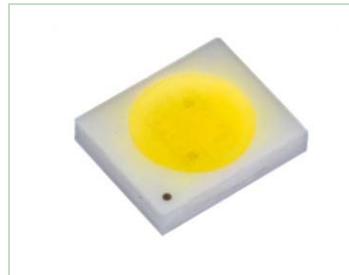


Application Note 1-1

**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.

**Z1**

**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
- $X_2$  : New Z-Power LED - 'Z'
- $X_3$  : New Z-Power LED series number
- $X_4$  : LENS type
- $X_5$  : Chip quantity (or Power Dissipation)
- $X_6$  : Package outline size
- $X_7$  : Type of PCB

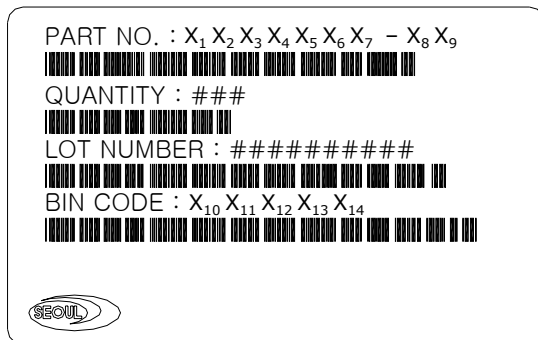
### 2. Internal Number

- $X_8$
- $X_9$

### 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



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

## Part Number

Part numbers specify color, New Z-Power series, Lens type, P<sub>d</sub>, size and PCB type of New Z-Power LED.

- Example: X<sub>1</sub> X<sub>2</sub> X<sub>3</sub> X<sub>4</sub> X<sub>5</sub> X<sub>6</sub> X<sub>7</sub> - X<sub>8</sub>X<sub>9</sub><sup>1)</sup>

X <sub>1</sub>	Color
W	Pure White
N	Warm White
S	Natural White*
D	Royal Blue*
B	Blue*
C	Cyan*
G	Green*
A	Amber*
R	Red*

X <sub>2</sub>	Z-Power Series
Z	New Z-Power Series

X <sub>3</sub>	Z-Power Series
1	Z1
2	Z2

X <sub>4</sub>	LENS Type
0	Flat Type

Note:

- 1) X<sub>8</sub> X<sub>9</sub> is an internal code number
- 2) Hemispherical dome type
- 3) \* : Not yet available.



<b>X<sub>5</sub></b>	<b>Chip Quantity (or Power Dissipation)</b>
1	1 chip (1W)
3	X chip (3.5W)

<b>X<sub>6</sub></b>	<b>Package Outline Size</b>
6	5.8 X 11.3 mm
5	5 X 6 mm

<b>X<sub>7</sub></b>	<b>Metal PCB Type</b>
0	Emitter Only

## Code Labeling

### 1. Luminous Flux Bins

- Luminous flux bin structure for pure white, warm white, blue, cyan, green, amber and red 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	S1	54.0 ~ 60.0
	S2	60.0 ~ 70.0
T	T1	70.0 ~ 80.0
	T2	80.0 ~ 91.0
U	U1	91.0 ~ 100.0
	U2	100.0 ~ 118.5
V		118.5 ~ 154.0
W	W1	154.0 ~ 177.0
	W2	177.0 ~ 200.0
X	X1	200.0 ~ 230.0
	X2	230.0 ~ 260.0
Y	Y1	260.0 ~ 300.0
	Y2	300.0 ~ 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

Z-Power are tested and binned for dominant wavelength (blue, green, red) or x,y coordinates (pure white, warm white)

2 -1 Blue, Green, Red

Bin Code	Color	Dominant Wavelength [nm]
BB1	Blue*	455 ~ 460
BB2		460 ~ 465
BB3		465 ~ 470
BB4		470 ~ 475
GG1	Green*	520 ~ 525
GG2		525 ~ 530
GG3		530 ~ 535
RR1	Red*	618 ~ 625
RR2		625 ~ 632

