

Product Specification

XBLW AOD603

Dual N+P-Channel Enhancement Mode MOSFET

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Description

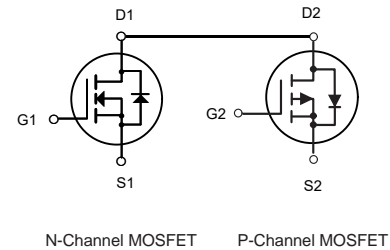
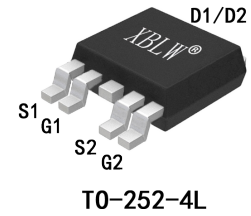
The AOD603 uses advanced trench technology to provide excellent RDS(ON), low gate charge and operation with gate voltages as low as 4.5V. This device is suitable for use as a Battery protection or in other Switching application.

General Features

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

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°C unless otherwise noted)

Symbol	Parameter	Rating		Units
		N-Channel	P-Channel	
VDS	Drain-Source Voltage	60	-60	V
VGS	Gate-Source Voltage	±20	±20	V
Id@TA=25°C	Continuous Drain Current, VGS @ 10V ¹	20	-15	A
Id@TA=70°C	Continuous Drain Current, VGS @ 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
Pd@TA=25°C	Total Power Dissipation ⁴	50	50	W
TSTG	Storage Temperature Range	-55 to 150	-55 to 150	°C
TJ	Operating Junction Temperature Range	-55 to 150	-55 to 150	°C
RθJA	Thermal Resistance Junction-Ambient ¹	62		°C/W
RθJC	Thermal Resistance Junction-Case ¹	3		°C/W

N-Channel Electrical Characteristics (T_J=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°C	---	---	1	uA
		V _{DS} =48V, V _{GS} =0V, T _J =55°C	---	---	5	
I _{GSS}	Gate-Source Leakage Current	V _{GS} =±20V, V _{DS} =0V	---	---	±100	nA
g _{fs}	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°C	---	---	1.2	V

Note :

- 1.The data tested by surface mounted on a 1 inch² 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°C 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 (T_J=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 , T _J =25°C	---	---	1	uA
		VDS=-48V , VGS=0V , T _J =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 , T _J =25°C	---	---	-1	V

Note :

 1.The data tested by surface mounted on a 1 inch² 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

