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With the principle of “Quality Parts,Customers Priority,Honest Operation,and Considerate Service”,our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip,ALPS,ROHM,Xilinx,Pulse,ON,Everlight and Freescale. Main products comprise IC,Modules,Potentiometer,IC Socket,Relay,Connector.Our parts cover such applications as commercial,industrial, and automotives areas.

We are looking forward to setting up business relationship with you and hope to provide you with the best service and solution. Let us make a better world for our industry!



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General Description

- Trench Power AlphaMOS-II technology
- Low $R_{DS(ON)}$
- Low C_{iss} and C_{rss}
- High Current Capability
- RoHS and Halogen Free Compliant

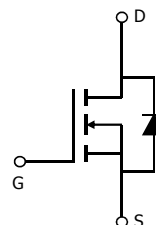
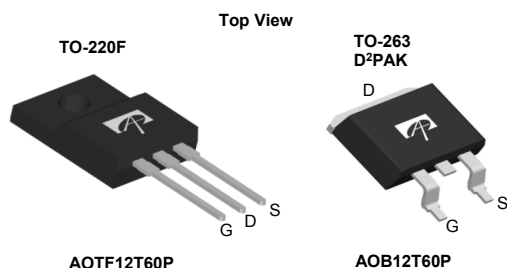
Applications

- General Lighting for LED and CCFL
- AC/DC Power supplies for Industrial, Consumer, and Telecom

Product Summary

$V_{DS} @ T_{j,max}$	700V
I_{DM}	48A
$R_{DS(ON),max}$	< 0.52 Ω
$Q_{g,typ}$	33nC
$E_{oss} @ 400V$	4.4 μ J

100% UIS Tested
100% R_g Tested



Orderable Part Number	Package Type	Form	Minimum Order Quantity
AOB12T60PL	TO-263 Green	Tape & Reel	800
AOTF12T60P	TO-220F Pb Free	Tube	1000
AOTF12T60PL	TO-220F Green	Tube	1000

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

Parameter		Symbol	AOB12T60P	AOTF12T60P	AOTF12T60PL	Units
Drain-Source Voltage		V _{DS}	600			V
Gate-Source Voltage		V _{GS}	±30			V
Continuous Drain Current	T _C =25°C	I _D	12	12*	12*	A
	T _C =100°C		9	9*	9*	
Pulsed Drain Current ^C		I _{DM}	48			
Avalanche Current ^C L=1mH		I _{AR}	12			A
Repetitive avalanche energy ^C		E _{AR}	72			mJ
Single pulsed avalanche energy ^G		E _{AS}	750			mJ
MOSFET dv/dt ruggedness		dv/dt	50			V/ns
Peak diode recovery dv/dt ^J			15			
Power Dissipation ^B	T _C =25°C	P _D	250	50	35	W
	Derate above 25°C		2	0.4	0.3	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	AOB12T60P	AOTF12T60P	AOTF12T60PL	Units
Maximum Junction-to-Ambient ^{A,D}	$R_{\theta JA}$	65	65	65	$^\circ\text{C/W}$
Maximum Case-to-sink ^A	$R_{\theta CS}$	0.5	—	—	$^\circ\text{C/W}$
Maximum Junction-to-Case	$R_{\theta JC}$	0.5	2.5	3.6	$^\circ\text{C/W}$

