Apollo Display Technologies, LLC

Component LED Specification
W100-2 Improved Brightness White LED
August, 2005
Issue 1

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1.SPECIFICATIONS

(1) Absolute Maximum Ratings (Ta=25°C)

Item	Symbol	Absolute Maximum Rating	Unit
Forward Current	I_F	30	mA
Pulse Forward Current	I_{FP}	100	mA
Reverse Voltage	V_R	5	V
Power Dissipation	P_D	120	mW
Operating Temperature	T_{opr}	-30 ~ + 85	°C
Storage Temperature	T_{stg}	-40 ~ +100	°C
Soldering Temperature	T_{sld}	Reflow Soldering : 260°C for 10sec. Hand Soldering : 350°C for 3sec.	

I_{FP} Conditions : Pulse Width ≦ 10msec. and Duty ≦ 1/10

(2) Initial Electrical/Optical Characteristics (Ta=25°C)

Item		Symbol	Condition	Typ.	Max.	Unit
Forward Voltage		V_F	I_F=20[mA]	(3.6)	4.0	V
Reverse Current		I_R	V_R= 5[V]	-	50	μA
Luminous Intensity		Iv	I_F=20[mA]	(740)	-	mcd
Chromaticity Coordinate *	x	-	I_F=20[mA]	0.31	-	-
	y	-	I_F=20[mA]	0.32	-	-

* Please refer to CIE 1931 chromaticity diagram.

(3) Ranking (Ta=25°C)

Item		Symbol	Condition	Min.	Max.	Unit
Luminous Intensity	Rank V	Iv	I_F=20[mA]	880	1240	mcd
	Rank U	Iv	I_F=20[mA]	620	880	mcd
	Rank T	Iv	I_F=20[mA]	440	620	mcd

* Luminous Intensity Measurement allowance is ± 10%.

Color Ranks (I_F=20mA,Ta=25°C)

	Rank a0			
x	0.280	0.264	0.283	0.296
y	0.248	0.267	0.305	0.276

	Rank b1			
x	0.287	0.283	0.330	0.330
y	0.295	0.305	0.360	0.339

	Rank b2			
x	0.296	0.287	0.330	0.330
y	0.276	0.295	0.339	0.318

	Rank c0			
x	0.330	0.330	0.361	0.356
y	0.318	0.360	0.385	0.351

* Color Coordinates Measurement allowance is ± 0.01.

