LED Part-Numbering System

Application Brief L-001

Introduction

There are two Avago Technologies LED Part Numbering Systems, namely:

1) Existing LED Part Numbering system (shown in Section 1)
2) New LED Part Numbering System (shown in Section 2)

The existing Avago Technologies Part Numbering System differs from product family to product family and will continue to be applicable for existing products. The New Avago Technologies LED Part Numbering system incorporates Avago Technologies Brand Identification with more standardized features and will only be applicable for new Avago Technologies LEDs.

This document is intended as a general guide to the part numbering systems employed by each part family. This document is not intended as a selection guide, and does not contain parametric values for specific devices. For further information on specific products, please refer to the respective Product Technical Data Sheet.

Some part numbers may not appear to fall in the categories contained herein—this does not indicate obsolescence, but rather the specific part number may not exactly match the generalizations in this document. For those part numbers not exactly matching the descriptions in this document, please download the appropriate Product Technical Data Sheet from Avago Technologies Website (*http://www.avagotech.com*) or contact the nearest Avago Technologies Representative.

Section 1: Index of Part-Numbering System

There are six main product families, and there may be several Part Number groups in each product family. For convenience, two indexes are provided in this document—one sorted by Product Family (Table 1), and the other sorted by Part Number (Table 2).

The next page contains an index table sorted by Part Number, where an "x" or "X" indicates a wildcard (any) character.

Table 1. Index of Part Numbering System by Product Family

Product Family	Description	Figure
Through-Hole Lamps	3 mm, 5 mm, 4 mm Round, Oval and Rectangular Through-Hole LED Lamps	Figure 1a, Figure 1b
Segmented Displays	Seven Segment LED Displays	Figure 2
Light Bars	Light Bars and Bar Graph Arrays	Figure 3
Surface Mount Lamps		
• SMT Subminiatures	Subminiature Through-hole and Surface Mountable LED Lamps	Figure 4a, Figure 4b
• SMT ChipLEDs	Surface Mountable Chip LED	Figure 5
• SMT Flash LED	Flash LED	Figure 5
Dot Matrix Displays	LED Dots in a Matrix (Array)	Figure 6
Smart Alphanumeric Displays	Intelligent Alphanumeric Displays	Figure 7a, Figure 7b

Table 2[1]. Index of Part Numbering System Sorted by Part Number

Part Number	Description / Product Family	Figure
5082-76xx-xxxxx	Segmented Displays	Figure 2
HCMS-2xxx	Smart Alphanumeric Displays	Figure 7a
HCMS-39xx	Smart Alphanumeric Displays	Figure 7a
HDLx-2416	Smart Alphanumeric Displays	Figure 7a
HDLx-1414	Smart Alphanumeric Displays	Figure 7a
HDLx-3416	Smart Alphanumeric Displays	Figure 7a
HDSP-0xxx	Smart Alphanumeric Displays	Figure 7b
HDSP-2xxx	Smart Alphanumeric Displays	Figure 7b
HDSP-5xxx	Dot Matrix Displays	Figure 6
HDSP-7xxx	Dot Matrix Displays	Figure 6
HDSP-Axxx	Segmented Displays	Figure 2
HDSP-Bxxx	Dot Matrix Displays	Figure 6
HDSP-Exxx	Segmented Displays	Figure 2
HDSP-Fxxx	Segmented Displays	Figure 2
HDSP-Gxxx	Segmented Displays	Figure 2
HDSP-Hxxx	Segmented Displays	Figure 2
HDSP-Kxxx	Segmented Displays	Figure 2
HDSP-Mxxx	Dot Matrix Displays	Figure 6
HDSP-Nxxx	Segmented Displays	Figure 2
HDSP-Rxxx	Dot Matrix Displays	Figure 6
HDSP-Sxxx	Dot Matrix Displays	Figure 6
HDSP-Uxxx	Segmented Displays	Figure 2
HEMT-xxxx-xxxxx	Through Hole Lamps	Figure 1a, 1b
HPDL-x41x	Smart Segmented Displays	Figure 7b
HLCP-xxxx-xxxxx	Light Bars and Bar Graph Arrays	Figure 3
HLMA-xxxx-xxxxx	SMT Subminiatures	Figure 4a, 4b
HLMP-1xxx-xxxxx	Through Hole Lamps	Figure 1a, 1b
HLMP-2xxx-xxxxx	Light Bars and Bar Graph Arrays	Figure 3
HLMP-3xxx-xxxxx	Through Hole Lamps	Figure 1a, 1b
HLMP-Cxxx-xxxxx	Through Hole Lamps	Figure 1a, 1b
HLMP-Dxxx-xxxxx	Through Hole Lamps	Figure 1a, 1b
HLMP-Kxxx-xxxxx	Through Hole Lamps	Figure 1a, 1b
HLMP-Nxxx-xxxxx	Through Hole Lamps	Figure 1a, 1b
HLMP-Sxxx-xxxxx	Through Hole Lamps	Figure 1a, 1b
HLMP-xxxx-xxxxx	SMT Subminiatures	Figure 4a, 4b
HLMT-xxxx-xxxxx	SMT Subminiatures	Figure 4a, 4b
HSMx-xxxx	SMT ChipLED	Figure 5

Note:
1. For codes not listed in this Table, please refer to the respective data sheet or contact your nearest Avago Technologies representative for details.

