

LM231B – CRI 90 Middle Power LED



Introduction

Features

- Package : Silicone Reflector LED Package
- Beam Angle : 120°
- Precondition : JEDEC Level 2a
- Dimension : 2.3 x 2.3 x 0.7 mm
- ESD withstand Voltage : up to $\pm 5\text{KV}$ [HBM]

Applications

- INDOOR LIGHTING : Ambient Light, LED tube, Down light, LED bulb and Ceiling Light

SAMSUNG ELECTRONICS

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1. Product Code Information

1) Luminous Flux Bins ($T_s = 25^\circ\text{C}$)

Nominal CCT	Product Code	Flux Rank	Sorting Condition I_m @65mA	
			Flux Bin	Flux Range (Φ_v, I_m)
2700K	SPMWHT223MD7WAW0S0	S0	S1	16.50 ~ 19.00
			S2	19.00 ~ 21.50
			S3	21.50 ~ 24.00
3000K	SPMWHT223MD7WAV0S0	S0	S1	17.00 ~ 19.50
			S2	19.50 ~ 22.00
			S3	22.00 ~ 24.50
3500K	SPMWHT223MD7WAU0S0	S0	S1	17.50 ~ 20.00
			S2	20.00 ~ 22.50
			S3	22.50 ~ 25.00
4000K	SPMWHT223MD7WAT0S0	S0	S1	18.00 ~ 20.50
			S2	20.50 ~ 23.00
			S3	23.00 ~ 25.50

Notes:

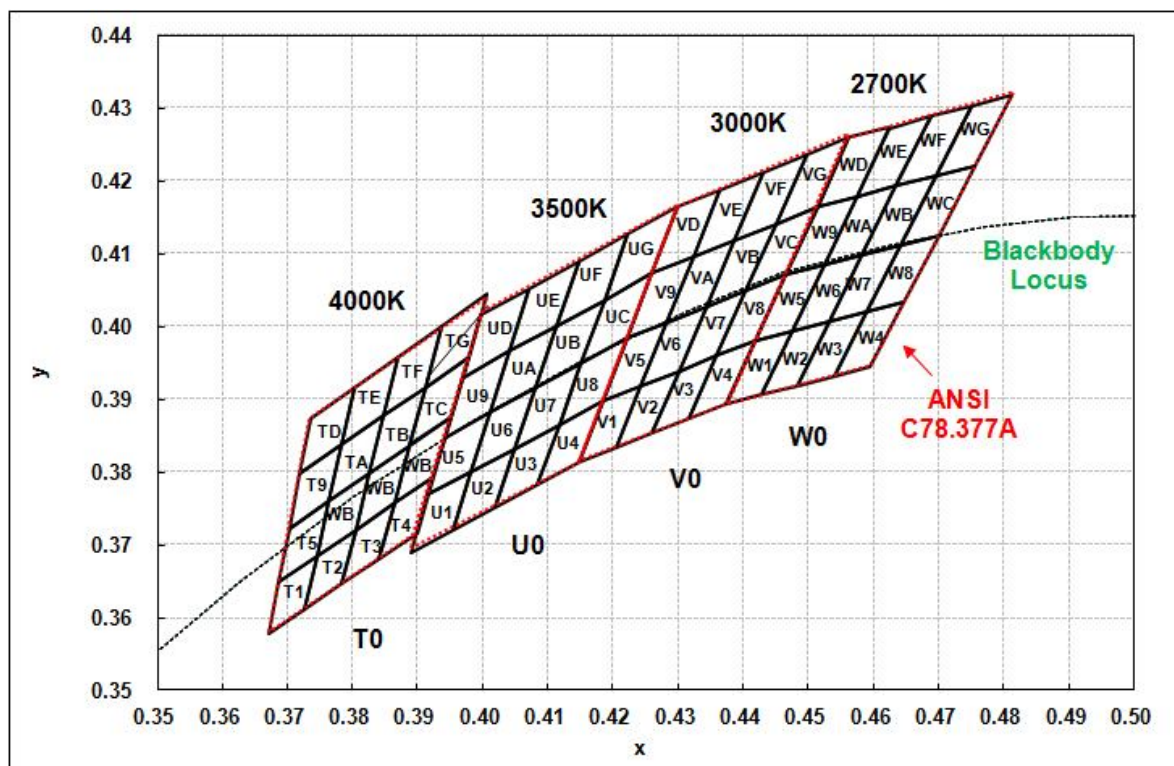
SAMSUNG ELECTRONICS maintains a tolerance of $\pm 5\%$ on Luminous Flux measurements

2) Color Bins ($T_s = 25^\circ\text{C}$)

1) Color Binning

Nominal CCT	Product Code	Color Rank	Chromaticity Bins
2700K	SPMWHT223MD7WAW0S0	W0(Whole bin)	W1, W2, W3, W4, W5, W6, W7, W8, W9, WA, WB, WC, WD, WE, WF, WG
	SPMWHT223MD7WAWKS0	WK(Kitting bin)	–
3000K	SPMWHT223MD7WAV0S0	V0(Whole bin)	V1, V2, V3, V4, V5, V6, V7, V8, V9, VA, VB, VC, VD, VE, VF, VG
	SPMWHT223MD7WAVKS0	VK(Kitting bin)	–
3500K	SPMWHT223MD7WAU0S0	U0(Whole bin)	U1, U2, U3, U4, U5, U6, U7, U8, U9, UA, UB, UC, UD, UE, UF, UG
	SPMWHT223MD7WAUKS0	UK(Kitting bin)	–
4000K	SPMWHT223MD7W0T0S0	T0(Whole bin)	T1, T2, T3, T4, T5, T6, T7, T8, T9, TA, TB, TC, TD, TE, TF, TG
	SPMWHT223MD7W0TKS0	TK(Kitting bin)	–

2) Chromaticity Region & Coordinates



2) Chromaticity Region & Coordinates (Continued)

Region	CIE X	CIE Y	Region	CIE X	CIE Y
W rank (2700K)					
W1	0.4373	0.3893	W9	0.4465	0.4071
	0.4418	0.3981		0.4513	0.4164
	0.4475	0.3994		0.4573	0.4178
	0.4428	0.3906		0.4523	0.4085
W2	0.4428	0.3906	WA	0.4523	0.4085
	0.4475	0.3994		0.4573	0.4178
	0.4532	0.4008		0.4634	0.4193
	0.4483	0.3919		0.4582	0.4099
W3	0.4483	0.3919	WB	0.4582	0.4099
	0.4532	0.4008		0.4634	0.4193
	0.4589	0.4021		0.4695	0.4207
	0.4538	0.3931		0.4641	0.4112
W4	0.4538	0.3931	WC	0.4641	0.4112
	0.4589	0.4021		0.4695	0.4207
	0.4646	0.4034		0.4756	0.4221
	0.4593	0.3944		0.4700	0.4126
W5	0.4418	0.3981	WD	0.4513	0.4164
	0.4465	0.4071		0.4562	0.4260
	0.4523	0.4085		0.4624	0.4274
	0.4475	0.3994		0.4573	0.4178
W6	0.4475	0.3994	WE	0.4573	0.4178
	0.4523	0.4085		0.4624	0.4274
	0.4582	0.4099		0.4687	0.4289
	0.4532	0.4008		0.4634	0.4193
W7	0.4532	0.4008	WF	0.4634	0.4193
	0.4582	0.4099		0.4687	0.4289
	0.4641	0.4112		0.4750	0.4304
	0.4589	0.4021		0.4695	0.4207
W8	0.4589	0.4021	WG	0.4695	0.4207
	0.4641	0.4112		0.4750	0.4304
	0.4700	0.4126		0.4813	0.4319
	0.4646	0.4034		0.4756	0.4221

Region	CIE X	CIE Y	Region	CIE X	CIE Y
V rank (3000K)					
V1	0.4147	0.3814	V9	0.4221	0.3984
	0.4183	0.3898		0.4259	0.4073
	0.4242	0.3919		0.4322	0.4096
	0.4203	0.3833		0.4281	0.4006
V2	0.4203	0.3833	VA	0.4281	0.4006
	0.4242	0.3919		0.4322	0.4096
	0.4300	0.3939		0.4385	0.4119
	0.4259	0.3853		0.4342	0.4028
V3	0.4259	0.3853	VB	0.4342	0.4028
	0.4300	0.3939		0.4385	0.4119
	0.4359	0.3960		0.4449	0.4141
	0.4316	0.3873		0.4403	0.4049
V4	0.4316	0.3873	VC	0.4403	0.4049
	0.4359	0.3960		0.4449	0.4141
	0.4418	0.3981		0.4513	0.4164
	0.4373	0.3893		0.4465	0.4071
V5	0.4183	0.3898	VD	0.4259	0.4073
	0.4221	0.3984		0.4299	0.4165
	0.4281	0.4006		0.4364	0.4188
	0.4242	0.3919		0.4322	0.4096
V6	0.4242	0.3919	VE	0.4322	0.4096
	0.4281	0.4006		0.4364	0.4188
	0.4342	0.4028		0.4430	0.4212
	0.4300	0.3939		0.4385	0.4119
V7	0.4300	0.3939	VF	0.4385	0.4119
	0.4342	0.4028		0.4430	0.4212
	0.4403	0.4049		0.4496	0.4236
	0.4359	0.3960		0.4449	0.4141
V8	0.4359	0.3960	VG	0.4449	0.4141
	0.4403	0.4049		0.4496	0.4236
	0.4465	0.4071		0.4562	0.4260
	0.4418	0.3981		0.4513	0.4164

2) Chromaticity Region & Coordinates (Continued)

Region	CIE X	CIE Y	Region	CIE X	CIE Y
U rank (3500K)					
U1	0.3889	0.3690	U9	0.3941	0.3848
	0.3953	0.3720		0.4010	0.3882
	0.3981	0.3800		0.4040	0.3966
	0.3915	0.3768		0.3968	0.3930
U2	0.3953	0.3720	UA	0.4010	0.3882
	0.4017	0.3751		0.4080	0.3916
	0.4048	0.3832		0.4113	0.4001
	0.3981	0.380		0.4040	0.3966
U3	0.4017	0.3751	UB	0.4080	0.3916
	0.4082	0.3782		0.4150	0.3950
	0.4116	0.3865		0.4186	0.4037
	0.4048	0.3832		0.4113	0.4001
U4	0.4082	0.3782	UC	0.4150	0.3950
	0.4147	0.3814		0.4221	0.3984
	0.4183	0.3898		0.4259	0.4073
	0.4116	0.3865		0.4186	0.4037
U5	0.3915	0.3768	UD	0.3968	0.3930
	0.3981	0.3800		0.4040	0.3966
	0.4010	0.3882		0.4071	0.4052
	0.3941	0.3848		0.3996	0.4015
U6	0.3981	0.3800	UE	0.4040	0.3966
	0.4048	0.3832		0.4113	0.4001
	0.4080	0.3916		0.4146	0.4089
	0.4011	0.3882		0.4071	0.4052
U7	0.4048	0.3832	UF	0.4113	0.4001
	0.4116	0.3865		0.4186	0.4037
	0.4150	0.3950		0.4222	0.4127
	0.4080	0.3916		0.4146	0.4089
U8	0.4116	0.3865	UG	0.4186	0.4037
	0.4183	0.3898		0.4259	0.4073
	0.4221	0.3984		0.4299	0.4165
	0.4150	0.3950		0.4222	0.4127

Region	CIE X	CIE Y	Region	CIE X	CIE Y
T rank (4000K)					
T1	0.3670	0.3578	T9	0.3702	0.3722
	0.3726	0.3612		0.3763	0.3760
	0.3744	0.3685		0.3782	0.3837
	0.3686	0.3649		0.3719	0.3797
T2	0.3726	0.3612	TA	0.3763	0.3760
	0.3783	0.3646		0.3825	0.3798
	0.3804	0.3721		0.3847	0.3877
	0.3744	0.3685		0.3782	0.3837
T3	0.3783	0.3646	TB	0.3825	0.3798
	0.3840	0.3681		0.3887	0.3836
	0.3863	0.3758		0.3912	0.3917
	0.3804	0.3721		0.3847	0.3877
T4	0.3840	0.3681	TC	0.3887	0.3837
	0.3898	0.3716		0.3950	0.3875
	0.3924	0.3794		0.3978	0.3958
	0.3863	0.3758		0.3912	0.3917
T5	0.3686	0.3649	TD	0.3719	0.3797
	0.3744	0.3685		0.3782	0.3837
	0.3763	0.3760		0.3802	0.3916
	0.3702	0.3722		0.3736	0.3874
T6	0.3744	0.3685	TE	0.3782	0.3837
	0.3804	0.3721		0.3847	0.3877
	0.3825	0.3798		0.3869	0.3958
	0.3763	0.3760		0.3802	0.3916
T7	0.3804	0.3721	TF	0.3847	0.3877
	0.3863	0.3758		0.3912	0.3917
	0.3887	0.3836		0.3937	0.4001
	0.3825	0.3798		0.3869	0.3958
T8	0.3863	0.3758	TG	0.3912	0.3917
	0.3924	0.3794		0.3978	0.3958
	0.3950	0.3875		0.4006	0.4044
	0.3887	0.3836		0.3937	0.4001

Notes:

SAMSUNG ELECTRONICS maintains ± 0.005 tolerance of CCx, CCy

2. Luminous Flux Characteristics ($T_s = 25^{\circ}\text{C}$)

Nominal CCT	Minimum CRI	If(mA)	Vf(V)	Power(W)	Flux(lm)	lm/W
2700K	90	50	2.85	0.14	16.3	114
		60	2.88	0.17	19.1	111
		65	2.90	0.19	20.5	109
		70	2.91	0.20	21.8	107
		80	2.93	0.23	24.4	104
		90	2.96	0.27	26.8	101
		100	2.98	0.30	29.2	98
		150	3.07	0.46	39.7	86
3000K	90	50	2.85	0.14	17.1	120
		60	2.88	0.17	20.1	116
		65	2.90	0.19	21.6	114
		70	2.91	0.20	23.0	113
		80	2.93	0.23	25.8	110
		90	2.96	0.27	28.4	107
		100	2.98	0.30	31.0	104
		150	3.07	0.46	42.5	92
3500K	90	50	2.85	0.14	17.9	126
		60	2.88	0.17	21.1	122
		65	2.90	0.19	22.6	120
		70	2.91	0.20	24.1	119
		80	2.93	0.23	27.1	115
		90	2.96	0.27	30.0	113
		100	2.98	0.30	32.8	110
		150	3.07	0.46	45.2	98
4000K	90	50	2.85	0.14	18.2	127
		60	2.88	0.17	21.4	124
		65	2.90	0.19	22.9	122
		70	2.91	0.20	24.5	120
		80	2.93	0.23	27.5	117
		90	2.96	0.27	30.4	114
		100	2.98	0.30	33.3	112
		150	3.07	0.46	46.3	100

Notes:

Luminous Flux(Φ_v , lm) values are for representative reference only

3. Characteristics

1) Absolute Maximum Rating

Item	Symbol	Rating	Condition
Operating temperature range	T_{op}	-40°C ~ +85°C	–
Storage temperature range	T_{stg}	-40°C ~ +100°C	–
LED junction temperature	T_J	110°C	–
Forward Current	I_F	150 mA	–
Peak Pulsed Forward Current	I_{FP}	300 mA	Duty 1/10 pulse width 10ms
Assembly Process Temperature	–	260°C, < 10sec	–
ESD	–	5kV	HBM

2) Electro-optical Characteristics

Item	Unit	Nominal CCT	Product Code	Rank	Min	Typ	Max
Forward Voltage ¹⁾ (V_F) (@65 mA, $T_s = 25^\circ\text{C}$)	V	–	–	WA	AZ	2.70	2.80
					A1	2.80	2.90
					A2	2.90	3.00
					A3	3.00	3.10
					A4	3.10	3.20
Luminous Flux ²⁾ (Φ_v) (@65 mA, $T_s = 25^\circ\text{C}$)	lm	2700K (W0)	*WAW0S1	S1	16.50	–	19.00
			*WAW0S2	S2	19.00	–	21.50
			*WAW0S3	S3	21.50	–	24.00
		3000K (V0)	*WAV0S1	S1	17.00	–	19.50
			*WAV0S2	S2	19.50	–	22.00
			*WAV0S3	S3	22.00	–	24.50
		3500K (U0)	*WAU0S1	S1	17.50	–	20.00
			*WAU0S2	S2	20.00	–	22.50
			*WAU0S3	S3	22.50	–	25.00
		4000K (T0)	*WAT0S1	S1	18.00	–	20.50
			*WAT0S2	S2	20.50	–	23.00
			*WAT0S3	S3	23.00	–	25.50
Reverse Voltage (@5 mA, $T_s = 25^\circ\text{C}$)	V	–	–	–	0.7	–	1.2
Color Rendering Index ³⁾ (R_a)	–	–	–	7	90	–	–
Special CRI ⁴⁾ (R9)	–	–	–	–	50	–	–
Thermal resistance	°C/W	–	–	–	–	20	–
Beam Angle	–	–	–	–	–	120	–

Notes:

1)~4) SAMSUNG ELECTRONICS maintains a tolerance of $V_F: \pm 0.1$ V, $\Phi_v: \pm 5$ %, $R_a: \pm 3.0$, $R9: \pm 6.5$ on measurements

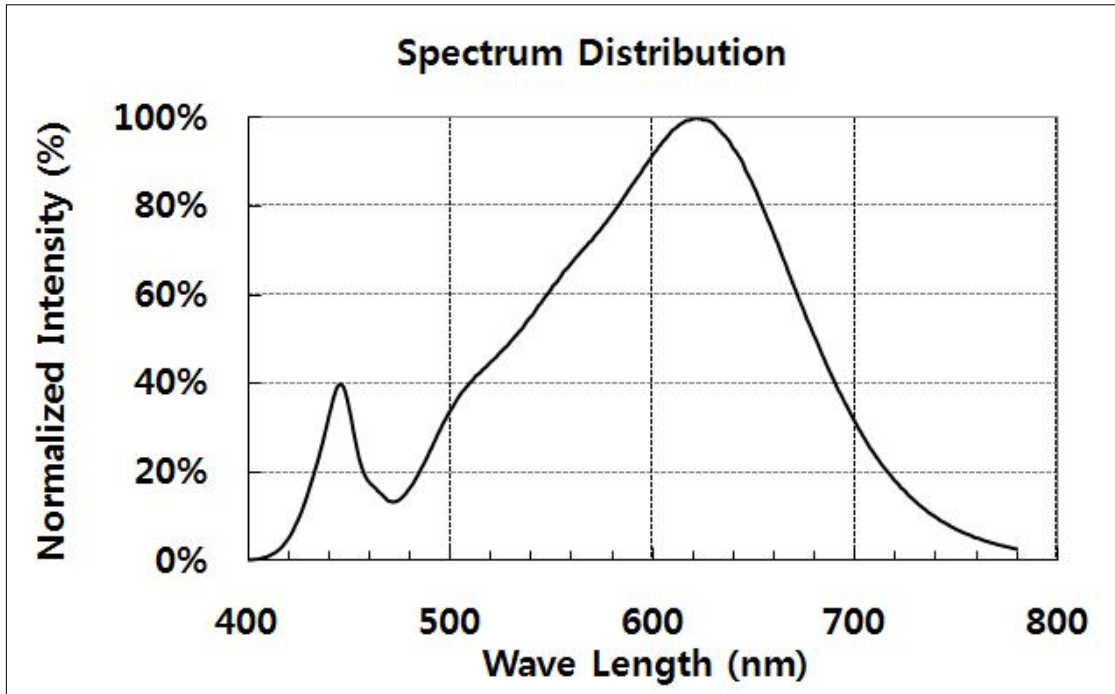
5) " * " is Product Code of "SPMWHT223MD7"

4. Typical Characteristics Graph (@65mA)

1) Spectrum Distribution

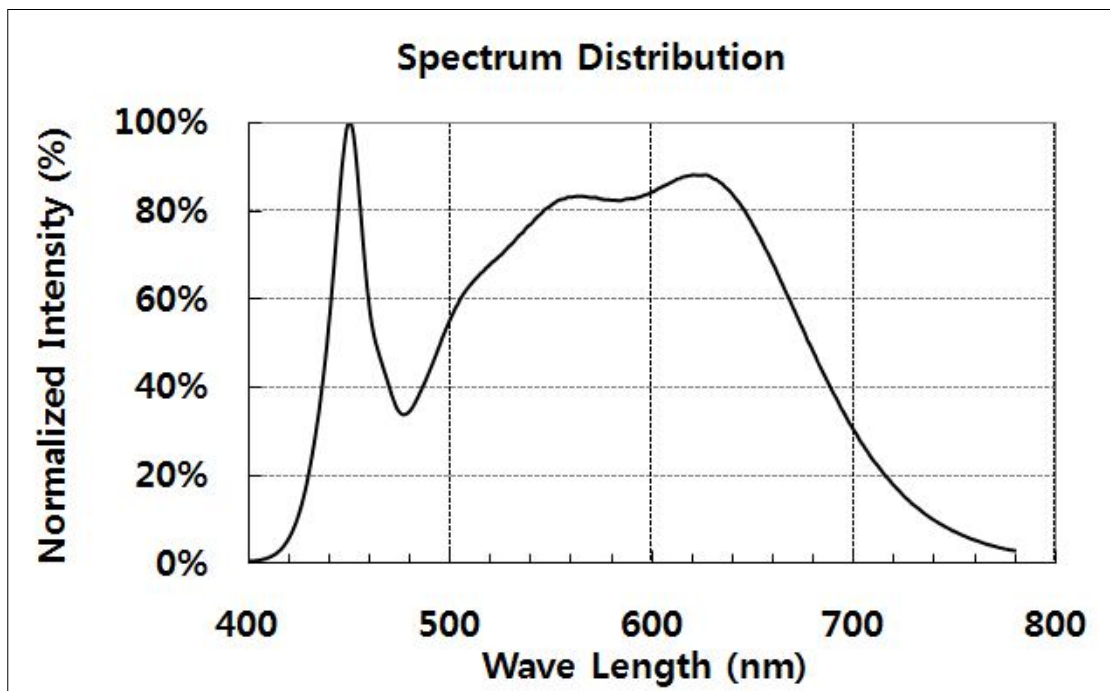
[CCT : 2700K & 3000K]

$T_s = 25^\circ\text{C}$



[CCT : 3500K & 4000K]

