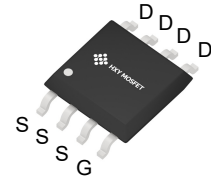




Description

The AO4438 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.



SOP-8

General Features

$V_{DS} = 60V$ $I_D = 10A$

$R_{DS(ON)} < 18m\Omega$ @ $V_{GS}=10V$

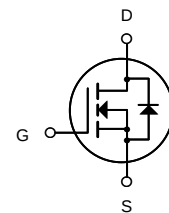
$R_{DS(ON)} < 23m\Omega$ @ $V_{GS}=4.5V$

Application

Battery protection

Load switch

Uninterruptible power supply



N-Channel MOSFET

Package Marking and Ordering Information

Product ID	Pack	Brand	Qty(PCS)
AO4438	SOP-8	HXY MOSFET	3000

Absolute Maximum Ratings (Tc=25°C unless otherwise noted)

Symbol	Parameter	Limit	Unit
V_{DS}	Drain-Source Voltage	60	V
V_{GS}	Gate-Source Voltage	± 20	V
I_D	Drain Current-Continuous	10	A
$I_D(100^\circ C)$	Drain Current-Continuous($T_C=100^\circ C$)	6.5	A
I_{DM}	Pulsed Drain Current	40	A
P_D	Maximum Power Dissipation	1.64	W
E_{AS}	Single pulse avalanche energy ²	72	mJ
T_J, T_{STG}	Operating Junction and Storage Temperature Range	-55 To 150	°C
$R_{\theta JA}$	Thermal Resistance,Junction to Ambient	76	°C/W



Electrical Characteristics (TC=25°C unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Units
Off Characteristics						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =250μA	60	---	---	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{GS} =0V, V _{DS} =60V	---	---	1	μA
I _{GSS}	Gate-Source Leakage Current	V _{GS} =±20V, V _{DS} =0A	---	---	±100	nA
On Characteristics						
V _{GS(th)}	Gate-Source Threshold Voltage	V _{GS} =V _{DS} , I _D =250μA	1	1.5	2.5	V
R _{DS(ON)}	Drain-Source On Resistance ³	V _{GS} =10V, I _D =10A	---	15.5	18	mΩ
		V _{GS} =4.5V, I _D =5A	---	18	23	mΩ
Dynamic Characteristics						
C _{iss}	Input Capacitance	V _{DS} =25V, V _{GS} =0V, f=1MHz	---	1890	---	pF
C _{oss}	Output Capacitance		---	141	--	
C _{rss}	Reverse Transfer Capacitance		---	120	---	
Switching Characteristics						
t _{d(on)}	Turn-On Delay Time	V _{DS} =30V, I _D =5A, R _{ENG} =1.8Ω, V _{GS} =10V	---	9.4	---	ns
t _r	Rise Time		---	15.7	---	ns
t _{d(off)}	Turn-Off Delay Time		---	37.8	---	ns
t _f	Fall Time		---	6.3	---	ns
Q _g	Total Gate Charge	V _{GS} =10V, V _{DS} =30V, I _D =5A	---	48	---	nC
Q _{gs}	Gate-Source Charge		---	7.3	---	nC
Q _{gd}	Gate-Drain “Miller” Charge		---	10.5	---	nC
Drain-Source Diode Characteristics						
V _{SD}	Diode Forward Voltage	V _{GS} =0V, I _{SD} =10A	---	---	1.2	V
I _S	Continuous Drain Current	V _D =V _G =0V	---	---	10	A
I _{SM}	Pulsed Drain Current		---	---	40	A

Notes:

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



Test Circuit

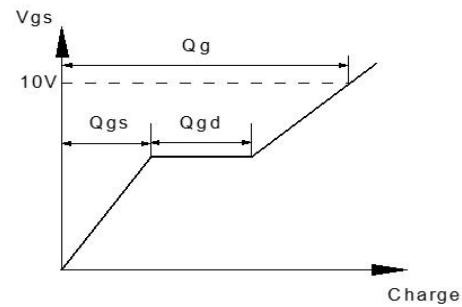
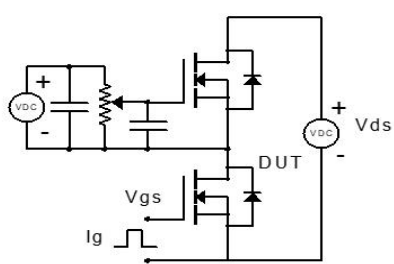


