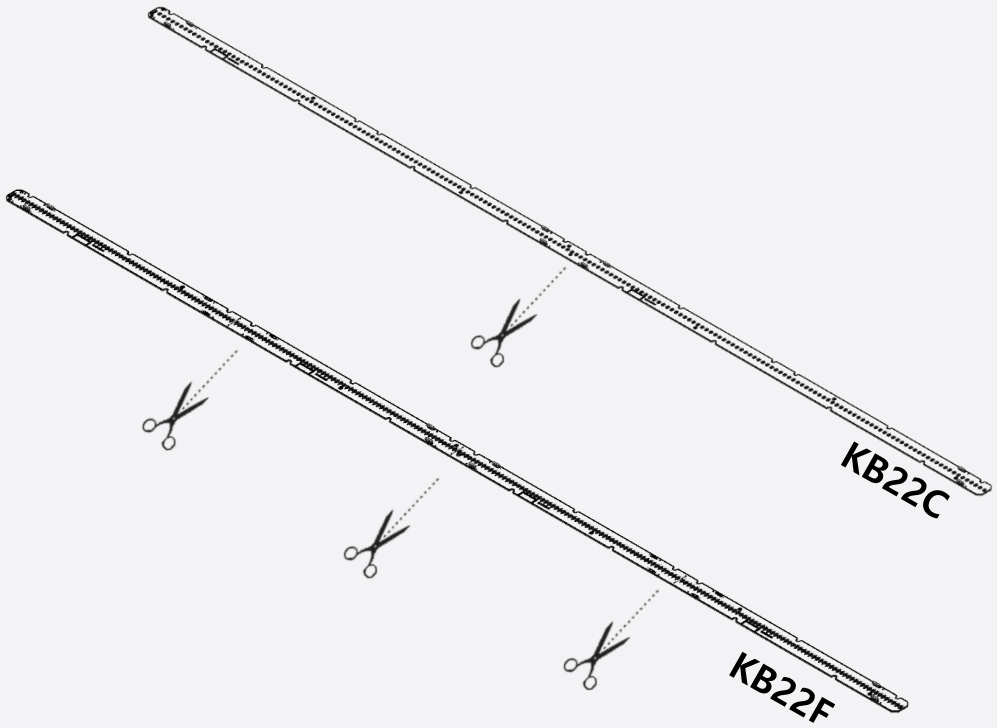
Datasheet



SAMSUNG				CUSTOMER
DEVELOP.	PRODUCT MANAGER	QA(DQA)	SALES	

SAMSUNG ELECTRONICS CO,.LTD.
1 Samsung-ro , Giheung-gu ,
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Version	Remark	Page	Date	Traced
0.0	The Preliminary Specification established.	ALL	23.06.22	S.A.JOO
1.0	The First Specification established	ALL	23.07.06	S.A.JOO

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LED Module

K Series

Features & Benefits

- Cuttable feature for better SKU management and design flexibility
- 2835 Pro of high degree of reliability & long lifetime
- High efficacy up to 187.5 lm/W

Applications

- Office, Building, Education
- Troffer, Linear, Line
- Highbay/Lowbay for warehouse, plant, high ceiling etc

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Table of Contents

Appendix

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1. Product Code Information

a) KB22C

Board Option	CRI	Nominal CCT (K)	Product Code
96LED-Board	80	3000	SI-B8V271B20WW
		3500	SI-B8U271B20WW
		4000	SI-B8T271B20WW
		5000	SI-B8R271B20WW
	90	3000	SI-B9V271B20WW
		3500	SI-B9U271B20WW
		4000	SI-B9T271B20WW
		5000	SI-B9R271B20WW
192LED-Board	80	3000	SI-B8V531B20WW
		3500	SI-B8U531B20WW
		4000	SI-B8T531B20WW
		5000	SI-B8R531B20WW
	90	3000	SI-B9V531B20WW
		3500	SI-B9U531B20WW
		4000	SI-B9T531B20WW
		5000	SI-B9R531B20WW