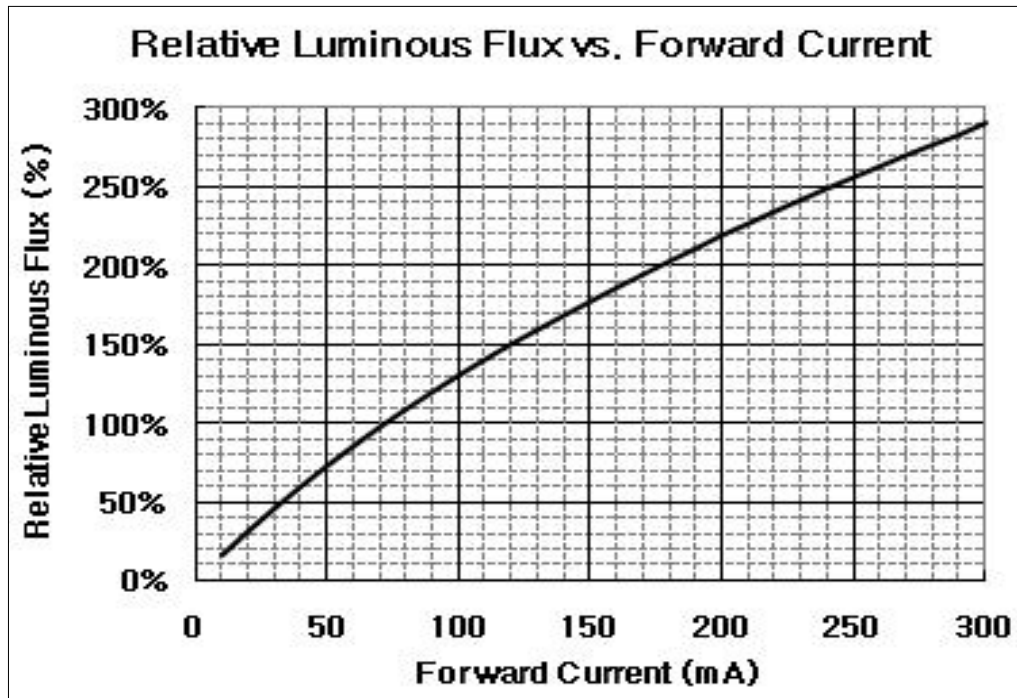
$T_s = 25^\circ\text{C}$



2) Forward Current Characteristics

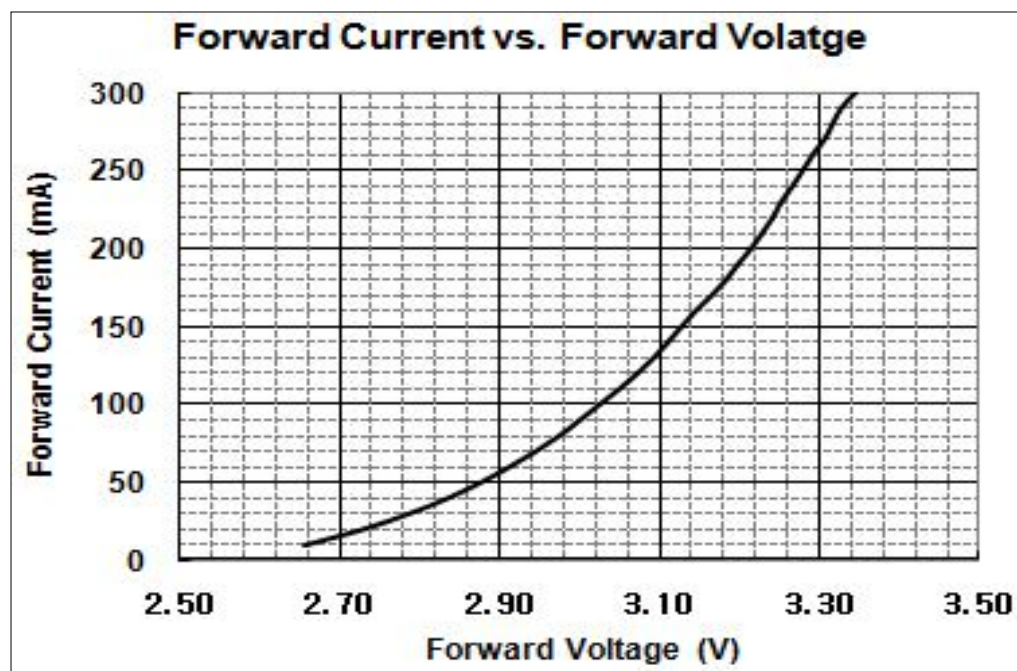
[Relative Luminous Flux vs. Forward Current]

$T_s = 25^\circ\text{C}$



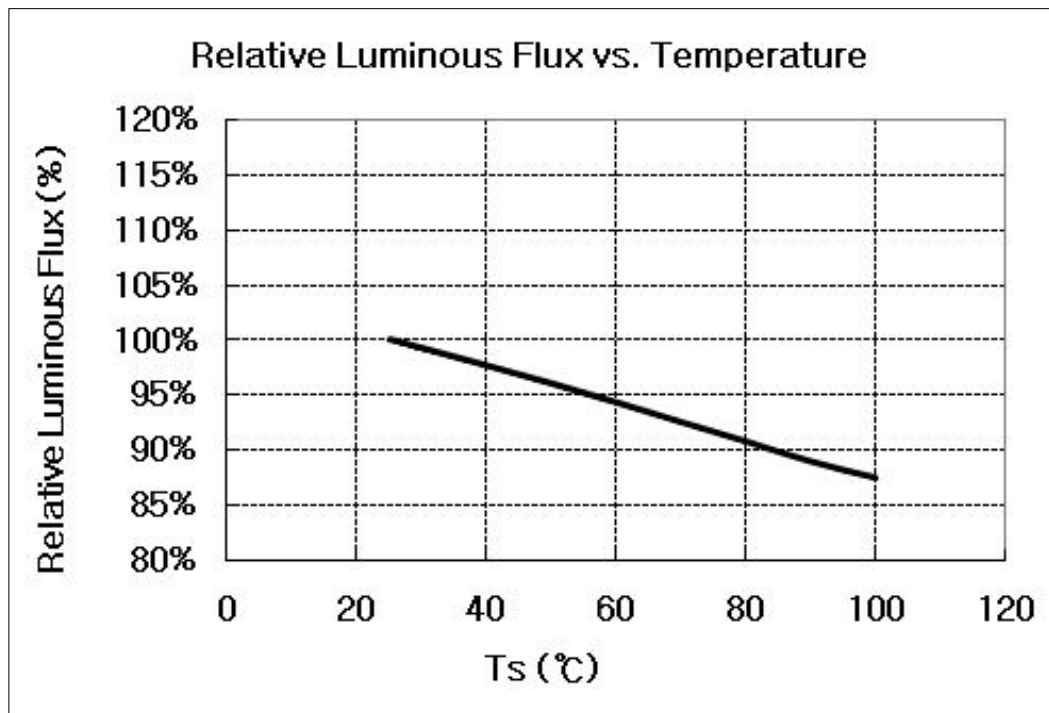
[Forward Current vs. Forward Voltage]

$T_s = 25^\circ\text{C}$

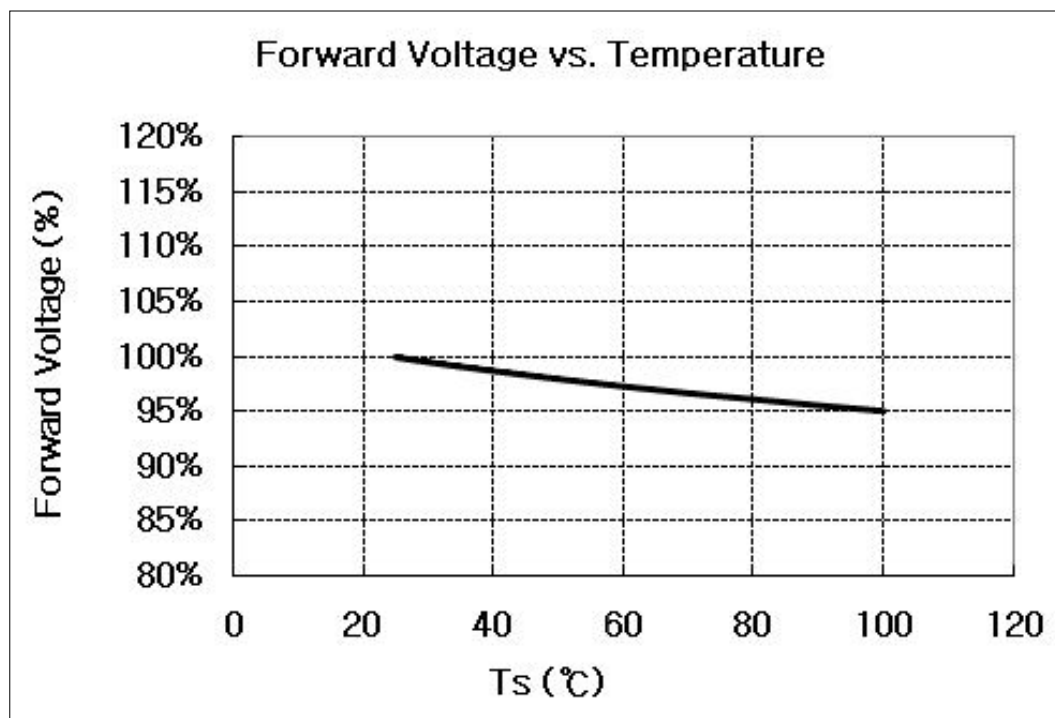


3) Temperature Characteristics (@65mA)

[Relative Luminous Flux vs. Ts (solder temp.)]

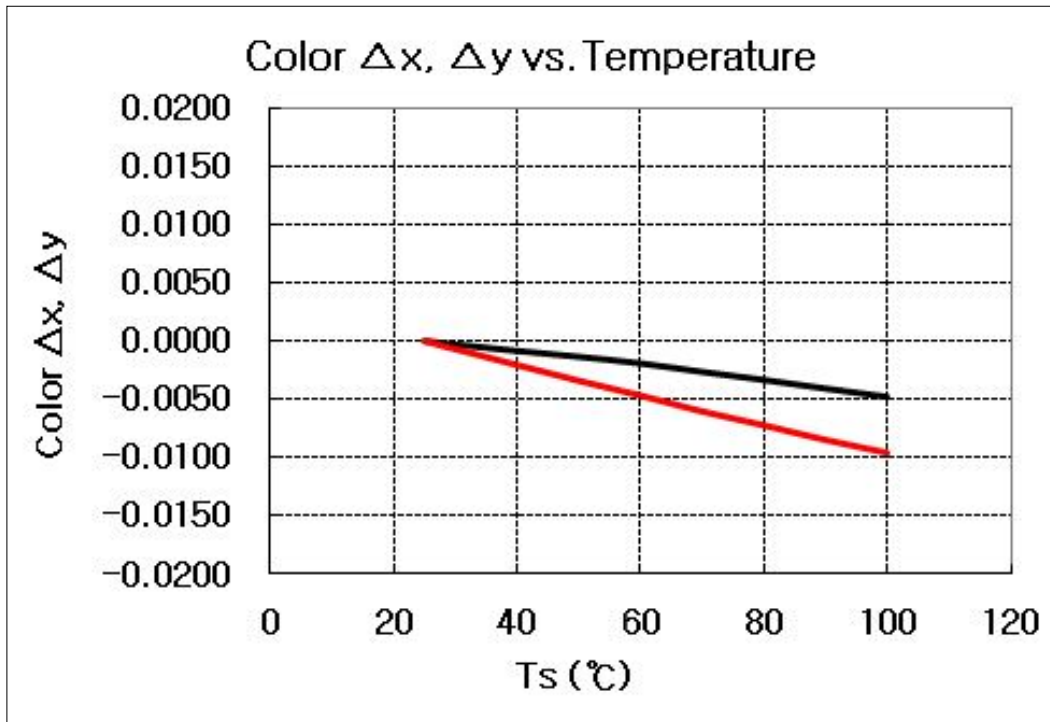


[Forward Voltage vs. Ts (solder temp.)]



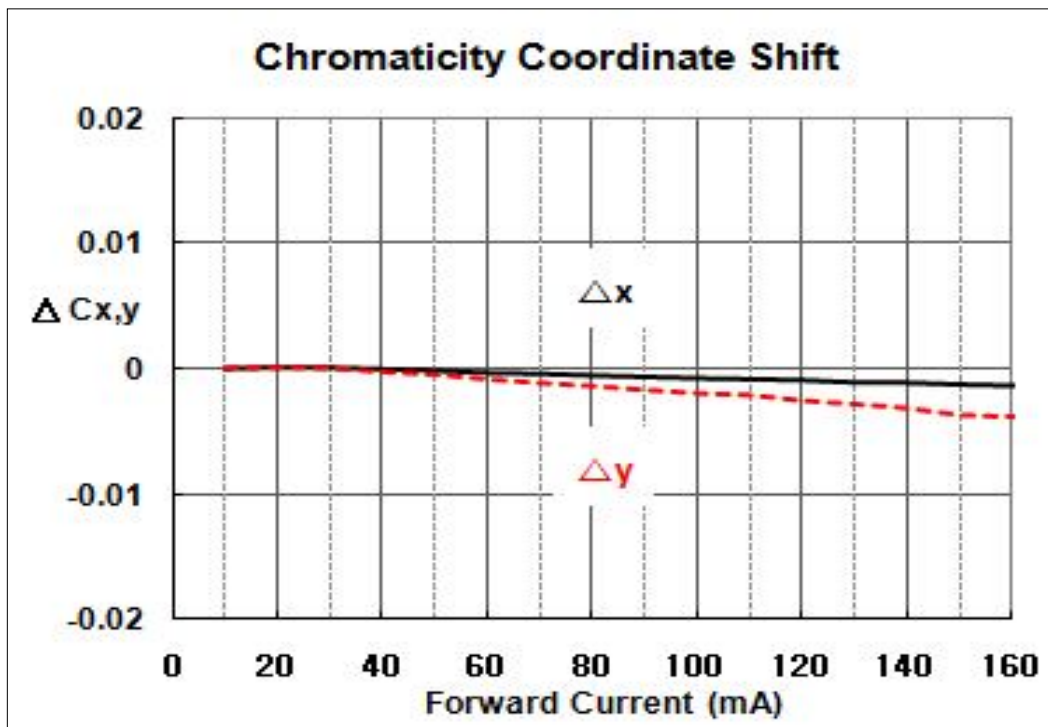
[Color Δx , Δy vs. T_s (solder temp.) @65mA]

CCT : 3000K



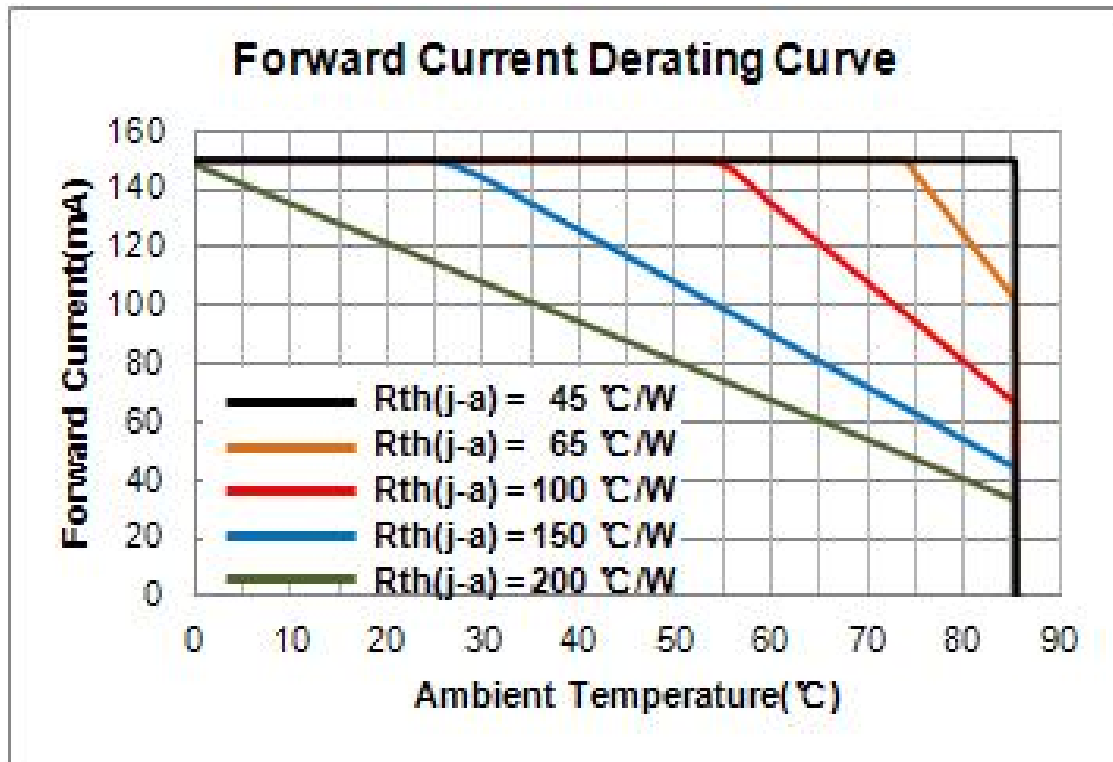
4) Color shift Characteristics ($T_s = 25^\circ\text{C}$)

[Color Δx , Δy vs. Forward Current



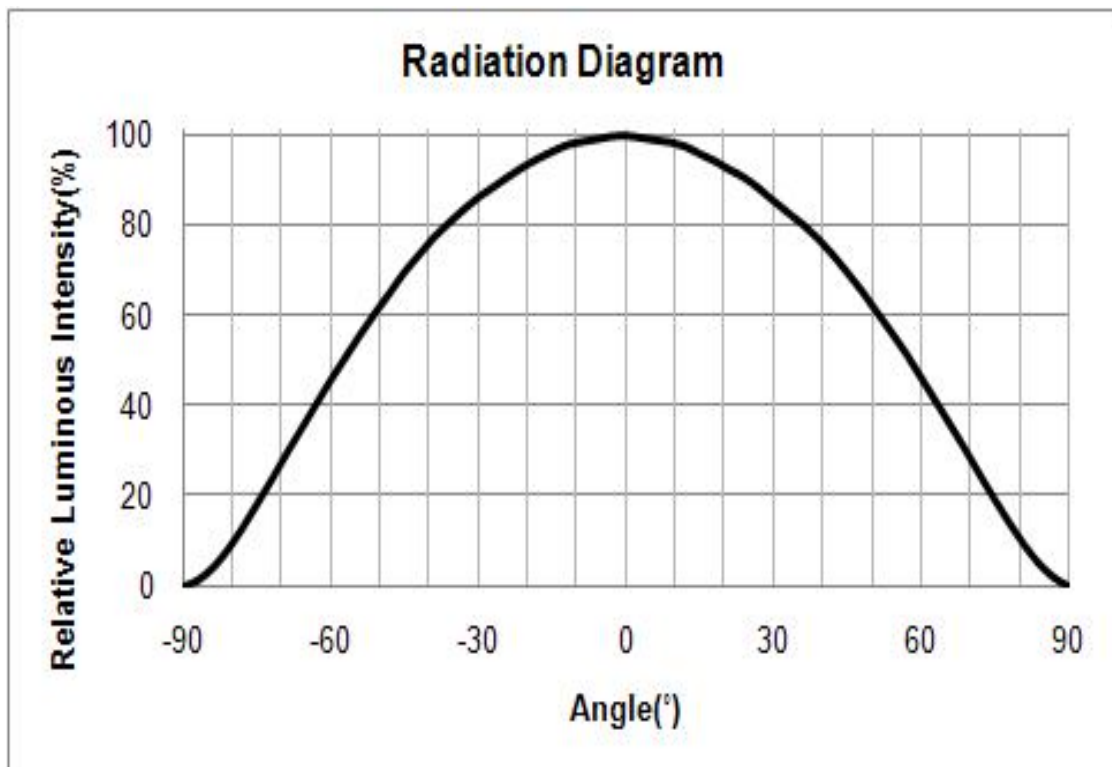
5) Derating Curve

$T_a = 25^\circ\text{C}$

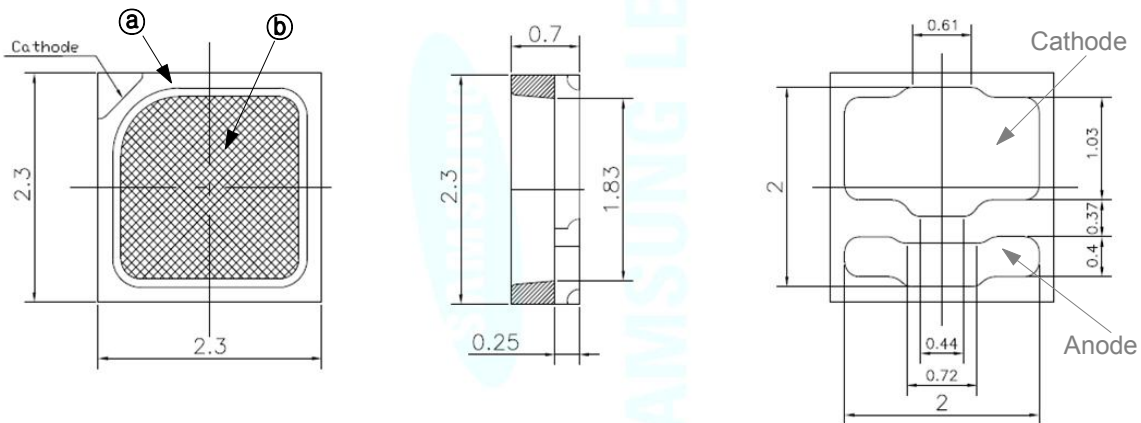


6) Beam Angle Characteristics (@65mA)

$T_s = 25^\circ\text{C}$

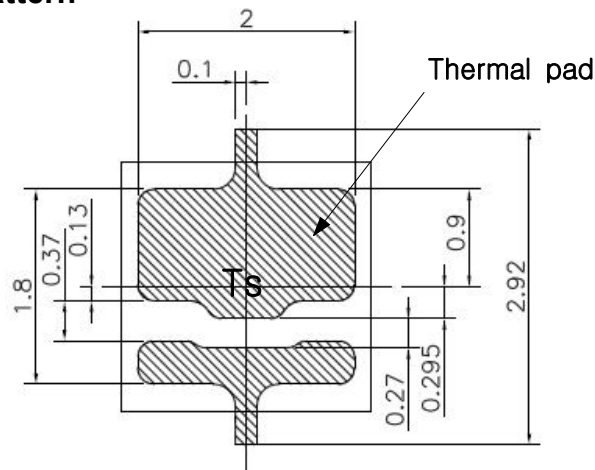


5. Outline Drawing & Dimension



1. Tolerance is ± 0.1 mm
2. The maximum compressing force is 15N on the silicone ①
3. Do not place pressure on the encapsulation resin ②

Recommended Land Pattern

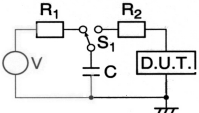


Notes:

- 1) This LED has built-in ESD protection device(s) connected in parallel to LED Chip(s).
- 2) Ts point & measurement method
 - ① Measure the nearest point to the thermal pad. If necessary, remove PSR of PCB to reach Ts point.
 - ② Thermal pad must be soldered to the PCB to dissipate heat properly. Otherwise, LED can be damaged.
- 3) The thermal pad is electrically connected to the cathode contact pads.
- 4) Precautions
 - ① The pressure on the LEDs will influence to the reliability of the LEDs. Precautions should be taken to avoid the strong pressure on the LEDs. Do not put stress on the LEDs during heating.
 - ② Re-soldering should not be done after the LEDs have been soldered. If re-soldering is unavoidable, LED's characteristics should be carefully checked before and after such repair.
 - ③ Do not stack assembled PCBs together. Since materials of LEDs is soft, abrasion between two PCB assembled with LED might cause catastrophic failure of the LEDs.

