



### Description

The AO4720 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

$V_{DS} = 30V$   $I_D = 10A$

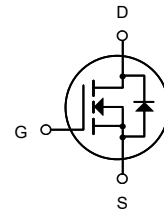
$R_{DS(ON)} < 12m\Omega$  @  $V_{GS}=10V$

### Application

Battery protection

Load switch

Uninterruptible power supply



N-Channel MOSFET

### Ordering Information

Product ID	Pack	Brand	Qty(PCS)
AO4720	SOP-8	HXY MOSFET	3000

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

Symbol	Parameter	Limit	Unit
$V_{DS}$	Drain-Source Voltage	30	V
$V_{GS}$	Gate-Source Voltage	$\pm 20$	V
$I_D$	Drain Current-Continuous	10.0	A
$I_{DM}$	Pulsed Drain Current	40	A
$P_D$	Maximum Power Dissipation	2.2	W
$E_{AS}$	Single pulse avalanche energy	17	mJ
$T_J, T_{STG}$	Operating Junction and Storage Temperature Range	-55 To 150	°C
$R_{\theta JA}$	Thermal Resistance, Junction-to-Case	57	°C/W



**Electrical Characteristics (T<sub>J</sub>=25 °C, unless otherwise noted)**

Symbol	Parameter	Conditions	Min	Typ	Max	Units
<b>BV<sub>DSS</sub></b>	Drain-Source Breakdown Voltage	V <sub>GS</sub> =0V, I <sub>D</sub> =250μA	30	---	---	V
<b>I<sub>DSS</sub></b>	Zero Gate Voltage Drain Current	V <sub>GS</sub> =0V, V <sub>DS</sub> =30V	---	---	1	μA
<b>I<sub>GSS</sub></b>	Gate-Source Leakage Current	V <sub>GS</sub> =±20V, V <sub>DS</sub> =0A	---	---	±100	nA
<b>V<sub>GS(th)</sub></b>	Gate-Source Threshold Voltage	V <sub>GS</sub> =V <sub>DS</sub> , I <sub>D</sub> =250μA	1	1.4	2.5	V
<b>R<sub>DS(on)</sub></b>	Drain-Source On Resistance	V <sub>GS</sub> =10V, I <sub>D</sub> =10A	---	9	12	mΩ
		V <sub>GS</sub> =4.5V, I <sub>D</sub> =5A	---	15	20	mΩ
<b>C<sub>iss</sub></b>	Input Capacitance	V <sub>DS</sub> =15V, V <sub>GS</sub> =0V, f=1MHz	---	580	---	pF
<b>C<sub>oss</sub></b>	Output Capacitance		---	110	---	
<b>C<sub>rss</sub></b>	Reverse Transfer Capacitance		---	94	---	
<b>t<sub>d(on)</sub></b>	Turn-On Delay Time	V <sub>DS</sub> =30V, I <sub>D</sub> =20A, R <sub>G</sub> =3Ω, V <sub>GS</sub> =10V	---	4	---	ns
<b>t<sub>r</sub></b>	Rise Time		---	7	---	ns
<b>t<sub>d(off)</sub></b>	Turn-Off Delay Time		---	20	---	ns
<b>t<sub>f</sub></b>	Fall Time		---	6	---	ns
<b>Q<sub>g</sub></b>	Total Gate Charge	V <sub>GS</sub> =4.5V, V <sub>DS</sub> =15V, I <sub>D</sub> =10A	---	8	---	nC
<b>Q<sub>gs</sub></b>	Gate-Source Charge		---	4.6	---	nC
<b>Q<sub>gd</sub></b>	Gate-Drain "Miller" Charge		---	3.5	---	nC
<b>I<sub>S</sub></b>	Continuous Drain Current	V <sub>D</sub> =V <sub>G</sub> =0V	---	---	10	A
<b>I<sub>SM</sub></b>	Diode pulsed current	V <sub>D</sub> =V <sub>G</sub> =0V	---	---	40	A
<b>V<sub>SD</sub></b>	Source-Drain Diode Forward Voltage	V <sub>GS</sub> =0V, I <sub>S</sub> =10A	---	---	1.2	V
<b>Q<sub>rr</sub></b>	Reverse Recovery Charge	I <sub>S</sub> =20A, di/dt=100A/us	---	5.9	---	nC
<b>T<sub>rr</sub></b>	Reverse Recovery Time		---	7	---	ns

**Notes:**

1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature
2. EAS condition: T<sub>J</sub>=25°C, V<sub>DD</sub>=15V, V<sub>G</sub>=10V, L=0.5mH
3. Pulse Test: Pulse Width≤300μs, Duty Cycle≤0.5%