6.RELIABILITY

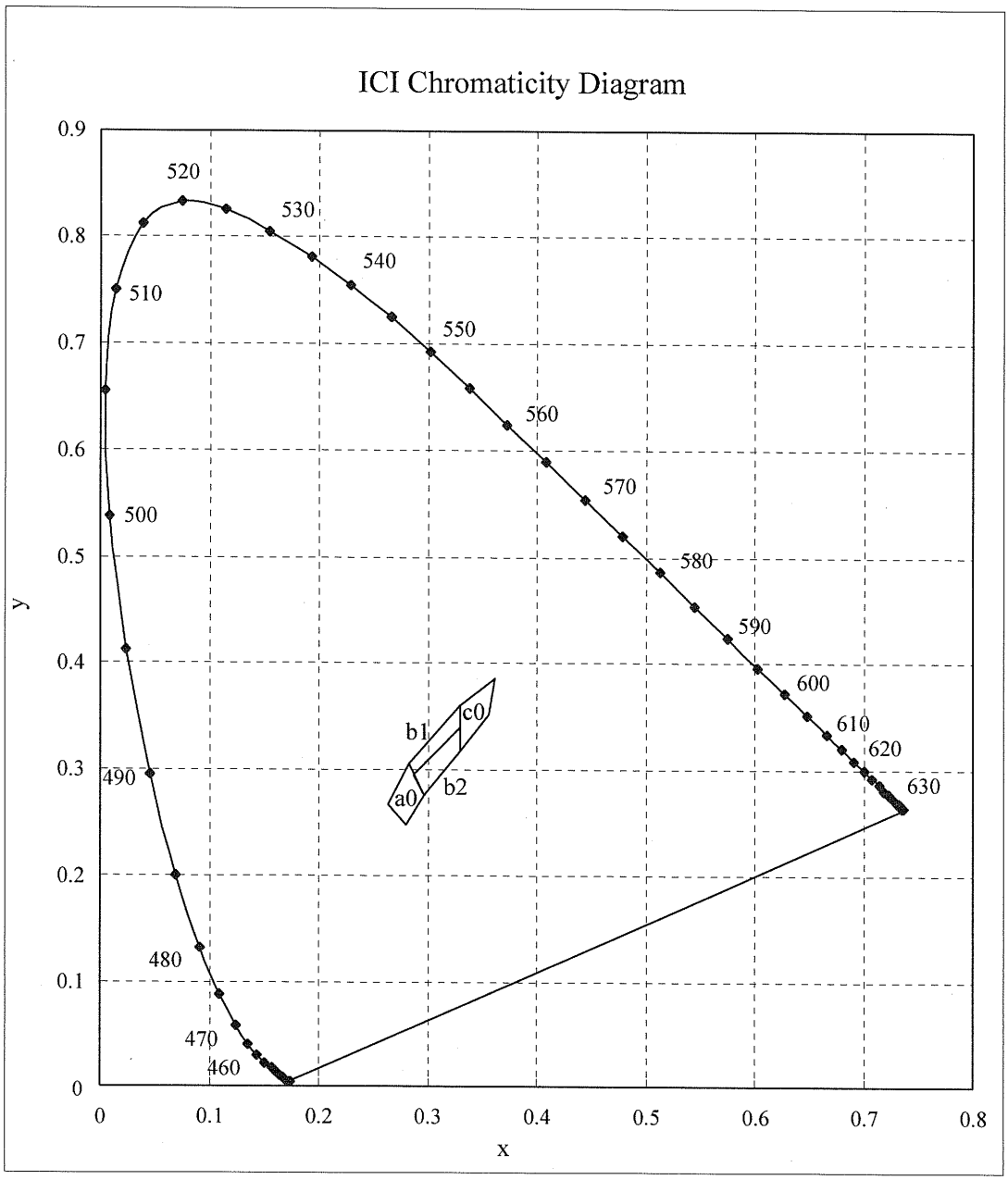
(1) TEST ITEMS AND RESULTS

Test Item	Standard Test Method	Test Conditions	Note	Number of Damaged
Resistance to Soldering Heat (Reflow Soldering)	JEITA ED-4701 300 301	Tsld=260°C, 10sec. (Pre treatment 30°C,70%,168hrs.)	2 times	0/50
Solderability (Reflow Soldering)	JEITA ED-4701 300 303	Tsld=215 ± 5°C, 3sec. (Lead Solder)	1 time over 95%	0/50
Thermal Shock	JEITA ED-4701 300 307	0°C ~ 100°C 15sec. 15sec.	20 cycles	0/50
Temperature Cycle	JEITA ED-4701 100 105	-40°C ~ 25°C ~ 100°C ~ 25°C 30min. 5min. 30min. 5min.	100 cycles	0/50
Moisture Resistance Cyclic	JEITA ED-4701 200 203	25°C ~ 65°C ~ -10°C 90%RH 24hrs./1cycle	10 cycles	0/50
High Temperature Storage	JEITA ED-4701 200 201	Ta=100°C	1000 hrs.	0/50
Temperature Humidity Storage	JEITA ED-4701 100 103	Ta=60°C, RH=90%	1000 hrs.	0/50
Low Temperature Storage	JEITA ED-4701 200 202	Ta=-40°C	1000 hrs.	0/50
Steady State Operating Life Condition 1		Ta=25°C, IF=20mA	1000 hrs.	0/50
Steady State Operating Life Condition 2		Ta=25°C, IF=30mA	1000 hrs.	0/50
Steady State Operating Life of High Temperature		Ta=85°C, IF=7.5mA	1000 hrs.	0/50
Steady State Operating Life of High Humidity Heat		60°C, RH=90%, IF=20mA	500 hrs.	0/50
Steady State Operating Life of Low Temperature		Ta=-30°C, IF=20mA	1000 hrs.	0/50
Vibration	JEITA ED-4701 400 403	100 ~ 2000 ~ 100Hz Sweep 4min. 200m/s^2 3direction, 4cycles	48min.	0/50
Substrate Bending	JEITA ED-4702	3mm, 5 ± 1 sec.	1 time	0/50
Stick	JEITA ED-4702	5N, 10 ± 1 sec.	1 time	0/50

