ALPHA & OMEGA SEMICONDUCTOR

AOT20S60L/AOB20S60L/AOTF20S60L/AOTF20S60

600V 20A αMOS™ Power Transistor

General Description

The AOT20S60L & AOB20S60L & AOTF20S60L & AOTF20S60 have been fabricated using the advanced αMOS™ high voltage process that is designed to deliver high levels of performance and robustness in switching applications.
By providing low $R_{DS(on)}$, Q_g and E_{OSS} along with guaranteed avalanche capability these parts can be adopted quickly into new and existing offline power supply designs.

Product Summary

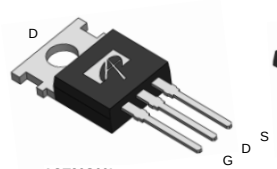
V_{DS} @ $T_{j,max}$	700V
I_{DM}	80A
$R_{DS(ON),max}$	0.199Ω
$Q_{g,typ}$	20nC
E_{oss} @ 400V	4.9µJ

100% UIS Tested
100% R_g Tested

RoHS Compliant

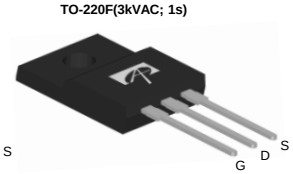
Top View

TO-220



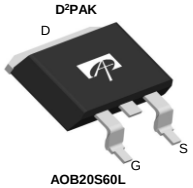
AOT20S60L

TO-220F(3kVAC; 1s)

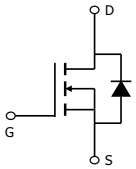


AOTF20S60(L)

TO-263
D²PAK



AOB20S60L



Absolute Maximum Ratings T_A=25°C unless otherwise noted

Parameter		Symbol	AOT20S60L/AOB20S60L	AOTF20S60	AOTF20S60L	Units
Drain-Source Voltage		V_{DS}	600			V
Gate-Source Voltage		V_{GS}	±30			V
Continuous Drain Current	T_C=25°C	I_D	20	20*	20*	A
	T_C=100°C		14	14*	14*	
Pulsed Drain Current [C]		I_{DM}	80			
Avalanche Current [C]		I_{AR}	3.4			A
Repetitive avalanche energy [C]		E_{AR}	23			mJ
Single pulsed avalanche energy [G]		E_{AS}	188			mJ
Power Dissipation [B]	T_C=25°C	P_D	266	50	37.8	W
	Derate above 25°C		2.1	0.4	0.3	W/ °C
MOSFET dv/dt ruggedness		dv/dt	100			V/ns
Peak diode recovery dv/dt [H]			20			
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 [J]		T_L	300			°C

Thermal Characteristics

Parameter	Symbol	AOT20S60L/AOB20S60L	AOTF20S60	AOTF20S60L	Units
Maximum Junction-to-Ambient [A,D]	$R_{\theta JA}$	65	65	65	°C/W
Maximum Case-to-sink [A]	$R_{\theta CS}$	0.5	--	--	°C/W
Maximum Junction-to-Case	$R_{\theta JC}$	0.47	2.5	3.3	°C/W

* Drain current limited by maximum junction temperature.

