

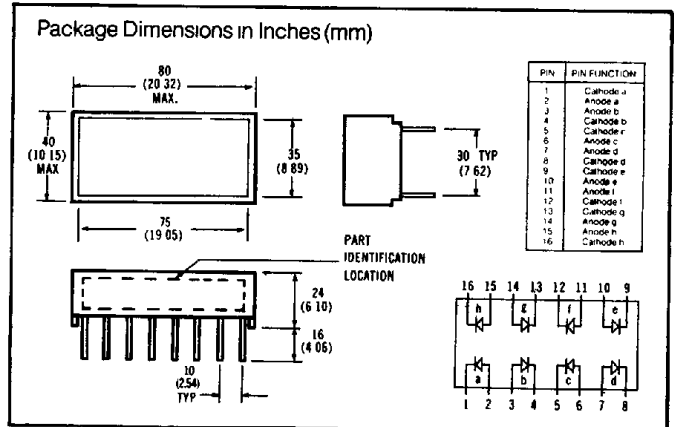
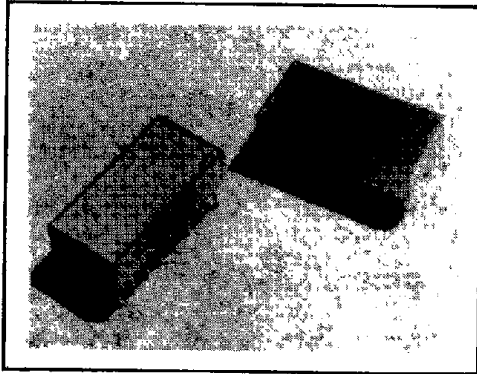
**SIEMENS**

**SUPER-RED OLB 2685**

**YELLOW YLB 2785**

**GREEN GLB 2885**

**LIGHT BARS**



**FEATURES**

- Large Rectangular Package
- Uniform Light Emitting Area
- Excellent ON/OFF Contrast
- Choice of Three Colors
- Categorized for Light Output
- Yellow and Green Categorized for Dominant Wavelength
- Panel or Legend Mountable
- Can be Mounted on P.C. Boards or DIP Sockets
- X-Y Stackable
- Suitable for Multiplexing
- IC Compatible

**APPLICATIONS**

These devices are ideally suited for:

- Message Annunciators
- Positions/Status Indicators
- Telecommunications Indicators
- Bar Graphs

**DESCRIPTION**

The OLB 2685/YLB 2785/GLB 2885 series light bars are rectangular displays designed for applications requiring a large light emitting area. They are configured in a dual in-line package and contain a single light emitting area. The OLB 2685 and YLB 2785 devices utilize eight LED chips which are made from GaAsP on a transparent GaP substrate. The GLB 2885 device utilizes eight chips made from GaP on a transparent GaP substrate.

**Maximum Ratings**

	OLB 2685 & GLB 2885	YLB 2785
Average Power Dissipation per LED chip	135mW	85mW
Peak Forward Current per LED chip Ta = 50°C (max pulse width = 2ms)	90mA	60mA
Average Forward Current per LED Pulsed conditions (Ta = 50°C)	25mA	20mA
DC Forward Current Per LED (Ta = 50°C)	30mA	25mA
Reverse Voltage per LED chip	6V	6V
Operating Temperature	-40°C to +85°C	-40°C to +85°C
Storage Temperature	-40°C to +85°C	-40°C to +85°C
Lead Soldering Temperature, 1/16 inch below seating plane	260°C for 3 sec.	260°C for 3 sec.
Junction Temperature	100°C	100°C

**Electrical/Optical Characteristics (T<sub>amb</sub> = 25°C)**

Parameters	Min.	Typ.	Max.	Units	Test Conditions
Luminous Intensity					
OLB2685	18	40		mcd	20mA DC
YLB2785	16	24		mcd	20mA DC
GLB2885	15	40		mcd	20mA DC
Peak Wavelength					
OLB2685		635		nm	
YLB2785		583		nm	
GLB2885		565		nm	
Dominant Wavelength					
OLB2685		626		nm	
YLB2785		585		nm	
GLB2885		572		nm	
Forward Voltage					
OLB2685		2.1	2.6	V	I <sub>F</sub> = 20mA
YLB2785		2.2	2.6	V	I <sub>F</sub> = 20mA
GLB2885		2.2	2.6	V	I <sub>F</sub> = 20mA
Reverse Voltage					
OLB2685	6	15		V	I <sub>R</sub> = 100µA
YLB2785	6	15		V	I <sub>R</sub> = 100µA
GLB2885	6	15		V	I <sub>R</sub> = 100µA

# Light Emitting Diodes

SIEMENS AKTIENGESELLSCHAFT 47E D

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## New LED type designation system

The range of Siemens light emitting diodes has received new type designations and ordering codes

In the following tables of types available both, the new and the previous designation, are listed.