(2) CRITERIA FOR JUDGING THE DAMAGE

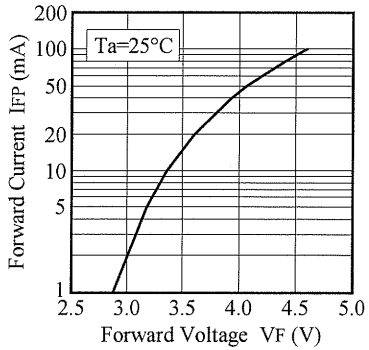
Item	Symbol	Test Conditions	Criteria for Judgement	
			Min.	Max.
Forward Voltage	VF	IF=20mA	-	U.S.L.*)× 1.1
Reverse Current	IR	VR=5V	-	U.S.L.*)× 2.0
Luminous Intensity	Iv	IF=20mA	L.S.L.**)× 0.7	-

*) U.S.L. : Upper Standard Level **) L.S.L. : Lower Standard Level

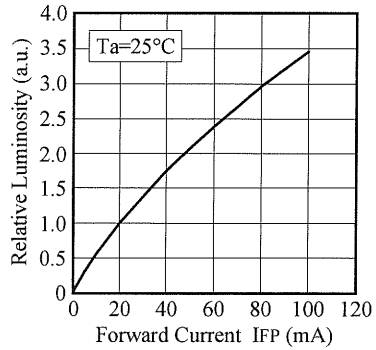


* Color Coordinates Measurement allowance is ± 0.01.

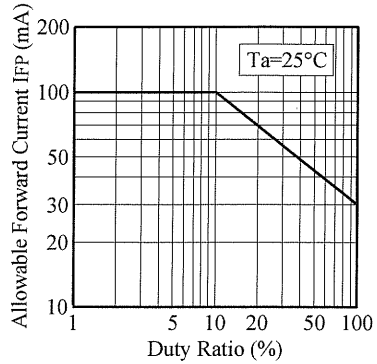
■ Forward Voltage vs. Forward Current



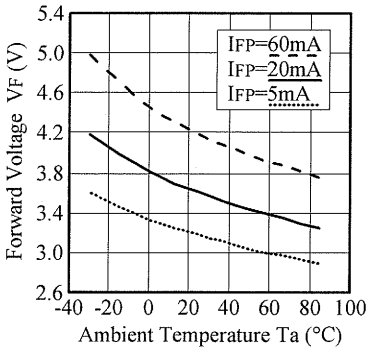
■ Forward Current vs. Relative Luminosity



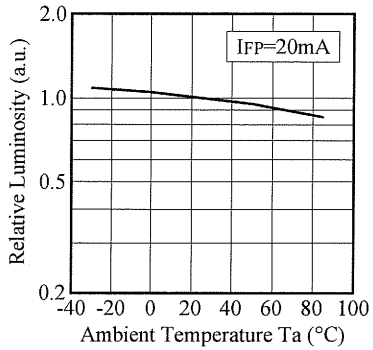
■ Duty Ratio vs. Allowable Forward Current



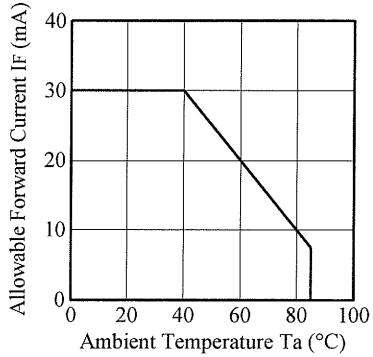
■ Ambient Temperature vs. Forward Voltage



