



TEST REPORT

According to ANSI/IES LM-80-15
For

Shenzhen Runlite Technology Co.,Ltd

Building A15, Tantou the 4th Industrial Estate, SongGang Town, BaoAn District, ShenZhen,
China

#Model: F3085F-524W27SN1N2HY0Y9-D000

Report Type: 6000 Hours Test Report	Product Type: LED Module
Test Engineer: Pote Wang	<i>Pote Wang</i>
Report Number: RSZ190701501-10	
Test Date: 2019-07-03 to 2020-04-03	
Report Date: 2020-04-20	
Reviewed By: Blake Zhang / EE Engineer	
Test Facility: Test facility was located at No.69,Pulongcun ,Puxinhu Industrial Area, Tangxia , Dongguan, Guangdong, China.	
Prepared By:	Bay Area Compliance Laboratories Corp. (Dongguan). No.69,Pulongcun ,Puxinhu Industrial Area, Tangxia , Dongguan, Guangdong, China. Tel: +86-0769-86858888 Fax:+86-0769-86858588
Accreditation: The IAS Accreditation Number TL-460.	

TABLE OF CONTENTS

1 - General Information	3
1.1 Description of LED Light Sources	3
1.2 Standards and Reference Documentations	4
1.3 Testing Equipment	4
1.4 Drive Level	4
1.5 Ambient Conditions for Maintenance Test	5
1.6 Photometric Measurement Method and Uncertainty.....	5
1.7 Statement of Traceability	5
1.8 Sample Set.....	5
2 - Summary of Test Result	6
3 - Test Data	7
3.1 Data Set 1, 55°C, 40mA (Lumen Maintenance)	7
3.2 Data Set 1, 55°C, 40mA (Forward Voltage).....	8
3.3 Data Set 1, 55°C, 40mA (Chromaticity Shift)	9
3.4 Data Set 2, 85°C, 40mA (Lumen Maintenance)	10
3.5 Data Set 2, 85°C, 40mA (Forward Voltage).....	11
3.6 Data Set 2, 85°C, 40mA (Chromaticity Shift).....	12
4 - DUT Photo	13
4.1 #Mechanical Dimensions.....	13
4.2 DUT Photo.....	13
Directions	14

1 - General Information

1.1 Description of LED Light Sources

Sample Size:

24 PCS test samples were in good condition and received on 2019-07-01. The samples were numbered from 1 to 12 and 13 to 24.

#Manufacturer:	Shenzhen Runlite Technology Co.,Ltd
#Part Number:	F3085F-524W27SN1N2HY0Y9-D000
#Series Number	308mm
#Part Type:	LED Module
#Drive Level:	DC 40mA
#Nominal CCT:	2700K
#Power:	5.6W
#Average Current Density per LED die:	161.459mA/mm ²
#Average Power Density per LED die:	0.436W/mm ²
#CRI:	90
#Die Spacing:	1.38mm

Sampling Method:

LED samples for IESNA LM-80 testing consist of units built from a minimum of three manufacturing lots with each manufacturing lot built from different wafer lots built on non-consecutive days.

These manufacturing lots are picked to represent a wide parametric distribution.

#Family products covered by this report:

According to *ENERGY STAR® Requirements for the Use of LM-80 Data*, the following products can be covered by this report base on the information and declaration provided by manufacturer. The information of these models shows that the covered products meet all section 4 requirements of *ENERGY STAR® Requirements for the Use of LM-80 Data* (September 28, 2017)

This report covers the following models:

Model type	Model name	CCT (typ.)	Series	Parallel	Power density (W/mm ²)	Current density per LED die (mA/mm ²)	Current per die (mA)	Die Spacing (mm)	Current (mA)
Master model	F3085F-524W27SN1N2HY0Y9-D000	2700K	52	4	0.0117	161.459	10	1.38	40
Multiple Model	F3085F-524XXXN1N2XXXXXX-XXXX	2200K-6500K	52	4	0.0117	161.459	10	1.38	40
	F3085F-524XXXN2N3XXXXXX-XXXX	2200K-6500K	52	4	0.0117	129.507	10	1.38	40
	F3085F-524XXXN3N4XXXXXX-XXXX	2200K-6500K	52	4	0.0117	73.81	10	1.38	40
	F3085F-A02XXXN2N3XXXXXX-XXXX	2200K-6500K	100	2	0.0113	161.459	10	1.43	20
	F3085F-A02XXXN3N4XXXXXX-XXXX	2200K-6500K	100	2	0.0113	129.507	10	1.43	20
	F3085F-A02XXXN4N5XXXXXX-XXXX	2200K-6500K	100	2	0.0113	73.81	10	1.43	20

