



Description

The AOD454A uses advanced trench technology to provide excellent $R_{DS(ON)}$, 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

$V_{DS} = 40V$ $I_D = 25A$

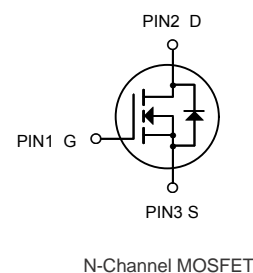
$R_{DS(ON)} < 25m\Omega$ @ $V_{GS}=10V$

Application

Battery protection

Load switch

Uninterruptible power supply



Package Marking and Ordering Information

Product ID	Pack	Brand	Qty(PCS)
AOD454A	TO252-2L	HXY MOSFET	2500

Absolute Maximum Ratings ($T_C=25^{\circ}C$ unless otherwise noted)

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	40	V
V_{GS}	Gate-Source Voltage	± 20	V
$I_D@T_C=25^{\circ}C$	Continuous Drain Current, V_{GS} @ 10V ¹	25	A
$I_D@T_C=100^{\circ}C$	Continuous Drain Current, V_{GS} @ 10V ¹	17	A
I_{DM}	Pulsed Drain Current ²	100	A
EAS	Single Pulse Avalanche Energy ³	23	mJ
$P_D@T_C=25^{\circ}C$	Total Power Dissipation ⁴	26	W
T_{STG}	Storage Temperature Range	-50 to 150	$^{\circ}C$
T_J	Operating Junction Temperature Range	-50 to 150	$^{\circ}C$
$R_{\theta JA}$	Thermal Resistance Junction-ambient	62	$^{\circ}C/W$
$R_{\theta JC}$	Thermal Resistance Junction-Case	4.8	$^{\circ}C/W$



Electrical Characteristics ($T_J = 25^{\circ}\text{C}$, unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Units
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	40	---	---	V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{GS}=0V, V_{DS}=40V$	---	---	1	μA
		$V_{GS}=0V, V_{DS}=32V$	---	---	10	μA
I_{GSS}	Gate-Source Leakage Current	$V_{GS}=\pm 20V, V_{DS}=0A$	---	---	± 100	nA
$V_{GS(th)}$	Gate-Source Threshold Voltage	$V_{GS}=V_{DS}, I_D=250\mu A$	1.2	1.6	2.5	V
$R_{DS(ON)}$	Drain-Source On Resistance	$V_{GS}=10V, I_D=12A$	---	18	25	m Ω
		$V_{GS}=4.5V, I_D=10A$	---	25	35	m Ω
C_{iss}	Input Capacitance	$V_{DS}=25V, V_{GS}=0V, f=1MHz$	---	825	---	pF
C_{oss}	Output Capacitance		---	70	---	
C_{rss}	Reverse Transfer Capacitance		---	39	---	
$t_{d(on)}$	Turn-On Delay Time	$V_{DD}=20V, I_D=1A,$ $R_{ENG}=25\Omega, V_{GS}=4.5V$	---	2.2	---	ns
t_r	Rise Time		---	7.6	---	ns
$t_{d(off)}$	Turn-Off Delay Time		---	17	---	ns
t_f	Fall Time		---	5	---	ns
Q_{gs}	Total Gate Charge	$V_{GS}=10V,$ $V_{DS}=20V, I_D=5A$	---	1.3	---	nC
Q_{gd}	Gate-Source Charge		---	1.7	---	nC
Q_g	Gate-Drain "Miller" Charge		---	13	---	nC
V_{SD}	Diode Forward Voltage	$V_{GS}=0V, I_S=1A$	---	---	1	V
I_S	Continuous Drain Current	$V_D=V_G=0V$	---	---	25	A
I_{SM}	Pulsed Drain Current		---	---	95	A

Notes:

1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature
2. EAS condition : $T_J=25^{\circ}\text{C}, V_{DD}=30V, V_G=10V, L=0.5mH$
3. Pulse Test: Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 0.5\%$