6. Reliability Test Items & Conditions

1) Test Items and Results

Test Item	Test Conditions	Test Hours/Cycles	Sample No
MSL Test	125°C, 24hrs → 60°C, 60%RH, 120hrs → Peak 260±5°C, 220°C over time 60sec, 3 cycles	1 cycle	11
Room Temperature Life Test	25°C±3°C, DC 150mA	1,000 hrs	22
High Temperature Life Test	85°C±3°C, DC 150mA	1,000 hrs	22
High Temperature Humidity Life Test	85°C±3°C, 85%±2%RH, DC 150mA	1,000 hrs	22
Low Temperature Life Test	-40°C±3°C, DC 150mA	1,000 hrs	22
Powered Temperature Cycle Test	-45°C/20min ↔ 85°C/20min, Sweep 100min cycle on/off: each 5min, DC 150mA	100 cycles	22
Thermal Shock	-45°C/15min ↔ 125°C/15min, → Hot plate 180°C	500 cycles	100
High Temperature Storage	Ta=120°C±3°C	1,000 hrs	11
Low Temperature Storage	Ta=-40°C±3°C	1,000 hrs	11
ESD(HBM)		5 times	5
ESD(MM)		5 times	5
Vibration Test	20~2000~20 Hz 200 m/s ² , Sweep 4 min X, Y, Z 3 direction, each 1 cycle	4 cycles	11
Mechanical Shock Test	1500G, 0.5ms,	5 cycles	11

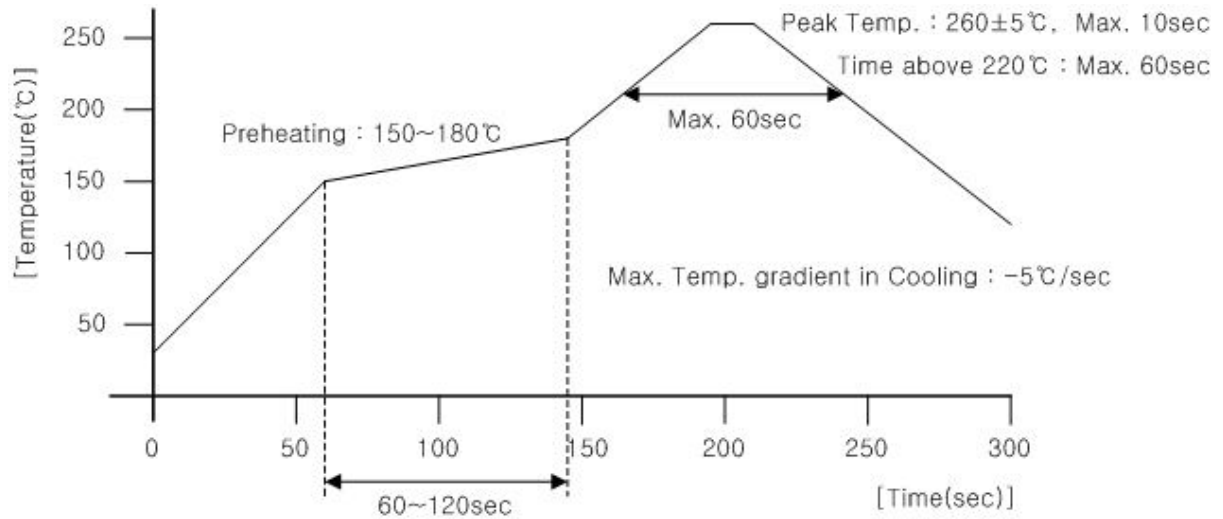
2) Criteria for Judging the Damage

Item	Symbol	Test Condition	Limit	
			Min	Max
Forward Voltage	V _F	I _F = 65 mA	Init. Value*0.9	Init. Value*1.1
Luminous Flux	Φ _v	I _F = 65 mA	Init. Value*0.7	Init. Value*1.1

7. Solder Conditions

1) Reflow Conditions (Pb Free)

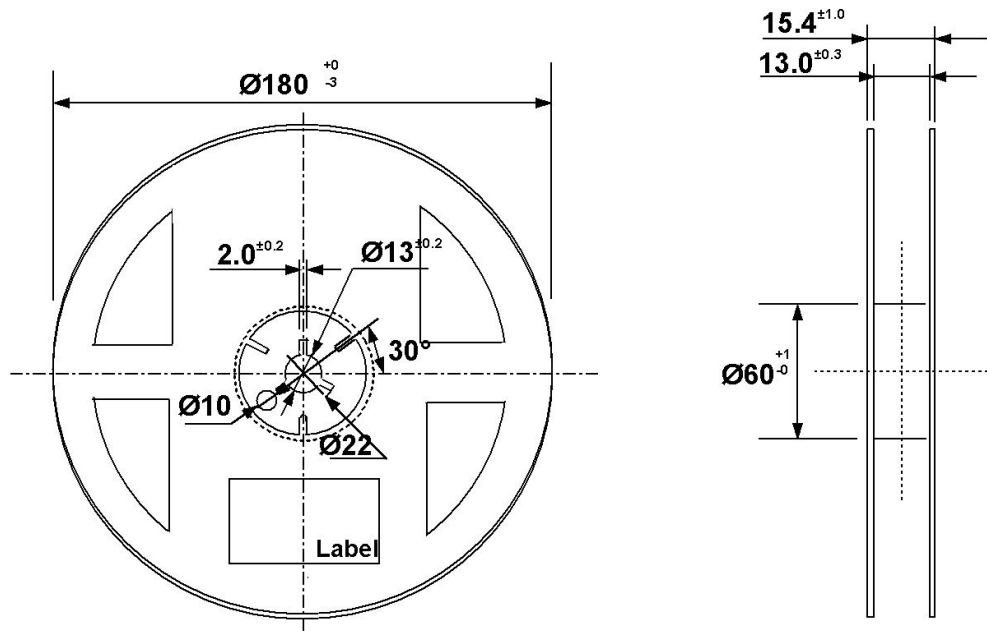
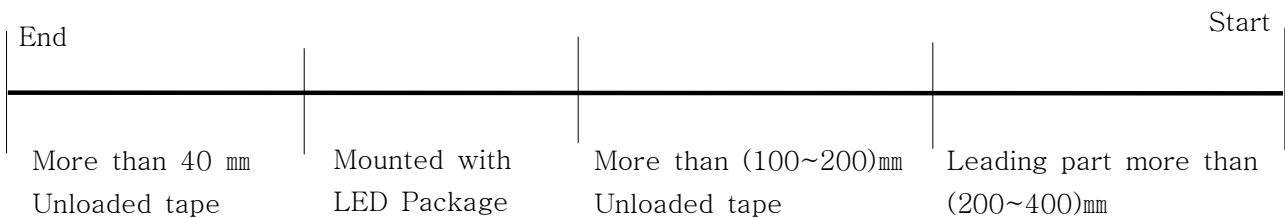
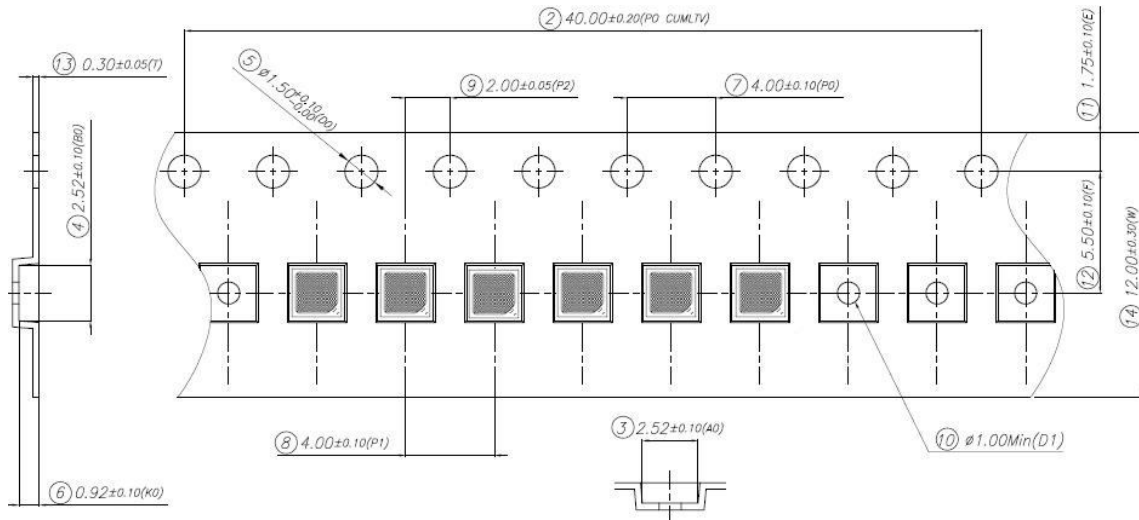
Reflow Frequency : 2 times max.



2) For Manual Soldering

Not more than 5 seconds @Max. 300°C, under soldering iron.

8. Tape & Reel

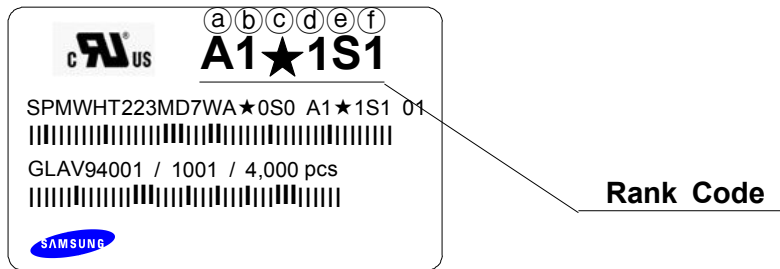


Tolerance ± 0.2 , Unit:mm

- (1) Quantity : The quantity/reel to be 4,000 pcs.
- (2) Cumulative Tolerance : Cumulative tolerance/10 pitches to be ± 0.2 mm
- (3) Adhesion Strength of Cover Tape : Adhesion strength to be 0.1-0.7 N when the cover tape is turned off from the carrier tape at 10 °C angle to be the carrier tape.
- (4) Packaging : P/N, Manufacturing data code no. and quantity to be indicated on a damp proof package.

9. Label Structure

1) Label Structure



N.B) Denoted rank is the only example.

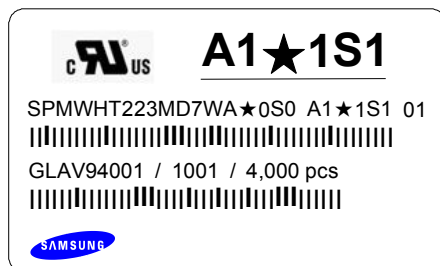
'★' means All kind of Chromaticity Coordinate Rank.

Rank Code

- ①② : Forward Voltage(V_F) Rank
- ③④ : Chromaticity Coordinate Rank
- ⑤⑥ : Luminous Intensity(cd) Rank

2) LOT Number

The Lot number is composed of the following characters



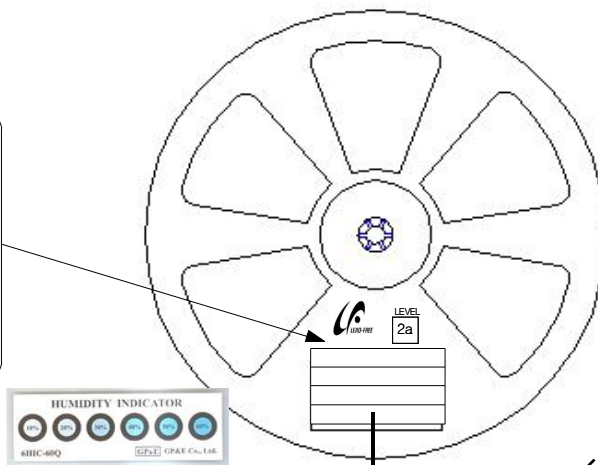
①②③④⑤⑥⑦⑧⑨ / 1①②③ / 4,000 PCS

- ① : Production site (S: Giheung, Korea, G: Tianjin, China)
- ② : L (LED)
- ③ : Product State (A:Normality, B:Bulk, C:First Production, R:Reproduction, S:Sample)
- ④ : Year (Y: 2014, Z: 2015, A:2016...)
- ⑤ : Month (1 ~ 9, A, B, C)
- ⑥ : Day (1 ~ 9, A, B ~ V)
- ⑦⑧⑨ : Product serial number (001 ~ 999)
- ①②③ : Reel Number (001 ~ 999)

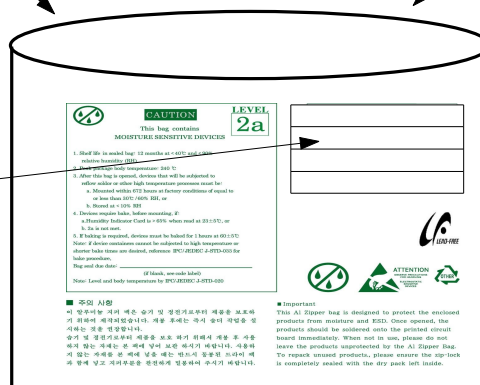
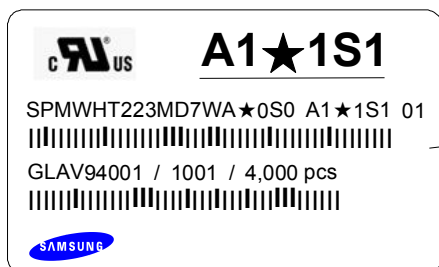
10. Packing Structure

1) Packing Process

Reel



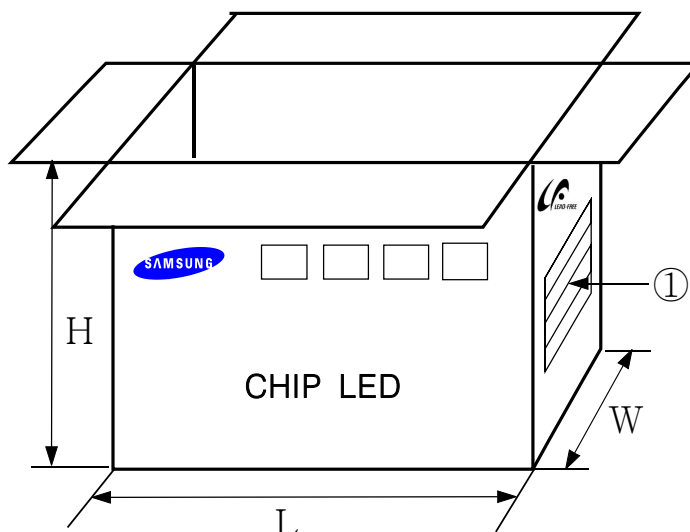
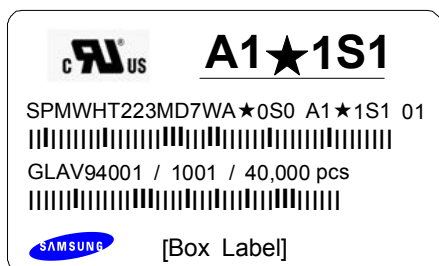
Aluminum Vinyl Bag



Material : Paper(SW3B(B))

TYPE	SIZE(mm)			Reels/ box
	a	b	c	
7inch	245±5	220±5	182±5	Up to 10 Reels
	245±5	220±5	86±5	Up to 5 Reels

① SIDE



2) Aluminum Packing Bag



CAUTION
 This bag contains
MOISTURE SENSITIVE DEVICES

LEVEL
2a

1. Shelf life in sealed bag: 12 months at <40°C and <90% relative humidity (RH)
2. Peak package body temperature: 240 °C
3. After this bag is opened, devices that will be subjected to reflow solder or other high temperature processes must be:
 - a. Mounted within 672 hours at factory conditions of equal to or less than 30°C /60% RH, or
 - b. Stored at <10% RH
4. Devices require bake, before mounting, if:
 - a. Humidity Indicator Card is > 65% when read at 23±5°C, or
 - b. 2a is not met.
5. If baking is required, devices must be baked for 1 hours at 60±5°C

Note: if device containers cannot be subjected to high temperature or shorter bake times are desired, reference IPC/JEDEC J-STD-033 for bake procedure,

Bag seal due date: _____
 (if blank, see code label)

Note: Level and body temperature by IPC/JEDEC J-STD-020



A1★1S1

SPMWHT223MD7WA★0S0 A1★1S1 01

GLAV94001 / 1001 / 4,000 pcs






ATTENTION
 OBSERVE PRECAUTIONS
 FOR HANDLING
 ELECTROSTATIC
 SENSITIVE
 DEVICES



■ 주의 사항

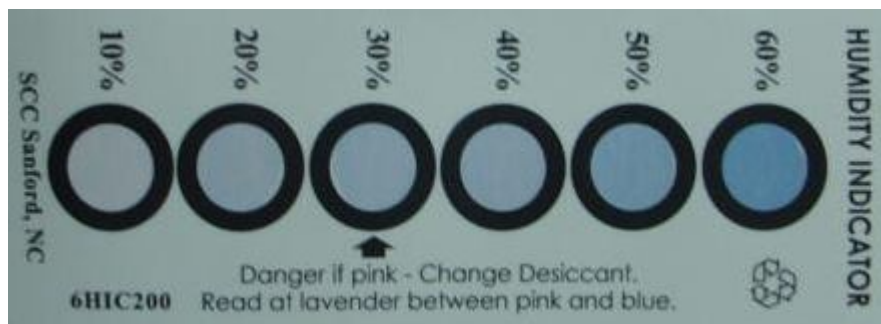
이 알루미늄 지퍼 백은 습기 및 정전기로부터 제품을 보호하기 위하여 제작되었습니다. 개봉 후에는 즉시 솔더 작업을 실시하는 것을 권장합니다.

습기 및 정전기로부터 제품을 보호 하기 위해서 개봉 후 사용하지 않는 자재는 본 팩에 넣어 보관 하시기 바랍니다. 사용하지 않는 자재를 본 팩에 넣을 때는 반드시 동봉된 드라이 팩과 함께 넣고 지퍼부분을 완전하게 밀봉하여 주시기 바랍니다.

■ Important

This Al Zipper bag is designed to protect the enclosed products from moisture and ESD. Once opened, the products should be soldered onto the printed circuit board immediately. When not in use, please do not leave the products unprotected by the Al Zipper Bag. To repack unused products., please ensure the zip-lock is completely sealed with the dry pack left inside.

Silica gel & Humidity Indicator Card in Aluminum Vinyl Bag



11. Kitting Rule

1) Kitting bin Concept – 2700K, 3000K, 3500K and 4000K

1. This item is included to ☆K models.
2. Under agreement between customer and SAMSUNG ELECTRONICS, SAMSUNG can supply kitting bin(V_F , Color, lm).
3. A forward voltage(V_F) of kitting bin is combined by a pair of same V_F rank such as (A1+A1), (A2+A2), (A3+A3), (A4+A4) or (AZ+AZ).
4. A Chromaticity Coordinates of kitting bin is mixed by kitting procedure.(below kitting simulation)
Especially, one of 1, 2, 3, or 4 rank can be mixed with other rank, or can be used alone.
5. A luminous flux(lm) is average by kitting procedure.(below kitting simulation)
For example Kitting lm is average S1 and S2 [Kitting lm = $(S1+S2)/2$]
6. '□' means one of the W(2700K), V(3000K), U(3500K) and T(4000K) a segment of the CCT rank.

[Kitting example]

Target

	D	E	F	G
9		A	B	C
5		6	7	8
1		2	3	4

User can get the green box position by kitting combination.

Kitting Combination :

Figure 1 displays a 4x4 grid of 16 small 4x4 grids, each representing a different state of a 4x4 grid. The grids are arranged in a 4x4 pattern. Each small grid has columns labeled D, E, F, G and rows labeled 9, 5, 1, and an unlabeled row. The cells contain letters A, B, C, D, E, F, G or numbers 1, 2, 3, 4, 5, 6, 7, 8. The grids show various combinations of highlighted cells (blue, orange, green, red, yellow) representing different states or transitions.

[Kitting combination – 2700K, 3000K, 3500K and 4000K]