Figure 1: Gate Charge Test Circuit & Waveform

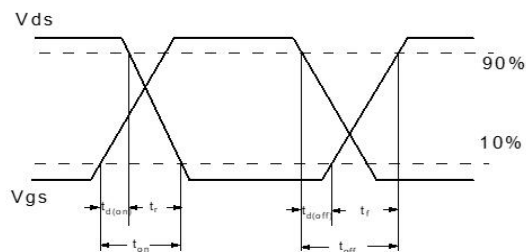
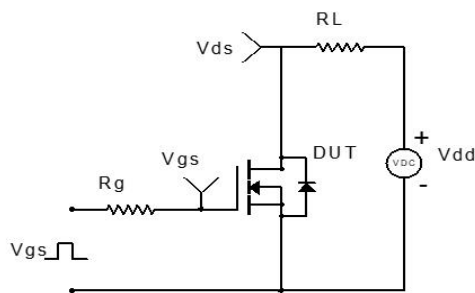


Figure 2: Resistive Switching Test Circuit & Waveform

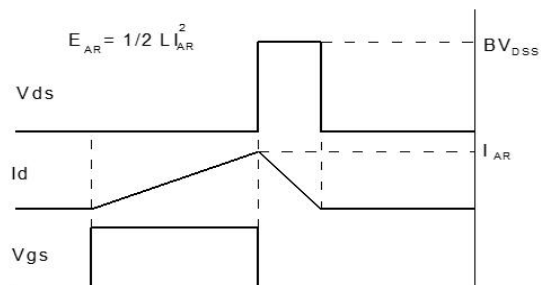
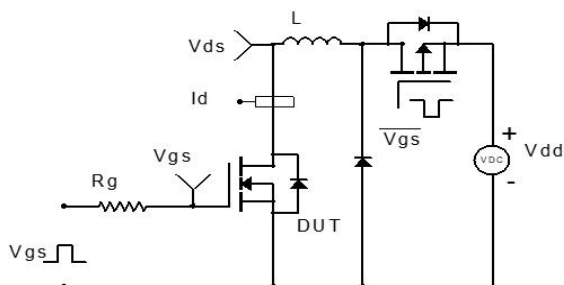


