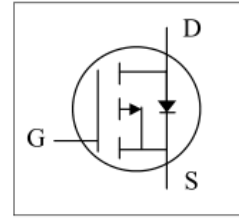


## 30V P-Channel Enhancement Mode MOSFET

### Description

The AO4435 uses advanced trench technology to provide excellent  $R_{DS(ON)}$ , low gate charge and operation with gate voltages as low as 2.5V. This device is suitable for use as a Battery protection or in other Switching application.



### General Features

$V_{DS} = -30V$   $I_D = -12A$

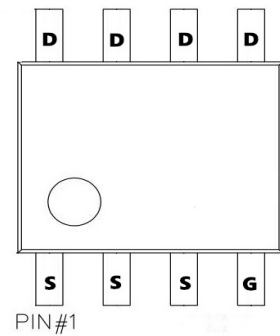
$R_{DS(ON)} < 20m\Omega @ V_{GS}=10V$

### Application

Battery protection

Load switch

Uninterruptible power supply



### Absolute Maximum Ratings ( $T_c=25^\circ C$ unless otherwise noted )

Symbol	Parameter	Rating	Units
$V_{DS}$	Drain-Source Voltage	- 30	V
$V_{GS}$	Gate-Source Voltage	$\pm 20$	V
$I_D@T_A=25^\circ C$	Drain Current <sup>3</sup> , $V_{GS}$ @ 10V	-12	A
$I_D@T_A=70^\circ C$	Drain Current <sup>3</sup> , $V_{GS}$ @ 10V	-10	A
$I_{DM}$	Pulsed Drain Current <sup>1</sup>	-50	A
$P_D@T_A=25^\circ C$	Total Power Dissipation	2.5	W
	Linear Derating Factor	0.02	W/ $^\circ C$
$T_{STG}$	Storage Temperature Range	-55 to 150	$^\circ C$
$T_J$	Operating Junction Temperature Range	-55 to 150	$^\circ C$
$R_{thj-a}$	Maximum Thermal Resistance, Junction-ambient <sup>3</sup>	50	$^\circ C/W$

**30V P-Channel Enhancement Mode MOSFET**
**Electrical Characteristics@T<sub>j</sub>=25°C(unless otherwise specified)**

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
BV <sub>DSS</sub>	Drain-Source Breakdown Voltage	V <sub>GS</sub> =0V, I <sub>D</sub> =-250uA	-30	-	-	V
RDS(ON)	Static Drain-Source On-Resistance <sup>2</sup>	V <sub>GS</sub> =-10V, I <sub>D</sub> =-7A	-	15	20	mΩ
		V <sub>GS</sub> =-4.5V, I <sub>D</sub> =-5A	-	25	32	mΩ
VGS(th)	Gate Threshold Voltage	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =-250uA	-1	-	-3	V
g <sub>fs</sub>	Forward Transconductance	V <sub>DS</sub> =-10V, I <sub>D</sub> =-7A	-	16	-	S
IDSS	Drain-Source Leakage Current	V <sub>DS</sub> =-24V, V <sub>GS</sub> =0V	-	-	-30	uA
IGSS	Gate-Source Leakage	V <sub>GS</sub> =±20V, V <sub>DS</sub> =0V	-	-	±100	nA
Q <sub>g</sub>	Total Gate Charge	I <sub>D</sub> =-7A	-	18	29	nC
Q <sub>gs</sub>	Gate-Source Charge	V <sub>DS</sub> =-24V	-	3	-	nC
Q <sub>gd</sub>	Gate-Drain ("Miller") Charge	V <sub>GS</sub> =-4.5V	-	10	-	nC
td(on)	Turn-on Delay Time	V <sub>DS</sub> =-15V	-	8	-	ns
t <sub>r</sub>	Rise Time	I <sub>D</sub> =-1A	-	6.6	-	ns
td(off)	Turn-off Delay Time	R <sub>G</sub> =3.3Ω	-	44	-	ns
t <sub>f</sub>	Fall Time	V <sub>GS</sub> =-10V	-	34	-	ns
C <sub>iss</sub>	Input Capacitance	V <sub>GS</sub> =0V	-	1175	1690	pF
C <sub>oss</sub>	Output Capacitance	V <sub>DS</sub> =-25V	-	195	-	pF
C <sub>rss</sub>	Reverse Transfer Capacitance	f=1.0MHz	-	190	-	pF
V <sub>SD</sub>	Forward On Voltage <sup>2</sup>	I <sub>S</sub> =-2.1A, V <sub>GS</sub> =0V	-	-	-1.2	V
t <sub>rr</sub>	Reverse Recovery Time	I <sub>S</sub> =-7A, V <sub>GS</sub> =0V, dI/dt=100A/μs	-	28	-	ns
Q <sub>rr</sub>	Reverse Recovery Charge		-	18	-	nC

