

SPECIFICATION No.	
DATE OF ISSUE	2011. 3. 23

**LED Driver**

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Preliminary**SPECIFICATION**

Samsung Model : STOOPF22175Z032STD

Customer Model :

CUSTOMER :	
CHECKED	APPROVED
20 . . .	20 . . .

SAMSUNG LED			
DRAWN	CHECKED		APPROVED
	SALES	QA	
20 . .	20 . .	20 . .	20 . .

SAMSUNG LED CO., LTD.
314, MAETAN3-DONG, YOUNGTONG-GU,
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1. Description

This specification defines the general specification and performance of the LED driver for 6000lm Platform LED Module to consist 25W LED Module 3ea.

2. FUNDAMENTAL SPECIFICATION

No.	ARTICLE	SPECIFICATION
2-1	LED Driver	<ul style="list-style-type: none"> • Dimensions : 196 × 70 × 33.1 mm(Tol: ± 1.0 mm) • Power Consumption : Typ 78W • Input Voltage : 100 to 240Vac • Output Current : 2100mA ± 5% • Output Voltage : 28 to 36Vdc • 0-10V Dimming
2-2	Weight	• 660 [g] ± 60 [g]
2-3	Ambient Temperature (Ta)	• -30[°C] ~ +50[°C], Surrounding Temp. of LED Driver within Fixture
2-4	Storage Temperature	• -30 [°C]~ 85[°C]
2-5	Safety	• KC & CE (Independent type)
2-6	EMI	• K15 & EN55015(Fixture level)
2-7	RoHS	• RoHS compliant

3. APPEARANCE AND STRUCTURE

No.	ARTICLE	SPECIFICATION
3-1	Appearance	See the Appendix 1
3-2	Structure	See the Appendix 1



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4. PERFORMANCE

- Electric Specification

No.	ARTICLE	SPECIFICATION						
		Symbol	Min.	Typ.	Max.	Unit	Remarks	
4-1	Power Consumption ※	P	-	78.0	82.4	W	Vac=240V/60Hz @32V, measured with electronic load	
4-2	Output Current	Io	1,995	2,100	2,205	mA	Each channel Vac=240V/60Hz, Vload=32V	
4-3	Output Voltage	Vo	28.0	32.0	36.0	V		
4-4	Efficiency	-	84	85	-	%	Vac=240V/60Hz @32V	
		-	82	83	-	%	Vac=100V/60Hz @32V	
4-5	Power Factor	PF	0.9	-	-	-	Vac=240V/60Hz @32V	
4-6	Total Harmonic Distortion	THD	-	-	20	%	Vac=240V/60Hz	
4-7	Turn On Time				1.5	Sec		
4-8	Ripple Current				±210	mA	Output Current ± 10%	
4-9	Peak Current				4200	mA		
4-10	Dimming	Dim	0.8 1.4	-	9.1	V	See the Appendix 5	
		-	1080	1200	1320	mA	@ 5V Dim_voltage	
		100% Brightness without Dimmer : Open state for Dimming Port						
4-11	Standby Power				4	W	< 0.8V Dim_voltage	
4-12	Source Current for 0-10V port	-	0.2	-	1.0	mA	Dim_voltage 0.8V ~ 9.1V Current Sink Method	
4-13	Flickering See the Appendix 6				15	%	SLED	
4-14	Auxiliary Power	Voltage	Vaux	10.8	12	13.2	V	for Dimming controller
		Current	Iaux	-	-	100	mA	
4-15	S.C.P	-	-	-	-	A	Auto-recovery	
4-16	O.V.P	-	-	-	42.4	V	Auto-recovery	
4-17	O.T.P	-	120	135	150	℃	Junction Temp. of Control IC	
4-18	Ambient Temperature	-	-30	-	50	℃	Surrounding Temp.of Driver	
4-19	Case Temperature (Tc)	-			90	℃	Case of LED Driver	
4-20	Lifetime (E-Cap.)				50,000	hours	@ Tc 50℃	

