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XINBOLE

Product Specification

XBLW AOD603

Dual N+P-Channel Enhancement Mode MOSFET

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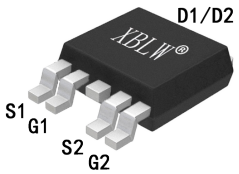
Description

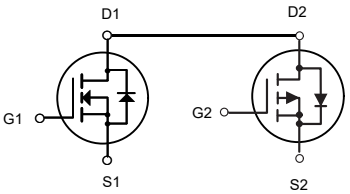
The AOD603 uses advanced trench technology to provide excellent RDS(ON), low gate charge and operation with gate voltages as low as 4.5V. This device is suitable for use as a Battery protection or in other Switching application.

General Features

- VDS = 60V ID =20A
- RDS(ON) < 34mΩ @ VGS=10V
- VDS = -60V ID =-15A
- RDS(ON) < 86mΩ @ VGS=-10V



TO-252-4L



N-Channel MOSFET P-Channel MOSFET

Application

- Wireless charging
- Boost driver
- Brushless motor

Package Marking and Ordering Information

Product Model	Package Type	Marking	Packing	Packing Qty
XBLW AOD603	TO-252-4L	AOD603	Tape	2500Pcs/Reel

Absolute Maximum Ratings (TC=25°Cunless otherwise noted)

Symbol	Parameter	Rating		Units
		N-Channel	P-Channel	
VDS	Drain-Source Voltage	60	-60	V
VGS	Gate-Source Voltage	±20	±20	V
I_D@T_A=25℃	Continuous Drain Current, V_{GS} @ 10V[1]	20	-15	A
I_D@T_A=70℃	Continuous Drain Current, V_{GS} @ 10V[1]	14	-8.5	A
IDM	Pulsed Drain Current[2]	60	-30	A
EAS	Single Pulse Avalanche Energy[3]	22	29.8	mJ
IAS	Avalanche Current	21	-24.4	A
P_D@T_A=25℃	Total Power Dissipation[4]	50	50	W
TSTG	Storage Temperature Range	-55 to 150	-55 to 150	℃
T_J	Operating Junction Temperature Range	-55 to 150	-55 to 150	℃
$R_{\theta}JA$	Thermal Resistance Junction-Ambient [1]	62		℃/W
$R_{\theta}JC$	Thermal Resistance Junction-Case[1]	3		℃/W

N-Channel Electrical Characteristics (TJ=25 °C, unless otherwise noted)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V , I_D=250uA	60	---	---	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance[2]	V_{GS}=10V , I_D=15A	---	26	34	mΩ
		V_{GS}=4.5V , I_D=7A	---	35	45	
$V_{GS(th)}$	Gate Threshold Voltage	V_{GS}=V_{DS} , I_D =250uA	1.0	---	2.5	V
I_{DSS}	Drain-Source Leakage Current	V_{DS}=48V , V_{GS}=0V , T_J=25℃	---	---	1	uA
		V_{DS}=48V , V_{GS}=0V , T_J=55℃	---	---	5	
I_{GSS}	Gate-Source Leakage Current	V_{GS}=±20V , V_{DS}=0V	---	---	±100	nA
gfs	Forward Transconductance	V_{DS}=5V , I_D=15A	---	25.3	---	S
Q_g	Total Gate Charge (10V)	V_{DS}=48V , V_{GS}=10V , I_D=15A	---	19	---	nC
Q_{gs}	Gate-Source Charge		---	2.5	---	
Q_{gd}	Gate-Drain Charge		---	5	---	
$T_{d(on)}$	Turn-On Delay Time	V_{DD}=30V , V_{GS}=10V , R_G=3.3Ω I_D=15A	---	2.8	---	ns
T_r	Rise Time		---	16.6	---	
$T_{d(off)}$	Turn-Off Delay Time		---	21.2	---	
T_f	Fall Time		---	5.6	---	
C_{iss}	Input Capacitance	V_{DS}=15V , V_{GS}=0V , f=1MHz	---	1027	---	pF
C_{oss}	Output Capacitance		---	65	---	
C_{rss}	Reverse Transfer Capacitance		---	46	---	

Diode Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I_S	Continuous Source Current[1,6]	V_G=V_D=0V , Force Current	---	---	20	A
V_{SD}	Diode Forward Voltage[2]	V_{GS}=0V , I_S=1A , T_J=25℃	---	---	1.2	V

Note :
1.The data tested by surface mounted on a 1 inch^2 FR-4 board with 2OZ copper.
2.The data tested by pulsed , pulse width ≦ 300us , duty cycle ≦ 2%
3.The EAS data shows Max. rating . The test condition is V_{DD}=25V,V_{GS}=10V,L=0.1mH,I_{AS}=21A
4.The power dissipation is limited by 150℃ junction temperature
5.The data is theoretically the same as I_D and I_{DM} , in real applications , should be limited by total power dissipation.