Tolerance

Dominant wavelength :  $\pm 0.5$  nm

Peak wavelength :  $\pm 2.0$  nm

**\* : Not yet available**

2-2. Pure White CIE

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

- Pure white bin structure

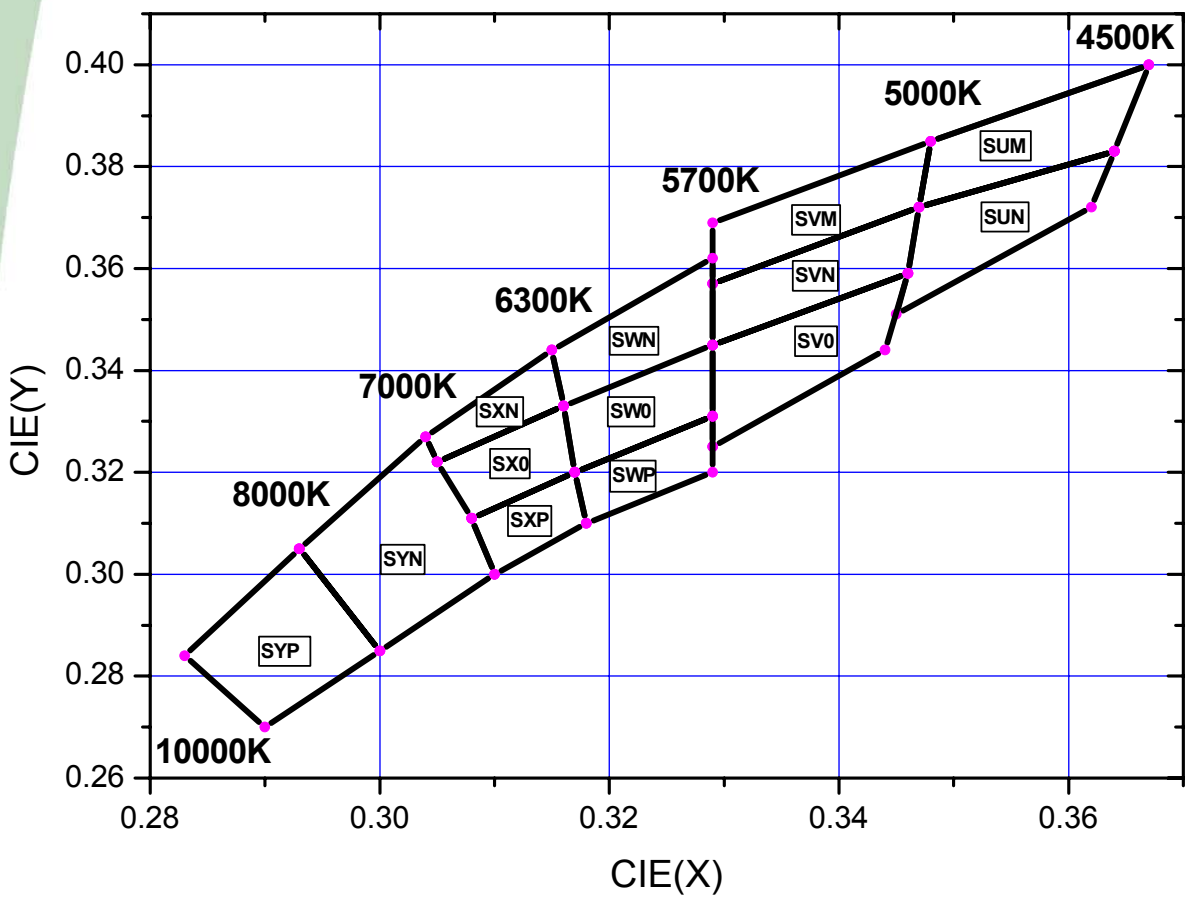
Bin	CHR_X	CHR_Y	CCT(K)	Bin	CHR_X	CHR_Y	CCT(K)
SYP	0.293	0.305	9000	SWP	0.329	0.331	6050
	0.283	0.284			0.317	0.320	
	0.290	0.270			0.318	0.310	
	0.300	0.285			0.329	0.320	
SYN	0.304	0.327	7500	SVM	0.329	0.325	5350
	0.293	0.305			0.348	0.385	
	0.300	0.285			0.329	0.369	
	0.310	0.300			0.329	0.362	
	0.308	0.311			0.329	0.357	
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	SV0	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	
SXP	0.317	0.320	6700	SUM	0.344	0.344	4800
	0.308	0.311			0.345	0.351	
	0.310	0.300			0.367	0.400	
	0.318	0.310			0.348	0.385	
SWN	0.329	0.362	6050	SUN	0.347	0.372	4800
	0.315	0.344			0.364	0.383	
	0.316	0.333			0.364	0.383	
	0.329	0.345			0.347	0.372	
	0.329	0.357			0.346	0.359	
SW0	0.329	0.345	6050		0.345	0.351	
	0.316	0.333			0.362	0.372	
	0.317	0.320					
	0.329	0.331					