H x x x – x x x x – x x x x x

Mechanical Options [1]

00	: Bulk Packing`
01	: Tape & Reel, Crimped Leads
02	: Tape & Reel, Straight Leads
A1	: Right Angle Housing
A2	: Right Angle Housing
Ax	: Tape & Reel, Straight Leads
B1	: Right Angle Housing
B2	: Right Angle Housing
Bx	: Tape & Reel, Straight Leads
Cx	: Ammo Pack, Straight Leads
Dx	: Ammo Pack, Straight Leads
Ex	: Ammo Pack, Straight Leads
Fx	: Special Mechanical Option
Jx	: Tape & Reel, Diagonal Leads
Kx	: Tape & Reel, Diagonal Leads
Lx	: Ammo Pack, Diagonal Leads
Mx	: Ammo Pack, Diagonal Leads
Nx	: Ammo Pack, Diagonal Leads
Rx	: Tape & Reel, Counterclockwise Direction
Sx	: Tape & Reel, Horizontal Leads
Tx	: Tape & Reel, Horizontal Leads
Ux	: Ammo Pack, Horizontal Leads
Vx	: Ammo Pack, Horizontal Leads
Wx	: Ammo Pack, Horizontal Leads
YY	: Flexi-bin, Bulk Packing
ZZ	: Flexi-bin, Ammo Pack

Color Bin and VF Options [1, 2]

0	: Full Color Distribution
A	: Color bin 1 & 2
B	: Color bin 2 & 3
C	: Color bin 3 & 4
D	: Color bin 4 & 5
E	: Color bin 5 & 6
F	: Color bin 1,2 & 3
G	: Color bin 2,3 & 4
H	: Color bin 3,4 & 5
J	: Color bin 2 & 4
K	: Color bin 2 & 4
L	: Color bin 4 & 6
M	: Color bin 2,4 & 6
N	: Color bin 6 & 7
P	: Special Color Bin Range
Q	: Color bin 7 & 8
R	: Color bin 1,2 4 & 6, Vf max 2.6 V
S	:Color bin 2 & 4, Vf max 2.6 V
T	: Full color bin distribution, Vf max 2.6 V
U	: Color bin 4, Vf max 2.6 V
W	: Color bin 2,4 & 6, Vf max 2.6 V
Y	: Color bin 4 & 6, Vf max 2.6 V
Z	: Special Vf Bin Range

Maximum Intensity Bin [1, 2]

0	: No Maximum Intensity Bin Limitation

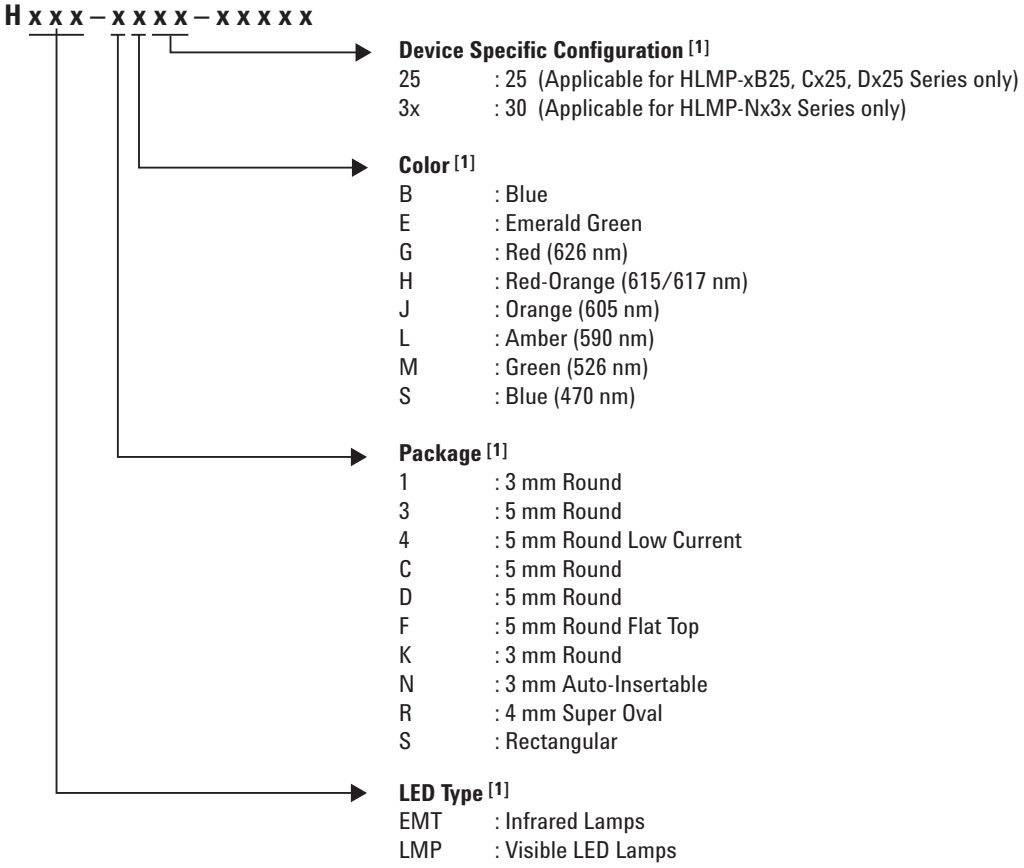
Minimum Intensity Bin [1, 2]

0	: No Minimum Intensity Bin Limitation

Notes

1. For codes not listed in the figure above, please refer to the respective data sheet or contact your nearest Avago Technologies representative for details.
2. Bin options refer to shippable bins for a part-number. Color and Intensity Bins are typically restricted to 1 bin per bulk pack, ammo-pack, or reel (exceptions may apply). Please refer to respective data sheet for specific bin limit information.
3. Continued on next page.

Figure 1a [3]**. Through Hole Lamps** [1]



Notes

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2. Bin options refer to shippable bins for a part-number. Color and Intensity Bins are typically restricted to 1 bin per bulk pack, ammo-pack, or reel (exceptions may apply). Please refer to respective data sheet for specific bin limit information.
3. Continued from previous page.