※ When measured with actual LED modules with forward voltage of 29V/2135mA and 12V/100mA, typical power consumption is 71.25W. (Vac=240V/60Hz)

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- Final Test Items

No.	ARTICLE	SPECIFICATION					
		Symbol	Min.	Typ.	Max.	Unit	Remarks
4-1	Power Consumption	P	-	78.0	82.4	W	Vac=240V/60Hz @32V
4-2	Output Current	Io	1,995	2,100	2,205	mA	Each channel Vac=240V/60Hz, Vload=32V
4-3	Dimming current				1.0	mA	@ 1.0V Dim voltage
		-	1080	1200	1320	mA	@ 5V Dim_voltage
4-4	Flickering	Dimming Voltage : 10V~1.2V by 0.1V Step (Each step : 39Sec) Vin : 220Vac Max : 15%					
4-5	Output voltage of Auxiliary Power	Vaux	10.8	12	13.2	V	10V or No.Dim. Voltage



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5. STANDARD TESTING CONDITION

5-1 Standard testing environment

Generally all tests are performed in normal room temperature and humidity. If the problem occurs, re-tests are performed at $25\pm 3^{\circ}\text{C}$ and $60\pm 5\%$ relative humidity.

5-2 Standard testing method

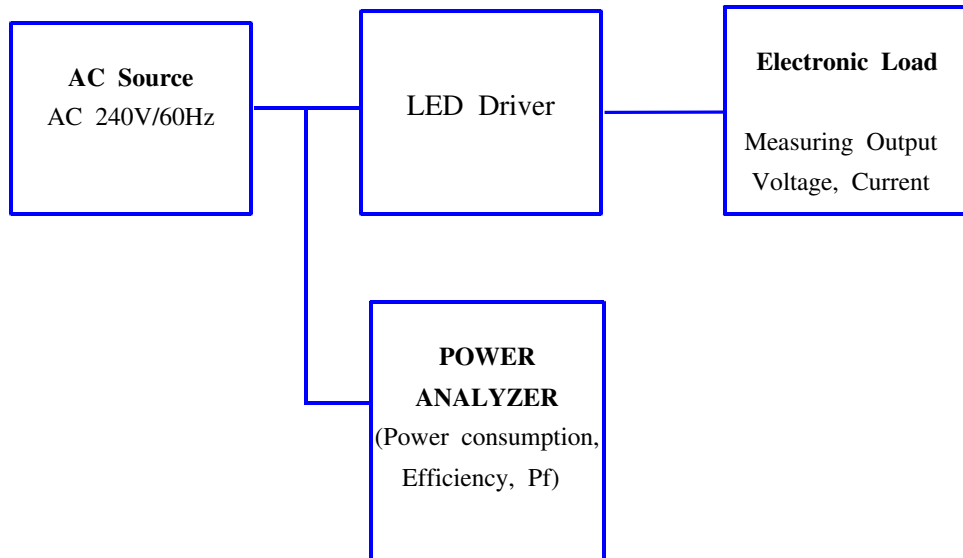
1) Testing equipment

Type	Company	Model (Reference)
AC Input Driver	Extech	AC Source 6610
Power Consumption measuring equipment	Xitron	2801
Electrical Load	Chroma	DC Electronic Load 6314A/63110A

2) Testing equipment Condition

Measuring Equipment	Condition
AC Source	AC 240V / 60Hz
DC Electronic Load	LED Mode @ 32V

3) Measurement Method





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6. RELIABILITY STANDARD

- 1) This test was run with LED Driver.
- 2) The reliability specifications is specified by the difference from the initial value.
- 3) The test condition of reliability shall be made in the standard testing condition same as the performance tests.
- 4) Unless otherwise specified, reliability tests shall be made according to these standards.