### Typical Characteristics

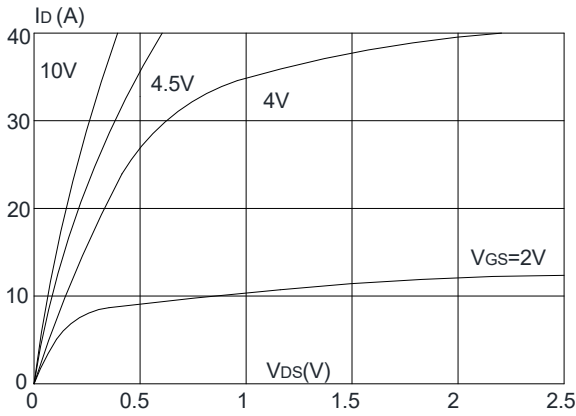


Figure 1: Output Characteristics

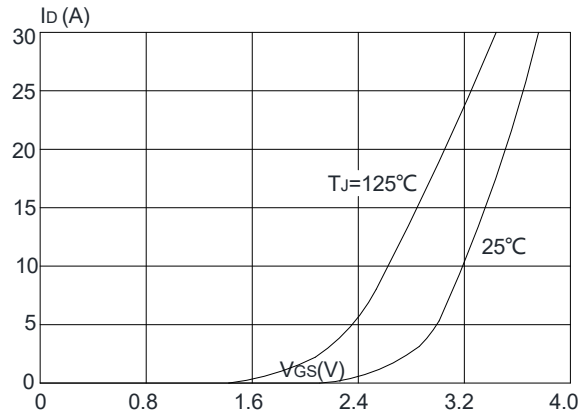


Figure 2: Typical Transfer Characteristics

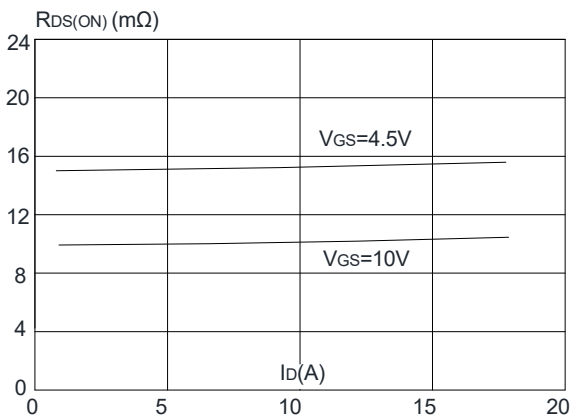


Figure 3: On-resistance vs. Drain Current

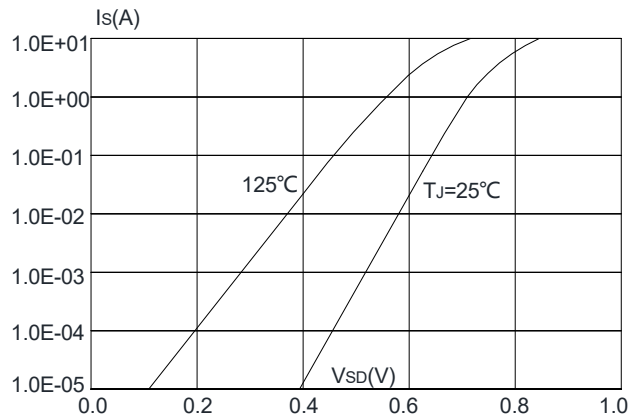


Figure 4: Body Diode Characteristics

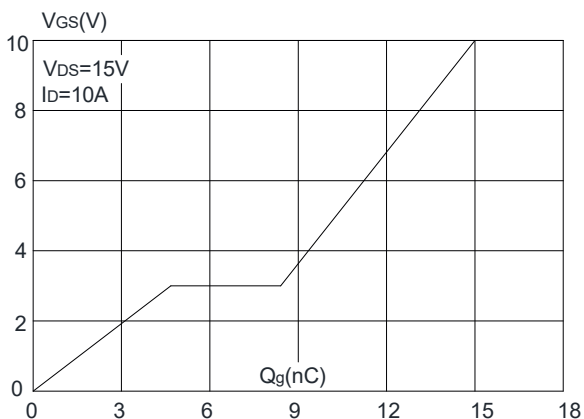


Figure 5: Gate Charge Characteristics

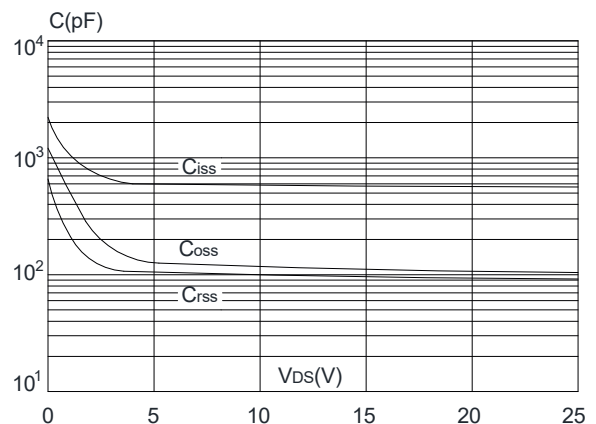
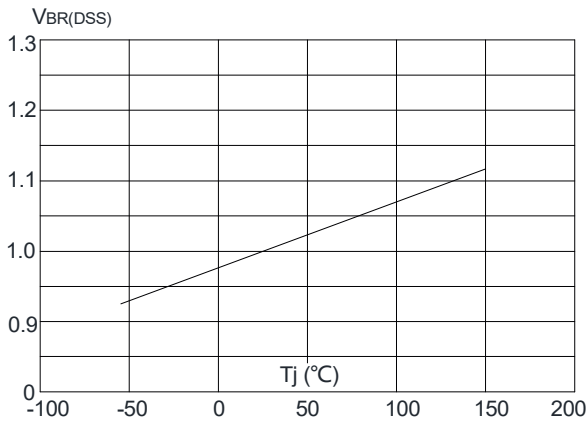
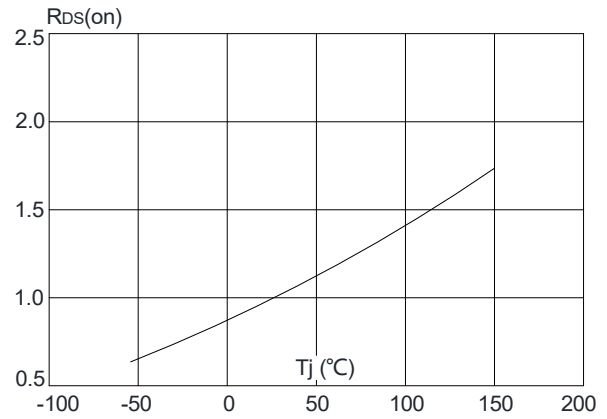


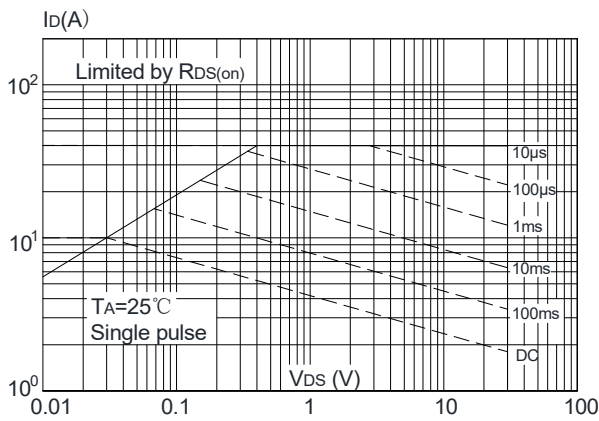
Figure 6: Capacitance Characteristics



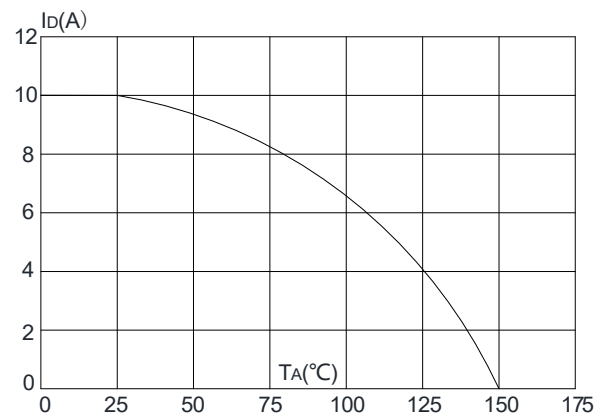
**Figure 7:** Normalized Breakdown Voltage vs. Junction Temperature



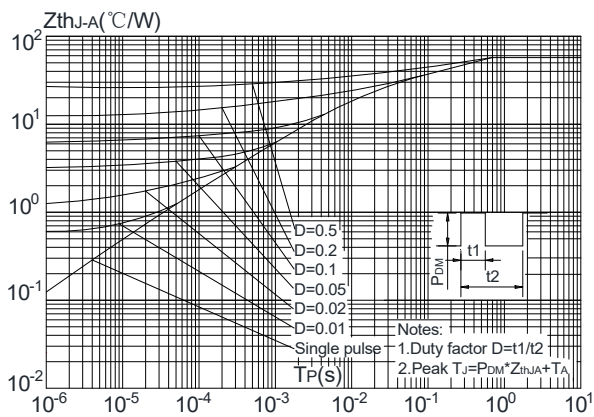
**Figure 8:** Normalized on Resistance vs. Junction Temperature



**Figure 9:** Maximum Safe Operating Area



**Figure 10:** Maximum Continuous Drain Current vs. Ambient Temperature



**Figure.11:** Maximum Effective Transient Thermal Impedance, Junction-to-Ambient



### SOP-8 Package Outline Dimensions



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.350	1.750	0.053	0.069
A1	0.100	0.250	0.004	0.010
A2	1.350	1.550	0.053	0.061
b	0.330	0.510	0.013	0.020
c	0.170	0.250	0.007	0.010
D	4.800	5.000	0.189	0.197
e	1.270 (BSC)		0.050 (BSC)	
E	5.800	6.200	0.228	0.244
E1	3.800	4.000	0.150	0.157
L	0.400	1.270	0.016	0.050
θ	0°	8°	0°	8°



Note:  
 1. Controlling dimension: in millimeters.  
 2. General tolerance:  $\pm 0.05\text{mm}$ .  
 3. The pad layout is for reference purposes only.



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