

# Laser Diodes

## Solid State Lighting

Distributor

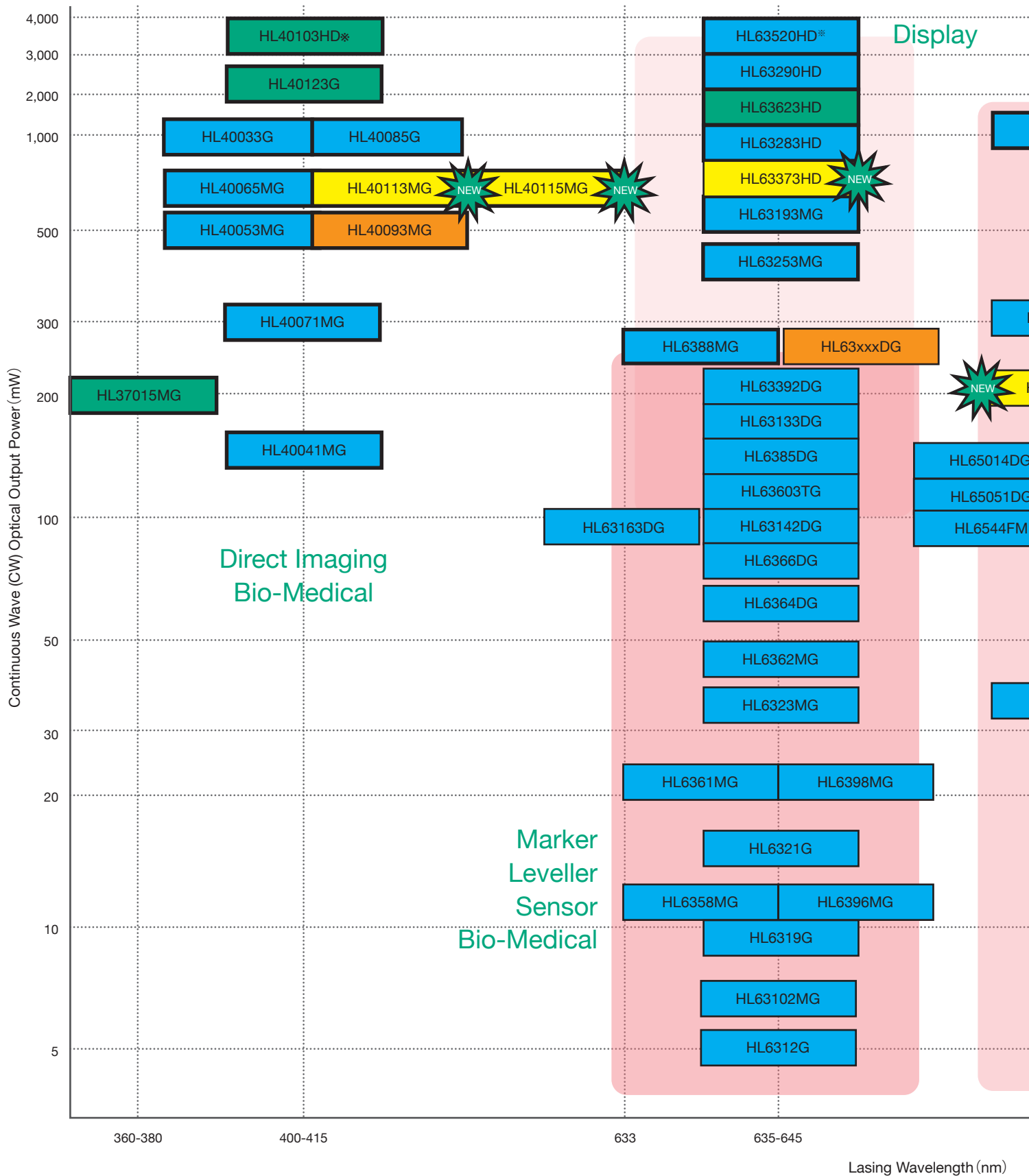


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