* 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		700		
BV _{DSS} /ΔT _J	Breakdown Voltage Temperature Coefficient	I _D =250μA, V _{GS} =0V		0.58		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} =±30V			±100	nA
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =5V, I _D =250μA	3	4.1	5	V
R _{DS(ON)}	Static Drain-Source On-Resistance	V _{GS} =10V, I _D =6A		0.44	0.52	Ω
g _{FS}	Forward Transconductance	V _{DS} =40V, I _D =6A		11		S
V _{SD}	Diode Forward Voltage	I _S =1A, V _{GS} =0V		0.73	1	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} =0V, V _{DS} =100V, f=1MHz		2028		pF
C _{oss}	Output Capacitance			71		pF
C _{o(er)}	Effective output capacitance, energy related ^H	V _{GS} =0V, V _{DS} =0 to 480V, f=1MHz		52		pF
C _{o(tr)}	Effective output capacitance, time related ^I			94		pF
C _{rss}	Reverse Transfer Capacitance	V _{GS} =0V, V _{DS} =100V, f=1MHz		13		pF
R _g	Gate resistance	f=1MHz		2.2		Ω
SWITCHING PARAMETERS						
Q _g	Total Gate Charge	V _{GS} =10V, V _{DS} =480V, I _D =12A		33	50	nC
Q _{gs}	Gate Source Charge			13		nC
Q _{gd}	Gate Drain Charge			10		nC
t _{D(on)}	Turn-On DelayTime	V _{GS} =10V, V _{DS} =300V, I _D =12A, R _G =25Ω		52		ns
t _r	Turn-On Rise Time			72		ns
t _{D(off)}	Turn-Off DelayTime			66		ns
t _f	Turn-Off Fall Time			42		ns
t _{rr}	Body Diode Reverse Recovery Time	I _F =12A, di/dt=100A/μs, V _{DS} =100V		483		ns
Q _{rr}	Body Diode Reverse Recovery Charge	I _F =12A, di/dt=100A/μs, V _{DS} =100V		7		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 ms 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}=5A, V_{DD}=150V, R_G=25Ω, 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. I_{SD}≤I_D, di/dt≤200A/μs, V_{DD}=400V, T_J≤T_{J(MAX)}.

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TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