P-Channel Electrical Characteristics (TJ=25 °C, unless otherwise noted)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BVDSS	Drain-Source Breakdown Voltage	VGS=0V , ID=-250uA	-60	---	---	V
RDS(ON)	Static Drain-Source On-Resistance[2]	VGS=-10V , ID=-10A	---	78	86	mΩ
		VGS=-4.5V , ID=-5A	---	85	100	
VGS(th)	Gate Threshold Voltage	VGS=VDS , ID =-250uA	-1.0	---	-2.5	V
IDSS	Drain-Source Leakage Current	VDS=-48V , VGS=0V , TJ=25°C	---	---	1	uA
		VDS=-48V , VGS=0V , TJ=55°C	---	---	5	
IGSS	Gate-Source Leakage Current	VGS=±20V , VDS=0V	---	---	±100	nA
gfs	Forward Transconductance	VDS=-5V , ID=-4A	---	8.7	---	S
Qg	Total Gate Charge (-4.5V)	VDS=-12V , VGS=-4.5V , ID=-6A	---	11.8	---	nC
Qgs	Gate-Source Charge		---	1.9	---	
Qgd	Gate-Drain Charge		---	6.5	---	
Td(on)	Turn-On Delay Time	VDD=-15V , VGS=-10V , RG=3.3Ω, ID=-1A	---	8.8	---	ns
Tr	Rise Time		---	19.6	---	
Td(off)	Turn-Off Delay Time		---	47.2	---	
Tf	Fall Time		---	9.6	---	
Ciss	Input Capacitance	VDS=-15V , VGS=0V , f=1MHz	---	1080	---	pF
Coss	Output Capacitance		---	73	---	
Crss	Reverse Transfer Capacitance		---	50	---	

Diode Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
IS	Continuous Source Current[1,5]	VG=VD=0V , Force Current	---	---	-15	A
VSD	Diode Forward Voltage[2]	VGS=0V , IS=-1A , TJ=25°C	---	---	-1	V

Note :
1.The data tested by surface mounted on a 1 inch^2 FR-4 board with 2OZ copper.
2.The data tested by pulsed , pulse width ≦ 300us , duty cycle ≦ 2%
3.The EAS data shows Max. rating . The test condition is VDD=-25V,VGS=-10V,L=0.1mH,IAS=-24.4A
4.The power dissipation is limited by 150°C junction temperature
5.The data is theoretically the same as ID and IDM , in real applications , should be limited by total power dissipation.