Model type	Model name	CCT (typ.)	Series	Parallel	Power density (W/mm ²)	Current density per LED die (mA/mm ²)	Current per die (mA)	Die Spacing (mm)	Current (mA)
	F3085F-972XXXM4N0XXXXXX-XXXX	2200K-6500K	97	2	0.0108	161.459	10	1.48	20
	F3085F-972XXXN0N1XXXXXX-XXXX	2200K-6500K	97	2	0.0108	129.507	10	1.48	20
	F3085F-972XXXN1N2XXXXXX-XXXX	2200K-6500K	97	2	0.0108	73.81	10	1.48	20
	F3085F-523XXXN0N1XXXXXX-XXXX	2200K-6500K	52	3	0.0087	161.459	10	1.83	30
	F3085F-523XXXN1N2XXXXXX-XXXX	2200K-6500K	52	3	0.0087	129.507	10	1.83	30
	F3085F-523XXXN2N3XXXXXX-XXXX	2200K-6500K	52	3	0.0087	73.81	10	1.83	30
	F3085F-522XXXN1N2XXXXXX-XXXX	2200K-6500K	52	2	0.0089	110.715	10	2.77	20

1.2 Standards and Reference Documentations

- ANSI/IES LM-80-15: IES Approved Method for Measuring Lumen Maintenance of LED Light Sources.
- CIE 127:2007: Measurement of LEDs
- ENERGY STAR® Requirements for the Use of LM-80 Data (This standard was not accredited by IAS)

1.3 Testing Equipment

Device	Manufacture	Model No	Serial No	Calibration date	Calibration due date
1.0m integrating sphere	SENSING	SCD-20008	N/A	2019-10-22	2020-10-21
spectroradiometer	SENSING	SCD-20008	N/A	2019-10-22	2020-10-21
DC Power Supply	Hanshenpuyuan	HSPY-100-05	2013010210003	2019-07-23	2020-07-22
Standard Light Source	EVERFINE	D204	N/A	2019-07-19	2020-07-18
DC Power Supply	BACL	B25001	90020	2020-01-07	2021-01-07
Multilayer aging machine	BACL	B2-270	20005	2020-03-11	2021-03-10
Programmable dc power supply	Xinnuoer	PDF 1200-300	NA	2019-07-23	2020-07-22

1.4 Drive Level

Samples are driven with a constant direct current (DC) during maintenance test, photometric and electrical measurement. The current value was regulated to within $\pm 3\%$ of the specified value of the manufacturer during maintenance test, and was within $\pm 0.5\%$ during photometric and electrical measurement test.

1.5 Ambient Conditions for Maintenance Test

For lumen maintenance test, samples within one data set, were installed on cooling boards in thermal chambers with minimal ambient airflow. The case temperature and ambient temperature was monitored by thermocouples which one was soldered to the coldest DUTs' case (TMP_{LED}) location, while the other is mounted at a distance of 5 mm above the TMP location.

During life testing, TMP_{LED} of the coldest LEDs were maintained at a temperature that was greater than or equal to 2°C below the corresponding nominal case temperature. Surrounding air was maintained at a temperature that was greater than or equal to 5°C below the corresponding nominal case temperature. Thermocouples were shielded from direct DUT optical radiation and comply with ASTM E230 Table 1 "Special Limits".

Samples were connected to DC power supply in series circuits with a constant current. The forward current was regulated to within ±3% of the specified value of the manufacturer.

The relative humidity within chamber was kept less than 65% during test.

For photometry measurement, the ambient temperature during test was set to 25°C ± 2°C, RH <65%.

1.6 Photometric Measurement Method and Uncertainty

Integrating sphere and spectroradiometer is used to measure luminous flux and chromaticity coordinate u'v'. 2π measurement was used and sample was driven by DC power supply. The forward current was regulated to within ±0.5% of the nominal value. The test system was calibrated by halogen reference lamp. The ambient temperature during test was set to 25°C ± 2°C, RH <65%. The temperature measurement point was located in the sphere and the temperature was detected by a temperature probe.

