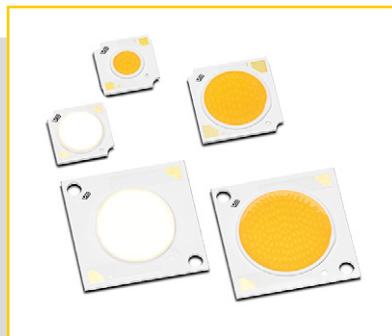


LED MODULES

COMFORT COB
500 LM TO 11,000 LM



COMFORT COB – RESIDENTIAL, RETAIL AND INDUSTRIAL LIGHTING

Typical Applications

VCA102 / VCA123

- Integration in reflector luminaires
- Residential lighting
- Furniture lighting

VCA125 / VCA127

- Integration in reflector luminaires
- Retail lighting
- Downlights

VCA1210 / VCA1212


- Industrial lighting for:
 - Production halls
 - Warehouses

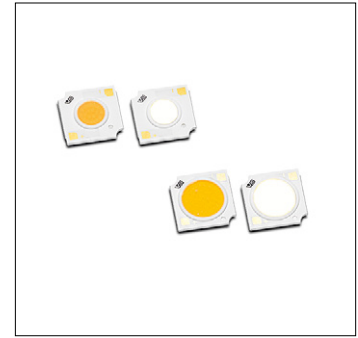
Comfort COB

- **LONG SERVICE LIFETIME: 50,000 HOURS**
- **NARROW COLOUR TOLERANCES:
3 STEP MACADAM (CRI 82/92)**
- **HIGHLY EFFICIENT: UP TO 187 LM/W**
- **SPECIAL COLOURS:
FOOD AND PEARL WHITE**
- **READY-TO-ASSEMBLE VARIANT:
MODULE + TIM + HOLDER AS ONE UNIT**

Comfort COB – up to 2500 lm

Technical Notes

- LED module for integration into luminaires 
- Dimensions: 13.5x13.5 mm
- Light emitting surface (LES): Ø 6 mm or Ø 9 mm
- Use of external LED constant current driver



Electrical Characteristics

at $t_p = 65\text{ °C}$

Type	Typ. voltage DC			Typ. power consumption		
	250 mA V	350 mA V	500 mA V	250 mA W	350 mA W	500 mA W
VCA102-xxx	29.7	30.9	—	7.4	10.8	—
VCA123-xxx	34.3	35.3	36.9	8.6	12.4	18.5

Voltage and power tolerance: $\pm 10\%$

Maximum Ratings

Exceeding the maximum ratings can lead to reduction of service life or destruction of the modules.

Type	Operating current mA	Operation temperature range at t_c point			Ambient temperature range		Storage temperature range		Max. allowed repetitive peak current mA
		°C min.	°C max.	at LES surface °C max.	°C min.	°C max.	°C min.	°C max.	
VCA102-xxx	250	-40	+110	+180	-40	+40	-40	+105	400
	350		+105						
VCA123-xxx	250	-40	+115	+180	-40	+40	-40	+105	600
	350		+110						
	500		+100						

Operating Life

at $t_p = 65\text{ °C}$

Lumen maintenance	250 mA	350 mA	250 mA	350 mA	500 mA
	in hours	in hours	in hours	in hours	in hours
	VCA102-xxx (at I_f)		VCA123-xxx (at I_f)		
L90/B10	44,000	41,000	47,000	44,000	39,000
L80/B10	51,000	48,000	55,000	50,000	45,000
L70/B10	57,000	53,000	64,000	59,000	52,000

Preliminary lifetime data

The values contained in this data sheet can change due to technical innovations. Any such changes will be made without separate notification.

