Specification for ViTron LED

SMD 5450 [Full Color]

Part No. : VPSFC5450-W

Revision No. : Ver 2.1

Date : May. 26, 2017

VISSEM Electronics Co., Ltd.

1. SPECIFICATION

Absolute Maximum Rating (T_a = 25°C)

Parameter	Symbol	Absolute Maximum Rating			Units
		RED	GREEN	BLUE	
Power Dissipation	P_D	60	85	85	mW
Forward Current	I_F	25	25	25	mA
Peak Forward Current	I_{FP}	80	80	80	mA
Operation Temperature	T_{OP}	-20 ~ 85			°C
Storage Temperature	T_{ST}	-40 ~ 100			°C
Soldering Temperature	T_{SOL}	Reflow Soldering (Lead): 200°C for 80sec. Reflow Soldering (Lead free): 190°C for 75sec			

IFP : Duty ratio ≤ 1/10, Pulse width ≤ 10ms

2. Electrical and Optical Characteristics

(T_a = 25°C)

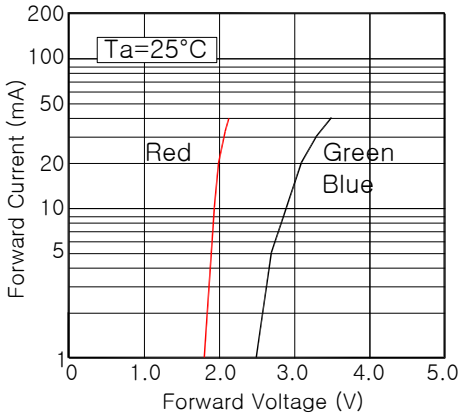
Parameter	Color	Symbol	Test Condition	Min	Max	Units
Forward Voltage	Red	V_F	I_F=20 mA	2.0	2.4	V
	Green			3.0	3.4	
	Blue			3.0	3.4	
Luminous Intensity	Red	I_V	I_F=20 mA	850	1120	mcd
	Green			1520	1960	
	Blue			270	400	
Dominant Wavelength	Red	W_D	I_F=20 mA	618	628	nm
	Green			522	530	
	Blue			462	468	
Reverse Voltage	Red	I_R	V_R=5 V	-	0.2	μA
	Green			Zener Diode Protect		
	Blue					

* Luminous intensity measurement allowance is ± 10%

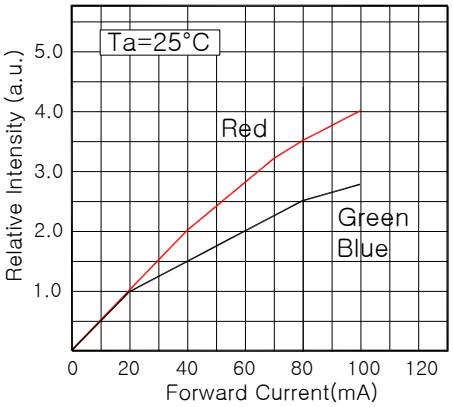
* Dominant wavelength measurement allowance is ±2nm

2. CHARACTERISTIC DIAGRAM

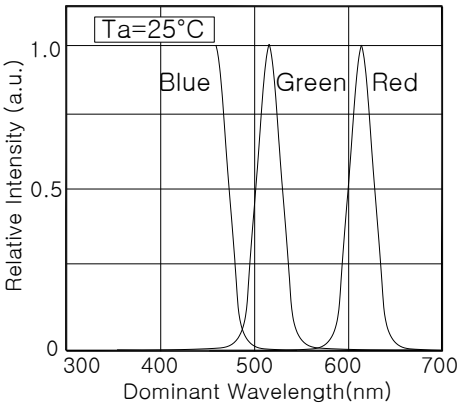
● **Forward Voltage vs. Forward Current**



