

Application Note 1-1

Z-POWER LED series

Binning and Labeling

Z-Power series is designed for high current operation and high flux output applications.



Z-Power LED's thermal management perform exceeds other power LED solutions.

It incorporates state of the art SMD design and Thermal emission material.

Z-Power LED is ideal light sources for general illumination applications, custom designed solutions, automotive large LCD backlights

This application note provides binning and labeling information of Z-Power LED series.

It includes the Z-Power LED bins for luminous flux, wavelength (or x,y coordinates), correlated color temperature (CCT) for white and forward voltage.

P9

Features

- Super high flux output and high luminance
- Designed for high current operation
- Low thermal resistance
- SMT solderability
- Lead free product
- RoHS compliant

Applications

- Mobile phone flash
- Automotive interior / Exterior lighting
- Automotive signal lighting
- Automotive forward lighting
- Torch
- Architectural lighting
- LCD TV / Monitor backlight
- Projector light source
- Traffic signals
- Task lighting
- Decorative / Pathway lighting
- Remote / Solar powered lighting
- Household appliances

Full Code of Z-Power LED Series

Full code form : $X_1 X_2 X_3 X_4 X_5 X_6 X_7 - X_8 X_9 - X_{10} X_{11} X_{12} X_{13} X_{14}$

1. Part Number

- X_1 : Color
- X_2 : Z-Power LED series number
- X_3 : LENS type
- X_4 : Chip quantity or Watt
- X_5 : Package outline size
- X_6 : Type of PCB
- X_7 : Grade of characteristic code





2. Internal Number


- X_8
- X_9

3. Code Labeling

- X_{10} : Luminous flux (or Radiant flux for royal blue)
- $X_{11} X_{12} X_{13}$: Dominant wavelength (or x, y coordinates rank code)
- X_{14} : Forward voltage

4. Sticker Diagram on Reel & Aluminum Vinyl Bag

PART NO. : $X_1 X_2 X_3 X_4 X_5 X_6 - X_7 X_8$

 QUANTITY : ###

 LOT NUMBER : #####

 BIN CODE : $X_9 X_{10} X_{11} X_{12} X_{13}$




For more information about binning and labeling, refer to the Application Note -1

Part Number

Part numbers specify color, Z-Power series, Lens type, P_d, size, PCB and Grade of characteristic code type of Z-Power LED.

- Example: X₁ X₂ X₃ X₄ X₅ X₆ X₇ - X₈ X₉ ¹⁾

X ₁	Color
W	Pure White
N	Warm White
S	Natural White
D	Royal Blue
B	Blue
C	Cyan
G	Green
A	Amber
R	Red
F	Full Color (7-color)

X ₂	Z-Power Series
1	P1
4	P4
5	P5-II
7	P7
9	P9

X ₃	LENS Type
0	Flat Type
2	Dome Type ²⁾
7	Narrow Type ³⁾

Note:

- 1) X₈, X₉ is a internal code number
- 2) View angle : -80° ~ 80°
- 3) View angle : 70°



X₄	Chip Quantity (or Power Dissipation)
0	0.5W
1	1 chip (1W)
3	Full Color (7-color)
4	4 chip (10W)

X₅	Package Outline Size
C	D 12 mm
9	9 X 9 mm
8	D 8 mm
6	6 X 5 mm
5	D 5 mm

X₆	Metal PCB Type
0	Emitter Only
2	Star

X₇	Grade of Characteristic Code
C	P9 Characteristic Code

Code Labeling

1. Luminous Flux Bins

- Luminous flux bin structure for pure white and warm white Z-Power.

