

# Agilent Surface Mount LED ChipLED Products

## Product Selection



### ChipLED Background

An industry leader in high brightness LED technology, Agilent Technologies offers a wide range of high quality ChipLED products to meet customer demands for various surface mount lighting requirements.

High brightness LED technology offers better efficiency, lower driving current and lower number of LEDs required. Agilent's ChipLED products have the lowest profile in the industry, and are positioned to support high volume, cost effective solutions.

### About the Products

Agilent manufactures AllnGaP, AlGaAs and InGaN ChipLEDs. AllnGaP ChipLEDs are available in amber, orange and red for high brightness applications. Standard brightness colors include green, red, AlGaAs red, orange, and yellow in addition to several bi-color variations.

Also available now are Agilent InGaN ChipLEDs in blue and green. Agilent has all the colors you need!

The ChipLED footprint is industry standard with top mount, reverse mount and right angle mount packaging options. Our low profile products integrate well into designs where space is limited.

ChipLED products are used in a variety of applications including LCD and push button backlighting for cellular phones, white goods and appliances, industrial measurement and control systems, and for symbol lighting and status indication in computer peripherals and consumer goods.

Low power consumption, small size and easy assembly make the ChipLED ideal for backlighting handsets as well as backlighting industrial displays.

### Features and Benefits

- Small size
  - Saves PC board space
- Wide viewing angle
  - Well-suited for backlighting applications
- Intensity and color bin uniformity
  - Can be closely mounted without any intensity variations

- Available in multiple colors
  - Broad range of colors: Red, AlGaAs Red, Green, Orange, Yellow, and InGaN Blue and InGaN Green
- Variety of packages and mounting options
  - Top, reverse, and right angle auto mountable
- Industry standard footprint
  - No change in existing board layout
- High volume, high reliability
  - Cost effective solution

### Typical Applications

- Telecommunications
  - Keypad and LCD backlighting for mobile phones, pagers and cordless phones
- Industrial
  - Status and symbol indicator
  - Keypad and LCD backlighting
- Consumer
  - White goods and appliances
- Computer Peripherals
  - Status indicator
- Indoor Full/Mono Color Sign



## Agilent Surface Mount LED ChipLED Products

Part Number	Color	Dominant Wavelength (nm)	Viewing Angle	Lens	Intensity		Vf Typ (V)	Test Current (mA)
					Min (mcd)	Typ (mcd)		

### Top Mount (C150)

3.2 x 1.6 x 1.1 mm (L x W x H)

HSMH-C150	AS AlGaAs Red	639	170°	Diffused	6.3	17	1.8	20
HSMS-C150	GaP Red	626	170°	Diffused	2.5	10	2.1	20
HSMD-C150	GaP Orange	604	170°	Diffused	2.5	8	2.2	20
HSMY-C150	GaP Yellow	586	170°	Diffused	2.5	8	2.1	20
HSMG-C150	GaP Green	572	170°	Diffused	4.0	15	2.2	20

Quantity: 3,000 per 7 inch reel

### Right Angle (C110)

3.2 x 1.0 x 1.5 mm (L x W x H)

HSMH-C110	AS AlGaAs Red	639	130°	Non-diffused	6.3	19	1.8	20
HSMS-C110	GaP Red	626	130°	Non-diffused	2.5	11	2.1	20
HSMD-C110	GaP Orange	604	130°	Non-diffused	2.5	9	2.2	20
HSMY-C110	GaP Yellow	586	130°	Non-diffused	2.5	9	2.1	20
HSMG-C110	GaP Green	572	130°	Non-diffused	4.0	16	2.2	20
HSMB-C110	GaN Blue	466	130°	Non-diffused	1.6	6.5	3.8	20
HSMM-C110	InGaN Green	525	130°	Non-diffused	40.0	126	3.5	20
HSMN-C110	InGaN Blue	470	130°	Non-diffused	10.0	39	3.5	20
HSMA-C110	AS AllnGaP Amber	592	130°	Non-diffused	25	95	1.9	20
HSMC-C110	AS AllnGaP Red	626	130°	Non-diffused	25	95	1.9	20
HSML-C110	AS AllnGaP Orange	605	130°	Non-diffused	25	95	1.9	20
HSMQ-C110	InGaN Green	527	130°	Non-diffused	40	150	3.4	20
HSMR-C110	InGaN Blue	473	130°	Non-diffused	16	60	3.4	20