N-Channel Typical Characteristics

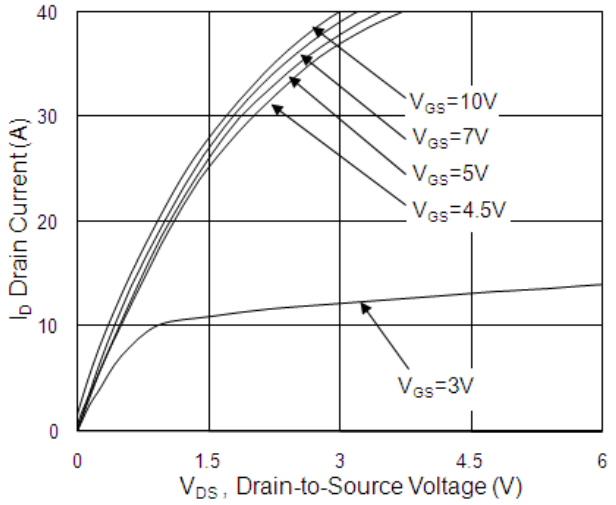


Fig.1 Typical Output Characteristics

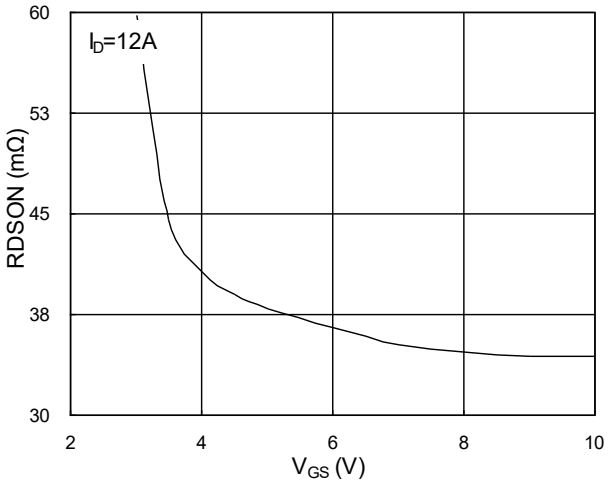


Fig.2 On-Resistance vs. G-S Voltage

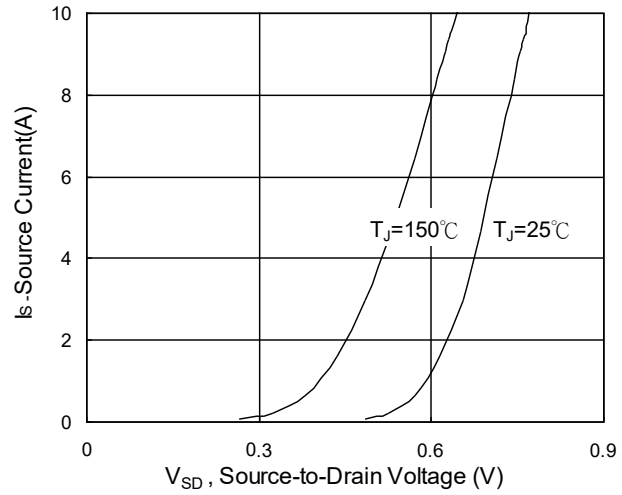


Fig.3 Source Drain Forward Characteristics

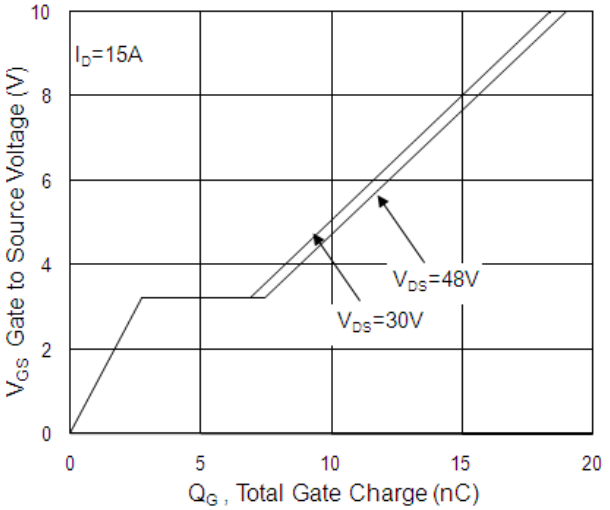


Fig.4 Gate-Charge Characteristics