**Notes:**

- 1.Pulse width limited by Max. junction temperature.
- 2.Pulse test
- 3.Surface mounted on 1 in<sup>2</sup> copper pad of FR4 board, t ≤10sec ; 125 °C/W when mounted on Min. cop

30V P-Channel Enhancement Mode MOSFET

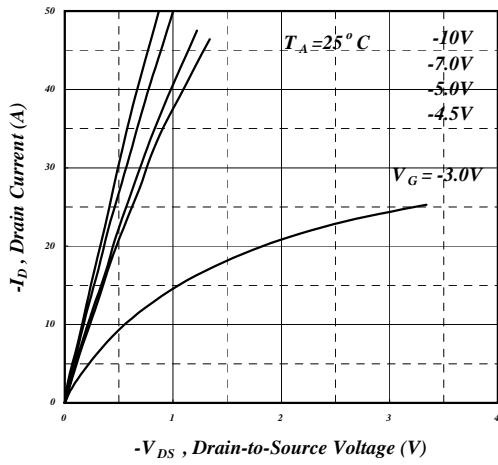


Fig 1. Typical Output Characteristics

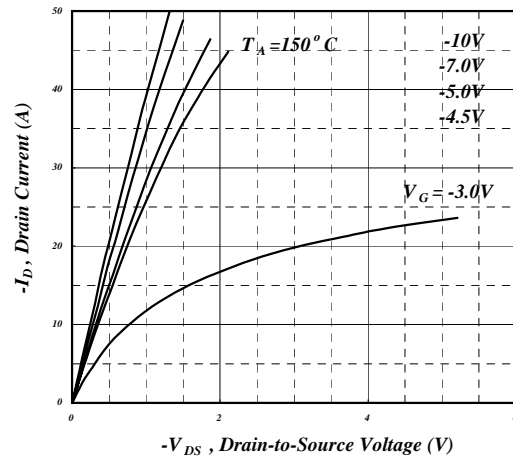


Fig 2. Typical Output Characteristics

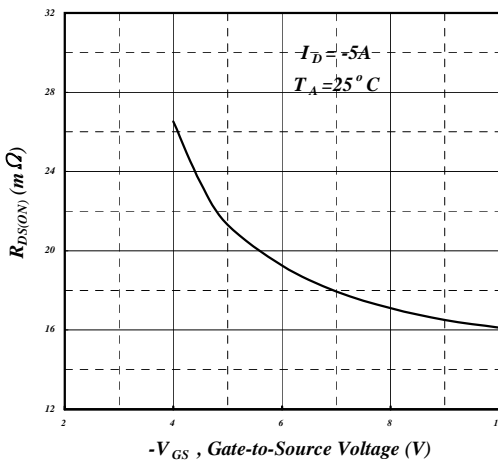


Fig 3. On-Resistance v.s. Gate Voltage

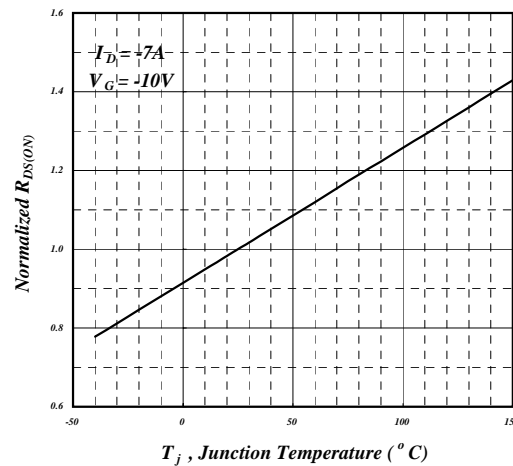


Fig 4. Normalized On-Resistance v.s. Junction Temperature

