA
		V _{DS} =480V, T _J =150°C	-	10	-	
I _{GSS}	Gate-Body leakage current	V _{DS} =0V, V _{GS} =±30V	-	-	±100	nA
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =5V, I _D =250μA	2.5	3.2	3.8	V
R _{DS(ON)}	Static Drain-Source On-Resistance	V _{GS} =10V, I _D =21A, T _J =25°C	-	0.095	0.109	Ω
		V _{GS} =10V, I _D =21A, T _J =150°C	-	0.27	0.31	Ω
V _{SD}	Diode Forward Voltage	I _S =21A, V _{GS} =0V, T _J =25°C	-	0.84	-	V
I _S	Maximum Body-Diode Continuous Current		-	-	37	A
I _{SM}	Maximum Body-Diode Pulsed Current		-	-	166	A
DYNAMIC PARAMETERS						
C _{iss}	Input Capacitance	V _{GS} =0V, V _{DS} =100V, f=1MHz	-	2154	-	pF
C _{oss}	Output Capacitance		-	135	-	pF
C _{o(er)}	Effective output capacitance, energy related ^H	V _{GS} =0V, V _{DS} =0 to 480V, f=1MHz	-	103	-	pF
C _{o(tr)}	Effective output capacitance, time related ^I		-	344	-	pF
C _{rss}	Reverse Transfer Capacitance	V _{GS} =0V, V _{DS} =100V, f=1MHz	-	2.7	-	pF
R _g	Gate resistance	V _{GS} =0V, V _{DS} =0V, f=1MHz	-	1.7	-	Ω
SWITCHING PARAMETERS						
Q _g	Total Gate Charge	V _{GS} =10V, V _{DS} =480V, I _D =21A	-	40	-	nC
Q _{gs}	Gate Source Charge		-	11.7	-	nC
Q _{gd}	Gate Drain Charge		-	11.9	-	nC
t _{D(on)}	Turn-On Delay Time	V _{GS} =10V, V _{DS} =400V, I _D =21A, R _G =25Ω	-	38.5	-	ns
t _r	Turn-On Rise Time		-	53	-	ns
t _{D(off)}	Turn-Off Delay Time		-	136	-	ns
t _f	Turn-Off Fall Time		-	46	-	ns
t _{rr}	Body Diode Reverse Recovery Time	I _F =21A, dI/dt=100A/μs, V _{DS} =400V	-	473	-	ns
I _{rm}	Peak Reverse Recovery Current	I _F =21A, dI/dt=100A/μs, V _{DS} =400V	-	38.5	-	A
Q _{rr}	Body Diode Reverse Recovery Charge	I _F =21A, dI/dt=100A/μs, V _{DS} =400V	-	10.5	-	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 <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(MAX)}=150°C. The SOA curve provides a single pulse rating.

G. L=60mH, I_{AS}=6.7A, V_{DD}=150V, Starting T_J=25°C

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}.

J. Wavesoldering only allowed at leads.

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TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