■ Ambient Temperature vs. Relative Luminosity

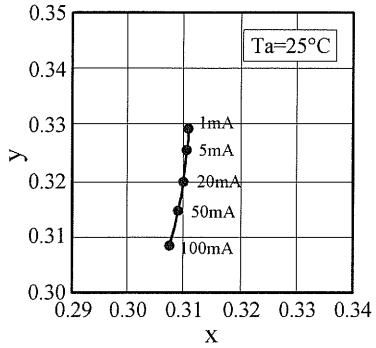


■ Ambient Temperature vs. Allowable Forward Current

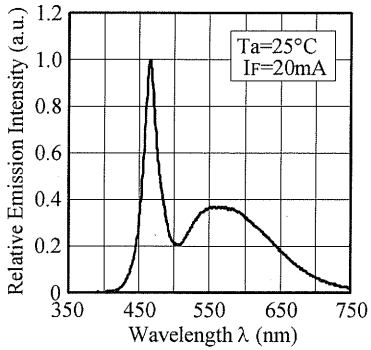


	Model	
	Title CHARACTERISTICS	
	No.	

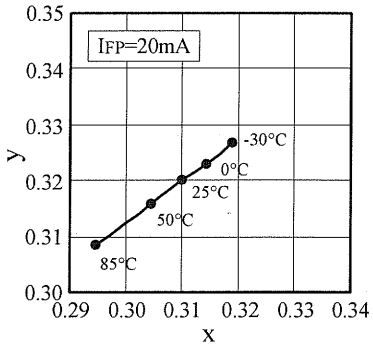
■ Forward Current vs. Chromaticity Coordinate