-	RANK 1	RANK 2	RANK 1	RANK 2	RANK 1	RANK 2	RANK 1	RANK 2	RANK 1	RANK 2	RANK 1	RANK 2
1	A1□1S1	A1□GS1	A2□1S1	A2□FS1	A3□1S1	A3□BS1	A4□1S1	A4□CS1	AZ□2S1	AZ□GS1	A1□2S1	A1□ES1
2	A1□1S1	A1□GS2	A2□1S1	A2□FS2	A3□1S1	A3□BS2	A4□1S1	A4□CS2	AZ□2S1	AZ□GS2	A1□2S1	A1□ES2
3	A1□1S1	A1□GS3	A2□1S1	A2□FS3	A3□1S1	A3□BS3	A4□1S1	A4□CS3	AZ□2S1	AZ□GS3	A1□2S1	A1□ES3
4	A1□1S2	A1□GS1	A2□1S2	A2□FS1	A3□1S2	A3□BS1	A4□1S2	A4□CS1	AZ□2S2	AZ□GS1	A1□2S2	A1□ES1
5	A1□1S2	A1□GS2	A2□1S2	A2□FS2	A3□1S2	A3□BS2	A4□1S2	A4□CS2	AZ□2S2	AZ□GS2	A1□2S2	A1□ES2
6	A1□1S2	A1□GS3	A2□1S2	A2□FS3	A3□1S2	A3□BS3	A4□1S2	A4□CS3	AZ□2S2	AZ□GS3	A1□2S2	A1□ES3
7	A1□1S3	A1□GS1	A2□1S3	A2□FS1	A3□1S3	A3□BS1	A4□1S3	A4□CS1	AZ□2S3	AZ□GS1	A1□2S3	A1□ES1
8	A1□1S3	A1□GS2	A2□1S3	A2□FS2	A3□1S3	A3□BS2	A4□1S3	A4□CS2	AZ□2S3	AZ□GS2	A1□2S3	A1□ES2
9	A1□1S3	A1□GS3	A2□1S3	A2□FS3	A3□1S3	A3□BS3	A4□1S3	A4□CS3	AZ□2S3	AZ□GS3	A1□2S3	A1□ES3
10	A2□1S1	A2□GS1	A3□1S1	A3□FS1	A4□1S1	A4□BS1	AZ□1S1	AZ□CS1	A1□2S1	A1□FS1	A1□AS1	A1□AS1
11	A2□1S1	A2□GS2	A3□1S1	A3□FS2	A4□1S1	A4□BS2	AZ□1S1	AZ□CS2	A1□2S1	A1□FS2	A1□AS1	A1□AS2
12	A2□1S1	A2□GS3	A3□1S1	A3□FS3	A4□1S1	A4□BS3	AZ□1S1	AZ□CS3	A1□2S1	A1□FS3	A1□AS1	A1□AS3
13	A2□1S2	A2□GS1	A3□1S2	A3□FS1	A4□1S2	A4□BS1	AZ□1S2	AZ□CS1	A1□2S2	A1□FS1	A1□AS2	A1□AS1
14	A2□1S2	A2□GS2	A3□1S2	A3□FS2	A4□1S2	A4□BS2	AZ□1S2	AZ□CS2	A1□2S2	A1□FS2	A1□AS2	A1□AS2
15	A2□1S2	A2□GS3	A3□1S2	A3□FS3	A4□1S2	A4□BS3	AZ□1S2	AZ□CS3	A1□2S2	A1□FS3	A1□AS2	A1□AS3
16	A2□1S3	A2□GS1	A3□1S3	A3□FS1	A4□1S3	A4□BS1	AZ□1S3	AZ□CS1	A1□2S3	A1□FS1	A1□AS3	A1□AS1
17	A2□1S3	A2□GS2	A3□1S3	A3□FS2	A4□1S3	A4□BS2	AZ□1S3	AZ□CS2	A1□2S3	A1□FS2	A1□AS3	A1□AS2
18	A2□1S3	A2□GS3	A3□1S3	A3□FS3	A4□1S3	A4□BS3	AZ□1S3	AZ□CS3	A1□2S3	A1□FS3	A1□AS3	A1□AS3
19	A3□1S1	A3□GS1	A4□1S1	A4□FS1	AZ□1S1	AZ□BS1	A1□2S1	A1□GS1	A2□2S1	A2□FS1	A2□AS1	A2□AS1
20	A3□1S1	A3□GS2	A4□1S1	A4□FS2	AZ□1S1	AZ□BS2	A1□2S1	A1□GS2	A2□2S1	A2□FS2	A2□AS1	A2□AS2
21	A3□1S1	A3□GS3	A4□1S1	A4□FS3	AZ□1S1	AZ□BS3	A1□2S1	A1□GS3	A2□2S1	A2□FS3	A2□AS1	A2□AS3
22	A3□1S2	A3□GS1	A4□1S2	A4□FS1	AZ□1S2	AZ□BS1	A1□2S2	A1□GS1	A2□2S2	A2□FS1	A2□AS2	A2□AS1
23	A3□1S2	A3□GS2	A4□1S2	A4□FS2	AZ□1S2	AZ□BS2	A1□2S2	A1□GS2	A2□2S2	A2□FS2	A2□AS2	A2□AS2
24	A3□1S2	A3□GS3	A4□1S2	A4□FS3	AZ□1S2	AZ□BS3	A1□2S2	A1□GS3	A2□2S2	A2□FS3	A2□AS2	A2□AS3
25	A3□1S3	A3□GS1	A4□1S3	A4□FS1	AZ□1S3	AZ□BS1	A1□2S3	A1□GS1	A2□2S3	A2□FS1	A2□AS3	A2□AS1
26	A3□1S3	A3□GS2	A4□1S3	A4□FS2	AZ□1S3	AZ□BS2	A1□2S3	A1□GS2	A2□2S3	A2□FS2	A2□AS3	A2□AS2
27	A3□1S3	A3□GS3	A4□1S3	A4□FS3	AZ□1S3	AZ□BS3	A1□2S3	A1□GS3	A2□2S3	A2□FS3	A2□AS3	A2□AS3
28	A4□1S1	A4□GS1	AZ□1S1	AZ□FS1	A1□1S1	A1□CS1	A2□2S1	A2□GS1	A3□2S1	A3□FS1	A3□AS1	A3□AS1
29	A4□1S1	A4□GS2	AZ□1S1	AZ□FS2	A1□1S1	A1□CS2	A2□2S1	A2□GS2	A3□2S1	A3□FS2	A3□AS1	A3□AS2
30	A4□1S1	A4□GS3	AZ□1S1	AZ□FS3	A1□1S1	A1□CS3	A2□2S1	A2□GS3	A3□2S1	A3□FS3	A3□AS1	A3□AS3
31	A4□1S2	A4□GS1	AZ□1S2	AZ□FS1	A1□1S2	A1□CS1	A2□2S2	A2□GS1	A3□2S2	A3□FS1	A3□AS2	A3□AS1
32	A4□1S2	A4□GS2	AZ□1S2	AZ□FS2	A1□1S2	A1□CS2	A2□2S2	A2□GS2	A3□2S2	A3□FS2	A3□AS2	A3□AS2
33	A4□1S2	A4□GS3	AZ□1S2	AZ□FS3	A1□1S2	A1□CS3	A2□2S2	A2□GS3	A3□2S2	A3□FS3	A3□AS2	A3□AS3
34	A4□1S3	A4□GS1	AZ□1S3	AZ□FS1	A1□1S3	A1□CS1	A2□2S3	A2□GS1	A3□2S3	A3□FS1	A3□AS3	A3□AS1
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36	A4□1S3	A4□GS3	AZ□1S3	AZ□FS3	A1□1S3	A1□CS3	A2□2S3	A2□GS3	A3□2S3	A3□FS3	A3□AS3	A3□AS3
37	AZ□1S1	AZ□GS1	A1□1S1	A1□BS1	A2□1S1	A2□CS1	A3□2S1	A3□GS1	A4□2S1	A4□FS1	A4□AS1	A4□AS1
38	AZ□1S1	AZ□GS2	A1□1S1	A1□BS2	A2□1S1	A2□CS2	A3□2S1	A3□GS2	A4□2S1	A4□FS2	A4□AS1	A4□AS2
39	AZ□1S1	AZ□GS3	A1□1S1	A1□BS3	A2□1S1	A2□CS3	A3□2S1	A3□GS3	A4□2S1	A4□FS3	A4□AS1	A4□AS3
40	AZ□1S2	AZ□GS1	A1□1S2	A1□BS1	A2□1S2	A2□CS1	A3□2S2	A3□GS1	A4□2S2	A4□FS1	A4□AS2	A4□AS1
41	AZ□1S2	AZ□GS2	A1□1S2	A1□BS2	A2□1S2	A2□CS2	A3□2S2	A3□GS2	A4□2S2	A4□FS2	A4□AS2	A4□AS2
42	AZ□1S2	AZ□GS3	A1□1S2	A1□BS3	A2□1S2	A2□CS3	A3□2S2	A3□GS3	A4□2S2	A4□FS3	A4□AS2	A4□AS3
43	AZ□1S3	AZ□GS1	A1□1S3	A1□BS1	A2□1S3	A2□CS1	A3□2S3	A3□GS1	A4□2S3	A4□FS1	A4□AS3	A4□AS1
44	AZ□1S3	AZ□GS2	A1□1S3	A1□BS2	A2□1S3	A2□CS2	A3□2S3	A3□GS2	A4□2S3	A4□FS2	A4□AS3	A4□AS2
45	A1□1S1	A1□GS1	A2□1S1	A2□FS1	A3□1S1	A3□BS1	A4□1S1	A4□CS1	AZ□2S1	AZ□GS1	A1□2S1	A1□ES1
46	A1□1S1	A1□GS2	A2□1S1	A2□FS2	A3□1S1	A3□BS2	A4□1S1	A4□CS2	AZ□2S1	AZ□GS2	A1□2S1	A1□ES2
47	A1□1S1	A1□GS3	A2□1S1	A2□FS3	A3□1S1	A3□BS3	A4□1S1	A4□CS3	AZ□2S1	AZ□GS3	A1□2S1	A1□ES3
48	A1□1S2	A1□GS1	A2□1S2	A2□FS1	A3□1S2	A3□BS1	A4□1S2	A4□CS1	AZ□2S2	AZ□GS1	A1□2S2	A1□ES1
49	A1□1S2	A1□GS2	A2□1S2	A2□FS2	A3□1S2	A3□BS2	A4□1S2	A4□CS2	AZ□2S2	AZ□GS2	A1□2S2	A1□ES2
50	A1□1S2	A1□GS3	A2□1S2	A2□FS3	A3□1S2	A3□BS3	A4□1S2	A4□CS3	AZ□2S2	AZ□GS3	A1□2S2	A1□ES3
51	A1□1S3	A1□GS1	A2□1S3	A2□FS1	A3□1S3	A3□BS1	A4□1S3	A4□CS1	AZ□2S3	AZ□GS1	A1□2S3	A1□ES1
52	A1□1S3	A1□GS2	A2□1S3	A2□FS2	A3□1S3	A3□BS2	A4□1S3	A4□CS2	AZ□2S3	AZ□GS2	A1□2S3	A1□ES2
53	A1□1S3	A1□GS3	A2□1S3	A2□FS3	A3□1S3	A3□BS3	A4□1S3	A4□CS3	AZ□2S3	AZ□GS3	A1□2S3	A1□ES3
54	A2□1S1	A2□GS1	A3□1S1	A3□FS1	A4□1S1	A4□BS1	AZ□1S1	AZ□CS1	A1□2S1	A1□FS1	A1□AS1	A1□AS1

[Kitting combination – 2700K, 3000K, 3500K and 4000K]

	RANK 1	RANK 2	RANK 1	RANK 2	RANK 1	RANK 2	RANK 1	RANK 2	RANK 1	RANK 2	RANK 1	RANK 2
1	A2□2S1	A2□ES1	A3□2S1	A3□CS1	A4□2S1	A4□AS1	AZ□2S1	AZ□BS1	A1□3S1	A1□ES1	A2□3S1	A2□DS1
2	A2□2S1	A2□ES2	A3□2S1	A3□CS2	A4□2S1	A4□AS2	AZ□2S1	AZ□BS2	A1□3S1	A1□ES2	A2□3S1	A2□DS2
3	A2□2S1	A2□ES3	A3□2S1	A3□CS3	A4□2S1	A4□AS3	AZ□2S1	AZ□BS3	A1□3S1	A1□ES3	A2□3S1	A2□DS3
4	A2□2S2	A2□ES1	A3□2S2	A3□CS1	A4□2S2	A4□AS1	AZ□2S2	AZ□BS1	A1□3S2	A1□ES1	A2□3S2	A2□DS1
5	A2□2S2	A2□ES2	A3□2S2	A3□CS2	A4□2S2	A4□AS2	AZ□2S2	AZ□BS2	A1□3S2	A1□ES2	A2□3S2	A2□DS2
6	A2□2S2	A2□ES3	A3□2S2	A3□CS3	A4□2S2	A4□AS3	AZ□2S2	AZ□BS3	A1□3S2	A1□ES3	A2□3S2	A2□DS3
7	A2□2S3	A2□ES1	A3□2S3	A3□CS1	A4□2S3	A4□AS1	AZ□2S3	AZ□BS1	A1□3S3	A1□ES1	A2□3S3	A2□DS1
8	A2□2S3	A2□ES2	A3□2S3	A3□CS2	A4□2S3	A4□AS2	AZ□2S3	AZ□BS2	A1□3S3	A1□ES2	A2□3S3	A2□DS2
9	A2□2S3	A2□ES3	A3□2S3	A3□CS3	A4□2S3	A4□AS3	AZ□2S3	AZ□BS3	A1□3S3	A1□ES3	A2□3S3	A2□DS3
10	A3□2S1	A3□ES1	A4□2S1	A4□CS1	AZ□2S1	AZ□AS1	A1□3S1	A1□FS1	A2□3S1	A2□ES1	A3□3S1	A3□DS1
11	A3□2S1	A3□ES2	A4□2S1	A4□CS2	AZ□2S1	AZ□AS2	A1□3S1	A1□FS2	A2□3S1	A2□ES2	A3□3S1	A3□DS2
12	A3□2S1	A3□ES3	A4□2S1	A4□CS3	AZ□2S1	AZ□AS3	A1□3S1	A1□FS3	A2□3S1	A2□ES3	A3□3S1	A3□DS3
13	A3□2S2	A3□ES1	A4□2S2	A4□CS1	AZ□2S2	AZ□AS1	A1□3S2	A1□FS1	A2□3S2	A2□ES1	A3□3S2	A3□DS1
14	A3□2S2	A3□ES2	A4□2S2	A4□CS2	AZ□2S2	AZ□AS2	A1□3S2	A1□FS2	A2□3S2	A2□ES2	A3□3S2	A3□DS2
15	A3□2S2	A3□ES3	A4□2S2	A4□CS3	AZ□2S2	AZ□AS3	A1□3S2	A1□FS3	A2□3S2	A2□ES3	A3□3S2	A3□DS3
16	A3□2S3	A3□ES1	A4□2S3	A4□CS1	AZ□2S3	AZ□AS1	A1□3S3	A1□FS1	A2□3S3	A2□ES1	A3□3S3	A3□DS1
17	A3□2S3	A3□ES2	A4□2S3	A4□CS2	AZ□2S3	AZ□AS2	A1□3S3	A1□FS2	A2□3S3	A2□ES2	A3□3S3	A3□DS2
18	A3□2S3	A3□ES3	A4□2S3	A4□CS3	AZ□2S3	AZ□AS3	A1□3S3	A1□FS3	A2□3S3	A2□ES3	A3□3S3	A3□DS3
19	A4□2S1	A4□ES1	AZ□2S1	AZ□CS1	A1□2S1	A1□BS1	A2□3S1	A2□FS1	A3□3S1	A3□ES1	A4□3S1	A4□DS1
20	A4□2S1	A4□ES2	AZ□2S1	AZ□CS2	A1□2S1	A1□BS2	A2□3S1	A2□FS2	A3□3S1	A3□ES2	A4□3S1	A4□DS2
21	A4□2S1	A4□ES3	AZ□2S1	AZ□CS3	A1□2S1	A1□BS3	A2□3S1	A2□FS3	A3□3S1	A3□ES3	A4□3S1	A4□DS3
22	A4□2S2	A4□ES1	AZ□2S2	AZ□CS1	A1□2S2	A1□BS1	A2□3S2	A2□FS1	A3□3S2	A3□ES1	A4□3S2	A4□DS1
23	A4□2S2	A4□ES2	AZ□2S2	AZ□CS2	A1□2S2	A1□BS2	A2□3S2	A2□FS2	A3□3S2	A3□ES2	A4□3S2	A4□DS2
24	A4□2S2	A4□ES3	AZ□2S2	AZ□CS3	A1□2S2	A1□BS3	A2□3S2	A2□FS3	A3□3S2	A3□ES3	A4□3S2	A4□DS3
25	A4□2S3	A4□ES1	AZ□2S3	AZ□CS1	A1□2S3	A1□BS1	A2□3S3	A2□FS1	A3□3S3	A3□ES1	A4□3S3	A4□DS1
26	A4□2S3	A4□ES2	AZ□2S3	AZ□CS2	A1□2S3	A1□BS2	A2□3S3	A2□FS2	A3□3S3	A3□ES2	A4□3S3	A4□DS2
27	A4□2S3	A4□ES3	AZ□2S3	AZ□CS3	A1□2S3	A1□BS3	A2□3S3	A2□FS3	A3□3S3	A3□ES3	A4□3S3	A4□DS3
28	AZ□2S1	AZ□ES1	A1□2S1	A1□AS1	A2□2S1	A2□BS1	A3□3S1	A3□FS1	A4□3S1	A4□ES1	AZ□3S1	AZ□DS1
29	AZ□2S1	AZ□ES2	A1□2S1	A1□AS2	A2□2S1	A2□BS2	A3□3S1	A3□FS2	A4□3S1	A4□ES2	AZ□3S1	AZ□DS2
30	AZ□2S1	AZ□ES3	A1□2S1	A1□AS3	A2□2S1	A2□BS3	A3□3S1	A3□FS3	A4□3S1	A4□ES3	AZ□3S1	AZ□DS3
31	AZ□2S2	AZ□ES1	A1□2S2	A1□AS1	A2□2S2	A2□BS1	A3□3S2	A3□FS1	A4□3S2	A4□ES1	AZ□3S2	AZ□DS1
32	AZ□2S2	AZ□ES2	A1□2S2	A1□AS2	A2□2S2	A2□BS2	A3□3S2	A3□FS2	A4□3S2	A4□ES2	AZ□3S2	AZ□DS2

[Kitting combination – 2700K, 3000K, 3500K and 4000K]

	RANK 1	RANK 2	RANK 1	RANK 2	RANK 1	RANK 2	RANK 1	RANK 2	RANK 1	RANK 2	RANK 1	RANK 2
1	A3□3S1	A3□9S1	A4□3S1	A4□AS1	AZ□3S1	AZ□BS1	A1□4S1	A1□CS1	A2□4S1	A2□9S1	A3□4S1	A3□AS1
2	A3□3S1	A3□9S2	A4□3S1	A4□AS2	AZ□3S1	AZ□BS2	A1□4S1	A1□CS2	A2□4S1	A2□9S2	A3□4S1	A3□AS2
3	A3□3S1	A3□9S3	A4□3S1	A4□AS3	AZ□3S1	AZ□BS3	A1□4S1	A1□CS3	A2□4S1	A2□9S3	A3□4S1	A3□AS3
4	A3□3S2	A3□9S1	A4□3S2	A4□AS1	AZ□3S2	AZ□BS1	A1□4S2	A1□CS1	A2□4S2	A2□9S1	A3□4S2	A3□AS1
5	A3□3S2	A3□9S2	A4□3S2	A4□AS2	AZ□3S2	AZ□BS2	A1□4S2	A1□CS2	A2□4S2	A2□9S2	A3□4S2	A3□AS2
6	A3□3S2	A3□9S3	A4□3S2	A4□AS3	AZ□3S2	AZ□BS3	A1□4S2	A1□CS3	A2□4S2	A2□9S3	A3□4S2	A3□AS3
7	A3□3S3	A3□9S1	A4□3S3	A4□AS1	AZ□3S3	AZ□BS1	A1□4S3	A1□CS1	A2□4S3	A2□9S1	A3□4S3	A3□AS1
8	A3□3S3	A3□9S2	A4□3S3	A4□AS2	AZ□3S3	AZ□BS2	A1□4S3	A1□CS2	A2□4S3	A2□9S2	A3□4S3	A3□AS2
9	A3□3S3	A3□9S3	A4□3S3	A4□AS3	AZ□3S3	AZ□BS3	A1□4S3	A1□CS3	A2□4S3	A2□9S3	A3□4S3	A3□AS3
10	A4□3S1	A4□9S1	AZ□3S1	AZ□AS1	A1□4S1	A1□ES1	A2□4S1	A2□CS1	A3□4S1	A3□9S1	A4□4S1	A4□AS1
11	A4□3S1	A4□9S2	AZ□3S1	AZ□AS2	A1□4S1	A1□ES2	A2□4S1	A2□CS2	A3□4S1	A3□9S2	A4□4S1	A4□AS2
12	A4□3S1	A4□9S3	AZ□3S1	AZ□AS3	A1□4S1	A1□ES3	A2□4S1	A2□CS3	A3□4S1	A3□9S3	A4□4S1	A4□AS3
13	A4□3S2	A4□9S1	AZ□3S2	AZ□AS1	A1□4S2	A1□ES1	A2□4S2	A2□CS1	A3□4S2	A3□9S1	A4□4S2	A4□AS1
14	A4□3S2	A4□9S2	AZ□3S2	AZ□AS2	A1□4S2	A1□ES2	A2□4S2	A2□CS2	A3□4S2	A3□9S2	A4□4S2	A4□AS2
15	A4□3S2	A4□9S3	AZ□3S2	AZ□AS3	A1□4S2	A1□ES3	A2□4S2	A2□CS3	A3□4S2	A3□9S3	A4□4S2	A4□AS3
16	A4□3S3	A4□9S1	AZ□3S3	AZ□AS1	A1□4S3	A1□ES1	A2□4S3	A2□CS1	A3□4S3	A3□9S1	A4□4S3	A4□AS1
17	A4□3S3	A4□9S2	AZ□3S3	AZ□AS2	A1□4S3	A1□ES2	A2□4S3	A2□CS2	A3□4S3	A3□9S2	A4□4S3	A4□AS2
18	A4□3S3	A4□9S3	AZ□3S3	AZ□AS3	A1□4S3	A1□ES3	A2□4S3	A2□CS3	A3□4S3	A3□9S3	A4□4S3	A4□AS3
19	AZ□3S1	AZ□9S1	A1□3S1	A1□BS1	A2□4S1	A2□ES1	A3□4S1	A3□CS1	A4□4S1	A4□9S1	AZ□4S1	AZ□AS1
20	AZ□3S1	AZ□9S2	A1□3S1	A1□BS2	A2□4S1	A2□ES2	A3□4S1	A3□CS2	A4□4S1	A4□9S2	AZ□4S1	AZ□AS2
21	AZ□3S1	AZ□9S3	A1□3S1	A1□BS3	A2□4S1	A2□ES3	A3□4S1	A3□CS3	A4□4S1	A4□9S3	AZ□4S1	AZ□AS3
22	AZ□3S2	AZ□9S1	A1□3S2	A1□BS1	A2□4S2	A2□ES1	A3□4S2	A3□CS1	A4□4S2	A4□9S1	AZ□4S2	AZ□AS1
23	AZ□3S2	AZ□9S2	A1□3S2	A1□BS2	A2□4S2	A2□ES2	A3□4S2	A3□CS2	A4□4S2	A4□9S2	AZ□4S2	AZ□AS2
24	AZ□3S2	AZ□9S3	A1□3S2	A1□BS3	A2□4S2	A2□ES3	A3□4S2	A3□CS3	A4□4S2	A4□9S3	AZ□4S2	AZ□AS3
25	AZ□3S3	AZ□9S1	A1□3S3	A1□BS1	A2□4S3	A2□ES1	A3□4S3	A3□CS1	A4□4S3	A4□9S1	AZ□4S3	AZ□AS1
26	AZ□3S3	AZ□9S2	A1□3S3	A1□BS2	A2□4S3	A2□ES2	A3□4S3	A3□CS2	A4□4S3	A4□9S2	AZ□4S3	AZ□AS2
27	AZ□3S3	AZ□9S3	A1□3S3	A1□BS3	A2□4S3	A2□ES3	A3□4S3	A3□CS3	A4□4S3	A4□9S3	AZ□4S3	AZ□AS3
28	A1□3S1	A1□AS1	A2□3S1	A2□BS1	A3□4S1	A3□ES1	A4□4S1	A4□CS1	AZ□4S1	AZ□9S1	A1□5S1	A1□8S1
29	A1□3S1	A1□AS2	A2□3S1	A2□BS2	A3□4S1	A3□ES2	A4□4S1	A4□CS2	AZ□4S1	AZ□9S2	A1□5S1	A1□8S2
30	A1□3S1	A1□AS3	A2□3S1	A2□BS3	A3□4S1	A3□ES3	A4□4S1	A4□CS3	AZ□4S1	AZ□9S3	A1□5S1	A1□8S3
31	A1□3S2	A1□AS1	A2□3S2	A2□BS1	A3□4S2	A3□ES1	A4□4S2	A4□CS1	AZ□4S2	AZ□9S1	A1□5S2	A1□8S1
32	A1□3S2	A1□AS2	A2□3S2	A2□BS2	A3□4S2	A3□ES2	A4□4S2	A4□CS2	AZ□4S2	AZ□9S2	A1□5S2	A1□8S2
33	A1□3S2	A1□AS3	A2□3S2	A2□BS3	A3□4S2	A3□ES3	A4□4S2	A4□CS3	AZ□4S2	AZ□9S3	A1□5S2	A1□8S3
34	A1□3S3	A1□AS1	A2□3S3	A2□BS1	A3□4S3	A3□ES1	A4□4S3	A4□CS1	AZ□4S3	AZ□9S1	A1□5S3	A1□8S1
35	A1□3S3	A1□AS2	A2□3S3	A2□BS2	A3□4S3	A3□ES2	A4□4S3	A4□CS2	AZ□4S3	AZ□9S2	A1□5S3	A1□8S2
36	A1□3S3	A1□AS3	A2□3S3	A2□BS3	A3□4S3	A3□ES3	A4□4S3	A4□CS3	AZ□4S3	AZ□9S3	A1□5S3	A1□8S3
37	A2□3S1	A2□AS1	A3□3S1	A3□BS1	A4□4S1	A4□ES1	AZ□4S1	AZ□CS1	A1□4S1	A1□AS1	A2□5S1	A2□8S1
38	A2□3S1	A2□AS2	A3□3S1	A3□BS2	A4□4S1	A4□ES2	AZ□4S1	AZ□CS2	A1□4S1	A1□AS2	A2□5S1	A2□8S2
39	A2□3S1	A2□AS3	A3□3S1	A3□BS3	A4□4S1	A4□ES3	AZ□4S1	AZ□CS3	A1□4S1	A1□AS3	A2□5S1	A2□8S3
40	A2□3S2	A2□AS1	A3□3S2	A3□BS1	A4□4S2	A4□ES1	AZ□4S2	AZ□CS1	A1□4S2	A1□AS1	A2□5S2	A2□8S1
41	A2□3S2	A2□AS2	A3□3S2	A3□BS2	A4□4S2	A4□ES2	AZ□4S2	AZ□CS2	A1□4S2	A1□AS2	A2□5S2	A2□8S2
42	A2□3S2	A2□AS3	A3□3S2	A3□BS3	A4□4S2	A4□ES3	AZ□4S2	AZ□CS3	A1□4S2	A1□AS3	A2□5S2	A2□8S3
43	A2□3S3	A2□AS1	A3□3S3	A3□BS1	A4□4S3	A4□ES1	AZ□4S3	AZ□CS1	A1□4S3	A1□AS1	A2□5S3	A2□8S1
44	A2□3S3	A2□AS2	A3□3S3	A3□BS2	A4□4S3	A4□ES2	AZ□4S3	AZ□CS2	A1□4S3	A1□AS2	A2□5S3	A2□8S2
45	A2□3S3	A2□AS3	A3□3S3	A3□BS3	A4□4S3	A4□ES3	AZ□4S3	AZ□CS3	A1□4S3	A1□AS3	A2□5S3	A2□8S3
46	A3□3S1	A3□AS1	A4□3S1	A4□BS1	AZ□4S1	AZ□ES1	A1□4S1	A1□9S1	A2□4S1	A2□AS1	A3□5S1	A3□8S1
47	A3□3S1	A3□AS2	A4□3S1	A4□BS2	AZ□4S1	AZ□ES2	A1□4S1	A1□9S2	A2□4S1	A2□AS2	A3□5S1	A3□8S2
48	A3□3S1	A3□AS3	A4□3S1	A4□BS3	AZ□4S1	AZ□ES3	A1□4S1	A1□9S3	A2□4S1	A2□AS3	A3□5S1	A3□8S3
49	A3□3S2	A3□AS1	A4□3S2	A4□BS1	AZ□4S2	AZ□ES1	A1□4S2	A1□9S1	A2□4S2	A2□AS1	A3□5S2	A3□8S1
50	A3□3S2	A3□AS2	A4□3S2	A4□BS2	AZ□4S2	AZ□ES2	A1□4S2	A1□9S2	A2□4S2	A2□AS2	A3□5S2	A3□8S2
51	A3□3S2	A3□AS3	A4□3S2	A4□BS3	AZ□4S2	AZ□ES3	A1□4S2	A1□9S3	A2□4S2	A2□AS3	A3□5S2	A3□8S3
52	A3□3S3	A3□AS1	A4□3S3	A4□BS1	AZ□4S3	AZ□ES1	A1□4S3	A1□9S1	A2□4S3	A2□AS1	A3□5S3	A3□8S1
53	A3□3S3	A3□AS2	A4□3S3	A4□BS2	AZ□4S3	AZ□ES2	A1□4S3	A1□9S2	A2□4S3	A2□AS2	A3□5S3	A3□8S2
54	A3□3S3	A3□AS3	A4□3S3	A4□BS3	AZ□4S3	AZ□ES3	A1□4S3	A1□9S3	A2□4S3	A2□AS3	A3□5S3	A3□8S3