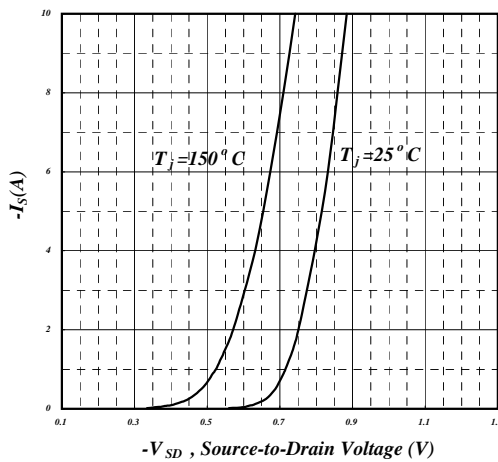


Fig 5. Forward Characteristic of Reverse Diode

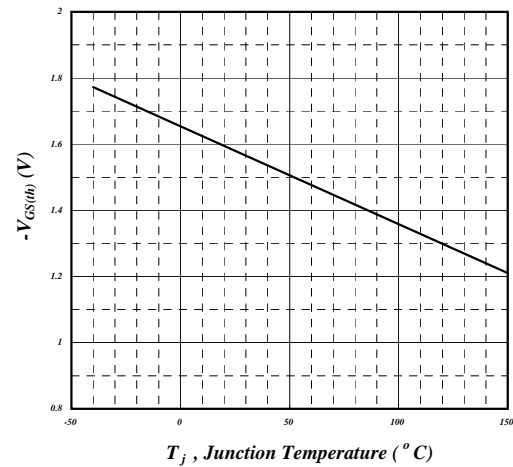


Fig 6. Gate Threshold Voltage v.s. Junction Temperature

30V P-Channel Enhancement Mode MOSFET

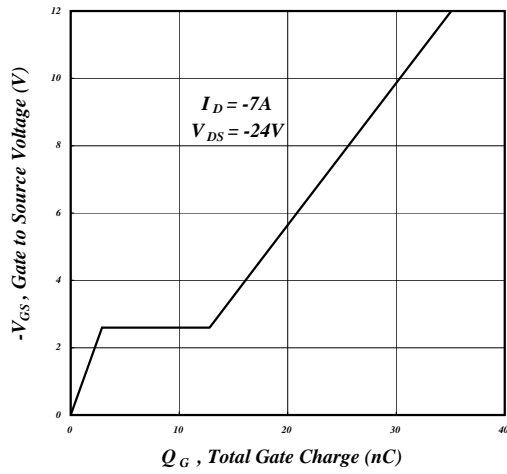


Fig 7. Gate Charge Characteristics

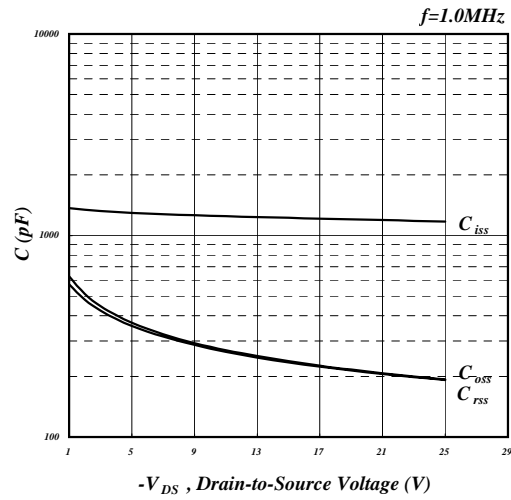


Fig 8. Typical Capacitance Characteristics

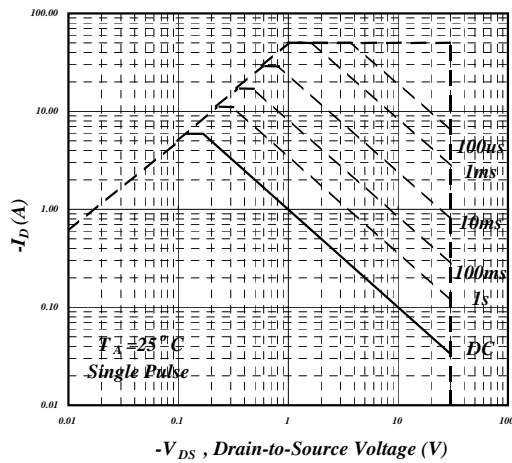


Fig 9. Maximum Safe Operating Area

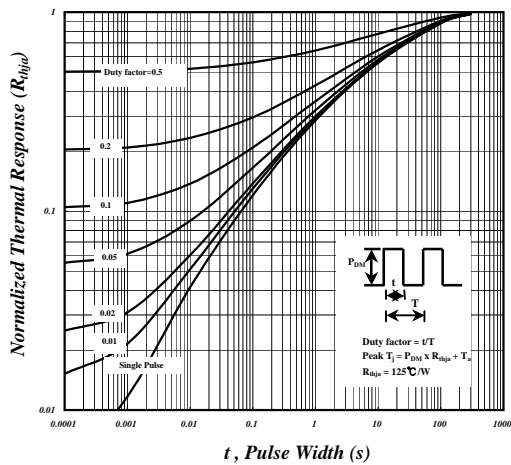


Fig 10. Effective Transient Thermal Impedance

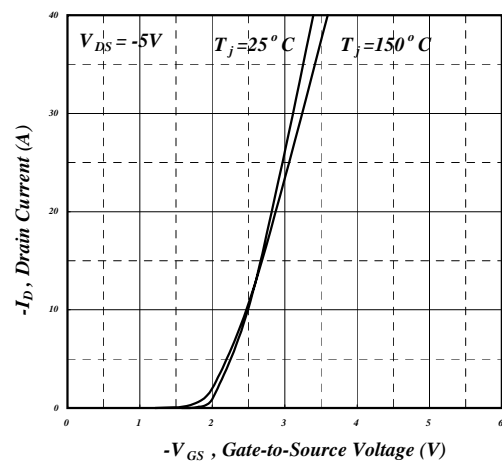