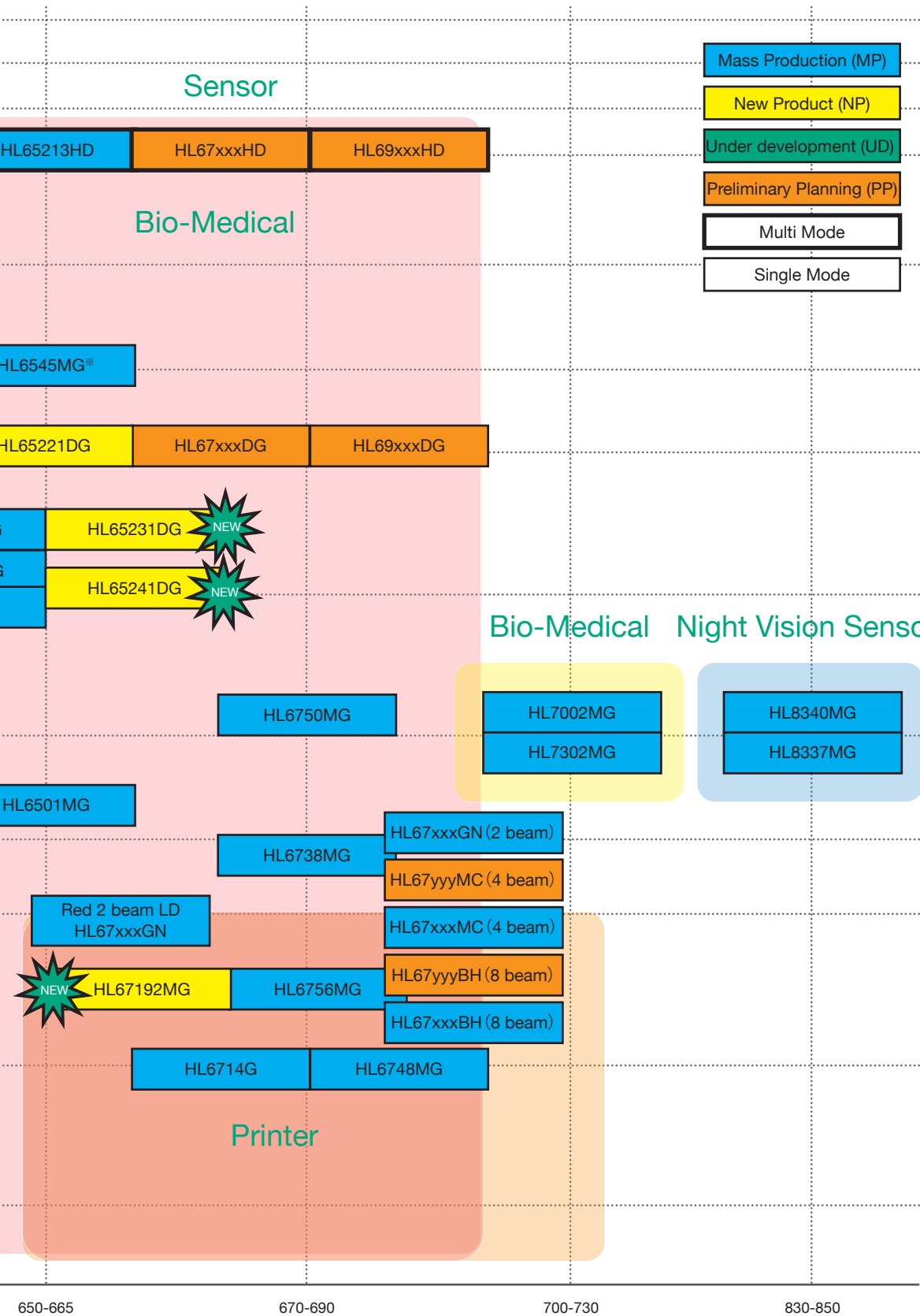
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Po: maximum rating  
 \* pulse optical power