Figure 3: Unclamped Inductive Switching Test Circuit & Waveform

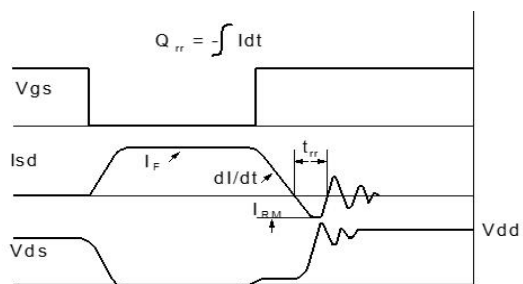
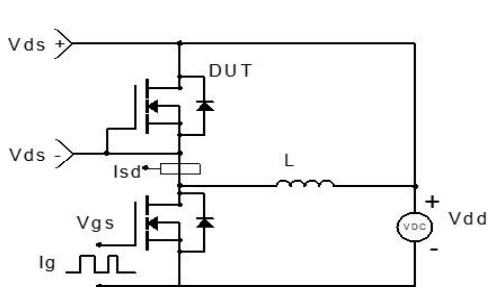
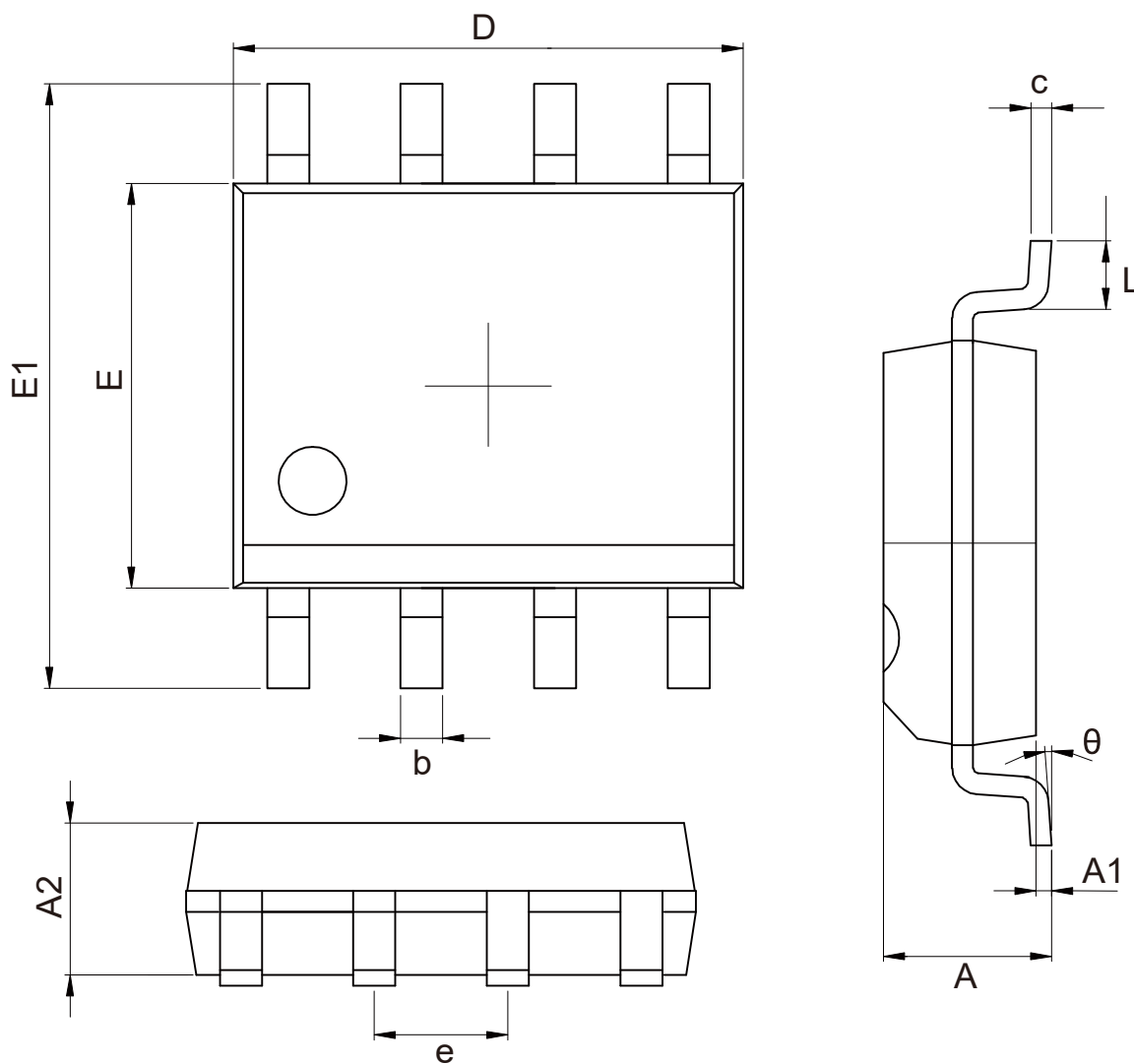


Figure 4: Diode Recovery Test Circuit & Waveform



SOP-8 Package Outline Dimensions



COMMON DIMENSIONS CUNITS MEASURE=MILLIMETER			
SYMBOL	MIN	NOM	MAX
A	1.350	---	1.750
A1	0.100	---	0.250
A2	1.350	---	1.550
b	0.330	---	0.510
c	0.170	---	0.250
D	4.700	---	5.100
E	3.800	3.900	4.000
E1	5.800	---	6.200
e	1.270BSC		
L	0.400	---	1.270
θ	0°	--	8°

Unit:mm



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