Comfort COB – up to 2500 lm

Optical Characteristics

at $t_p = 65\text{ °C}$

Type	Ref. No.	Colour	Correlated colour temperature* K	Typ. luminous flux** and efficiency at						Typ. beam angle °	Typ. CRI R _a	Photometric code
				250 mA		350 mA		500 mA				
				lm	lm/W	lm	lm/W	lm	lm/W			
VCA102 – CRI 80												
VCA102-827	568690	warm white	2700	965	130	1271	118	–	–	120	82	827/349
VCA102-830	568691	warm white	3000	1015	137	1338	124	–	–	120	82	830/349
VCA102-830B	568692	warm white	3000 (below BBL)	995	134	1311	121	–	–	120	82	830/349
VCA102-831PW	568693	pearl white	3100	1015	137	1338	124	–	–	120	82	831/349
VCA102-835	568694	neutral white	3500	1025	138	1351	125	–	–	120	82	835/349
VCA102-840	568695	neutral white	4000	1045	141	1378	127	–	–	120	82	840/349
VCA102-857	568696	cool white	5700	1056	142	1391	129	–	–	120	82	857/349
VCA102 – CRI 90												
VCA102-927	568697	warm white	2700	791	107	1042	96	–	–	120	92	927/349
VCA102-930	568698	warm white	3000 (below BBL)	842	113	1110	103	–	–	120	92	930/349
VCA102-931PW	568699	pearl white	3100	826	111	1088	101	–	–	120	92	931/349
VCA102-935	568700	neutral white	3500 (below BBL)	851	115	1121	104	–	–	120	92	935/349
VCA102-940	568701	neutral white	4000 (below BBL)	868	117	1143	106	–	–	120	92	940/349
VCA123 – CRI 80												
VCA123-827	568702	warm white	2700	1283	150	1720	139	2326	126	120	82	827/349
VCA123-830	568703	warm white	3000	1350	157	1810	146	2448	133	120	82	830/349
VCA123-840	568704	neutral white	4000	1390	162	1864	151	2521	137	120	82	840/349
VCA123-857	568705	cool white	5700	1404	164	1882	152	2546	138	120	82	857/349
VCA123 – CRI 90												
VCA123-927	568706	warm white	2700	1052	123	1410	114	1907	103	120	92	927/349
VCA123-930	568707	warm white	3000 (below BBL)	1120	131	1502	122	2032	110	120	92	930/349
VCA123-940	568708	neutral white	4000 (below BBL)	1154	135	1547	125	2092	113	120	92	940/349


* Colour tolerance: 3 MacAdam | ** Production tolerance of luminous flux and efficiency: $\pm 10\%$ | Min. CRI Ra: > 80 at VCAxxx-8xx, > 90 at VCAxxx-9xx

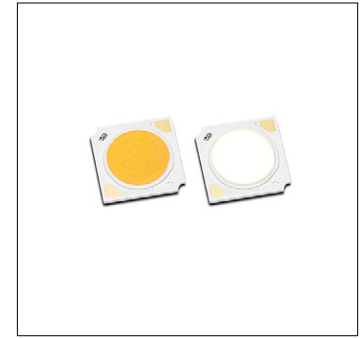
Minimum order quantity (packaging unit): 490 pcs.

The values contained in this data sheet can change due to technical innovations. Any such changes will be made without separate notification.

Comfort COB – up to 5500 lm

Technical Notes

- LED module for integration into luminaires 
- Dimensions: 19x19 mm
- Light emitting surface (LES): Ø 14 mm
- Use of external LED constant current driver



Electrical Characteristics

at $t_p = 65\text{ °C}$

Type	Typ. voltage DC				Typ. power consumption			
	350 mA V	500 mA V	700 mA V	1050 mA V	350 mA W	500 mA W	700 mA W	1050 mA W
VCA125-xxx	33.9	34.9	36.2	—	11.9	17.5	25.3	—
VCA127-xxx	33.1	33.9	34.8	36.4	11.6	17.0	24.4	38.2

Voltage and power tolerance: $\pm 10\%$

Maximum Ratings

Exceeding the maximum ratings can lead to reduction of service life or destruction of the modules.

Type	Operating current mA	Operation temperature range at t_c point			Ambient temperature range		Storage temperature range		Max. allowed repetitive peak current mA
		$^{\circ}\text{C min.}$	$^{\circ}\text{C max.}$	at LES surface $^{\circ}\text{C max.}$	$^{\circ}\text{C min.}$	$^{\circ}\text{C max.}$	$^{\circ}\text{C min.}$	$^{\circ}\text{C max.}$	
VCA125-xxx	350	-40	+120	+180	-40	+40	-40	+105	1000
	500		+115						
	700		+105						
VCA127-xxx	< 500	-40	+115	+180	-40	+40	-40	+105	1400
	700		+110						
	1050		+95						

Operating Life

at $t_p = 65\text{ °C}$

Lumen maintenance	350 mA in hours	500 mA in hours	700 mA in hours	350 mA in hours	500 mA in hours	700 mA in hours	1050 mA in hours
	VCA125-xxx (at I_f)			VCA127-xxx (at I_f)			
L90/B10	51,000	45,000	39,000	59,000	53,000	46,000	38,000
L80/B10	56,000	50,000	44,000	63,000	56,000	49,000	40,000
L70/B10	70,000	62,000	54,000	73,000	66,000	60,000	55,000

Preliminary lifetime data

The values contained in this data sheet can change due to technical innovations. Any such changes will be made without separate notification.