Bin Code	Luminous Flux [lm]
J	6 ~ 8.5
K	8.5 ~ 11.0
L	11.0 ~ 14.5
M	14.5 ~ 19.0
O	19.0 ~ 24.5
P	24.5 ~ 32.0
Q	32.0 ~ 41.5
R	41.5 ~ 54.0
S	54.0 ~ 70.0
T	70.0 ~ 91.0
U	91.0 ~ 118.5
V	118.5 ~ 154.0
W	154.0 ~ 200.0
X	200.0 ~ 260.0
Y	260.0 ~ 340.0

The list explains the photometric luminous flux bins for Z-Power LED. Z-Power LED are tested and binned by photometric luminous flux. Not all bins are available in all colors.

Tolerance : $\pm 10\%$ of Luminous flux value

2. COLOR BINS

2-1 Pure White

Pure white product tested and binned by x,y coordinates and CCT

- Pure white bin structure

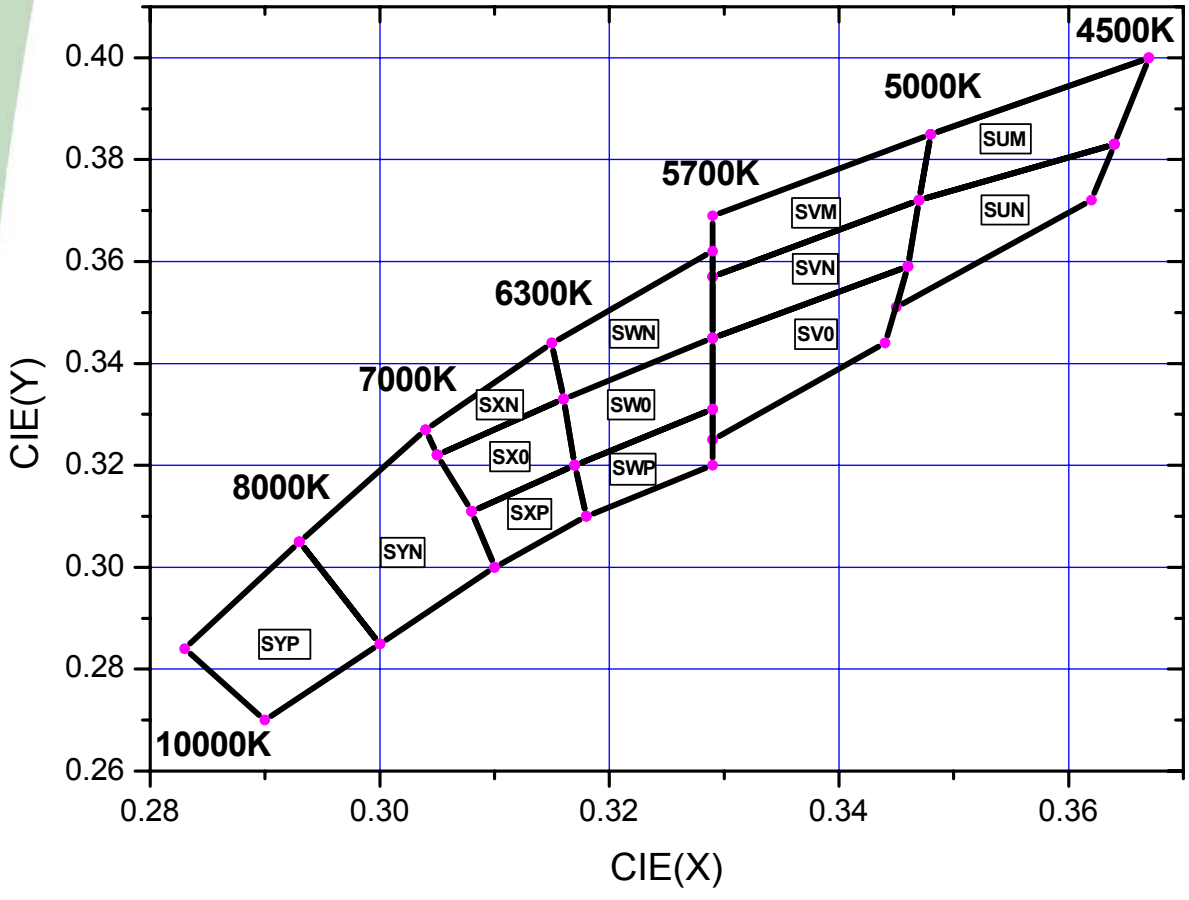
Bin	CHR_X	CHR_Y	CCT(K)	Bin	CHR_X	CHR_Y	CCT(K)
SYP	0.293	0.305	9000	SWP	0.329	0.331	6050
	0.283	0.284			0.317	0.320	
	0.290	0.270			0.318	0.310	
	0.300	0.285			0.329	0.320	
			0.329		0.325		
