Dear Customer Notification

- Elimination of TiO2 in 561C -

LED Business,
26th June 2018

SAMSUNG

Product Change Notification

This document serves as formal notification that Samsung Electronics strategy to eliminate TiO2 from 561C LED
We seek your kind understanding and co-operation towards smooth change of 561C

- **Product**
  561C LED
- **Effective Date**
  All products, and shipping from Samsung Electronics as of Nov, 2018
- **Description of change**
  Samsung is announcing the elimination of TiO2 from LM561C LED which is used for all.
- **Reason for change**
  - TiO2 was applied only to 561C LED to improve a lumen intensity by increasing reflectivity of lights
  - The power of chip was improved and met the performance (lumen intensity) criteria of LM561C without TiO2
- **Customer impact**
  This changes should not affect the specification on the data sheet
  No functional specification have changes other than as mentioned above

Summary

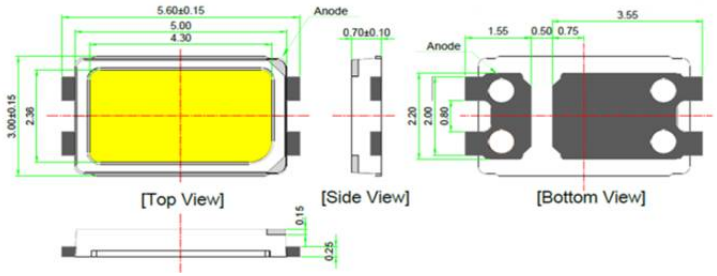
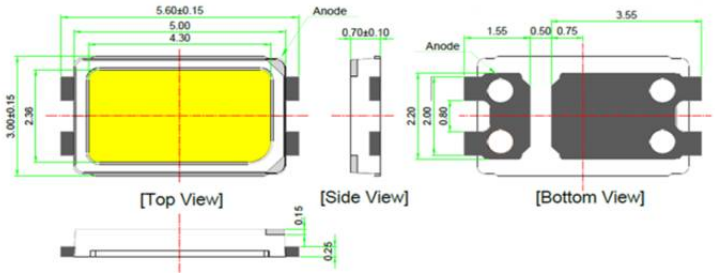
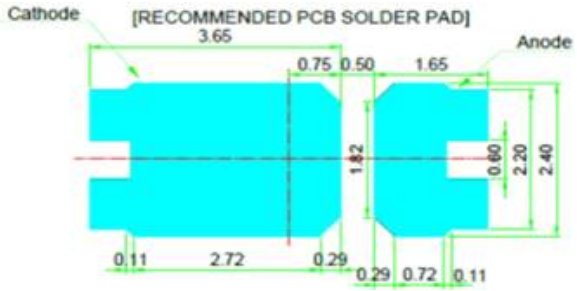
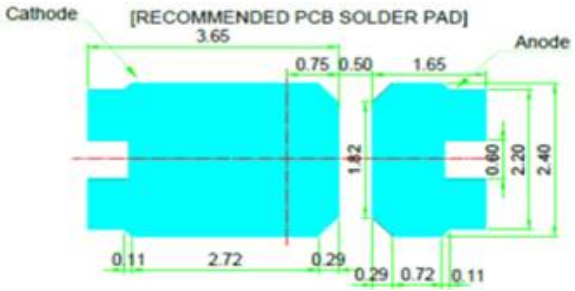
Same equivalent characteristics, reliability and performance secured

Item		Before change	After change
Material	Chip	Epi-up	Same
	Pre-mold	PCT	Same
1. Exterior	Dimension	Same	
	Appearance	Zener diode can't be identified with the naked eye	Zener diode can be Identified with the naked eye
2. Electrical performance		Equivalent	
3. Radiation diagram & Spectrum		Equivalent	
4.Reliability		Passed all items in the specification	