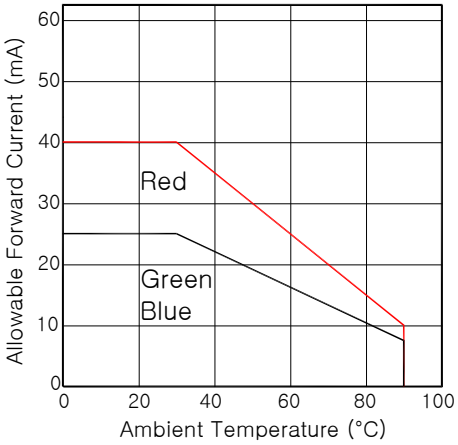
● **Forward Current vs. Relative Intensity**



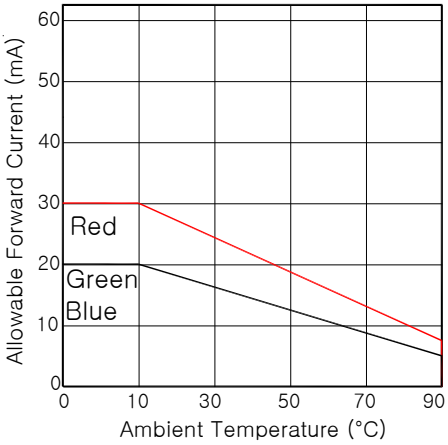
● **Spectrum**



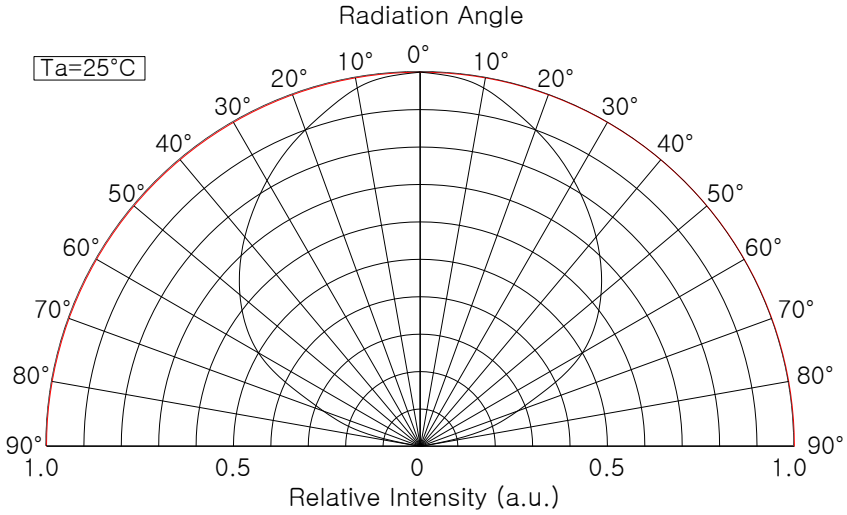
● **Ambient Temp. vs. Allowable Forward Current** (For individual chip Operation)



● **Ambient Temp. vs. Allowable Forward Current** (For 3chip Operation)



● **Typical Radiation Diagram**



3. PART NUMBER DESCRIPTION

Part Number : VPS FC 5450-W

①② ③ ④

① Device Type : SMD LED

② Emission Color : Full Color

③ Package Shape : 5450

④ Package Color : White body

4. RANK DESCRIPTION

Luminous Intensity

(@IF=20㎃, unit: mcd, T_a=25°C)

BLUE	RED	GREEN
270 ~ 330	850 ~ 1120	1520 ~ 1960
330 ~ 400		

Dominant Wavelength

(@IF=20㎃, unit: nm, T_a=25°C)