Figure 1b [3]. Through Hole Lamps [1]

5082– xxxx–xxxxx
HDSP–xxxx–xxxxx

Mechanical Options [1]
- 00 : No Mechanical Option
- 01 : Special Shear
- 16 : Special Lead Length
- 23 : Special Lead Length
- 33 : Special Shear
- 36 : Special Dimensional Tolerances

Color Bin Options [1, 2]
- 0 : No Color Bin Limitation
- 3 : Color Bins 3- & 3+ Only (Applicable for Yellow Devices Only)
- 4 : Color Bin 4 Only (Applicable for Green Devices Only)
- B : Color Bins 2 & 3 (Applicable for Yellow Devices Only)
- C : Color Bins 3 & 4 Only (Applicable for Green Devices Only)
- Z : Color Bins 2- & 3+ Only (Applicable for Yellow Devices Only)

Maximum Intensity Bin [1, 2]
- 0 : No Maximum Intensity Bin Limitation

Minimum Intensity Bin [1, 2]
- 0 : No Minimum Intensity Bin Limitation

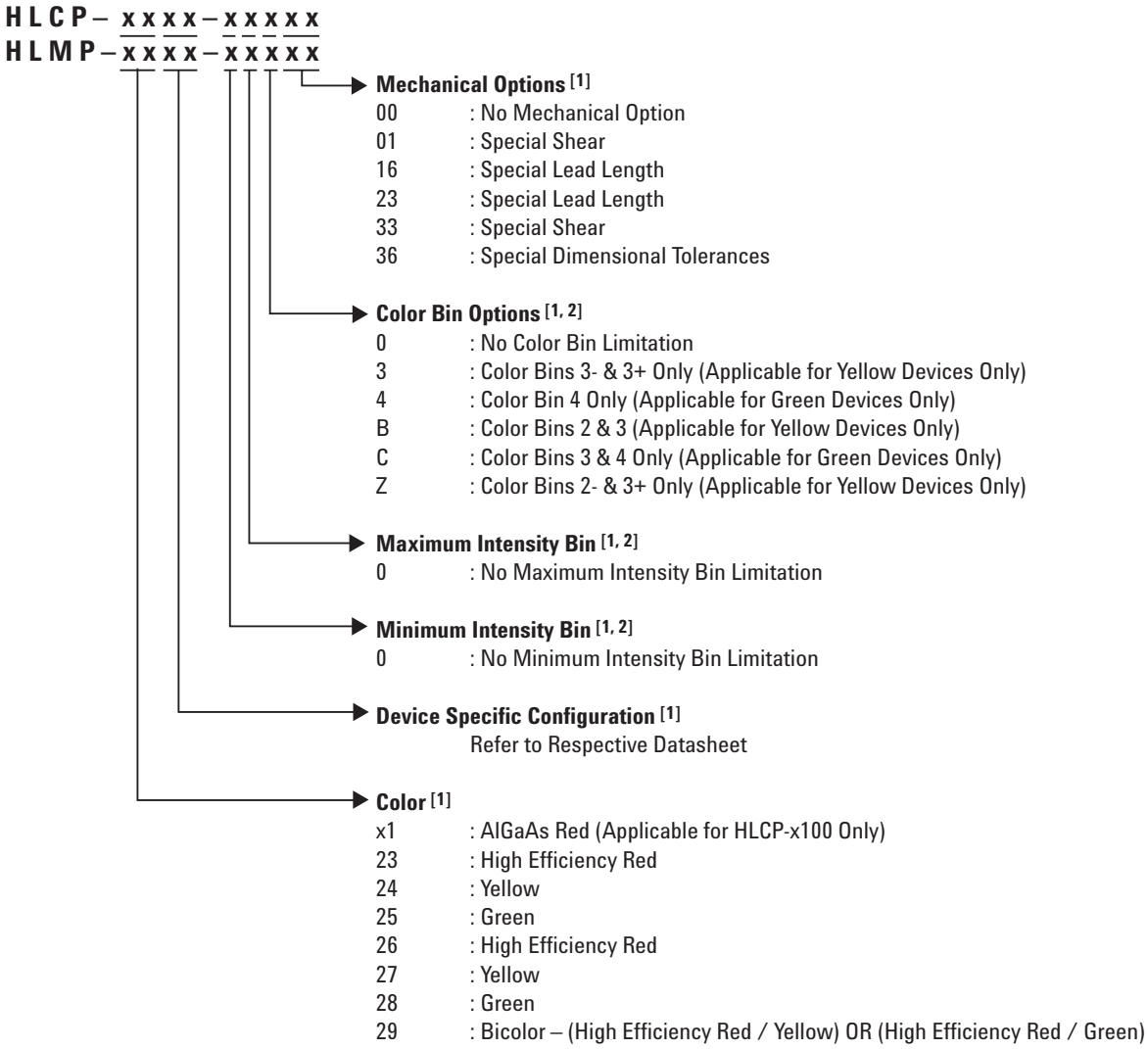
Device Configuration / Color [1]
- 0 : Common Anode
- 1 : Common Anode
- 2 : Common Anode
- 3 : Common Cathode
- 4 : Common Cathode
- 6 : Overflow Universal
- 7 : Overflow Common Anode
- 8 : Overflow Common Cathode
- A : AlGaAs Red
- H : AlGaAs Red
- B : Blue
- E : High Efficiency Red
- G : Green
- Y : Yellow

Device Specific Configuration [1]
Refer to Respective Data sheet

Package [1]
- A : 7.6 mm (0.3 Inch) Single Digit Seven Segment Display
- E : 10.9 mm (0.43 Inch) Single Digit Seven Segment Display
- F : 10 mm (0.4 Inch) Single Digit Seven Segment Display
- G : 10 mm (0.4 Inch) Dual Digit Seven Segment Display
- H : 14.2 mm (0.56 Inch) Single Digit Seven Segment Display
- K : 14.2 mm (0.56 Inch) Dual Digit Seven Segment Display
- N : 20 mm (0.8 Inch) Single Digit Seven Segment Display
- U : 8 mm (0.31 Inch) Ultra Mini Single Digit Seven Segment Display

Notes
1. For codes not listed in the figure above, please refer to the respective datasheet or contact your nearest Avago Technologies representative for details.
2. Bin options refer to shippable bins for a part-number. Color and Intensity Bins are typically restricted to 1 bin per tube (exceptions may apply). Please refer to respective datasheet for specific bin limit information.