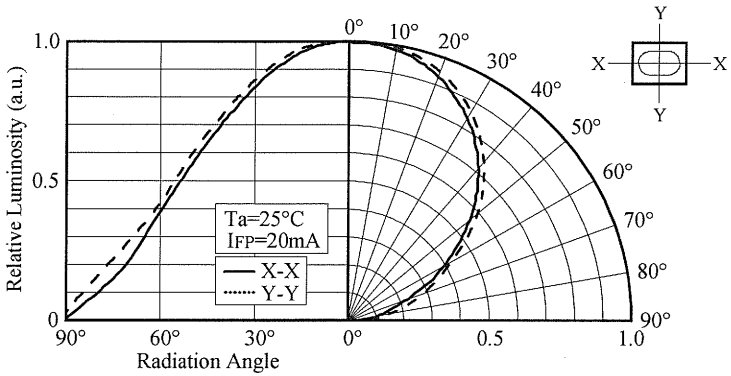
■ Spectrum



■ Ambient Temperature vs. Chromaticity Coordinate



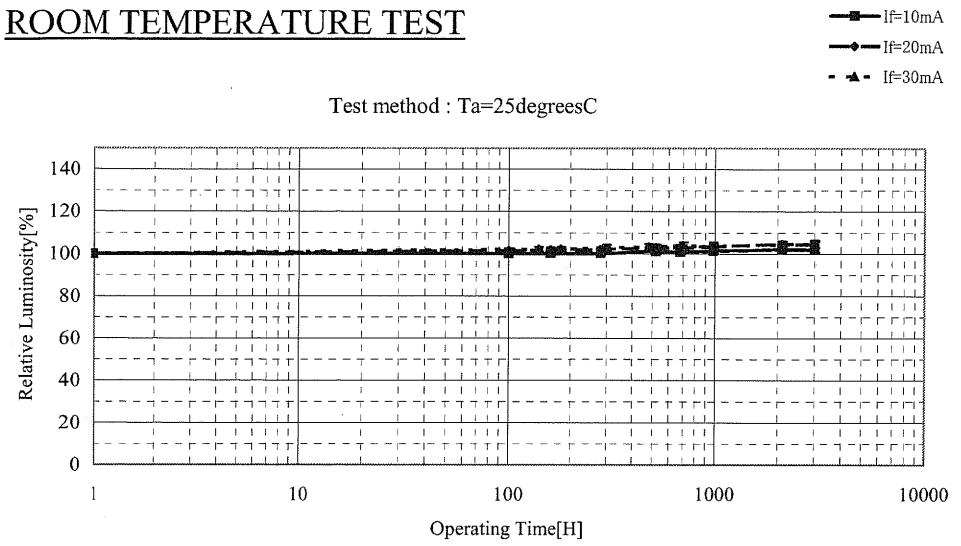
■ Directivity



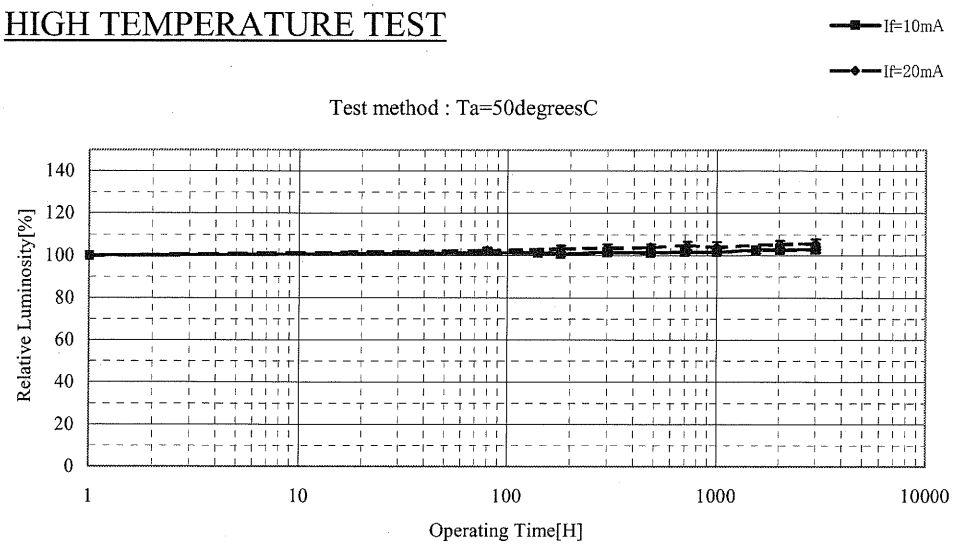
	Model	
	Title CHARACTERISTICS	
	No.	