[Kitting combination – 2700K, 3000K, 3500K and 4000K]

-	RANK 1	RANK 2	RANK 1	RANK 2	RANK 1	RANK 2	RANK 1	RANK 2	RANK 1	RANK 2	RANK 1	RANK 2
1	A4□5S1	A4□8S1	AZ□5S1	AZ□CS1	A1□5S1	A1□FS1	A2□5S1	A2□BS1	A3□5S1	A3□7S1	A4□6S1	A4□8S1
2	A4□5S1	A4□8S2	AZ□5S1	AZ□CS2	A1□5S1	A1□FS2	A2□5S1	A2□BS2	A3□5S1	A3□7S2	A4□6S1	A4□8S2
3	A4□5S1	A4□8S3	AZ□5S1	AZ□CS3	A1□5S1	A1□FS3	A2□5S1	A2□BS3	A3□5S1	A3□7S3	A4□6S1	A4□8S3
4	A4□5S2	A4□8S1	AZ□5S2	AZ□CS1	A1□5S2	A1□FS1	A2□5S2	A2□BS1	A3□5S2	A3□7S1	A4□6S2	A4□8S1
5	A4□5S2	A4□8S2	AZ□5S2	AZ□CS2	A1□5S2	A1□FS2	A2□5S2	A2□BS2	A3□5S2	A3□7S2	A4□6S2	A4□8S2
6	A4□5S2	A4□8S3	AZ□5S2	AZ□CS3	A1□5S2	A1□FS3	A2□5S2	A2□BS3	A3□5S2	A3□7S3	A4□6S2	A4□8S3
7	A4□5S3	A4□8S1	AZ□5S3	AZ□CS1	A1□5S3	A1□FS1	A2□5S3	A2□BS1	A3□5S3	A3□7S1	A4□6S3	A4□8S1
8	A4□5S3	A4□8S2	AZ□5S3	AZ□CS2	A1□5S3	A1□FS2	A2□5S3	A2□BS2	A3□5S3	A3□7S2	A4□6S3	A4□8S2
9	A4□5S3	A4□8S3	AZ□5S3	AZ□CS3	A1□5S3	A1□FS3	A2□5S3	A2□BS3	A3□5S3	A3□7S3	A4□6S3	A4□8S3
10	AZ□5S1	AZ□8S1	A1□5S1	A1□GS1	A2□5S1	A2□FS1	A3□5S1	A3□BS1	A4□5S1	A4□7S1	AZ□6S1	AZ□8S1
11	AZ□5S1	AZ□8S2	A1□5S1	A1□GS2	A2□5S1	A2□FS2	A3□5S1	A3□BS2	A4□5S1	A4□7S2	AZ□6S1	AZ□8S2
12	AZ□5S1	AZ□8S3	A1□5S1	A1□GS3	A2□5S1	A2□FS3	A3□5S1	A3□BS3	A4□5S1	A4□7S3	AZ□6S1	AZ□8S3
13	AZ□5S2	AZ□8S1	A1□5S2	A1□GS1	A2□5S2	A2□FS1	A3□5S2	A3□BS1	A4□5S2	A4□7S1	AZ□6S2	AZ□8S1
14	AZ□5S2	AZ□8S2	A1□5S2	A1□GS2	A2□5S2	A2□FS2	A3□5S2	A3□BS2	A4□5S2	A4□7S2	AZ□6S2	AZ□8S2
15	AZ□5S2	AZ□8S3	A1□5S2	A1□GS3	A2□5S2	A2□FS3	A3□5S2	A3□BS3	A4□5S2	A4□7S3	AZ□6S2	AZ□8S3
16	AZ□5S3	AZ□8S1	A1□5S3	A1□GS1	A2□5S3	A2□FS1	A3□5S3	A3□BS1	A4□5S3	A4□7S1	AZ□6S3	AZ□8S1
17	AZ□5S3	AZ□8S2	A1□5S3	A1□GS2	A2□5S3	A2□FS2	A3□5S3	A3□BS2	A4□5S3	A4□7S2	AZ□6S3	AZ□8S2
18	AZ□5S3	AZ□8S3	A1□5S3	A1□GS3	A2□5S3	A2□FS3	A3□5S3	A3□BS3	A4□5S3	A4□7S3	AZ□6S3	AZ□8S3
19	A1□5S1	A1□CS1	A2□5S1	A2□GS1	A3□5S1	A3□FS1	A4□5S1	A4□BS1	AZ□5S1	AZ□7S1	A1□6S1	A1□CS1
20	A1□5S1	A1□CS2	A2□5S1	A2□GS2	A3□5S1	A3□FS2	A4□5S1	A4□BS2	AZ□5S1	AZ□7S2	A1□6S1	A1□CS2
21	A1□5S1	A1□CS3	A2□5S1	A2□GS3	A3□5S1	A3□FS3	A4□5S1	A4□BS3	AZ□5S1	AZ□7S3	A1□6S1	A1□CS3
22	A1□5S2	A1□CS1	A2□5S2	A2□GS1	A3□5S2	A3□FS1	A4□5S2	A4□BS1	AZ□5S2	AZ□7S1	A1□6S2	A1□CS1
23	A1□5S2	A1□CS2	A2□5S2	A2□GS2	A3□5S2	A3□FS2	A4□5S2	A4□BS2	AZ□5S2	AZ□7S2	A1□6S2	A1□CS2
24	A1□5S2	A1□CS3	A2□5S2	A2□GS3	A3□5S2	A3□FS3	A4□5S2	A4□BS3	AZ□5S2	AZ□7S3	A1□6S2	A1□CS3
25	A1□5S3	A1□CS1	A2□5S3	A2□GS1	A3□5S3	A3□FS1	A4□5S3	A4□BS1	AZ□5S3	AZ□7S1	A1□6S3	A1□CS1
26	A1□5S3	A1□CS2	A2□5S3	A2□GS2	A3□5S3	A3□FS2	A4□5S3	A4□BS2	AZ□5S3	AZ□7S2	A1□6S3	A1□CS2
27	A1□5S3	A1□CS3	A2□5S3	A2□GS3	A3□5S3	A3□FS3	A4□5S3	A4□BS3	AZ□5S3	AZ□7S3	A1□6S3	A1□CS3
28	A2□5S1	A2□CS1	A3□5S1	A3□GS1	A4□5S1	A4□FS1	AZ□5S1	AZ□BS1	A1□6S1	A1□8S1	A2□6S1	A2□CS1
29	A2□5S1	A2□CS2	A3□5S1	A3□GS2	A4□5S1	A4□FS2	AZ□5S1	AZ□BS2	A1□6S1	A1□8S2	A2□6S1	A2□CS2
30	A2□5S1	A2□CS3	A3□5S1	A3□GS3	A4□5S1	A4□FS3	AZ□5S1	AZ□BS3	A1□6S1	A1□8S3	A2□6S1	A2□CS3
31	A2□5S2	A2□CS1	A3□5S2	A3□GS1	A4□5S2	A4□FS1	AZ□5S2	AZ□BS1	A1□6S2	A1□8S1	A2□6S2	A2□CS1
32	A2□5S2	A2□CS2	A3□5S2	A3□GS2	A4□5S2	A4□FS2	AZ□5S2	AZ□BS2	A1□6S2	A1□8S2	A2□6S2	A2□CS2
33	A2□5S2	A2□CS3	A3□5S2	A3□GS3	A4□5S2	A4□FS3	AZ□5S2	AZ□BS3	A1□6S2	A1□8S3	A2□6S2	A2□CS3
34	A2□5S3	A2□CS1	A3□5S3	A3□GS1	A4□5S3	A4□FS1	AZ□5S3	AZ□BS1	A1□6S3	A1□8S1	A2□6S3	A2□CS1
35	A2□5S3	A2□CS2	A3□5S3	A3□GS2	A4□5S3	A4□FS2	AZ□5S3	AZ□BS2	A1□6S3	A1□8S2	A2□6S3	A2□CS2
36	A2□5S3	A2□CS3	A3□5S3	A3□GS3	A4□5S3	A4□FS3	AZ□5S3	AZ□BS3	A1□6S3	A1□8S3	A2□6S3	A2□CS3
37	A3□5S1	A3□CS1	A4□5S1	A4□GS1	AZ□5S1	AZ□FS1	A1□5S1	A1□7S1	A2□6S1	A2□8S1	A3□6S1	A3□CS1
38	A3□5S1	A3□CS2	A4□5S1	A4□GS2	AZ□5S1	AZ□FS2	A1□5S1	A1□7S2	A2□6S1	A2□8S2	A3□6S1	A3□CS2
39	A3□5S1	A3□CS3	A4□5S1	A4□GS3	AZ□5S1	AZ□FS3	A1□5S1	A1□7S3	A2□6S1	A2□8S3	A3□6S1	A3□CS3
40	A3□5S2	A3□CS1	A4□5S2	A4□GS1	AZ□5S2	AZ□FS1	A1□5S2	A1□7S1	A2□6S2	A2□8S1	A3□6S2	A3□CS1
41	A3□5S2	A3□CS2	A4□5S2	A4□GS2	AZ□5S2	AZ□FS2	A1□5S2	A1□7S2	A2□6S2	A2□8S2	A3□6S2	A3□CS2
42	A3□5S2	A3□CS3	A4□5S2	A4□GS3	AZ□5S2	AZ□FS3	A1□5S2	A1□7S3	A2□6S2	A2□8S3	A3□6S2	A3□CS3
43	A3□5S3	A3□CS1	A4□5S3	A4□GS1	AZ□5S3	AZ□FS1	A1□5S3	A1□7S1	A2□6S3	A2□8S1	A3□6S3	A3□CS1
44	A3□5S3	A3□CS2	A4□5S3	A4□GS2	AZ□5S3	AZ□FS2	A1□5S3	A1□7S2	A2□6S3	A2□8S2	A3□6S3	A3□CS2
45	A3□5S3	A3□CS3	A4□5S3	A4□GS3	AZ□5S3	AZ□FS3	A1□5S3	A1□7S3	A2□6S3	A2□8S3	A3□6S3	A3□CS3
46	A4□5S1	A4□CS1	AZ□5S1	AZ□GS1	A1□5S1	A1□BS1	A2□5S1	A2□7S1	A3□6S1	A3□8S1	A4□6S1	A4□CS1
47	A4□5S1	A4□CS2	AZ□5S1	AZ□GS2	A1□5S1	A1□BS2	A2□5S1	A2□7S2	A3□6S1	A3□8S2	A4□6S1	A4□CS2
48	A4□5S1	A4□CS3	AZ□5S1	AZ□GS3	A1□5S1	A1□BS3	A2□5S1	A2□7S3	A3□6S1	A3□8S3	A4□6S1	A4□CS3
49	A4□5S2	A4□CS1	AZ□5S2	AZ□GS1	A1□5S2	A1□BS1	A2□5S2	A2□7S1	A3□6S2	A3□8S1	A4□6S2	A4□CS1
50	A4□5S2	A4□CS2	AZ□5S2	AZ□GS2	A1□5S2	A1□BS2	A2□5S2	A2□7S2	A3□6S2	A3□8S2	A4□6S2	A4□CS2
51	A4□5S2	A4□CS3	AZ□5S2	AZ□GS3	A1□5S2	A1□BS3	A2□5S2	A2□7S3	A3□6S2	A3□8S3	A4□6S2	A4□CS3
52	A4□5S3	A4□CS1	AZ□5S3	AZ□GS1	A1□5S3	A1□BS1	A2□5S3	A2□7S1	A3□6S3	A3□8S1	A4□6S3	A4□CS1
53	A4□5S3	A4□CS2	AZ□5S3	AZ□GS2	A1□5S3	A1□BS2	A2□5S3	A2□7S2	A3□6S3	A3□8S2	A4□6S3	A4□CS2
54	A4□5S3	A4□CS3	AZ□5S3	AZ□GS3	A1□5S3	A1□BS3	A2□5S3	A2□7S3	A3□6S3	A3□8S3	A4□6S3	A4□CS3

[Kitting combination – 2700K, 3000K, 3500K and 4000K]

	RANK 1	RANK 2	RANK 1	RANK 2	RANK 1	RANK 2	RANK 1	RANK 2	RANK 1	RANK 2	RANK 1	RANK 2
1	AZ□6S1	AZ□CS1	A1□6S1	A1□FS1	A2□6S1	A2□ES1	A3□6S1	A3□7S1	A4□6S1	A4□BS1	AZ□6S1	AZ□AS1
2	AZ□6S1	AZ□CS2	A1□6S1	A1□FS2	A2□6S1	A2□ES2	A3□6S1	A3□7S2	A4□6S1	A4□BS2	AZ□6S1	AZ□AS2
3	AZ□6S1	AZ□CS3	A1□6S1	A1□FS3	A2□6S1	A2□ES3	A3□6S1	A3□7S3	A4□6S1	A4□BS3	AZ□6S1	AZ□AS3
4	AZ□6S2	AZ□CS1	A1□6S2	A1□FS1	A2□6S2	A2□ES1	A3□6S2	A3□7S1	A4□6S2	A4□BS1	AZ□6S2	AZ□AS1
5	AZ□6S2	AZ□CS2	A1□6S2	A1□FS2	A2□6S2	A2□ES2	A3□6S2	A3□7S2	A4□6S2	A4□BS2	AZ□6S2	AZ□AS2
6	AZ□6S2	AZ□CS3	A1□6S2	A1□FS3	A2□6S2	A2□ES3	A3□6S2	A3□7S3	A4□6S2	A4□BS3	AZ□6S2	AZ□AS3
7	AZ□6S3	AZ□CS1	A1□6S3	A1□FS1	A2□6S3	A2□ES1	A3□6S3	A3□7S1	A4□6S3	A4□BS1	AZ□6S3	AZ□AS1
8	AZ□6S3	AZ□CS2	A1□6S3	A1□FS2	A2□6S3	A2□ES2	A3□6S3	A3□7S2	A4□6S3	A4□BS2	AZ□6S3	AZ□AS2
9	AZ□6S3	AZ□CS3	A1□6S3	A1□FS3	A2□6S3	A2□ES3	A3□6S3	A3□7S3	A4□6S3	A4□BS3	AZ□6S3	AZ□AS3
10	A1□6S1	A1□GS1	A2□6S1	A2□FS1	A3□6S1	A3□ES1	A4□6S1	A4□7S1	AZ□6S1	AZ□BS1	A1□7S1	A1□FS1
11	A1□6S1	A1□GS2	A2□6S1	A2□FS2	A3□6S1	A3□ES2	A4□6S1	A4□7S2	AZ□6S1	AZ□BS2	A1□7S1	A1□FS2
12	A1□6S1	A1□GS3	A2□6S1	A2□FS3	A3□6S1	A3□ES3	A4□6S1	A4□7S3	AZ□6S1	AZ□BS3	A1□7S1	A1□FS3
13	A1□6S2	A1□GS1	A2□6S2	A2□FS1	A3□6S2	A3□ES1	A4□6S2	A4□7S1	AZ□6S2	AZ□BS1	A1□7S2	A1□FS1
14	A1□6S2	A1□GS2	A2□6S2	A2□FS2	A3□6S2	A3□ES2	A4□6S2	A4□7S2	AZ□6S2	AZ□BS2	A1□7S2	A1□FS2
15	A1□6S2	A1□GS3	A2□6S2	A2□FS3	A3□6S2	A3□ES3	A4□6S2	A4□7S3	AZ□6S2	AZ□BS3	A1□7S2	A1□FS3
16	A1□6S3	A1□GS1	A2□6S3	A2□FS1	A3□6S3	A3□ES1	A4□6S3	A4□7S1	AZ□6S3	AZ□BS1	A1□7S3	A1□FS1
17	A1□6S3	A1□GS2	A2□6S3	A2□FS2	A3□6S3	A3□ES2	A4□6S3	A4□7S2	AZ□6S3	AZ□BS2	A1□7S3	A1□FS2
18	A1□6S3	A1□GS3	A2□6S3	A2□FS3	A3□6S3	A3□ES3	A4□6S3	A4□7S3	AZ□6S3	AZ□BS3	A1□7S3	A1□FS3
19	A2□6S1	A2□GS1	A3□6S1	A3□FS1	A4□6S1	A4□ES1	AZ□6S1	AZ□7S1	A1□6S1	A1□AS1	A2□7S1	A2□FS1
20	A2□6S1	A2□GS2	A3□6S1	A3□FS2	A4□6S1	A4□ES2	AZ□6S1	AZ□7S2	A1□6S1	A1□AS2	A2□7S1	A2□FS2
21	A2□6S1	A2□GS3	A3□6S1	A3□FS3	A4□6S1	A4□ES3	AZ□6S1	AZ□7S3	A1□6S1	A1□AS3	A2□7S1	A2□FS3
22	A2□6S2	A2□GS1	A3□6S2	A3□FS1	A4□6S2	A4□ES1	AZ□6S2	AZ□7S1	A1□6S2	A1□AS1	A2□7S2	A2□FS1
23	A2□6S2	A2□GS2	A3□6S2	A3□FS2	A4□6S2	A4□ES2	AZ□6S2	AZ□7S2	A1□6S2	A1□AS2	A2□7S2	A2□FS2
24	A2□6S2	A2□GS3	A3□6S2	A3□FS3	A4□6S2	A4□ES3	AZ□6S2	AZ□7S3	A1□6S2	A1□AS3	A2□7S2	A2□FS3
25	A2□6S3	A2□GS1	A3□6S3	A3□FS1	A4□6S3	A4□ES1	AZ□6S3	AZ□7S1	A1□6S3	A1□AS1	A2□7S3	A2□FS1
26	A2□6S3	A2□GS2	A3□6S3	A3□FS2	A4□6S3	A4□ES2	AZ□6S3	AZ□7S2	A1□6S3	A1□AS2	A2□7S3	A2□FS2
27	A2□6S3	A2□GS3	A3□6S3	A3□FS3	A4□6S3	A4□ES3	AZ□6S3	AZ□7S3	A1□6S3	A1□AS3	A2□7S3	A2□FS3
28	A3□6S1	A3□GS1	A4□6S1	A4□FS1	AZ□6S1	AZ□ES1	A1□6S1	A1□BS1	A2□6S1	A2□AS1	A3□7S1	A3□FS1
29	A3□6S1	A3□GS2	A4□6S1	A4□FS2	AZ□6S1	AZ□ES2	A1□6S1	A1□BS2	A2□6S1	A2□AS2	A3□7S1	A3□FS2
30	A3□6S1	A3□GS3	A4□6S1	A4□FS3	AZ□6S1	AZ□ES3	A1□6S1	A1□BS3	A2□6S1	A2□AS3	A3□7S1	A3□FS3
31	A3□6S2	A3□GS1	A4□6S2	A4□FS1	AZ□6S2	AZ□ES1	A1□6S2	A1□BS1	A2□6S2	A2□AS1	A3□7S2	A3□FS1
32	A3□6S2	A3□GS2	A4□6S2	A4□FS2	AZ□6S2	AZ□ES2	A1□6S2	A1□BS2	A2□6S2	A2□AS2	A3□7S2	A3□FS2
33	A3□6S2	A3□GS3	A4□6S2	A4□FS3	AZ□6S2	AZ□ES3	A1□6S2	A1□BS3	A2□6S2	A2□AS3	A3□7S2	A3□FS3
34	A3□6S3	A3□GS1	A4□6S3	A4□FS1	AZ□6S3	AZ□ES1	A1□6S3	A1□BS1	A2□6S3	A2□AS1	A3□7S3	A3□FS1
35	A3□6S3	A3□GS2	A4□6S3	A4□FS2	AZ□6S3	AZ□ES2	A1□6S3	A1□BS2	A2□6S3	A2□AS2	A3□7S3	A3□FS2
36	A3□6S3	A3□GS3	A4□6S3	A4□FS3	AZ□6S3	AZ□ES3	A1□6S3	A1□BS3	A2□6S3	A2□AS3	A3□7S3	A3□FS3
37	A4□6S1	A4□GS1	AZ□6S1	AZ□FS1	A1□6S1	A1□7S1	A2□6S1	A2□BS1	A3□6S1	A3□AS1	A4□7S1	A4□FS1
38	A4□6S1	A4□GS2	AZ□6S1	AZ□FS2	A1□6S1	A1□7S2	A2□6S1	A2□BS2	A3□6S1	A3□AS2	A4□7S1	A4□FS2
39	A4□6S1	A4□GS3	AZ□6S1	AZ□FS3	A1□6S1	A1□7S3	A2□6S1	A2□BS3	A3□6S1	A3□AS3	A4□7S1	A4□FS3
40	A4□6S2	A4□GS1	AZ□6S2	AZ□FS1	A1□6S2	A1□7S1	A2□6S2	A2□BS1	A3□6S2	A3□AS1	A4□7S2	A4□FS1
41	A4□6S2	A4□GS2	AZ□6S2	AZ□FS2	A1□6S2	A1□7S2	A2□6S2	A2□BS2	A3□6S2	A3□AS2	A4□7S2	A4□FS2
42	A4□6S2	A4□GS3	AZ□6S2	AZ□FS3	A1□6S2	A1□7S3	A2□6S2	A2□BS3	A3□6S2	A3□AS3	A4□7S2	A4□FS3
43	A4□6S3	A4□GS1	AZ□6S3	AZ□FS1	A1□6S3	A1□7S1	A2□6S3	A2□BS1	A3□6S3	A3□AS1	A4□7S3	A4□FS1
44	A4□6S3	A4□GS2	AZ□6S3	AZ□FS2	A1□6S3	A1□7S2	A2□6S3	A2□BS2	A3□6S3	A3□AS2	A4□7S3	A4□FS2
45	A4□6S3	A4□GS3	AZ□6S3	AZ□FS3	A1□6S3	A1□7S3	A2□6S3	A2□BS3	A3□6S3	A3□AS3	A4□7S3	A4□FS3
46	AZ□6S1	AZ□GS1	A1□6S1	A1□ES1	A2□6S1	A2□7S1	A3□6S1	A3□BS1	A4□6S1	A4□AS1	AZ□7S1	AZ□FS1
47	AZ□6S1	AZ□GS2	A1□6S1	A1□ES2	A2□6S1	A2□7S2	A3□6S1	A3□BS2	A4□6S1	A4□AS2	AZ□7S1	AZ□FS2
48	AZ□6S1	AZ□GS3	A1□6S1	A1□ES3	A2□6S1	A2□7S3	A3□6S1	A3□BS3	A4□6S1	A4□AS3	AZ□7S1	AZ□FS3
49	AZ□6S2	AZ□GS1	A1□6S2	A1□ES1	A2□6S2	A2□7S1	A3□6S2	A3□BS1	A4□6S2	A4□AS1	AZ□7S2	AZ□FS1
50	AZ□6S2	AZ□GS2	A1□6S2	A1□ES2	A2□6S2	A2□7S2	A3□6S2	A3□BS2	A4□6S2	A4□AS2	AZ□7S2	AZ□FS2
51	AZ□6S2	AZ□GS3	A1□6S2	A1□ES3	A2□6S2	A2□7S3	A3□6S2	A3□BS3	A4□6S2	A4□AS3	AZ□7S2	AZ□FS3
52	AZ□6S3	AZ□GS1	A1□6S3	A1□ES1	A2□6S3	A2□7S1	A3□6S3	A3□BS1	A4□6S3	A4□AS1	AZ□7S3	AZ□FS1
53	AZ□6S3	AZ□GS2	A1□6S3	A1□ES2	A2□6S3	A2□7S2	A3□6S3	A3□BS2	A4□6S3	A4□AS2	AZ□7S3	AZ□FS2
54	AZ□6S3	AZ□GS3	A1□6S3	A1□ES3	A2□6S3	A2□7S3	A3□6S3	A3□BS3	A4□6S3	A4□AS3	AZ□7S3	AZ□FS3

