

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	800			V
		I _D =250μA, V _{GS} =0V, T _J =150°C		900		
BV _{DSS} /ΔT _J	Breakdown Voltage Temperature Coefficient	I _D =250μA, V _{GS} =0V		0.86		V/°C
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =800V, V _{GS} =0V			1	μA
		V _{DS} =640V, T _J =125°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	3.3	3.9	4.5	V
R _{DS(ON)}	Static Drain-Source On-Resistance	V _{GS} =10V, I _D =4A		1.35	1.63	Ω
g _{FS}	Forward Transconductance	V _{DS} =40V, I _D =4A		9		S
V _{SD}	Diode Forward Voltage	I _S =1A, V _{GS} =0V		0.72	1	V
I _S	Maximum Body-Diode Continuous Current				7.4	A
I _{SM}	Maximum Body-Diode Pulsed Current				26	A
DYNAMIC PARAMETERS						
C _{iss}	Input Capacitance	V _{GS} =0V, V _{DS} =25V, f=1MHz	1100	1375	1650	pF
C _{oss}	Output Capacitance		70	101	132	pF
C _{rss}	Reverse Transfer Capacitance		6	11	16	pF
R _g	Gate resistance	V _{GS} =0V, V _{DS} =0V, f=1MHz	1.7	3.5	5.3	Ω
SWITCHING PARAMETERS						
Q _g	Total Gate Charge	V _{GS} =10V, V _{DS} =640V, I _D =8A	20	26	32	nC
Q _{gs}	Gate Source Charge			7.3		nC
Q _{gd}	Gate Drain Charge			9.1		nC
t _{D(on)}	Turn-On DelayTime	V _{GS} =10V, V _{DS} =400V, I _D =8A, R _G =25Ω		35		ns
t _r	Turn-On Rise Time			51		ns
t _{D(off)}	Turn-Off DelayTime			69		ns
t _f	Turn-Off Fall Time			41		ns
t _{rr}	Body Diode Reverse Recovery Time	I _F =8A, dI/dt=100A/μs, V _{DS} =100V	380	484	585	ns
Q _{rr}	Body Diode Reverse Recovery Charge	I _F =8A, dI/dt=100A/μs, V _{DS} =100V	4.5	6	7.5	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}=3.8A, V_{DD}=150V, R_G=25Ω, Starting T_J=25° C

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TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

