

# HDSP-A22C/HDSP-A27C

Two Character 14 Segment

AllnGaP Display



## Reliability Data Sheet

### Description

The following cumulative test results have been obtained from testing performed at Avago Technologies in accordance with the specific requirement.

The actual performance you obtain from Avago parts depends on the electrical and environmental characteristics of your application but will probably be better than the performance outlined in Table 1.

Table 1. Life Tests  
Demonstrated Performance

Colors	Stress Test	Stress Test Conditions	Total Device Hrs.	Units Tested	Units Failed	Point Typical Performance	
						MTBF	Failure Rate (% /1K Hours)
AllnGaP Red	High Temperature Operating Life	$T_A = +55^{\circ}\text{C}$ , $I_{FP, HER} = 55 \text{ mA}$ $I_{FP, Green} = 5.5 \text{ mA}$ Cycle = 1/10 Duty Frequency = 1 kHz	22,000	22	0	22,000	< 4.54
AllnGaP Red	High Temperature Operating Life	$T_A = +105^{\circ}\text{C}$ , $I_{FP, HER} = 55 \text{ mA}$ $I_{FP, Green} = 5.5 \text{ mA}$ Cycle = 1/10 Duty Frequency = 1 kHz	22,000	22	0	22,000	< 4.54
AllnGaP Red	Humidity Operating Life	$T_A = +85^{\circ}\text{C}$ , RH = 85% $I_{FP, HER} = 55 \text{ mA}$ $I_{FP, Green} = 5.5 \text{ mA}$ Cycle = 1/10 Duty Frequency = 1 kHz	30,000	30	0	30,000	< 3.33

**Table 2. Environmental Tests**

Test Name	Reference	Test Conditions	Units Tested	Units Failed
Solder Heat Resistance	IEC 68 2-20	1x solder dip at 260°C for total of 6 ± 1 seconds Immersion depth 1.5 mm from case.	22	0
Thermal Shock	Avago Ref.	Upper temp. 105 ± 5°C. Lower temp -40 ± 5°C. Dwell time 30 min. Transition time 20 deg. per minutes. Total cycles = 30	77	0
Vibration sine sweep	IEC 68 part 2-6 test group Fc	Frequency range = 10 to 2000 Hz to 10 Hz Constant displacement = 1.5 mm peak to peak (for 10 to 55 Hz). Constant acceleration = 10 g (for 55 to 2000 Hz). Sweep rate = 1 oct/min. Test durations = 2 hrs/axis No. of axis = 3 (x, y, z)	10	0
Mechanical shock	IEC 68 part 2-27 test group Ea	Pulse shape = half sine Peak acceleration = 100 g Pulse duration = 6 ± 0.5 ms No. of axis = 3 (x, y, z). No. of directions = 6 (±x, ±y, ±z) No. of shocks = 3 shocks/direction	10	0
Drop test	Avago Ref.	1.2 meter drop, concrete surface. 10 repetitions.	10	0
Temperature Cycle	IEC 68 part 2-14 test group Na	105 ± 5°C – 30min. 25 ± 5°C – 15 min. -40 ± 5°C – 30 min. Total cycles = 60	60	0
Temperature Cycle	Avago Ref.	105 ± 5°C – 15 min. 25 ± 5°C – 2 min. -40 ± 5°C – 15 min. Total cycles = 1100	60	0
High temperature storage	IEC 68 part 2-2 test group Ba	105 ± 5°C Total hours = 168	22	0
Low temperature storage	IEC 68 part 2-1 test group Aa	-40°C Total hours = 168	22	0
Solderability	IEC 68 2-20 test group Ta	Solder temperature = 235 ± 5°C Solder time = 2 ± 0.5 sec Immersion rate = 25 ± 5 mm/sec., one time dip	10	0
Terminal tension strength	IEC 68 2-21 test group Ua1	Bending arc 90 degrees Applied force 227 gw, 3 cycles	10	0
Dewetting	IEC 68 2-20 test group Ta	260 ± 5°C, 2.5 ± 0.5 sec, Immersion rate 5 ± 2 mm /sec Emersion rate 5 ± 2 mm/sec	10	0

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