BLUE	RED	GREEN
462 ~ 465	618 ~ 628	522 ~ 526
465 ~ 468		526 ~ 530

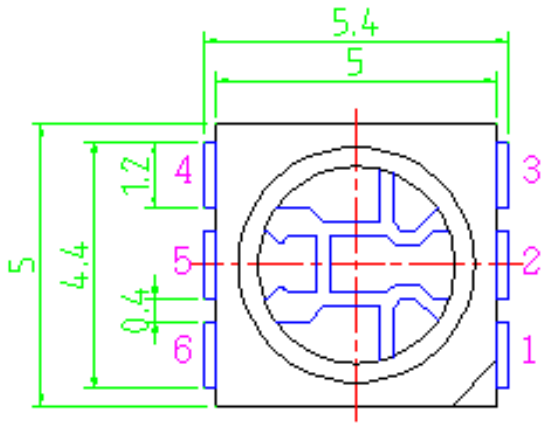
Forward Voltage

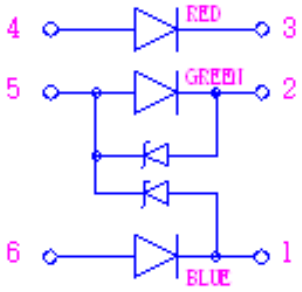
(@IF=20㎃, unit: V, T_a=25°C)

BLUE	RED	GREEN
3.0 ~ 3.4	2.0 ~ 2.4	3.0 ~ 3.4

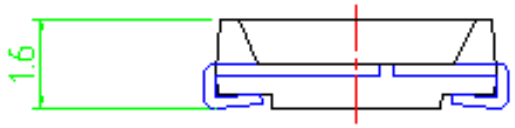
5. OUTLINE DIMENSION

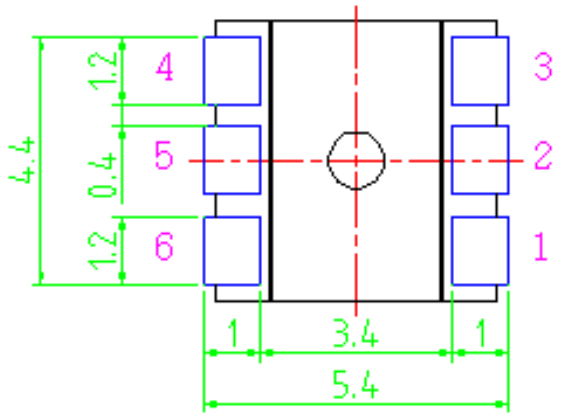
NO.	PART NAME	MATERIAL	TREATMENT	Q'TY	MATERIAL DIM.

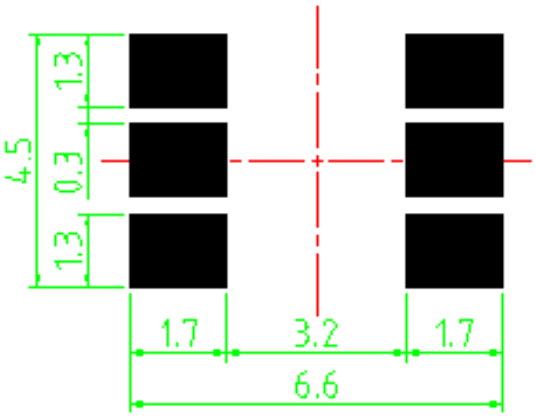




Polarity







Recommended PCB Pad

DRAW.N	CAD	SIZE	UNIT	SCALE	VIEW	TITLE
DESIGD' D	YW.Park	A4	[mm]	NONE		SMD5050FC 사양도면
CHECK' D	YW.Park	DATE				
APPR' D		REV. NO.				DRAW. NO. 20150616-001
STD. TOLERANCE UNLESS NOTED	± 0.1	SURF. FIN		Remove All Burrs & Sharp Edges		VISSEM ELECTRONICS.

6. BARE CHIP SPEC

RED

(@IF=20㎃)

제조사	DIE SIZE		VF	WD	IV
	Chip Size	Chip thickness			
대만	360 ㎛ x 360 ㎛	125 ㎛	1.8 ~ 2.3V	620 ~ 625 ㎚	700 ~ 800 mcd

GREEN

(@IF=10㎃)

제조사	DIE SIZE		VF	WD	IV
	Chip Size	Chip thickness			
대만	233 ㎛ x 183 ㎛	110 ㎛	2.6 ~ 3.0V	524 ~ 528 ㎚	550 ~ 650 mcd