SYN	0.304	0.327	7500	SVM	0.348	0.385	5350
	0.293	0.305			0.329	0.369	
	0.300	0.285			0.329	0.362	
	0.310	0.300			0.329	0.357	
	0.308	0.311			0.347	0.372	
0.305	0.322						
SXN	0.315	0.344	6700	SVN	0.347	0.372	5350
	0.304	0.327			0.329	0.357	
	0.305	0.322			0.329	0.345	
	0.316	0.333			0.346	0.359	
SX0	0.316	0.333	6700	SVO	0.346	0.359	5350
	0.305	0.322			0.329	0.345	
	0.308	0.311			0.329	0.331	
	0.317	0.32			0.329	0.325	
			0.344		0.344		
SXP	0.317	0.320	6700		0.345	0.351	
	0.308	0.311		SUM	0.367	0.400	4800
	0.310	0.300			0.348	0.385	
	0.318	0.310			0.347	0.372	
SWN	0.329	0.362	6050		0.364	0.383	
	0.315	0.344		SUN	0.364	0.383	4800
	0.316	0.333			0.347	0.372	
	0.329	0.345			0.346	0.359	
	0.329	0.357			0.345	0.351	
SW0	0.329	0.345	6050		0.362	0.372	
	0.316	0.333					
	0.317	0.320					
	0.329	0.331					