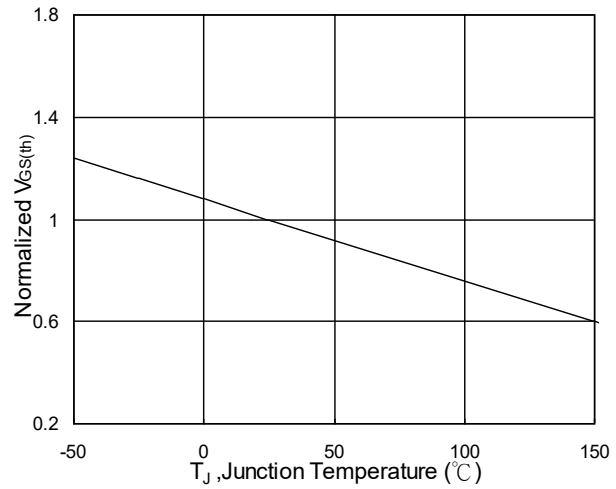


Fig.5 Normalized $V_{GS(th)}$ vs. T_J

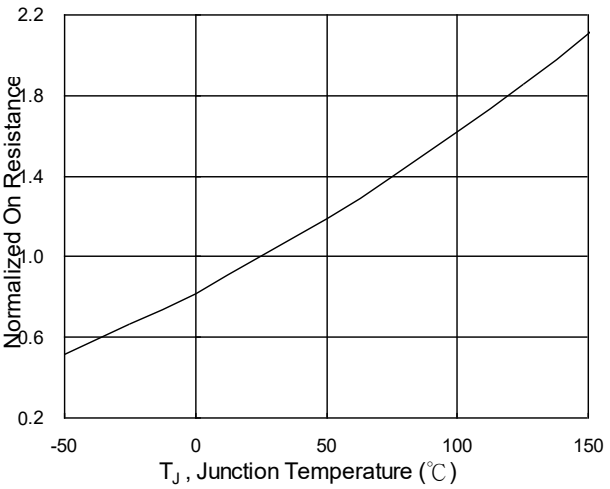


Fig.6 Normalized R_{DSON} vs. T_J

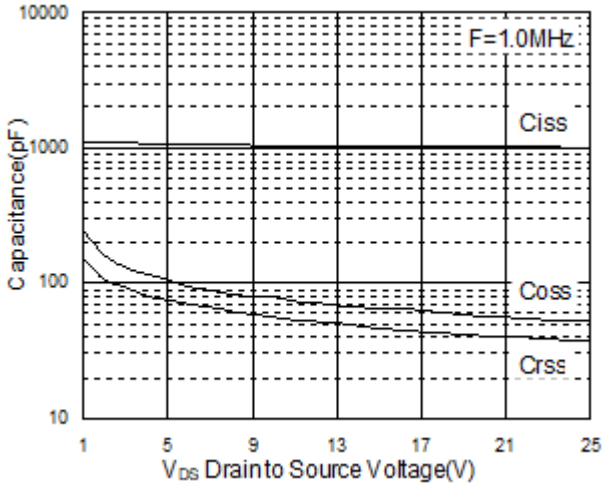


Fig.7 Capacitance

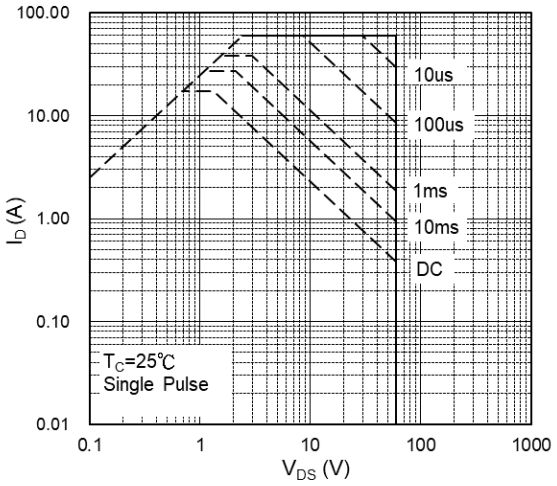


Fig.8 Safe Operating Area

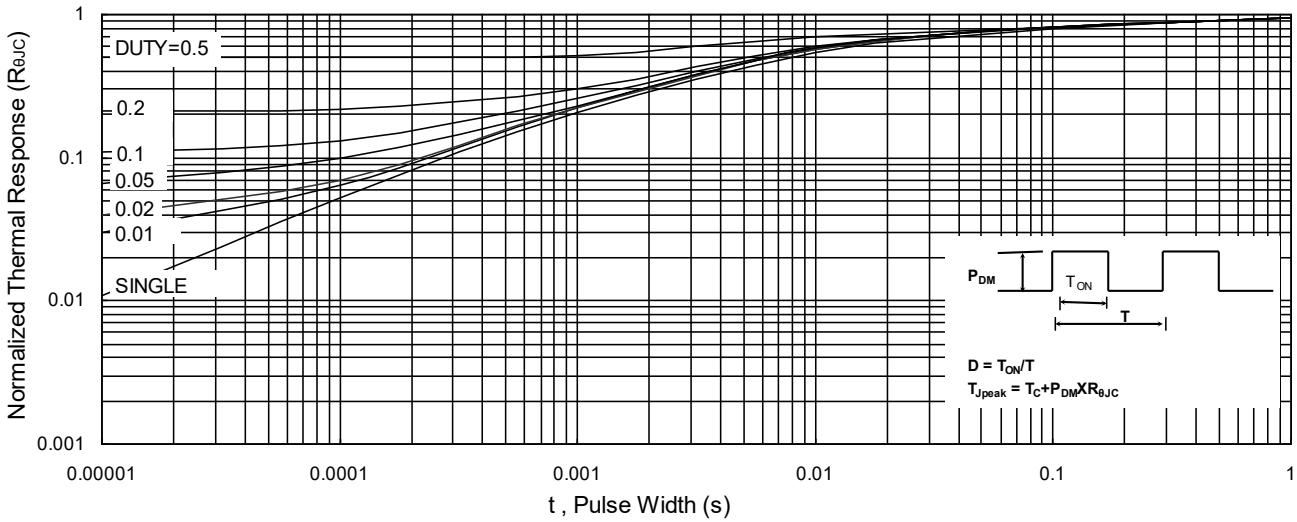