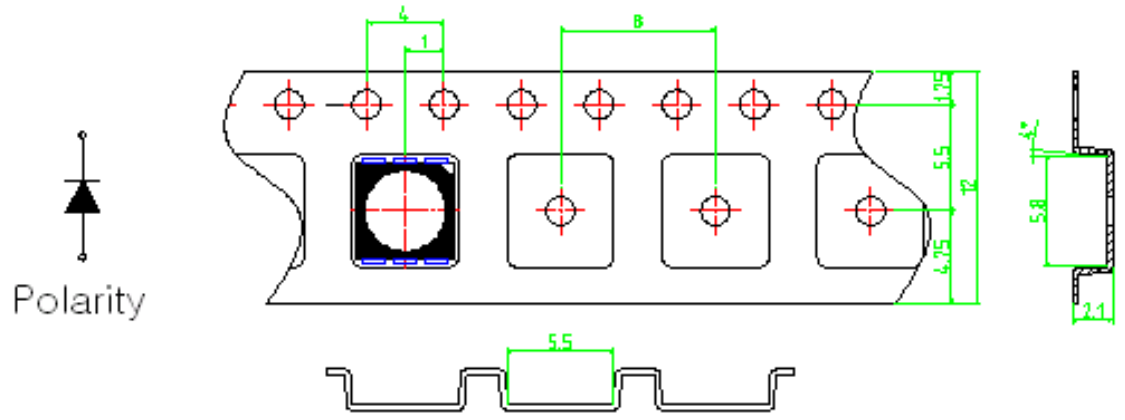
BLUE

(@IF=10㎃)

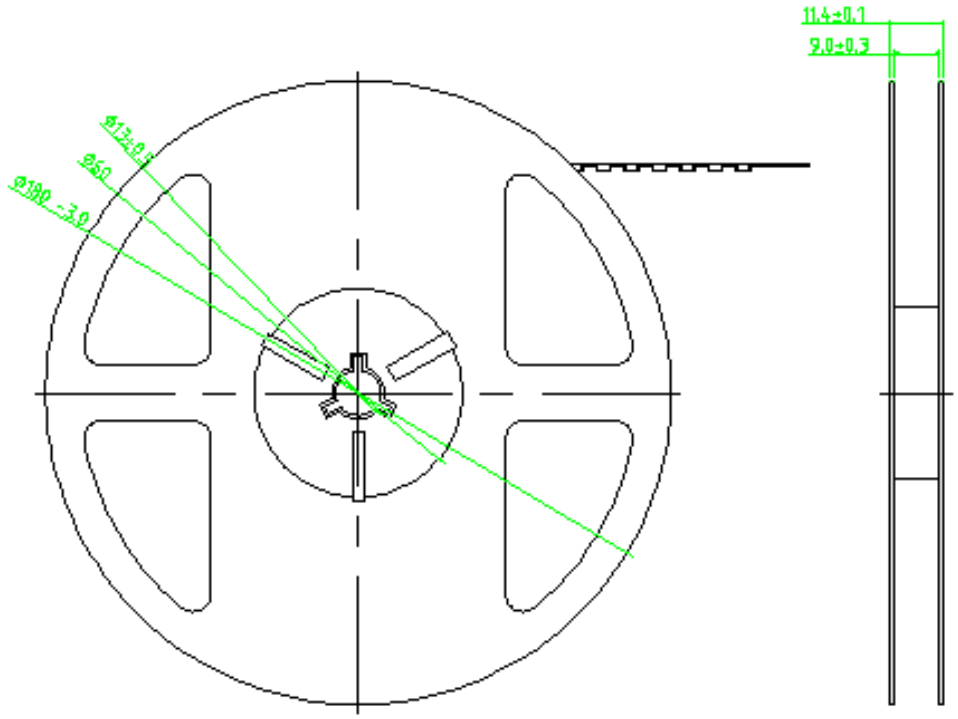
제조사	DIE SIZE		VF	WD	IV
	Chip Size	Chip thickness			
대만	233 ㎛ x 183 ㎛	110 ㎛	2.6 ~ 3.0V	466 ~ 470 ㎚	230 ~ 290 mcd

7. TAPING

NO.	PART NAME	MATERIAL	TREATMENT	Q'TY	MATERIAL DIM.