Tolerance

Color coordinate : ± 0.005

CCT : $\pm 5\%$ of value

- Pure white binning structure graphical representation



2-2 Warm White

Warm white product tested and binned by x,y coordinates and CCT

- Warm white bin structure

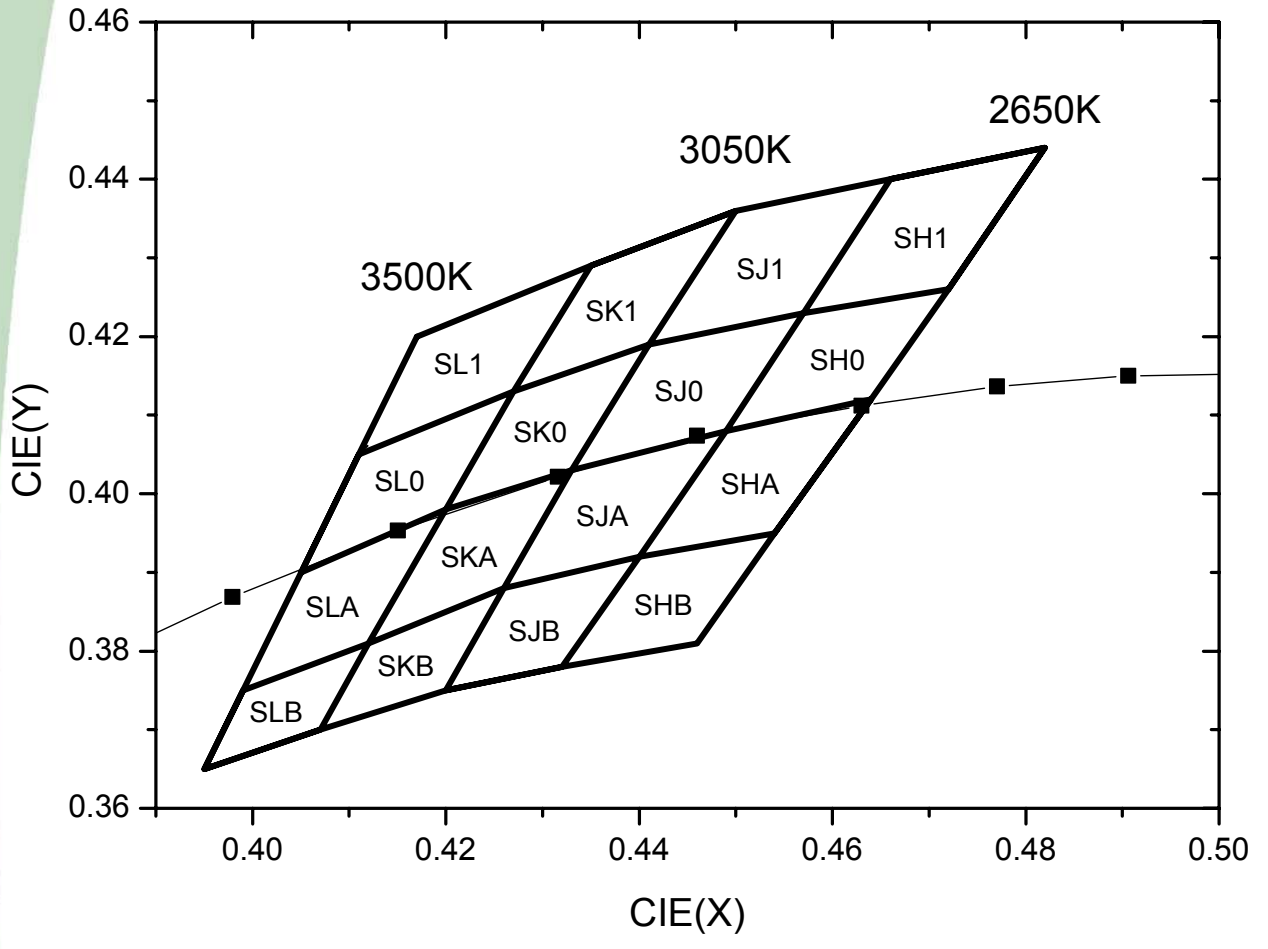
Bin	CHR_X	CHR_Y	CCT(K)	Bin	CHR_X	CHR_Y	CCT(K)
SL1	0.435	0.429	3375	SJ1	0.466	0.440	2950
	0.417	0.420			0.450	0.436	
	0.411	0.405			0.441	0.419	
	0.427	0.413			0.457	0.423	
SL0	0.427	0.413	3375	SJ0	0.457	0.423	2950
	0.411	0.405			0.441	0.419	
	0.405	0.390			0.433	0.403	
	0.420	0.398			0.449	0.408	
SLA	0.420	0.398	3375	SJA	0.449	0.408	2950
	0.405	0.390			0.433	0.403	
	0.399	0.375			0.426	0.388	
	0.412	0.381			0.440	0.392	
SLB	0.412	0.381	3375	SJB	0.440	0.392	2950
	0.399	0.375			0.426	0.388	
	0.395	0.365			0.42	0.375	
	0.407	0.37			0.432	0.378	
SK1	0.450	0.436	3150	SH1	0.482	0.444	2750
	0.435	0.429			0.466	0.440	
	0.427	0.413			0.457	0.423	
	0.441	0.419			0.472	0.426	
SK0	0.441	0.419	3150	SH0	0.472	0.426	2750
	0.427	0.413			0.457	0.423	
	0.420	0.398			0.449	0.408	
	0.433	0.403			0.464	0.412	
SKA	0.433	0.403	3150	SHA	0.464	0.412	2750
	0.420	0.398			0.449	0.408	
	0.412	0.381			0.440	0.392	
	0.426	0.388			0.454	0.395	
SKB	0.426	0.388	3150	SHB	0.454	0.395	2750
	0.412	0.381			0.440	0.392	
	0.407	0.370			0.432	0.378	
	0.420	0.375			0.446	0.381	

