



ALPHA & OMEGA
SEMICONDUCTOR

Alpha & Omega Semiconductor Product Reliability Report

AO4830/AO4830L, rev B

Plastic Encapsulated Device

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This AOS product reliability report summarizes the qualification result for AO4830. 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 AO4830 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 AO4830 uses advanced trench technology to provide excellent $R_{DS(ON)}$ and low gate charge. This device is suitable for use as a load switch or in PWM applications. Standard Product AO4830 is Pb-free (meets ROHS & Sony 259 specifications). AO4830L is a Green Product ordering option. AO4830 and AO4830L are electrically identical.

Absolute Maximum Ratings $T_A=25^\circ\text{C}$ unless otherwise noted			
Parameter	Symbol	Maximum	Units
Drain-Source Voltage	V_{DS}	80	V
Gate-Source Voltage	V_{GS}	± 30	V
Continuous Drain Current	I_D	$T_C=25^\circ\text{C}$	5
		$T_C=70^\circ\text{C}$	4
Pulsed Drain Current ^C	I_{DM}	21	A
Avalanche Current ^C	I_{AR}	16	A
Repetitive avalanche energy $L=0.1\text{mH}$ ^C	E_{AR}	12.8	mJ
Power Dissipation ^B	P_D	$T_C=25^\circ\text{C}$	2
		$T_C=70^\circ\text{C}$	1.3
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 ^A	$t \leq 10\text{s}$	$R_{\theta JA}$	48	62.5	$^\circ\text{C/W}$
Maximum Junction-to-Ambient ^{A,D}	Steady-State		74	90	$^\circ\text{C/W}$
Maximum Junction-to-Lead	Steady-State	$R_{\theta JL}$	32	40	$^\circ\text{C/W}$

II. Die / Package Information:

	AO4830	AO4830L (Green Compound)
Process	Standard sub-micron Low voltage N channel process	Standard sub-micron Low voltage N channel process
Package Type	8 leads SOIC	8 leads SOIC
Lead Frame	Cu, D/pad, Ag spot	Cu, D/pad, Ag spot
Die Attach	Ag epoxy	Ag epoxy
Bond wire	S: Cu 2 misl, G: Au 1.3mils	S: Cu 2 misl, G: Au 1.3mils
Mold Material	Epoxy resin with silica filler	Epoxy resin with silica filler
Flammability Rating	UL-94 V-0	UL-94 V-0
Backside Metallization	Ti / Ni / Ag	Ti / Ni / Ag
Moisture Level	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 AO4830 (Standard) & AO4830L (Green)

Test Item	Test Condition	Time Point	Lot Attribution	Total Sample size	Number of Failures
Solder Reflow Precondition	Standard: 1hr PCT+3 cycle reflow@260°c Green: 168hr 85°c /85RH +3 cycle reflow@260°c	-	Standard: 49 lots Green: 16 lots	9625 pcs	0
HTGB	Temp = 150°c , Vgs=100% of Vgsmax	168 / 500 hrs 1000 hrs	1lot (note A*)	82 pcs 77+5 pcs / lot	0
HTRB	Temp = 150°c , Vds=80% of Vdsmax	168 / 500 hrs 1000 hrs	1lot (note A*)	82 pcs 77+5 pcs / lot	0
HAST	130 +/- 2°c , 85%RH, 33.3 psi, Vgs = 80% of Vgs max	100 hrs	Standard: 33 lots Green: 13 lots (note B**)	2530 pcs 50+5 pcs / lot	0
Pressure Pot	121°c , 29.7 psi, RH=100%	96 hrs	Standard: 49 lots Green: 16 lots (note B**)	3575 pcs 50+5 pcs / lot	0
Temperature Cycle	-65°c to 150°c , air to air,	250 / 500 cycles	Standard: 49 lots Green: 15 lots (note B**)	3520 pcs 50+5 pcs / lot	0

III. Result of Reliability Stress for AO4830 (Standard) & AO4830L (Green) Continues

DPA	Internal Vision Cross-section X-ray	NA	5	5	0
			5	5	
			5	5	
CSAM		NA	5	5	0
Bond Integrity	Room Temp 150°c bake 150°c bake	0hr	40	40 wires	0
		250hr	40	40 wires	
		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 AO4830 and AO4830L burn-in data up to the published date.

Note B: The pressure pot, temperature cycle and HAST reliability data for AO4830 and AO4830L comes from the AOS generic package qualification data.

IV. Reliability Evaluation

FIT rate (per billion):43

MTTF =2639years