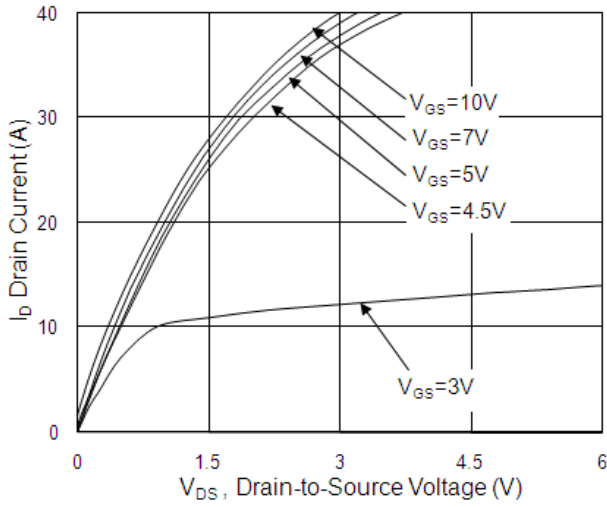


Fig.1 Typical Output Characteristics

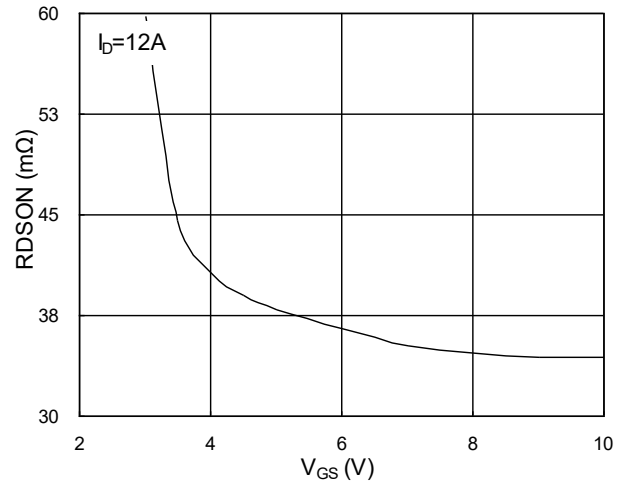


Fig.2 On-Resistance vs. G-S Voltage

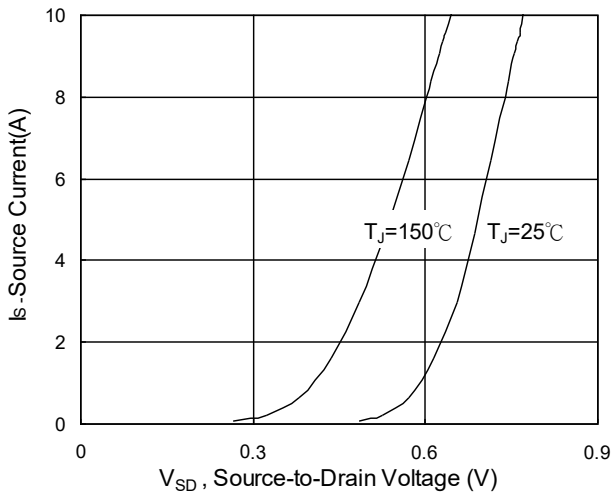


Fig.3 Source Drain Forward Characteristics

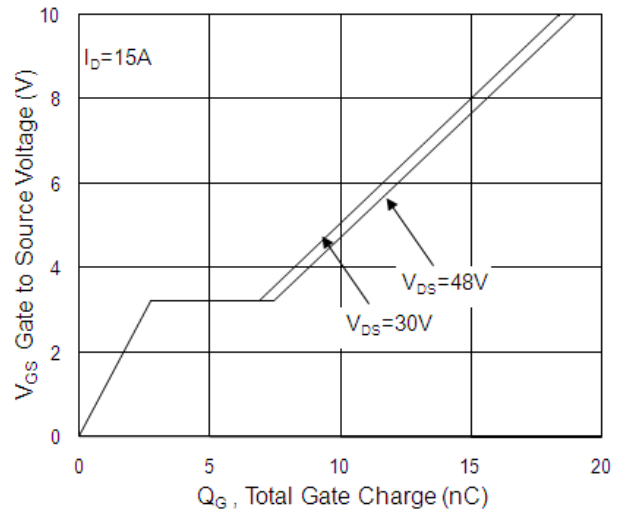


Fig.4 Gate-Charge Characteristics