Part Number	Internal Circuit *5	Maximum Rating		Po (mW)	Ith (mA)	Iop (mA)	Vop (V)	Is (mA)	λp (nm)	θ // (°)	θ ⊥ (°)
		Po (mW)	Topt (°C)								
HL37013MG (UD) *1	FN	250	20 to 30	200	160	370	5	-	375	14*3	50*3
HL40041MG*1	CC	150	-10 to 50	150	60	150	4.5	0.2	404	13*3	45*3
HL40053MG*1	FN	500	0 to 30	400	110	370	4.5	-	404	13*3	42*3
HL40093MG*1	FN	500	0 to 30	400	110	370	4.9	-	404	13*3	42*3
HL40071MG	CC	360	0 to 70	300	50	280	6	0.09	405	6	15
HL40063MG*1	FN	700	0 to 30	600	140	600	4.2	-	405	13*3	42*3
HL40065MG*1	BC	700	0 to 30	600	140	600	4.2	2	405	13*3	42*3
HL40113MG*1	FN	700	0 to 30	600	110	500	4.2	-	405	13*3	45*3
HL40115MG*1	BC	700	0 to 30	600	110	550	4.2	2	405	13*3	45*3
HL40033G*1	FN	1,000	0 to 30	1,000	320	1,000	4.3	-	405	13*3	42*3
HL40085G*1	BC	1,000	0 to 30	1,000	320	1,000	4.3	1.3	405	13*3	42*3
HL40103HD (UD) *1	FN	3,500*2	0 to 30	3,500*2	260	2,500*2	4.7	-	405	13*3	45*3
HL63163DG	FN	100	-10 to 40	100	70	170	2.6	-	633	8.5	18
HL63101MG	CC	7	-10 to 60	5	15	20	2.2	0.2	637	8	34
HL63102MG	AC	7	-10 to 60	5	15	20	2.2	0.2	637	8	34
HL63142DG	AC	120	-10 to 50	100	50	140	2.7	0.3	637	8	18
HL63253MG*1	FN	450	-10 to 40	450	200	600	2.2	-	637	8.5	33
HL63283HD*1	FN	1,200 (1,500*2)	-10 to 45	1,200	340	1,300	2.3	-	637	10	33
HL6388MG*1	LN	250	-10 to 50	250	100	340	2.3	-	637	11	40
HL6354MG	AC	7	-10 to 50	5	20	27	2.2	0.4	638	8	25
HL6355MG	CC	7	-10 to 50	5	20	27	2.2	0.4	638	8	25
HL6312G	AC	5	-10 to 50	5	45	55	2.3	0.4	638	8	31
HL6319G	CC	10	-10 to 50	10	50	70	2.3	0.17	638	8	31
HL6320G	AC	10	-10 to 50	10	50	70	2.3	0.17	638	8	31
HL6321G	CC	15	-10 to 50	15	55	85	2.5	0.2	638	8	30
HL6322G	AC	15	-10 to 50	15	55	85	2.5	0.2	638	8	30
HL63603TG	FN	120	-10 to 60	120	50	165	2.7	-	638	8.5	18
HL63133DG	FN	170	-10 to 40	170	60	250	2.8	-	638	9	17
HL63192DG*1	AC	700	-10 to 40	700	200	820	2.2	2	638	9	35
HL63193MG*1	FN	700	-10 to 40	700	200	820	2.2	-	638	9	35
HL63290HD*1	FN	2,200*4 (2,800*2*4*5)	-10 to 55	2,200 (2,800*2)	600	2,400 (2,800*2)	2.4	-	638	10	33
HL63520HD*1	FN	2,400*4 (3,500*2*4*5)	-10 to 55	2,400 (3,500*2)	570	2,400 (3,300*2)	2.4	-	638	10	33
HL63373HD*1	FN	1100	-10 to 45	1,000	200	1,000	2.4	-	638	10	35
HL63391DG	CC	200	-10 to 60	200	65	255	2.8	0.8	639	8.5	14
HL63392DG	AC	200	-10 to 60	200	65	255	2.8	0.8	639	8.5	14
HL63583DG	FN	210	-10 to 50	200	65	255	2.8	-	639	8.5	14
HL6358MG	AC	12	-10 to 50	10	30	40	2.3	1	639	8	21
HL6359MG	CC	12	-10 to 50	10	30	40	2.3	1	639	8	21
HL6395MG	CC	12	-10 to 60	10	45	55	2.3	0.07	639	9	21
HL6396MG	AC	12	-10 to 60	10	45	55	2.5	0.07	639	9	21
HL6360MG	AC	25	-10 to 50	20	45	65	2.5	0.2	639	9	21
HL6361MG	CC	25	-10 to 50	20	45	65	2.5	0.2	639	9	21
HL6397MG	CC	25	-10 to 60	20	45	65	2.3	0.2	639	9	21
HL6398MG	AC	25	-10 to 60	20	45	65	2.3	0.2	639	9	21
HL6323MG	AC	35	-10 to 50	30	45	95	2.3	0.15	639	8.5	30
HL6362MG	AC	45	-10 to 50	40	45	90	2.4	0.3	640	10	21
HL6363MG	CC	45	-10 to 50	40	45	90	2.4	0.3	640	10	21
HL6364DG	AC	65	-10 to 50	60	65	125	2.5	0.4	642	10	21
HL6365DG	CC	65	-10 to 50	60	65	125	2.5	0.4	642	10	21
HL6366DG	AC	90	-10 to 50	80	80	155	2.5	0.3	642	10	21
HL6367DG	CC	90	-10 to 50	80	80	155	2.5	0.3	642	10	21
HL6385DG	LN	150	-10 to 40	150	110	280	2.6	-	642	9	17