b) KB22F

Board Option	CRI	Nominal CCT (K)	Product Code
64LED-Board	80	3000	SI-B8V231B20WW
		3500	SI-B8U231B20WW
		4000	SI-B8T231B20WW
		5000	SI-B8R231B20WW
	90	3000	SI-B9V231B20WW
		3500	SI-B9U231B20WW
		4000	SI-B9T231B20WW
		5000	SI-B9R231B20WW
128LED-Board	80	3000	SI-B8V451B20WW
		3500	SI-B8U451B20WW
		4000	SI-B8T451B20WW
		5000	SI-B8R451B20WW
	90	3000	SI-B9V451B20WW
		3500	SI-B9U451B20WW
		4000	SI-B9T451B20WW
		5000	SI-B9R451B20WW
256LED-Board	80	3000	SI-B8V901B20WW
		3500	SI-B8U901B20WW
		4000	SI-B8T901B20WW
		5000	SI-B8R901B20WW
	90	3000	SI-B9V901B20WW
		3500	SI-B9U901B20WW
		4000	SI-B9T901B20WW
		5000	SI-B9R901B20WW

2. Characteristics (Rated Current, t_c = 50℃)

a) Basic Information

Item	Unit	Rating	Remark
Rated Lifetime	hour	>50,000	L70B10 @ t_c≤80ºC, Rated current
Ingress Protection (IP)	-	no rating	
Ambient / Operating Temperature (t_a)	ºC	-40 ~ +65	
Storage Temperature	ºC	-40 ~ +85	
Isolation Breakdown Voltage	Vac	Min. 500	

Notes

※ Rated Lifetime is calculated based on theoretical TM-21 calculations.

※ I_F: Forward current or Operating current

※ t_c: Case temperature at “Tc point”.

※ t_a: ambient temperature

b) Electro-Optical Characteristics

- KB22C

① 96LED-Board : CRI 80

Item	Nom. CCT (K)	Unit	Rating			Remark
			Min	Typ.	Max	
Luminous Flux	3000	lm	4269	4743	5217	I_f = 600mA t_p = 50ºC
	3500		4331	4812	5293	
	4000		4442	4936	5429	
	5000		4516	5018	5520	
Luminous Efficacy	3000	lm/W	-	177.2	-	
	3500		-	179.8	-	
	4000		-	184.4	-	
	5000		-	187.5	-	
Color Rendering Index (Ra)	-	-	80	-	-	-
Operating Current (I_f)	-	mA	60	600	1800	-
Operating Voltage (V_f)	-	Vdc	41.48	44.60	47.72	I_f = 600mA t_p = 50ºC
Power Consumption	-	W	24.9	26.8	28.7	

② 96LED-Board : CRI 90

Item	Nom. CCT (K)	Unit	Rating			Remark
			Min	Typ.	Max	
Luminous Flux	3000	lm	3650	4056	4461	I_f = 600mA t_p = 50ºC
	3500		3774	4193	4612	
	4000		3898	4331	4764	
	5000		3959	4399	4839	
Luminous Efficacy	3000	lm/W	-	151.6	-	
	3500		-	156.7	-	
	4000		-	161.8	-	
	5000		-	164.4	-	
Color Rendering Index (Ra)	-	-	90	-	-	-
Operating Current (I_f)	-	mA	60	600	1800	-
Operating Voltage (V_f)	-	Vdc	41.48	44.60	47.72	I_f = 600mA t_p = 50ºC
Power Consumption	-	W	24.9	26.8	28.7	

③ 192LED-Board : CRI 80

Item	Nom. CCT (K)	Unit	Rating			Remark
			Min	Typ.	Max	
Luminous Flux	3000	lm	8538	9486	10435	I_f = 1200mA t_p = 50ºC
	3500		8661	9624	10586	
	4000		8884	9871	10858	
	5000		9032	10036	11040	
Luminous Efficacy	3000	lm/W	-	177.2	-	
	3500		-	179.8	-	
	4000		-	184.4	-	
	5000		-	187.5	-	
Color Rendering Index (Ra)	-	-	80	-	-	-
Operating Current (I_f)	-	mA	120	1200	2000	-
Operating Voltage (V_f)	-	Vdc	41.48	44.60	47.72	I_f = 1200mA t_p = 50ºC
Power Consumption	-	W	49.8	53.5	57.3	

④ 192LED-Board : CRI 90

Item	Nom. CCT (K)	Unit	Rating			Remark
			Min	Typ.	Max	
Luminous Flux	3000	lm	7300	8111	8922	I_f = 1200mA t_p = 50ºC
	3500		7548	8386	9225	
	4000		7795	8661	9527	
	5000		7919	8799	9679	
Luminous Efficacy	3000	lm/W	-	151.6	-	
	3500		-	156.7	-	
	4000		-	161.8	-	
	5000		-	164.4	-	
Color Rendering Index (Ra)	-	-	90	-	-	-
Operating Current (I_f)	-	mA	120	1200	2000	-
Operating Voltage (V_f)	-	Vdc	41.48	44.60	47.72	I_f = 1200mA t_p = 50ºC
Power Consumption	-	W	49.8	53.5	57.3	