Tolerance

Color coordinate :  $\pm 0.005$

CCT :  $\pm 5\%$  of value

- Pure white binning structure graphical representation





2-3. 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	

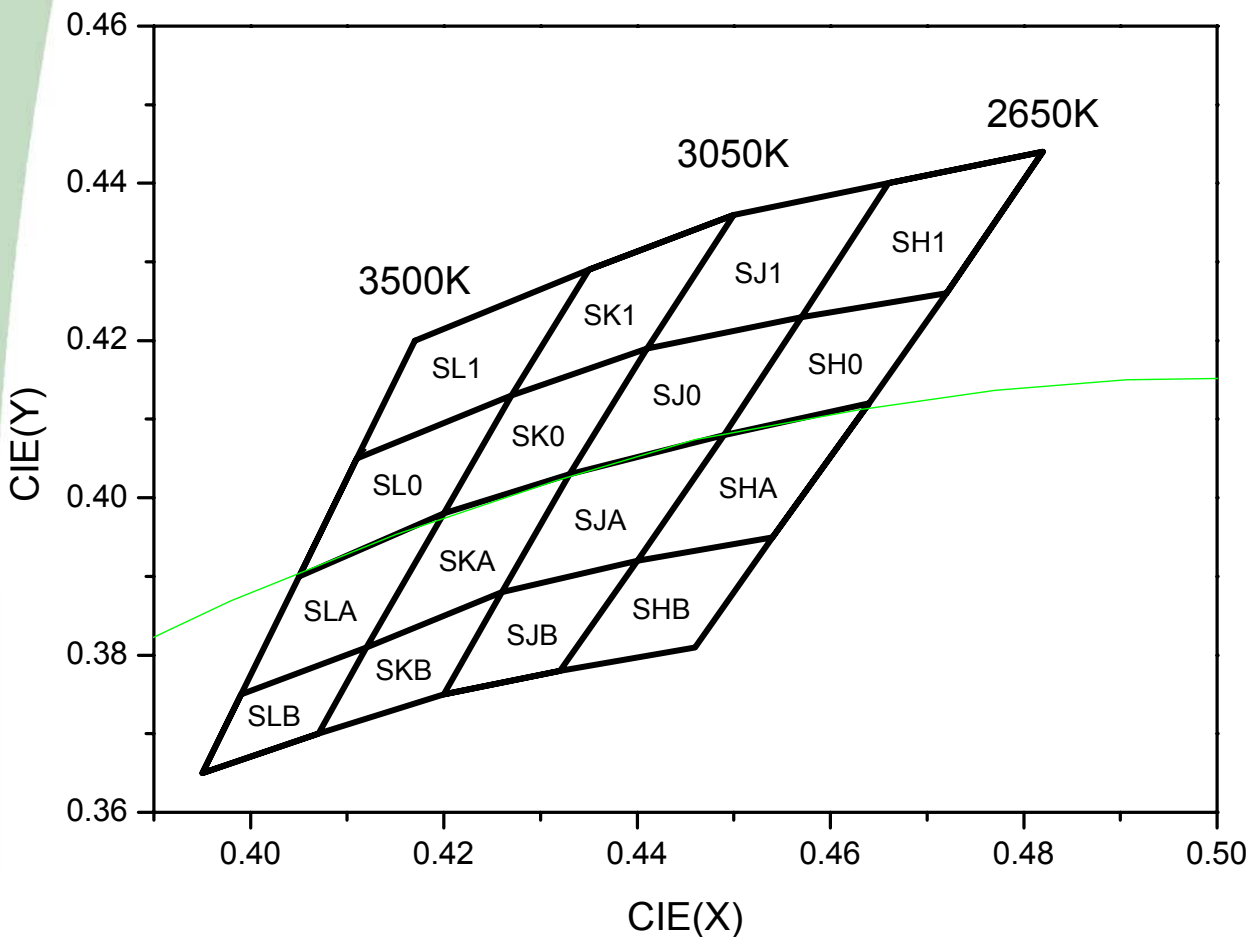
Tolerance

Color coordinate :  $\pm 0.005$

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
N	4.50~5.00

Tolerance :  $\pm 0.06V$

## 1W Order Code (Z1)

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

- Example: WZ10150 – 1A
  - WZ10150: Part Number
  - 1A : Order code

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

### 1. Pure White (1A,1B,1C,1D)

Standard Order Codes for pure white				
Order Code	LF	CC	V <sub>F</sub>	Bin Codes
Part No. – 1A	U1	SXN	J K L M N	U1SXNJ~U1SXNN
		SWN		U1SWNJ~U1SWNN
		SX0		U1SX0J~U1SX0N
		SW0		U1SW0J~U1SW0N
	U2	SXN		U2SXNJ~U2SXNN
		SWN		U2SWNJ~U2SWNN
		SX0		U2SX0J~U2SX0N
		SW0		U2SW0J~U2SW0N
Part No. – 1B	V*	SXN	VSXNJ~VSXNN	
		SWN	VSWNJ~VSWNN	
		SX0	VSX0J~VSX0N	
		SW0	VSW0J~VSW0N	
Part No. – 1C	U1	SX0	J K L M N	U1SX0J~U1SX0N