Quantity: 3,000 per 7 inch reel

### Top Mount Low Profile (C170)

2.0 x 1.25 x 0.8 mm (L x W x H)

HSMH-C170	AS AlGaAs Red	639	170°	Diffused	6.3	17	1.8	20
HSMS-C170	GaP Red	626	170°	Diffused	2.5	10	2.1	20
HSMD-C170	GaP Orange	604	170°	Diffused	2.5	8	2.2	20
HSMY-C170	GaP Yellow	586	170°	Diffused	2.5	8	2.1	20
HSMG-C170	GaP Green	572	170°	Diffused	4.0	15	2.2	20
HSMB-C170	GaN Blue	466	170°	Diffused	1.6	8	3.8	20
HSMM-C170	InGaN Green	525	170°	Diffused	40.0	120	3.5	20
HSMN-C170	InGaN Blue	470	170°	Diffused	10.0	30	3.5	20
HSMA-C170	AS AllnGaP Amber	592	170°	Diffused	25	90	1.9	20
HSMC-C170	AS AllnGaP Red	626	170°	Diffused	25	90	1.9	20
HSML-C170	AS AllnGaP Orange	605	170°	Diffused	25	90	1.9	20
HSMQ-C170	InGaN Green	527	140°	Diffused	40	145	3.4	20
HSMR-C170	InGaN Blue	473	140°	Diffused	16	55	3.4	20














Quantity: 4,000 per 7 inch reel

## Agilent Surface Mount LED ChipLED Products

Part Number	Color	Dominant Wavelength (nm)	Viewing Angle	Lens	Intensity		Vf Typ (V)	Test Current (mA)
					Min (mcd)	Typ (mcd)		

### Top Mount Low Profile (C190)







1.6 x 0.8 x 0.8 mm (L x W x H)

HSMH-C190	 AS AlGaAs Red	639	170°	Diffused	6.3	17	1.8	20
HSMS-C190	 GaP Red	626	170°	Diffused	2.5	10	2.1	20
HSMD-C190	 GaP Orange	604	170°	Diffused	2.5	8	2.2	20
HSMY-C190	 GaP Yellow	586	170°	Diffused	2.5	8	2.1	20
HSMG-C190	 GaP Green	572	170°	Diffused	4.0	15	2.2	20
HSMB-C190	 GaN Blue	466	170°	Diffused	1.6	8	3.8	20
HSMC-C190	 InGaN Green	525	170°	Diffused	40.0	120	3.5	20
HSMN-C190	 InGaN Blue	470	170°	Diffused	10.0	30	3.5	20
HSMA-C190	 AS AllnGaP Amber	592	170°	Diffused	25	90	1.9	20
HSMC-C190	 AS AllnGaP Red	626	170°	Diffused	25	90	1.9	20
HSMC-C190	 AS AllnGaP Orange	605	170°	Diffused	25	90	1.9	20
HSMQ-C190	 InGaN Green	527	140°	Diffused	40	145	3.4	20
HSMR-C190	 InGaN Blue	473	140°	Diffused	16	55	3.4	20

Quantity: 4,000 per 7 inch reel

### Bi-Color (C15x)













3.2 x 2.7 x 1.1 mm (L x W x H)

HSMF-C155	 GaP Green	572	170°	Diffused	4.0	15	2.2	20
	 GaP Red	626	170°	Diffused	2.5	10	2.1	20
HSMF-C156	 GaP Green	572	170°	Diffused	4.0	15	2.2	20
	 GaP Yellow	586	170°	Diffused	2.5	8	2.1	20
HSMF-C157	 GaP Green	572	170°	Diffused	4.0	15	2.2	20
	 GaP Orange	604	170°	Diffused	2.5	8	2.2	20

Quantity: 3,000 per 7 inch reel

### Top Mount Very Low Profile (C191)

1.6 x 0.8 x 0.6 mm (L x W x H)