- KB22F

① 64LED-Board : CRI 80

Item	Nom. CCT (K)	Unit	Rating			Remark
			Min	Typ.	Max	
Luminous Flux	3000	lm	3508	3898	4287	I_f = 500mA t_p = 50°C
	3500		3559	3954	4350	
	4000		3650	4056	4461	
	5000		3711	4124	4536	
Luminous Efficacy	3000	lm/W	-	172.8	-	
	3500		-	175.4	-	
	4000		-	179.9	-	
	5000		-	182.9	-	
Color Rendering Index (Ra)	-	-	80	-	-	-
Operating Current (I_f)	-	mA	40	500	1200	-
Operating Voltage (V_f)	-	Vdc	41.94	45.10	48.26	I_f = 500mA t_p = 50°C
Power Consumption	-	W	21.0	22.6	24.2	

② 64LED-Board : CRI 90

Item	Nom. CCT (K)	Unit	Rating			Remark
			Min	Typ.	Max	
Luminous Flux	3000	lm	3000	3333	3666	I_f = 500mA t_p = 50°C
	3500		3101	3446	3790	
	4000		3203	3559	3915	
	5000		3254	3615	3977	
Luminous Efficacy	3000	lm/W	-	147.8	-	
	3500		-	152.8	-	
	4000		-	157.8	-	
	5000		-	160.3	-	
Color Rendering Index (Ra)	-	-	90	-	-	-
Operating Current (I_f)	-	mA	40	500	1200	-
Operating Voltage (V_f)	-	Vdc	41.94	45.10	48.26	I_f = 500mA t_p = 50°C
Power Consumption	-	W	21.0	22.6	24.2	

③ 128LED-Board : CRI 80

Item	Nom. CCT (K)	Unit	Rating			Remark
			Min	Typ.	Max	
Luminous Flux	3000	lm	7016	7795	8575	I_f = 1000mA t_p = 50ºC
	3500		7117	7908	8699	
	4000		7300	8112	8923	
	5000		7423	8247	9072	
Luminous Efficacy	3000	lm/W	-	172.8	-	
	3500		-	175.4	-	
	4000		-	179.9	-	
	5000		-	182.9	-	
Color Rendering Index (Ra)	-	-	80	-	-	-
Operating Current (I_f)	-	mA	80	1000	2000	-
Operating Voltage (V_f)	-	Vdc	41.94	45.10	48.26	I_f = 1000mA t_p = 50ºC
Power Consumption	-	W	42.0	45.1	48.3	

④ 128LED-Board : CRI 90

Item	Nom. CCT (K)	Unit	Rating			Remark
			Min	Typ.	Max	
Luminous Flux	3000	lm	5999	6666	7332	I_f = 1000mA t_p = 50ºC
	3500		6202	6892	7581	
	4000		6406	7117	7829	
	5000		6507	7230	7953	
Luminous Efficacy	3000	lm/W	-	147.8	-	
	3500		-	152.8	-	
	4000		-	157.8	-	
	5000		-	160.3	-	
Color Rendering Index (Ra)	-	-	90	-	-	-
Operating Current (I_f)	-	mA	80	1000	2000	-
Operating Voltage (V_f)	-	Vdc	41.94	45.10	48.26	I_f = 1000mA t_p = 50ºC
Power Consumption	-	W	42.0	45.1	48.3	

⑤ 256LED-Board : CRI 80

Item	Nom. CCT (K)	Unit	Rating			Remark
			Min	Typ.	Max	
Luminous Flux	3000	lm	14032	15591	17150	I_f = 2000mA t_p = 50ºC
	3500		14235	15817	17398	
	4000		14601	16223	17846	
	5000		14845	16494	18144	
Luminous Efficacy	3000	lm/W	-	172.8	-	
	3500		-	175.4	-	
	4000		-	179.9	-	
	5000		-	182.9	-	
Color Rendering Index (Ra)	-	-	80	-	-	-
Operating Current (I_f)	-	mA	160	2000	2000	-
Operating Voltage (V_f)	-	Vdc	41.94	45.10	48.26	I_f = 2000mA t_p = 50ºC
Power Consumption	-	W	83.9	90.2	96.6	