Fig.9 Normalized Maximum Transient Thermal Impedance

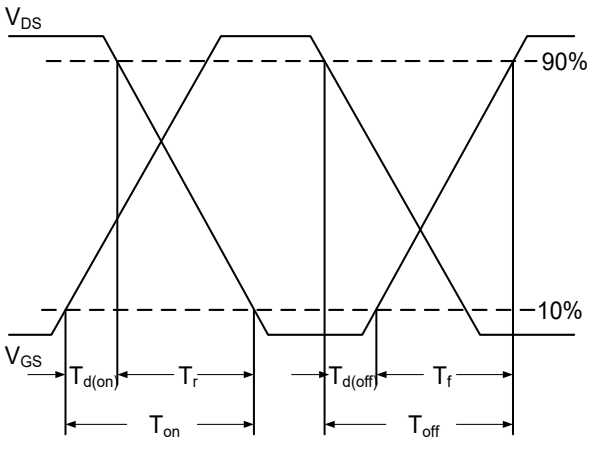


Fig.10 Switching Time Waveform

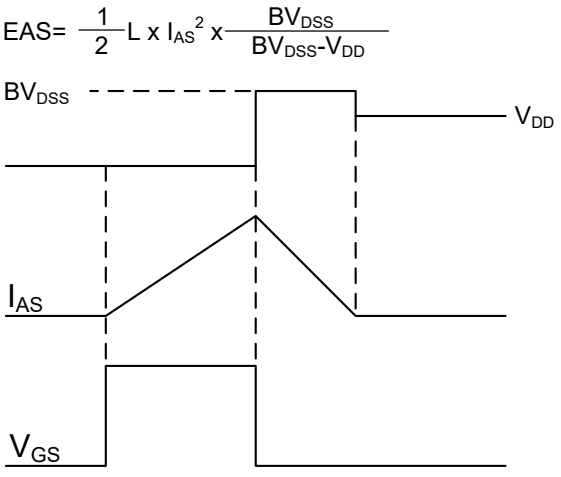


Fig.11 Unclamped Inductive Switching Waveform

P-Channel Typical Characteristics

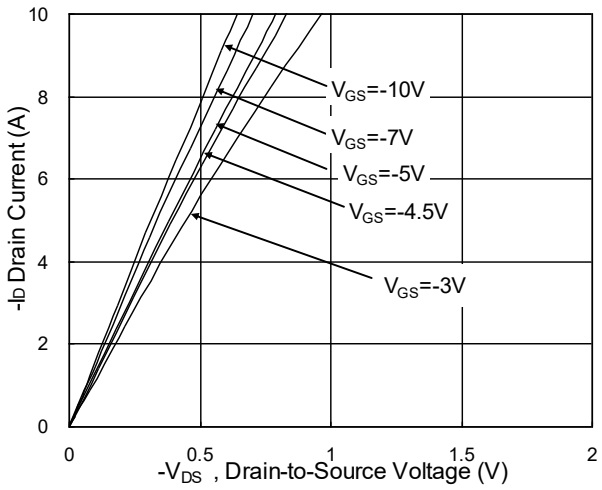
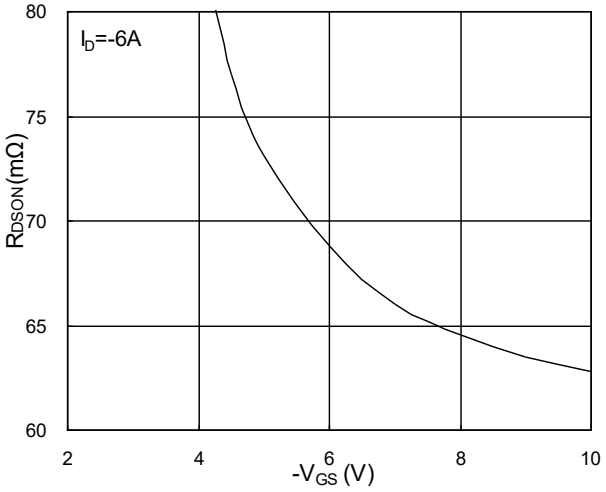