6-1 Test Items and Condition

No.	Stress Test	Stress Condition
1	High Temp Operating Test	60℃, 220Vac
2	High Temp/Humid Operating Test	60℃, 95%RH, 220Vac
3	High Temp & Tumidity Storage	85℃, 95%RH
4	Low Temp Storage Test	-40℃
5	High Temp Storage Test	85℃
6	Temp Step Stress	Low Temp : 0℃ → -10℃ → -20℃ → -30℃ High Temp : 40℃ → 50℃ → 60℃ → 70℃ ... 220Vac
7	Thermal Shock	-40℃/30min. ↔ 85℃/30min.
8	Package Drop Test	Height : 10Kg↑ 60cm, 10Kg ↓ 70cm Direction : 6sides/3edge/1Angle
9	Package Vibration Test	10 ~ 600 Hz/5 min, 3G, X Y Z each 30min
10	Hi-POT Test	Input Voltage : 3.75kVac, Cut off Current : 10mA, Withstanding Voltage : 60sec, 10times
11	E.S.D Test	Air : ±8kV, 150pF/300Ω Contact : ±4kV, 150pF/300Ω
12	Lighting Surge Test	Ring Wave : 2kV[C mode(line to line), CR Mode(line to ground)] Bi Wave : 1kV[C mode(line to line), CR Mode(line to ground)]
13	Impulse Noise Test	Wave width: 50, 250, 1000ns, Zo:50Ω Phase: 0~360°

6-2 Criteria for Judging the Damage

* During the test, there must be no failure of the product.

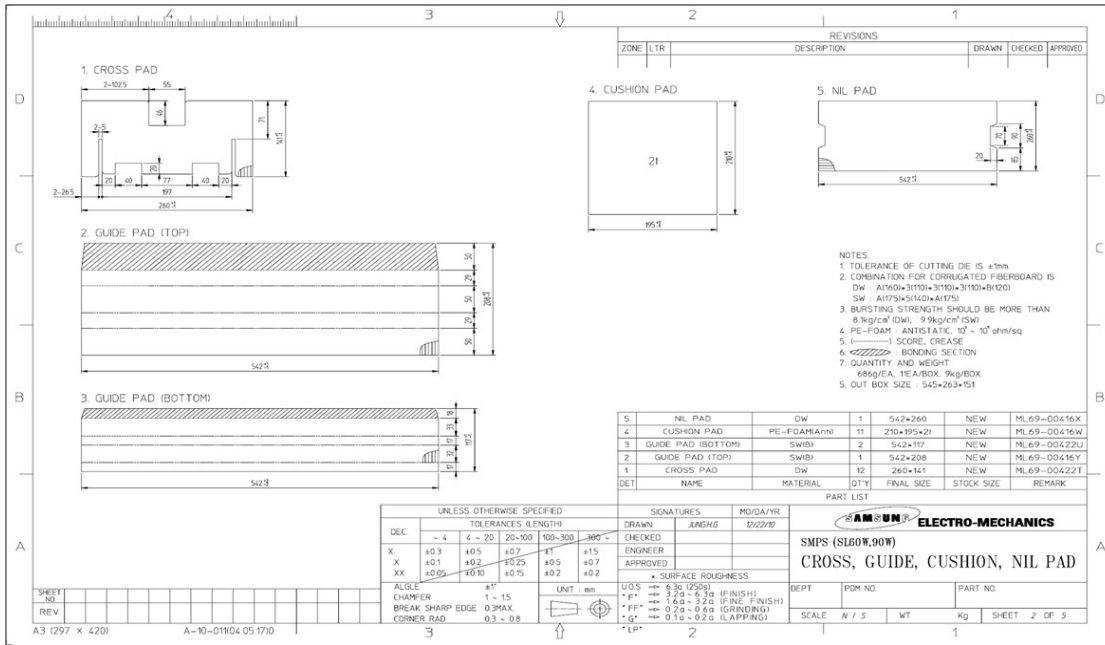
All product meet the final test spec.