Figure 2. Segmented Displays [1]



Notes

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2. Bin options refer to shippable bins for a part-number. Color and Intensity Bins are typically restricted to 1 bin per tube (exceptions may apply). Please refer to respective datasheet for specific bin limit information.

Figure 3. Light Bars and Bar Graph Arrays[1]

HLMx – xxxx – xxxxx

Mechanical Options [1]

00	: Straight Leads, Bulk Packaging, Quantity of 500 Parts
10	: Right Angle Housing
11	: Gull Wing Bend, Tape and Reel, 7" Reel
12	: Gull Wing Bend, Bulk Packing
14	: Gull Wing Bend, Tape and Reel, 13" Reel
1L	: 0.1" Center Lead Spacing, Long Leads
1S	: 0.1" Center Lead Spacing, Short Leads
21	: Yoke Bend, Tape and Reel, 7" Reel
22	: Yoke Bend, Bulk Packing
24	: Yoke Bend, Tape and Reel, 13" Reel
2L	: 0.2" Center Lead Spacing, Long Leads
2S	: 0.2" Center Lead Spacing, Short Leads
31	: Z-Bend, Tape and Reel, 7" Reel
32	: Z-Bend, Bulk Packing
34	: Z-Bend, Tape and Reel, 13" Reel

Color Bin Options [1, 2]

0	: No Color Bin Limitation
B	: Color Bins 3 & 4 Only
K	: Color Bins 2, 3 & 4 Only
R	: Color Bins 2 & 4 Only
W	: Color Bins 2, 4, 6 & 7 Only
X	: Color Bins 4, 6 & 7 Only

Maximum Intensity Bin [1, 2]

0 : No Maximum Intensity Bin Limitation

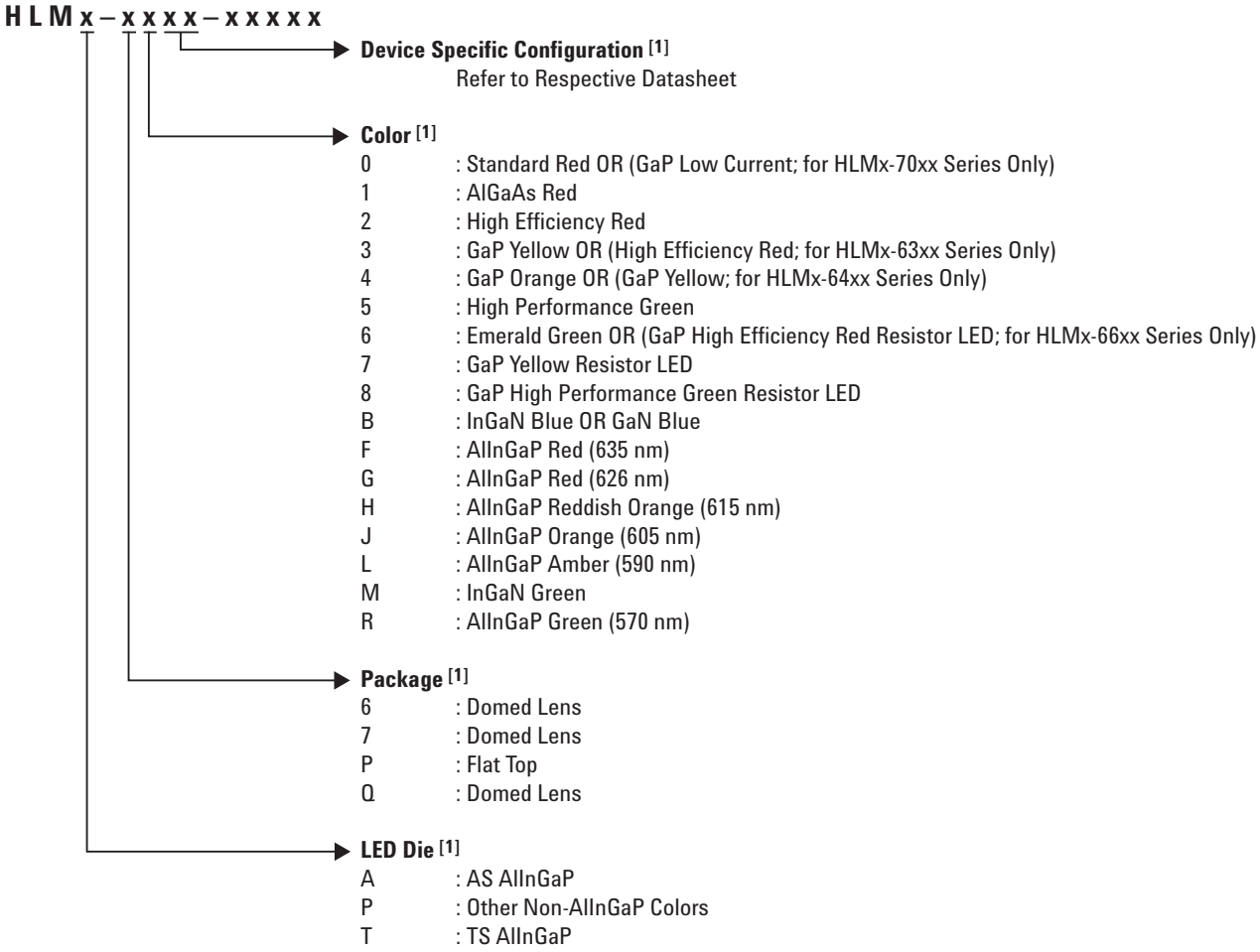
Minimum Intensity Bin [1, 2]