Fig.1 Typical Output Characteristics



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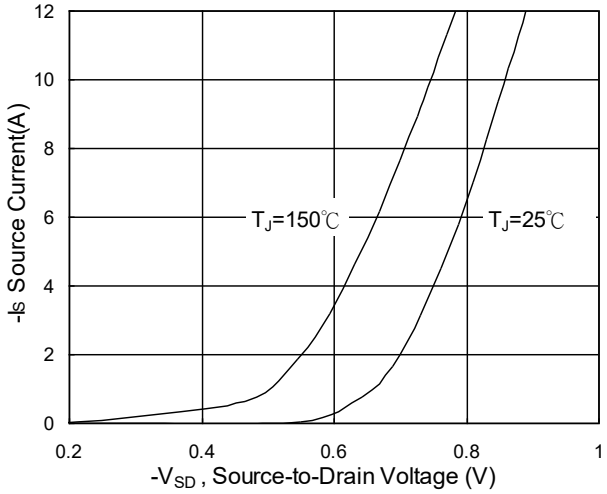


Fig.3 Source Drain Forward Characteristics

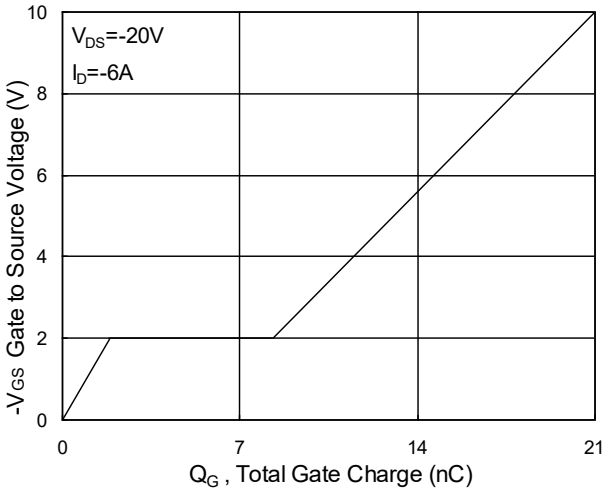


Fig.4 Gate-Charge Characteristics

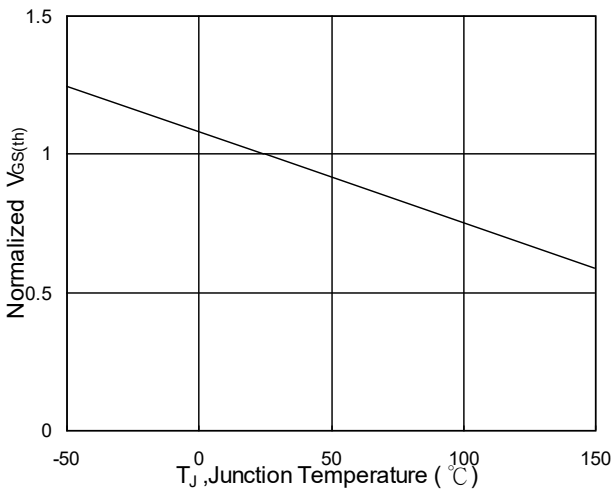


Fig.5 Normalized $V_{GS(th)}$ vs. T_J