		SW0		U1SW0J~U1SW0N
		SXP		U1SXPJ~U1SXPN
		SWP		U1SWPJ~U1SWPN
	U2	SX0		U2SX0J~U2SX0N
		SW0		U2SW0J~U2SW0N
		SXP		U2SXPJ~U2SXPN
		SWP		U2SWPJ~U2SWPN
Part No. – 1D	V*	SX0	VSX0J~VSX0N	
		SW0	VSW0J~VSW0N	
		SXP	VSXPJ~VSXPN	
		SWP	VSWPJ~VSWPN	

\* : Not yet available

**1W Order Code (Z1)**

**1. Pure White (1E,1F,1G,1H,1I,1J)**

Standard Order Codes for pure white				
Order Code	LF	CC	V <sub>F</sub>	Bin Codes
Part No. - 1E	U1	SYP	J K L M N	U1SYPJ~U1SYPN
		SYN		U1SYNJ~U1SYNN
	U2	SYP		U2SYPJ~U2SYPN
		SYN		U2SYNJ~U2SYNN
Part No. - 1F	V*	SYP		VSYPJ~VSYPN
		SYN		VSYNJ~VSYNN
Part No. - 1G	U1	SVM	J K L M N	U1SVMJ~U1SVMN
		SVN		U1SVNJ~U1SVNN
		SV0		U1SV0J~U1SV0N
	U2	SVM		U2SVMJ~U2SVMN
		SVN		U2SVNJ~U2SVNN
		SV0		U2SV0J~U2SV0N
Part No. - 1H	V*	SVM		VSVMJ~VSVMN
		SVN		VSVNJ~VSVNN
		SV0		VSV0J~VSV0N
Part No. - 1I	U1	SUM	J K L M N	U1SUMJ~U1SUMN
		SUN		U1SUNJ~U1SUNN
		SVN		U1SVNJ~U1SVNN
	U2	SUM		U2SUMJ~U2SUMN
		SUN		U2SUNJ~U2SUNN
		SVN		U2SVNJ~U2SVNN
Part No. - 1J	V*	SUM		VSUMJ~VSUMN
		SUN		VSUNJ~VSUNN
		SVN		VSVNJ~VSVNN