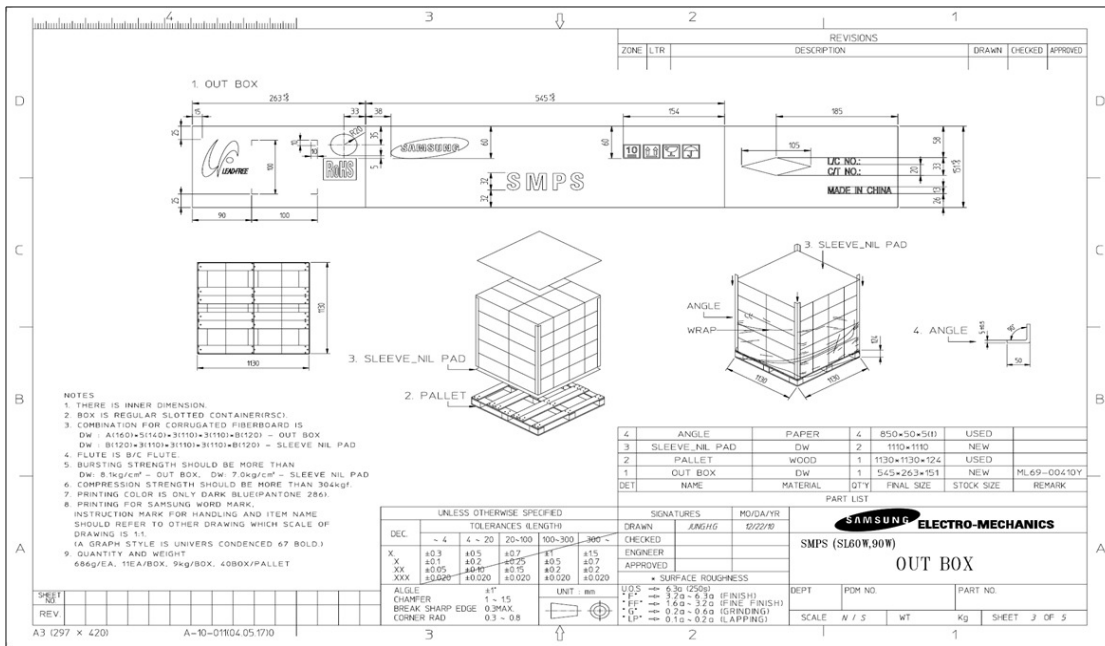
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3) CROOS PAD, CUSHION PAD, NIL PAD



4) Pallet



► Vinyl should be wrapped from middle of pallet(vertical) to top



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5) Box Barcode Specification

A. Labels are keep the maintenance rule of Samsung Electro-Mechanics.

B. Box Barcode Label specification

LED LIGHTING	
MODEL	PSDV750101A Rev.A01
LOT No	H1117S018
Qty	11 PC
Date	2011.02.17
USER	SAMSUNG LED
USER MODEL No	STOOPF22175Z032STD
Remarks	

- ① MODEL : Samsung Electro-Mechanics MODEL CODE
- ② LOT No : Samsung Electro-Mechanics LOT No
- ③ Q.ty : Quantity of Products
- ④ Data : Product Data
- ⑤ USER :
- ⑥ USER MODEL NO : Samsung LED MODEL CODE
- ⑦ Remarks

※ Samsung Electro-Mechanic Lot No.

Digit	Year		Month		Data		Factory		Serial Number	
	1	2	3	4	5	6	7	8	9	
	H	1	1	1	7	S	0	0	1	
	H → 2010					D : DSEM				
	J → 2011					S : Solytech				
	K → 2012					M : IM				
	L → 2013					A : Ap tech				

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8. PRECAUTIONS IN HANDLING

1) This LED Driver is only for outdoor Platform 25W 3-Module.

2) Handling

To prevent the LED Driver from any defect, please handle it with care as follows.