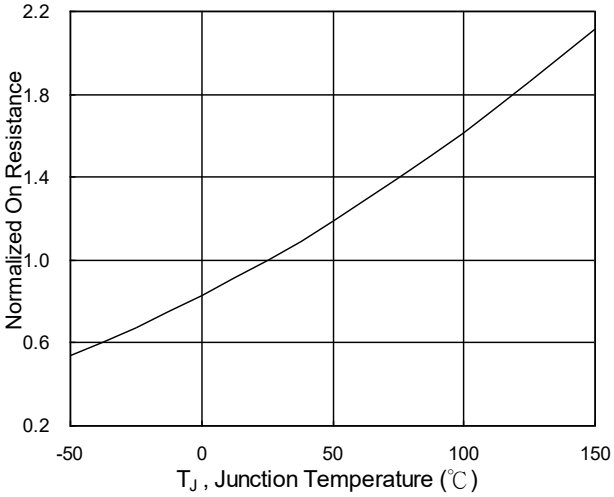


Fig.6 Normalized R_{DSON} vs. T_J

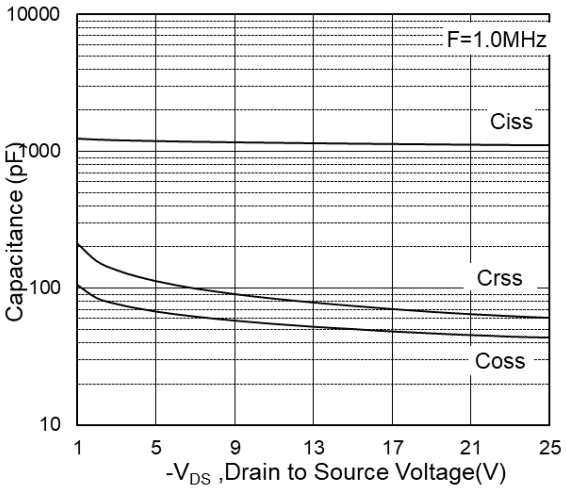


Fig.7 Capacitance

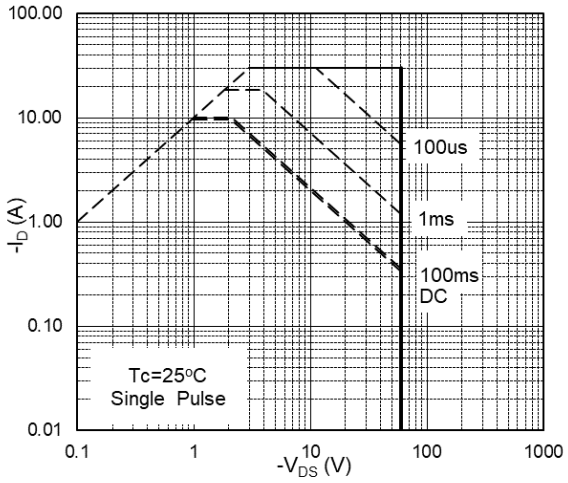
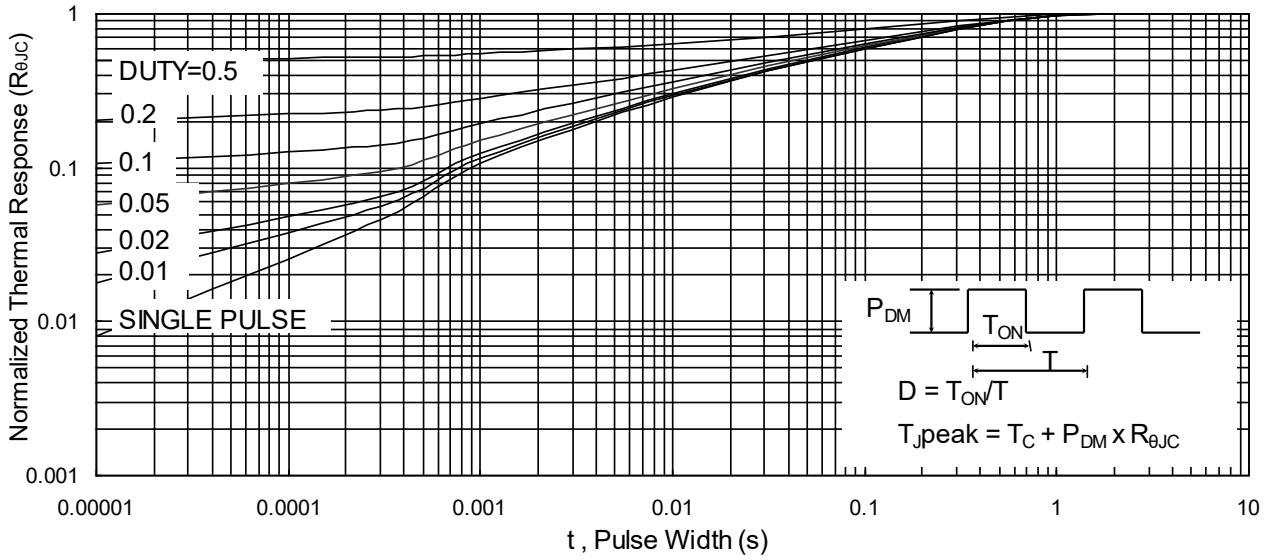


Fig.8 Safe Operating Area



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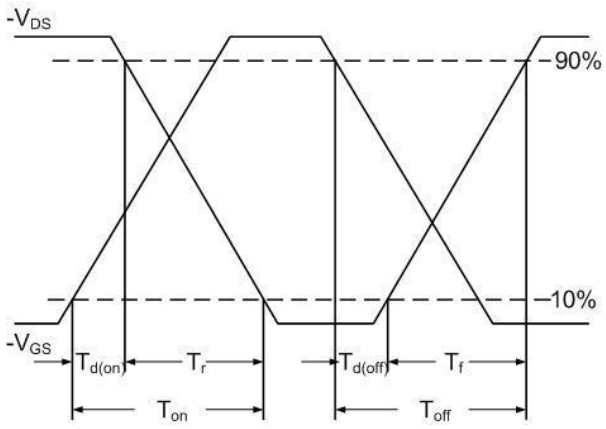