Comfort COB – up to 5500 lm

Optical Characteristics

at $t_p = 65\text{ °C}$

Type	Ref. No.	Colour	Correlated colour temperature* K	Typ. luminous flux** and efficiency at								Typ. beam angle (°)	Typ. CRI Ra	Photo-metric code
				350 mA		500 mA		700 mA		1050 mA				
				lm	lm/W	lm	lm/W	lm	lm/W	lm	lm/W			
VCA125 – CRI 80														
VCA125-827	568709	warm white	2700	1887	159	2590	148	3443	136	–	–	120	82	827/349
VCA125-830	568710	warm white	3000	1986	167	2726	156	3624	143	–	–	120	82	830/349
VCA125-830B	568711	warm white	3000 (below BBL)	1946	164	2671	153	3551	140	–	–	120	82	830/349
VCA125-831PW	568712	pearl white	3100	1986	167	2726	156	3624	143	–	–	120	82	831/349
VCA125-835	568713	neutral white	3500	2006	169	2753	158	3660	144	–	–	120	82	835/349
VCA125-840	568714	neutral white	4000	2045	172	2807	161	3731	147	–	–	120	82	840/349
VCA125-850	568715	cool white	5000	2085	176	2862	164	3804	150	–	–	120	82	850/349
VCA125-857	568716	cool white	5700	2065	174	2834	162	3768	149	–	–	120	82	857/349
VCA125 – CRI 90														
VCA125-927	568717	warm white	2700	1547	130	2124	122	2823	111	–	–	120	92	927/349
VCA125-930	568718	warm white	3000 (below BBL)	1648	139	2262	130	3007	119	–	–	120	92	930/349
VCA125-931PW	568719	pearl white	3100	1616	136	2217	127	2947	116	–	–	120	92	931/349
VCA125-935	568720	neutral white	3500 (below BBL)	1665	140	2285	131	3037	120	–	–	120	92	935/349
VCA125-940	568721	neutral white	4000 (below BBL)	1697	143	2330	134	3097	122	–	–	120	92	940/349
VCA127 – CRI 80														
VCA127-827	568722	warm white	2700	1923	166	2671	158	3605	148	5025	131	120	82	827/349
VCA127-830	568723	warm white	3000	2024	175	2812	166	3794	156	5288	138	120	82	830/349
VCA127-830B	568724	warm white	3000 (below BBL)	1983	171	2755	163	3718	153	5182	136	120	82	830/349
VCA127-831PW	568725	pearl white	3100	2024	175	2812	166	3794	156	5288	138	120	82	831/349
VCA127-835	568726	neutral white	3500	2044	176	2840	168	3832	157	5341	140	120	82	835/349
VCA127-840	568727	neutral white	4000	2084	180	2895	171	3907	160	5445	142	120	82	840/349
VCA127-850	568728	cool white	5000	2125	183	2952	174	3983	164	5552	145	120	82	850/349
VCA127-857	568729	cool white	5700	2104	182	2923	172	3945	162	5499	144	120	82	857/349
VCA127 – CRI 90														
VCA127-927	568730	warm white	2700	1576	136	2190	129	2956	121	4120	108	120	92	927/349
VCA127-930	568731	warm white	3000 (below BBL)	1679	145	2333	138	3149	129	4389	115	120	92	930/349
VCA127-931PW	568732	pearl white	3100	1646	142	2287	135	3086	127	4301	113	120	92	931/349
VCA127-935	568733	neutral white	3500 (below BBL)	1696	146	2356	139	3180	131	4432	116	120	92	935/349
VCA127-940	568734	neutral white	4000 (below BBL)	1729	149	2403	142	3242	133	4519	118	120	92	940/349
VCA127 – FOOD														
VCA127-MP	568735	meat pink	2000 "pink effect"	1194	103	1659	98	2239	92	3121	82	120	82	820/349


* Colour tolerance: 3 MacAdam | ** Production tolerance of luminous flux and efficiency: $\pm 10\%$ | Min. CRI Ra: > 80 at VCAxxx-8xx, > 90 at VCAxxx-9xx

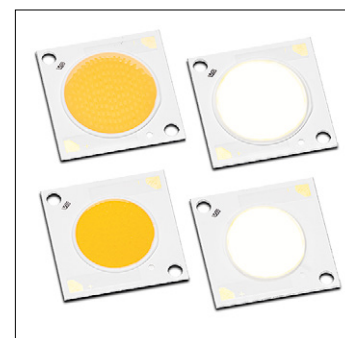
Minimum order quantity (packaging unit): 250 pcs.