[Kitting combination – 2700K, 3000K, 3500K and 4000K]

	RANK 1	RANK 2	RANK 1	RANK 2	RANK 1	RANK 2	RANK 1	RANK 2	RANK 1	RANK 2	RANK 1	RANK 2
1	A1□7S1	A1□ES1	A2□7S1	A2□DS1	A3□7S1	A3□9S1	A4□7S1	A4□AS1	AZ□7S1	AZ□BS1	A1□8S1	A1□DS1
2	A1□7S1	A1□ES2	A2□7S1	A2□DS2	A3□7S1	A3□9S2	A4□7S1	A4□AS2	AZ□7S1	AZ□BS2	A1□8S1	A1□DS2
3	A1□7S1	A1□ES3	A2□7S1	A2□DS3	A3□7S1	A3□9S3	A4□7S1	A4□AS3	AZ□7S1	AZ□BS3	A1□8S1	A1□DS3
4	A1□7S2	A1□ES1	A2□7S2	A2□DS1	A3□7S2	A3□9S1	A4□7S2	A4□AS1	AZ□7S2	AZ□BS1	A1□8S2	A1□DS1
5	A1□7S2	A1□ES2	A2□7S2	A2□DS2	A3□7S2	A3□9S2	A4□7S2	A4□AS2	AZ□7S2	AZ□BS2	A1□8S2	A1□DS2
6	A1□7S2	A1□ES3	A2□7S2	A2□DS3	A3□7S2	A3□9S3	A4□7S2	A4□AS3	AZ□7S2	AZ□BS3	A1□8S2	A1□DS3
7	A1□7S3	A1□ES1	A2□7S3	A2□DS1	A3□7S3	A3□9S1	A4□7S3	A4□AS1	AZ□7S3	AZ□BS1	A1□8S3	A1□DS1
8	A1□7S3	A1□ES2	A2□7S3	A2□DS2	A3□7S3	A3□9S2	A4□7S3	A4□AS2	AZ□7S3	AZ□BS2	A1□8S3	A1□DS2
9	A1□7S3	A1□ES3	A2□7S3	A2□DS3	A3□7S3	A3□9S3	A4□7S3	A4□AS3	AZ□7S3	AZ□BS3	A1□8S3	A1□DS3
10	A2□7S1	A2□ES1	A3□7S1	A3□DS1	A4□7S1	A4□9S1	AZ□7S1	AZ□AS1	A1□8S1	A1□ES1	A2□8S1	A2□DS1
11	A2□7S1	A2□ES2	A3□7S1	A3□DS2	A4□7S1	A4□9S2	AZ□7S1	AZ□AS2	A1□8S1	A1□ES2	A2□8S1	A2□DS2
12	A2□7S1	A2□ES3	A3□7S1	A3□DS3	A4□7S1	A4□9S3	AZ□7S1	AZ□AS3	A1□8S1	A1□ES3	A2□8S1	A2□DS3
13	A2□7S2	A2□ES1	A3□7S2	A3□DS1	A4□7S2	A4□9S1	AZ□7S2	AZ□AS1	A1□8S2	A1□ES1	A2□8S2	A2□DS1
14	A2□7S2	A2□ES2	A3□7S2	A3□DS2	A4□7S2	A4□9S2	AZ□7S2	AZ□AS2	A1□8S2	A1□ES2	A2□8S2	A2□DS2
15	A2□7S2	A2□ES3	A3□7S2	A3□DS3	A4□7S2	A4□9S3	AZ□7S2	AZ□AS3	A1□8S2	A1□ES3	A2□8S2	A2□DS3
16	A2□7S3	A2□ES1	A3□7S3	A3□DS1	A4□7S3	A4□9S1	AZ□7S3	AZ□AS1	A1□8S3	A1□ES1	A2□8S3	A2□DS1
17	A2□7S3	A2□ES2	A3□7S3	A3□DS2	A4□7S3	A4□9S2	AZ□7S3	AZ□AS2	A1□8S3	A1□ES2	A2□8S3	A2□DS2
18	A2□7S3	A2□ES3	A3□7S3	A3□DS3	A4□7S3	A4□9S3	AZ□7S3	AZ□AS3	A1□8S3	A1□ES3	A2□8S3	A2□DS3
19	A3□7S1	A3□ES1	A4□7S1	A4□DS1	AZ□7S1	AZ□9S1	A1□7S1	A1□BS1	A2□8S1	A2□ES1	A3□8S1	A3□DS1
20	A3□7S1	A3□ES2	A4□7S1	A4□DS2	AZ□7S1	AZ□9S2	A1□7S1	A1□BS2	A2□8S1	A2□ES2	A3□8S1	A3□DS2
21	A3□7S1	A3□ES3	A4□7S1	A4□DS3	AZ□7S1	AZ□9S3	A1□7S1	A1□BS3	A2□8S1	A2□ES3	A3□8S1	A3□DS3
22	A3□7S2	A3□ES1	A4□7S2	A4□DS1	AZ□7S2	AZ□9S1	A1□7S2	A1□BS1	A2□8S2	A2□ES1	A3□8S2	A3□DS1
23	A3□7S2	A3□ES2	A4□7S2	A4□DS2	AZ□7S2	AZ□9S2	A1□7S2	A1□BS2	A2□8S2	A2□ES2	A3□8S2	A3□DS2
24	A3□7S2	A3□ES3	A4□7S2	A4□DS3	AZ□7S2	AZ□9S3	A1□7S2	A1□BS3	A2□8S2	A2□ES3	A3□8S2	A3□DS3
25	A3□7S3	A3□ES1	A4□7S3	A4□DS1	AZ□7S3	AZ□9S1	A1□7S3	A1□BS1	A2□8S3	A2□ES1	A3□8S3	A3□DS1
26	A3□7S3	A3□ES2	A4□7S3	A4□DS2	AZ□7S3	AZ□9S2	A1□7S3	A1□BS2	A2□8S3	A2□ES2	A3□8S3	A3□DS2
27	A3□7S3	A3□ES3	A4□7S3	A4□DS3	AZ□7S3	AZ□9S3	A1□7S3	A1□BS3	A2□8S3	A2□ES3	A3□8S3	A3□DS3
28	A4□7S1	A4□ES1	AZ□7S1	AZ□DS1	A1□7S1	A1□AS1	A2□7S1	A2□BS1	A3□8S1	A3□ES1	A4□8S1	A4□DS1
29	A4□7S1	A4□ES2	AZ□7S1	AZ□DS2	A1□7S1	A1□AS2	A2□7S1	A2□BS2	A3□8S1	A3□ES2	A4□8S1	A4□DS2
30	A4□7S1	A4□ES3	AZ□7S1	AZ□DS3	A1□7S1	A1□AS3	A2□7S1	A2□BS3	A3□8S1	A3□ES3	A4□8S1	A4□DS3
31	A4□7S2	A4□ES1	AZ□7S2	AZ□DS1	A1□7S2	A1□AS1	A2□7S2	A2□BS1	A3□8S2	A3□ES1	A4□8S2	A4□DS1
32	A4□7S2	A4□ES2	AZ□7S2	AZ□DS2	A1□7S2	A1□AS2	A2□7S2	A2□BS2	A3□8S2	A3□ES2	A4□8S2	A4□DS2
33	A4□7S2	A4□ES3	AZ□7S2	AZ□DS3	A1□7S2	A1□AS3	A2□7S2	A2□BS3	A3□8S2	A3□ES3	A4□8S2	A4□DS3
34	A4□7S3	A4□ES1	AZ□7S3	AZ□DS1	A1□7S3	A1□AS1	A2□7S3	A2□BS1	A3□8S3	A3□ES1	A4□8S3	A4□DS1
35	A4□7S3	A4□ES2	AZ□7S3	AZ□DS2	A1□7S3	A1□AS2	A2□7S3	A2□BS2	A3□8S3	A3□ES2	A4□8S3	A4□DS2
36	A4□7S3	A4□ES3	AZ□7S3	AZ□DS3	A1□7S3	A1□AS3	A2□7S3	A2□BS3	A3□8S3	A3□ES3	A4□8S3	A4□DS3
37	AZ□7S1	AZ□ES1	A1□7S1	A1□9S1	A2□7S1	A2□AS1	A3□7S1	A3□BS1	A4□8S1	A4□ES1	AZ□8S1	AZ□DS1
38	AZ□7S1	AZ□ES2	A1□7S1	A1□9S2	A2□7S1	A2□AS2	A3□7S1	A3□BS2	A4□8S1	A4□ES2	AZ□8S1	AZ□DS2
39	AZ□7S1	AZ□ES3	A1□7S1	A1□9S3	A2□7S1	A2□AS3	A3□7S1	A3□BS3	A4□8S1	A4□ES3	AZ□8S1	AZ□DS3
40	AZ□7S2	AZ□ES1	A1□7S2	A1□9S1	A2□7S2	A2□AS1	A3□7S2	A3□BS1	A4□8S2	A4□ES1	AZ□8S2	AZ□DS1
41	AZ□7S2	AZ□ES2	A1□7S2	A1□9S2	A2□7S2	A2□AS2	A3□7S2	A3□BS2	A4□8S2	A4□ES2	AZ□8S2	AZ□DS2
42	AZ□7S2	AZ□ES3	A1□7S2	A1□9S3	A2□7S2	A2□AS3	A3□7S2	A3□BS3	A4□8S2	A4□ES3	AZ□8S2	AZ□DS3
43	AZ□7S3	AZ□ES1	A1□7S3	A1□9S1	A2□7S3	A2□AS1	A3□7S3	A3□BS1	A4□8S3	A4□ES1	AZ□8S3	AZ□DS1
44	AZ□7S3	AZ□ES2	A1□7S3	A1□9S2	A2□7S3	A2□AS2	A3□7S3	A3□BS2	A4□8S3	A4□ES2	AZ□8S3	AZ□DS2
45	AZ□7S3	AZ□ES3	A1□7S3	A1□9S3	A2□7S3	A2□AS3	A3□7S3	A3□BS3	A4□8S3	A4□ES3	AZ□8S3	AZ□DS3
46	A1□7S1	A1□DS1	A2□7S1	A2□9S1	A3□7S1	A3□AS1	A4□7S1	A4□BS1	AZ□8S1	AZ□ES1	A1□8S1	A1□9S1
47	A1□7S1	A1□DS2	A2□7S1	A2□9S2	A3□7S1	A3□AS2	A4□7S1	A4□BS2	AZ□8S1	AZ□ES2	A1□8S1	A1□9S2
48	A1□7S1	A1□DS3	A2□7S1	A2□9S3	A3□7S1	A3□AS3	A4□7S1	A4□BS3	AZ□8S1	AZ□ES3	A1□8S1	A1□9S3
49	A1□7S2	A1□DS1	A2□7S2	A2□9S1	A3□7S2	A3□AS1	A4□7S2	A4□BS1	AZ□8S2	AZ□ES1	A1□8S2	A1□9S1
50	A1□7S2	A1□DS2	A2□7S2	A2□9S2	A3□7S2	A3□AS2	A4□7S2	A4□BS2	AZ□8S2	AZ□ES2	A1□8S2	A1□9S2
51	A1□7S2	A1□DS3	A2□7S2	A2□9S3	A3□7S2	A3□AS3	A4□7S2	A4□BS3	AZ□8S2	AZ□ES3	A1□8S2	A1□9S3
52	A1□7S3	A1□DS1	A2□7S3	A2□9S1	A3□7S3	A3□AS1	A4□7S3	A4□BS1	AZ□8S3	AZ□ES1	A1□8S3	A1□9S1
53	A1□7S3	A1□DS2	A2□7S3	A2□9S2	A3□7S3	A3□AS2	A4□7S3	A4□BS2	AZ□8S3	AZ□ES2	A1□8S3	A1□9S2
54	A1□7S3	A1□DS3	A2□7S3	A2□9S3	A3□7S3	A3□AS3	A4□7S3	A4□BS3	AZ□8S3	AZ□ES3	A1□8S3	A1□9S3

[Kitting combination – 2700K, 3000K, 3500K and 4000K]

-	RANK 1	RANK 2	RANK 1	RANK 2	RANK 1	RANK 2	RANK 1	RANK 2	RANK 1	RANK 2	RANK 1	RANK 2
1	A2□8S1	A2□9S1	A3□8S1	A3□AS1	A4□9S1	A4□BS1	AZ□9S1	AZ□CS1	A1□AS1	A1□CS1	A2□6S1	A2□6S1
2	A2□8S1	A2□9S2	A3□8S1	A3□AS2	A4□9S1	A4□BS2	AZ□9S1	AZ□CS2	A1□AS1	A1□CS2	A2□6S1	A2□6S2
3	A2□8S1	A2□9S3	A3□8S1	A3□AS3	A4□9S1	A4□BS3	AZ□9S1	AZ□CS3	A1□AS1	A1□CS3	A2□6S1	A2□6S3
4	A2□8S2	A2□9S1	A3□8S2	A3□AS1	A4□9S2	A4□BS1	AZ□9S2	AZ□CS1	A1□AS2	A1□CS1	A2□6S2	A2□6S1
5	A2□8S2	A2□9S2	A3□8S2	A3□AS2	A4□9S2	A4□BS2	AZ□9S2	AZ□CS2	A1□AS2	A1□CS2	A2□6S2	A2□6S2
6	A2□8S2	A2□9S3	A3□8S2	A3□AS3	A4□9S2	A4□BS3	AZ□9S2	AZ□CS3	A1□AS2	A1□CS3	A2□6S2	A2□6S3
7	A2□8S3	A2□9S1	A3□8S3	A3□AS1	A4□9S3	A4□BS1	AZ□9S3	AZ□CS1	A1□AS3	A1□CS1	A2□6S3	A2□6S1
8	A2□8S3	A2□9S2	A3□8S3	A3□AS2	A4□9S3	A4□BS2	AZ□9S3	AZ□CS2	A1□AS3	A1□CS2	A2□6S3	A2□6S2
9	A2□8S3	A2□9S3	A3□8S3	A3□AS3	A4□9S3	A4□BS3	AZ□9S3	AZ□CS3	A1□AS3	A1□CS3	A2□6S3	A2□6S3
10	A3□8S1	A3□9S1	A4□8S1	A4□AS1	AZ□9S1	AZ□BS1	A1□AS1	A1□BS1	A2□AS1	A2□CS1	A3□6S1	A3□6S1
11	A3□8S1	A3□9S2	A4□8S1	A4□AS2	AZ□9S1	AZ□BS2	A1□AS1	A1□BS2	A2□AS1	A2□CS2	A3□6S1	A3□6S2
12	A3□8S1	A3□9S3	A4□8S1	A4□AS3	AZ□9S1	AZ□BS3	A1□AS1	A1□BS3	A2□AS1	A2□CS3	A3□6S1	A3□6S3
13	A3□8S2	A3□9S1	A4□8S2	A4□AS1	AZ□9S2	AZ□BS1	A1□AS2	A1□BS1	A2□AS2	A2□CS1	A3□6S2	A3□6S1
14	A3□8S2	A3□9S2	A4□8S2	A4□AS2	AZ□9S2	AZ□BS2	A1□AS2	A1□BS2	A2□AS2	A2□CS2	A3□6S2	A3□6S2
15	A3□8S2	A3□9S3	A4□8S2	A4□AS3	AZ□9S2	AZ□BS3	A1□AS2	A1□BS3	A2□AS2	A2□CS3	A3□6S2	A3□6S3
16	A3□8S3	A3□9S1	A4□8S3	A4□AS1	AZ□9S3	AZ□BS1	A1□AS3	A1□BS1	A2□AS3	A2□CS1	A3□6S3	A3□6S1
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18	A3□8S3	A3□9S3	A4□8S3	A4□AS3	AZ□9S3	AZ□BS3	A1□AS3	A1□BS3	A2□AS3	A2□CS3	A3□6S3	A3□6S3
19	A4□8S1	A4□9S1	AZ□8S1	AZ□AS1	A1□9S1	A1□CS1	A2□AS1	A2□BS1	A3□AS1	A3□CS1	A4□6S1	A4□6S1
20	A4□8S1	A4□9S2	AZ□8S1	AZ□AS2	A1□9S1	A1□CS2	A2□AS1	A2□BS2	A3□AS1	A3□CS2	A4□6S1	A4□6S2
21	A4□8S1	A4□9S3	AZ□8S1	AZ□AS3	A1□9S1	A1□CS3	A2□AS1	A2□BS3	A3□AS1	A3□CS3	A4□6S1	A4□6S3
22	A4□8S2	A4□9S1	AZ□8S2	AZ□AS1	A1□9S2	A1□CS1	A2□AS2	A2□BS1	A3□AS2	A3□CS1	A4□6S2	A4□6S1
23	A4□8S2	A4□9S2	AZ□8S2	AZ□AS2	A1□9S2	A1□CS2	A2□AS2	A2□BS2	A3□AS2	A3□CS2	A4□6S2	A4□6S2
24	A4□8S2	A4□9S3	AZ□8S2	AZ□AS3	A1□9S2	A1□CS3	A2□AS2	A2□BS3	A3□AS2	A3□CS3	A4□6S2	A4□6S3
25	A4□8S3	A4□9S1	AZ□8S3	AZ□AS1	A1□9S3	A1□CS1	A2□AS3	A2□BS1	A3□AS3	A3□CS1	A4□6S3	A4□6S1
26	A4□8S3	A4□9S2	AZ□8S3	AZ□AS2	A1□9S3	A1□CS2	A2□AS3	A2□BS2	A3□AS3	A3□CS2	A4□6S3	A4□6S2
27	A4□8S3	A4□9S3	AZ□8S3	AZ□AS3	A1□9S3	A1□CS3	A2□AS3	A2□BS3	A3□AS3	A3□CS3	A4□6S3	A4□6S3
28	AZ□8S1	AZ□9S1	A1□9S1	A1□BS1	A2□9S1	A2□CS1	A3□AS1	A3□BS1	A4□AS1	A4□CS1	AZ□6S1	AZ□6S1
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31	AZ□8S2	AZ□9S1	A1□9S2	A1□BS1	A2□9S2	A2□CS1	A3□AS2	A3□BS1	A4□AS2	A4□CS1	AZ□6S2	AZ□6S1
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37	A1□8S1	A1□AS1	A2□9S1	A2□BS1	A3□9S1	A3□CS1	A4□AS1	A4□BS1	AZ□AS1	AZ□CS1	A1□7S1	A1□7S1
38	A1□8S1	A1□AS2	A2□9S1	A2□BS2	A3□9S1	A3□CS2	A4□AS1	A4□BS2	AZ□AS1	AZ□CS2	A1□7S1	A1□7S2
39	A1□8S1	A1□AS3	A2□9S1	A2□BS3	A3□9S1	A3□CS3	A4□AS1	A4□BS3	AZ□AS1	AZ□CS3	A1□7S1	A1□7S3
40	A1□8S2	A1□AS1	A2□9S2	A2□BS1	A3□9S2	A3□CS1	A4□AS2	A4□BS1	AZ□AS2	AZ□CS1	A1□7S2	A1□7S1
41	A1□8S2	A1□AS2	A2□9S2	A2□BS2	A3□9S2	A3□CS2	A4□AS2	A4□BS2	AZ□AS2	AZ□CS2	A1□7S2	A1□7S2
42	A1□8S2	A1□AS3	A2□9S2	A2□BS3	A3□9S2	A3□CS3	A4□AS2	A4□BS3	AZ□AS2	AZ□CS3	A1□7S2	A1□7S3
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46	A2□8S1	A2□AS1	A3□9S1	A3□BS1	A4□9S1	A4□CS1	AZ□AS1	AZ□BS1	A1□6S1	A1□6S1	A2□7S1	A2□7S1
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48	A2□8S1	A2□AS3	A3□9S1	A3□BS3	A4□9S1	A4□CS3	AZ□AS1	AZ□BS3	A1□6S1	A1□6S3	A2□7S1	A2□7S3
49	A2□8S2	A2□AS1	A3□9S2	A3□BS1	A4□9S2	A4□CS1	AZ□AS2	AZ□BS1	A1□6S2	A1□6S1	A2□7S2	A2□7S1
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52	A2□8S3	A2□AS1	A3□9S3	A3□BS1	A4□9S3	A4□CS1	AZ□AS3	AZ□BS1	A1□6S3	A1□6S1	A2□7S3	A2□7S1
53	A2□8S3	A2□AS2	A3□9S3	A3□BS2	A4□9S3	A4□CS2	AZ□AS3	AZ□BS2	A1□6S3	A1□6S2	A2□7S3	A2□7S2
54	A2□8S3	A2□AS3	A3□9S3	A3□BS3	A4□9S3	A4□CS3	AZ□AS3	AZ□BS3	A1□6S3	A1□6S3	A2□7S3	A2□7S3

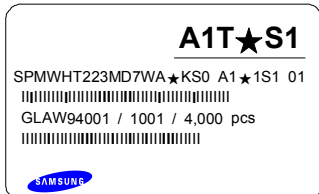
[Kitting combination – 2700K, 3000K, 3500K and 4000K]

-	RANK 1	RANK 2	RANK 1	RANK 2	RANK 1	RANK 2	RANK 1	RANK 2	RANK 1	RANK 2	RANK 1	RANK 2
1	A3□7S1	A3□7S1	A4□BS1	A4□BS1								
2	A3□7S1	A3□7S2	A4□BS1	A4□BS2								
3	A3□7S1	A3□7S3	A4□BS1	A4□BS3								
4	A3□7S2	A3□7S1	A4□BS2	A4□BS1								
5	A3□7S2	A3□7S2	A4□BS2	A4□BS2								
6	A3□7S2	A3□7S3	A4□BS2	A4□BS3								
7	A3□7S3	A3□7S1	A4□BS3	A4□BS1								
8	A3□7S3	A3□7S2	A4□BS3	A4□BS2								
9	A3□7S3	A3□7S3	A4□BS3	A4□BS3								
10	A4□7S1	A4□7S1	AZ□BS1	AZ□BS1								
11	A4□7S1	A4□7S2	AZ□BS1	AZ□BS2								
12	A4□7S1	A4□7S3	AZ□BS1	AZ□BS3								
13	A4□7S2	A4□7S1	AZ□BS2	AZ□BS1								
14	A4□7S2	A4□7S2	AZ□BS2	AZ□BS2								
15	A4□7S2	A4□7S3	AZ□BS2	AZ□BS3								
16	A4□7S3	A4□7S1	AZ□BS3	AZ□BS1								
17	A4□7S3	A4□7S2	AZ□BS3	AZ□BS2								
18	A4□7S3	A4□7S3	AZ□BS3	AZ□BS3								
19	AZ□7S1	AZ□7S1										
20	AZ□7S1	AZ□7S2										
21	AZ□7S1	AZ□7S3										
22	AZ□7S2	AZ□7S1										
23	AZ□7S2	AZ□7S2										
24	AZ□7S2	AZ□7S3										
25	AZ□7S3	AZ□7S1										
26	AZ□7S3	AZ□7S2										
27	AZ□7S3	AZ□7S3										
28	A1□BS1	A1□BS1										
29	A1□BS1	A1□BS2										
30	A1□BS1	A1□BS3										
31	A1□BS2	A1□BS1										
32	A1□BS2	A1□BS2										
33	A1□BS2	A1□BS3										
34	A1□BS3	A1□BS1										
35	A1□BS3	A1□BS2										
36	A1□BS3	A1□BS3										
37	A2□BS1	A2□BS1										
38	A2□BS1	A2□BS2										
39	A2□BS1	A2□BS3										
40	A2□BS2	A2□BS1										
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44	A2□BS3	A2□BS2										
45	A2□BS3	A2□BS3										
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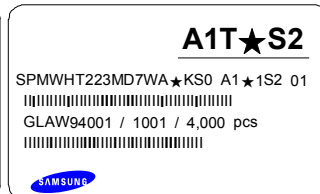
2) Kitting bin Packing process

Reel

Kitting 'A'

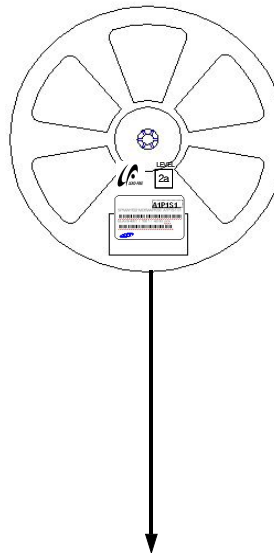


Kitting 'B'

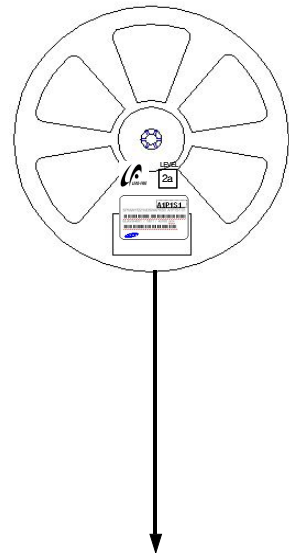


※ '★' means All kind of Chromaticity Coordinate Rank.