A. Don't drop the unit and don't give the unit any shocks.

B. Don't store the product in a dusty place or room.

C. Don't take the product apart.

D. Don't pull wire with hand in case of carry or move the product.

3) Static Electricity

Static electricity or surge voltage damages the LED Driver. Please keep the working process anti-static electricity condition to prevent the luminaire from damage.

a. Anyone who handles the unit should be well grounded. (earth ring or anti-static glove)

b. Anyone who handles the unit should wear anti-electrostatic working clothes.

c. All kinds of device and instruments, such as working table, measuring instruments and assembly jigs in production line should be well grounded.

4) Others

If over voltage which exceeds the absolute maximum rating is applied to LED Driver, it will cause damaging circuits and result in malfunction.

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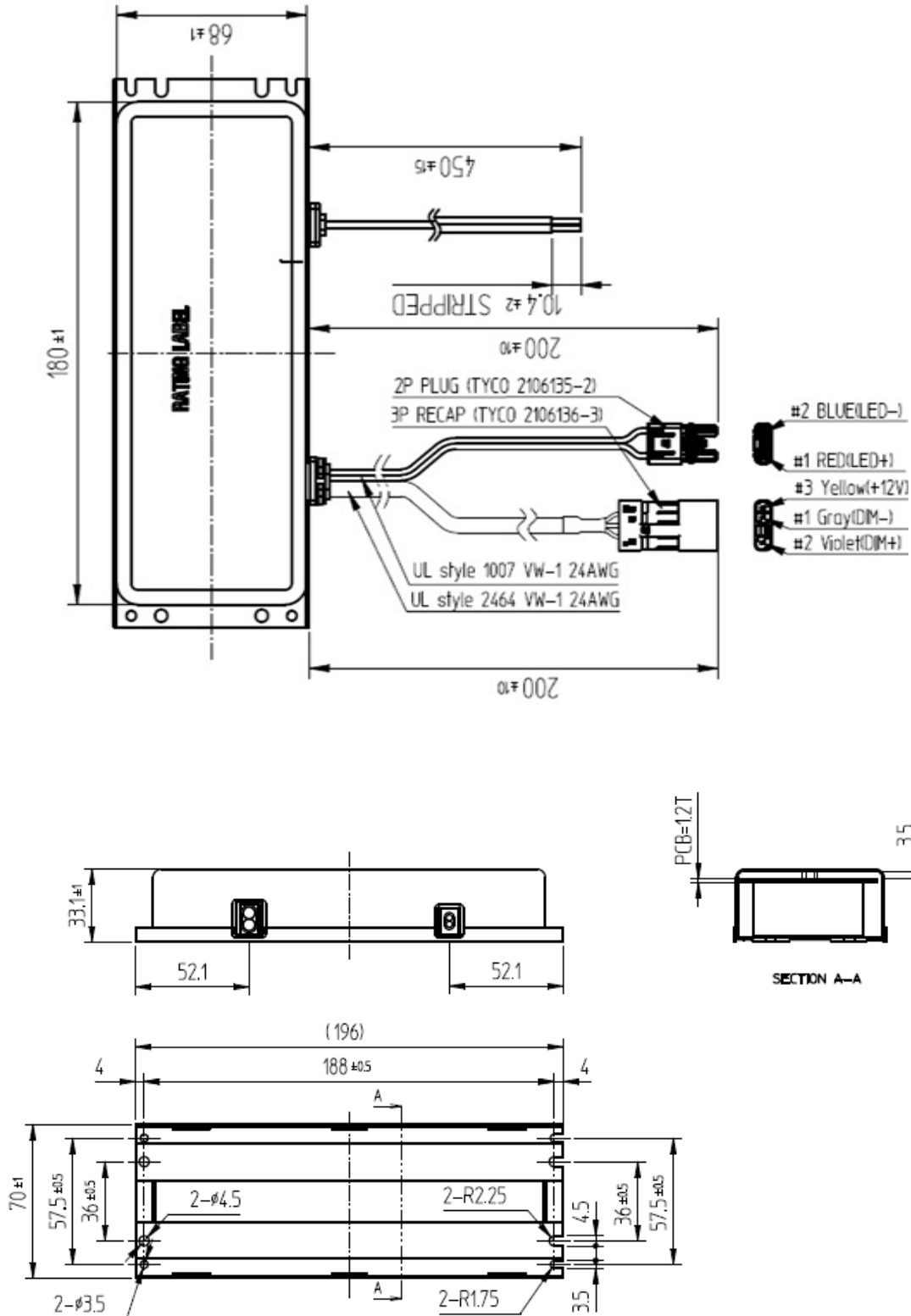