The values contained in this data sheet can change due to technical innovations. Any such changes will be made without separate notification.

Comfort COB – up to 11,000 lm

Technical Notes

- LED module for integration into luminaires 
- Dimensions: 28x28 mm
- Light emitting surface (LES): Ø 17 mm, Ø 20 mm
- Use of external LED constant current driver



Electrical Characteristics

at $t_p = 65^\circ\text{C}$

Type	Typ. voltage DC					Typ. power consumption				
	700 mA V	1050 mA V	1400 mA V	1700 mA V	2100 mA V	700 mA W	1050 mA W	1400 mA W	1700 mA W	2100 mA W
VCA1210-xxx	33.8	35.1	36.4	37.4	—	23.7	36.9	51.0	63.6	—
VCA1212-xxx	33.5	34.5	35.6	36.4	37.5	23.4	36.2	49.8	61.9	78.8

Voltage and power tolerance: $\pm 10\%$

Maximum Ratings

Exceeding the maximum ratings can lead to reduction of service life or destruction of the modules.

Type	Operating current mA	Operation temperature range at t_c point			Ambient temperature range		Storage temperature range		Max. allowed repetitive peak current mA
		$^\circ\text{C min.}$	$^\circ\text{C max.}$	at LES surface $^\circ\text{C max.}$	$^\circ\text{C min.}$	$^\circ\text{C max.}$	$^\circ\text{C min.}$	$^\circ\text{C max.}$	
VCA1210-xxx	700	-40	+120	+180	-40	+40	-40	+105	2000
	1050		+110						
	1400		+100						
	1700		+90						
VCA1212-xxx	700	-40	+115	+180	-40	+40	-40	+105	2500
	1050		+110						
	1400		+100						
	1700		+90						
	2100		+85						

Operating Life

at $t_p = 65^\circ\text{C}$

Lumen maintenance	700 mA in hours	1050 mA in hours	1400 mA in hours	1700 mA in hours	700 mA in hours	1050 mA in hours	1400 mA in hours	1700 mA in hours	2100 mA in hours
	VCA1210-xxx (at I_f)				VCA1212-xxx (at I_f)				
L90/B10	49,000	42,000	37,000	33,000	54,000	46,000	40,000	35,000	30,000
L80/B10	53,000	45,000	40,000	36,000	60,000	51,000	44,000	39,000	31,000
L70/B10	65,000	55,000	48,000	43,000	73,000	62,000	53,000	46,000	36,000

Preliminary lifetime data

The values contained in this data sheet can change due to technical innovations. Any such changes will be made without separate notification.