The new type designation now indicates the most important characteristics of an LED.

<p><b>Wavelength</b> (<math>\lambda_{peak}</math> typ)</p> <p>U 635 and 565 nm super-red/green  V 635 nm super-red/super-red  W 565 nm green/green  B 480 nm SiC blue  G 560 570 nm green  Y 585 595 nm yellow  S 620 640 nm super-red  R 645 665 nm GaAsP red</p>	<p><b>Emission color</b></p>	<p><b>Type</b></p> <p>3 3 mm, circular (standard version)  5 5 mm, circular (standard version)  B 2,5 x 5mm, (symbol LED)  H 4 mm, circular (symbol LED)  S SOT-23 package (LED for surface mounting)  U 1 mm circular (array version)  Z 2 mm, circular (array version)  K 3 mm ARGUS-LED</p>																																																																									
<p><b>Product</b></p> <p>L Light emitting diode</p>																																																																											
<div style="border: 1px solid black; padding: 5px; display: inline-block;"> <span style="font-size: 24px; margin: 0 5px;">L</span> <span style="font-size: 24px; margin: 0 5px;">R</span> <span style="font-size: 24px; margin: 0 5px;">3</span> <span style="font-size: 24px; margin: 0 5px;">1</span> <span style="font-size: 24px; margin: 0 5px;">6</span> <span style="font-size: 24px; margin: 0 5px;">0</span> <span style="font-size: 24px; margin: 0 5px;">-</span> <span style="font-size: 24px; margin: 0 5px;">F</span> <span style="font-size: 24px; margin: 0 5px;">H</span> </div>																																																																											
<p><b>Length of leads</b></p> <p>1 &lt; 20 mm with stand-off  2 &lt; 20 mm without stand-off  3 &lt; 30 mm with stand off  4 &lt; 30 mm without stand-off</p>																																																																											
<p><b>Case</b></p> <p>1 colorless clear 15 30 degrees  2 colored clear 15 30 degrees  3 colorless clear 30 70 degrees  4 colored clear 30 70 degrees  5 colorless diffused 40 80 degrees  6 colored diffused 40 80 degrees  7 colorless diffused &gt; 80 degrees  8 colored diffused &gt; 80 degrees  (SOT-23 requires no angle)</p>	<p><b>Viewing angle (typ)</b></p>																																																																										
<p><b>Special versions</b></p> <p>0 8 can be individually determined for each type  9 LED with low-current chip  For array versions (digit 4-Z)  Number of lamps per array</p>																																																																											
			<p><b>Luminous intensity <math>I_v</math></b> (<math>I_f = 10</math> mA)</p> <table border="1"> <tr><td>A</td><td>0,1</td><td>0,2 mcd</td></tr> <tr><td>B</td><td>0,16</td><td>0,32 mcd</td></tr> <tr><td>C</td><td>0,25</td><td>0,50 mcd</td></tr> <tr><td>D</td><td>0,40</td><td>0,80 mcd</td></tr> <tr><td>E</td><td>0,63</td><td>1,25 mcd</td></tr> <tr><td>F</td><td>1</td><td>2 mcd</td></tr> <tr><td>G</td><td>1,6</td><td>3,2 mcd</td></tr> <tr><td>H</td><td>2,5</td><td>5 mcd</td></tr> <tr><td>J:</td><td>4</td><td>8 mcd</td></tr> <tr><td>K</td><td>6,3</td><td>12,5 mcd</td></tr> <tr><td>L</td><td>10</td><td>20 mcd</td></tr> <tr><td>M</td><td>16</td><td>32 mcd</td></tr> <tr><td>N</td><td>25</td><td>50 mcd</td></tr> <tr><td>P</td><td>40</td><td>80 mcd</td></tr> <tr><td>Q</td><td>63</td><td>125 mcd</td></tr> <tr><td>R</td><td>100</td><td>200 mcd</td></tr> <tr><td>S</td><td>160</td><td>320 mcd</td></tr> <tr><td>T</td><td>250</td><td>500 mcd</td></tr> <tr><td>U</td><td>400</td><td>800 mcd</td></tr> <tr><td>V</td><td>630</td><td>1250 mcd</td></tr> <tr><td>W</td><td>1000</td><td>2000 mcd</td></tr> <tr><td>X</td><td>1600</td><td>3200 mcd</td></tr> <tr><td>Y</td><td>2500</td><td>5000 mcd</td></tr> <tr><td>Z</td><td>&gt; 5000</td><td>mcd</td></tr> </table> <p>O open top  (For blue LED <math>I_f = 20</math> mA)  (For ARGUS LED <math>I_f = 15</math> mA,  luminous flux <math>\Phi_v</math> in mlm)  <u>One</u> letter = Single group.  <u>Two</u> letters = Family group</p>	A	0,1	0,2 mcd	B	0,16	0,32 mcd	C	0,25	0,50 mcd	D	0,40	0,80 mcd	E	0,63	1,25 mcd	F	1	2 mcd	G	1,6	3,2 mcd	H	2,5	5 mcd	J:	4	8 mcd	K	6,3	12,5 mcd	L	10	20 mcd	M	16	32 mcd	N	25	50 mcd	P	40	80 mcd	Q	63	125 mcd	R	100	200 mcd	S	160	320 mcd	T	250	500 mcd	U	400	800 mcd	V	630	1250 mcd	W	1000	2000 mcd	X	1600	3200 mcd	Y	2500	5000 mcd	Z	> 5000	mcd
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This example illustrates the new type designation