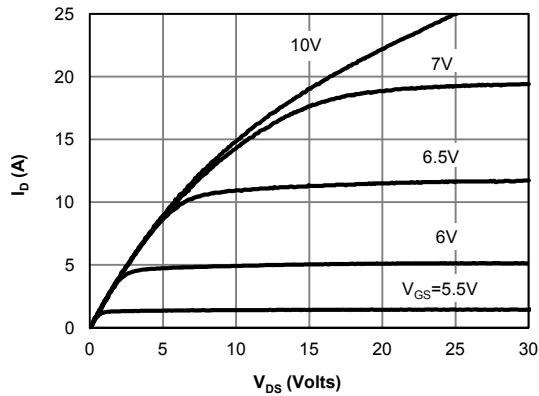


Figure 1: On-Region Characteristics

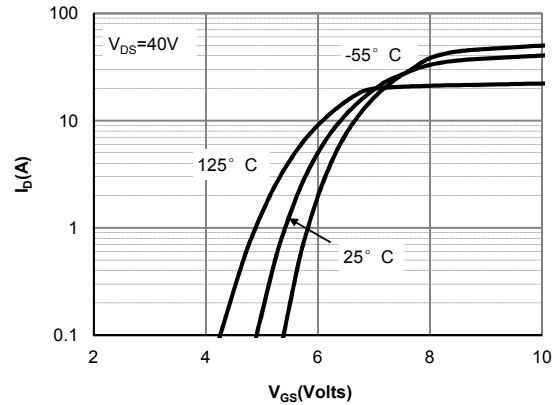


Figure 2: Transfer Characteristics

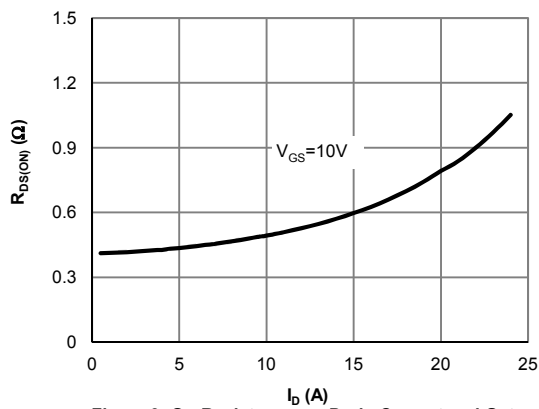


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

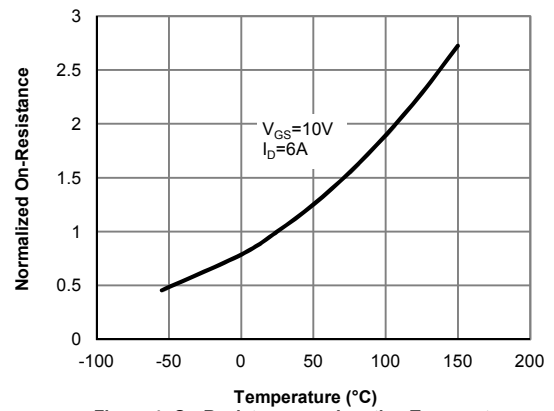


Figure 4: On-Resistance vs. Junction Temperature

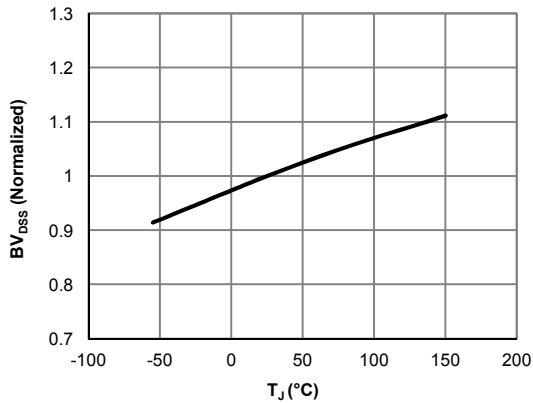


Figure 5: Break Down vs. Junction Temperature

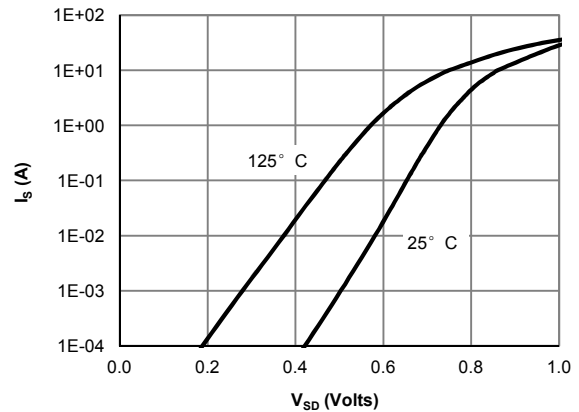
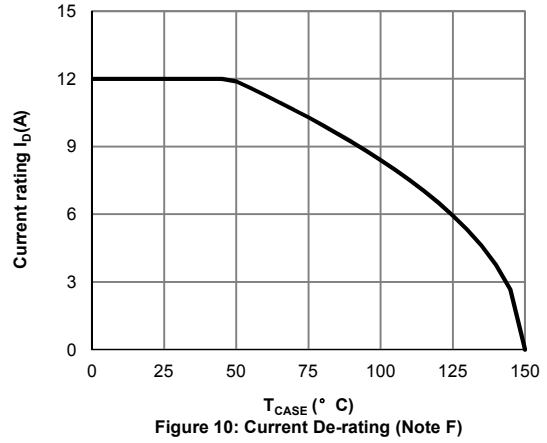
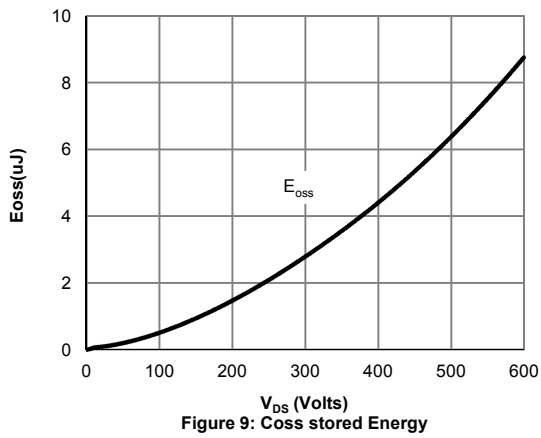
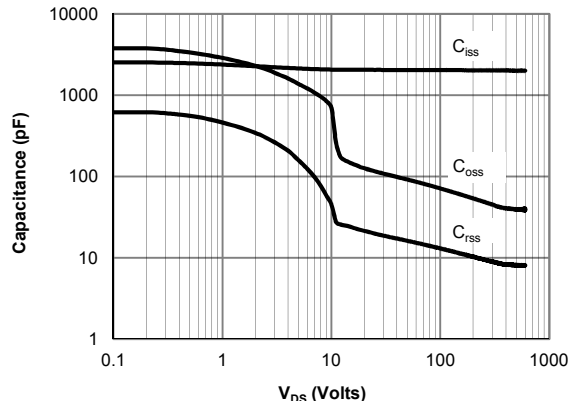
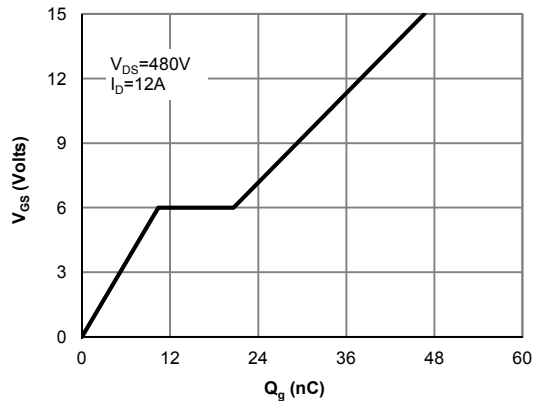