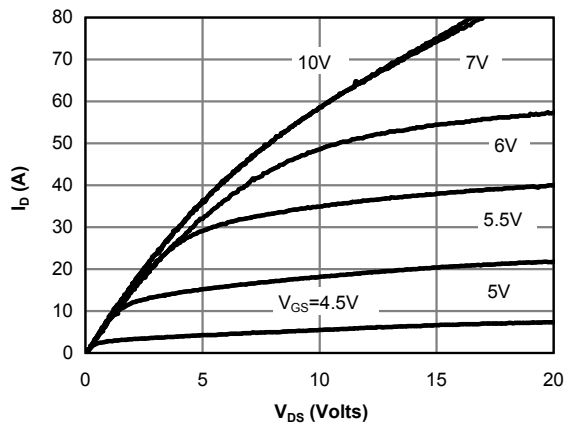


Figure 1: On-Region Characteristics@25°C

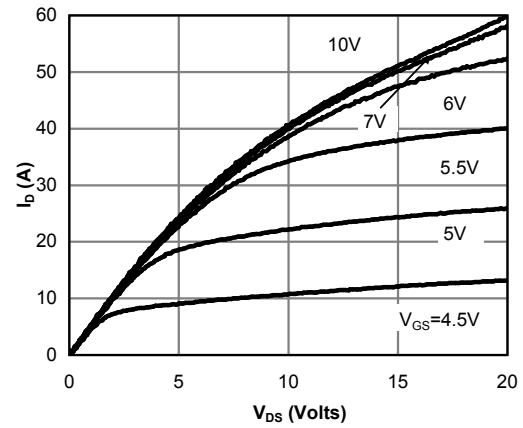


Figure 2: On-Region Characteristics@125°C

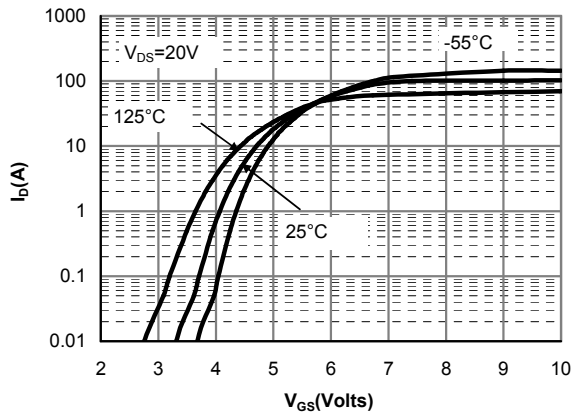


Figure 3: Transfer Characteristics

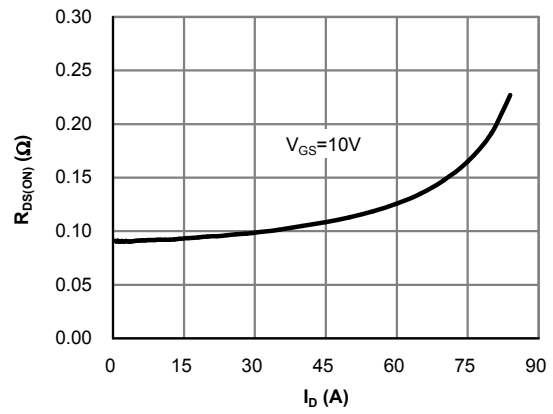


Figure 4: On-Resistance vs. Drain Current and Gate Voltage

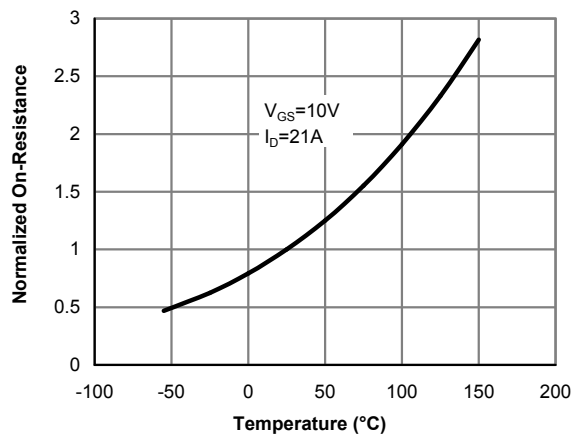


Figure 5: On-Resistance vs. Junction Temperature

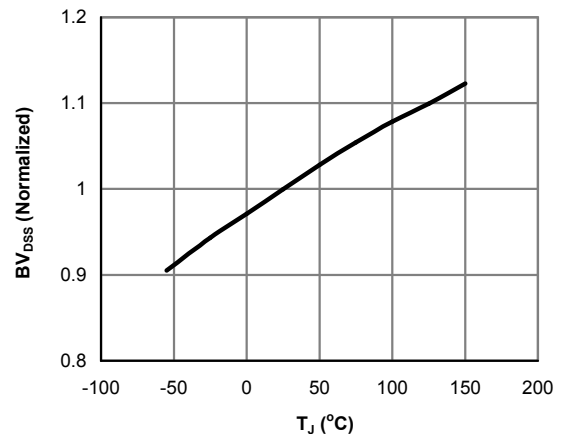


Figure 6: Break Down vs. Junction Temperature

TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

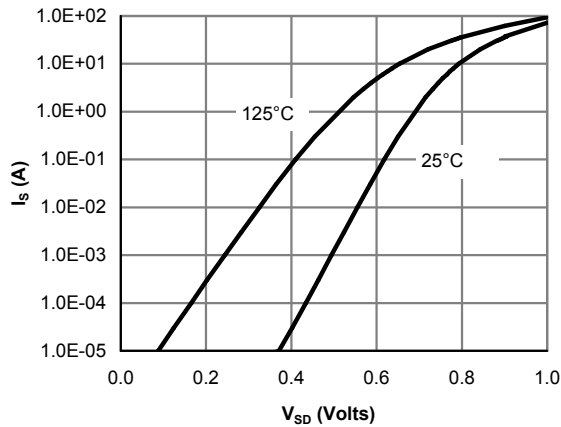


Figure 7: Body-Diode Characteristics (Note E)

