



**ALPHA & OMEGA**  
SEMICONDUCTOR

# ***AOS Semiconductor Product Reliability Report***

**AOD407** rev C

**Plastic Encapsulated Device**

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This AOS product reliability report summarizes the qualification result for AOD407. Accelerated environmental tests are performed on a specific sample size, and then followed by electrical test at end point. Review of final electrical test result confirms that AOD407 passes AOS quality and reliability requirements. The released product will be categorized by the process family and be monitored on a quarterly basis for continuously improving the product quality.

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### I. Product Description:

The AOD407 uses advanced trench technology to provide excellent  $R_{DS(ON)}$ , low gate charge and low gate resistance. With the excellent thermal resistance of the DPAK package, this device is well suited for high current load applications.

-RoHS Compliant

-Halogen Free

Absolute Maximum Ratings $T_A=25^\circ\text{C}$ unless otherwise noted			
Parameter	Symbol	Maximum	Units
Drain-Source Voltage	$V_{DS}$	-60	V
Gate-Source Voltage	$V_{GS}$	$\pm 20$	V
Continuous Drain Current <sup>G</sup>	$I_D$	$T_C=25^\circ\text{C}$	-12
		$T_C=100^\circ\text{C}$	-10
Pulsed Drain Current <sup>C</sup>	$I_{DM}$	-30	A
Avalanche Current <sup>C</sup>	$I_{AR}$	-12	A
Repetitive avalanche energy $L=0.1\text{mH}$ <sup>C</sup>	$E_{AR}$	23	mJ
Power Dissipation <sup>B</sup>	$P_D$	$T_C=25^\circ\text{C}$	50
		$T_C=100^\circ\text{C}$	25
Power Dissipation <sup>A</sup>	$P_{DSM}$	$T_A=25^\circ\text{C}$	2.5
		$T_A=70^\circ\text{C}$	1.6
Junction and Storage Temperature Range	$T_J, T_{STG}$	-55 to 175	$^\circ\text{C}$

Thermal Characteristics					
Parameter	Symbol	Typ	Max	Units	
Maximum Junction-to-Ambient <sup>A</sup>	$R_{\theta JA}$	16.7	25	$t \leq 10\text{s}$	
Maximum Junction-to-Ambient <sup>A</sup>				Steady-State	
Maximum Junction-to-Case <sup>B</sup>	$R_{\theta JC}$	2.5	3	Steady-State	

## II. Die / Package Information:

<b>Process</b>	<b>AOD407</b> Standard sub-micron Low voltage P channel process
<b>Package Type</b>	3 leads TO252
<b>Lead Frame</b>	Bare Cu
<b>Die Attach</b>	Soft solder
<b>Bond wire</b>	G: Au 1.3mils; S: Al 12mils
<b>Mold Material</b>	Epoxy resin with silica filler
<b>Flammability Rating</b>	UL-94 V-0
<b>Backside Metallization</b>	Ti / Ni / Ag
<b>Moisture Level</b>	Up to Level 1 *

**Note \*** based on info provided by assembler and mold compound supplier

## III. Result of Reliability Stress for AOD407

Test Item	Test Condition	Time Point	Lot Attribution	Total Sample size	Number of Failures
Solder Reflow Precondition	168hr 85°c /85%RH +3 cycle reflow@260 c	-	9 lots	1210pcs	0
HTGB	Temp = 150°c , Vgs=100% of Vgsmax	168 / 500 hrs 1000 hrs	6 lots (Note A*)	492pcs 77+5 pcs / lot	0
HTRB	Temp = 150°c , Vds=80% of Vdsmax	168 / 500 hrs 1000 hrs	6 lots (Note A*)	492pcs 77+5 pcs / lot	0
HAST	130 +/- 2°c , 85%RH, 33.3 psi, Vgs = 80% of Vgs max	100 hrs	9 lots (Note B**)	495pcs 50+5 pcs / lot	0
Pressure Pot	121°c , 29.7psi, 100%RH	96 hrs	5 lots (Note B**)	275pcs 50+5 pcs / lot	0
Temperature Cycle	-65°c to 150°c , air to air,	250 / 500 cycles	8 lots (Note B**)	440pcs 50+5 pcs / lot	0

### III. Result of Reliability Stress for AOD407

Continues

<b>DPA</b>	<b>Internal Vision Cross-section X-ray</b>	<b>NA</b>	<b>5 5 5</b>	<b>5 5 5</b>	<b>0</b>
<b>CSAM</b>		<b>NA</b>	<b>5</b>	<b>5</b>	<b>0</b>
<b>Bond Integrity</b>	<b>Room Temp 150°C bake 150°C bake</b>	<b>0hr 250hr 500hr</b>	<b>40 40 40</b>	<b>40 wires 40 wires 40 wires</b>	<b>0</b>
<b>Solderability</b>	<b>245°C</b>	<b>5 sec</b>	<b>15</b>	<b>15 leads</b>	<b>0</b>
<b>Solder dunk</b>	<b>260°C</b>	<b>10secs 3 cycles</b>	<b>1</b>	<b>30 units</b>	<b>0</b>

**Note A:** The HTGB and HTRB reliability data presents total of available AOD407 burn-in data up to the published date.

**Note B:** The pressure pot, temperature cycle and HAST reliability data for AOD407 comes from the AOS generic package qualification data.

### IV. Reliability Evaluation

**FIT rate (per billion): 9**

**MTTF = 12331 years**