Kitting 'A'

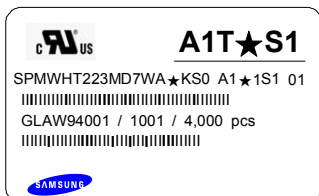


Kitting 'B'

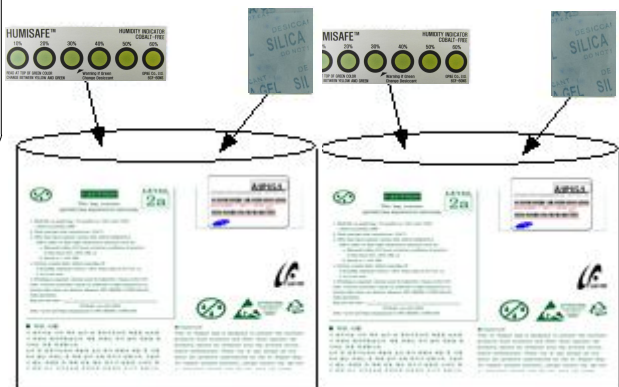
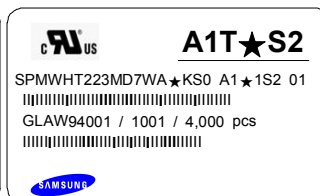


Aluminum Vinyl Bag

Kitting 'A'

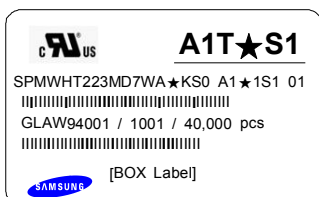


Kitting 'B'

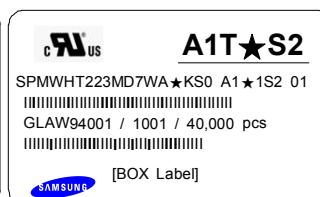


Outer Box

Kitting 'A'

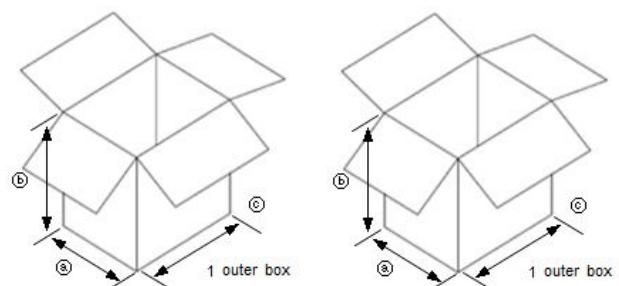


Kitting 'B'



Material : Paper(SW3B(B))

TYPE	SIZE(mm)		
	a	b	c
7inch	245±5	220±5	182±5



12. Precaution for use

- 1) For over-current-proof function, customers are recommended to apply resistors to prevent sudden change of the current caused by slight shift of the voltage.
- 2) This device 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.
- 3) When the LEDs illuminate, operating current should be decided after considering the ambient maximum temperature.
- 4) LEDs must be stored in a clean environment. If the LEDs are to be stored for 3 months or more after being shipped from Samsung Electronics, they should be packed by a sealed container with nitrogen gas injected.(Shelf life of sealed bags: 12 months, temp. $\sim 40^{\circ}\text{C}$, $\sim 90\%\text{RH}$)
- 5) After storage bag is open, device subjected to soldering, solder reflow, or other high temperature processes must be:
 - a. Mounted within 672 hours(28 days) at an assembly line with a condition of no more than $30^{\circ}\text{C}/60\%\text{RH}$,
 - b. Stored at $<10\%\text{RH}$.
- 6) Repack unused Products with anti-moisture packing, fold to close any opening and then store in a dry place.
- 7) Devices require baking before mounting, if humidity card reading is $>60\%$ at $23\pm 5^{\circ}\text{C}$..
- 8) Devices must be baked for 1 hour at $65\pm 5^{\circ}\text{C}$, if baking is required.
- 9) 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 LEDs. 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.
- 10) 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 light and heat. This phenomenon can cause a significant loss of light emitted(output) from the luminaires(fixture). In order to prevent these problems, we recommend you to know the physical properties of materials used in luminaires, They must be selected carefully.

11) Risk of Sulfurization(or Tarnishing)

The LED from Samsung Electronics 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, LED should not be used and stored together with oxidizing substances made of materials in a following list,

: Rubber, plain paper, lead solder cream and so on.

13. Hazard Substance Analysis - SGS


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Issued Date: 2013. 11. 27 Page 1 of 6

To: SAMSUNG ELECTRONICS CO., LTD.
 San #24, Nongseo-dong
 Giheung-gu
 Yongin-si
 Gyeonggi-do
 Korea

The following merchandise was submitted and identified by the client as :

SGS File No.	: AYAA13-52933
Product Name	: 2323 white PKG
Item No./Part No.	: N/A
Received Date	: 2013. 11. 20
Test Period	: 2013. 11. 21 to 2013. 11. 27
Test Results	: For further details, please refer to following page(s)
Test Performed	: SGS Korea tested the sample(s) selected by applicant with following results.
Job Comments	: By the applicant's specific request, the sampling and testing was performed only for the part indicated in the photo without disassembly.

Timothy Jeon
 Jinhee Kim
 Cindy Park
 Jerry Jung/ Testing Person

SGS Korea Co., Ltd.

Jeff Jang / Chemical Lab Mgr

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SGS Korea Co., Ltd.

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F052 Version5

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Sample No. : AYAA13-52933.001

Sample Description : 2323 white PKG

Item No./Part No. : N/A

Materials : N/A

Heavy Metals

Test Items	Unit	Test Method	MDL	Results
Cadmium (Cd)	mg/kg	With reference to IEC 62321:2013, ICP	0.5	N.D.
Lead (Pb)	mg/kg	With reference to IEC 62321:2013, ICP	5	N.D.
Mercury (Hg)	mg/kg	With reference to IEC 62321:2013, ICP	2	N.D.
Hexavalent Chromium (Cr VI)	mg/kg	With reference to IEC 62321:2008, UV-VIS	1	N.D.

Flame Retardants-PBBs/PBDEs

Test Items	Unit	Test Method	MDL	Results
Monobromobiphenyl	mg/kg	With reference to IEC 62321:2008, GC-MS	5	N.D.
Dibromobiphenyl	mg/kg	With reference to IEC 62321:2008, GC-MS	5	N.D.
Tribromobiphenyl	mg/kg	With reference to IEC 62321:2008, GC-MS	5	N.D.
Tetrabromobiphenyl	mg/kg	With reference to IEC 62321:2008, GC-MS	5	N.D.
Pentabromobiphenyl	mg/kg	With reference to IEC 62321:2008, GC-MS	5	N.D.
Hexabromobiphenyl	mg/kg	With reference to IEC 62321:2008, GC-MS	5	N.D.
Heptabromobiphenyl	mg/kg	With reference to IEC 62321:2008, GC-MS	5	N.D.
Octabromobiphenyl	mg/kg	With reference to IEC 62321:2008, GC-MS	5	N.D.
Nonabromobiphenyl	mg/kg	With reference to IEC 62321:2008, GC-MS	5	N.D.
Decabromobiphenyl	mg/kg	With reference to IEC 62321:2008, GC-MS	5	N.D.
Monobromodiphenyl ether	mg/kg	With reference to IEC 62321:2008, GC-MS	5	N.D.
Dibromodiphenyl ether	mg/kg	With reference to IEC 62321:2008, GC-MS	5	N.D.
Tribromodiphenyl ether	mg/kg	With reference to IEC 62321:2008, GC-MS	5	N.D.
Tetrabromodiphenyl ether	mg/kg	With reference to IEC 62321:2008, GC-MS	5	N.D.
Pentabromodiphenyl ether	mg/kg	With reference to IEC 62321:2008, GC-MS	5	N.D.
Hexabromodiphenyl ether	mg/kg	With reference to IEC 62321:2008, GC-MS	5	N.D.
Heptabromodiphenyl ether	mg/kg	With reference to IEC 62321:2008, GC-MS	5	N.D.
Octabromodiphenyl ether	mg/kg	With reference to IEC 62321:2008, GC-MS	5	N.D.
Nonabromodiphenyl ether	mg/kg	With reference to IEC 62321:2008, GC-MS	5	N.D.
Decabromodiphenyl ether	mg/kg	With reference to IEC 62321:2008, GC-MS	5	N.D.

NOTE:

- (1) N.D. = Not detected. (<MDL)
- (2) mg/kg = ppm
- (3) MDL = Method Detection Limit
- (4) - = No regulation
- (5) Negative = Undetectable / Positive = Detectable
- (6) ** = Qualitative analysis (No Unit)
- (7) * = Boiling-water-extraction:
 Negative = Absence of CrVI coating
 Positive = Presence of CrVI coating; the detected concentration in boiling-water-extraction solution is equal or greater than 0.02 mg/kg with 50 cm² sample surface area.

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Test Report No. F690101/LF-CTSAYAA13-52933

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Sample No. : AYAA13-52933.001

Sample Description : 2323 white PKG

Item No./Part No. : N/A

Materials : N/A

Halogen Content

Test Items	Unit	Test Method	MDL	Results
Bromine(Br)	mg/kg	BS EN 14582:2007 , IC	30	N.D.
Chlorine(Cl)	mg/kg	BS EN 14582:2007 , IC	30	N.D.
Fluorine(F)	mg/kg	BS EN 14582:2007 , IC	30	N.D.
Iodine(I)	mg/kg	BS EN 14582:2007 , IC	50	N.D.

Other(s)

Test Items	Unit	Test Method	MDL	Results
PFOS (Perfluorooctane Sulfonates-Acid/Metal Salt/Amide)	mg/kg	US EPA 3540C/3550C, LC/MS	1	N.D.

NOTE:

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- (7) * = Boiling-water-extraction:
 Negative = Absence of Cr/VI coating
 Positive = Presence of Cr/VI coating; the detected concentration in boiling-water-extraction solution is equal or greater than 0.02 mg/kg with 50 cm2 sample surface area.

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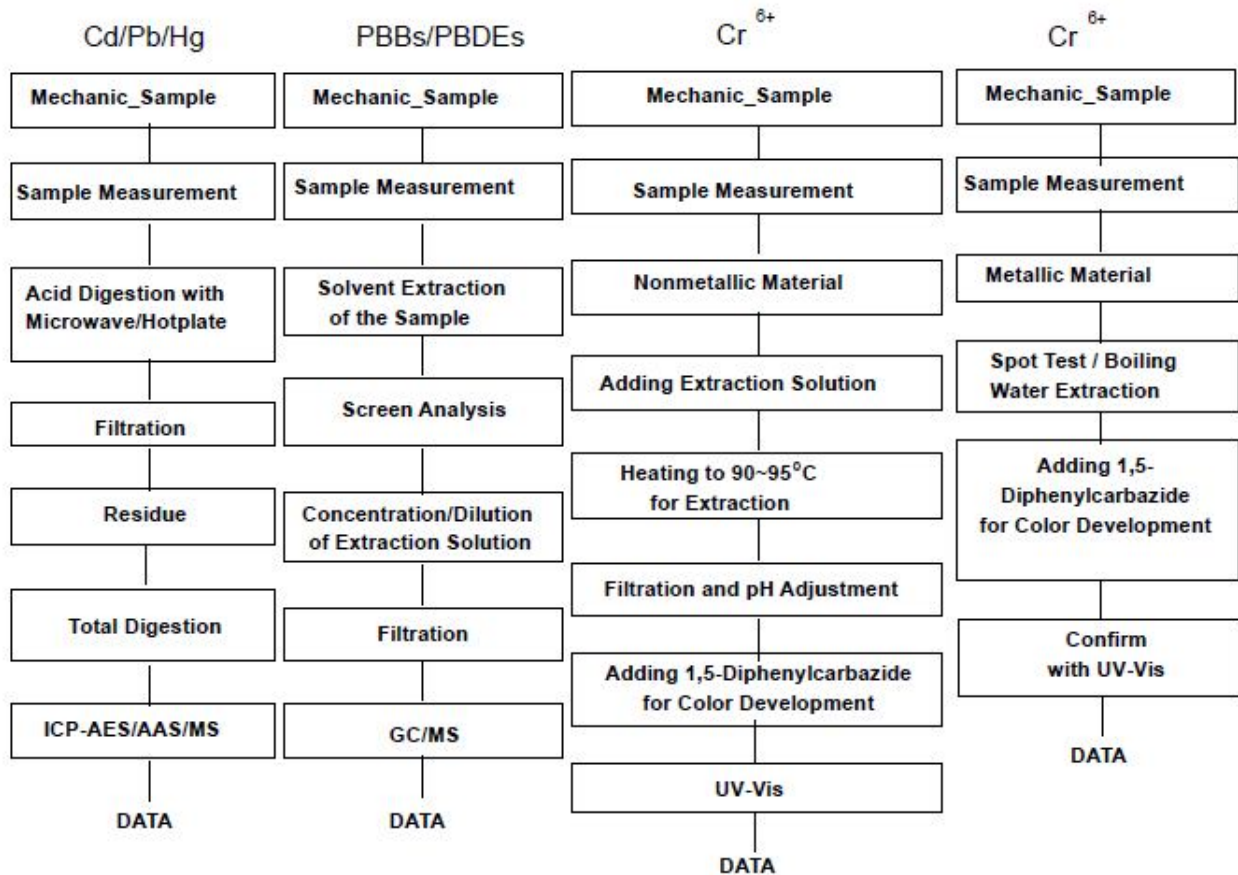
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Test Report No. F690101/LF-CTSAYAA13-52933

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Testing Flow Chart for RoHS: Cd/Pb/Hg/Cr⁶⁺ /PBBs&PBDEs Testing

The samples were dissolved totally by pre-conditioning method according to above flow chart for Cd,Pb,Hg.
Section Chief : Gilsae Yi

NOTE:

- (1) N.D. = Not detected.(<MDL)
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- (7) * = Boiling-water-extraction:
Negative = Absence of CrVI coating
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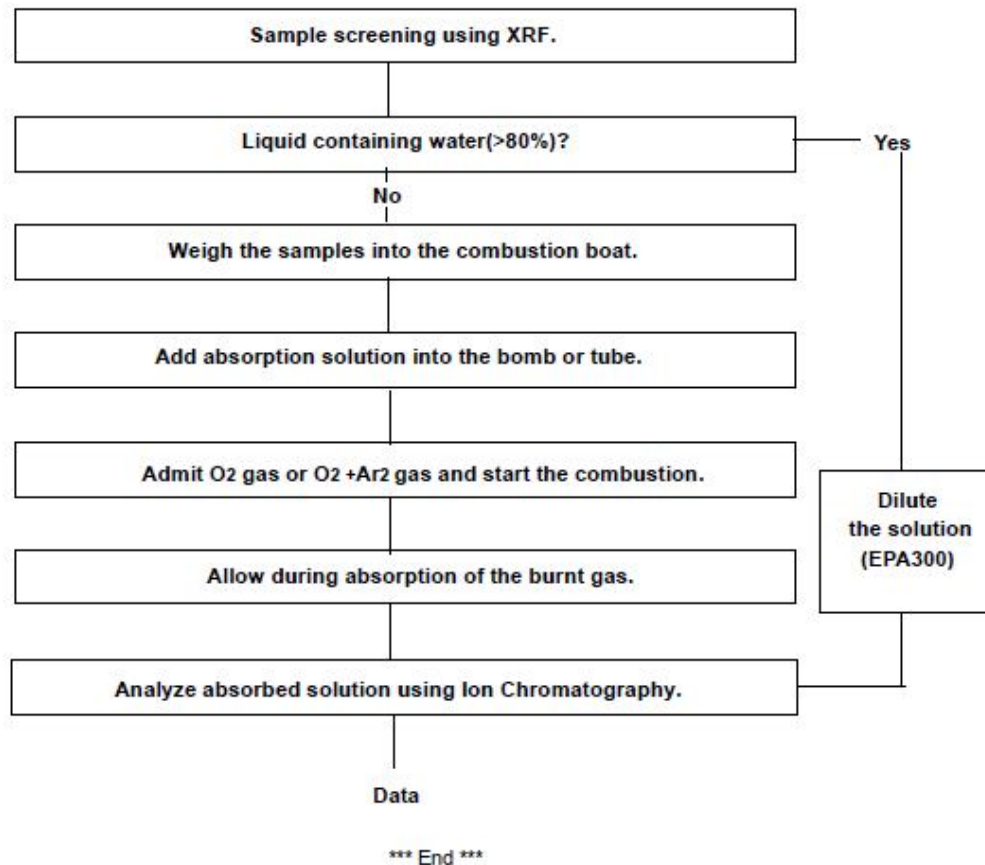
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Test Report No. F690101/LF-CTSAYAA13-52933

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Flow Chart for Halogen Test



NOTE:

- (1) N.D. = Not detected.(<MDL)
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- (4) - = No regulation
- (5) Negative = Undetectable / Positive = Detectable
- (6) ** = Qualitative analysis (No Unit)
- (7) * = Boiling-water-extraction:
 Negative = Absence of CrVI coating
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12. Hazard Substance Analysis - SVHC(REACH)



Test Report No. F690101/LF-CTSAYAA13-52932 Issued Date: 2013. 11. 27 Page 1 of 16

To: **SAMSUNG ELECTRONICS CO., LTD.**
95, Samsung 2-ro
Giheung-gu
Yongin-si
Gyeonggi-do
Korea

The following sample(s) was/were submitted and identified by/on behalf of the client as:-

Product Name	: 2323 white PKG
Item/Part Name	: N/A
SGS File No.	: AYAA13-52932
Received Date	: 2013. 11. 20
Test Period	: 2013. 11. 21 ~ 2013. 11. 27
Test Performed	: SGS Korea tested the sample(s) selected by applicant with following results
Test Requested	: One hundred-forty four (144) substances in the Candidate List of Substances of Very High Concern (SVHC) for authorization published by European Chemicals Agency (ECHA) on June 20, 2013 regarding Regulation (EC) No 1907/2006 concerning the REACH. Seven(7) substances in the Public Consultation List of potential Substances of Very High Concern (SVHC) published by European Chemicals Agency (ECHA) on September 02, 2013 regarding Regulation (EC) No 1907/2006 concerning the REACH.
Test Method	: Please refer to next page(s).
Test Result(s)	: Please refer to next page(s).
Summary	: According to the specified scope and analytical technique, concentrations of all SVHC are <0.1% in the submitted sample(s).

Timothy Jeon
Cindy park
Jinhee Kim
Sophia Kim
/Testing Person

SGS Korea Co., Ltd

Jeff Jang / Chemical Lab Mgr

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Test Method:

SGS In-House method - Analyzed by ICP-OES, PLM, UV/VIS, LC/MS, GC/MS and colorimetric method

Remarks:

1. The chemical analysis of specified SVHC is performed by means of currently available analytical techniques against the following SVHC related documents published by ECHA:
<http://echa.europa.eu/web/guest/candidate-list-table> (Candidate list)
http://echa.europa.eu/proposals-to-identify-substances-of-very-high-concern-previous-consultations?p_p_id=substancetypelist_WAR_substanceportlet&p_p_lifecycle=0&p_p_state=normal&p_p_mode=view&p_p_col_id=column-1&p_p_col_pos=2&p_p_col_count=4&substancetypelist
 (Proposals to identify SVHC consultations)
 This list is under evaluation by ECHA and may subject to change in the future.
2. In accordance with Regulation (EC) No 1907/2006, any producer or importer of articles shall notify ECHA, in accordance with paragraph 2 of Article 7, if a substance meets the criteria in Article 57 and is identified in accordance with Article 59(1) of the Regulation, if (a) the substance is present in those articles in quantities totaling over one tonne per producer or importer per year; and (b) the substance is present in those articles above a concentration of **0.1 % weight by weight (w/w)**.
3. Article 33 of Regulation (EC) No 1907/2006 requires supplier of an article containing a substance meeting the criteria in Article 57 and identified in accordance with Article 59(1) in a concentration above **0.1 % weight by weight (w/w)** shall provide the recipient of the article with sufficient information, available to the supplier, to allow safe use of the article including, as a minimum, the name of that substance in the Candidate List.
4. SGS adopts the interpretation of ECHA for SVHC in article unless indicated otherwise. Detail explanation is available at the following link:
http://webstage.contribute.sgs.net/corpreach/documents/SGS-CTS_SVHC-paper-EN-11.pdf
5. Test results in this report are based on the tested sample. This report refers to testing result of composite material group by equal weight proportion. The material in each composite test group may come from one article.
6. If a SVHC is found over the reporting limit, client is suggested to identify the component which contains the SVHC and the exact concentration of the SVHC by requesting further quantitative analysis from the laboratory.

