

HIGH TEMPERATURE OPERATING LIFE TEST REPORT

Company : SYNC POWER CORP.

Model Name : SP6019

Date Received : MAY.13. 2009

Date Tested : JUN.09. 2009

TESTING LABORATORY IS ACCREDITED BY:

IEC/IECQ 17025 certificate of independent test laboratory approval

Certificate No. : T1091

ISO 17025 accredited in respect of laboratory is approved by TAF

Certificate No. : L0835-060321

ISO 9001 certificate is approved by TUV CERT certification body of TUV NORD Cert GmbH

WE HEREBY CERTIFY THAT:

The test(s) shown in the attachment were conducted according to the indicating procedures. We assume full responsibility for the accuracy and completeness of these tests and vouch for the qualifications of all personnel performing them.

	Name	Signature	Date
Test Engineer	Ian Lin	<i>Ian Lin</i>	2009/06/18
Section Manager	Allan Tseng	<i>Allan Tseng</i>	2009/06/18

Note :

1. This report will be invalid if reproduced in whole or in part.
2. This report refers only to the specimen(s) submitted to test, and is invalid if used separately.
3. This report is ONLY valid with the examination seal and signature of this institute.
4. The tested specimen(s) will only be preserved for thirty days from the date issued, if not collected by the applicant.



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1. GENERAL INFORMATION

1.1 DESCRIPTION OF UNIT

Manufacturer	: SYNC POWER CORP.
Model Name	: SP6019
Lot No	: F63800.3
Package Type	: SOP8
Sample Quantity	: 77ea

2. HIGH TEMPERATURE OPERATING LIFE

2.1 DESCRIPTION OF TEST EQUIPMENT

Test Equipment	Serial Number	Calibration Trace Code
SIGNALITY B1120M	TE-P105	A98-01-442-02

2.2 LABORATORY AMBIENCE CONDITION

Verification area temperature : $25 \pm 5^{\circ}\text{C}$

Verification area relative humidity : $55\% \pm 10\%$

Laboratory area temperature : $30 \pm 5^{\circ}\text{C}$

Laboratory area relative humidity : $45\% \pm 10\%$

2.3 REFERENCE DOCUMENT

The test refers to JESD22-A108C Test Method

2.4 TEST CONDITION

Temperature	: 125°C
Bias Setting	: PS1:12V
VIH	: 5V
Test Time	: 500hours
Test Pattern	: SP6019.BTP

2.5 SUMMARY OF TEST

Visual inspection of samples' surface showed no abnormality.

Functional Test will be performed by customer in SYNC POWER CORP.

without 3rd party lab (ISTI) person participated.

To follow customer's requirement, attached functional test result as below.

Item	Test result
Full functional test	77ea Passed

3. MTTF CALCULATE

3.1 MTTF CALCULATE

To follow customer's provided parameter, attached MTTF calculated result as below.



SP6019 HTOL test MTTF & FIT calculation

Device Name	SP6019	
Test Hours(T.H.)	500	Hours
Sample Size(S.S.)	77	ea
Normal Operating Temperature	55	°C
Stress Temperature	125	°C
Normal Operating Voltage	12	V
Stress Voltage	12	V
Activation Energy	0.700	eV
γ_v	1.00	1/V

$$AF_T = \exp^{(Ea/k)(1/T_{use}-1/T_{stress})}$$

$$AF_V = \exp^{w(V_{stress}-V_{use})}$$

Parametric	Value	Unit
k	8.62E-05	eV/K
Ea	0.700	eV
Tuse	55	°C
Tstress	125	°C
Tuse	328	°K
Tstress	398	°K

Parametric	Value	Unit
γ_v	1.00	1/V
Vuse	12	V
Vstress	12	V

$AF_T =$	77.94098
$AF_V =$	1
$AF = AF_T * AF_V =$	77.94098

Confidence Level(%)=	90%
Total Rejects(r)=	0
$\chi^2(\%CL, 2r+2) =$	4.60517

Confidence Level(%)=	60%
Total Rejects(r)=	0
$\chi^2(\%CL, 2r+2) =$	1.83258

$$\lambda = \frac{\chi^2(\%CL, 2r+2) * 10^9}{2 * AF * T.H. * S.S.}$$

$$MTTF = 1/\lambda * 10^9$$

60% Confidence Level Result

$\lambda =$	305.36 FITs
MTTF=	3,274,864 Hours

90% Confidence Level Result

$\lambda =$	767.34 FITs
MTTF=	1,303,199 Hours

Life Time= (Test Hours*AF) / (365*24)

Refer to JEDEC 47F

Calculated Life Time

Life Time=	4.45 Years
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