\* : Not yet available

## 1W Order Code (Z1)

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

- Example: NZ10150 – 1A
  - NZ10150 : Part Number
  - 1A : Order code

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

## 2. Warm White (1A,1B,1C)

Standard Order Codes for Warm white				
Order Code	LF	CC	V <sub>F</sub>	Bin Codes
Part No. – 1A	S2	SL0	J	S2SL0J~S2SL0N
		SLA	K	S2SLAJ~S2SLAN
		SKA	L	S2SKAJ~S2SKAN
		SK0	M	S2SK0J~S2SK0N
Part No. – 1B	T1	SL0	J K L M N	T1SL0J~T1SL0N
		SLA		T1SLAJ~T1SLAN
		SKA		T1SKAJ~T1SKAN
		SK0		T1SK0J~T1SK0N
	T2	SL0		T2SL0J~T2SL0N
		SLA		T2SLAJ~T2SLAN
		SKA		T2SKAJ~T2SKAN
		SK0		T2SK0J~T2SK0N
Part No. – 1C	U1*	SL0	J	U1SL0J~U1SL0N
		SLA	K	U1SLAJ~U1SLAN
		SKA	L	U1SKAJ~U1SKAN
		SK0	M	U1SK0J~U1SK0N
			N	

\* : Not yet available

1W Order Code (Z1)

2. Warm White (1D,1E,1F)

Standard Order Codes for Warm white				
Order Code	LF	CC	V <sub>F</sub>	Bin Codes
Part No. - 1D	S2	SK0	J	S2SK0J~S2SK0N
		SKA	K	S2SKAJ~S2SKAN
		SJA	L	S2SJAJ~S2SJAN
		SJ0	M N	S2SJ0J~S2SJ0N
Part No. - 1E	T1	SK0	J K L M N	T1SK0J~T1SK0N
		SKA		T1SKAJ~T1SKAN
		SJA		T1SJAJ~T1SJAN
		SJ0		T1SJ0J~T1SJ0N
	T2	SK0		T2SK0J~T2SK0N
		SKA		T2SKAJ~T2SKAN
		SJA		T2SJAJ~T2SJAN
		SJ0		T2SJ0J~T2SJ0N
Part No. - 1F	U1*	SK0	J	U1SK0J~U1SK0N
		SKA	K	U1SKAJ~U1SKAN
		SJA	L	U1SJAJ~U1SJAN
		SJ0	M N	U1SJ0J~U1SJ0N

\* : Not yet available

**1W Order Code (Z1)**

**2. Warm White (1G,1H,1I)**

Standard Order Codes for Warm white				
Order Code	LF	CC	V <sub>F</sub>	Bin Codes
Part No. - 1G	S2	SJ0	J	S2SJ0J~S2SJ0N
		SJA	K	S2SJAJ~S2SJAN
		SHA	L	S2SHAJ~S2SHAN
		SH0	M N	S2SH0J~S2SH0N
Part No. - 1H	T1	SJ0	J K L M N	T1SJ0J~T1SJ0N
		SJA		T1SJAJ~T1SJAN
		SHA		T1SHAJ~T1SHAN
		SH0		T1SH0J~T1SH0N
	T2	SJ0		T2SJ0J~T2SJ0N
		SJA		T2SJAJ~T2SJAN
		SHA		T2SHAJ~T2SHAN
		SH0		T2SH0J~T2SH0N
Part No. - 1I	U1*	SJ0	J	U1SJ0J~U1SJ0N
		SJA	K	U1SJAJ~U1SJAN
		SHA	L M	U1SHAJ~U1SHAN
		SH0	N	U1SH0J~U1SH0N