The uncertainty of the light output (luminous flux) measurements is U=2.1% (K=2), at the 95% confidence level. The uncertainty of the correlated color temperature measurements is U=21K (K=2), at the 95% confidence level. The uncertainty of the CRI is U=2.1 (K=2) , at the 95% confidence level.

The uncertainty of the temperature is U=0.8671°C (K=2), at the 95% confidence level.

1.7 Statement of Traceability

Bay Area Compliance Laboratories Corp. (Dongguan) attested that all calibration has been performed using suitable standards traceable to National Primary Standards and International System of Units (SI).

1.8 Sample Set

Data Set 1: 55°C, 40mA

Part Number: F3085F-524W27SN1N2HY0Y9-D000
Number of Units: 12
Case Temperature: >53°C
Ambient Temperature: >50°C
Life Test Drive Current: 40mA
Measurement Current: 40mA

Data Set 2: 85°C, 40mA

Part Number: F3085F-524W27SN1N2HY0Y9-D000
Number of Units: 12
Case Temperature: >83°C
Ambient Temperature: >80°C
Life Test Drive Current: 40mA
Measurement Current: 40mA

2 - Summary of Test Result

Data Set:	Sample Size	Failures Observed:	Test Interval	Test Duration	α	β	Reported TM-21 L ₇₀ Lifetime	Reported TM-21 L ₉₀ Lifetime
1	12	0	1000hrs	6000hrs	6.898E-06	0.998	>33000 hours	15,000 hours
2	12	0	1000hrs	6000hrs	7.744E-06	0.995	>33000 hours	13,000 hours

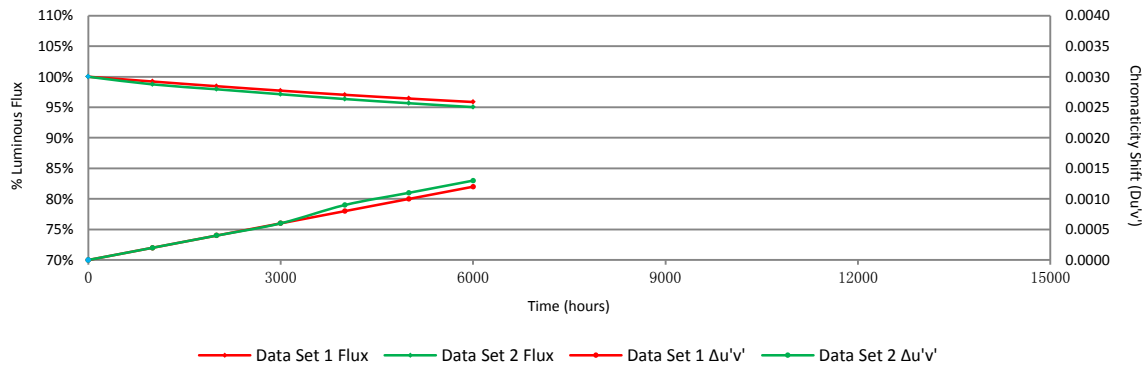
Average Lumen Maintenance (Percentage of Initial Luminous Flux)

Data Set:	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs
1	99.22%	98.45%	97.72%	97.04%	96.43%	95.86%
2	98.75%	97.95%	97.13%	96.35%	95.66%	95.03%

Average Chromaticity Shift

Data Set:	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs
1	0.0002	0.0004	0.0006	0.0008	0.001	0.0012
2	0.0002	0.0004	0.0006	0.0009	0.0011	0.0013

Average Lumen Maintenance and Chromaticity Shift VS. Time



3 - Test Data

3.1 Data Set 1, 55°C, 40mA (Lumen Maintenance)

No.	Φ(lm)	Lumen Maintenance (%)					
	0hr(Initial)	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs
1	692.49	98.55	97.66	97.03	96.27	95.74	95.09
2	706.14	99.43	98.44	97.69	96.98	96.35	95.74
3	703.59	99.12	98.49	97.77	97.16	96.57	96.06
4	688.41	99.36	98.45	97.73	97.14	96.47	95.95
5	697.59	99.35	98.17	97.45	96.74	96.15	95.66
6	693.51	99.33	98.67	97.88	97.10	96.51	95.84
7	712.52	99.33	98.38	97.74	97.12	96.40	95.76
8	703.46	99.32	98.74	98.04	97.38	96.89	96.15
9	702.95	99.15	98.58	97.73	97.00	96.48	95.99
10	699.76	99.22	98.52	97.79	97.13	96.58	96.08
11	706.53	99.30	98.69	97.93	97.22	96.52	96.09
12	700.14	99.24	98.65	97.81	97.18	96.46	95.93
Avg.	700.59	99.22	98.45	97.72	97.04	96.43	95.86
Med.	701.55	99.31	98.50	97.76	97.13	96.48	95.94
st dev	6.78	0.23	0.30	0.26	0.28	0.28	0.29
Min.	688.41	98.55	97.66	97.03	96.27	95.74	95.09
Max.	712.52	99.43	98.74	98.04	97.38	96.89	96.15