**LR 3160 - FH**:

- L Light emitting diode
- R Emission color red,  $\lambda_{peak} = 660$  nm (typ)
- 3 Standard version 3 mm
- 1 Length of leads < 20 mm with stand-off
- 6 Colored case, diffused; viewing angle 70 degrees (typ)
- 0 No special version
- FH Luminous intensity of this family group: min 1 mcd, max 5 mcd

**Light Emitting Diodes**

T-91-01

**Grouping of luminous intensities ( $I_v$ )**

The different luminous intensities throughout one type family are grouped according to the following plan ( $I_F = 10 \text{ mA}$ )<sup>1)</sup>.

Group	A		B		C		D		E		F		G		H		J		K		L		M		N	
$I_v$ mcd	0,1	0,2	0,16	0,32	0,25	0,50	0,40	0,80	0,63	1,25	1	2	1,6	3,2	2,5	5	4	8	6,3	12,5	10	20	16	32	25	50

Group	P		Q		R		S		T		U		V		W		X		Y		Z		O
$I_v$ mcd	40	80	63	125	100	200	160	320	250	500	400	800	630	1250	1000	2000	1600	3200	2500	5000	> 5000	top open	

<sup>1)</sup> For blue LED  $I_F = 20 \text{ mA}$   
 ARGUS LED Luminous flux  $\Phi$  in mlm at  $I_F = 15 \text{ mA}$  (at low current  $I_F = 2 \text{ mA}$ )

Marking	Single-color LEDs		Two-color LEDs <sup>2)</sup>	
	Family groups	Single groups	Lower family groups	Medium/upper family groups
Marking of the single groups on each package	yes	yes	no	yes

Stray field of brightness	Single-color LEDs		Two-color LEDs <sup>2)</sup>	
	Family groups	Single groups	Lower family groups	Medium/upper family groups
$I_{v \text{ min}}$ $I_{v \text{ max}}$ within one packaging unit	max 1 2	max 1 2	Total brightness range	max 1 2
$I_{v \text{ min}}$ $I_{v \text{ max}}$ within one diode	-	-	max 1 4	max 1 2

<sup>2)</sup> In case of two-color LEDs, the brightness of the darker chip in one package determines the brightness group of the LED

**Soldering conditions for LEDs**

When soldering the component into position, make sure that it is not thermally overloaded. The maximum junction temperature may only be exceeded briefly (for no more than 1 min). Maximum permissible soldering temperatures and soldering times are