HSMH-C191	 AS AlGaAs Red	639	170°	Diffused	6.3	17	1.8	20
HSMS-C191	 HER	626	170°	Diffused	2.5	10	2.1	20
HSMD-C191	 GaP Orange	604	170°	Diffused	2.5	8	2.2	20
HSMY-C191	 GaP Yellow	586	170°	Diffused	2.5	8	2.1	20
HSMG-C191	 GaP Green	572	170°	Diffused	4	5	2.2	20
HSMC-C191	 InGaN Green	525	170°	Diffused	40.0	120	3.5	20
HSMN-C191	 InGaN Blue	470	170°	Diffused	10.0	30	3.5	20
HSMA-C191	 AS AllnGaP Amber	592	170°	Diffused	25	90	1.9	20
HSMC-C191	 AS AllnGaP Red	626	170°	Diffused	25	90	1.9	20
HSMC-C191	 AS AllnGaP Orange	605	170°	Diffused	25	90	1.9	20
HSMQ-C191	 InGaN Green	527	140°	Diffused	40	145	3.4	20
HSMR-C191	 InGaN Blue	473	140°	Diffused	16	55	3.4	20

Quantity: 4,000 per 7 inch reel








## Agilent Surface Mount LED ChipLED Products

Part Number	Color	Dominant Wavelength (nm)	Viewing Angle	Lens	Intensity		Vf Typ (V)	Test Current (mA)
					Min (mcd)	Typ (mcd)		

### The SIZE DOES MATTER Series

#### World's Smallest Top Mount (C280)








1.0 x 0.5 x 0.4 mm

HSMS-C280	 HER	626	140°	Diffused	2.5	10	2.1	20
HSMD-C280	 GaP Orange	604	140°	Diffused	2.5	8	2.2	20
HSMY-C280	 GaP Yellow	586	140°	Diffused	2.5	8	2.1	20
HSMG-C280	 GaP Green	572	140°	Diffused	4	15	2.2	20
HSMA-C280	 AS AllnGaP Amber	592	140°	Diffused	25	90	1.9	20
HSMC-C280	 AS AllnGaP Red	626	140°	Diffused	25	90	1.9	20
HSML-C280	 AS AllnGaP Orange	605	140°	Diffused	25	90	1.9	20

Quantity: 4,000 per 7 inch reel

#### Top Mount World's Lowest Profile (C177)







2.0 x 1.25 x 0.4 mm

HSMS-C177	 HER	626	140°	Diffused	2.5	10	2.1	20
HSMD-C177	 GaP Orange	604	140°	Diffused	2.5	8	2.2	20
HSMY-C177	 GaP Yellow	586	140°	Diffused	2.5	8	2.1	20
HSMG-C177	 GaP Green	572	140°	Diffused	4	15	2.2	20
HSMA-C177	 AS AllnGaP Amber	592	140°	Diffused	25	90	1.9	20
HSMC-C177	 AS AllnGaP Red	626	140°	Diffused	25	90	1.9	20
HSML-C177	 AS AllnGaP Orange	605	140°	Diffused	25	90	1.9	20

Quantity: 4,000 per 7 inch reel

#### World's Smallest Bicolor (C16x)

1.6 x 0.8 x 0.5 mm












HSMF-C165	 GaP Green	572	120°	Diffused	4.0	15	2.2	20
	 GaP Red	626	120°	Diffused	2.5	10	2.1	20
HSMF-C166	 GaP Green	572	120°	Diffused	4.0	15	2.2	20
	 GaP Yellow	586	120°	Diffused	2.5	8	2.1	20
HSMF-C167	 GaP Green	572	120°	Diffused	4.0	15	2.2	20
	 GaP Orange	604	120°	Diffused	2.5	8	2.2	20

Quantity: 4,000 per 7 inch reel

## Agilent Surface Mount LED ChipLED Products





Part Number	Color	Dominant Wavelength (nm)	Viewing Angle	Lens	Intensity		Vf Typ (V)	Test Current (mA)
					Min (mcd)	Typ (mcd)		

### High Performance Directional Package (C220)

HSMA-C220	 AS AllnGaP Amber	592	85	Non-diffused	63	180	1.9	20
HSMC-C220	 AS AllnGaP Red	626	85	Non-diffused	63	180	1.9	20
HSML-C220	 AS AllnGaP Orange	605	85	Non-diffused	63	180	1.9	20
HSMU-C220	 TS AllnGaP Amber	592	85	Non-diffused	100	300	2.2	20
HSMM-C220	 InGaN Green	525	65	Non-diffused	63	230	3.5	20
HSMN-C220	 InGaN Blue	470	65	Non-diffused	25	70	3.5	20
HSMO-C220	 GaP Orange	604	75	Non-diffused	6.3	25	2.2	20
HSMG-C220	 GaP Green	572	75	Non-diffused	10	30	2.2	20
HSMS-C220	 HER	626	75	Non-diffused	6.3	20	2.1	20
HSMY-C220	 GaP Yellow	586	75	Non-diffused	6.3	20	2.1	20
HSMH-C220	 AS AlGaAs Red	639	75	Non-diffused	25	80	1.8	20

Part Number	Color	Dominant Wavelength (nm)	Intensity (mcd) @ 20 mA		Viewing Angle Typ. (degree)	Dimension L x W x H (mm)
			Typ.	Min.		

