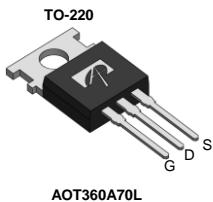




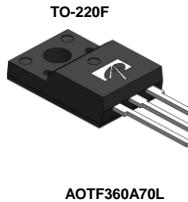
ALPHA & OMEGA
SEMICONDUCTOR

AOT360A70L/AOTF360A70L/AOB360A70L 700V, α MOS5™ N-Channel Power Transistor

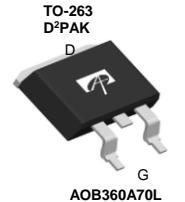
General Description		Product Summary	
<ul style="list-style-type: none"> Proprietary αMOS5™ technology Low $R_{DS(ON)}$ Optimized switching parameters for better EMI performance Enhanced body diode for robustness and fast reverse recovery 		V_{DS} @ $T_{j,max}$	800V
Applications <ul style="list-style-type: none"> Flyback for SMPS Charger ,PD Adapter, TV, lighting. 		I_{DM}	48A
		$R_{DS(ON),max}$	< 0.36Ω
		$Q_{g,typ}$	22.5nC
		E_{oss} @ 400V	2.8μJ
		100% UIS Tested	
		100% R_g Tested	



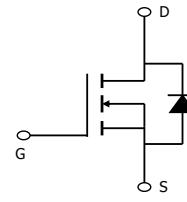
AOT360A70L



AOTF360A70L



AOB360A70L



Orderable Part Number	Package Type	Form	Minimum Order Quantity
AOB360A70L	TO263	Tape&Reel	800
AOT360A70L	TO220 Green	Tube	1000
AOTF360A70L	TO220F Green	Tube	1000

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

Parameter	Symbol	AOT(B)360A70L	AOTF360A70L	Units
Drain-Source Voltage	V_{DS}	700		V
Gate-Source Voltage	V_{GS}		± 20	V
Gate-Source Voltage (dynamic AC(f>1Hz))	V_{GS}		± 30	V
Continuous Drain Current ^{T_C=25°C}	I_D	12	12*	A
Continuous Drain Current ^{T_C=100°C}		7.6	7.6*	
Pulsed Drain Current ^C	I_{DM}	48		
Avalanche Current ^{C L=1mH}	I_{AR}	3.4		A
Repetitive avalanche energy ^C	E_{AR}	5.8		mJ
Single pulsed avalanche energy ^G	E_{AS}	50		mJ
MOSFET dv/dt ruggedness	dv/dt	100		V/ns
Peak diode recovery dv/dt		20		
Power Dissipation ^{B T_C=25°C}	P_D	156	29.5	W
Power Dissipation ^{B Derate above 25°C}		1.25	0.23	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	AOT(B)360A70L	AOTF360A70L	Units
Maximum Junction-to-Ambient ^{A,D}	R_{JJA}	65	65	°C/W
Maximum Case-to-sink ^A	R_{ICS}	0.5	---	°C/W
Maximum Junction-to-Case	R_{JJC}	0.8	4.2	°C/W

* Drain current limited by maximum junction temperature.