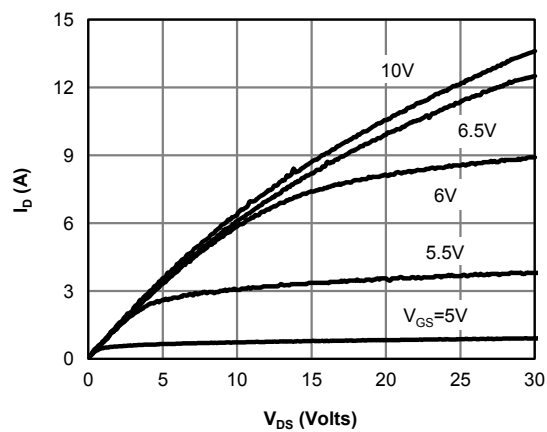


Fig 1: On-Region Characteristics

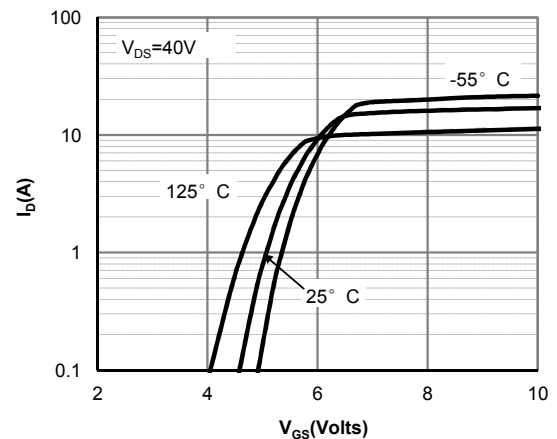


Figure 2: Transfer Characteristics

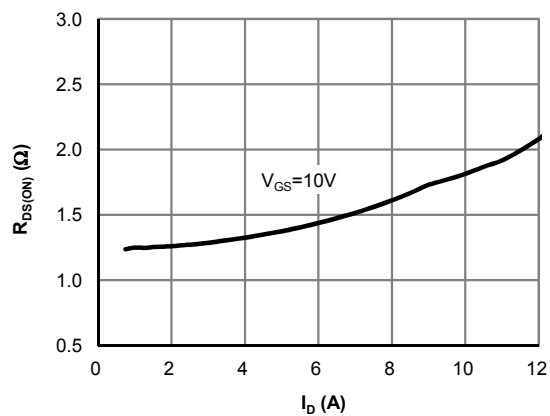


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

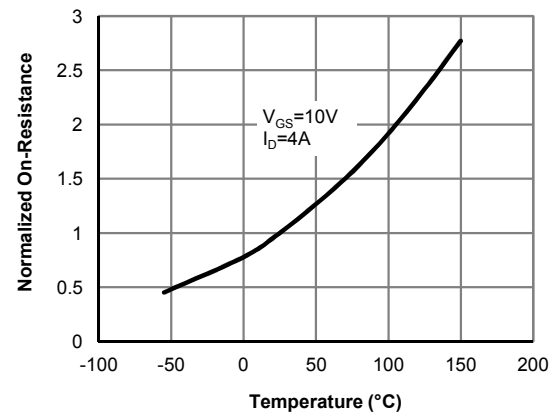


Figure 4: On-Resistance vs. Junction Temperature

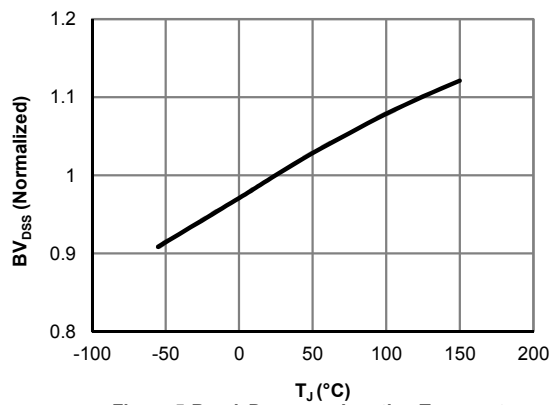


Figure 5: Break Down vs. Junction Temperature

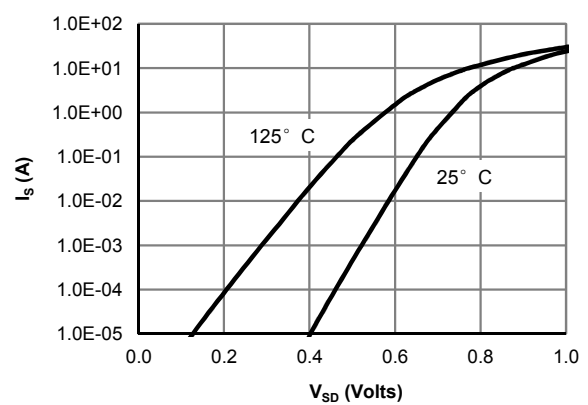


Figure 6: Body-Diode Characteristics (Note E)

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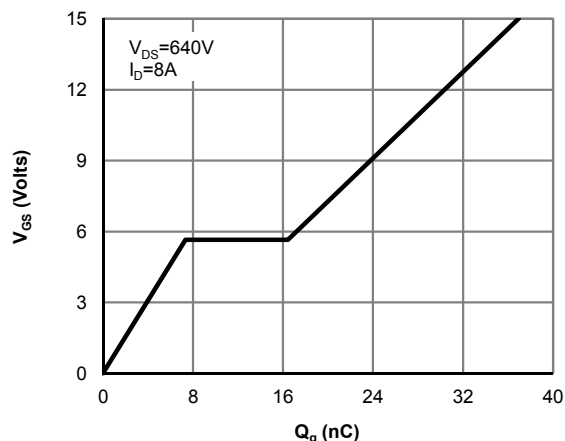


