

N-Ch 40V Fast Switching MOSFETs

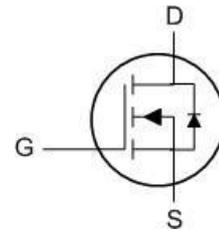
Features

Advanced Trench MOS Technology
 100% EAS Guaranteed
 Fast Switching Speed
 Green Device Available

TO-252



MARKING : AOD4184A

Equivalent Circuit


BVDSS	RDSON	ID
40V	5.8mΩ	60A

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

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	40	V
V_{GS}	Gate-Source Voltage	± 20	V
$I_D@T_c=25^\circ\text{C}$	Continuous Drain Current ¹	60	A
$I_D@T_c=100^\circ\text{C}$	Continuous Drain Current ¹	35	A
I_{DM}	Pulsed Drain Current ²	130	A
EAS	Single Pulse Avalanche Energy ³	48	mJ
I_{AS}	Avalanche Current	35	A
$P_D@=25^\circ\text{C}$	Total Power Dissipation ⁴	39	W
T_{STG}	Storage Temperature Range	-55 to 150	$^\circ\text{C}$
T_J	Operating Junction Temperature Range	-55 to 150	$^\circ\text{C}$

Thermal Data

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction-ambient (Steady State) ¹	--	60	$^\circ\text{C/W}$
$R_{\theta JC}$	Thermal Resistance Junction-Case ¹	--	3.2	$^\circ\text{C/W}$

Electrical Characteristics (T_J=25°C unless otherwise specified)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =250uA	40	--	--	V
R _{DS(ON)}	Static Drain-Source On-Resistance ²	V _{GS} =10V, I _D =12A	--	5.8	7.4	mΩ
		V _{GS} =4.5V, I _D =10A	--	8.9	13.8	
V _{GS(th)}	Gate Threshold Voltage	V _{GS} =V _{DS} , I _D =250uA	1.35	--	3	V
I _{DSS}	Drain-Source Leakage Current	V _{DS} =32V, V _{GS} =0V, T _J =25°C	--	--	1	uA
		V _{DS} =32V, V _{GS} =0V, T _J =55°C	--	--	5	
I _{GSS}	Gate-Source Leakage Current	V _{GS} =±20V, V _{DS} =0V	--	--	±100	nA
R _g	Gate Resistance	V _{DS} =0V, V _{GS} =0V, f=1MHz	--	1.7	--	Ω
Q _g	Total Gate Charge (4.5V)	V _{DS} =20V, V _{GS} =4.5V, I _D =12A	--	5.8	--	nC
Q _{gs}	Gate-Source Charge		--	3	--	
Q _{gd}	Gate-Drain Charge		--	1.2	--	
T _{d(on)}	Turn-On Delay Time	V _{DD} =15V, V _{GS} =10V, R _G =3.3Ω I _D =1A	--	14.3	--	ns
T _r	Rise Time		--	5.6	--	
T _{d(off)}	Turn-Off Delay Time		--	20	--	
T _f	Fall Time		--	11	--	
C _{iss}	Input Capacitance	V _{DS} =15V, V _{GS} =0V, f=1MHz	--	690	--	pF
C _{oss}	Output Capacitance		--	193	--	
C _{rss}	Reverse Transfer Capacitance		--	38	--	

Diode Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I _s	Continuous Source Current ^{1,5}	V _G =V _D =0V, Force Current	--	--	60	A
V _{SD}	Diode Forward Voltage ²	V _{GS} =0V, I _s =1A, T _J =25°C	--	--	1	V