\* : Not yet available



**1W Order Code (Z1)**

**2. Warm White (1J,1K,1L)**

Standard Order Codes for Warm white				
Order Code	LF	CC	V <sub>F</sub>	Bin Codes
Part No. - 1J	S2	SL1	J	S2SL1J~S2SL1N
		SL0	K	S2SL0J~S2SL0N
		SK0	L	S2SK0J~S2SK0N
		SK1	M	S2SK1J~S2SK1N
Part No. - 1K	T1	SL1	J K L M N	T1SL1J~T1SL1N
		SL0		T1SL0J~T1SL0N
		SK0		T1SK0J~T1SK0N
		SK1		T1SK1J~T1SK1N
	T2	SL1		T2SL1J~T2SL1N
		SL0		T2SL0J~T2SL0N
		SK0		T2SK0J~T2SK0N
		SK1		T2SK1J~T2SK1N
Part No. - 1L	U1*	SL1	J	U1SL1J~U1SL1N
		SL0	K	U1SL0J~U1SL0N
		SK0	L	U1SK0J~U1SK0N
		SK1	M	U1SK1J~U1SK1N
			N	

\* : Not yet available

**1W Order Code (Z1)**

**2. Warm White (1M,1N,1O)**

Standard Order Codes for Warm white				
Order Code	LF	CC	V <sub>F</sub>	Bin Codes
Part No. - 1M	S2	SJ1	J	S2SJ1J~S2SJ1N
		SJ0	K	S2SJ0J~S2SJ0N
		SH0	L	S2SH0J~S2SH0N
		SH1	M N	S2SH1J~S2SH1N
Part No. - 1N	T1	SJ1	J K L M N	T1SJ1J~T1SJ1N
		SJ0		T1SJ0J~T1SJ0N
		SH0		T1SH0J~T1SH0N
		SH1		T1SH1J~T1SH1N
	T2	SJ1		T2SJ1J~T2SJ1N
		SJ0		T2SJ0J~T2SJ0N
		SH0		T2SH0J~T2SH0N
		SH1		T2SH1J~T2SH1N
Part No. - 1O	U1*	SJ1	J	U1SJ1J~U1SJ1N
		SJ0	K	U1SJ0J~U1SJ0N
		SH0	L	U1SH0J~U1SH0N
		SH1	M N	U1SH1J~U1SH1N

\* : Not yet available

**1W Order Code (Z1)**

**2. Warm White (1P,1Q,1R)**

Standard Order Codes for Warm White				
Order Code	LF	CC	V <sub>F</sub>	Bin Codes
Part No. – 1P	S2	SLA	J	S2SLAJ~S2SLAN
		SLB	K	S2SLBJ~S2SLBN
		SKB	L	S2SKBJ~S2SKBN
		SKA	M N	S2SKAJ~S2SKAN
Part No. – 1Q	T1	SLA	J K L M N	T1SLAJ~T1SLAN
		SLB		T1SLBJ~T1SLBN
		SKB		T1SKBJ~T1SKBN
		SKA		T1SKAJ~T1SKAN
	T2	SLA		T2SLAJ~T2SLAN
		SLB		T2SLBJ~T2SLBN
		SKB		T2SKBJ~T2SKBN
		SKA		T2SKAJ~T2SKAN
Part No. – 1R	U1*	SLA	J	U1SLAJ~U1SLAN
		SLB	K	U1SLBJ~U1SLBN
		SKB	L	U1SKBJ~U1SKBN
		SKA	M N	U1SKAJ~U1SKAN

\* : Not yet available

1W Order Code (PZ1)

2. Warm White (1S,1T,1U)

Standard Order Codes for Warm White				
Order Code	LF	CC	V <sub>F</sub>	Bin Codes
Part No. – 1S	S2	SJA	J	S2SJAJ~S2SJAN
		SJB	K	S2SJB~S2SJB
		SHB	L	S2SHBJ~S2SHBN
		SHA	M N	S2SHAJ~S2SHAN
Part No. – 1T	T1	SJA	J K L M N	T1SJAJ~T1SJAN
		SJB		T1SJB~T1SJB
		SHB		T1SHBJ~T1SHBN
		SHA		T1SHAJ~T1SHAN
	T2	SJA		T2SJAJ~T2SJAN
		SJB		T2SJB~T2SJB
		SHB		T2SHBJ~T2SHBN
		SHA		T2SHAJ~T2SHAN
Part No. – 1U	U1*	SJA	J	U1SJAJ~U1SJAN
		SJB	K	U1SJB~U1SJB
		SHB	L	U1SHBJ~U1SHBN
		SHA	M N	U1SHAJ~U1SHAN