Comfort COB – up to 11,000 lm

Optical Characteristics

at $t_p = 65\text{ °C}$

Type	Ref. No.	Colour	Correlated colour temperature* K	Typ. luminous flux** and efficiency at										Typ. beam angle (°)	Typ. CRI Ra	Photo-metric code
				700 mA		1050 mA		1400 mA		1700 mA		2100 mA				
				lm	lm/W	lm	lm/W	lm	lm/W	lm	lm/W	lm	lm/W			
VCA1210 – CRI 80																
VCA1210-827	568736	warm white	2700	3828	162	5459	148	6939	136	8051	127	–	–	120	82	827/349
VCA1210-830	568737	warm white	3000	4028	170	5745	156	7303	143	8473	133	–	–	120	82	830/349
VCA1210-830B	568738	warm white	3000 (below BBL)	3948	167	5630	153	7156	140	8303	131	–	–	120	82	830/349
VCA1210-831PW	568739	pearl white	3100	4028	170	5745	156	7303	143	8473	133	–	–	120	82	831/349
VCA1210-835	568740	neutral white	3500	4069	172	5803	157	7376	145	8558	135	–	–	120	82	835/349
VCA1210-840	568741	neutral white	4000	4148	175	5916	161	7520	148	8725	137	–	–	120	82	840/349
VCA1210-850	568742	cool white	5000	4229	179	6031	164	7666	150	8895	140	–	–	120	82	850/349
VCA1210-857	568743	cool white	5700	4189	177	5974	162	7593	149	8810	139	–	–	120	82	857/349
VCA1210 – CRI 90																
VCA1210-927	568744	warm white	2700	3138	133	4475	121	5689	112	6600	104	–	–	120	92	927/349
VCA1210-930	568745	warm white	3000 (below BBL)	3343	141	4768	129	6060	119	7032	111	–	–	120	92	930/349
VCA1210-931PW	568746	pearl white	3100	3277	139	4673	127	5940	117	6892	108	–	–	120	92	931/349
VCA1210-935	568747	neutral white	3500 (below BBL)	3376	143	4815	131	6121	120	7101	112	–	–	120	92	935/349
VCA1210-940	568748	neutral white	4000 (below BBL)	3443	146	4910	133	6241	122	7241	114	–	–	120	92	940/349
VCA1212 – CRI 80																
VCA1212-827	568749	warm white	2700	3952	169	5701	157	7330	147	8605	139	10186	129	120	82	827/349
VCA1212-830	568750	warm white	3000	4159	178	6000	166	7714	155	9057	146	10721	136	120	82	830/349
VCA1212-830B	568751	warm white	3000 (below BBL)	4076	174	5880	162	7560	152	8876	143	10506	133	120	82	830/349
VCA1212-831PW	568752	pearl white	3100	4159	178	6000	166	7714	155	9057	146	10721	136	120	82	831/349
VCA1212-835	568753	neutral white	3500	4201	179	6060	167	7792	157	9148	148	10828	137	120	82	835/349
VCA1212-840	568754	neutral white	4000	4283	183	6178	171	7943	160	9326	151	11039	140	120	82	840/349
VCA1212-850	568755	cool white	5000	4367	187	6299	174	8099	163	9508	154	11255	143	120	82	850/349
VCA1212-857	568756	cool white	5700	4325	185	6239	172	8021	161	9417	152	11147	142	120	82	857/349
VCA1212 – CRI 90																
VCA1212-927	568757	warm white	2700	3240	138	4674	129	6009	121	7055	114	8351	106	120	92	927/349
VCA1212-930	568758	warm white	3000 (below BBL)	3452	147	4979	137	6402	129	7516	121	8897	113	120	92	930/349
VCA1212-931PW	568759	pearl white	3100	3383	144	4880	135	6275	126	7367	119	8720	111	120	92	931/349
VCA1212-935	568760	neutral white	3500 (below BBL)	3486	149	5029	139	6465	130	7591	123	8985	114	120	92	935/349
VCA1212-940	568761	neutral white	4000 (below BBL)	3555	152	5128	142	6592	132	7740	125	9162	116	120	92	940/349
VCA1212 – FOOD																
VCA1212-MP	568762	meat pink	2000 "pink effect"	2406	103	3471	96	4463	90	5239	85	6202	79	120	82	820/349

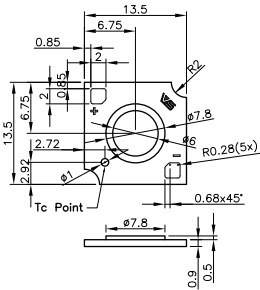
* Colour tolerance: 3 MacAdam | ** Production tolerance of luminous flux and efficiency: $\pm 10\%$ | Min. CRI Ra: > 80 at VCAxxx-8xx, > 90 at VCAxxx-9xx

Minimum order quantity (packaging unit): 160 pcs.

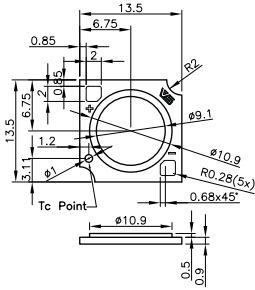
The values contained in this data sheet can change due to technical innovations. Any such changes will be made without separate notification.