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	$I_D=250\mu\text{A}, V_{GS}=0\text{V}, T_J=25^\circ\text{C}$	700			V
		$I_D=250\mu\text{A}, V_{GS}=0\text{V}, T_J=150^\circ\text{C}$		800		
$BV_{DSS}/\Delta T_J$	Breakdown Voltage Temperature Coefficient	$I_D=250\mu\text{A}, V_{GS}=0\text{V}$	0.6			$\text{V}/^\circ\text{C}$
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS}=700\text{V}, V_{GS}=0\text{V}$		1		μA
		$V_{DS}=560\text{V}, T_J=125^\circ\text{C}$		10		
I_{GSS}	Gate-Body leakage current	$V_{DS}=0\text{V}, V_{GS}=\pm 20\text{V}$			± 100	nA
$V_{GS(\text{th})}$	Gate Threshold Voltage	$V_{DS}=5\text{V}, I_D=250\mu\text{A}$	3.4	4	4.6	V
$R_{DS(\text{ON})}$	Static Drain-Source On-Resistance	$V_{GS}=10\text{V}, I_D=6\text{A}$		0.316	0.36	Ω
g_{FS}	Forward Transconductance	$V_{DS}=10\text{V}, I_D=6\text{A}$		10		S
V_{SD}	Diode Forward Voltage	$I_S=6\text{A}, V_{GS}=0\text{V}$		0.86	1.2	V
I_S	Maximum Body-Diode Continuous Current				12	A
I_{SM}	Maximum Body-Diode Pulsed Current ^c				48	A
DYNAMIC PARAMETERS						
C_{iss}	Input Capacitance	$V_{GS}=0\text{V}, V_{DS}=100\text{V}, f=1\text{MHz}$		1360		pF
C_{oss}	Output Capacitance			34		pF
$C_{o(er)}$	Effective output capacitance, energy related ^H	$V_{GS}=0\text{V}, V_{DS}=0 \text{ to } 480\text{V}, f=1\text{MHz}$		32		pF
$C_{o(tr)}$	Effective output capacitance, time related ^I			147		pF
C_{rss}	Reverse Transfer Capacitance	$V_{GS}=0\text{V}, V_{DS}=100\text{V}, f=1\text{MHz}$		1.7		pF
R_g	Gate resistance	$f=1\text{MHz}$		2		Ω
SWITCHING PARAMETERS						
Q_g	Total Gate Charge	$V_{GS}=10\text{V}, V_{DS}=480\text{V}, I_D=6\text{A}$		22.5		nC
Q_{gs}	Gate Source Charge			9		nC
Q_{gd}	Gate Drain Charge			6.3		nC
$T_{d(on)}$	Turn-On Delay Time	$V_{GS}=10\text{V}, V_{DS}=400\text{V}, I_D=6\text{A}, R_G=5\Omega$		24.5		ns
T_r	Turn-On Rise Time			17		ns
$T_{d(off)}$	Turn-Off Delay Time			34.5		ns
T_f	Turn-Off Fall Time			13		ns
T_{rr}	Body Diode Reverse Recovery Time	$I_F=6\text{A}, dI/dt=100\text{A}/\mu\text{s}, V_{DS}=400\text{V}$		310		ns
I_{rm}	Peak Reverse Recovery Current			24.5		A
Q_{rr}	Body Diode Reverse Recovery Charge			4.8		μC

A. The value of R_{qJA} is measured with the device in a still air environment with $T_A=25^\circ\text{C}$.

B. The power dissipation P_0 is based on $T_{J(\text{MAX})}=150^\circ\text{C}$ in a TO252 package, 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 $T_{J(\text{MAX})}=150^\circ\text{C}$.

D. The R_{qJA} is the sum of the thermal impedance from junction to case R_{qJC} and case to ambient.

E. The static characteristics in Figures 1 to 6 are obtained using $<300\mu\text{s}$ 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 k , assuming a maximum junction temperature of $T_{J(\text{MAX})}=150^\circ\text{C}$. The SOA curve provides a single pulse rating.