⑥ 256LED-Board : CRI 90

Item	Nom. CCT (K)	Unit	Rating			Remark
			Min	Typ.	Max	
Luminous Flux	3000	lm	11998	13331	14664	I_f = 2000mA t_p = 50ºC
	3500		12405	13783	15161	
	4000		12811	14235	15658	
	5000		13015	14461	15907	
Luminous Efficacy	3000	lm/W	-	147.8	-	
	3500		-	152.8	-	
	4000		-	157.8	-	
	5000		-	160.3	-	
Color Rendering Index (Ra)	-	-	90	-	-	-
Operating Current (I_f)	-	mA	200	2000	2000	-
Operating Voltage (V_f)	-	Vdc	41.94	45.10	48.26	I_f = 2000mA t_p = 50ºC
Power Consumption	-	W	83.9	90.2	96.6	

Notes

※ t_C : temperature at which performance is specified measured at “Tc”.

※ Samsung maintains a measurement tolerance of Luminous flux ±7%, Ra ±3.0, Voltage ±5%, Power Consumption: ±0.3W

c) Color Coordinate

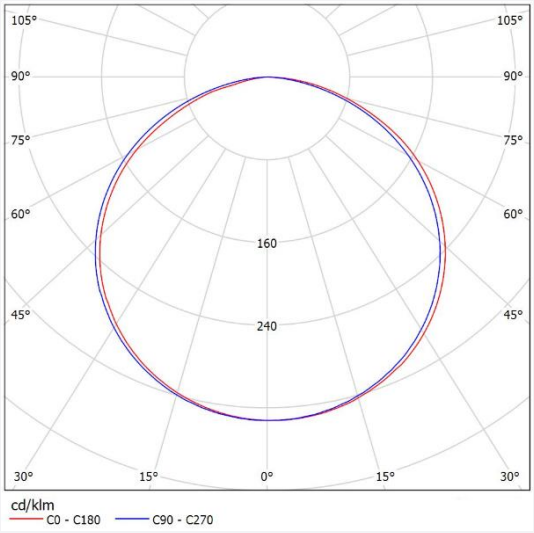
Model	Nom. CCT (K)	Unit	Color Correlated Temperature			Remark
			min	typ	max	
K-Series KB22C	3000	K	2870	3045	3220	@LED sorting condition
	3500		3220	3465	3710	
	4000		3710	3985	4260	
	5000		4746	5029	5312	
K-Series KB22F	3000	K	2870	3045	3220	
	3500		3220	3465	3710	
	4000		3710	3985	4260	
	5000		4746	5029	5312	
Color Consistency(initial)	-	Step	-	-	3	

Notes

※ Samsung maintains a measurement tolerance of CCT ± 5%

d) Light Distribution

Item	Unit	Nominal	Tolerance	Remark
Beam Angle (FWHM)	˚(degree)	118	± 5	



e) Temperature Characteristics

Item	Unit	Nominal(t_p)*	Life(t_L)**	Max(t_c)***
Case Temperature (t_c)	ºC	50	80	90

Notes:

* Nominal value at which typical performance is specified

** Value at which rated lifetime is specified

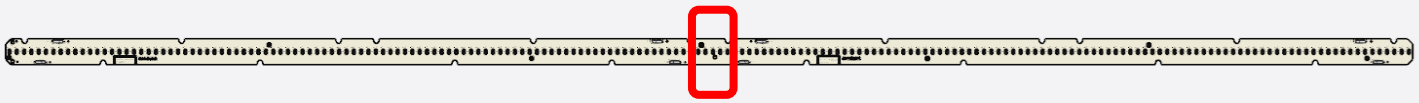
*** Maximum value, highest permissible temperature to avoid safety risk

All temperatures are measured at the designated “Tc point” as indicated on the module.

Please use heat-sink(or heat dissipation solution) with proper thermal capacity(operating wattage).

f) Thermal Measurement

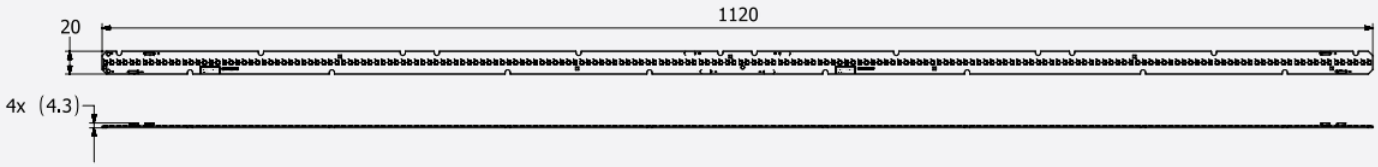
Performance temperatures are measured on “Tc” as indicated on the module.