Typical Characteristics

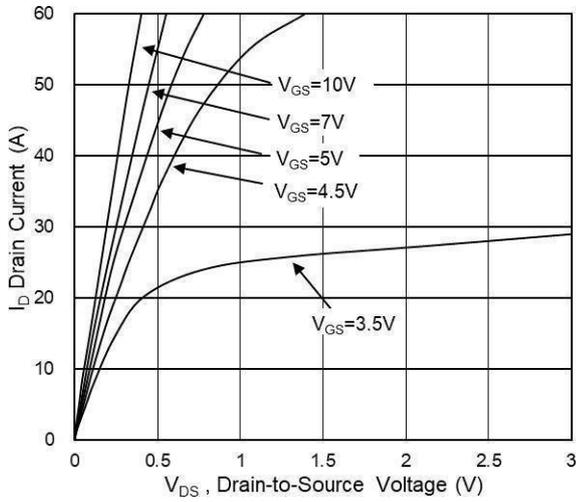


Fig.1 Typical Output Characteristics

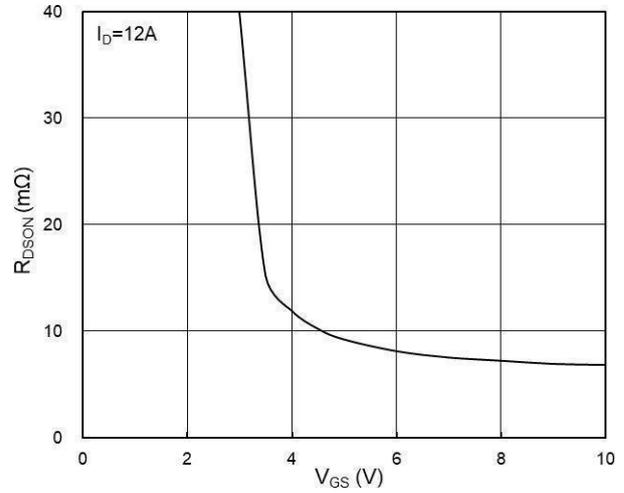


Fig.2 On-Resistance vs G-S Voltage

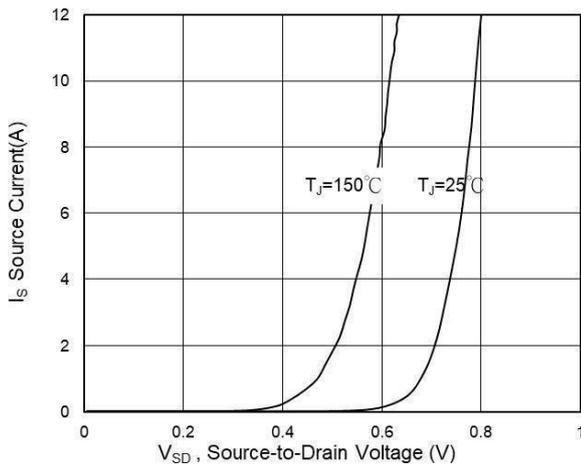


Fig.3 Source Drain Forward Characteristics

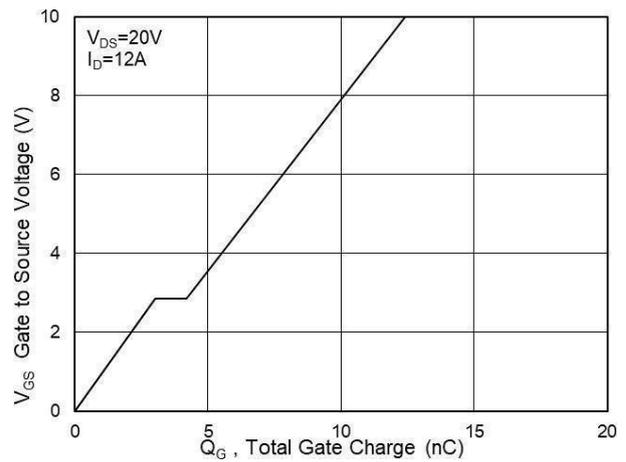


Fig.4 Gate-Charge Characteristics

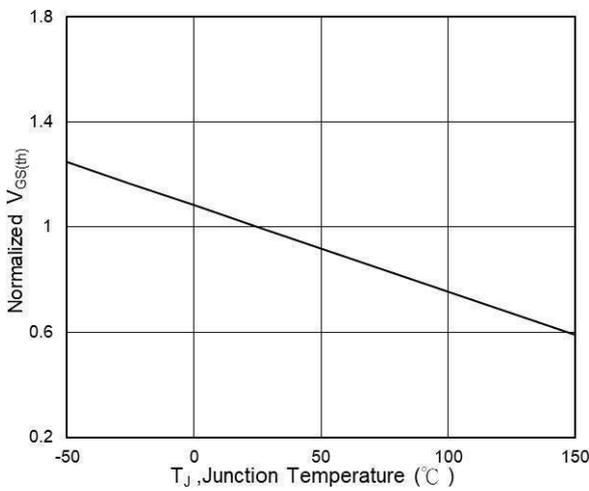


Fig.5 Normalized $V_{GS(th)}$ vs T_J