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APPENDIX 1. APPEARANCE DRAWING (in mm)



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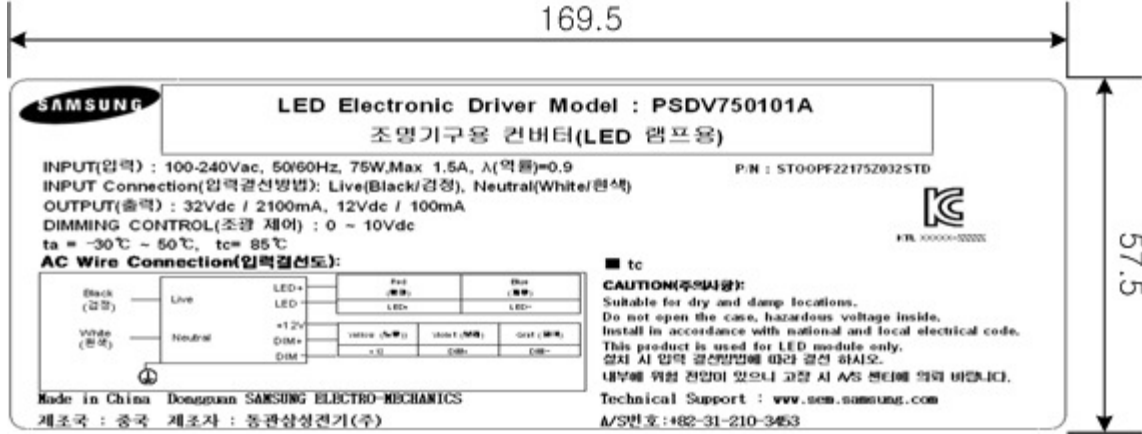


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PPENDIX 2. LABEL DRAWING





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APPENDIX 3. Over Temperature Protection

1. Thermal Protection by Protection Circuit built in IC of Power Driver

(No exclusive circuit for OTP)

2. OTP Spec of IC in Driver(FSFR2100US by Fairchild Corp.)

→ **Cut off Driver's Current Output**

When MOSTET temperature within IC is measured over Min 120°C.

But OTP acts in Typ temperature usually.

T _{SD}	Thermal Shutdown Temperature ⁽⁶⁾		120	135	150	°C
-----------------	---	--	-----	-----	-----	----

5.4 Thermal Shutdown (TSD): The MOSFETs and the control IC in one package makes it easy for the control IC to detect the abnormal over-temperature of the MOSFETs. If the temperature exceeds approximately 130°C, the thermal shutdown triggers.

-. T_c related to IC temperature

Ambient Temp. of Driver	T _c Temp.(expect) on driver	IC Temp.	
		IC Body	Junction (expect)
25°C	50°C	72.7°C	92.7°C
60°C	85°C	107.7°C	127.7°C

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APPENDIX 4. Life Time

- 예측 TOOL : RELEX SOFTWARE Ver7.6
- Calculation Model : Telcordia SR-332 Issue1
- Calculation Method : Method I CaseIII / Parts stress
- Environment : GF, GU - Ground Fixed, Uncontrolled, 25 °C