Figure 6: Body-Diode Characteristics

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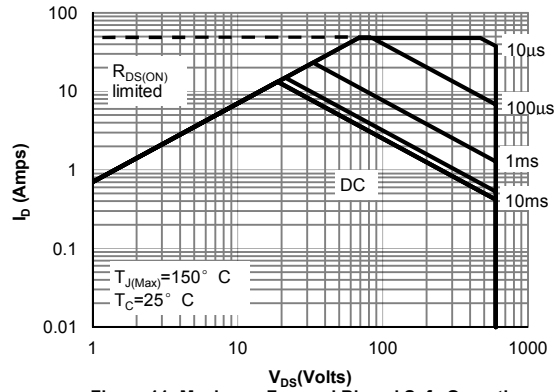


Figure 11: Maximum Forward Biased Safe Operating Area for TO-263 (Note F)

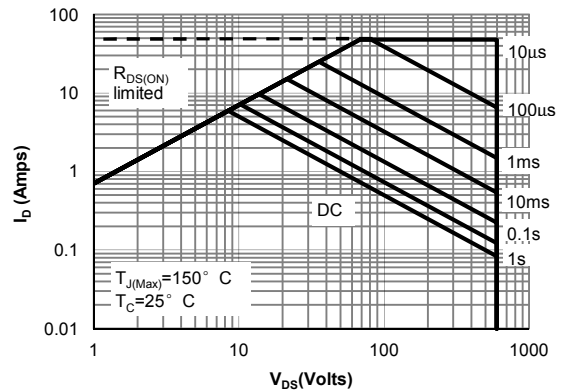


Figure 12: Maximum Forward Biased Safe Operating Area for TO-220F Pb Free (Note F)