1. Exterior

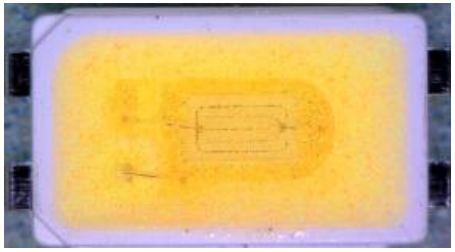
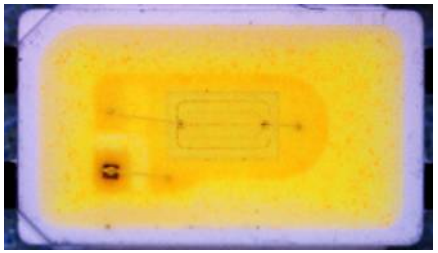
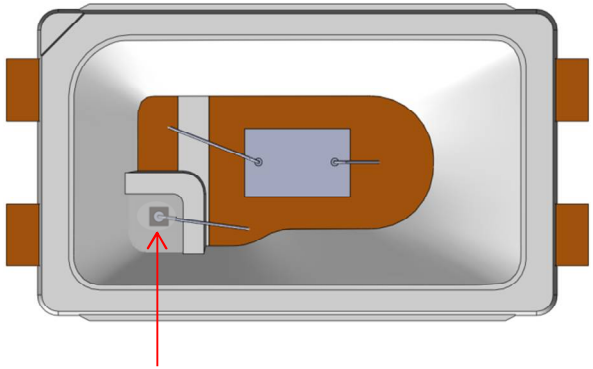
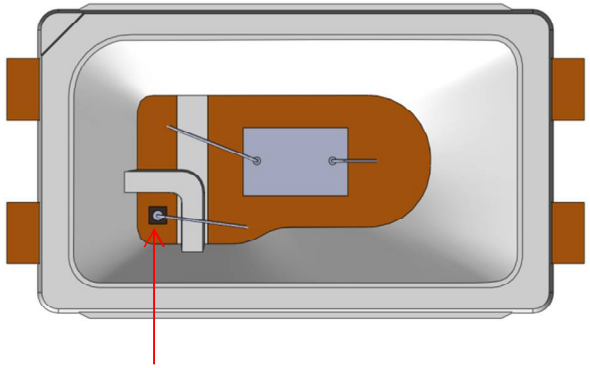
No change in LED Dimension

※ Tolerance is ±0.1 mm

	Before change	After change
LED Size		
Foot Print		

1. Exterior

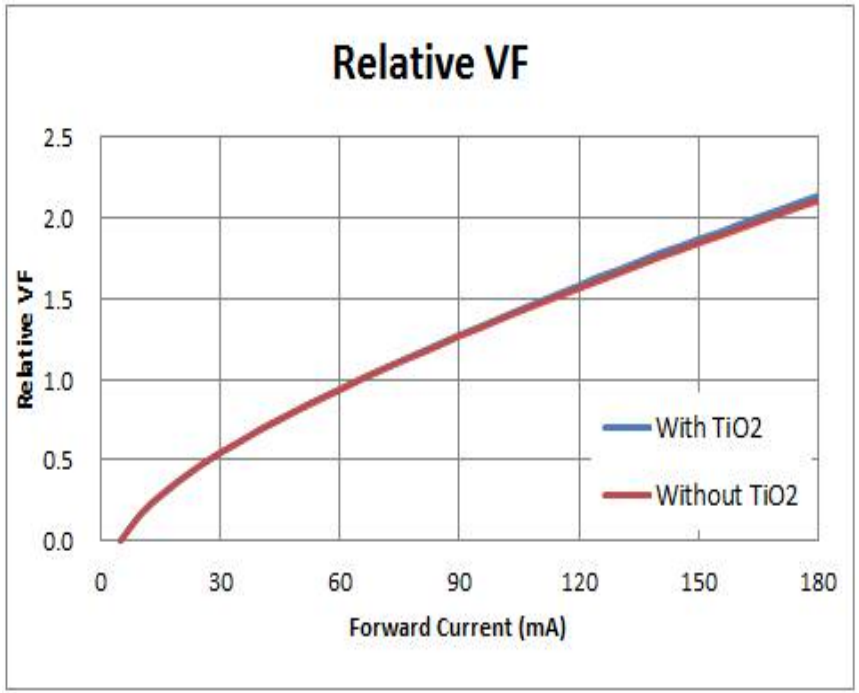
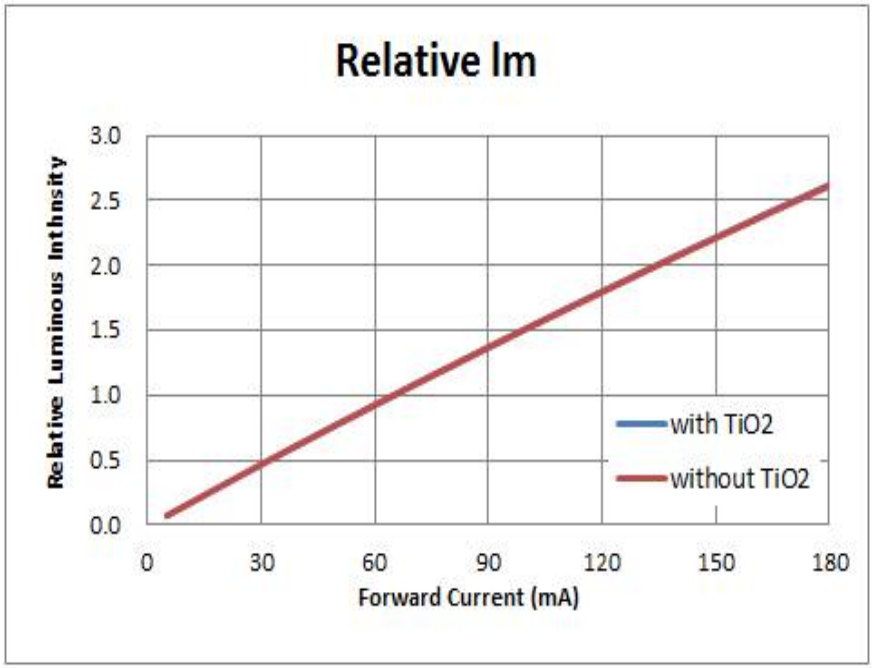
Eliminate filler which is TiO2 in zener diode zone