Fig.10 Switching Time Waveform

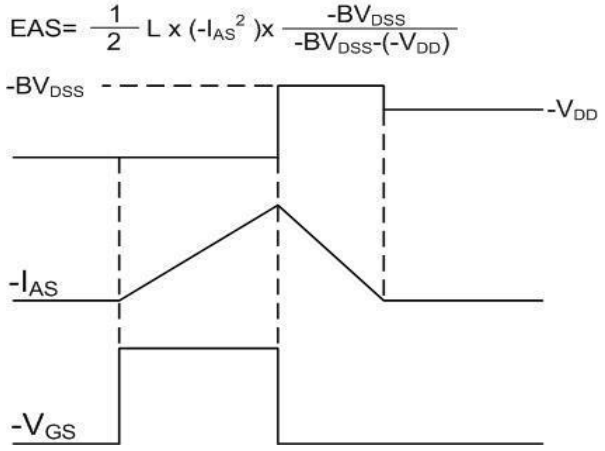
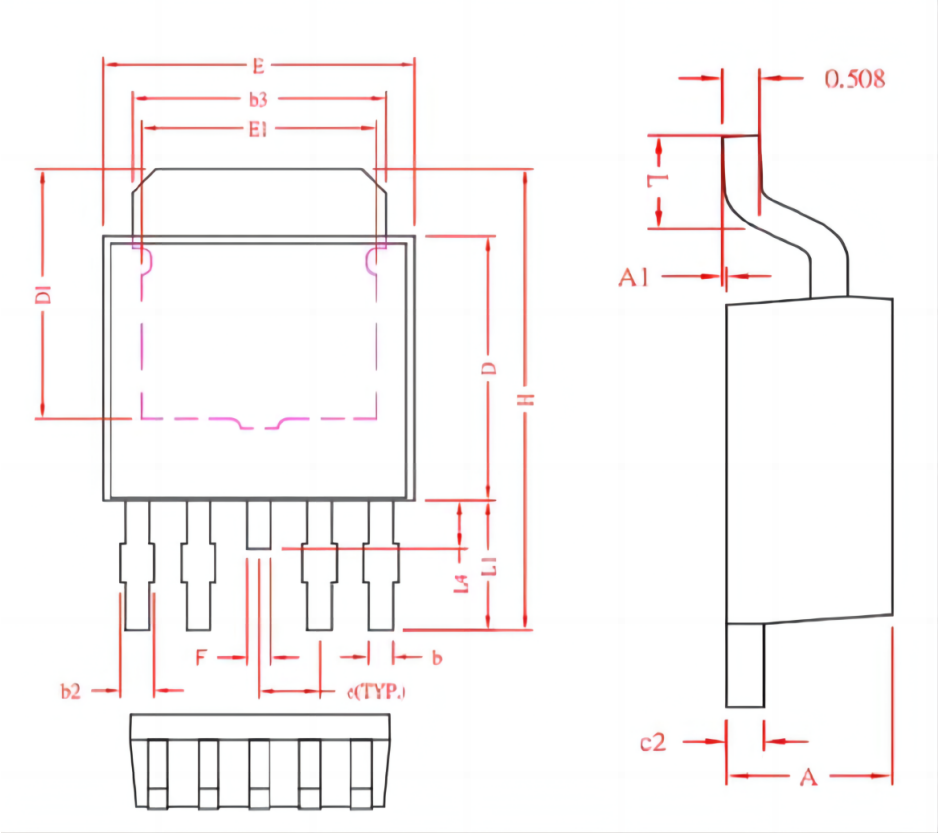


Fig.11 Unclamped Inductive Switching Waveform

Package Information

TO252-4L



COMMON DIMENSIONS
(UNITS OF MEASURE=MILLIMETER)

SYMBOL	MIN	NOM	MAX
A	2.20	2.30	2.40
A1	0	0.08	0.15
b	0.45	0.53	0.60
b2	0.50	0.65	0.80
b3	5.20	5.35	5.50
c2	0.45	0.50	0.55
D	5.40	5.60	5.80
D1	4.57	-	-
E	6.40	6.60	6.80
E1	3.81	-	-
e	1.27 REF.		
F	0.40	0.50	0.60
H	9.40	9.80	10.20
L	1.40	1.59	1.77
L1	2.40	2.70	3.00
L4	0.80	1.00	1.20

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