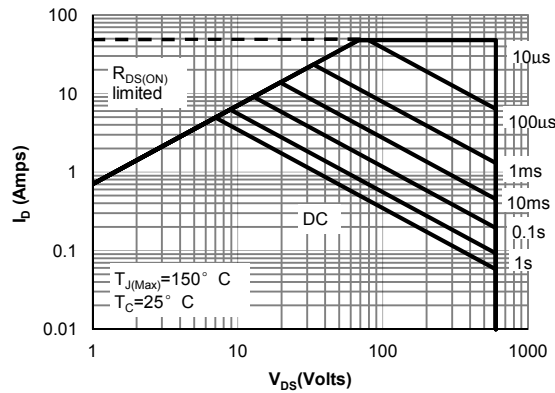
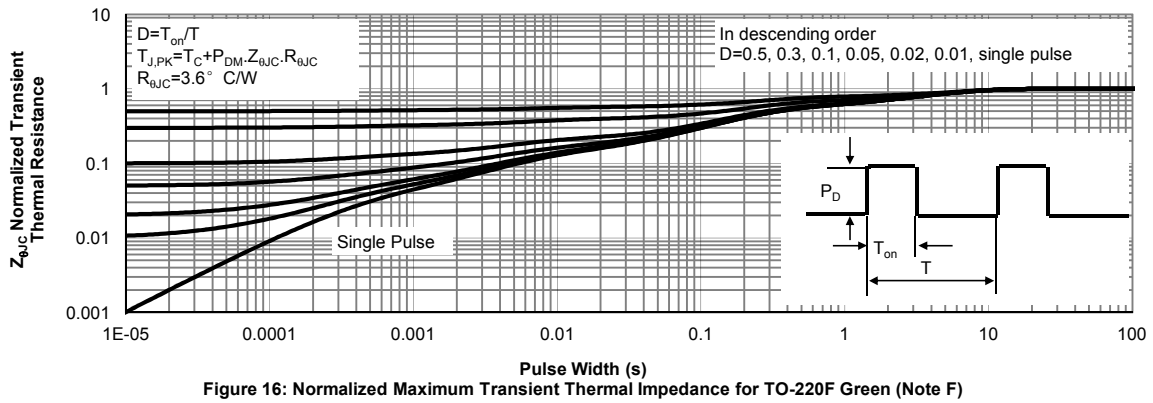
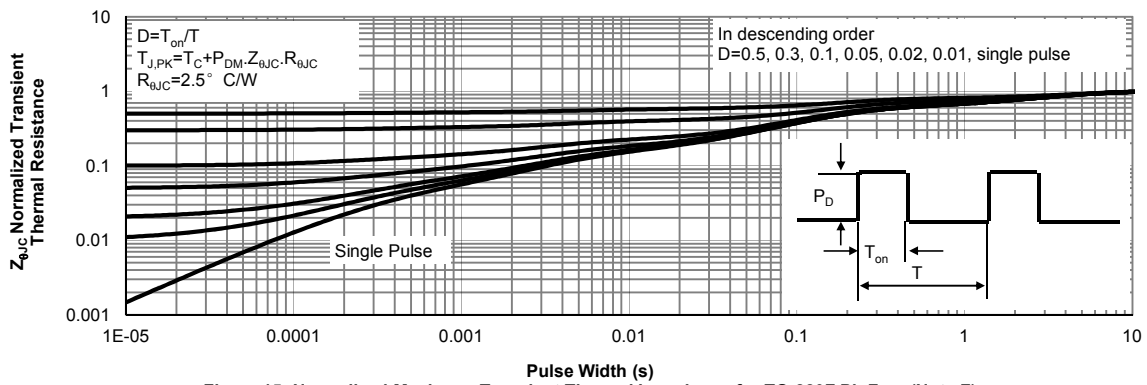
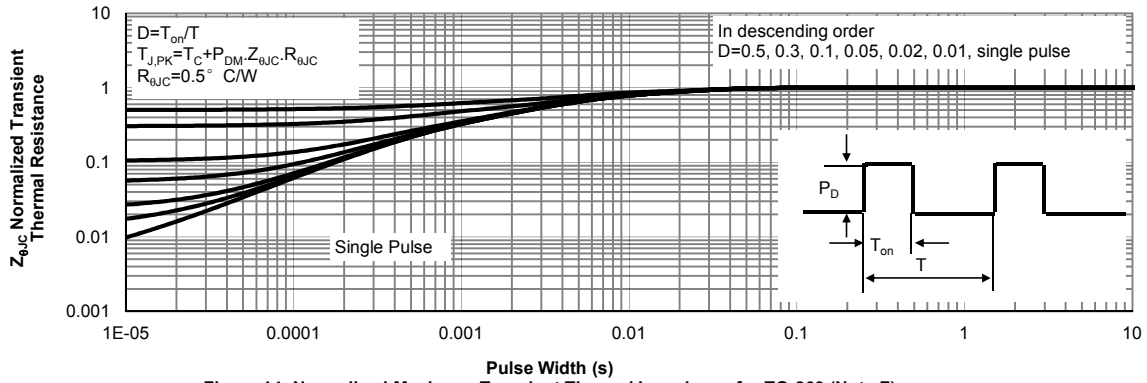
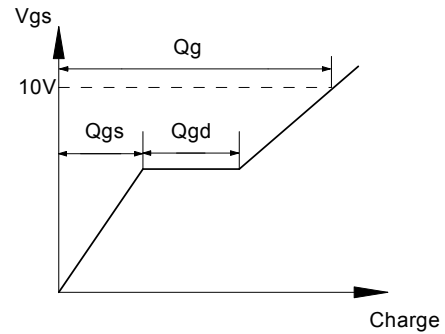
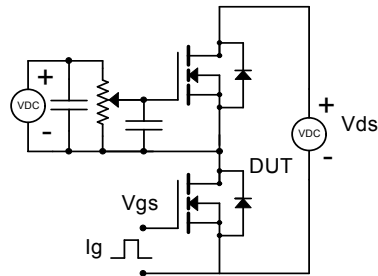