	Before change	After change
Appearance	 @5000K	 @5000K
Schematic Diagram	 Cover the zone of zener diode zone with TiO2	 No filler (Tio2) in zener diode zone

2. Electrical Performance

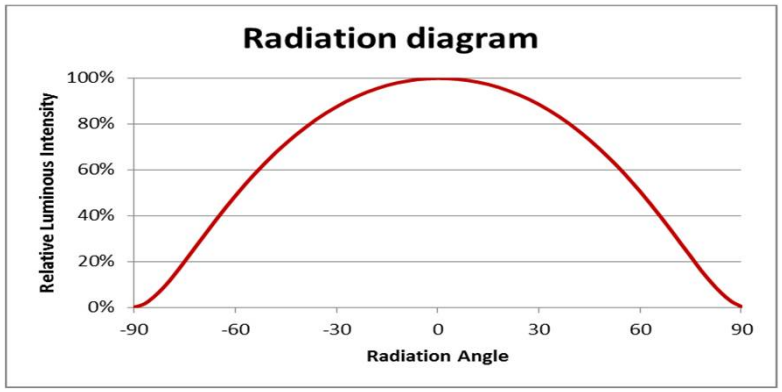
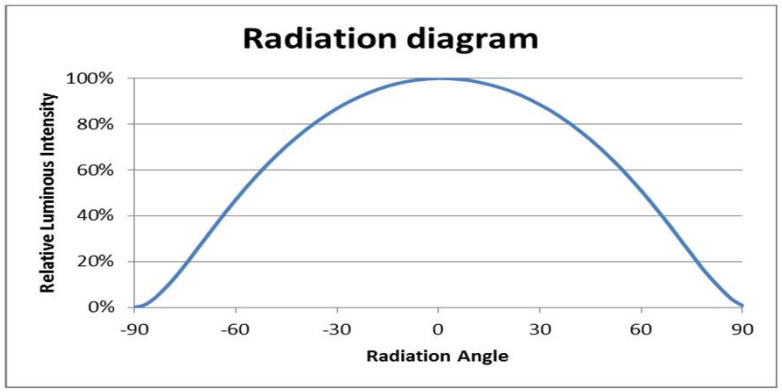
No change Electrical Performance.

- Forward current vs Relative Forward Voltage
- Forward current vs Relative Luminous Flux

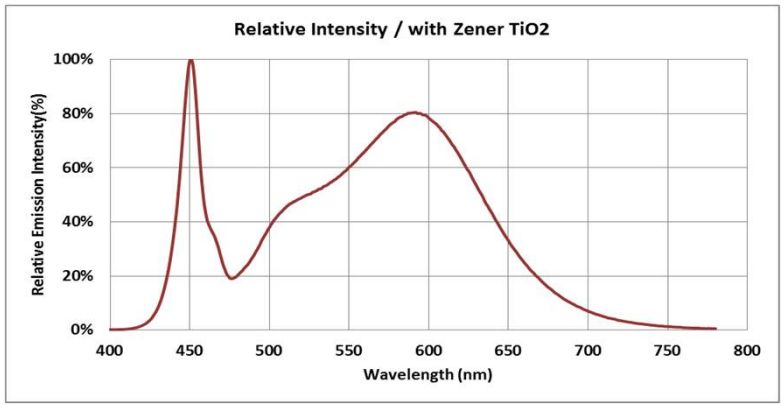
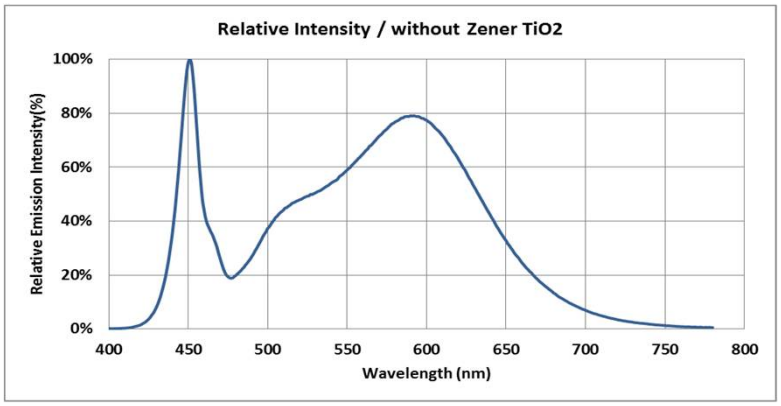
Forward Current vs. Relative Forward Voltage	Forward Current vs. Relative Luminous Flux
	