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	2.8	3.4	4.1	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance	V_{GS}=10V, I_D=10A, T_J=25°C	-	0.18	0.199	Ω
		V_{GS}=10V, I_D=10A, T_J=150°C	-	0.48	0.53	Ω
V_{SD}	Diode Forward Voltage	I_S=10A,V_{GS}=0V, T_J=25°C	-	0.84	-	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	-	1038	-	pF
C_{oss}	Output Capacitance		-	68	-	pF
$C_{o(er)}$	Effective output capacitance, energy related[H]	V_{GS}=0V, V_{DS}=0 to 480V, f=1MHz	-	56.6	-	pF
$C_{o(tr)}$	Effective output capacitance, time related[I]		-	176.5	-	pF
C_{rss}	Reverse Transfer Capacitance	V_{GS}=0V, V_{DS}=100V, f=1MHz	-	2.1	-	pF
R_g	Gate resistance	V_{GS}=0V, V_{DS}=0V, f=1MHz	-	9.3	-	Ω
SWITCHING PARAMETERS						
Q_g	Total Gate Charge	V_{GS}=10V, V_{DS}=480V, I_D=10A	-	19.8	-	nC
Q_{gs}	Gate Source Charge		-	4.6	-	nC
Q_{gd}	Gate Drain Charge		-	7.6	-	nC
$t_{D(on)}$	Turn-On DelayTime	V_{GS}=10V, V_{DS}=400V, I_D=10A, R_G=25Ω	-	27.5	-	ns
t_r	Turn-On Rise Time		-	32	-	ns
$t_{D(off)}$	Turn-Off DelayTime		-	87.5	-	ns
t_f	Turn-Off Fall Time		-	30	-	ns
t_{rr}	Body Diode Reverse Recovery Time	I_F=10A,dI/dt=100A/µs,V_{DS}=400V	-	350	-	ns
I_{rm}	Peak Reverse Recovery Current	I_F=10A,dI/dt=100A/µs,V_{DS}=400V	-	27	-	A
Q_{rr}	Body Diode Reverse Recovery Charge	I_F=10A,dI/dt=100A/µs,V_{DS}=400V	-	5.7	-	µC

A. The value of $R_{\theta JA}$ 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 $R_{\theta JA}$ is the sum of the thermal impedance from junction to case $R_{\theta JC}$ 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}=2.5A, 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.

APPLICATIONS OR USES 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 MAKE CHANGES TO PRODUCT SPECIFICATIONS WITHOUT NOTICE. IT IS THE RESPONSIBILITY OF THE CUSTOMER TO EVALUATE SUITABILITY OF THE PRODUCT FOR THEIR INTENDED APPLICATION. CUSTOMER SHALL COMPLY WITH APPLICABLE LEGAL REQUIREMENTS, INCLUDING ALL APPLICABLE EXPORT CONTROL RULES, REGULATIONS AND LIMITATIONS.

AOS' products are provided subject to AOS' terms and conditions of sale which are set forth at:
http://www.aosmd.com/terms_and_conditions_of_sale

TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

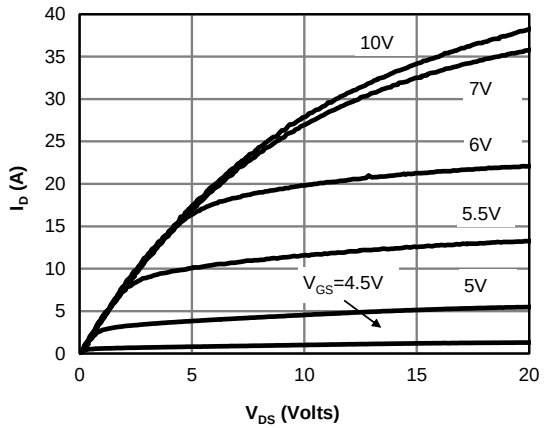


Figure 1: On-Region Characteristics@25° C

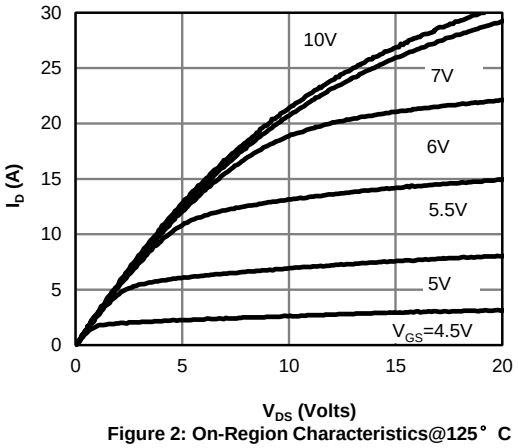


Figure 2: On-Region Characteristics@125° C

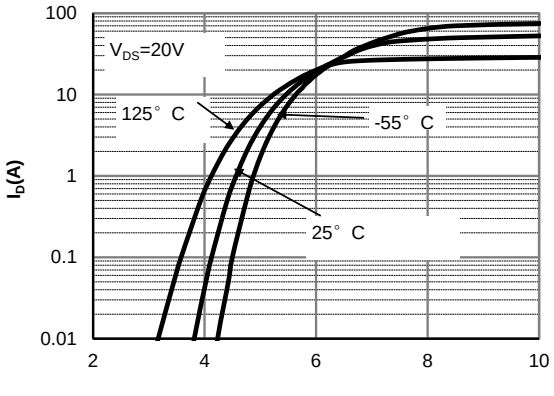


Figure 3: Transfer Characteristics

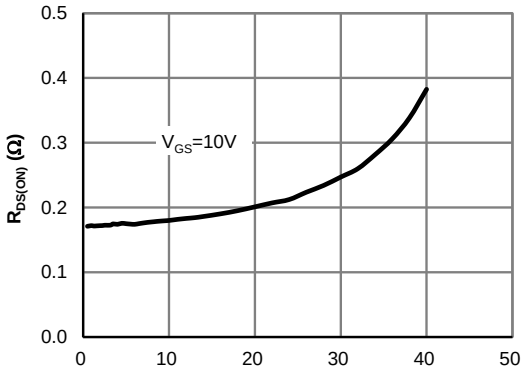


Figure 4: On-Resistance vs. Drain Current and Gate Voltage

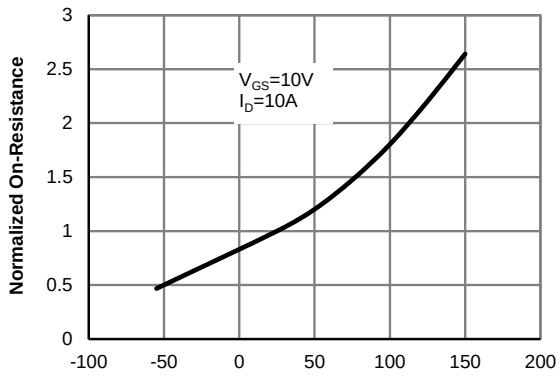


Figure 5: On-Resistance vs. Junction Temperature

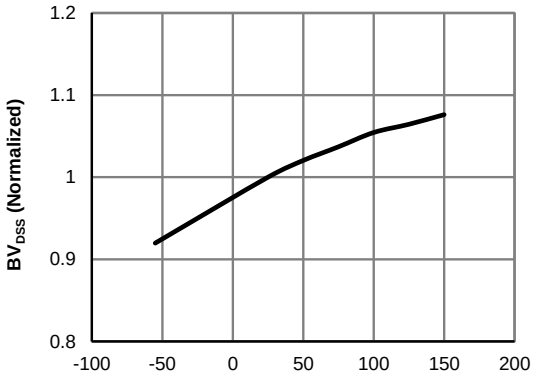


Figure 6: Break Down vs. Junction Temperature

TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

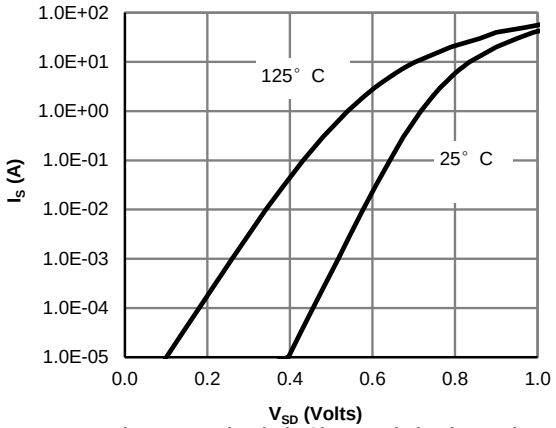


Figure 7: Body-Diode Characteristics (Note E)