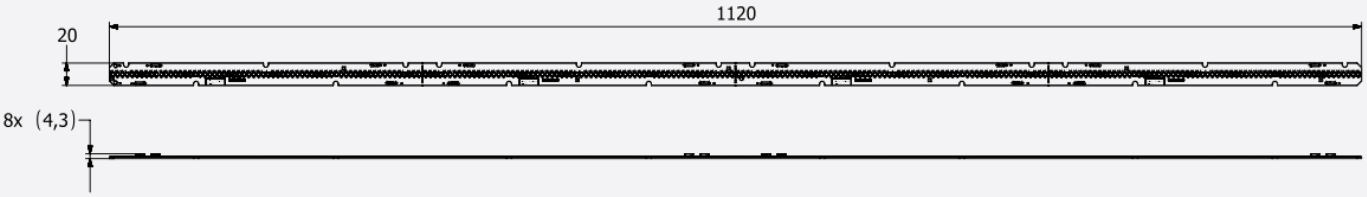
3. Appearance and Structure

a) Appearance & Dimension

- KB22C



- KB22F



Dimension	Specification	Tolerance	Unit
Module Length	1120.0	±0.3	mm
Module Width	20.0	±0.1	mm
Module Height	4.3	Ref.	mm
PCB Thickness	1.6	±0.16	mm
Module Weight	84	Ref.	g

b) Structure

Item	Specification
LED	LM281B+ Pro Middle Power LED KB22C : 96 LEDs or 192LEDs KB22F : 64LEDs or 128LEDs or 256LEDs
PCB	CEM-3 PCB
Connector	1pin poke-in type KB22C : 4 connectors KB22F : 8 connectors

c) Schematic Circuit

- KB22C 96LED 16S x 6P, 192LED 16S x 12P.
- KB22F 64LED 16S x 4P, 128LED 16S x 8P, 256LED 16S x 16P.

d) Handling Guide

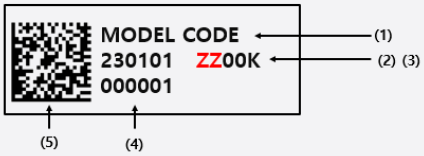
* Please use antistatic gloves or other ESD protection methods when handling this cuttable board to prevent ESD damage or contamination of LEDs.
* Customers should use proper tools and not use hands when they separate this cuttable board. It is not allowed to bend PCB and touch LED.
* Please be thoughful of securing withstanding voltage spec in case of cutting this board.
* If customers don't follow above guideline regarding handling, we won't be responsible for any quality issue.
* It is necessary to use after insulation work when exposed to insulating layer on PCB section.

4. Certification and Declaration

Item	Compliant to	Remark
Certification	UL / cUL	E344519
Declaration	RoHS	Hazardous Substance & Material

5. Label Structure

a) Module Label (16 X 5 mm)



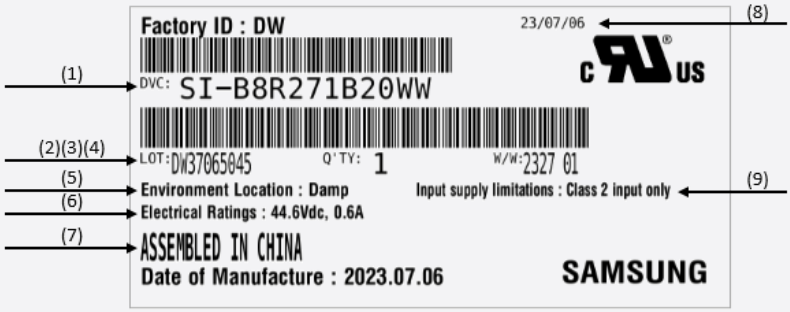
Number	Item	Remark
①	Model code	Refer to page 2~3
②	Date of manufacture	YYMMDD
③	Color temperature	ZZ = 50
④	Series number	000001~999999; Setting "000001" every working day
⑤	QR code	KB22C : SI-B8R271B20WW YYMMDD ZZ00K 000001 KB22F : SI-B8R231B20WW YYMMDD ZZ00K 000001

