



# Agilent HCNW-3120

## 2A Output Current IGBT Gate Drive Optocoupler

### Reliability Data Sheet

#### Description

The reliability data shown includes Agilent Technologies reliability test data from the qualification of this product family. All of these products use similar IC, and the same packaging materials, processes, stress conditions and testing. The data in Table 1 and Table 2 reflect actual test data for devices on a per channel basis. Before stress, all devices are preconditioned using a solder reflow process (245 °C peak temperature, 2X) and 20

temperature cycles (-55 °C to +125 °C, 15 mins dwell, 5 mins transfer). These data are taken from testing on Agilent Technologies devices using internal Agilent Technologies process, material specifications, design standards, and statistical process controls. **THEY ARE NOT TRANSFERABLE TO OTHER MANUFACTURERS' SIMILAR PART TYPES.**

#### Operating Life Test

For valid system reliability calculations it is necessary to adjust for the time when the system is not in operation. Note that if you are using MIL-HDBK-217 for predicting component reliability, the results may not be comparable to those given in Table 2 due to different conditions and factors that have been accounted for in MIL-HDBK-217. For example it is unlikely that your application will exercise all available channels at full rated power as Agilent Technologies testing does. Thus, your application total power and duty cycle must be carefully considered when comparing Table 2 to predictions using MIL-HDBK-217.

**Table 1. Demonstrated Operating Life Test Performance.**

Stress Test Condition	Total Device Tested	Total Device Hours	Number of Failed Units	Demonstrated MTTF(hr) @ Ta = +100°C	Demonstrated FITs @ Ta = +100°C
Ta = 100°C If = 25mA Vcc = 35V Iout = 26mA	360	360,000	0	> 360,000	< 2,777



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**Definition of Failure**

Inability to switch, i.e. “functional failure” is the definition of failure in this data sheet. Specifically, failure occurs when the device fails to switch ON with 2 times the minimum recommended drive current (but not exceeding the max rating) or fails to switch off when there is no input current

**Failure Rate Projections**

The demonstrated point mean time to failure (MTTF) is measured at the absolute maximum stress condition. The failure rate projections in Table 2 uses the Arrhenius acceleration relationship, where a 0.43 eV activation energy is used as in the hybrid section of MIL-HDBK-217.

**Application Information**

The data of Table 1 and 2 were obtained on devices with high temperature operating life duration up to 1000 hours. An exponential (random) failure distribution is assumed, expressed in units of FIT (failures per billion device hours) are only defined in the random failure portion of the reliability curve.

**Table 2. Reliability Projections (per channel) for Devices Listed in Title**

Ambient Temperature(°C)	Junction Temperature(°C)	Typical (60% Confidence)		90% Confidence	
		MTTF(Hr/fail)	FITs(Fail/10 <sup>9</sup> h)	MTTF(Hr/fail)	FITs(Fail/10 <sup>9</sup> h)
100	115	392,889	2,545	156,346	6,396
90	105	551,8390	1,812	219,598	4,554
80	95	789,540	1,267	314,189	3,183
70	85	1,152,461	868	458,609	2,181
60	75	1,719,167	582	684,124	1,462
50	65	2,625,958	381	1,044,972	957
40	55	4,115,996	243	1,637,916	611
30	45	6,636,486	151	2,640,918	379
25	40	8,523,95	117	3,392,014	295

**Mechanical Tests (Testing done on a constructional basis)**

Test Name	MIL-STD-883	Test Conditions	Units Tested	Units Failed
Temp Cycle	1010 Cond. B	-55 to 125°C Transfer = 5 mins Dwell = 15 mins 1000 cycles	360	0
Physical Dimension	2009	Dev profile @ 10X	200	0
Solder Heat Resistance	N/A	Temp = 260C, 10 sec	20	0
Solderability	2003	Sn 60 Pb 40 Solder Temp = 230 °C (2 sec)	20	0



### Environmental Testing

Test Name	MIL-STD-883	Test Conditions	Units Tested	Units Failed
Wet Temp Biased Test	-	Ta = 85C, RH = 85% If = 25mA Vcc = 35V Iout = 26mA	280	0
Autoclave	-	Ta = 121C, RH = 100% Unbiased Time = 168 hours	140	0

### Basic Material Properties

Material Property	Test Result
Mold Compound Flammability Classification	UL 94V-0
Mold Compound Oxygen Index	32%
Mold Compound Glass Transition Temperature	Tg = 160°C
Mold Compound Hydrolyzable Chlorine	<30 ppm

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