G. $L=60\text{mH}, I_{AS}=1.3\text{A}, R_G=25\Omega$, Starting $T_J=25^\circ\text{C}$.

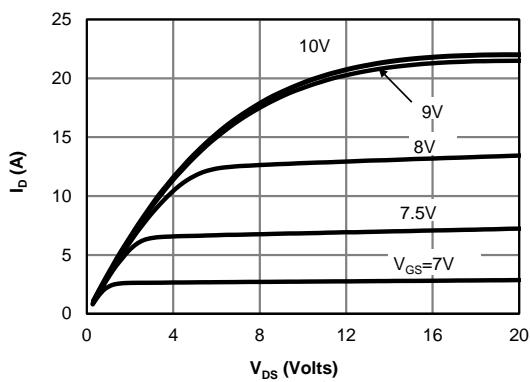
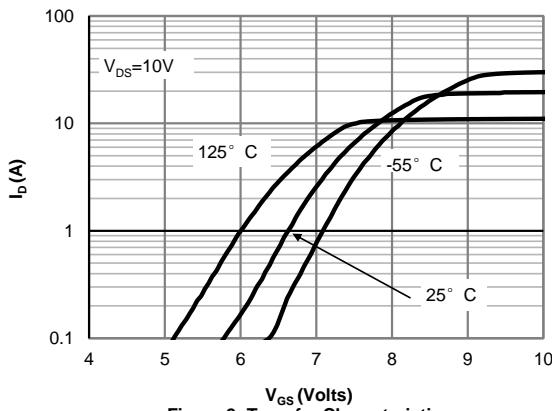
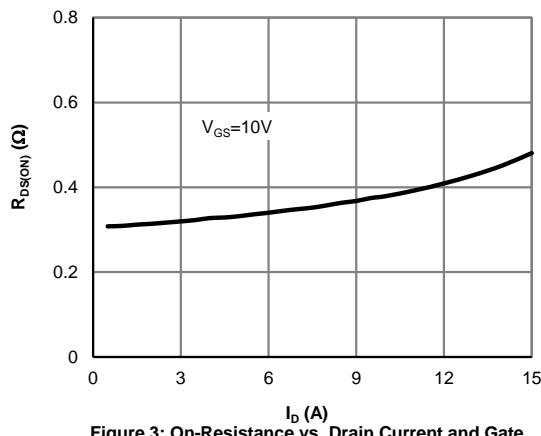
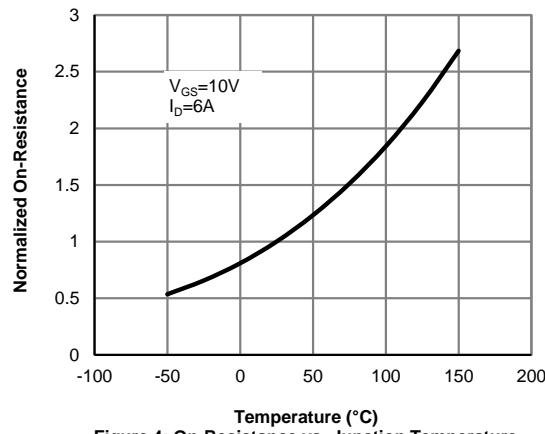
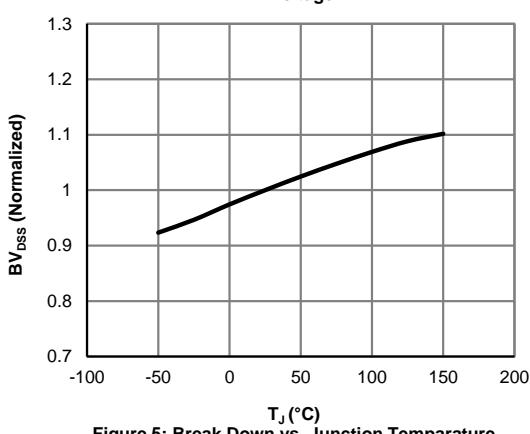
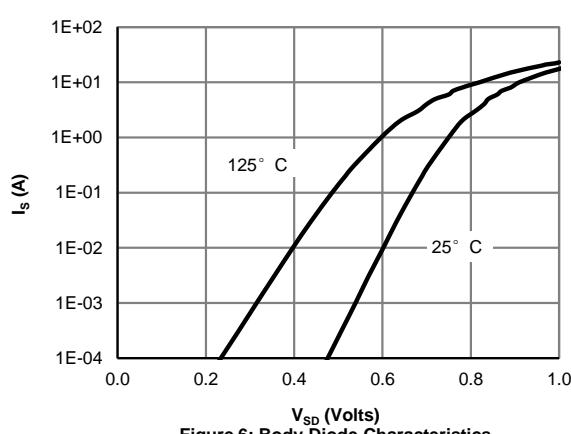
H. $C_{o(er)}$ is a fixed capacitance that gives the same stored energy as C_{oss} while V_{DS} is rising from 0 to 80% $V_{(BR)DSS}$.