3.2 Data Set 1, 55°C, 40mA (Forward Voltage)

No.	Forward Voltage (V)						
	0hr(Initial)	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs
1	139.87	139.42	139.43	139.07	138.75	138.68	138.72
2	141.85	141.71	141.43	140.93	140.73	140.54	140.32
3	140.36	140.17	139.75	139.64	139.50	139.27	138.98
4	139.83	139.66	139.47	139.22	138.94	138.84	138.58
5	140.38	140.21	139.88	139.64	139.53	139.22	139.08
6	139.74	139.63	139.47	139.22	139.13	138.97	138.75
7	140.52	140.39	140.15	140.01	139.86	139.75	139.48
8	140.24	140.03	139.95	139.77	139.72	139.53	139.33
9	140.30	140.05	139.99	139.72	139.51	139.13	138.89
10	139.83	139.70	139.59	139.39	139.35	139.09	138.80
11	140.42	140.28	140.19	140.08	139.81	139.56	139.26
12	140.30	140.10	139.97	139.72	139.44	139.31	139.08
Avg.	140.30	140.11	139.94	139.70	139.52	139.32	139.11
Med.	140.30	140.08	139.92	139.68	139.51	139.25	139.03
st dev	0.56	0.59	0.54	0.50	0.51	0.49	0.47
Min.	139.74	139.42	139.43	139.07	138.75	138.68	138.58
Max.	141.85	141.71	141.43	140.93	140.73	140.54	140.32

3.3 Data Set 1, 55°C, 40mA (Chromaticity Shift)

No.	u'	v'	CCT(K)	Chromaticity Shift ($\Delta u'v'$)					
	0hr(Initial)			1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs
1	0.2597	0.5274	2760	0.0003	0.0006	0.0007	0.0010	0.0011	0.0013
2	0.2616	0.5291	2712	0.0002	0.0004	0.0006	0.0008	0.0010	0.0011
3	0.2596	0.5280	2758	0.0003	0.0006	0.0008	0.0010	0.0012	0.0014
4	0.2605	0.5286	2736	0.0003	0.0005	0.0008	0.0009	0.0012	0.0014
5	0.2603	0.5293	2738	0.0002	0.0006	0.0007	0.0010	0.0011	0.0013
6	0.2596	0.5266	2764	0.0001	0.0004	0.0005	0.0007	0.0008	0.0011
7	0.2587	0.5280	2778	0.0002	0.0004	0.0005	0.0006	0.0008	0.0011
8	0.2603	0.5295	2736	0.0001	0.0002	0.0004	0.0005	0.0007	0.0009
9	0.2598	0.5287	2752	0.0003	0.0004	0.0006	0.0008	0.0012	0.0013
10	0.2588	0.5270	2778	0.0001	0.0002	0.0003	0.0006	0.0007	0.0010
11	0.2597	0.5289	2752	0.0001	0.0003	0.0004	0.0007	0.0008	0.0011
12	0.2599	0.5292	2748	0.0003	0.0004	0.0006	0.0010	0.0012	0.0013
Avg.	0.2599	0.5284	2751	0.0002	0.0004	0.0006	0.0008	0.0010	0.0012
Med.	0.2598	0.5287	2752	0.0002	0.0004	0.0006	0.0008	0.0011	0.0012
st dev	0.0008	0.0010	19	0.0001	0.0001	0.0002	0.0002	0.0002	0.0002
Min.	0.2587	0.5266	2712	0.0001	0.0002	0.0003	0.0005	0.0007	0.0009
Max.	0.2616	0.5295	2778	0.0003	0.0006	0.0008	0.0010	0.0012	0.0014