Part Number	Internal Circuit *5	Maximum Rating		Po (mW)	Ith (mA)	Iop (mA)	Vop (V)	Is (mA)	λp (nm)	θ // (°)	θ ⊥ (°)
		Po (mW)	ToPr (°C)								
HL65014DG	LN	150	-10 to 40	150	110	280	2.6	-	648.5	9	17
HL6501MG	CC	35 (50*2)	-10 to 60	30 (50*2)	45	85	2.6	0.3	658	8.5	22
HL65213HD*1	FN	1,200	-10 to 45	1,200	450	1,350	2.3	-	659	10	33
HL65051DG	CC	130	-10 to 60	120	60	175	2.5	0.4	660	10	15
HL65055DG	BC	130	-10 to 60	120	60	175	2.5	0.4	660	10	17
HL65241DG	CC	110 (220*2)	-10 to 90	100 (200*2)	60	145	2.45	0.35	660	7	15
HL65242DG	AC	110 (220*2)	-10 to 90	100 (200*2)	60	145	2.45	0.35	660	7	15
HL65243DG	FN	110 (220*2)	-10 to 90	100 (200*2)	60	145	2.45	0.35	660	7	15
HL6544FM	FN	130	-10 to 75	50	60	115	2.3	-	660	10	17
HL6545MG	LN	130 (300*2)	-10 to 75	120 (300*2)	60	175	2.5	-	660	10	17
HL65221DG	CC	210 (420*2)	-10 to 75	200 (400*2)	60	230	2.7	0.7	660	8	15
HL65222DG	AC	210 (420*2)	-10 to 75	200 (400*2)	60	230	2.7	0.7	660	8	15
HL65223DG	FN	210 (420*2)	-10 to 75	200 (400*2)	60	230	2.7	-	660	8	15
HL65231DG	CC	160 (320*2)	-10 to 75	150 (300*2)	60	190	2.55	0.55	660	7.5	15
HL65232DG	AC	160 (320*2)	-10 to 75	150 (300*2)	60	190	2.55	0.55	660	7.5	15
HL65233DG	FN	160 (320*2)	-10 to 75	150 (300*2)	60	190	2.55	-	660	7.5	15
HL6714G	AC	10	-10 to 50	10	30	50	2.2	0.9	670	8	22
HL67191MG	CC	16	-10 to 70	15	15	30	2.25	1.5	670	7.5	24
HL67192MG	AC	16	-10 to 70	15	15	30	2.25	1.5	670	7.5	24
HL6748MG	AC	10	-10 to 60	10	20	30	2.2	1	670	8	25
HL6756MG	AC	15	-10 to 60	15	20	35	2.3	1.5	670	8	24
HL6750MG	CC	55	-10 to 70	50	30	75	2.3	0.12	685	9	21
HL6738MG	CC	35 (50*2)	-10 to 70	30 (50*2)	45	90	2.5	0.1	690	8.5	19
HL7001MG	CC	50	-10 to 60	40	30	75	2.5	0.3	705	9	18
HL7002MG	AC	50	-10 to 60	40	30	75	2.5	0.3	705	9	18
HL7301MG	CC	50	-10 to 60	40	30	75	2.5	0.3	730	9	18
HL7302MG	AC	50	-10 to 60	40	30	75	2.5	0.3	730	9	18
HL83013MG	FN	50	-10 to 60	50	20	75	1.9	0.25	830	9	22
HL8337MG	AC	50	-10 to 60	50	20	75	1.9	0.25	830	9	22
HL8338MG	CC	50	-10 to 60	50	20	75	1.9	0.25	830	9	22
HL8340MG	AC	50	-10 to 60	50	20	75	1.9	0.25	852	9	22
HL8341MG	CC	50	-10 to 60	50	20	75	1.9	0.25	852	9	22