Tolerance

Color coordinate : ± 0.005

CCT : $\pm 5\%$ of value

- Warm white binning structure graphical representation



3. Forward Voltage Bins

Bin Code	Forward Voltage [V]
D	2.00 ~ 2.25
E	2.25 ~ 2.50
F	2.50 ~ 2.75
G	2.75 ~ 3.00
H	3.00 ~ 3.25
I	3.25 ~ 3.50
J	3.50 ~ 3.75
K	3.75 ~ 4.00
L	4.00 ~ 4.25
M	4.25 ~ 4.50

Tolerance : $\pm 0.06V$

0.5W Order Code (P9)

Z Power LED has an order code, use it as follows to purchase.

- Example: W92050C – 0A
 - W92050C : Part Number
 - 0A : Order code

You can select PCB type, Lens type and Z-Power LED series number as part number.

1. Pure White (0A,0B)

Standard Order Codes for pure white				
Order Code	LF	CC	V _F	Bin Codes
Part No. – 0A	O	SXN	H I J K	OSXNH~OSXNK
		SWN		OSWNH~OSWNK
		SX0		OSX0H~OSX0K
		SW0		OSW0H~OSW0K
	P	SXN		PSXNH~PSXNK
		SWN		PSWNH~PSWNK
		SX0		PSX0H~PSX0K
		SW0		PSW0H~PSW0K
Part No. – 0B *	Q	SXN	H I J K	QSXNH~QSXNK
		SWN		QSWNH~QSWNK
		SX0		QSX0H~QSX0K
		SW0		QSW0H~QSW0K
	R	SXN		RSXNH~RSXNK
		SWN		RSWNH~RSWNK
		SX0		RSX0H~RSX0K
		SW0		RSW0H~RSW0K

* : Not yet available

0.5W Order Code (P9)

1. Pure White (0C, 0D, 0E, 0F)

Standard Order Codes for pure white				
Order Code	LF	CC	V _F	Bin Codes
Part No. - 0C	O	SX0	H I J K	OSX0H~OSX0K
		SW0		OSW0H~OSW0K
		SXP		OSXPH~OSXPK
		SWP		OSWPH~OSWPK
	P	SX0		PSX0H~PSX0K
		SW0		PSW0H~PSW0K
		SXP		PSXPH~PSXPK
		SWP		PSWPH~PSWPK
Part No. - 0D *	Q	SX0	H I J K	QSX0H~QSX0K
		SW0		QSW0H~QSW0K
		SXP		QSXPH~QSXPK
		SWP		QSWPH~QSWPK
	R	SX0		RSX0H~RSX0K
		SW0		RSW0H~RSW0K
		SXP		RSXPH~RSXPK
		SWP		RSWPH~RSWPK
Part No. - 0E	O	SYP	H I J K	OSYPH~OSYPK
		SYN		OSYNH~OSYNK
	P	SYP		PSYPH~PSYPK
		SYN		PSYNH~PSYNK
Part No. - 0F *	Q	SYP	H I J K	QSYPH~QSYPK
		SYN		QSYNH~QSYNK
	R	SYP		RSYPH~RSYPK
		SYN		RSYNH~RSYNK

* : Not yet available

0.5W Order Code (P9)