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Test Report No. F690101/LF-CTSAYAA13-52932 Issued Date: 2013. 11. 27 Page 3 of 16

Test Result(s)

Substance Name	CAS number	EC number	Concentration (%)	Reporting Limit (%)	Classification
Alkanes, C10-13, chloro (Short Chain Chlorinated Paraffins)	85535-84-8	287-476-5	N.D.	0.05	PBT
Anthracene	120-12-7	204-371-1	N.D.	0.05	PBT
Benzyl butyl phthalate (BBP)	85-68-7	201-622-7	N.D.	0.05	Toxic for Reproduction
Bis(2-ethylhexyl)phthalate (DEHP)	117-81-7	204-211-0	N.D.	0.05	Toxic for Reproduction
Bis(tributyltin)oxide	56-35-9	200-268-0	N.D.	0.05	PBT
Cobalt dichloride*	7646-79-9	231-589-4	N.D.	0.005	Carcinogen Toxic for Reproduction
4,4-Diaminodiphenylmethane	101-77-9	202-974-4	N.D.	0.05	Carcinogen
Diarsenic pentaoxide*	1303-28-2	215-116-9	N.D.	0.005	Carcinogen
Diarsenic trioxide*	1327-53-3	215-481-4	N.D.	0.005	Carcinogen
Dibutyl phthalate (DBP)	84-74-2	201-557-4	N.D.	0.05	Toxic for Reproduction
Hexabromocyclododecane (HBCDD) and all major diastereoisomers identified (α -HBCDD, β -HBCDD, γ -HBCDD)	25637-99-4 3194-55-6 (134237-51-7, 134237-50-6, 134237-52-8)	247-148-4 221-695-9	N.D.	0.05	PBT
Lead hydrogen arsenate*	7784-40-9	232-064-2	N.D.	0.005	Carcinogen Toxic for Reproduction
Sodium dichromate* (Sodium dichromate, dehydrate)	10588-01-9 (7789-12-0)	234-190-3	N.D.	0.005	Carcinogen Mutagen Toxic for Reproduction
5-tert-butyl-2,4,6-trinitro-m-xylene (musk xylene)	81-15-2	201-329-4	N.D.	0.05	vPvB
Triethyl arsenate*	15606-95-8	427-700-2	N.D.	0.005	Carcinogen

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Test Report No. F690101/LF-CTSAYAA13-52932

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Substance Name	CAS number	EC number	Concentration (%)	Reporting Limit (%)	Classification
Di-isobutyl phthalate(DIBP)	84-69-5	201-553-2	N.D.	0.05	Toxic for Reproduction
2,4-Dinitrotoluene	121-14-2	204-450-0	N.D.	0.05	Carcinogen
Tris(2-chloroethyl) phosphate	115-96-8	204-118-5	N.D.	0.05	Toxic for Reproduction
Anthracene oil	90640-80-5	292-602-7	N.D.	0.05	PBT; vPvB Carcinogen
Anthracene oil, anthracene paste; distn. Lights	91995-17-4	295-278-5	N.D.	0.05	PBT; vPvB Carcinogen Mutagen
Anthracene oil, anthracene paste, anthracene fraction	91995-15-2	295-275-9	N.D.	0.05	PBT; vPvB Carcinogen Mutagen
Anthracene oil, anthracene-low	90640-82-7	292-604-8	N.D.	0.05	PBT; vPvB Carcinogen Mutagen
Anthracene oil, anthracene paste	90640-81-6	292-603-2	N.D.	0.05	PBT; vPvB Carcinogen Mutagen
Coal tar pitch, high temperature	65996-93-2	266-028-2	N.D.	0.05	PBT; vPvB Carcinogen
Lead sulfochromate yellow (C.I. Pigment Yellow 34)*	1344-37-2	215-693-7	N.D.	0.005	Carcinogen Toxic for Reproduction
Lead chromate molybdate sulfate red (C.I. Pigment Red 104)*	12656-85-8	235-759-9	N.D.	0.005	Carcinogen Toxic for Reproduction
Lead chromate*	7758-97-6	231-846-0	N.D.	0.005	Carcinogen Toxic for Reproduction
Acrylamide	79-06-01	201-173-7	N.D.	0.05	Carcinogen Mutagen

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Substance Name	CAS number	EC number	Concentration (%)	Reporting Limit (%)	Classification
Boric acid*	10043-35-3 11113-50-1	233-139-2 234-343-4	N.D.	0.005	Toxic for Reproduction
Disodium tetraborate, anhydrous*	1330-43-4 12179-04-3 1303-96-4	215-540-4	N.D.	0.005	Toxic for Reproduction
Tetraboron disodium heptaoxide, hydrate*	12267-73-1	235-541-3	N.D.	0.005	Toxic for Reproduction
Trichloroethylene	79-01-6	201-167-4	N.D.	0.05	Carcinogen
Sodium chromate*	7775-11-3	231-889-5	N.D.	0.005	Carcinogen Mutagen Toxic for Reproduction
Ammonium dichromate*	7789-09-5	232-143-1	N.D.	0.005	Carcinogen Mutagen Toxic for Reproduction
Potassium dichromate*	7778-50-9	231-906-6	N.D.	0.005	Carcinogen Mutagen Toxic for Reproduction
Potassium chromate*	7789-00-6	232-140-5	N.D.	0.005	Carcinogen Mutagen

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Substance Name	CAS number	EC number	Concentration (%)	Reporting Limit (%)	Classification
Cobalt(II) sulphate*	10124-43-3	233-334-2	N.D.	0.005	Carcinogen Toxic for Reproduction
Cobalt(II) dinitrate*	10141-05-6	233-402-1	N.D.	0.005	Carcinogen Toxic for Reproduction
Cobalt(II) carbonate*	513-79-1	208-169-4	N.D.	0.005	Carcinogen Toxic for Reproduction
Cobalt(II) diacetate*	71-48-7	200-755-8	N.D.	0.005	Carcinogen Toxic for Reproduction
2-Methoxyethanol	109-86-4	203-713-7	N.D.	0.05	Toxic for Reproduction
2-Ethoxyethanol	110-80-5	203-804-1	N.D.	0.05	Toxic for Reproduction
Chromium trioxide*	1333-82-0	215-607-8	N.D.	0.005	Carcinogen Mutagen
Acids generated from chromium trioxide and their oligomers:					
Chromic acid	7738-94-5	231-801-5	N.D.	0.005	Carcinogen
Dichromic acid	13530-68-2	236-881-5			
Oligomers of chromic acid and dichromic acid					
1-methyl-2-pyrrolidone	872-50-4	212-828-1	N.D.	0.05	Toxic for Reproduction
2-ethoxyethyl acetate	111-15-9	203-839-2	N.D.	0.05	Toxic for Reproduction
1,2-benzenedicarboxylic acid, di-C6-8-branched alkyl esters, C7-rich	71888-89-6	276-158-1	N.D.	0.05	Toxic for Reproduction
1,2-benzenedicarboxylic acid, di-C7-11-branched and linear alkyl esters	68515-42-4	271-084-6	N.D.	0.05	Toxic for Reproduction
1,2,3-trichloropropane	96-18-4	202-486-1	N.D.	0.05	Carcinogen Toxic for Reproduction
Hydrazine	7803-57-8 302-01-2	206-114-9	N.D.	0.05	Carcinogen
Strontium chromate*	7789-06-2	232-142-6	N.D.	0.005	Carcinogen

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Substance Name	CAS number	EC number	Concentration (%)	Reporting Limit (%)	Classification
1,2-Dichloroethane	107-06-2	203-458-1	N.D.	0.05	Carcinogenic
2,2'-dichloro-4,4'-methylenedianiline (MOCA)	101-14-4	202-918-9	N.D.	0.05	Carcinogenic
2-Methoxyaniline o-Anisidine	90-04-0	201-963-1	N.D.	0.05	Carcinogenic
4-(1,1,3,3-tetramethylbutyl)phenol, (4-tert-Octylphenol)	140-66-9	205-426-2	N.D.	0.05	Equivalent level of concern having probable serious effects to the environment
Aluminosilicate Refractory Ceramic Fibres* (RCF)	650-017-00-8 (Index no.)	-	N.D.	0.005	Carcinogenic
Arsenic acid*	7778-39-4	231-901-9	N.D.	0.005	Carcinogenic
Bis(2-methoxyethyl) ether	111-96-6	203-924-4	N.D.	0.05	Toxic for reproduction
Bis(2-methoxyethyl) phthalate	117-82-8	204-212-6	N.D.	0.05	Toxic for reproduction
Calcium arsenate*	7778-44-1	231-904-5	N.D.	0.005	Carcinogenic
Dichromium tris(chromate)*	24613-89-6	246-356-2	N.D.	0.005	Carcinogenic
Formaldehyde, oligomeric reaction products with aniline (technical MDA)	25214-70-4	500-036-1	N.D.	0.05	Carcinogenic
Lead diazide*	13424-46-9	236-542-1	N.D.	0.005	Toxic for reproduction
Lead dipicrate*	6477-64-1	229-335-2	N.D.	0.005	Toxic for reproduction
Lead styphnate*	15245-44-0	239-290-2	N.D.	0.005	Toxic for reproduction
N,N-dimethylacetamide (DMAC)	127-19-5	204-826-4	N.D.	0.05	Toxic for reproduction
Pentazinc chromate octahydroxide*	49663-84-5	256-418-0	N.D.	0.005	Carcinogenic
Phenolphthalein	77-09-8	201-004-7	N.D.	0.05	Carcinogenic
Potassium hydroxyocta-oxodizincatedichromate*	11103-86-9	234-329-8	N.D.	0.005	Carcinogenic
Trilead diarsenate*	3687-31-8	222-979-5	N.D.	0.005	Carcinogenic Toxic for reproduction
Zirconia Aluminosilicate Refractory Ceramic Fibres (Zr-RCF)*	650-017-00-8 (Index no.)	-	N.D.	0.005	Carcinogenic

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Substance Name	CAS number	EC number	Concentration (%)	Reporting Limit (%)	Classification
1,2-bis(2-methoxyethoxy) ethane (TEGDME; triglyme)	112-49-2	203-977-3	N.D.	0.05	Toxic for reproduction
1,2-dimethoxyethane; ethylene glycol dimethyl ether (EGDME)	110-71-4	203-794-9	N.D.	0.05	Toxic for reproduction
Diboron trioxide*	1303-86-2	215-125-8	N.D.	0.005	Toxic for reproduction
Formamide	75-12-7	200-842-0	N.D.	0.05	Toxic for reproduction
Lead(II) bis(methanesulfonate)*	17570-76-2	401-750-5	N.D.	0.005	Toxic for reproduction
TGIC(1,3,5-tris (oxiranyl methyl)-1,3,5-triazine-2,4,6-(1H,3H,5H)-trione)	2451-62-9	219-514-3	N.D.	0.05	Mutagenic
β-TGIC (1,3,5-tris[(2S and 2R)-2,3-epoxypropyl]-1,3,5-triazine-2,4,6-(1H,3H,5H)-trione)**	59653-74-6	423-400-0	N.D.	0.05	Mutagenic
4,4'-bis(dimethylamino) benzophenone (Michler's ketone)	90-94-8	202-027-5	N.D.	0.05	Carcinogenic
N,N,N',N'-tetramethyl-4,4'-methylenedianiline (Michler's base)	101-61-1	202-959-2	N.D.	0.05	Carcinogenic
[4-[4,4'-bis(dimethylamino) benzhydrylidene]cyclohexa-2,5-dien-1-ylidene] dimethylammonium chloride (C.I. Basic Violet 3)	548-62-9	208-953-6	N.D.	0.05	Carcinogenic
[4-[[4-anilino-1-naphthyl][4-(dimethylamino)phenyl]methylene]cyclohexa-2,5-dien-1-ylidene] dimethylammonium chloride (C.I. Basic Blue 26)	2580-56-5	219-943-6	N.D.	0.05	Carcinogenic
α,α-Bis[4-(dimethylamino) phenyl]-4 (phenylamino) naphthalene-1-methanol (C.I. Solvent Blue 4)	6786-83-0	229-851-8	N.D.	0.05	Carcinogenic
4,4'-bis(dimethylamino)-4''-(methylamino)trityl alcohol	561-41-1	209-218-2	N.D.	0.05	Carcinogenic

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Substance Name	CAS number	EC number	Concentration (%)	Reporting Limit (%)	Classification
Bis(pentabromophenyl) ether (DecaBDE)	1163-19-5	214-604-9	N.D.	0.05	PBT vPvB
Pentacosafuorotridecanoic acid	72629-94-8	276-745-2	N.D.	0.05	vPvB
Tricosafuorododecanoic acid	307-55-1	206-203-2	N.D.	0.05	vPvB
Henicosafuoroundecanoic acid	2058-94-8	218-165-4	N.D.	0.05	vPvB
Heptacosafuorotetradecanoic acid	376-06-7	206-803-4	N.D.	0.05	vPvB
4-(1,1,3,3-tetramethylbutyl) phenol, ethoxylated - covering well-defined substances and UVCB substances, polymers and homologues	-	-	N.D.	0.05	Equivalent level of concern - probable serious effects on the environment
4-Nonylphenol, branched and linear - substances with a linear and/or branched alkyl chain with a carbon number of 9 covalently bound in position 4 to phenol, covering also UVCB- and well-defined substances which include any of the individual isomers or a combination thereof	-	-	N.D.	0.05	Equivalent level of concern - probable serious effects on the environment
Diazene-1,2-dicarboxamide (C,C'-azodi(formamide))	123-77-3	204-650-8	N.D.	0.05	Equivalent level of concern - probable serious effects on human health
Cyclohexane-1,2-dicarboxylic anhydride (Hexahydrophthalic anhydride - HHPA)	85-42-7	201-604-9	N.D.	0.05	Equivalent level of concern - probable serious effects on human health

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Substance Name	CAS number	EC number	Concentration (%)	Reporting Limit (%)	Classification
Hexahydromethylphthalic anhydride, Hexahydro-4-methylphthalic anhydride, Hexahydro-1-methylphthalic anhydride, Hexahydro-3-methylphthalic anhydride	25550-51-0, 19438-60-9, 48122-14-1, 57110-29-9	247-094-1, 243-072-0, 256-356-4, 260-566-1	N.D.	0.05	Equivalent level of concern - probable serious effects on human health
Methoxy acetic acid	625-45-6	210-894-6	N.D.	0.05	Toxic for reproduction equivalent level of concern -probable serious effects on human health and the environment
1,2-Benzenedicarboxylic acid, dipentylester, branched and linear	84777-06-0	284-032-2	N.D.	0.05	Toxic for reproduction
Diisopentylphthalate (DIPP)	605-50-5	210-088-4	N.D.	0.05	Toxic for reproduction
N-pentyl-isopentylphthalate	-	-	N.D.	0.05	Toxic for reproduction
1,2-Diethoxyethane	629-14-1	211-076-1	N.D.	0.05	Toxic for reproduction
N,N-dimethylformamide; dimethyl formamide	68-12-2	200-679-5	N.D.	0.05	Toxic for reproduction
Dibutyltin dichloride (DBT)	683-18-1	211-670-0	N.D.	0.05	Toxic for reproduction
Acetic acid, lead salt, basic*	51404-69-4	257-175-3	N.D.	0.005	Toxic for reproduction
Basic lead carbonate (trilead bis(carbonate)dihydroxide)*	1319-46-6	215-290-6	N.D.	0.005	Toxic for reproduction
Lead oxide sulfate (basic lead sulfate)*	12036-76-9	234-853-7	N.D.	0.005	Toxic for reproduction
[Phthalato(2-)]dioxotrilead (dibasic lead phthalate)*	69011-06-9	273-688-5	N.D.	0.005	Toxic for reproduction

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Substance Name	CAS number	EC number	Concentration (%)	Reporting Limit (%)	Classification
Dioxobis(stearato)trilead*	12578-12-0	235-702-8	N.D.	0.005	Toxic for reproduction
Fatty acids, C16-18, lead salts*	91031-62-8	292-966-7	N.D.	0.005	Toxic for reproduction
Lead bis(tetrafluoroborate)*	13814-96-5	237-486-0	N.D.	0.005	Toxic for reproduction
Lead cyanamidate*	20837-86-9	244-073-9	N.D.	0.005	Toxic for reproduction
Lead dinitrate*	10099-74-8	233-245-9	N.D.	0.005	Toxic for reproduction
Lead oxide (lead monoxide)*	1317-36-8	215-267-0	N.D.	0.005	Toxic for reproduction
Lead tetroxide (orange lead)*	1314-41-6	215-235-6	N.D.	0.005	Toxic for reproduction
Lead titanium trioxide*	12060-00-3	235-038-9	N.D.	0.005	Toxic for reproduction
Lead Titanium Zirconium Oxide*	12626-81-2	235-727-4	N.D.	0.005	Toxic for reproduction
Pentalead tetraoxide sulphate*	12065-90-6	235-067-7	N.D.	0.005	Toxic for reproduction
Pyrochlore, antimony lead yellow*	8012-00-8	232-382-1	N.D.	0.005	Toxic for reproduction
Silicic acid, barium salt, lead-doped*	68784-75-8	272-271-5	N.D.	0.005	Toxic for reproduction
Silicic acid, lead salt*	11120-22-2	234-363-3	N.D.	0.005	Toxic for reproduction
Sulfurous acid, lead salt, dibasic*	62229-08-7	263-467-1	N.D.	0.005	Toxic for reproduction
Tetraethyllead*	78-00-2	201-075-4	N.D.	0.005	Toxic for reproduction
Tetralead trioxide sulphate*	12202-17-4	235-380-9	N.D.	0.005	Toxic for reproduction

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Substance Name	CAS number	EC number	Concentration (%)	Reporting Limit (%)	Classification
Trilead dioxide phosphonate*	12141-20-7	235-252-2	N.D.	0.005	Toxic for reproduction
Furan	110-00-9	203-727-3	N.D.	0.05	Carcinogenic
Propylene oxide; 1,2-epoxypropane; methyloxirane	75-56-9	200-879-2	N.D.	0.05	Carcinogenic Mutagenic
Diethyl sulphate	64-67-5	200-589-6	N.D.	0.05	Carcinogenic Mutagenic
Dimethyl sulphate	77-78-1	201-058-1	N.D.	0.05	Carcinogenic
3-ethyl-2-methyl-2-(3-methylbutyl)-1,3-oxazolidine	143860-04-2	421-150-7	N.D.	0.05	Toxic for reproduction
Dinoseb	88-85-7	201-861-7	N.D.	0.05	Toxic for reproduction
4,4'-methylenedi-o-toluidine	838-88-0	212-658-8	N.D.	0.05	Carcinogenic
4,4'-oxydianiline and its salts	101-80-4	202-977-0	N.D.	0.05	Carcinogenic Mutagenic
4-Aminoazobenzene; 4-Phenylazoaniline	60-09-3	200-453-6	N.D.	0.05	Carcinogenic
4-methyl-m-phenylenediamine (2,4-toluene-diamine)	95-80-7	202-453-1	N.D.	0.05	Carcinogenic
6-methoxy-m-toluidine (p-cresidine)	120-71-8	204-419-1	N.D.	0.05	Carcinogenic
Biphenyl-4-ylamine	92-67-1	202-177-1	N.D.	0.05	Carcinogenic
o-aminoazotoluene	97-56-3	202-591-2	N.D.	0.05	Carcinogenic
o-Toluidine; 2-Aminotoluene	95-53-4	202-429-0	N.D.	0.05	Carcinogenic
N-methylacetamide	79-16-3	201-182-6	N.D.	0.05	Toxic for reproduction
1-bromopropane; n-propyl bromide	106-94-5	203-445-0	N.D.	0.05	Toxic for reproduction

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Substance Name	CAS number	EC number	Concentration (%)	Reporting Limit (%)	Classification
Cadmium	7440-43-9	231-152-8	N.D.	0.005	Carcinogenic
Cadmium oxide	1306-19-0	215-146-2	N.D.	0.005	Carcinogenic
Dipentyl phthalate (DPP)	131-18-0	205-017-9	N.D.	0.05	Toxic for reproduction
4-Nonylphenol, branched and linear, ethoxylated [substances with a linear and/or branched alkyl chain with a carbon number of 9 covalently bound in position 4 to phenol, ethoxylated covering UVCB- and well-defined substances, polymers and homologues, which include any of the individual isomers and/or combinations thereof]	-	-	N.D.	0.05	Equivalent level of concern having probable serious effects to the environment
Ammonium pentadecafluorooctanoate (APFO)	3825-26-1	223-320-4	N.D.	0.05	Toxic for reproduction
Pentadecafluorooctanoic acid (PFOA)	335-67-1	206-397-9	N.D.	0.05	Toxic for reproduction

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F052 Version 5

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Substance Name	CAS number	EC number	Concentration (%)	Reporting Limit (%)	Classification
Diethyl phthalate	84-75-3	201-559-5	N.D.	0.05	Toxic for reproduction
Triethyl phosphate	25155-23-1	246-677-8	N.D.	0.05	Toxic for reproduction
Imidazolidine-2-thione; 2-imidazoline-2-thiol	96-45-7	202-506-9	N.D.	0.05	Toxic for reproduction
Disodium 4-amino-3-[[4'-[(2,4-diaminophenyl)azo][1,1'-biphenyl]-4-yl]azo]-5-hydroxy-6-(phenylazo)naphthalene-2,7-disulphonate (C.I. Direct Black 38)	1937-37-7	217-710-3	N.D.	0.05	Carcinogenic
Disodium 3,3'-[[1,1'-biphenyl]-4,4'-diylbis(azo)]bis(4-aminonaphthalene-1-sulphonate) (C.I. Direct Red 28)	573-58-0	209-358-4	N.D.	0.05	Carcinogenic
Cadmium sulphide	1306-23-6	215-147-8	N.D.	0.005	Carcinogenic Equivalent level of concern having probable serious effects to human health
Lead di(acetate)	301-04-2	206-104-4	N.D.	0.005	Toxic for reproduction

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Note:

1. RL = Reporting Limit
2. N.D. = Not detected (lower than RL)

N.A. = Not applicable for respective material type.

The submitted sample was found to contain significant amount of specific element(s) of SVHC. Upon further test verification and also information provided from client, the possibility that the element(s) content originate from SVHC is very unlikely, even though their presence cannot be exclude entirely. It may be assumed that the detected element(s) have a non-SVHC source.

3. Definition of classification is listed in Appendix A of this report in accordance with 67/548/EEC and Regulation (EC)

No 1907/2006. For detail information, Detail explanation is available at the following link:

<http://echa.europa.eu/web/guest/candidate-list-table> (Candidate list)

http://echa.europa.eu/proposals-to-identify-substances-of-very-high-concern-previous-consultations?p_p_id=substancetypelist_WAR_substanceportlet&p_p_lifecycle=0&p_p_state=normal&p_p_mode=view&p_p_col_id=column-1&p_p_col_pos=2&p_p_col_count=4&substancetypelis
(Proposals to identify SVHC consultations)

4. *. The test result is based on the calculation of selected element(s) / marker(s) and to the worst-case scenario. For detail information, please refer to the SGS REACH website: www.reach.sgs.com/substance-of-very-high-concern-analysis-information-page.htm

The client is advised to review the chemical formulation to ascertain above metal substances present in the article.

RL = 0.005% is evaluated for element (i.e. cobalt, arsenic, lead, sodium, chromium, chromium(VI), silicon, aluminum, zirconium, boron, and potassium respectively), except molybdenum RL=0.0005%

0.1% (w/w) = 1,000 ppm = 1,000 mg/kg

5. **.β-TGIC is one of the isomers for TGIC compounds and hence, tested together. The reported test result is based the proposed ratio as according to ECHA dossier.



*** End of Report ***

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Appendix A

Classification Definition under 67/548/EEC and Regulation (EC) No 1907/2006

Carcinogen Category 1: Substances known to be carcinogenic to man. There is sufficient evidence to establish a causal association between human exposure to a substance and the development of cancer.

Carcinogen Category 2: Substances which should be regarded as if they are carcinogenic to man. There is sufficient evidence to provide a strong presumption that human exposure to a substance may result in the development of cancer.
Generally on the basis of:
- appropriate long-term animal studies
- other relevant information.

Mutagen Category 1: Substances known to be mutagenic to man. There is sufficient evidence to establish a causal association between human exposure to a substance and heritable genetic damage.

Mutagen Category 2: Substances which should be regarded as if they are mutagenic to man. There is sufficient evidence to provide a strong presumption that human exposure to the substance may result in the development of heritable genetic damage, generally on the basis of:
- appropriate animal studies,
- other relevant information.

Toxic to Reproduction Category 1: Substances known to impair fertility in humans. There is sufficient evidence to establish a causal relationship between human exposure to the substance and impaired fertility.
Substances known to cause developmental toxicity in humans. There is sufficient evidence to establish a causal relationship between human exposure to the substance and subsequent developmental toxic effects in the progeny.

Toxic to Reproduction Category 2: Substances which should be regarded as if they impair fertility in humans. There is sufficient evidence to provide a strong presumption that human exposure to the substance may result in impaired fertility on the basis of:
- clear evidence in animal studies of impaired fertility in the absence of toxic effects, or, evidence of impaired fertility occurring at around the same dose levels as other toxic effects but which is not a secondary nonspecific consequence of the other toxic effects,
- other relevant information.
Substances which should be regarded as if they cause developmental toxicity to humans. There is sufficient evidence to provide a strong presumption that human exposure to the substance may result in developmental toxicity, generally on the basis of:
- clear results in appropriate animal studies where effects have been observed in the absence of signs of marked maternal toxicity, or at around the same dose levels as other toxic effects but which are not a secondary non-specific consequence of the other toxic effects,
- other relevant information.

PBT & vPvB: Substances which are persistent, bioaccumulative and toxic (PBT) or very persistent and very bioaccumulative (vPvB) pose a particular challenge to the chemicals safety management. For these substances a "safe" concentration in the environment cannot be established with sufficient reliability.

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