Typical Characteristics

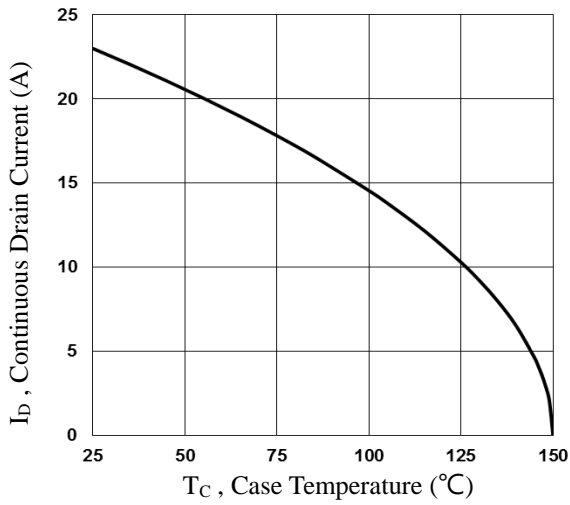


Fig.1 Continuous Drain Current vs. TC

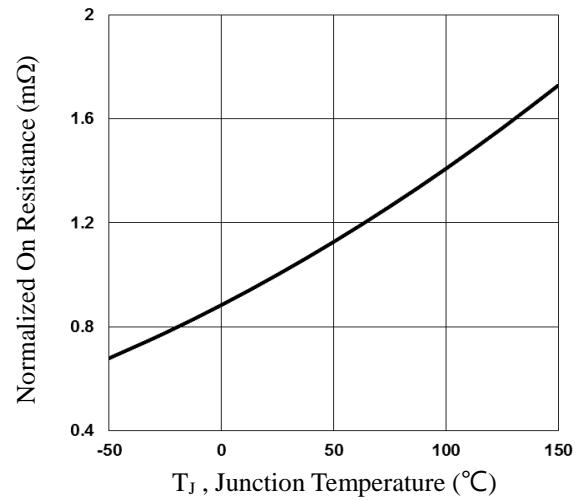


Fig.2 Normalized $R_{DS(on)}$ vs. T_J

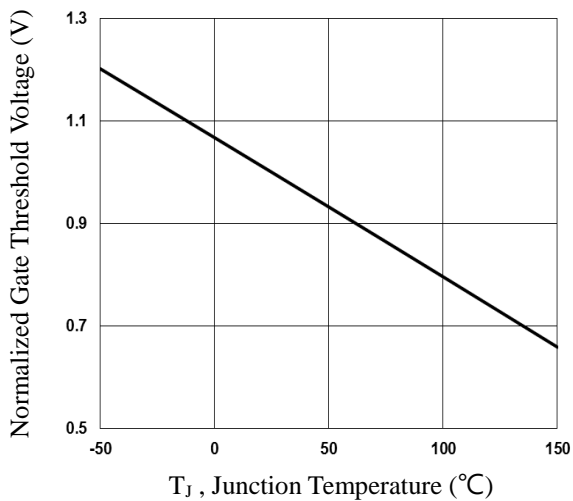


Fig.3 Normalized V_{th} vs. T_J

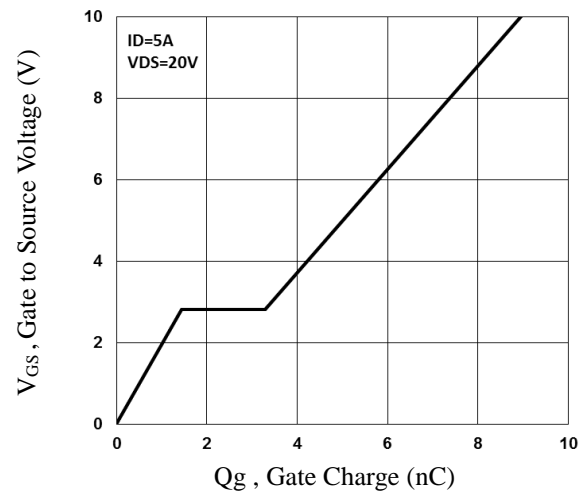


Fig.4 Gate Charge Characteristics

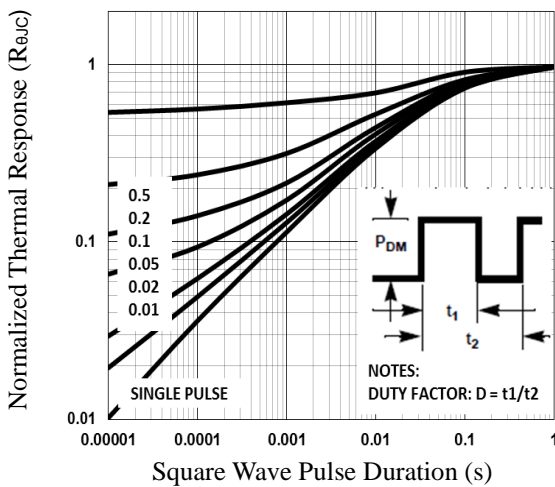


Fig.5 Normalized Transient Impedance

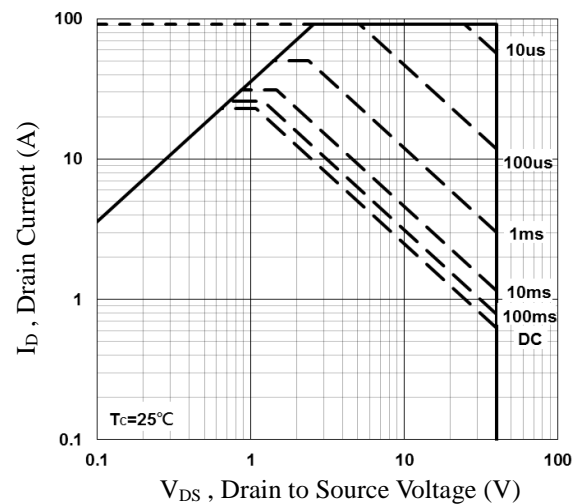


Fig.6 Maximum Safe Operation Area