Types	Dip, wave and drag soldering			Iron soldering (with 1.5 mm iron tip)			Reflow soldering	
	Temperature of the soldering bath	Max perm soldering time	Distance between solder joint and case	Temperature of soldering iron	Max perm soldering time	Distance between solder joint and case	Temperature of soldering zone	Max transit time
3 mm dia	235 °C 260 °C	8 s 5 s	≥ 2 mm	300 °C	3 s	≥ 2 mm	-	-
5 mm dia Symbol LED Two-color LED	235 °C 260 °C	8 s 5 s	≥ 1.5 mm	300 °C	3 s	> 1.5 mm	-	-
LED arrays	235 °C 260 °C	5 s 3 s	≥ 2 mm	300 °C	3 s	≥ 2 mm	-	-
SOT-23 LED	260 °C	8 s	-	-	-	-	260 °C 215 °C Preheating 150 °C	10 s 30 s Approx 1 min

**Cleaning solvents for soldered-in LEDs**

Organic solvents consisting of alcohols or hydrocarbon-fluorides or a mixture of both groups are suitable for cleaning soldered-in LEDs. In no way should solvents

or solvent mixtures be used which contain chlorinated hydrocarbons or ketones. This type of solvents may attack or corrode the display housing or casting

LED Lamps

## Packaging of LEDs on continuous tapes

Light emitting diodes are available now in taped form. Packaging of **unidirectional** LEDs on continuous tapes is based on the **IEC publication 40 (secretariat) 451**.

The component tapes are wound on reels and supplied in boxes containing two reels each. One reel comprises 1000 items of the 5 mm types or 2000 items of the 3 mm types.

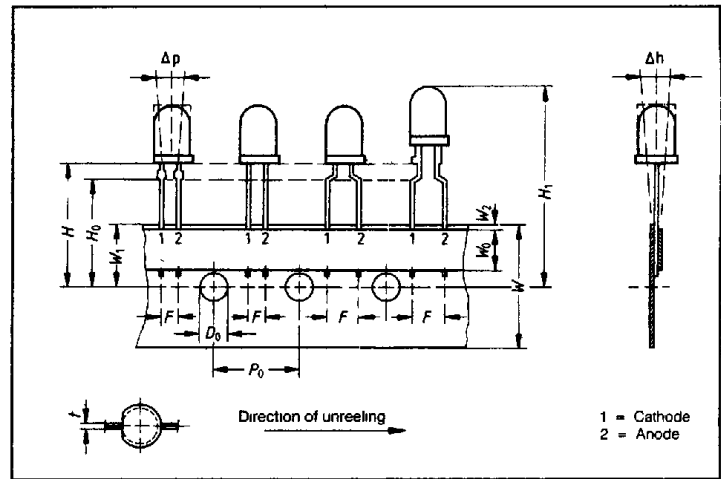
The **ordering codes** for taped components with unidirectional leads packaged on reels are as follows:

For components with 2.54 mm lead spacing (version A, B, and D), "E7500" is added to the last position of the type number.

Example: LDR1101 E7500

For components with 5.08 mm spacing (version C and E) "E7501" is added to the last position of the type number.