Comfort COB

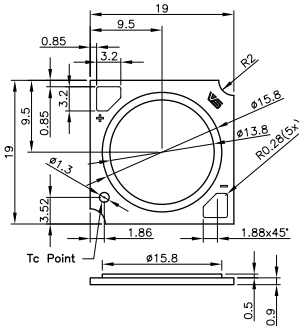
VCA102



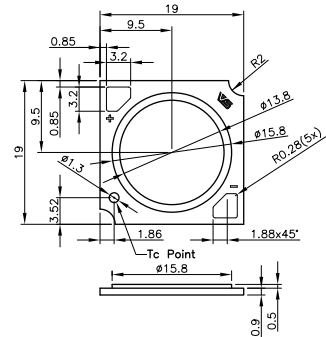
VCA123



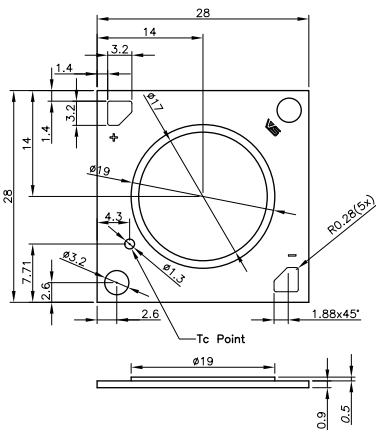
VCA125



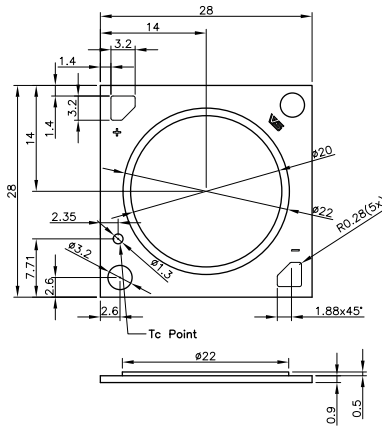
VCA127



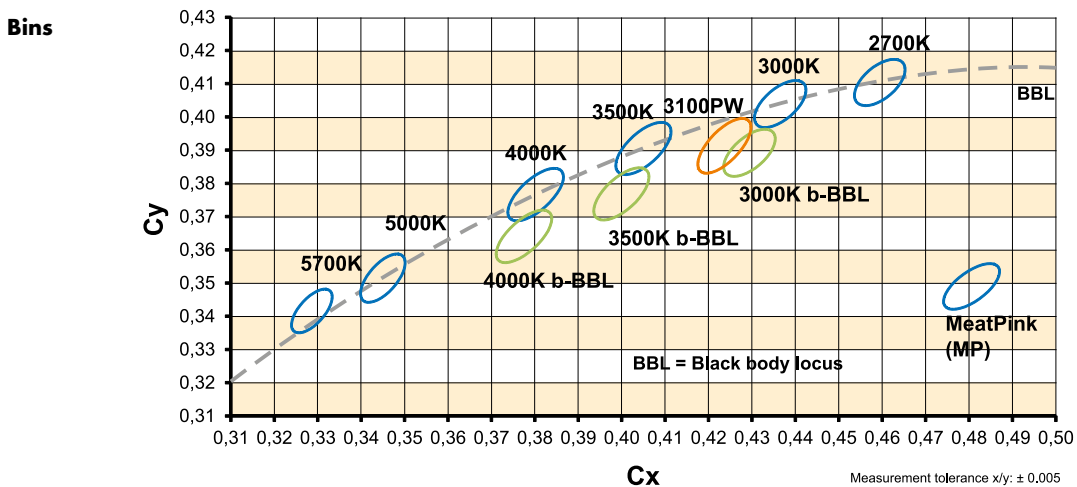
VCA1210



VCA1212



The clearance and creepage distances are designed for operation with SELV drivers. Alternatively for fixing with LED holders the Comfort COBs can be fixed with screws. Then the wires must be soldered to the solder pads.



The values contained in this data sheet can change due to technical innovations. Any such changes will be made without separate notification.

Comfort COB – Ready-to-Assemble

Technical Notes

- LED module for integration into luminaires
- Dimensions: Ø 44 mm or Ø 50 mm
- TIM (Thermal Interface Material) integrated
- Use of external LED constant current driver



Electrical Characteristics / Operating Life / Bins

Datas are mentioned on the product pages of LED modules in this data sheet.

Maximum Ratings

Exceeding the maximum ratings can lead to reduction of service life or destruction of the modules.

The mentioned maximum ratings are listed on the product pages of the LED modules. The operating and storage temperature are different.

Operating temperature: -40 to +105 °C / storage temperature: -20 to +40 °C

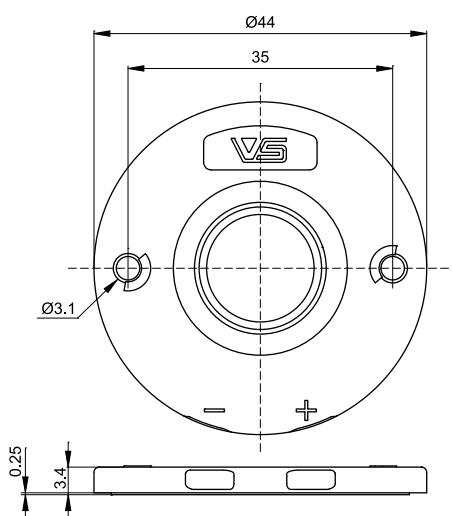
Optical Characteristics

The optical characteristics are mentioned on the product pages of LED modules in this data sheet.