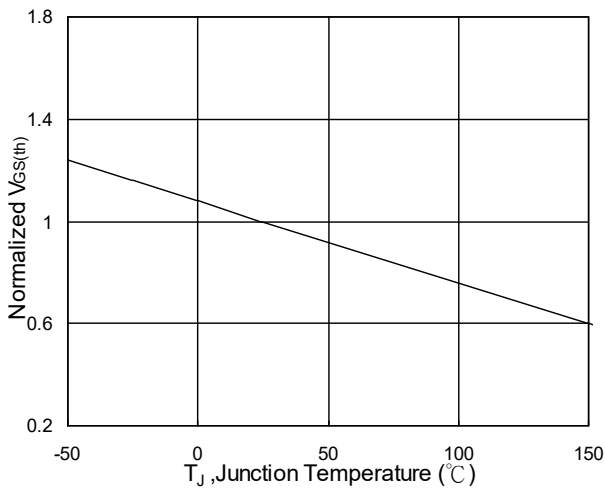


Fig.5 Normalized $V_{GS(th)}$ vs. T_J

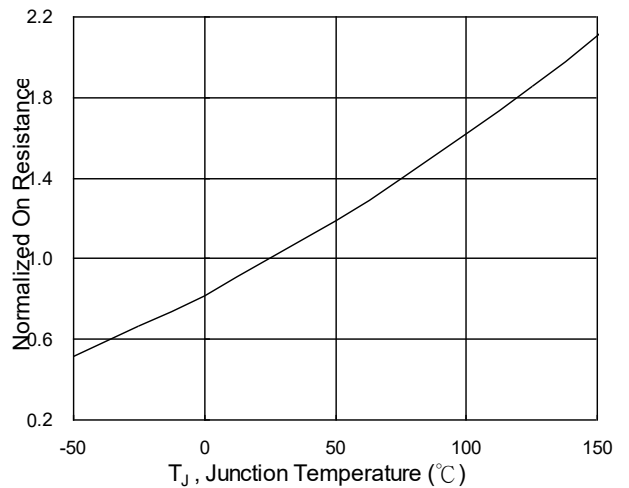


Fig.6 Normalized $R_{DS(on)}$ vs. T_J

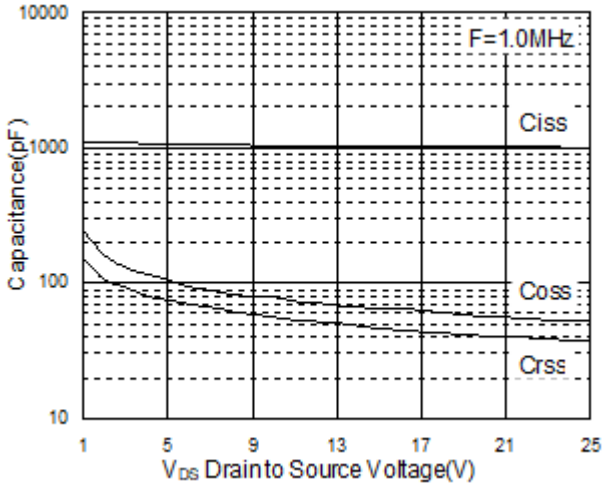


Fig.7 Capacitance

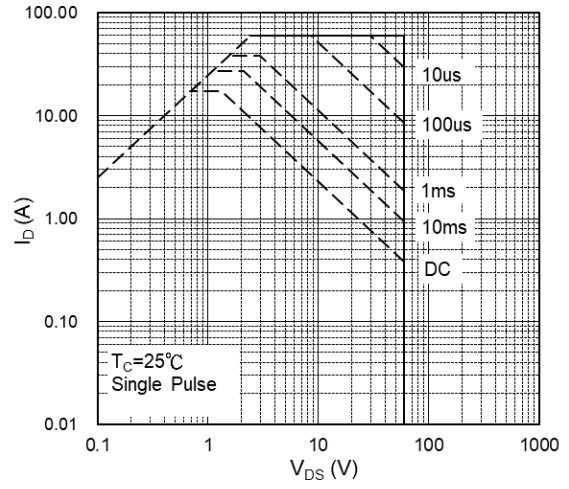


Fig.8 Safe Operating Area

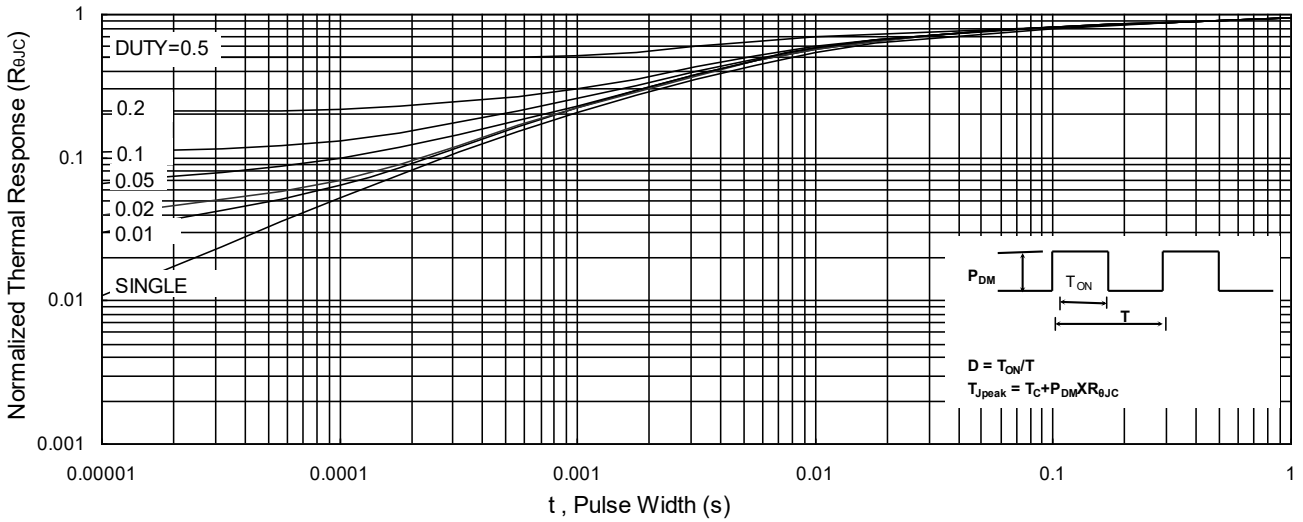