Samples : 3000H 20pcs
Reflow : 260℃MAX

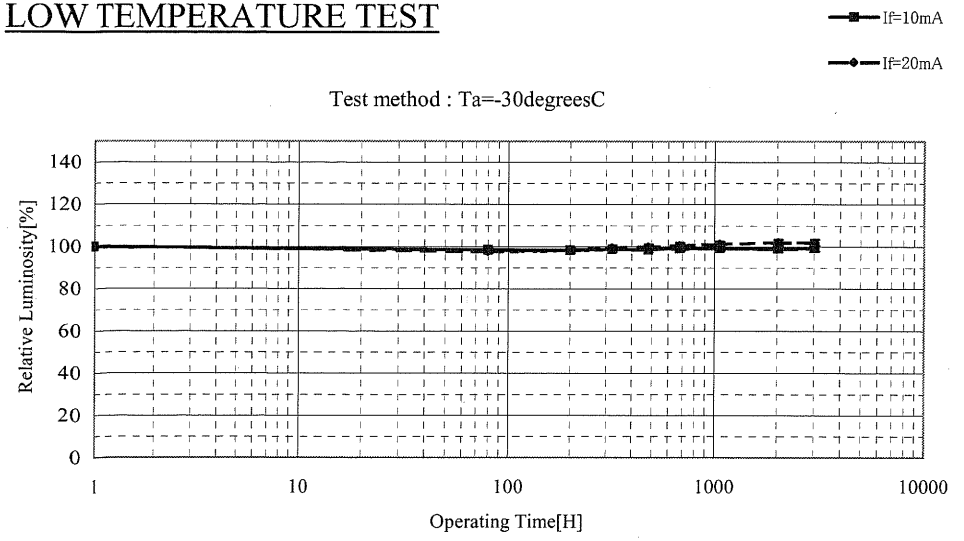
ROOM TEMPERATURE TEST



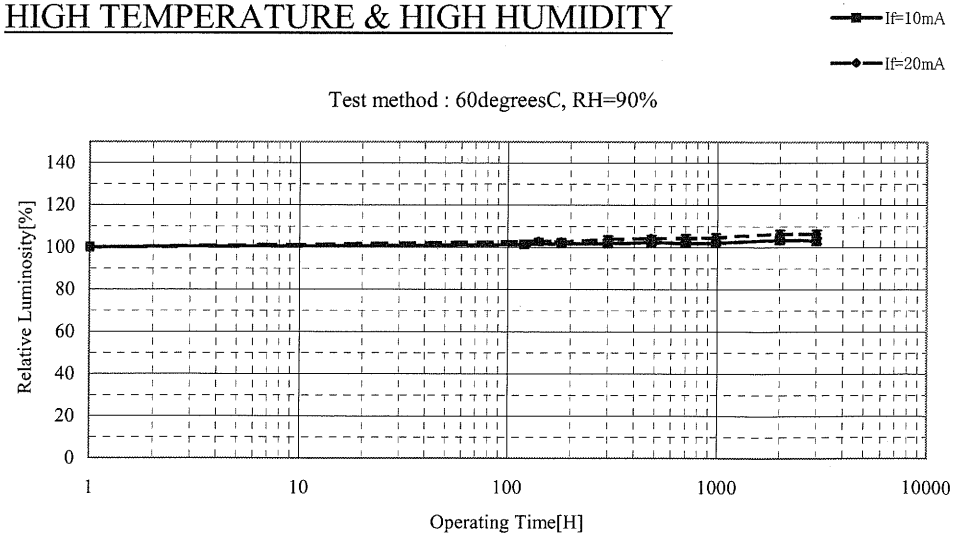
HIGH TEMPERATURE TEST



LOW TEMPERATURE TEST

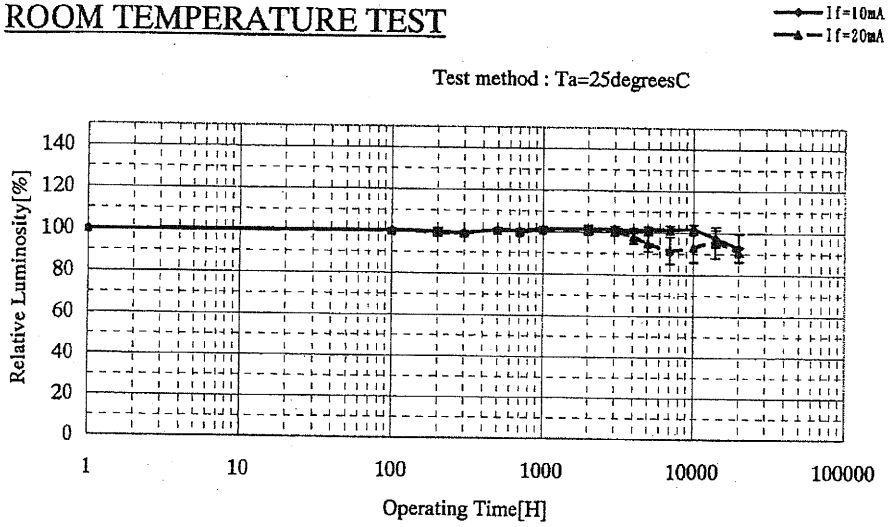


HIGH TEMPERATURE & HIGH HUMIDITY

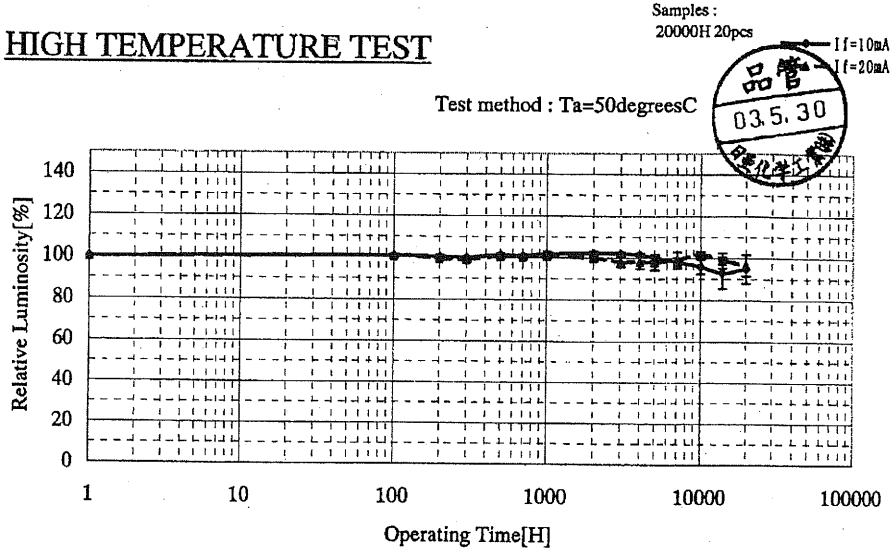