0 : No Minimum Intensity Bin Limitation

Notes

1. For codes not listed in the figure above, please refer to the respective datasheet or contact your nearest Avago Technologies representative for details.
2. Bin options refer to shippable bins for a part-number. Color and Intensity Bins are typically restricted to 1 bin per bulk pack, ammo-pack, or reel (exceptions may apply). Please refer to respective datasheet for specific bin limit information.
3. Continued on next page.

Figure 4a [3]. Subminiature Lamps [1]



Notes

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2. Bin options refer to shippable bins for a part-number. Color and Intensity Bins are typically restricted to 1 bin per bulk pack, ammo-pack, or reel (exceptions may apply). Please refer to respective datasheet for specific bin limit information.
3. Continued from previous page.

Figure 4b [3]. Subminiature Lamps [1]

H S M x – x x x x

Color Mix [1] (for HSMF-C15x, C16x, Series Only)

5 : High Efficiency Red & GaP Green
6 : GaP Yellow & GaP Green
7 : GaP Orange & GaP Green

Package Type / Dimension [1] (L x W x H in mm)

B191 : 1.6 x 0.8 x 0.6 (Bluish; for HSMW-xxxx Series Only)
C110 : 3.2 x 1.0 x 1.5
C150 : 3.2 x 1.6 x 1.1
C15x : 3.2 x 2.7 x 1.1 (for HSMF-C155, C156, C157 Series Only)
C16x : 1.6 x 0.8 x 0.5 (for HSMF-C165, C166, C167 Series Only)
C170 : 2.0 x 1.25 x 0.8
C177 : 2.0 x 1.25 x 0.4
C190 : 1.6 x 0.8 x 0.8
C191 : 1.6 x 0.8 x 0.6
C197 : 1.6 x 0.8 x 0.4
C260 : 3.4 x 1.25 x 1.1
C265 : 3.4 x 1.25 x 1.1
C280 : 1.0 x 0.5 x 0.4
C660 : 3.2 x 1.0 x 2.0
C670 : 2.0 x 1.25 x 1.1
C820 : 4.5 x 3.2 x 1.8 flash (single clip)
C830 : 2.2 x 7.0 x 1.7 flash (3 chips in parallel)
C850 : 2.2 x 7.0 x 1.7 flash (3 chips in series)
C860 : 2.2 x 7.0 x 1.78 flash (3 chips in parallel)
L640 : 3.0 x 1.5 x 0.9
S660 : 3.0 x 1.0 x 2.0
S670 : 2.0 x 1.25 x 0.8
S690 : 1.6 x 0.8 x 0.7

Color / LED Technology [1]

A : AS AlInGaP Amber
B : GaN Blue
C : AS AlInGaP Red
D : GaP Orange
F : Bi-Color
G : GaP Green
H : AlGaAs Red
L : AS AlInGaP Orange
M : InGaN Green
N : InGaN Blue
Q : InGaN Green
R : InGaN Blue
S : High Efficiency Red
U : TS AlInGaP Amber (AlInGaP II)
W : White
Y : GaP Yellow
Z : TS AlInGaP Red (AlInGaP II)

Notes

1. For codes not listed in the figure above, please refer to the respective datasheet or contact your nearest Avago Technologies representative for details.
2. Bin options refer to shippable bins for a part-number. Color and Intensity Bins are typically restricted to 1 bin per bulk pack, ammo-pack, or reel (exceptions may apply). Please refer to respective datasheet for specific bin limit information.

Figure 5. ChipLED [1]

HDSP – x x x x

Device Configuration / Color [1]

1	: Common Row Anode
3	: Common Row Cathode
A	: AlGaAs Red
B	: Blue
E	: High Efficiency Red
G	: Green
Y	: Yellow
Z	: Red / Green (Bi-Color)

Character Height / Device Configuration [1]

0	: 0 to 0.99 inch Height, Common Row Anode (for HDSP-Sxxx and Mxxx Series Only)
1	: Common Row Anode OR (1 to 1.99 inch Height, Common Row Anode; for HDSP-Sxxx and Mxxx Series Only)
2	: 2 to 2.99 inch Height, Common Row Anode
3	: (3 to 3.99 inch Height, Common Row Anode; for HDSP-Sxxx and Mxxx Series Only) OR (Common Row Cathode; for HDSP-7xxx Series Only)
5	: 0 to 0.99 inch Height, Common Row Cathode
6	: 1.0 to 1.99 inch Height, Common Row Cathode
7	: 2.0 to 2.99 inch Height, Common Row Cathode (for HDSP-Sxxx and Mxxx Series Only)
8	: 3.0 to 3.99 inch Height, Common Row Cathode (for HDSP-Sxxx and Mxxx Series Only)

Package Configuration [1]

0	: Gray Surface (for HDSP-7xxx Series Only)
1	: (1.04 inch Character Height; for HDSP-5xxx Only) OR (Black Surface; for HDSP-7xxx Series Only)
4	: 0.68 inch Character Height (for HDSP-5xxx Only)
5	5 x 7 Dot Matrix
6	: 5 x 8 Dot Matrix
7	: 4 x 8 Dot Matrix
8	: 8 x 8 Dot Matrix