Fig.9 Normalized Maximum Transient Thermal Impedance

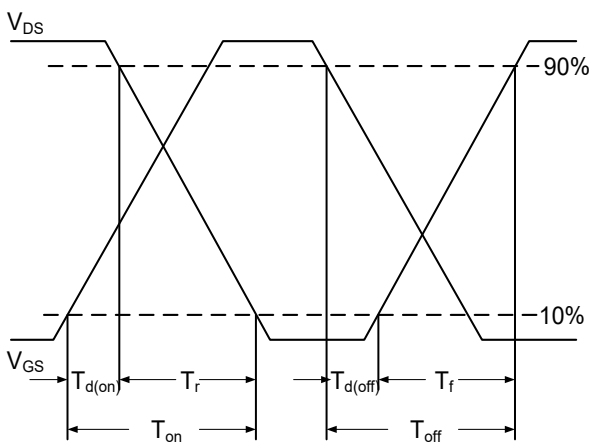


Fig.10 Switching Time Waveform

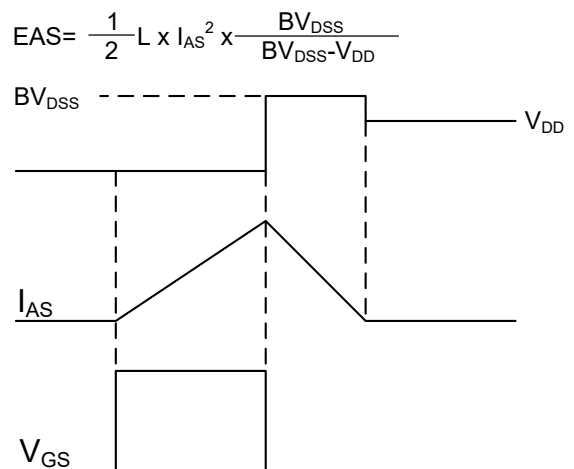


Fig.11 Unclamped Inductive Switching Waveform

P-Channel Typical Characteristics

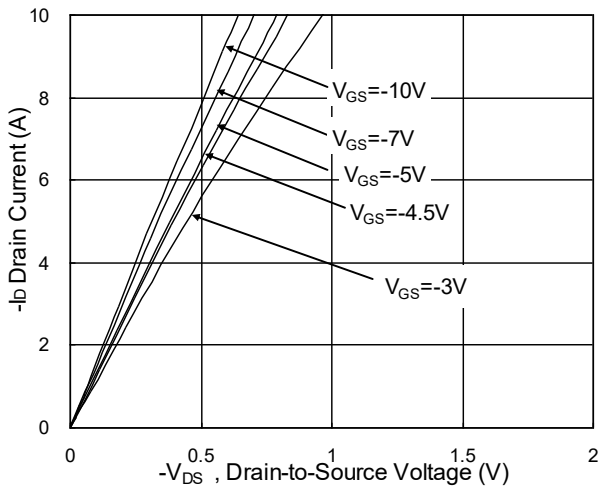


Fig.1 Typical Output Characteristics

