



# Agilent HSSR-7111, 5962-9314001HPX 90 V, 1.0 $\Omega$ , Hermetically Sealed, Power MOSFET Optocoupler

## Reliability Data Sheet

### Description

The reliability data shown includes Agilent reliability test data from the past three years. This data is taken from testing on Agilent Technologies' devices

using internal Agilent processes, material specifications, design standards, and statistical process controls. IT IS NOT TRANSFERABLE

TO OTHER MANUFACTURERS' SIMILAR PART TYPES.

### Operating Life Test

Table 1. Demonstrated Operating Life Test Performance, HSSR-7111

Stress Test Condition	Total Devices Tested	Total Device Hours	Number of Failed Units	Demonstrated MTTF (hr)@ $T_A = +125^\circ\text{C}$	Demonstrated FITs @ $T_A = +125^\circ\text{C}$
$I_f = 20 \text{ mA}$ $I_{out} = 800 \text{ mA}$ $V_{CC} = 20 \text{ V}$ $T_A = +125^\circ\text{C}$ $T_j = +150^\circ\text{C}$	330	453,000	0	>453,000	<2,207

### 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 use the Arrhenius acceleration relationship, where a 0.43 eV

activation energy is used as in the hybrid section of MIL-HDBK-217.

### Applications Information

The data of Table 1 was obtained on MIL-PRF-38534 screened devices with high temperature operating life. 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.

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 the 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 with the LED(s) always ON as Agilent testing does. Thus, your application total power and duty cycle must be carefully considered when comparing Table 2 to predictions using MIL-HDBK-217.



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**Table 2. Reliability Projections for Device Listed in Title**

Ambient Temperature (°C)	Junction Temperature (°C)	Point Typical Performance in Time (60% Confidence)		Performance in Time (90% Confidence)	
		MTTF (hr/fail)	FITs (fail/10 <sup>9</sup> hr)	MTTF (hr/fail)	FITs (fail/10 <sup>9</sup> hr)
125	150	494,000	2,023	193,000	5,172
120	145	569,000	1,757	222,000	4,491
110	135	762,000	1,311	298,000	3,352
100	125	1,037,000	964	405,000	2,465
90	115	1,432,000	698	560,000	1,784
80	105	2,013,000	497	787,000	1,270
70	95	2,882,000	347	1,127,000	887
60	85	4,209,000	238	1,646,000	607
50	75	6,283,000	159	2,457,000	407
40	65	9,603,000	104	3,756,000	266
30	55	15,063,000	66	5,892,000	170
25	50	19,063,000	52	7,456,000	134

**Environmental Testing**

All high reliability hermetic optocouplers listed meet the 100% screening and quality conformance inspection testing of MIL-PRF-38534 class H.

**Electrostatic Discharge Sensitivity**

**Table 3. ESDS Classification per Method 3015, MIL-STD-883**

Part Number	ESD Class
5962-9314001HPX / HSSR-7111	2

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Data subject to change.

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