Carrier Tape Dimension



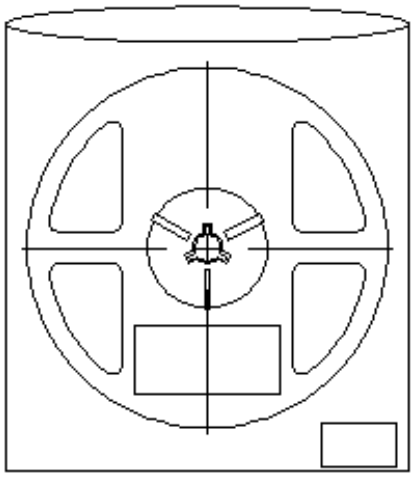
Reel Dimension

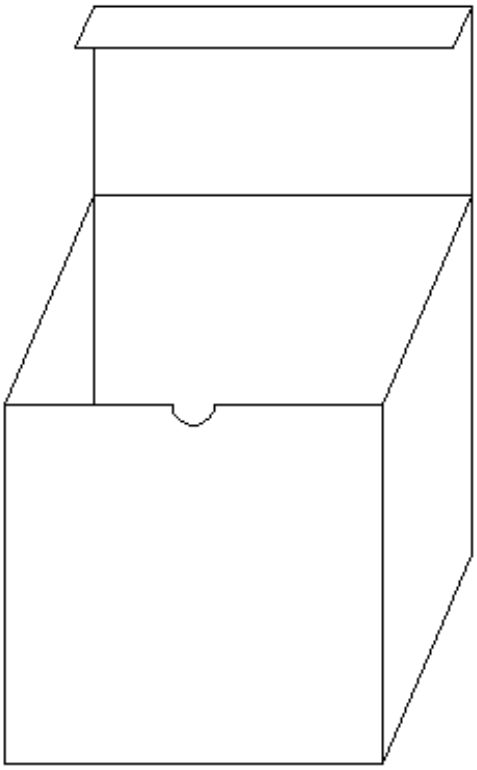
DRAW.N	CAD	SIZE	UNIT	SCALE	VIEW	TITLE
DESIGD' D	YW.Park	A4	[mm]	NONE		SMD5050 Taping SPEC.
CHECK' D	YW.Park	DATE				
APPR' D		REV. NO.				DRAW. NO. 20150616-002
STD. TOLERANCE UNLESS NOTED	± 0.1	SURF. FIN 125		Remove All Burrs & Sharp Edges		VISSEM ELECTRONICS.

8. PACKING

Packing unit	Size (W × L × D)	Quantity (ea)
Antistatic shielding bag (1 Reel)	220 × 250	1,000
Inner carton box (9 Reels)	220 × 220 × 145	9,000

NO.	PART NAME	MATERIAL	TREATMENT	Q'TY	MATERIAL DIM.





DRAW.N	CAD	SIZE	UNIT	SCALE	VIEW	TITLE
DESIGD' D	YW.Park	A4	[mm]	NONE		SMD5050 Packing SPEC.
CHECK' D	YW.Park	DATE				
APPR' D		REV. NO.				DRAW. NO. 20150616-003
STD. TOLERANCE UNLESS NOTED	± 0.1	SURF. FIN		Remove All Burrs & Sharp Edges		VISSEM ELECTRONICS.

9. RELIABILITY

Test Item and Results

Test Item	Reference Standard	Test Conditions	Test Time	Number of Damaged
Life Test	MIL-STD-883	Ta = 25℃, IF = 20mA	1000 [hrs]	0/50
Solder Heat Resistance test	MIL-STD-883 Method 2003	260℃ for 10 sec. 260℃ for 5 sec./2* dip	1 Time	0/50
Power Temp. Cycle	MIL-STD-883 Method 1010	-25℃ ~ transfer ~ 85℃ 20min 10min 20min @20mA	100 Cycle	0/50
Temperature Cycle	MIL-STD-883 Method 1010	-40℃ ~ 25℃ ~ 100℃ ~25℃ 30min 5min 30min 5min Non-operating	100 Cycle	0/50
Thermal Shock	MIL-STD-883 Method 1011	0℃ ~ 100℃ 15sec 15sec Non-operating 100 cycles	100 Cycle	0/50
Temperature Humidity	EIAJ ED 4701-100	65℃ [90%RH] @20mA Dwell 1hrs,transfer 5min	100 Cycle	0/50
ESD Rating	MIL-STD883 Method 3015	HBM Class Ⅱ (2,000 ~ 3,999[V])	3 Time	0/50