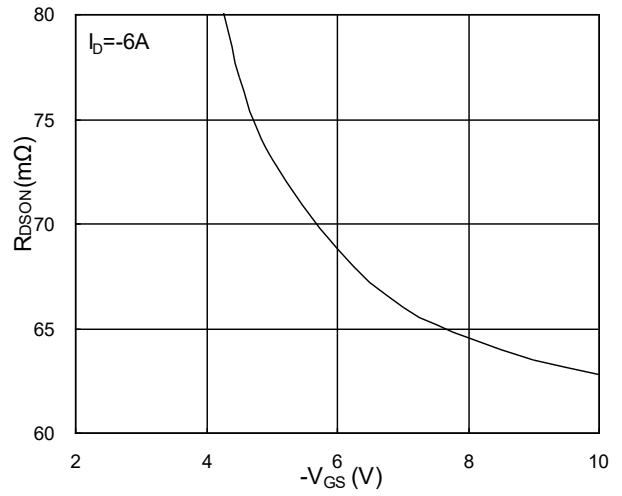


Fig.2 On-Resistance vs. G-S Voltage

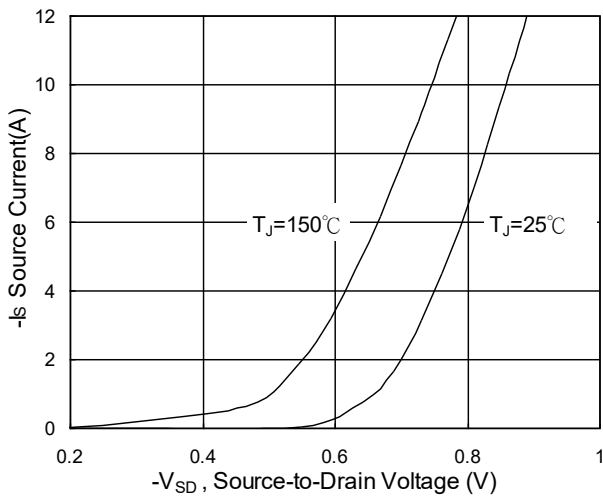


Fig.3 Source Drain Forward Characteristics

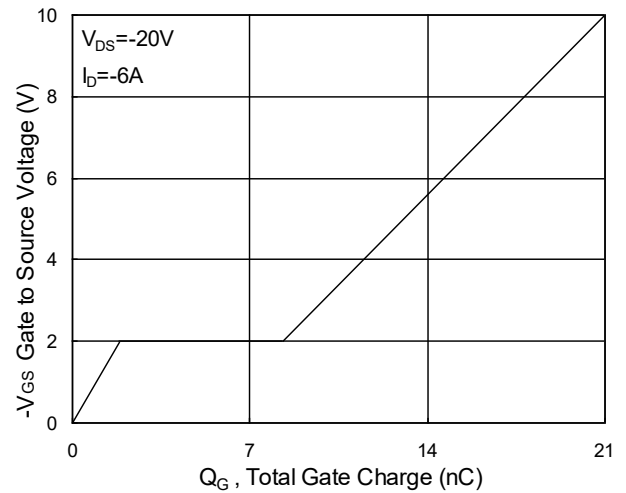


Fig.4 Gate-Charge Characteristics

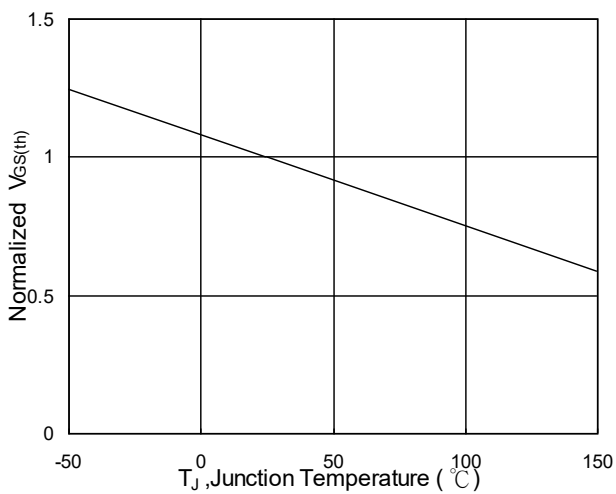


Fig.5 Normalized $V_{GS(th)}$ vs. T_J