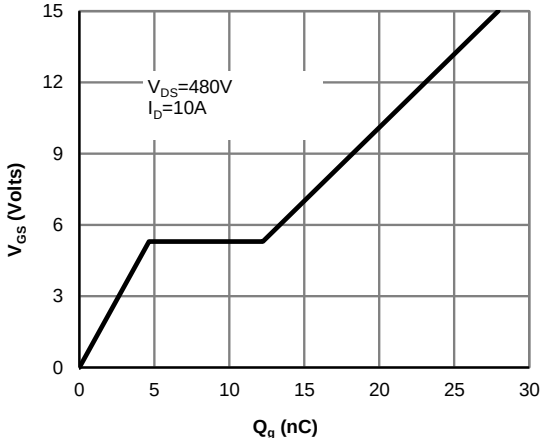


Figure 8: Gate-Charge Characteristics

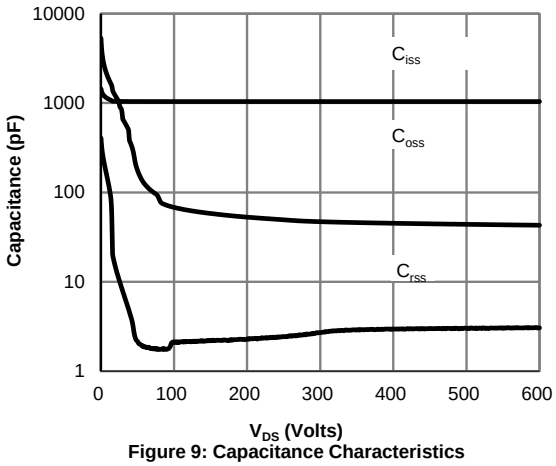


Figure 9: Capacitance Characteristics

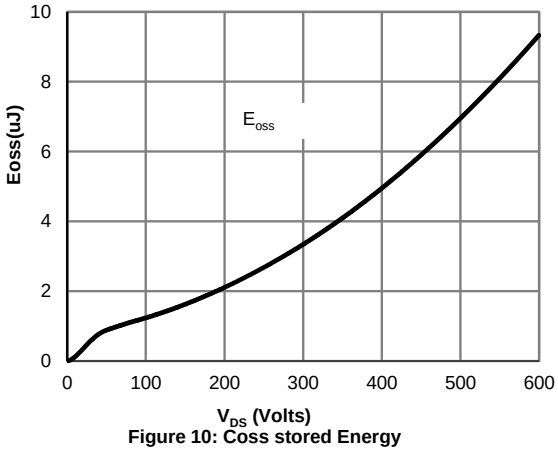


Figure 10: Coss stored Energy

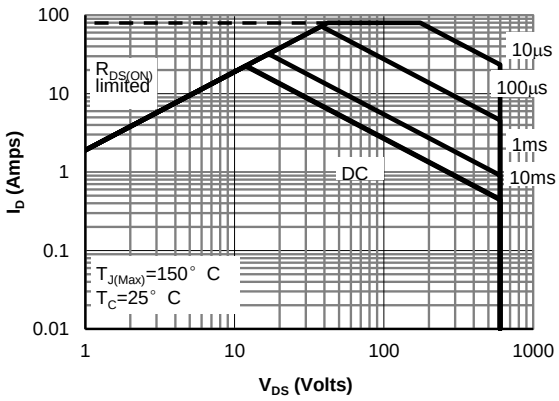


Figure 11: Maximum Forward Biased Safe Operating Area for AOT(B)20S60L (Note F)

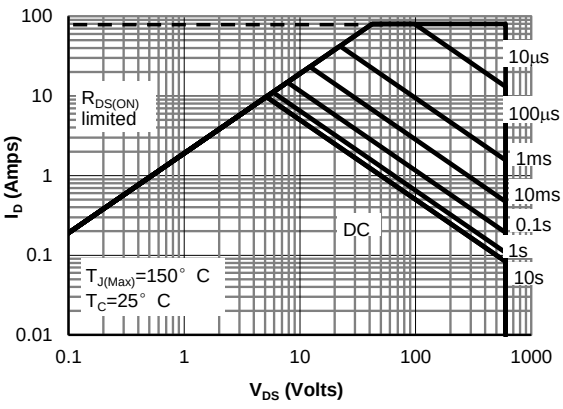


Figure 12: Maximum Forward Biased Safe Operating Area for AOTF20S60(Note F)

TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

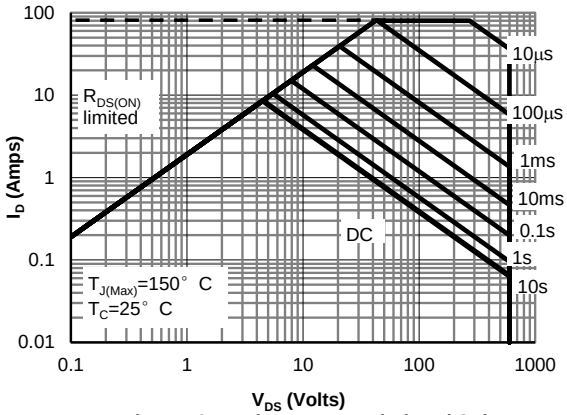


Figure 13: Maximum Forward Biased Safe Operating Area for AOTF20S60L(Note F)

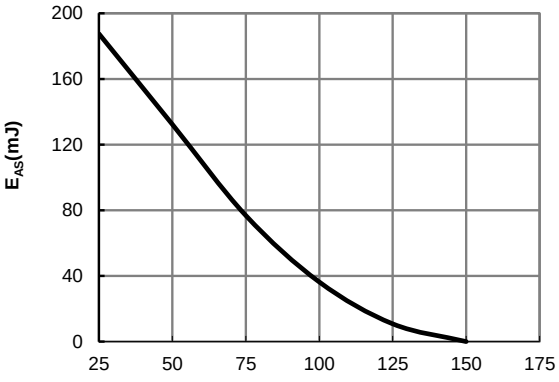


Figure 14: Avalanche energy

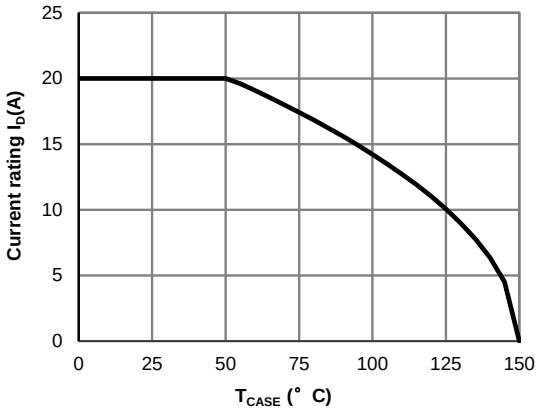


Figure 15: Current De-rating (Note B)

TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

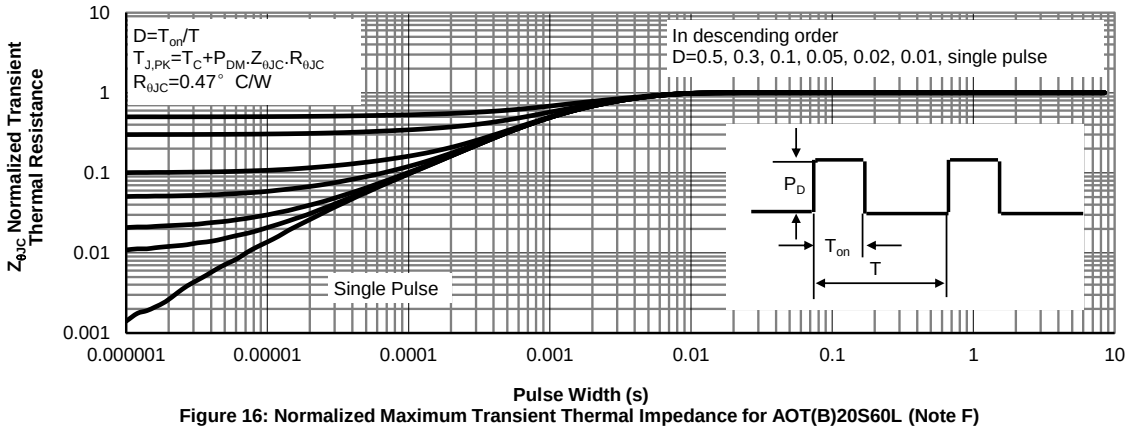


Figure 16: Normalized Maximum Transient Thermal Impedance for AOT(B)20S60L (Note F)