3. Radiation diagram / Spectrum

- No change Radiation diagram (Same L/F, Same Silicone)

Before change	After change
	

- No change Spectrum diagram

Before change	After change
	

4. Reliability

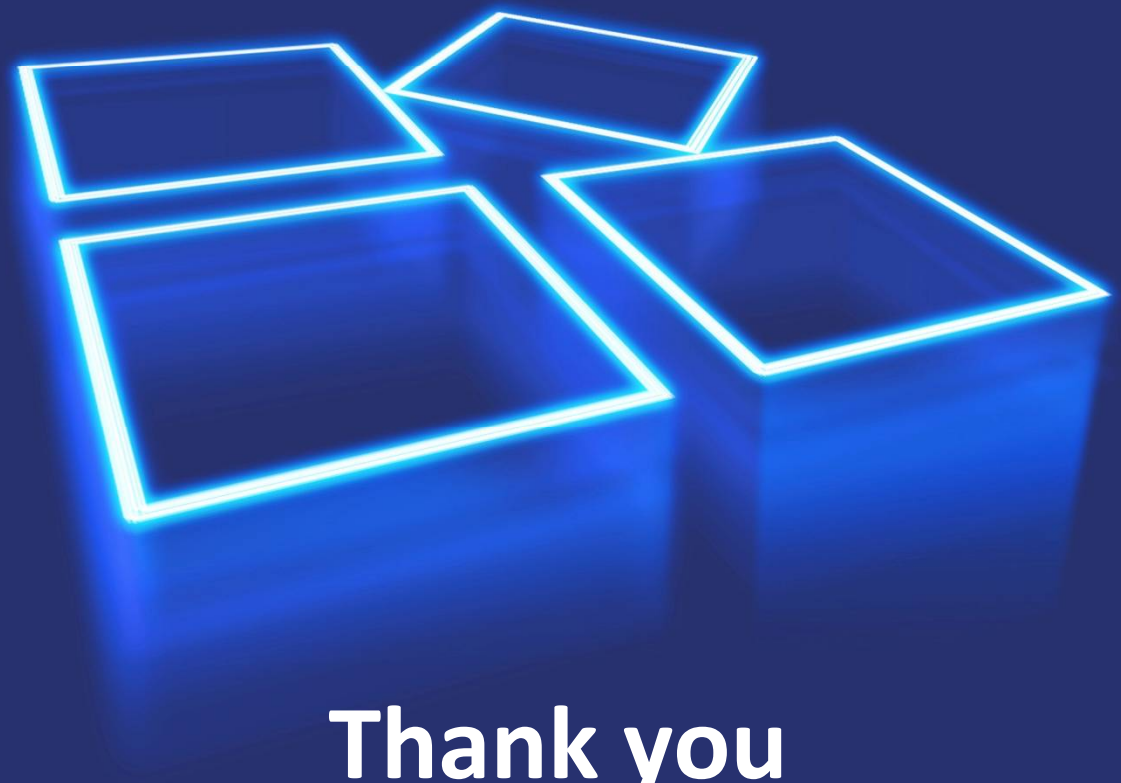
- **PASS all criteria in the specification**

1) Test Items

Test item	Test Condition	Test Time /cycle	Sample Q'ty
High Temperature Life Test	85 ºC, max IF	1000 h	22
High Temperature Humidity Life Test	85 ºC, 85 % RH, max IF	1000 h	22
Thermal Cycle	-45 ºC / 15 min ↔ 125 ºC / 15 min	500 cycles	100
ESD (HBM)	R1:10 MΩ, R2:1.5 kΩ, C:100 pF, V: ±2 kV	5 times	30
Vibration Test	20~2000~20 Hz, 200 m/s2, sweep 4 min X, Y, Z 3 direction, each 1 cycle	4 cycles	11
Mechanical Shock Test	1500 g, 0.5 ms 3 shocks each X-Y-Z axis	5 cycles	11

2) Criteria for judging the Damage

Item	Symbol	Test Condition	Min	Max
Forward Voltage	V_F	IF = 100mA	Int. Value*0.9	Int. Value*1.1
Luminous Flux	Φ_V	IF = 100mA	Int. Value*0.7	Int. Value*1.1



Thank you

SAMSUNG

SPMWHT541ML5XAWKS0
SPMWHT541ML5XAWGS0
SPMWHT541ML5XAW0S0
SPMWHT541ML5XAWMS0
SPMWHT541ML5XAWNS0
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