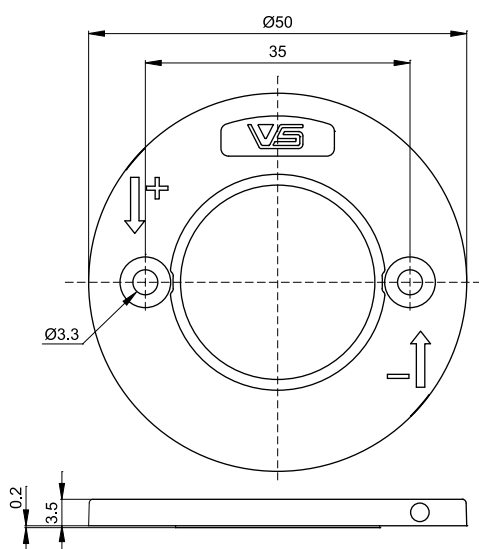
The typical luminous flux differs for the Ready-to-Assemble modules: -1%

Mechanical Dimensions

U-VCA 125/127



U-VCA 1210/1212



Assembly Instructions

Step 1: Put in the leads into the push-in terminals.

U-VCA 125/127:

- Conductor cross-section: 0.34–0.75 mm², solid or stranded conductor with tinned lead ends
- Stripped length: 10–12 mm

U-VCA 1210/1212:

- Conductor cross-section: 0.5–0.75 mm², solid or stranded conductor with tinned lead ends
- Stripped length: 7–8 mm

Step 2: Remove the transparent protection film on the rear side of the module.

Step 3: Screw the module with M3 screws onto the heat sink.

- Min. torque: 0.3 Nm
- Max. torque: 0.5 Nm

Step 1 (electrical connection) can also be done optional as final step.

The values contained in this data sheet can change due to technical innovations. Any such changes will be made without separate notification.

Comfort COB – Ready-to-Assemble

Ready-to-Assemble Comfort COB – up to 5000 lm

Ready-to-Assemble module	
Type	Ref. No.
U-VCA125-827	
U-VCA125-830	
U-VCA125-830B (below BBL)	
U-VCA125-831PW	
U-VCA125-835	
U-VCA125-840	
U-VCA125-850	
U-VCA125-857	
U-VCA125-927	
U-VCA125-930 (below BBL)	
U-VCA125-931PW	
U-VCA125-935 (below BBL)	
U-VCA125-940 (below BBL)	
U-VCA127-827	
U-VCA127-830	
U-VCA127-830B (below BBL)	
U-VCA127-831PW	
U-VCA127-835	
U-VCA127-840	
U-VCA127-850	
U-VCA127-857	
U-VCA127-927	
U-VCA127-930 (below BBL)	
U-VCA127-931PW	
U-VCA127-935 (below BBL)	
U-VCA127-940 (below BBL)	
U-VCA127-MP (meat pink)	

Ready-to-Assemble Comfort COB – up to 11,000 lm

Ready-to-Assemble module	
Type	Ref. No.
U-VCA1210-827	
U-VCA1210-830	
U-VCA1210-830B (below BBL)	
U-VCA1210-831PW	
U-VCA1210-835	
U-VCA1210-840	
U-VCA1210-850	
U-VCA1210-857	
U-VCA1210-927	
U-VCA1210-930 (below BBL)	
U-VCA1210-931PW	
U-VCA1210-935 (below BBL)	
U-VCA1210-940 (below BBL)	
U-VCA1212-827	
U-VCA1212-830	
U-VCA1212-830B (below BBL)	
U-VCA1212-831PW	
U-VCA1212-835	
U-VCA1212-840	
U-VCA1212-850	
U-VCA1212-857	
U-VCA1212-927	
U-VCA1212-930 (below BBL)	
U-VCA1212-931PW	
U-VCA1212-935 (below BBL)	
U-VCA1212-940 (below BBL)	
U-VCA1212-MP (meat pink)	

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Comfort COB

Assembly and Safety Information

Installation must be carried out under observation of the relevant regulations and standards. The LED modules are designed for operation within a casing or luminaire. Installation must be carried out in a voltage-free state (i.e. disconnection from the mains). The following advice must be observed; non-observance can result in the destruction of the LED assembly modules, fire and/or other hazards.