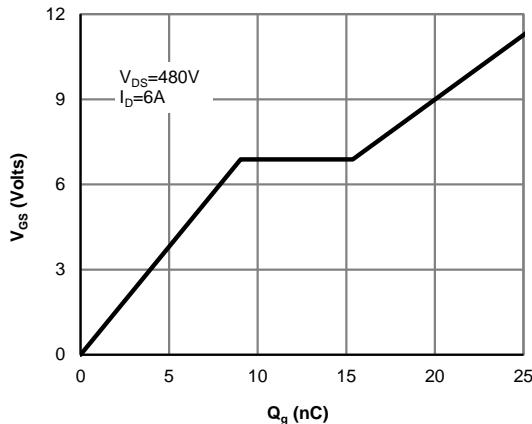
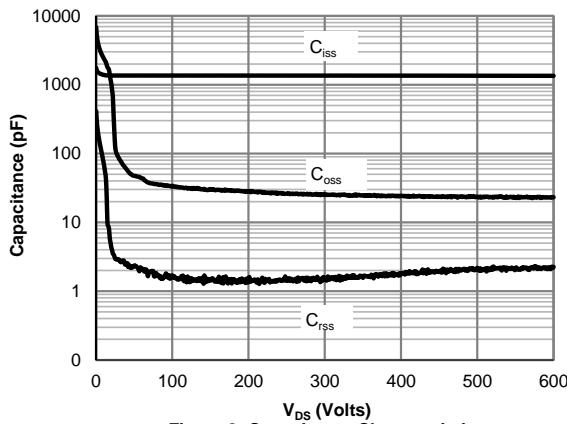
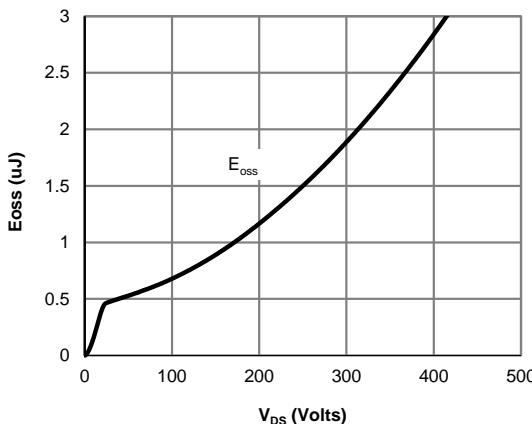
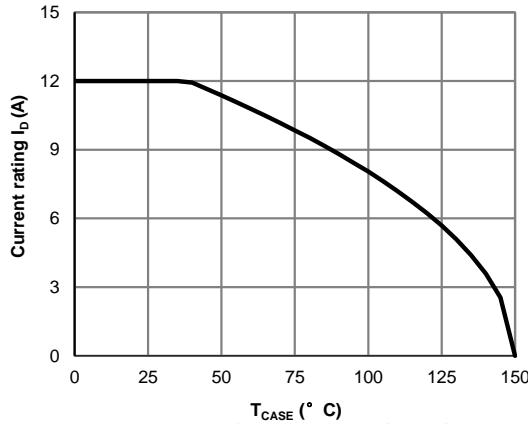
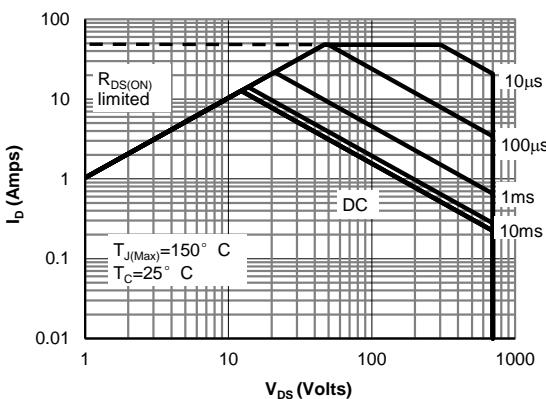
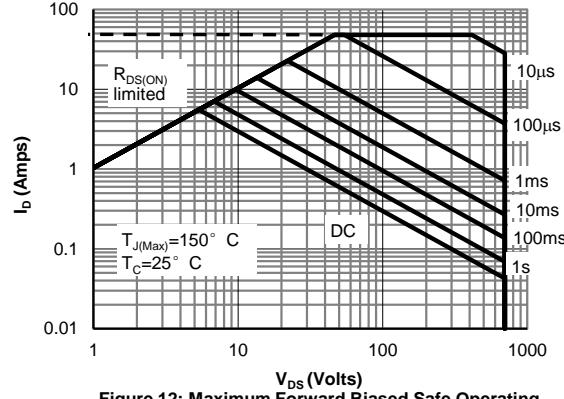
I. $C_{o(tr)}$ is a fixed capacitance that gives the same charging time as C_{oss} while V_{DS} is rising from 0 to 80% $V_{(BR)DSS}$.