SET Life Time Expect Result						
	MTBF	B10	시간당 고장률 [ppm/h]	1년간 예상 고장률	초기 1년간 예상 A/S율	Remark
SET MTBF	305 205 h	32 157 h	3.28	2.83 %	1.41 %	
	34.8 [year]	3.7 [year]				



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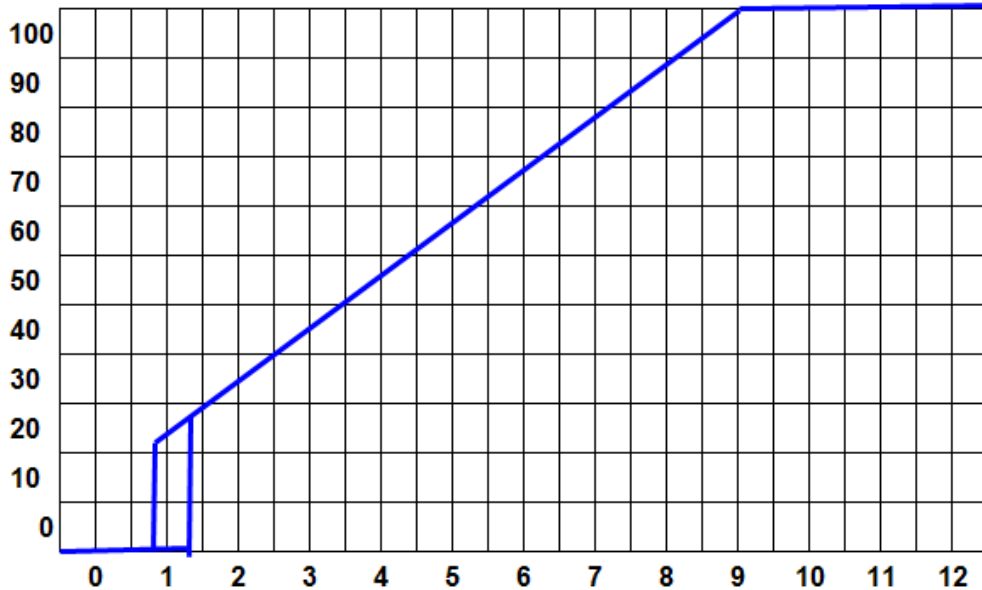
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APPENDIX 5. Dimming

1. Electric Specification

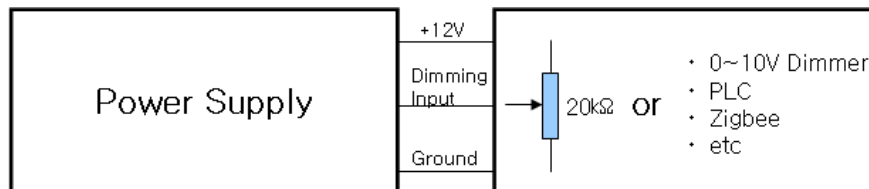
- a. Control Signal Range
- b. Precision $\pm 1\%$
- c. V Dim > 9.1 \pm 0.3V : Maxium Output (100%)
- d. V Dim < 0.8V : Output Off
- e. V Dim > 1.4V : Output On
- f. Output Signal Max @ Dim Signal Floating
 - * applied On/Off Hysteresis
 - 0.8V < V Dim < 1.4V Output On/Off no guarantee
 - not allowed the flicker

2. Example of Output current by Dimming



3. Application

For output current control of LED Driver, dimming input connector connect variable resistor or 0~10V.



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APPENDIX 6. Flicker Measurement System

A. Flicker Measurement Equipment

- Flicker Tester : SLED 8ch Auto tester

B. Test condition (recipe)

- No aging
- Dim voltage 10V ~ 1.2V by 0.1 volt step
- Sampling time : 39sec
- Measure : 3 times at 1 step for frequency range of 1~25Hz

C. Pass Criteria

- Max Flicker ratio < 15%