Fig 11. Transfer Characteristics

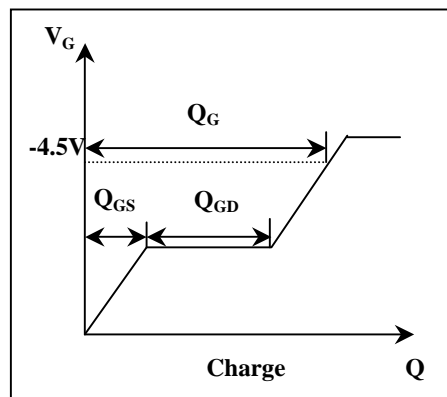
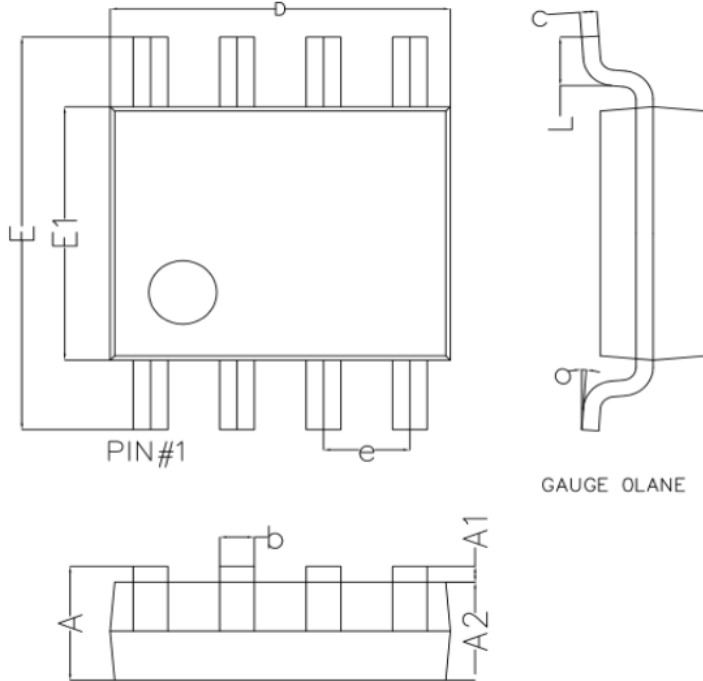


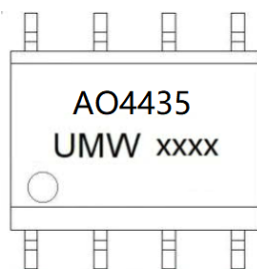
Fig 12. Gate Charge Circuit

SOP8 Package outline



Symbol	Dim in mm		
	Min	Nor	Max
A	1.350	1.550	1.750
A1	0.100	0.175	0.250
A2	1.350	1.450	1.550
b	0.330	0.420	0.510
c	0.170	0.210	0.250
D	4.800	4.900	5.000
e	1.270 (BSC)		
E	5.800	6.000	6.200
E1	3.800	3.900	4.000
L	0.400	0.835	1.2700
o	0°	4°	8°

Marking



("xxxx"代表年份周期)

Ordering information

Order code	Package	Baseqty	Deliverymode
UMW AO4435	SOP-8	3000	Tape and reel