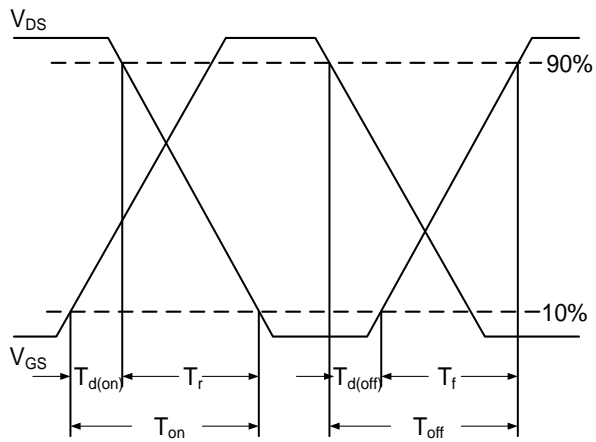


Fig.7 Switching Time Waveform

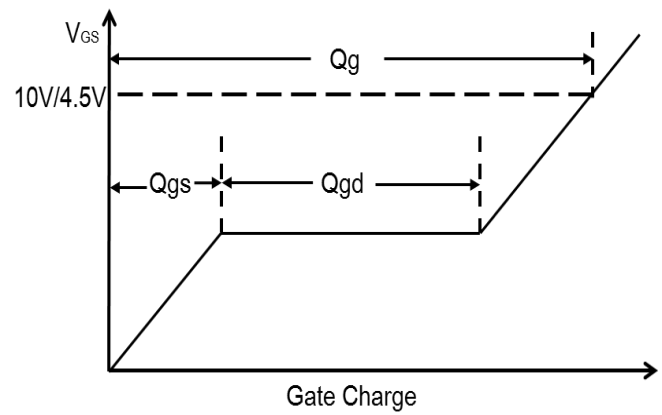


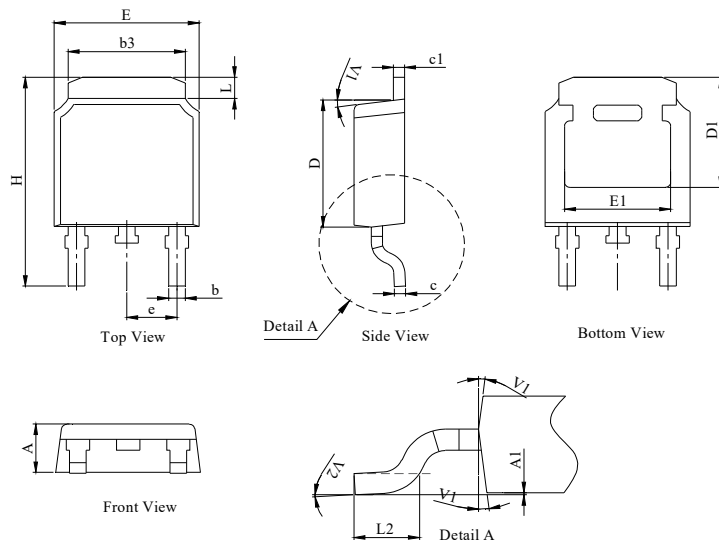
Fig.8 Gate Charge Waveform



TO252-2L Package Information

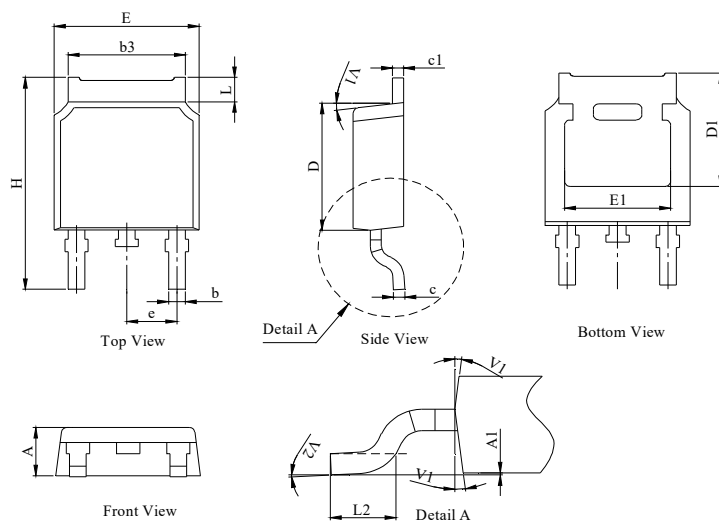
Package Outline Type-A

UNIT: mm



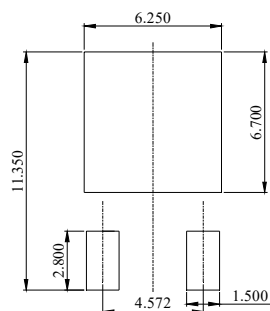
DIM.	MILLIMETER		
	MIN.	NOM.	MAX.
A	2.18	2.30	2.39
A1	0	--	0.13
b	0.64	0.76	0.89
c	0.40	0.50	0.61
c1	0.46	0.50	0.58
D	5.97	6.10	6.23
D1	5.05	--	--
E	6.35	6.60	6.73
E1	4.32	--	--
b3	5.21	5.38	5.55
e	2.29 BSC		
H	9.40	10.00	10.40
L	0.89	--	1.27
L2	1.40	--	1.78
V1	7° REF		
V2	0°	--	6°

Package Outline Type-B



DIM.	MILLIMETER		
	MIN.	NOM.	MAX.
A	2.10	2.30	2.40
A1	0	--	0.13
b	0.66	0.76	0.86
b3	5.21	5.38	5.55
c	0.40	0.50	0.60
c1	0.44	0.50	0.58
D	5.90	6.10	6.30
D1	5.30REF		
E	6.40	6.60	6.80
E1	4.63	-	-
e	2.29 BSC		
H	9.50	10.00	10.70
L	1.09	--	1.21
L2	1.35	--	1.65
V1	7° REF		
V2	0°	--	6°

Recommended Soldering Footprint





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