



# **AOS Semiconductor Product Reliability Report**

**AON6403/AON6403L, rev A**

**Plastic Encapsulated Device**

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This AOS product reliability report summarizes the qualification result for AON6403. 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 AON6403 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 AON6403/L combines advanced trench MOSFET technology with a low resistance package to provide extremely low  $R_{DS(ON)}$ . This device is ideal for load switch and battery protection applications.

- RoHs Compliant
- AON6403L is Halogen Free

Absolute Maximum Ratings $T_A=25^\circ\text{C}$ unless otherwise noted			
Parameter	Symbol	Maximum	Units
Drain-Source Voltage	$V_{DS}$	-30	V
Gate-Source Voltage	$V_{GS}$	$\pm 20$	V
Continuous Drain Current <sup>G</sup>	$I_D$	$T_C=25^\circ\text{C}$	A
		$T_C=100^\circ\text{C}$	
Pulsed Drain Current <sup>C</sup>	$I_{DM}$	-280	
Continuous Drain Current	$I_{DSM}$	$T_A=25^\circ\text{C}$	A
		$T_A=70^\circ\text{C}$	
Avalanche Current <sup>C</sup>	$I_{AR}$	-72	A
Repetitive avalanche energy $L=0.1\text{mH}$ <sup>C</sup>	$E_{AR}$	259	mJ
Power Dissipation <sup>B</sup>	$P_D$	$T_C=25^\circ\text{C}$	W
		$T_C=100^\circ\text{C}$	
Power Dissipation <sup>A</sup>	$P_{DSM}$	$T_A=25^\circ\text{C}$	W
		$T_A=70^\circ\text{C}$	
Junction and Storage Temperature Range	$T_J, T_{STG}$	-55 to 150	$^\circ\text{C}$

Thermal Characteristics					
Parameter		Symbol	Typ	Max	Units
Maximum Junction-to-Ambient <sup>A</sup>	$t \leq 10\text{s}$	$R_{\theta JA}$	14	17	$^\circ\text{C/W}$
Maximum Junction-to-Ambient <sup>A,D</sup>	Steady-State		40	55	$^\circ\text{C/W}$
Maximum Junction-to-Case	Steady-State	$R_{\theta JC}$	1	1.5	$^\circ\text{C/W}$

**II. Die / Package Information:**

	<b>AON6403</b>	<b>AON6403L (Green Compound)</b>
<b>Process</b>	Standard sub-micron	Standard sub-micron
<b>Package Type</b>	Low voltage P channel process	Low voltage P channel process
<b>Lead Frame</b>	8 leads DFN 5×6	8 leads DFN 5×6
<b>Die Attach</b>	Bare Cu	Bare Cu
<b>Bond wire</b>	Solder paste	Solder paste
<b>Mold Material</b>	Cu clip	Cu clip
<b>Flammability Rating</b>	Epoxy resin with silica filler	Epoxy resin with silica filler
<b>Moisture Level</b>	UL-94 V-0	UL-94 V-0
	Up to Level 1 *	Up to Level 1 *

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

**III. Result of Reliability Stress for AON6403 (Standard) & AON6403L (Green)**

Test Item	Test Condition	Time Point	Lot Attribution	Total Sample size	Number of Failures
<b>Solder Reflow Precondition</b>	Standard: 1hr PCT+3 cycle reflow@260°C Green: 168hr 85°C /85%RH +3 cycle reflow @260°C	-	Standard: 9 lots  Green: 5 lots  (Note B**)	1705 pcs	0
<b>HTGB</b>	Temp = 150°C , Vgs=100% of Vgsmax	168 / 500 hrs  1000 hrs	3 lots  (Note A*)	246 pcs  77+5 pcs / lot	0
<b>HTRB</b>	Temp = 150°C , Vds=80% of Vdsmax	168 / 500 hrs  1000 hrs	3 lots  (Note A*)	246 pcs  77+5 pcs / lot	0
<b>HAST</b>	130 +/- 2°C , 85%RH, 33.3 psi, Vgs = 80% of Vgs max	100 hrs	Standard: 2 lots Green: 3 lots  (Note B**)	275 pcs  50+5 pcs / lot	0
<b>Pressure Pot</b>	121°C , 29.7psi, RH=100%	96 hrs	Standard: 8 lots Green: 4 lots  (Note B**)	660 pcs  50+5 pcs / lot	0
<b>Temperature Cycle</b>	-65°C to 150°C , air to air	250 / 500 cycles	Standard: 9 lots Green: 5 lots  (Note B**)	770 pcs  50+5 pcs / lot	0

### III. Result of Reliability Stress for AON6403 (Standard) & AON6403L (Green) Continues

DPA	Internal Vision	NA	5	5	0
	Cross-section		5	5	
	X-ray		5	5	
CSAM		NA	5	5	0
Bond Integrity	Room Temp	0hr	40	40 wires	0
	150°C bake	250hr	40	40 wires	
	150°C bake	500hr	40	40 wires	
Solderability	245°C	5 sec	15	15 leads	0

**Note A:** The HTGB and HTRB reliability data presents total of available AON6403 and AON6403L burn-in data up to the published date.

**Note B:** The pressure pot, temperature cycle and HAST reliability data for AON6403 and AON6403L comes from the AOS generic package qualification data.

### IV. Reliability Evaluation

**FIT rate (per billion): 14**

**MTTF =7918 years**