- ESD (electrostatic discharge) protection measures must be observed when handling and installing the LED modules. See VS's application notes on ESD protection.
- LED assembly modules must not be subjected to any undue mechanical stress, e. g.:
 - do not treat as bulk cargo
 - avoid shear and compressive forces during handling and installation
 - do not damage circuit paths
 - do not touch the yellow phosphorus layer
- The module must be fixed onto a thermally conductive surface.
- Safe operation only possible by the use of external constant current sources (I_{max} , see table "Electrical Characteristics").
- Operation only with power supply units that feature the following protection:
 - Short-circuit protection
 - Overload protection
 - Overheating protection
 - SELV (Safety Extra Low Voltage); $U_{max.} \leq 60\text{ V}$
 - $I_{max.}$ (see table "Maximum Ratings") must not be exceeded.
- When operating devices will be selected care has been taken to ensure that the maximum values (see table "Maximum Ratings") will not be exceeded.
- Please ensure the correct polarity of the leads prior to commissioning. Reversed polarity can destroy the modules.
- Safety regulations acc. to EN 60598 (or further standards) has to be observed if the maximum output voltage exceed the permitted touchable value.
- Measurement tolerances:
 - luminous flux: $\pm 7\%$
 - voltage: $\pm 3\%$
 - CRI: $\pm 1\%$
- Maximum allowed number of switching cycles: 15,000
- A parallel connection of the modules is not allowed.
- To ensure problem-free operation, the specified maximum temperature at the t_c point (see "Operating Life") must be observed (and measured in accordance with EN 60598-1). To satisfy this point, it may be necessary to put measures in place to ensure any heat is dissipated from the PCB to the environment.

- In the event of outdoor applications or applications in damp locations, care must be taken to protect LED assembly modules against humidity, splashes and jets of water. Any corrosion damage resulting from humidity or contact with condensation will not be recognised as a defect or manufacturing fault. LED assembly modules are not specially protected against foreign bodies or dust. Depending on the type of application, further protection must be ensured to prevent dust and foreign bodies from entering.
- Operating LED modules in the presence of certain chemical substances or in chemically enriched (aggressive) environments can impair module functionality or even cause total module failure. Such conditions may occur e.g. in industry and street environments. Detailed information can be found in our "Chemical Incompatibility" PDF on our website www.vossloh-schwabe.com
- The photobiological safety of the LED modules must be classified into risk groups in accordance with EN 62471 Rating in accordance with IEC / TR 62778: risk group 1 Except the following products above the mentioned luminous flux values are classified into risk group 2.



Border condition of risk group 2

Product type (> 4000 K)	Luminous flux (lm)
VCA102	750
VCA123	1350
VCA125	2250
VCA127	3150
VCA1210	4502
VCA1212	5402

Assessment in acc. with IEC/TR 62778:

Given a clearance of more than d_{min} , within which the lighting intensity limit of E_{thr} = see table is attained, the classification goes down to Risk Group 1.

Colour type (> 4000 K)	$E_{threshold}$ (lx)
VCA102	1200
VCA123	1200
VCA125	1200
VCA127	1200
VCA1210	1200
VCA1212	1200

Product Guarantee

- 5 years
- The conditions for the Product Guarantee of the Vossloh-Schwabe Group shall apply as published on our homepage (www.vossloh-schwabe.com). We will be happy to send you these conditions upon request.

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Accessories

Reflectors:

- ACL-Lichttechnik GmbH
www.reflektor.com
- ALMECO Group
www.almecogroup.com
- Jordan Luxar GmbH & Co. KG
www.jordan-luxar.de
- JORDAN REFLEKTOREN GmbH & Co. KG
www.jordan-reflektoren.de
- LEDIL
www.ledil.com

Heat sinks with active cooling:

- AVC
www.avc-europa.de
- Nuventix, Inc.
www.nuventix.com
- Sunon
www.sunon.com
- MechaTronix
www.led-heatsink.com
- Colliance, Inc.
www.cooliance.eu

Heat sinks with passive cooling:

- AVC
www.avc-europa.de
- Fischer Elektronik GmbH & Co. KG
www.fischerelektronik.de
- Frigo Dynamics
www.frigodynamics.com
- MechaTronix
www.led-heatsink.com

LED Constant Current Drivers

Please visit our homepage for details for suitable

LED constant current drivers: www.vossloh-schwabe.com