Example: LDG5171 E7501



### Dimensional table for radial tape

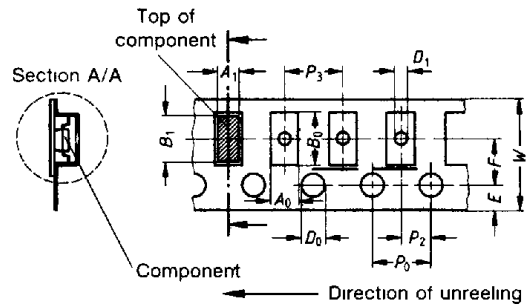
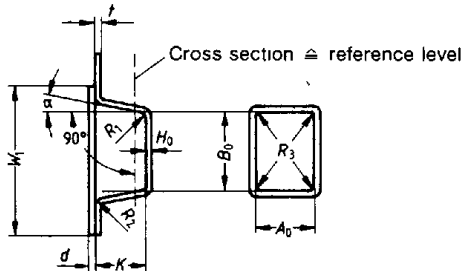
Description	Symbol	Dimensions in inches (mm)
Overall Tape Width	W	$709 \begin{matrix} + .039 \\ - .020 \end{matrix} \left( 18 \begin{matrix} + 1 \\ - 0.5 \end{matrix} \right)$
Hold Down Tape Width	$W_0$	$236 \pm .012 (6 \pm 0.3)$
Feed Hole Location	$W_1$	$.354 \begin{matrix} + .030 \\ - .020 \end{matrix} \left( 9 \begin{matrix} + 0.75 \\ - 0.5 \end{matrix} \right)$
Hold Down Tape Position	$W_2$	$\leq .118 (\leq 3)$
Overall Taped Package Thickness	t	035 max. (0.9)
Tape Feed Hole Diameter	$D_0$	$157 \pm .008 (4 \pm 0.2)$
Feed Hole to Bottom of Component	H	$709 + .079 (18 + 2)$
Height of Seating Plane	$H_0$	$.630 \pm .020 (16 \pm 0.5)$
Feed Hole to Overall Component Height	$H_1$	1 268 max. (32.2)
Feed Hole Pitch	$P_0$	$500 \pm .012 (12.7 \pm 0.3)$
Feed Hole-Component Center Distance	$P_2$	$250 \pm .028 (6.35 \pm 0.7)$
Component Lead Pitch	F	$100 \left. \begin{matrix} + .024 \\ - .004 \end{matrix} \right\} \left( 2.54 \begin{matrix} + 0.6 \\ - 0.1 \end{matrix} \right)$ $200 \left. \begin{matrix} + .024 \\ - .004 \end{matrix} \right\} \left( 5.08 \begin{matrix} + 0.6 \\ - 0.1 \end{matrix} \right)$
Deflection Left or Right	$\Delta p$	$\pm .040 (\pm 1)$
Deflection Front or Rear	$\Delta h$	$\pm .079 (\pm 2)$

T-91-20

# Packaging of surface mount LEDs

LEDs in **SOT 23 packages** are available on continuous tapes. In this case, the **IEC publication 40 (secretariat) 458** applies.

The 8 mm broad tape is wound on an 18 cm or 33 cm film reel and is equipped with 3000 or 10,000 components.



Blister Tape

LED Lamps

Dimensional table for blister tape

Designation	Symbol	Dimensions in inches (mm) SOT 23	Notes
Tape width	W	315 ± .012 (8 ± 0.3)	
Carrier tape thickness	t	.012 max. (0.3)	
Pitch of sprocket holes	P <sub>0</sub>	157 ± .004 (4 ± 0.1)	Cumulative pitch error + 0.2 mm/10 pitches
Diameter of sprocket holes	D <sub>0</sub>	.039 + .008 (1 + 0.2)	
Distance of sprocket holes	E	069 ± .004 (1.75 ± 0.1)	
Distance of components	F	138 ± .002 (35 ± 0.05)	Center hole to center compartment
	P <sub>2</sub>	.079 ± .002 (2 ± 0.05)	
Distance compartment to compartment	P <sub>3</sub>	157 (4)	
Compartment dimensions	K	098 max. (2.5)	Exact dimensions are given with the component dimensions
	a	15° max	
	R <sub>1</sub> , R <sub>2</sub>	012 max. (0.3)	
	H <sub>0</sub>	012 $\begin{matrix} + .004 \\ - .002 \end{matrix}$ $\begin{pmatrix} 0.3 & + 0.1 \\ & - 0.05 \end{pmatrix}$	Between inner side of the compartment bottom and the reference level for measuring A <sub>0</sub> , B <sub>0</sub>
Compartment	A <sub>0</sub> B <sub>0</sub>	The tolerances are chosen such that the components can change their orientation only within permissible tolerances, but can easily be removed from the tape	
Hole in compartment	D <sub>1</sub>	039 $\begin{matrix} + .008 \\ - .002 \end{matrix}$ $\begin{pmatrix} 1 & + 0.2 \\ & - 0.05 \end{pmatrix}$	Tolerance to the center of the sprocket hole. 0.1 mm
Width of fixing tape	W <sub>1</sub> d	217 typ. (5.5) 004 max (0.1)	The fixing tape shall not cover the sprocket holes, nor protrude beyond the carrier tape so that the max. tape width will not be exceeded.
Device tilt in the compartment	-	15° max	
Minimum bending radius	-	1.181 min. (30)	



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