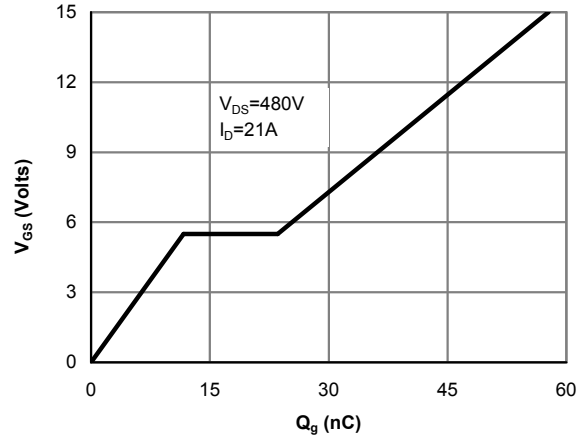


Figure 8: Gate-Charge Characteristics

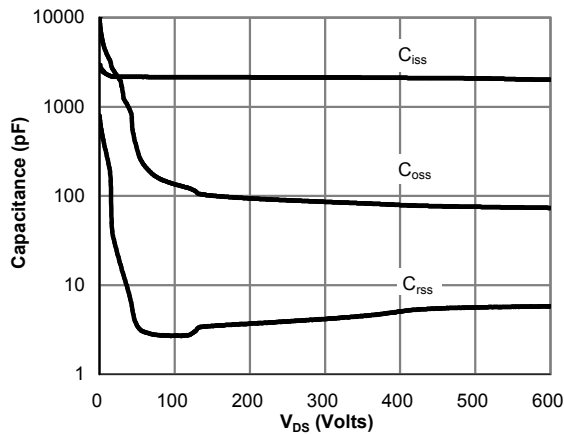


Figure 9: Capacitance Characteristics

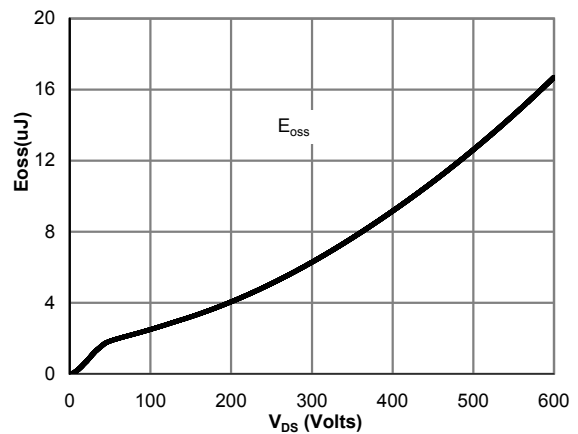


Figure 10: Coss stored Energy

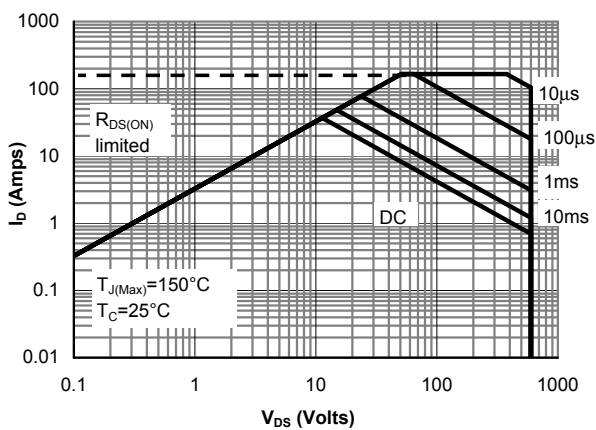


Figure 11: Maximum Forward Biased Safe Operating Area for AOT(B)42S60(Note F)

TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

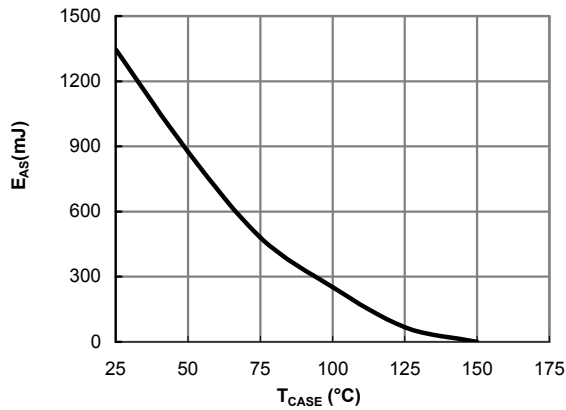


Figure 12: Avalanche energy

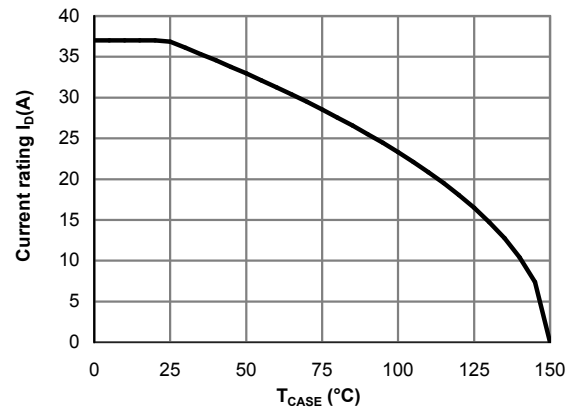


Figure 13: Current De-rating (Note B)