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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 AOT(B)360A70L (Note F)

Figure 12: Maximum Forward Biased Safe Operating Area for AOTF360A70L (Note F)

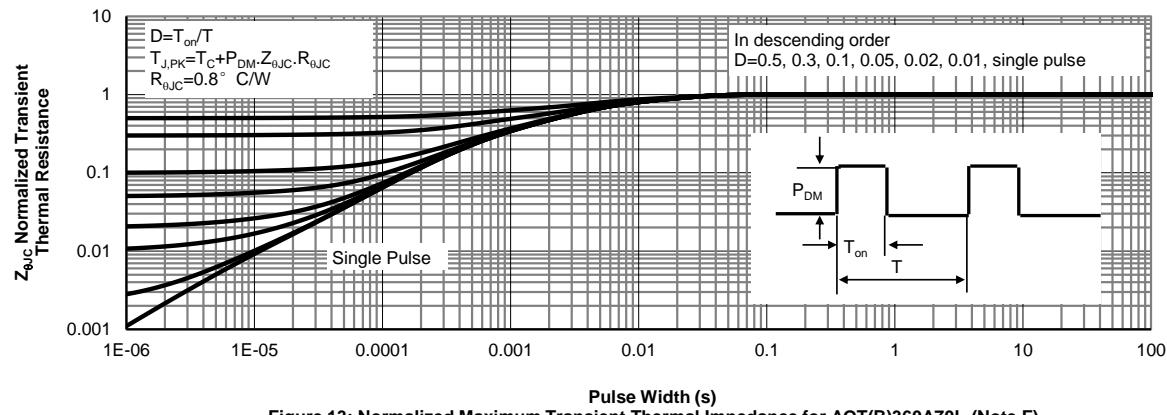
TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS


Figure 13: Normalized Maximum Transient Thermal Impedance for AOT(B)360A70L (Note F)