### High Performance Oval Lens Surface Mount LED

HSMA-C540-F0001	 Amber	590	160	96	100°/40°	2.0 x 1.25 x 1.20
HSMC-C540-F0001	 Red	626	210	96	100°/40°	2.0 x 1.25 x 1.20
HSMM-C540-D0001	 Green	525	230	57	100°/40°	2.0 x 1.25 x 1.20
HSMN-C540-A0001	 Blue	470	55	26	100°/40°	2.0 x 1.25 x 1.20

NOTE: Targeted for Indoor Full/Mono Color Sign

## Agilent Surface Mount LED ChipLED Products

### Surface Mount Chip LEDs Standard Intensity Categories

Bin ID	Customer Iv in mcd	
	min	max
A	0.1	0.2
B	0.16	0.32
C	0.25	0.5
D	0.4	0.8
E	0.63	1.25
F	1	2
G	1.6	3.2
H	2.5	5
J	4	8
K	6.3	12.5
L	10	20
M	16	32
N	25	50
P	40	80
Q	63	125
R	100	200
S	160	320
T	250	500
U	400	800
V	630	1250
W	1000	2000
X	1600	3200
Y	2500	5000

Package	Color Bin	Wavelength (nm)	
		min	max
GaN/InGaN Blue	A	459	465
	B	463	469
	C	467	473
	D	471	477
	E	475	481
InGaN Green	A	514	521
	B	519	526
	C	524	531
	D	529	536
Green	A	561	565
	B	565	568
	C	567	571
	D	570	574
	E	573	577
Yellow	A	581.5	585
	B	584	587.5
	C	586.5	590
	D	589	592.5
	H	591.5	595
	J	594	597.5
Orange	A	596	601
	B	599	604
	C	602	607
	D	605	610
	E	608	613
	F	611	616
Red	Full Distribution		
AlGaAs Red	Full Distribution		

# Agilent Surface Mount LED ChipLED Products

## High Performance Oval Lens Surface Mount LED

### Standard Intensity Categories

BIN ID	Production/Customer IV in mcd	
	Min	Max
A	30.0	40.0
B	40.0	50.0
C	50.0	65.0
D	65.0	85.0
E	85.0	110.0
F	110.0	140.0
G	140.0	180.0
H	180.0	240.0
J	240.0	310.0
K	310.0	400.0
L	400.0	520.0
M	520.0	680.0
N	680.0	880.0
P	880.0	1,150.0

QA limit will be  $\pm 15\%$  of these limits

### Color Binning

Category Color	Code	Production Limit min-max (nm)
Blue Range	0	Full Dist.
	1	460.0-464.0
	2	464.0-468.0
	3	468.0-472.0
	4	472.0-476.0
	5	476.0-480.0

QA limit will be  $\pm 2\text{nm}$  of these limits

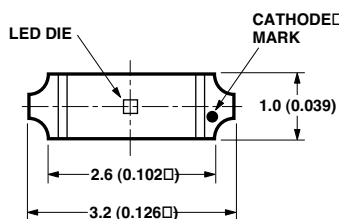
InGaN Green Range	Code	Production Limit min-max (nm)
InGaN Green Range	0	Full Dist.
	3	520.0-525.0
	4	525.0-530.0
	5	530.0-535.0
	6	535.0-540.0

QA limit will be  $\pm 2\text{nm}$  of these limits

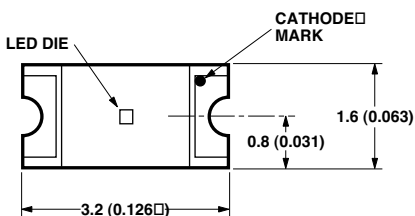
Yellow-Amber Range	Code	Production Limit min-max (nm)
Yellow-Amber Range	0	Full Dist.
	1	584.5-587.0
	2	587.0-589.5
	4	589.5-592.0
	6	592.0-594.5