Package Type / Color [1]

5	: 5 x 7 Dot Matrix
7	: 17.3mm (0.68 Inch) 5 x 7 Dot Matrix
B	: Bi-Color (HER/Green) Dot Matrix Display
L	: 17.3mm (0.68 Inch) 5 x 7 Dot Matrix
M	: 26.5mm (1.04 Inch) 5 x 7 Dot Matrix
R	: Rich Color (Red/Blue/Green) Dot Matrix Display
S	: Single Color Dot Matrix Display

Notes

1. For codes not listed in the figure above, please refer to the respective datasheet or contact your nearest Avago Technologies representative for details.
2. Bin options refer to shippable bins for a part-number. Color and Intensity Bins are typically restricted to 1 bin per tube or tray (exceptions may apply). Please refer to respective datasheet for specific bin limit information.

Figure 6. Dot Matrix Displays [1]

HCMS–xxxx High Performance CMOS 5 x 7 Alphanumeric Displays

Color [1]

1	: Yellow
2	: High Efficiency Red
3	: GaP Green
4	: GaP Orange
5	: AlGaAs Red
6	: AlInGaP Red
7	: AlInGaP Green

Character [1]

90	: 4 Character 0.15" Height, Plastic Package
91	: 8 Character 0.15" Height, Plastic Package
92	: 16 Character 0.15" Height, Plastic Package
96	: 4 Character 0.2" Height, Plastic Package
97	: 8 Character 0.2" Height, Plastic Package

Drive Voltage

2	: 5 V
3	: 3.3 V

HDLx–2416 4 Character 5 x 7 Smart Alphanumeric Displays

Color [1]

A	: Orange
G	: Green
O	: High Efficiency Red
U	: AlGaAs Red
S	: AlGaAs Red
Y	: Yellow

HDLx–1414

Color Options

A	: Orange
G	: Green
O	: High Efficiency Red
Y	: Yellow
U, S	: AlGaAs Red

HDLx–3416

Color Options

A	: Orange
G	: Green
O	: High Efficiency Red
Y	: Yellow

Notes

1. For codes not listed in the figure above, please refer to the respective datasheet or contact your nearest Avago Technologies representative for details.
2. Bin options refer to shippable bins for a part-number. Color and Intensity Bins are typically restricted to 1 bin per tube or tray (exceptions may apply). Please refer to respective datasheet for specific bin limit information.
3. Continued on next page.

Figure 7a [3]. Smart Alphanumeric Displays [1]

HDSP–0xxx Hexadecimal and Numeric Displays For Industrial Applications

Character [1]

0 : Numeric, Right-Hand DP
1 : (Numeric, Left-Hand DP; for HDSP-0x6x & -0x7x Only)
OR (Numeric, Right-Hand DP; for HDSP-0x8x & -0x9x Only)
2 : (Hexadecimal; for HDSP-0x6x & -0x7x Series Only)
OR (Numeric, Left-Hand DP; for HDSP-0x8x & -0x9x Only)
3 : Over-Range (+/- 1)
4 : Hexadecimal

Color [1]

76 : High Efficiency Red, Low Power
77 : High Efficiency Red, High Brightness
78 : High Efficiency Red, Low Power
79 : High Efficiency Red, High Brightness
86 : Yellow
88 : Yellow
96 : Green
98 : Green

HDSP–2xxx Smart Alphanumeric Displays

Color [1]

0 : Orange
1 : Yellow
2 : High Efficiency Red
3 : Green
4 : AlGaAs Red
7 : AlGaAs Red
9 : Orange

Character [1]

10 : 8 Character 0.2" Height
11 : 8 Character 0.2" Height
13 : 8 Character 0.2" Height, Glass/Ceramic Package
17 : 8 Character 0.2" Height, Glass/Ceramic Package
50 : 8 Character 0.27" Height
53 : 8 Character 0.2" Height

HPDL–1414 4 Character Smart Alphanumeric Displays

Character [1]

: 0.112" Height

Notes

1. For codes not listed in the figure above, please refer to the respective datasheet or contact your nearest Avago Technologies representative for details.
2. Bin options refer to shippable bins for a part-number. Color and Intensity Bins are typically restricted to 1 bin per tube or tray (exceptions may apply). Please refer to respective datasheet for specific bin limit information.
3. Continued from previous page.

Figure 7b [3]. Smart Alphanumeric Displays [1]

Section 2:

Table 3. Index of New Part Numbering System

Product Family	Part Numbering System	Figure
Through-Hole Lamps	ALMP-xxxx-xxxxx	Figure 8
	ALMC-xxxx-xxxxx	
Surface Mount Lamps	ASMT-xxxx-xxxxx	Figure 9
Display	ADSP-xxxx-xxxxx	Figure 10