W100 series White LED Life Data (E)

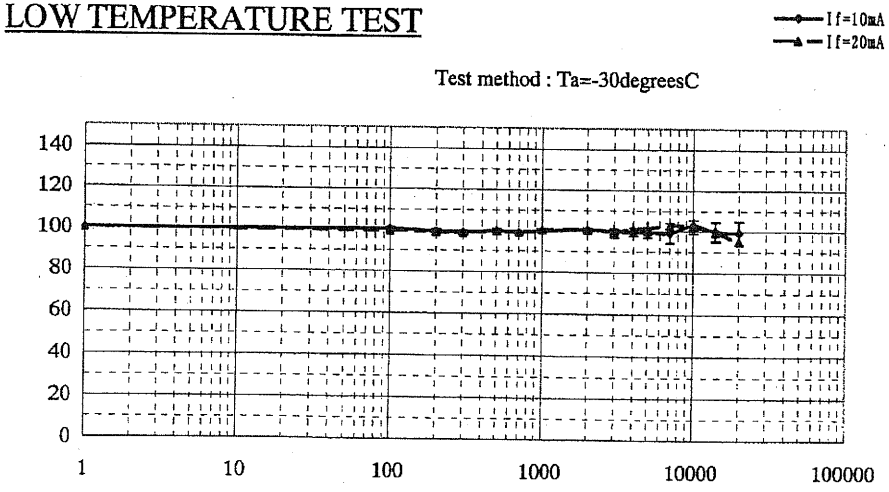
ROOM TEMPERATURE TEST



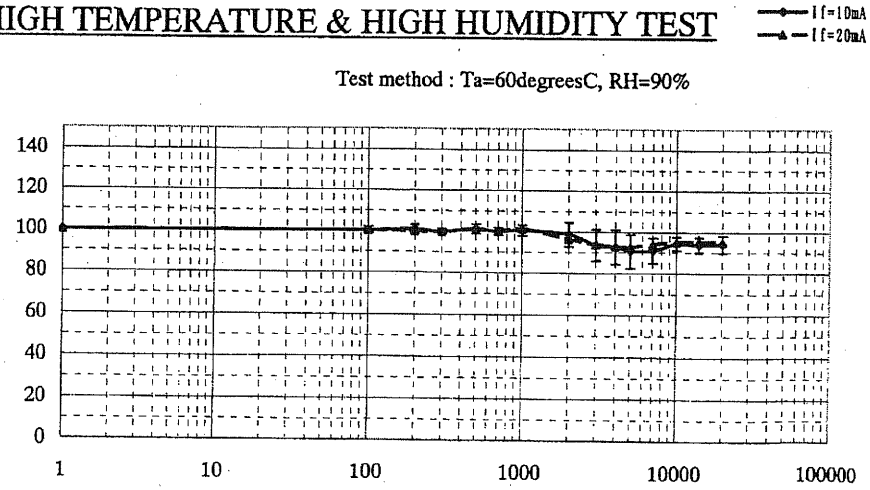
HIGH TEMPERATURE TEST



LOW TEMPERATURE TEST



HIGH TEMPERATURE & HIGH HUMIDITY TEST



(E) Extrapolated. The W100-2 Series is expected to have similar life characteristics to the W100 Series.