QA limit will be  $\pm 0.5\text{nm}$  of these limits

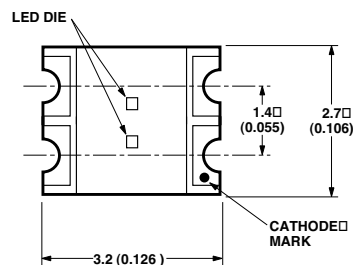
## Surface Mount Chip LEDs Package Dimensions



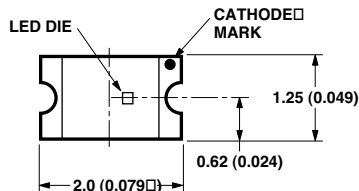
HSMx-C110



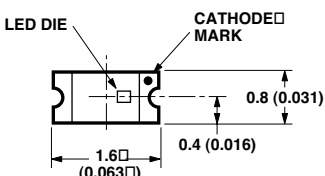
HSMx-C150



HSMF-C155, -C156, -C157



HSMx-C170

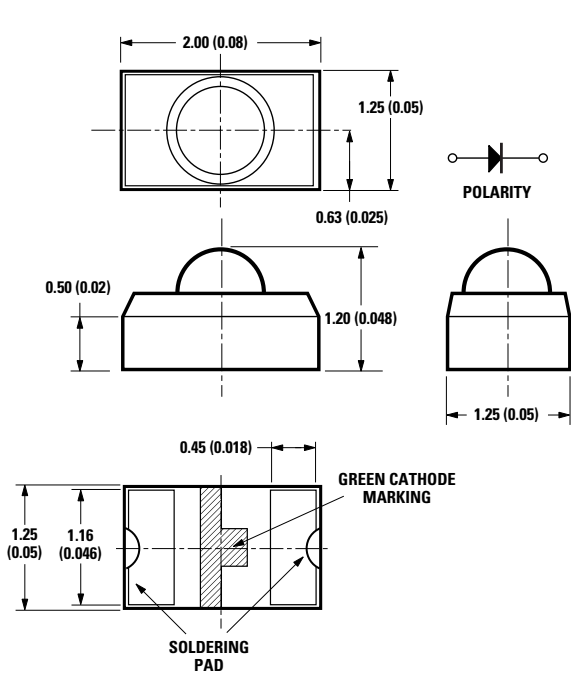


HSMx-C190

Dimensions are in millimeters (Inches).

Tolerance is  $\pm 0.1\text{ mm}$  ( $\pm 0.004\text{ in.}$ ) unless otherwise specified.

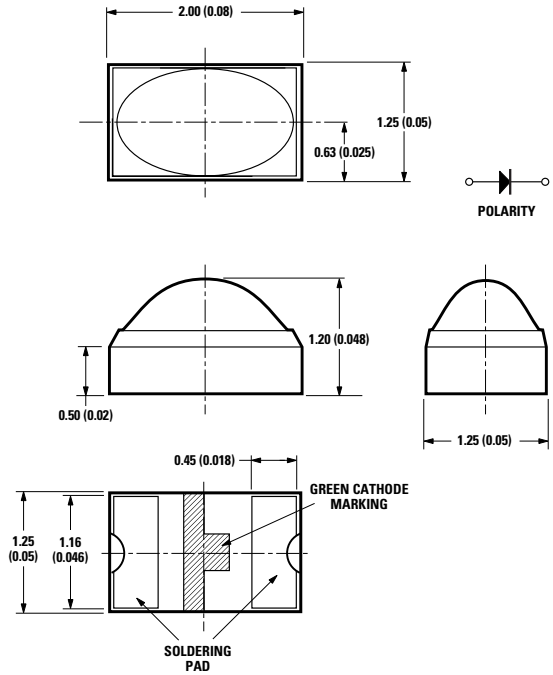
**Surface Mount Chip LEDs  
Package Dimensions**



- Notes:**  
1. Dimensions in millimeters (inches).  
2. Tolerance is  $\pm 0.1$  mm (0.004) unless otherwise specified.

**HSMx-C220**

**High Performance Oval Lens Surface Mount LED  
Package Dimensions**



- Notes:**  
1. Dimensions in millimeters (inches).  
2. Tolerance is  $\pm 0.1$  mm (0.004) unless otherwise specified.

**HSMx-C540**

For product information and a complete list of Agilent contacts and distributors, please go to our web site.

[www.agilent.com/semiconductors](http://www.agilent.com/semiconductors)

E-mail: SemiconductorSupport@agilent.com

Data subject to change.

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