(UD): Under Development \*1 Multi-transverse mode (The other products without \*1 are single transverse mode) \*2 Pulse optical power and pulse operation \*3 Full angle,% \*4 Typical Po at maximum current rating \*5 Please refer to the internal circuit diagram below

Part Numbering

Example 1: HL 63 54 MG -A  
 HL6354MG-A  
 (a) (b) (c) (e) (f)

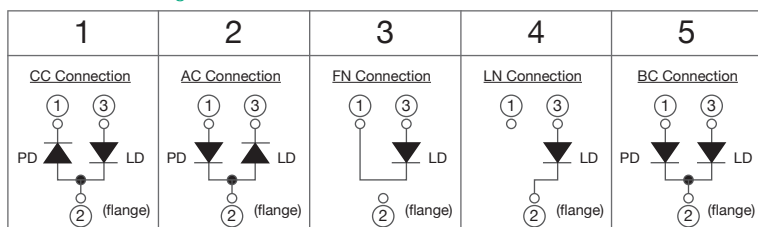
Example 2: HL 63 10 1 MG  
 HL63101MG  
 (a) (b) (c) (d) (e)

(e) MG: Package Type (CAN package)  
 G, HD: φ9.0 mm MG: φ5.6 mm (short can)  
 DG: φ5.6 mm (tall CAN) TG: φ3.8 mm AT: φ3.8 mm (tall CAN)  
 (f) -A: RoHS compliant\*

\* All currently available Ushio products are RoHS compliant  
 \* All products with new numbering, such as example 2, are RoHS compliant. (Therefore, No "-A".)

- (a) HL: Ushio Laser Diode
- (b) Wavelength: (first 2 digits of wavelength)  
 37: 375 nm      67: 670~690 nm  
 40: 404~405 nm      70: 705 nm  
 63: 633~642 nm      73: 730 nm  
 65: 648.5~660 nm      83: 830 nm (or 850 nm)
- (c) 54: Serial Number
- (d) 1: Internal Circuit (assigned either 1, 2, 3, 4, or 5)