※ Module Label attachment point (2ea/bar)

b) Tray & MBB Bag Label

Number	Item	Remark
①	Model Code	Refer to page 2~3
②	LOT ID	
③	Quantity	Refer to page 15
④	Production Date (year & week)	
⑤	Country of Origin	CHINA
⑥	Production Date (year / month / date)	

c) Box Label



Number	Item	Remark
①	Model Number (Product Code)	Refer to page 2~3
②	Lot No.	
③	Packing Quantity	Refer to page 15
④	Production Date (year & week)	
⑤	UL Cert. (Environment Location)	Damp
⑥	UL Cert. (Electrical Ratings)	(KF22C 96LED) : 47.72 Vdc / 1.8 A
		(KF22C 192LED) : 47.72 Vdc / 2.0 A
		(KF22F 64LED) : 48.26 Vdc / 1.2 A
		(KF22F 128LED) : 48.26 Vdc / 2.0 A
		(KF22F 256LED) : 48.26 Vdc / 2.0 A
⑦	Country of Origin	CHINA
⑧	Production Date (year / month / date)	
⑨	Input supply limitations	Class 2 input only

6. Packing Structure

Product	Packing	Quantity (modules)	Weight	Dimension (mm)		
				Length	Width	Height
KB22C KB22F	Tray	20 ea	14.23kg	1175	375	24
	Outer Box	120 ea		1185	385	130
	Pallet	1440 ea	186	1200	800	1015

Notes

※ Weight includes Modules, Trays and a Box.

7. Precautions in Handling & Use

1) This LED Module should not be used in any type of fluid such as water, oil, organic solvent, etc. When washing is required, IPA is recommended to use. When using other solvents it should be confirmed beforehand whether the solvents may react with the Module material. The banned Freon solvents should not be used. Do not clean using ultrasonic cleaner.

2) The LEDs are sensitive to the static electricity and surge. It is recommended to use a wrist band or anti-electrostatic glove when handling the LED Modules. If voltage exceeding the absolute maximum rating is applied to LEDs, it may cause damage or even destruction to LED devices. Damaged LEDs may show some unusual characteristics such as increase in leak current, lowered turn-on voltage, or abnormal lighting of LEDs at low current.

3) VOCs (Volatile Organic Compounds) can be generated from adhesives, flux, hardener or organic additives used in luminaires (fixtures). Transparent LED silicone encapsulant is permeable to those chemicals and they may lead a discoloration of encapsulant when they exposed to heat or light. This phenomenon can cause a significant loss of light emitted (output) from the luminaires (fixtures). In order to prevent these problems, we recommend users to know the physical properties of the materials used in luminaires, and they must be selected carefully.

4) Risk of sulfurization (or tarnishing)
The LED uses a silver-plated lead frame and its surface color may change to black (or dark colored) when it is exposed to sulfur (S), chlorine (Cl) or other halogen compound. Sulfurization of lead frame may cause intensity degradation, change of chromaticity coordinates and, in extreme cases, open circuit. It requires caution. Due to possible sulfurization of lead frame, the LED Modules should not be used and stored together with oxidizing substances made of materials such as rubber, plain paper, lead solder cream, etc.

5) The resin area is very sensitive, please do not handle, press, touch or rub it.

6) Do not drop the Module or give shocks.

7) Do not store the Module in a dusty place or humid location.

8) Do not disassemble the Module.

9) Do not directly look into the lighted LED with naked eyes for a long period of time.

10) Please consider the creepage and clearance distance at the end product.

11) Solder ball

There might be solder ball and/or residue on the surface of module as long as they do NOT affect performance and safety.

12) When you install products in fixture, you should not connect the product while it is powered on. It will cause damage Circuits(that LED is included) and result in emitting smoke and ignition.

[Appendix]

1. Applicable Solid Wire Information

a) Strip details

Connection method	Poke In
Solid Conductor	0.2-0.75mm^2 / 24-18 AWG
Strip length	8.5±1mm
Conductor entry angle to the PCB	0 °

b) Important processing notes

Depending on the SMD soldering process and associated parameters a minor discoloration might occur.
However, this will not influence the functionality.

Legal and additional information.

About Samsung Electronics Co., Ltd.

Samsung inspires the world and shapes the future with transformative ideas and technologies. The company is redefining the worlds of TVs, smartphones, wearable devices, tablets, digital appliances, network systems, and memory, system LSI, foundry and LED solutions. For the latest news, please visit the Samsung Newsroom at news.samsung.com.

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