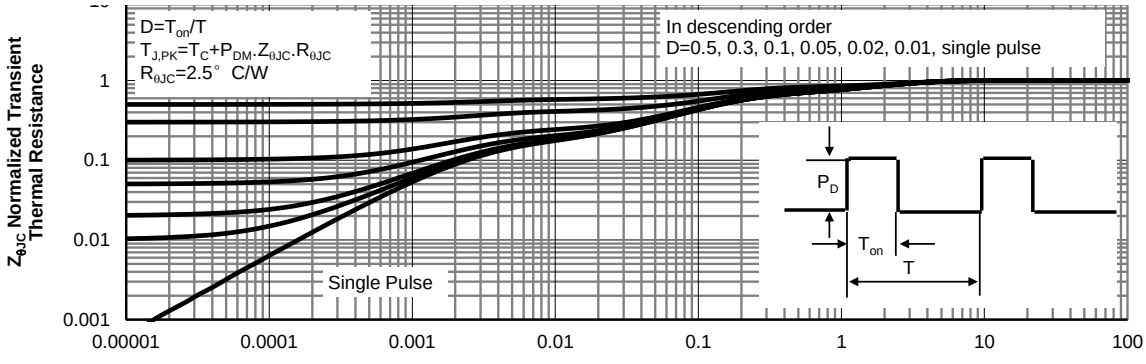


Figure 17: Normalized Maximum Transient Thermal Impedance for AOTF20S60 (Note F)

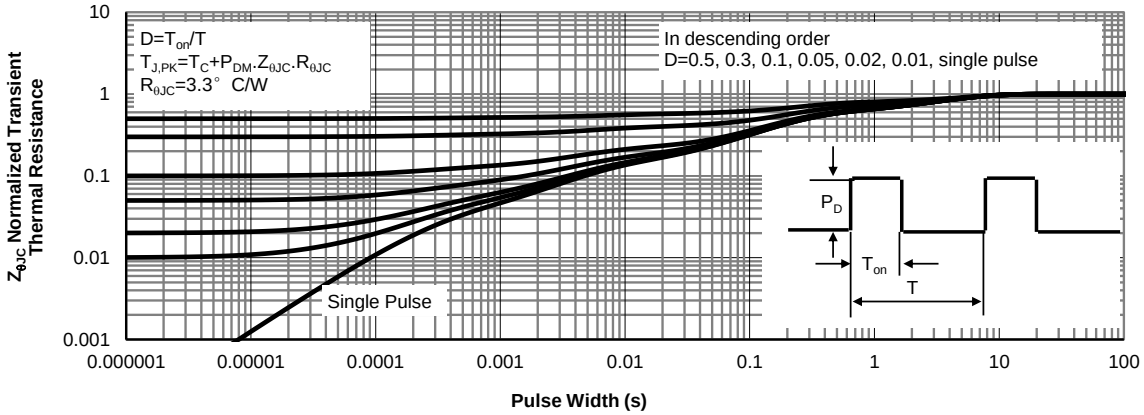
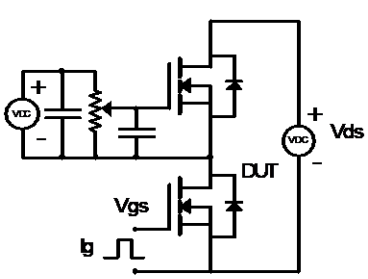
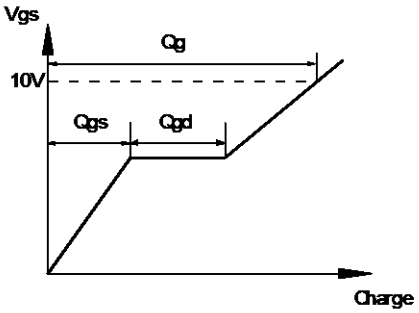


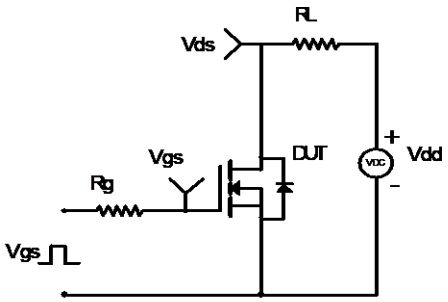
Figure 18: Normalized Maximum Transient Thermal Impedance for AOTF20S60L (Note F)