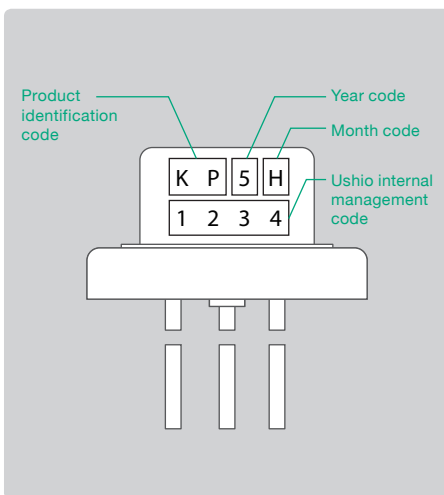
Internal circuit diagram



# Marking

## Package Type: MG, DG, G, FM, HD

The cap is laser marked with a combination of numbers and letters.



### 1st line

1st and 2nd letters:

Product identification code

If code is one character, 1st line is 3 characters.

3rd letter: Year code

The year code is the last number of the production year.  
(example: "5" denotes the year 2015)

4th letter: Month code

The month code is marked alphabetically (see Table 1)

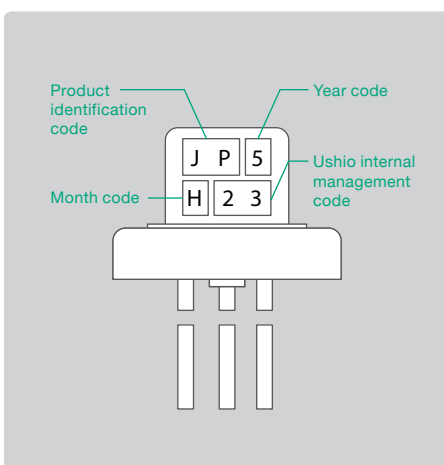
### 2nd line

5th to 8th letters:

Ushio internal management code

## Package Type: TG

The cap is laser marked with a combination of numbers and letters.



### 1st line

1st and 2nd letters:

Product identification code

3rd letter: Year code

The year code is the last number of the production year.  
(example: "5" denotes the year 2015)

### 2nd line

4th letter: Month code

The month code is marked alphabetically (see Table 1)

5th to 6th letters:

Ushio internal management code

Table 1) Month code

Month	1	2	3	4	5	6	7	8	9	10	11	12
Code	A	B	C	D	E	F	G	H	J	K	L	M

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# History of Ushio's Laser Diodes

## Ushio Laser Diode Development Timeline

- 1979 830 nm laser diode (LD) awarded "IR100"
- 1980 World's first shipment of 830 nm LD
- 1983 World's first shipment of 830 nm high power LD for reading optical disc
- 1984 World's first shipment of 780 nm LD for printers
- 1989 Started 670 nm LD shipment for pointers
- 2005 Started shipment of high efficiency Red LD with air ridge structure
- 2006 World's first shipment of 640 nm/40 mW LD and 642 nm/60 mW LD
- 2007 World's first shipment of 642 nm/80 mW LD
- 2008 World's first release of 642 nm/150 mW LD for showlaser and 705 nm/50 mW for medical applications
- 2010 World's first shipment of 638 nm/120 mW violet LD for small projectors
- 2011 Started shipment of high power (404 nm/400 mW) LD for industrial applications
- 2013 Started shipment of 633 nm/100 mW LD for bio-medical and inspection
- 2014 Started shipment of 638 nm/700 mW LD for projectors and laser TV
- 2019 Started shipment of 638 nm/3.5 W pulsed LD for projectors and laser TV
- 2019 World's first shipment of 659 nm/1.2 W red LD
- 2020 Started shipment of 660 nm/400 mW LD for bio-medical, sensing, and measurement
- 2020 Started shipment of 670 nm/30 mW for sensing and measurement
- 2020 Started shipment of 405 nm/600 mW violet LDs for bio-medical, direct imaging, and photo-lithography

## Ushio's Global Network

Ushio's solid state lighting (SSL) products are developed and produced in Japan, before being distributed through our extensive global network.