Figure 7: Gate-Charge Characteristics

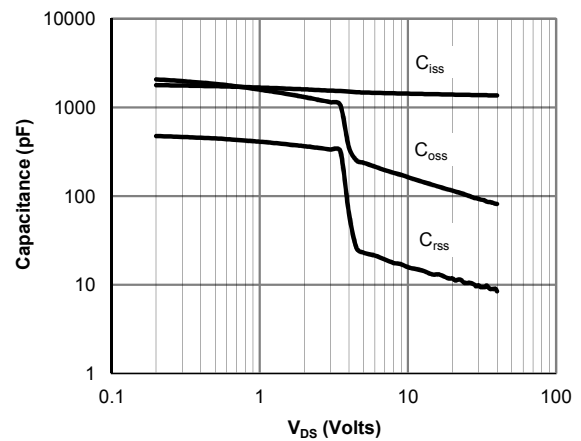


Figure 8: Capacitance Characteristics

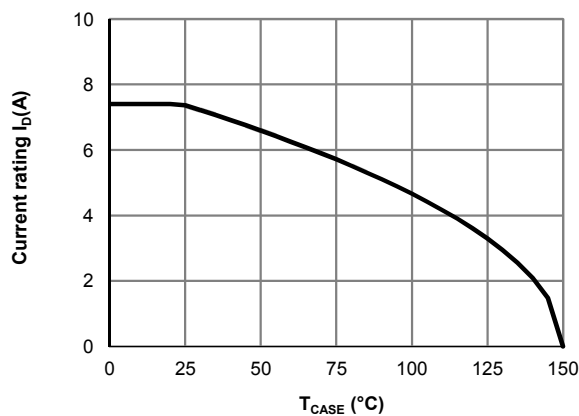


Figure 9: Current De-rating (Note B)

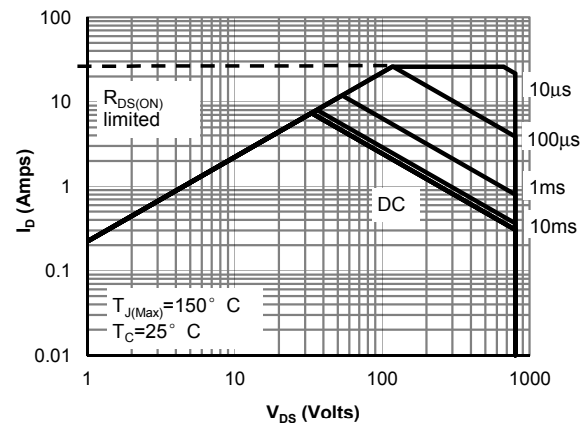


Figure 10: Maximum Forward Biased Safe Operating Area for AOK5N100 (Note F)