1. Pure White (0G,0H,0I,0J)

Standard Order Codes for pure white				
Order Code	LF	CC	V _F	Bin Codes
Part No. - 0G	O	SVM	H I J K	OSVMH~OSVMK
		SVN		OSVNH~OSVNK
		SV0		OSV0H~OSV0K
	P	SVM		PSVMH~PSVMK
		SVN		PSVNH~PSVNK
		SV0		PSV0H~PSV0K
Part No. - 0H *	Q	SVM	H I J K	QSVMH~QSVMK
		SVN		QSVNH~QSVNK
		SV0		QSV0H~QSV0K
	R	SVM		RSVMH~RSVMK
		SVN		RSVNH~RSVNK
		SV0		RSV0H~RSV0K
Part No. - 0I	O	SUM	H I J K	OSUMH~OSUMK
		SUN		OSUNH~OSUNK
		SVN		OSVNH~OSVNK
	P	SUM		PSUMH~PSUMK
		SUN		PSUNH~PSUNK
		SVN		PSVNH~PSVNK
Part No. - 0J *	Q	SUM	H I J K	QSUMH~QSUMK
		SUN		QSUNH~QSUNK
		SVN		QSVNH~QSVNK
	R	SUM		RSUMH~RSUMK
		SUN		RSUNH~RSUNK
		SVN		RSVNH~RSVNK

* : Not yet available

0.5W Order Code (P9)

2. Warm White (0A,0B)

Standard Order Codes for Warm white				
Order Code	LF	CC	V _F	Bin Codes
Part No. - 0A	L	SL0	H I J K	LSL0H~LSL0K
		SLA		LSLAH~LSLAK
		SKA		LSKAH~LSKAK
		SK0		LSK0H~LSK0K
	M	SL0		MSL0H~MSL0K
		SLA		MSLAH~MSLAK
		SKA		MSKAH~MSKAK
		SK0		MSK0H~MSK0K
Part No. - 0B*	O	SL0	H I J K	OSL0H~OSL0K
		SLA		OSLAH~OSLAK
		SKA		OSKAH~OSKAK
		SK0		OSK0H~OSK0K
	P	SL0		PSL0H~PSL0K
		SLA		PSLAH~PSLAK
		SKA		PSKAH~PSKAK
		SK0		PSK0H~PSK0K

* : Not yet available

0.5W Order Code (P9)

3. Warm White (0C,0D)

Standard Order Codes for Warm white				
Order Code	LF	CC	V _F	Bin Codes
Part No. - 0C	L	SK0	H I J K	LSK0H~LSK0K
		SKA		LSKAH~LSKAK
		SJA		LSJAH~LSJAK
		SJ0		LSJ0H~LSJ0K
	M	SK0		MSK0H~MSK0K
		SKA		MSKAH~MSKAK
		SJA		MSJAH~MSJAK
		SJ0		MSJ0H~MSJ0K
Part No. - 0D*	O	SK0	H I J K	OSK0H~OSK0K
		SKA		OSKAH~OSKAK
		SJA		OSJAH~OSJAK
		SJ0		OSJ0H~OSJ0K
	P	SK0		PSK0H~PSK0K
		SKA		PSKAH~PSKAK
		SJA		PSJAH~PSJAK
		SJ0		PSJ0H~PSJ0K

* : Not yet available

0.5W Order Code (P9)

3. Warm White (0E,0F)

Standard Order Codes for Warm white				
Order Code	LF	CC	V _F	Bin Codes
Part No. - 0E	L	SJ0	H I J K	LSJ0H~LSJ0K
		SJA		LSJAH~LSJAK
		SHA		LSHAH~LSHAK
		SH0		LSH0H~LSH0K
	M	SJ0		MSJ0H~MSJ0K
		SJA		MSJAH~MSJAK
		SHA		MSHAH~MSHAK
		SH0		MSH0H~MSH0K
Part No. - 0F*	O	SJ0	H I J K	OSJ0H~OSJ0K
		SJA		OSJAH~OSJAK
		SHA		OSHAH~OSHAK
		SH0		OSH0H~OSH0K
	P	SJ0		PSJ0H~PSJ0K
		SJA		PSJAH~PSJAK
		SHA		PSHAH~PSHAK
		SH0		PSH0H~PSH0K