3.4 Data Set 2, 85°C, 40mA (Lumen Maintenance)

No.	Φ(lm)	Lumen Maintenance (%)					
	Ohr(Initial)	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs
13	701.17	98.91	98.09	97.36	96.50	95.97	95.36
14	701.42	98.80	97.91	97.34	96.28	95.57	94.87
15	699.76	98.91	97.89	97.21	96.75	95.87	95.39
16	708.18	98.69	98.19	97.20	96.44	95.92	95.43
17	707.16	98.90	98.09	97.27	96.31	95.54	94.80
18	697.98	98.61	97.96	97.05	96.39	95.66	95.01
19	704.99	98.84	97.78	96.77	95.98	95.35	94.65
20	698.74	98.79	98.18	97.31	96.67	96.05	95.56
21	699.76	98.74	97.67	96.69	96.02	95.33	94.60
22	696.70	98.66	98.12	97.19	96.42	95.60	95.10
23	704.87	98.32	97.65	96.98	96.19	95.49	94.71
24	702.31	98.89	97.81	97.19	96.27	95.57	94.93
Avg.	701.92	98.75	97.95	97.13	96.35	95.66	95.03
Med.	701.30	98.80	97.94	97.20	96.35	95.59	94.97
st dev	3.67	0.17	0.19	0.22	0.23	0.24	0.33
Min.	696.70	98.32	97.65	96.69	95.98	95.33	94.60
Max.	708.18	98.91	98.19	97.36	96.75	96.05	95.56

3.5 Data Set 2, 85°C, 40mA (Forward Voltage)

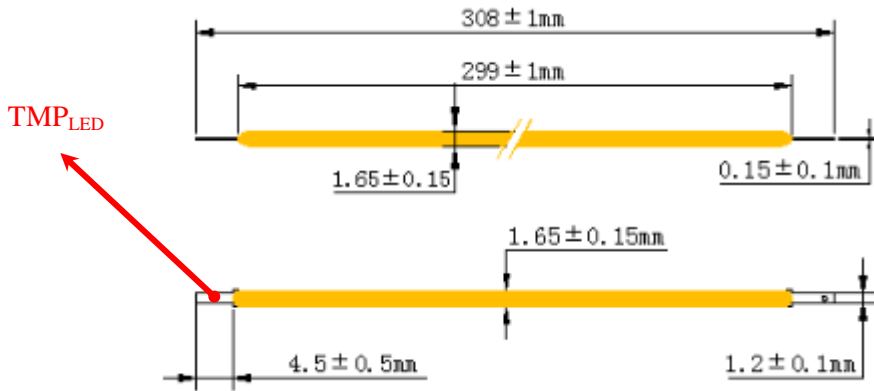
No.	Forward Voltage (V)						
	0hr(Initial)	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs
13	140.49	140.38	140.16	140.06	139.92	139.77	139.50
14	139.98	139.88	139.66	139.34	139.20	138.98	138.82
15	140.19	140.08	139.87	139.77	139.52	139.22	139.19
16	140.67	140.43	140.39	140.07	139.86	139.66	139.37
17	140.41	140.31	140.10	139.87	139.58	139.40	139.04
18	139.97	139.84	139.63	139.48	139.18	138.95	138.65
19	141.65	141.48	141.07	140.67	140.49	140.27	139.98
20	140.02	139.81	139.77	139.53	139.24	139.09	138.90
21	140.14	140.06	139.72	139.41	139.08	138.85	138.79
22	140.08	139.99	139.78	139.61	139.23	139.05	138.93
23	140.28	140.00	139.81	139.60	139.40	139.17	138.93
24	141.67	141.43	141.11	140.79	140.50	140.05	139.69
Avg.	140.46	140.31	140.09	139.85	139.60	139.37	139.15
Med.	140.24	140.07	139.84	139.69	139.46	139.20	138.99
st dev	0.60	0.57	0.52	0.47	0.49	0.46	0.41
Min.	139.97	139.81	139.63	139.34	139.08	138.85	138.65
Max.	141.67	141.48	141.11	140.79	140.50	140.27	139.98