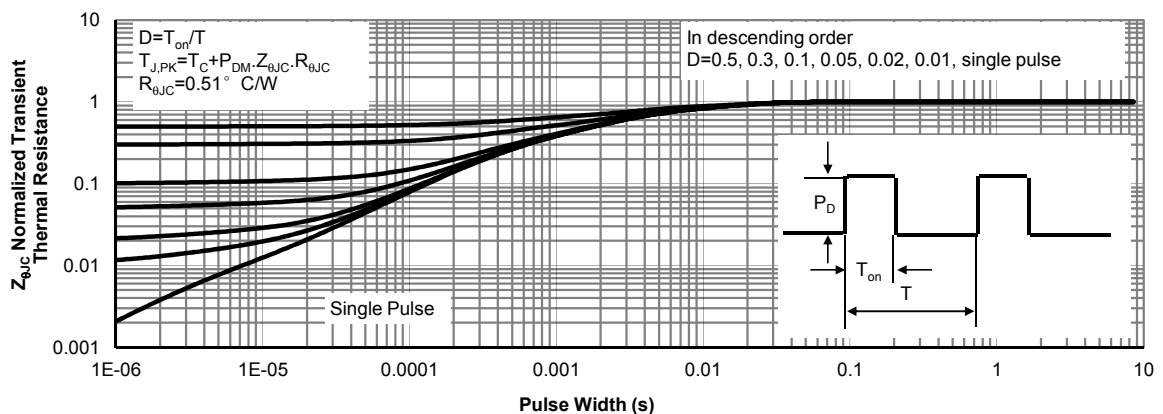
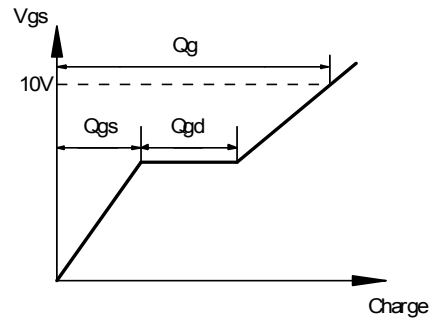
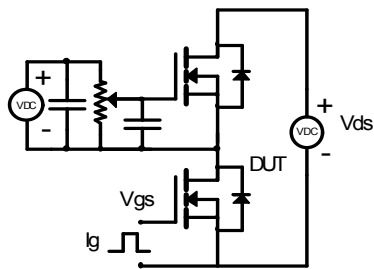
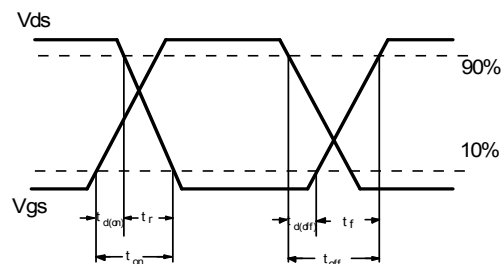
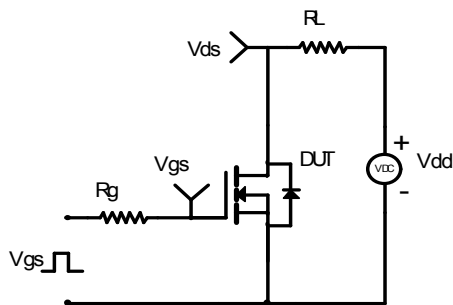


Figure 11: Normalized Maximum Transient Thermal Impedance for AOK5N100 (Note F)

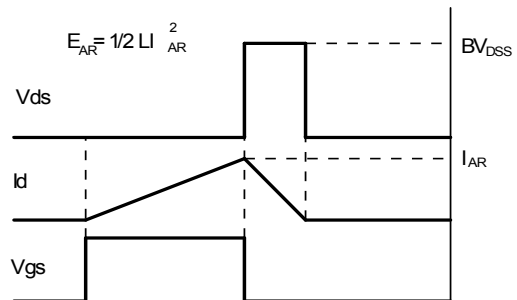
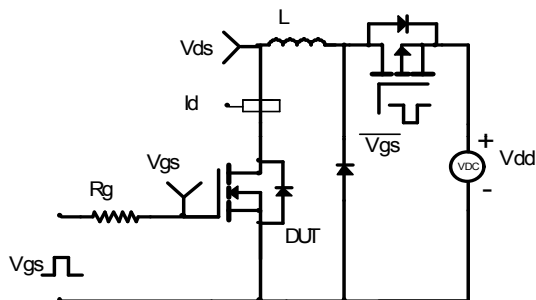
Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveforms



Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



Diode Recovery Test Circuit & Waveforms