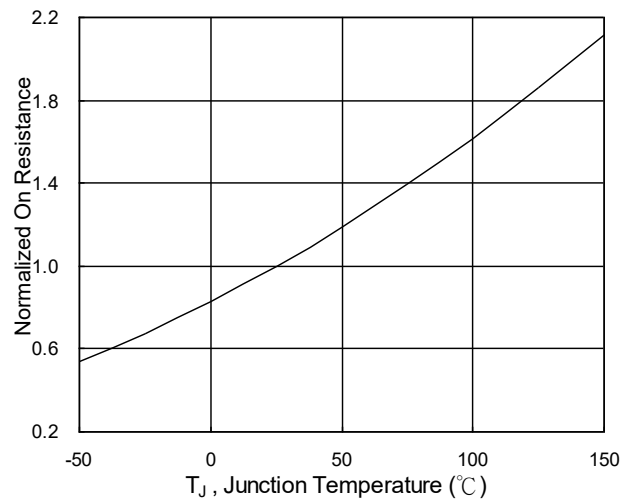


Fig.6 Normalized $R_{DS(on)}$ vs. T_J

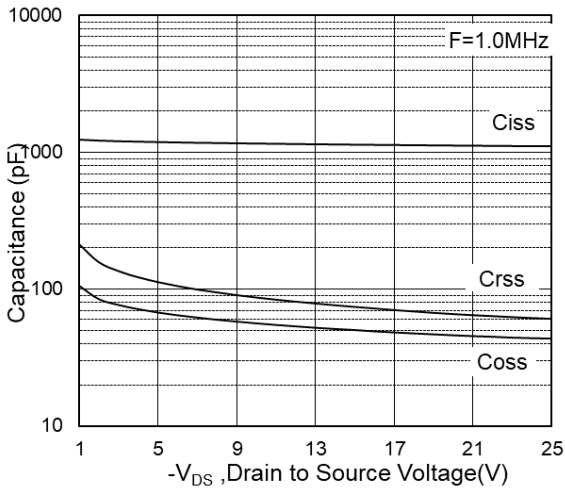


Fig.7 Capacitance

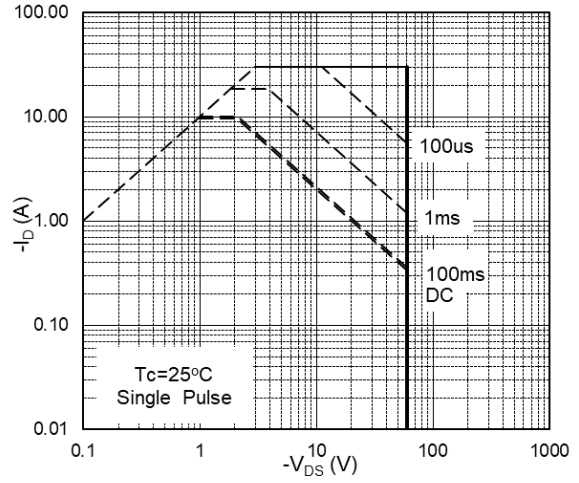


Fig.8 Safe Operating Area

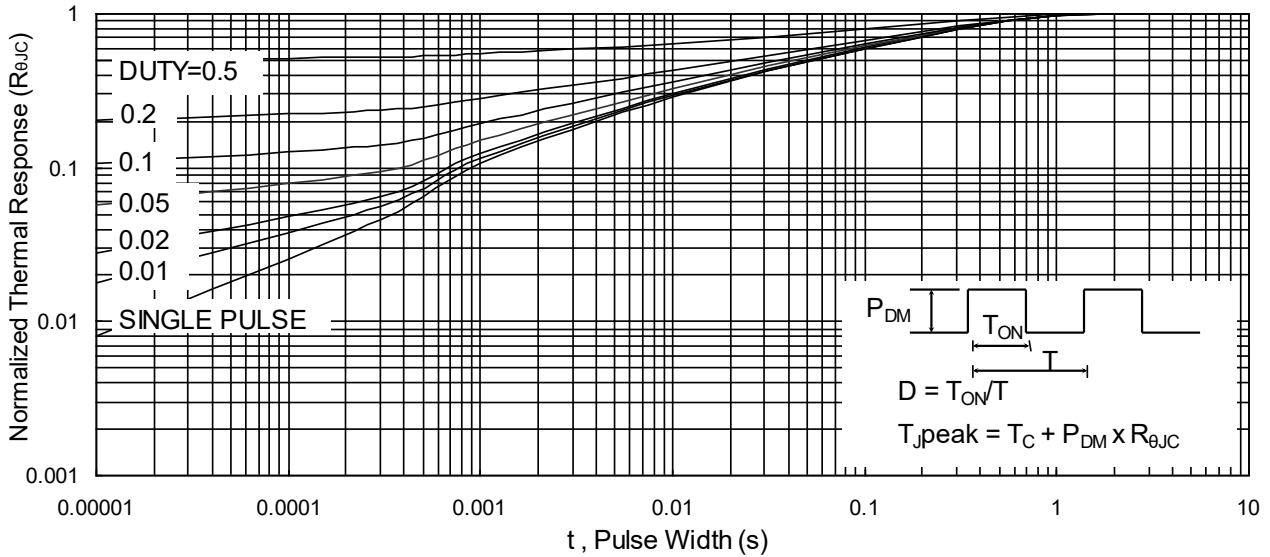


Fig.9 Normalized Maximum Transient Thermal Impedance