* : Not yet available

0.5W Order Code (P9)

3. Warm White (0G,0H)

Standard Order Codes for Warm white				
Order Code	LF	CC	V _F	Bin Codes
Part No. - 0G	L	SL1	H I J K	LSL1H~LSL1K
		SL0		LSL0H~LSL0K
		SK0		LSK0H~LSK0K
		SK1		LSK1H~LSK1K
	M	SL1		MSL1H~MSL1K
		SL0		MSL0H~MSL0K
		SK0		MSK0H~MSK0K
		SK1		MSK1H~MSK1K
Part No. - 0H*	O	SL1	H I J K	OSL1H~OSL1K
		SL0		OSL0H~OSL0K
		SK0		OSK0H~OSK0K
		SK1		OSK1H~OSK1K
	P	SL1		PSL1H~PSL1K
		SL0		PSL0H~PSL0K
		SK0		PSK0H~PSK0K
		SK1		PSK1H~PSK1K

* : Not yet available

0.5W Order Code (P9)

3. Warm White (0I,0J)

Standard Order Codes for Warm white				
Order Code	LF	CC	V _F	Bin Codes
Part No. - 0I	L	SJ1	H I J K	LSJ1H~LSJ1K
		SJ0		LSJ0H~LSJ0K
		SH0		LSH0H~LSH0K
		SH1		LSH1H~LSH1K
	M	SJ1		MSJ1H~MSJ1K
		SJ0		MSJ0H~MSJ0K
		SH0		MSH0H~MSH0K
		SH1		MSH1H~MSH1K
Part No. - 0J*	O	SJ1	H I J K	OSJ1H~OSJ1K
		SJ0		OSJ0H~OSJ0K
		SH0		OSH0H~OSH0K
		SH1		OSH1H~OSH1K
	P	SJ1		PSJ1H~PSJ1K
		SJ0		PSJ0H~PSJ0K
		SH0		PSH0H~PSH0K
		SH1		PSH1H~PSH1K

* : Not yet available

0.5W Order Code (P9)

3. Warm White (0K,0L)

Standard Order Codes for Warm White				
Order Code	LF	CC	V _F	Bin Codes
Part No. - 0K	L	SLA	H I J K	LSLAH~LSLAK
		SLB		LSLBH~LSLBK
		SKB		LSKBH~LSK BK
		SKA		LSKAH~LSKAK
	M	SLA		MSLAH~MSLAK
		SLB		MSLBH~MSLBK
		SKB		MSKBH~MSK BK
		SKA		MSKAH~MSKAK
Part No. - 0L*	O	SLA	H I J K	OSLAH~OSLAK
		SLB		OSLBH~OSLBK
		SKB		OSKBH~OSK BK
		SKA		OSKAH~OSKAK
	P	SLA		PSLAH~PSLAK
		SLB		PSLBH~PSLBK
		SKB		PSKBH~PSK BK
		SKA		PSKAH~PSKAK

* : Not yet available

0.5W Order Code (P9)

3. Warm White (0M,0N)

Standard Order Codes for Warm White				
Order Code	LF	CC	V _F	Bin Codes
Part No. - 0M	L	SJA	H I J K	LSJAH~LSJAK
		SJB		LSJBH~LSJBK
		SHB		LSHBH~LSHBK
		SHA		LSHAH~LSHAK
	M	SJA		MSJAH~MSJAK
		SJB		MSJBH~MSJBK
		SHB		MSHBH~MSHBK
		SHA		MSHAH~MSHAK
Part No. - 0N*	O	SJA	H I J K	OSJAH~OSJAK
		SJB		OSJBH~OSJBK
		SHB		OSHBH~OSHBK
		SHA		OSHAH~OSHAK
	P	SJA		PSJAH~PSJAK
		SJB		PSJBH~PSJBK
		SHB		PSHBH~PSHBK
		SHA		PSHAH~PSHAK

* : Not yet available