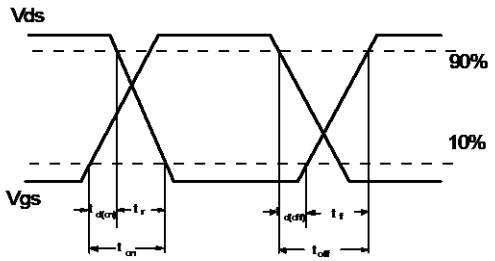
Gate Charge Test Circuit & Waveform



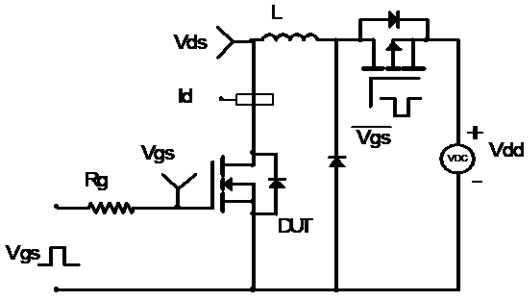


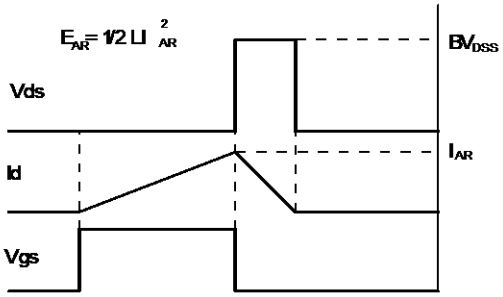
Resistive Switching Test Circuit & Waveforms



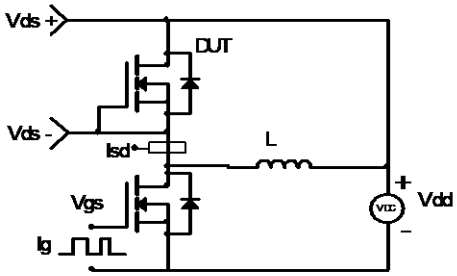


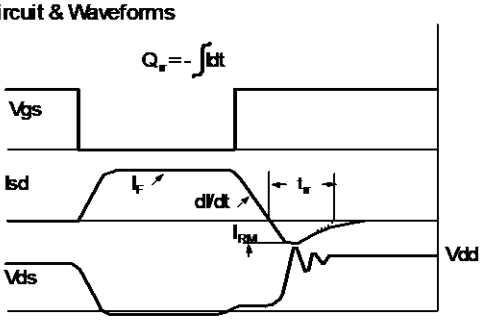
Unclamped Inductive Switching (UIS) Test Circuit & Waveforms





Diode Recovery Test Circuit & Waveforms





ENTEGRECİ

Bu belge www.entegreci.com üzerinden sunulmaktadır.

Elektronik komponent tedarikinde Entegreci

Entegreci, Eskişehir merkezli, Türkiye geneline satış yapan bir elektronik komponent mağazasıdır. Entegreler (IC), mikrodenetleyiciler, transistörler, diyotlar, pasif elemanlar, konnektörler, modüller ve geliştirme kartları tek adetten seri üretim adetlerine kadar satılır. Ürün sayfalarında güncel stok durumunu, fiyatı ve datasheet bağlantısını bulabilirsiniz.

Parça koduyla arama

Üretici parça numarasını yazın; stok ve fiyatı hemen görün.

www.entegreci.com

Ürün kategorileri

Entegreden kapasitöre tüm elektronik komponent kategorileri.

Kategorilere göz atın

Üreticiler

Aradığınız üreticinin ürünlerini tek sayfada inceleyin.

Üreticileri görün

Toplu alım ve teklif

Listede olmayan ya da yüksek adetli parçalar için teklif isteyin.

Teklif isteyin

www.entegreci.com | **destek@entegreci.com** | **0850 305 90 34**

Entegreci is an online electronic components store based in Türkiye. Search by manufacturer part number to see stock, prices and datasheets for integrated circuits, microcontrollers, transistors, passive components and connectors, or request a quote for parts that are not listed.

Bu sayfa Entegreci tarafından eklenmiştir. Belgenin önceki sayfaları asıl yayıncısına aittir ve içeriği değiştirilmemiştir; en güncel sürüm için belgenin yayıncısına başvurun.