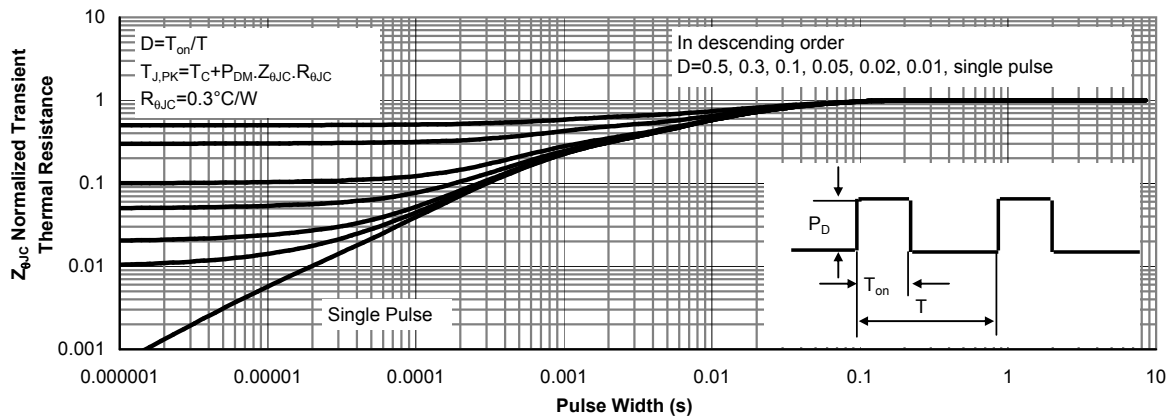
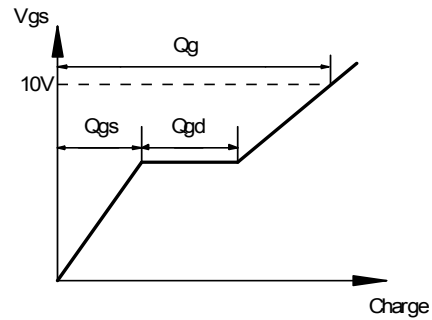
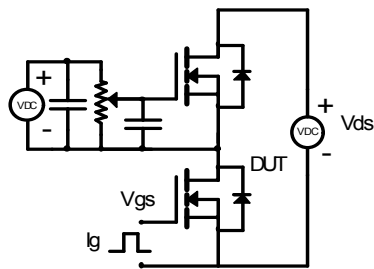
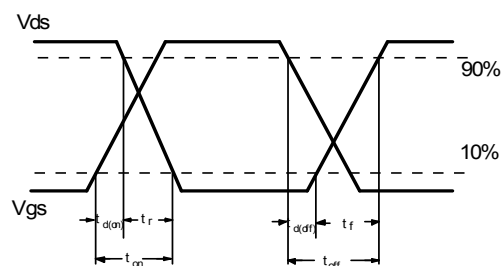
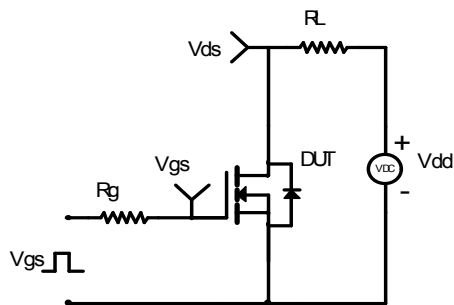


Figure 14: Normalized Maximum Transient Thermal Impedance for AOT(B)42S60(Note F)

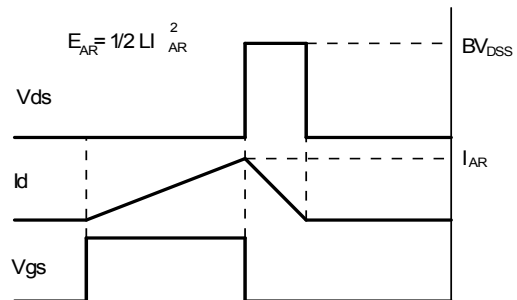
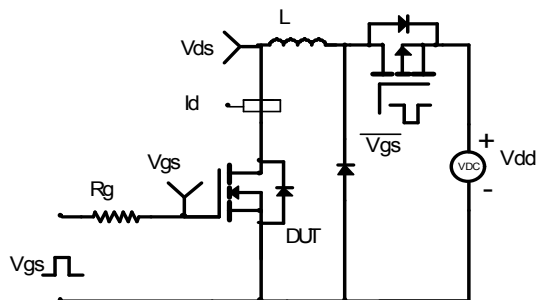
Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveforms



Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



Diode Recovery Test Circuit & Waveforms