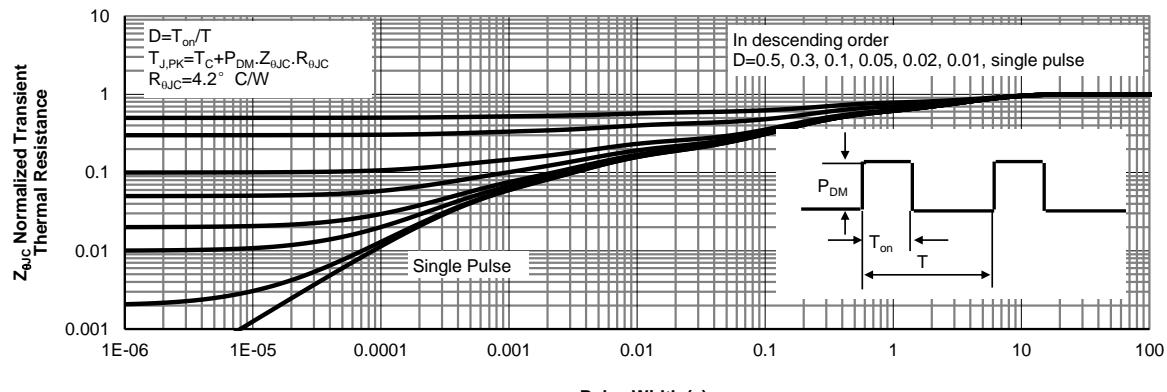
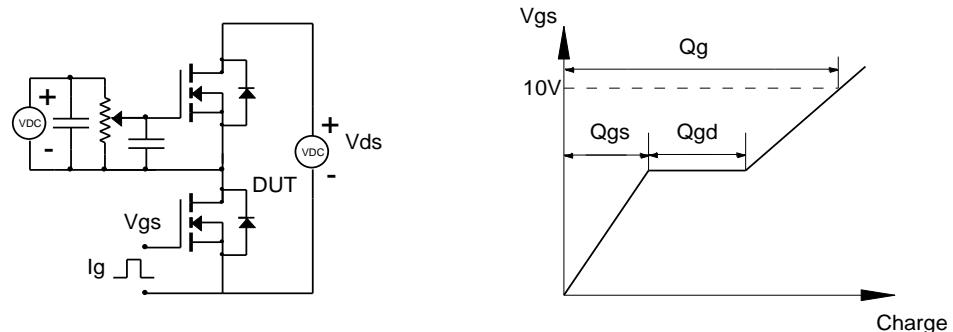
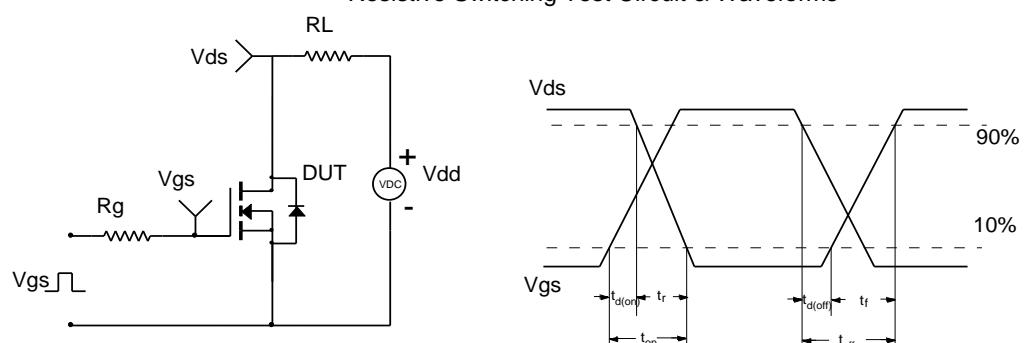
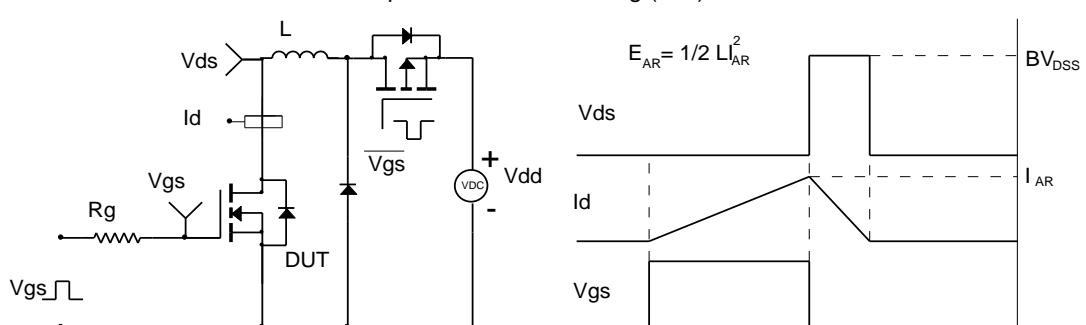


Figure 14: Normalized Maximum Transient Thermal Impedance for AOTF360A70L (Note F)

Gate Charge Test Circuit & Waveform

Resistive Switching Test Circuit & Waveforms

Unclamped Inductive Switching (UIS) Test Circuit & Waveforms

Diode Recovery Test Circuit & Waveforms