Figure 13: Maximum Forward Biased Safe Operating Area for TO-220F Green (Note F)

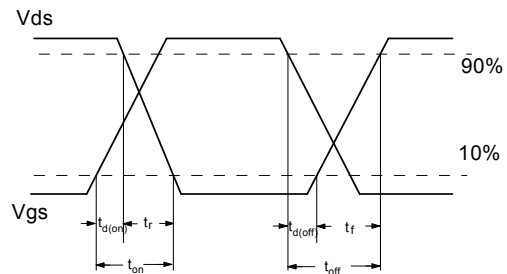
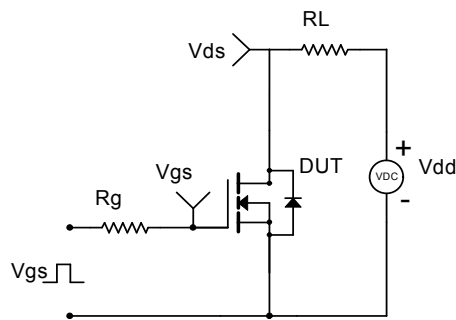
TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS



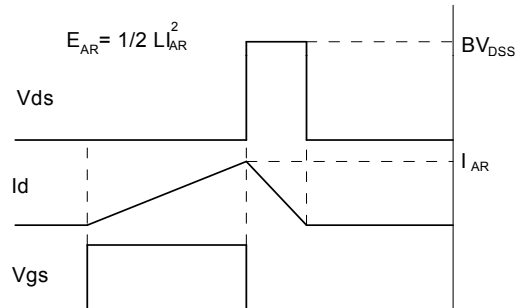
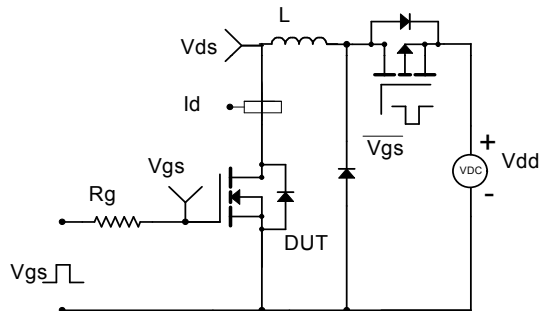
Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveforms



Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



Diode Recovery Test Circuit & Waveforms