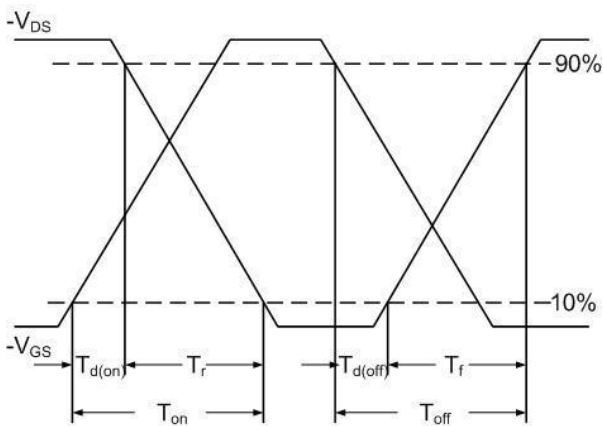


Fig.10 Switching Time Waveform

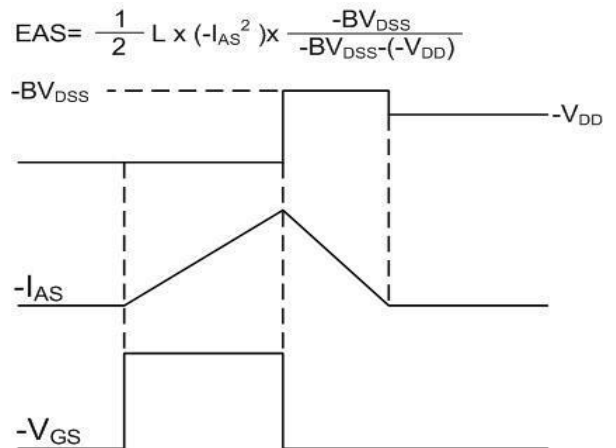
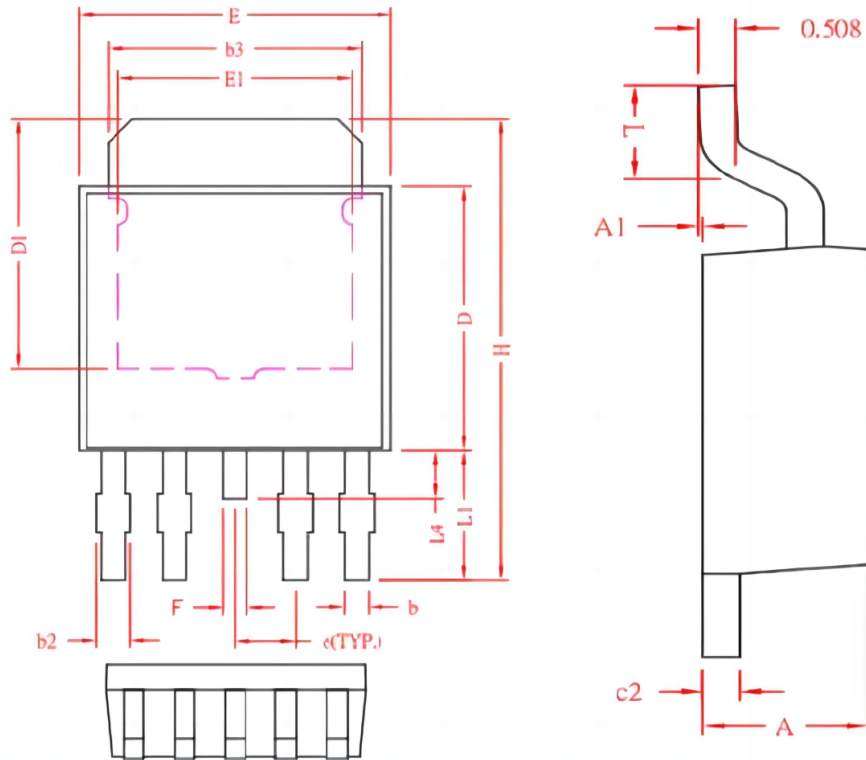


Fig.11 Unclamped Inductive Switching Waveform

Package Information

T0252-4L



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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