\* : Not yet available

**AMERICA**

- Los Angeles  
Tel : +1-310-324-7151  
Fax : +1-678-550-8374  
E-mail : karl@acriche.com
- Detroit  
Tel : +1-248-649-5381  
Fax : +1-248-649-5541  
E-mail charlie@acriche.com
- New Jersey  
Tel : +1-617-869-6779  
Fax : +1-201-585-1711  
E-mail : pcj77@acriche.com
- Atlanta  
Tel : +1-201-956-3609  
Fax : +1-201-632-4807  
E-mail : jason@acriche.com
- Texas  
Tel : +1-310-324-7151  
Fax : +1-678-550-8374  
E-mail : karl@acriche.com

**EUROPE**

- Frankfurt, Germany  
(Seoul Semiconductor Europe GmbH)  
Tel : +49-69716-750111  
Fax : +49-69716-750120  
E-mail : dykim@acriche.com
- Düsseldorf, Germany  
(Branch of Seoul Semiconductor Europe GmbH)  
Tel : +49-211-507-385-2  
E-mail : andrew@acriche.com
- Nuremberg, Germany  
(Branch of Seoul Semiconductor Europe GmbH)  
Tel : +49-911999-5860  
Fax : +49-911999-5865  
E-mail : info@seoul-semicon.de

- London, UK  
Tel : + 44-1256-818004  
E-mail : elliet@acriche.com
- Manchester, UK  
Tel : +44-1229-861-104  
E-mail : richard@acriche.com
- Copenhagen, Denmark  
Tel : +45-3512-5081  
E-mail : bchyun@acriche.com
- Rotterdam, Netherlands  
Tel. : +31-10-251-8668  
Fax : +31-10-251-8669  
E-mail : wim@seoulsemicon.nl
- Paris, France  
Tel : +33-671-461-341  
Fax : +33-1-6980-9269  
E-mail : italia@seoulsemicon.it
- Milan, Italy  
Tel : +39-039-599-503  
Fax : +39-039-598-4930  
E-mail : italia@seoulsemicon.it

- Madrid, Spain  
Tel : +34-91-268-7694  
Fax : +34-91-268-7694  
E-mail italia@seoulsemicon.it
- Warsaw, Poland  
Tel : +48-22-498-75-10  
Fax : +48-22-435-51-44  
E-mail : jhnam@acriche.com



**JAPAN**

- Tokyo  
Tel: +81-3-5360-7620  
Fax : +81-3-5360-7622  
E-mail : smyi@acriche.com

- Nagoya  
Tel : +81-52-251-1861  
Fax : +81-52-784-5888  
E-mail : b2yttark@acriche.com

**CHINA**

- Shanghai  
Tel : +86-21-3223-0032  
Fax : +86-21-6208-5754  
E-mail : Johnsun82@acriche.com

- Shenzhen  
Tel : +86-755-8204-2307  
Fax : +86-755-8204 7531  
E-mail : kevin@acriche.com

- Taiwan  
Tel : +886-28226-7678  
Fax : +886-28226-6211  
E-mail : peter@acriche.com

**ASIA**

- Singapore  
Tel : +65-6853-9593  
Fax : +65-6853-9591  
E-mail : sansanaw@acriche.com

- New Delhi, India  
Tel : +91-98711-55223  
Fax : +91-11-2989-3764  
E-mail : gopal.shukla@acriche.com

- Mumbai, India  
Tel : +91-98333-94060  
E-mail : kuldeep.gupta@acriche.com

**HEAD OFFICE**

Tel : +82-31-364-3789  
Fax : +82-2-6915-7776