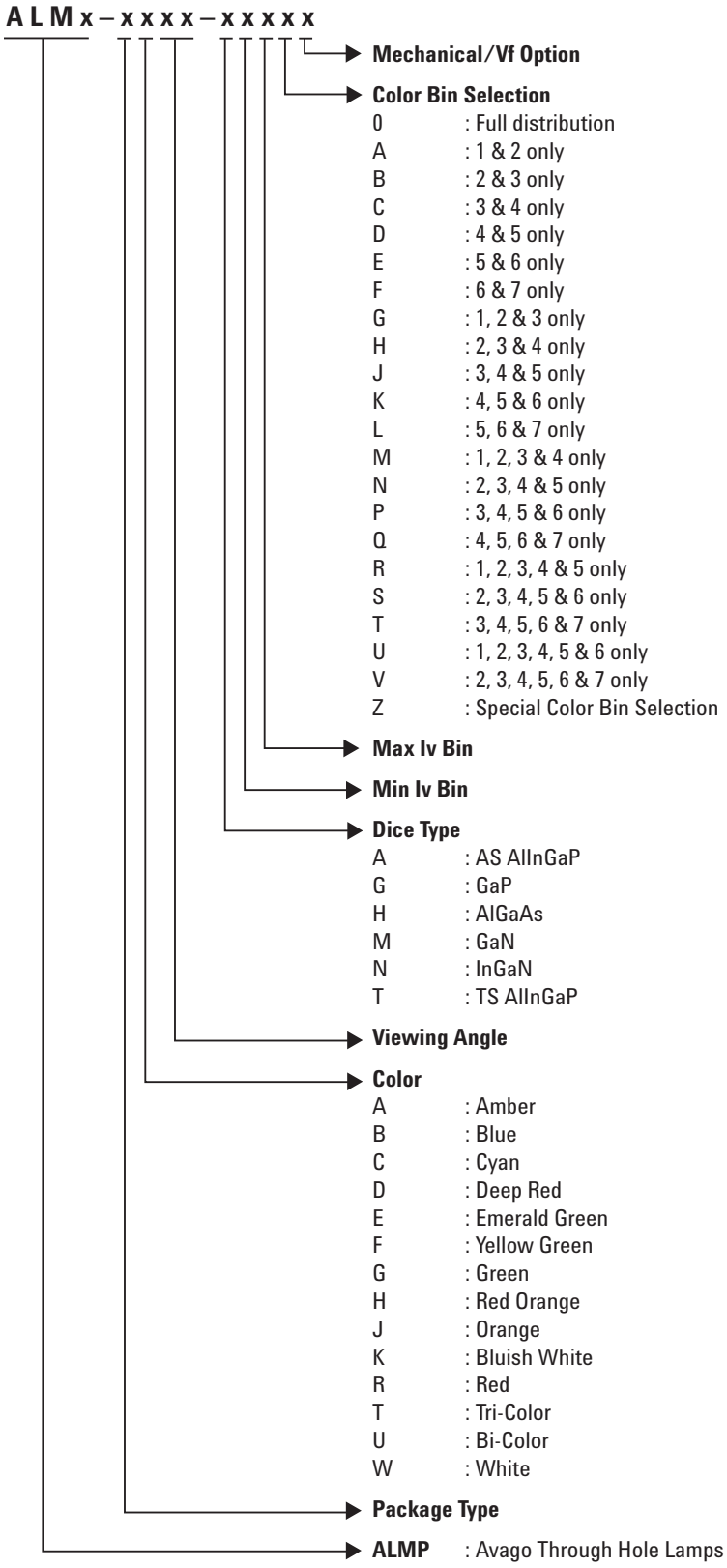

Figure 8. New "A" Series part number structure for Through Hole Lamps

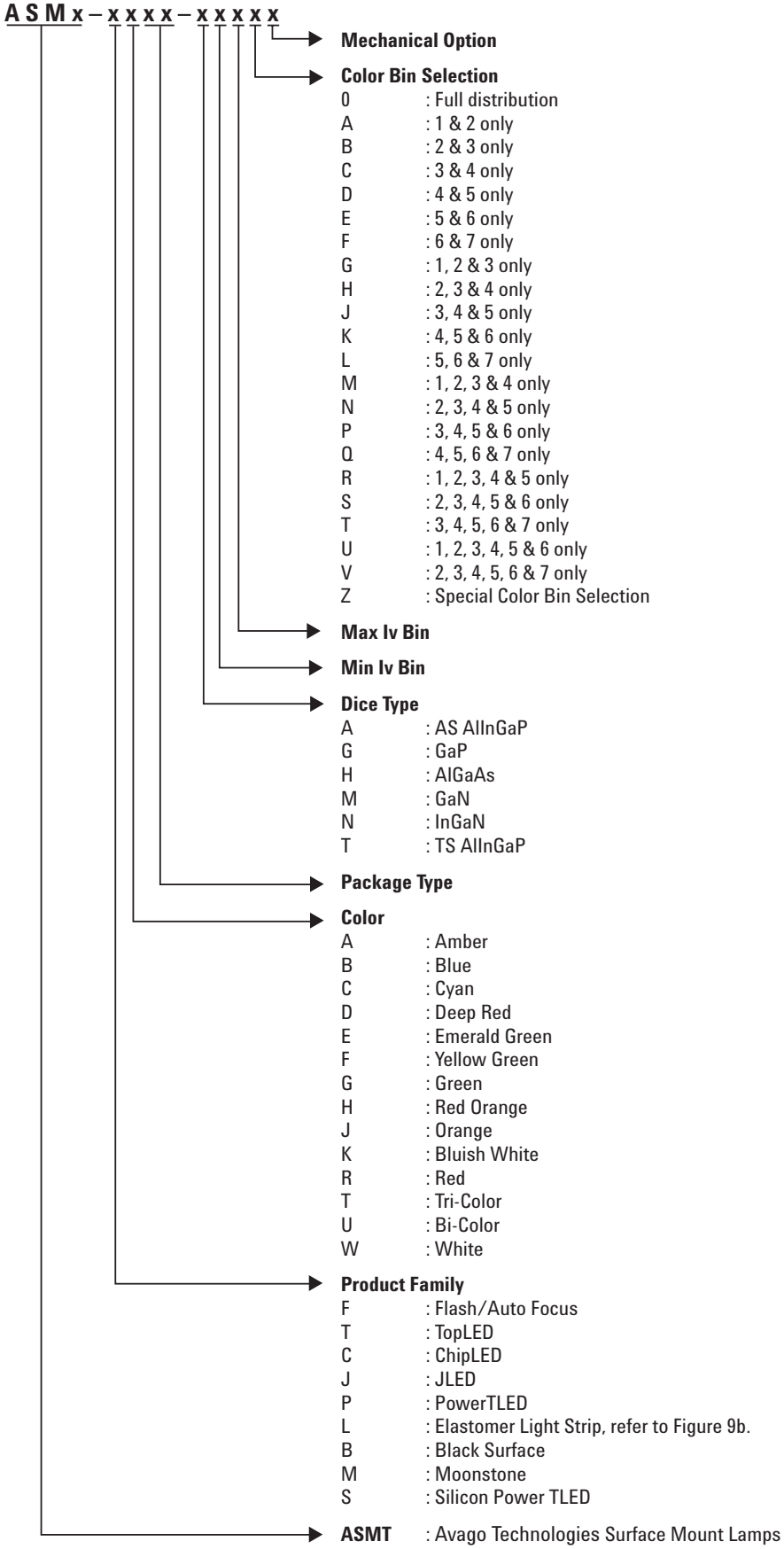

Figure 9a. New "A" Series part number structure for Surface Mount Lamps

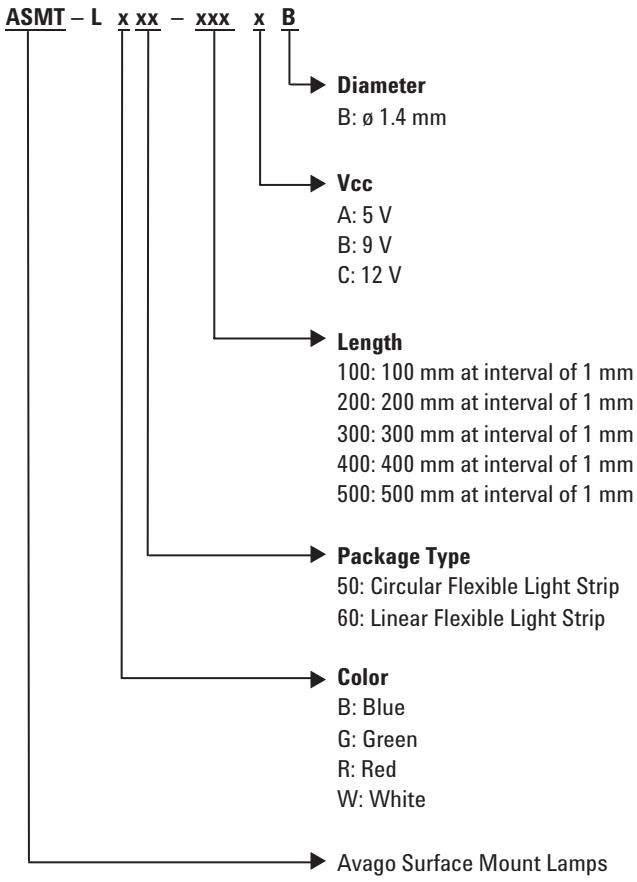