3.6 Data Set 2, 85°C, 40mA (Chromaticity Shift)

No.	u'	v'	CCT(K)	Chromaticity Shift ($\Delta u'v'$)					
	0hr(Initial)			1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs
13	0.2593	0.5287	2760	0.0001	0.0004	0.0004	0.0006	0.0007	0.0009
14	0.2587	0.5270	2782	0.0001	0.0004	0.0006	0.0009	0.0010	0.0012
15	0.2608	0.5288	2730	0.0002	0.0004	0.0005	0.0009	0.0011	0.0011
16	0.2597	0.5284	2756	0.0001	0.0004	0.0006	0.0009	0.0010	0.0013
17	0.2601	0.5294	2742	0.0001	0.0003	0.0005	0.0007	0.0010	0.0013
18	0.2601	0.5282	2748	0.0003	0.0003	0.0007	0.0009	0.0010	0.0013
19	0.2618	0.5291	2708	0.0002	0.0004	0.0006	0.0009	0.0010	0.0012
20	0.2600	0.5291	2746	0.0001	0.0003	0.0004	0.0007	0.0011	0.0011
21	0.2609	0.5298	2722	0.0003	0.0006	0.0009	0.0010	0.0013	0.0014
22	0.2598	0.5289	2750	0.0005	0.0004	0.0008	0.0011	0.0013	0.0015
23	0.2594	0.5282	2760	0.0002	0.0004	0.0006	0.0009	0.0010	0.0012
24	0.2615	0.5290	2714	0.0003	0.0004	0.0007	0.0010	0.0012	0.0015
Avg.	0.2602	0.5287	2743	0.0002	0.0004	0.0006	0.0009	0.0011	0.0013
Med.	0.2601	0.5289	2747	0.0002	0.0004	0.0006	0.0009	0.0010	0.0013
st dev	0.0009	0.0007	21	0.0001	0.0001	0.0001	0.0001	0.0002	0.0002
Min.	0.2587	0.5270	2708	0.0001	0.0003	0.0004	0.0006	0.0007	0.0009
Max.	0.2618	0.5298	2782	0.0005	0.0006	0.0009	0.0011	0.0013	0.0015

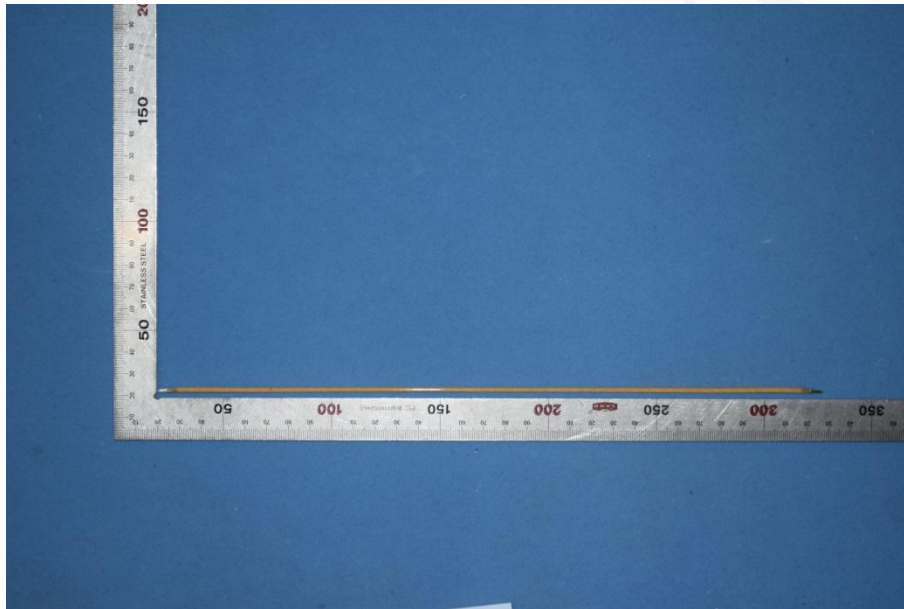
4 - DUT Photo

4.1 #Mechanical Dimensions



All dimensions are in millimeter

4.2 DUT Photo



Directions

1. The information marked "superscript #" is provided by the applicant, the laboratory is not responsible for its authenticity and this information can affect the validity of the result in the test report.
2. Unless otherwise stated the results shown in this test report refer only to the sample(s) tested.
3. Otherwise required by the applicant or Product Regulations, Decision Rule in this report did not consider the uncertainty.
4. The extended uncertainty given in this report is obtained by combining the standard uncertainty times the coverage factor K with the 95% confidence interval.
5. This report cannot be reproduced except in full, without prior written approval of the Company.
6. This report is valid only with a valid digital signature. The digital signature may be available only under the Adobe software above version 7.0.

*****END OF REPORT*****