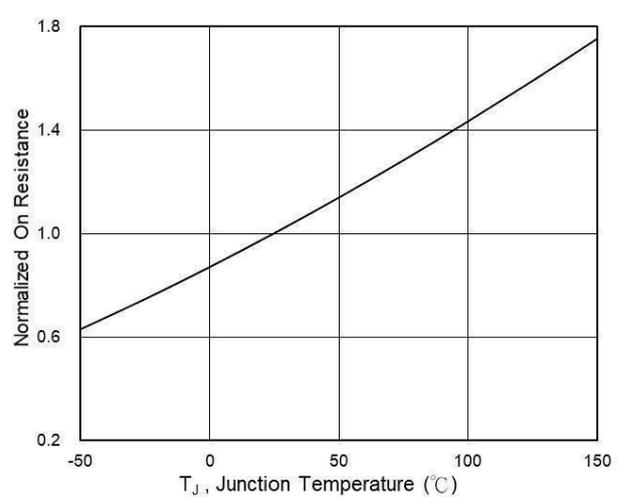


Fig.6 Normalized R_{DSON} vs T_J

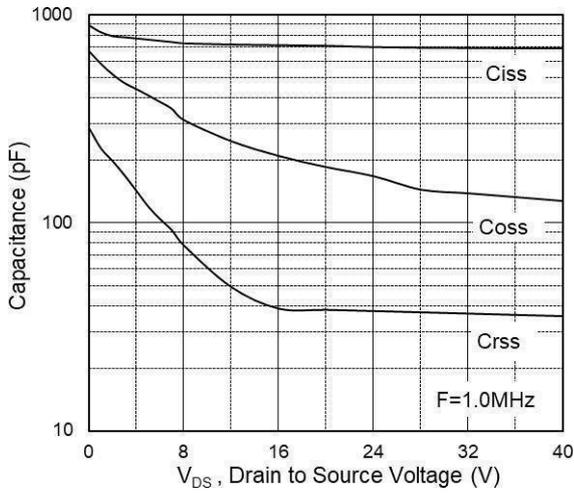


Fig.7 Capacitance

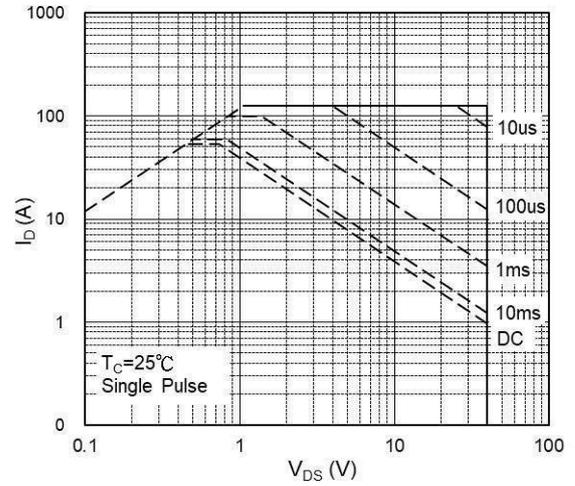


Fig.8 Safe Operating Area

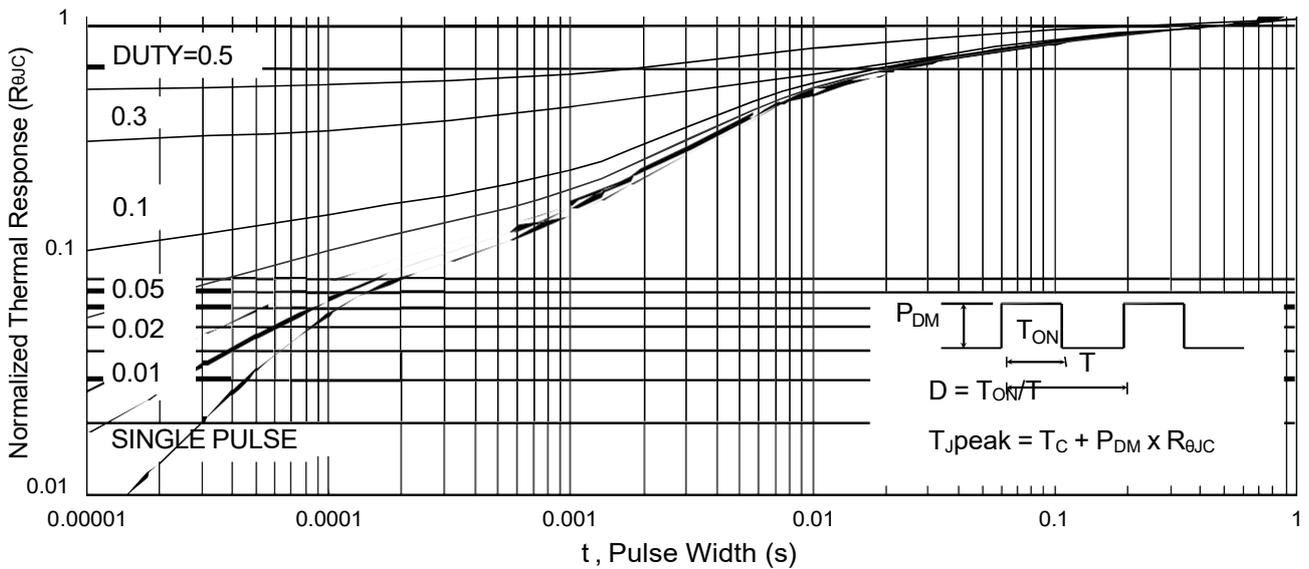
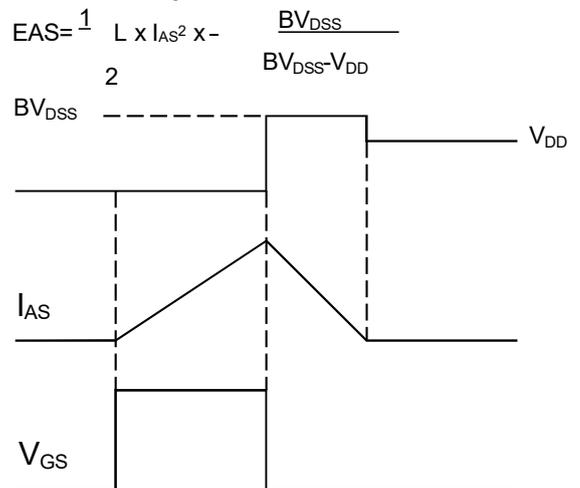
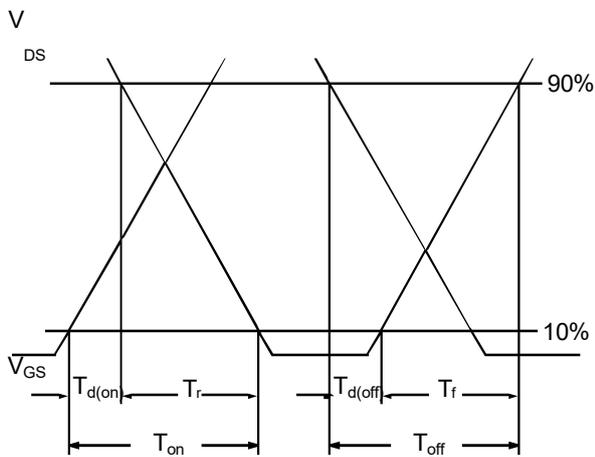
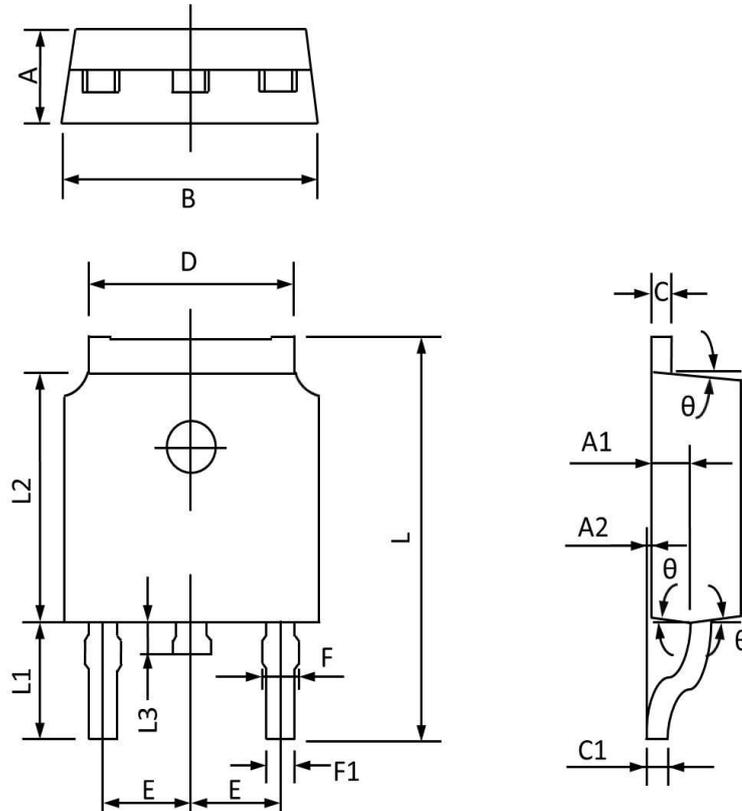


Fig.9 Normalized Maximum Transient Thermal Impedance



TO252 PACKAGE INFORMATION



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	MAX	MIN	MAX	MIN
A	2.400	2.200	0.094	0.087
A1	1.110	0.910	0.044	0.036
A2	0.150	0.000	0.006	0.000
B	6.800	6.400	0.268	0.252
C	0.580	0.450	0.023	0.018
C1	0.580	0.460	0.023	0.018
D	5.500	5.100	0.217	0.201
E	2.386	2.186	0.094	0.086
F	0.940	0.600	0.037	0.024
F1	0.860	0.500	0.034	0.020
L	10.400	9.400	0.409	0.370
L1	3.000	2.400	0.118	0.094
L2	6.200	5.400	0.244	0.213
L3	1.200	0.600	0.047	0.024
θ	9°	3°	9°	3°