Figure 9b. New "A" Series part number structure for Elastomer Light Strip

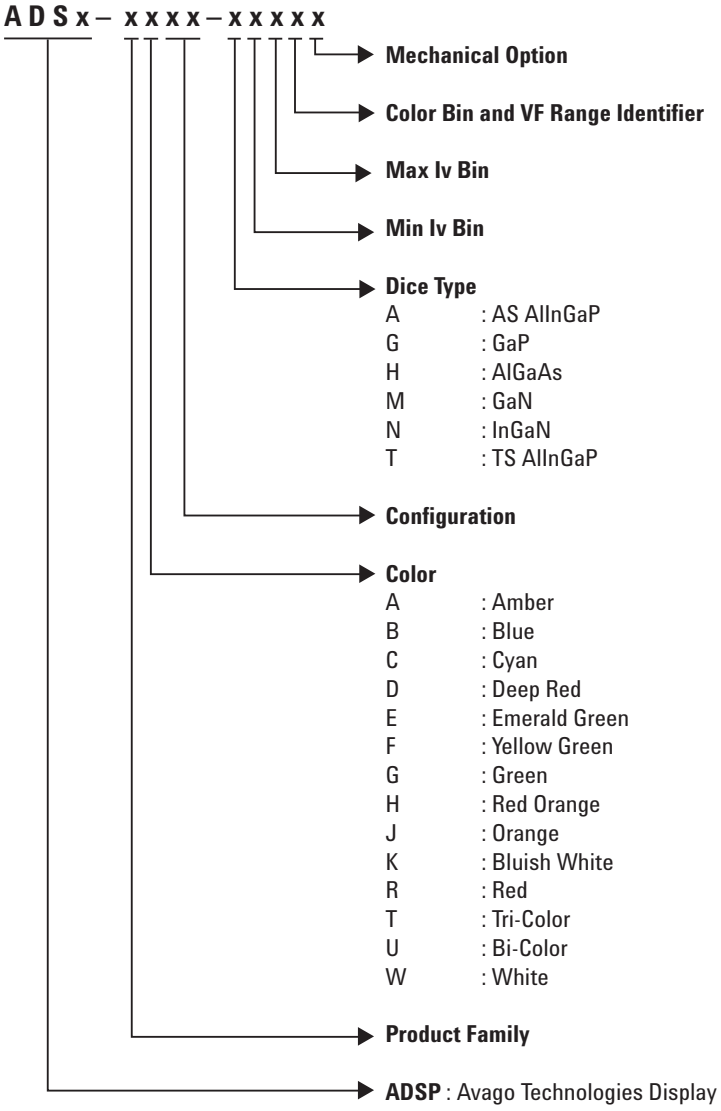

Figure 10. New "A" Series part number structure for Display

For product information and a complete list of distributors, please go to our web site: **www.avagotech.com**

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