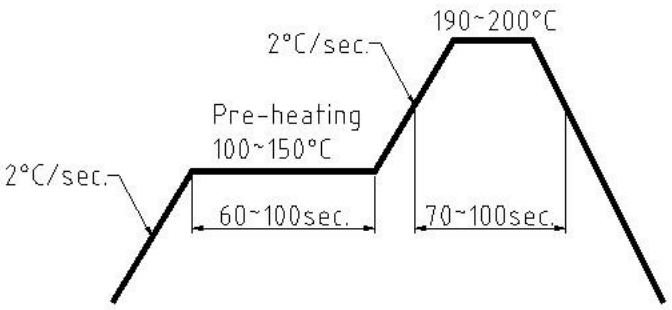
Criterion for Judgment

Test Item	Symbol	Condition	Criterion for Judgment
Forward Voltage	Vf	IF = 20 [mA]	Vf > Init. *1.1
Luminous Intensity	Iv	IF = 20 [mA]	Iv <Init * 0.7

10. SOLDERING

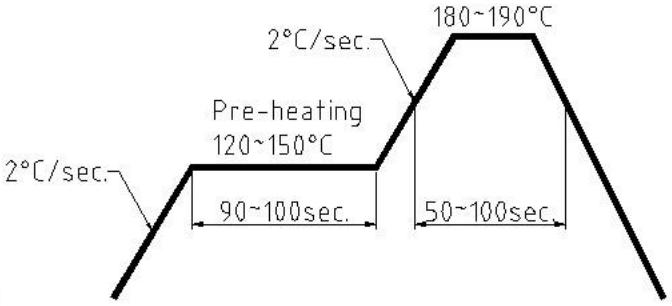
Recommended Reflow Soldering Profile

- Lead Solder



- Lead-free Solder

Must solder this chip LED under low temperature



- During the soldering process, keep the minimum clearance between the resin and the soldering point.
- Resin should not contact molten solder.
- No mechanical distortion or stress allowed after soldering.
- During soldering, do not apply any stress to the lead frame, particularly when heated.
- A soldering iron with a grounded tip is recommended.
- An isolator should also be installed where risk of static generation is high.

11. Cautions

Safety

- Customers should comply with the laws and public regulations concerning safety.
- Operation temperature or driving current may affect emission color.
  Please check sorting condition and characteristic diagram to estimate color shift.
- Moisture and dust may affect reliability issues.
  Do not open the shielding bag under humid or dirty environment.
- When installing the product in PCB, the device should not contact with other components.
- Do not apply force to the LED under high-temperature condition.
- Do not apply friction to the LED using hard material.
- Avoid exposure to chemicals which may dissolve the LED package and the epoxy.
- Use IPA(Isopropyl Alcohol) as a solvent when washing is required.

Static Electricity

- These products are sensitive to static electricity.
  Anti–electrostatic glove or wristband is recommended when handling the LEDs.
- A protection device should be installed in the LED driving circuit to eliminate or minimize the surge current effect.
- Proper grounding of products, use of conductive mat, semi-conductive working uniform and shoes, and semi-conductive containers are considered to be effective as countermeasures against static electricity and surge.

Storage Condition

- Before opening the anti-static shielding package:
  LEDs should be kept at 30°C or less and RH 80% or less.
  Maximum acceptable storage period is 6 months.
- After opening the anti-static shielding package:
  LEDs should be kept at 30°C or less and RH 70% or less.
  LEDs should be soldered within 7 days after opening the pack

Warning

- LED chip's surface is made by silicon. So, this chip is feeble of pressure or impact.