LED MODULES

LUGA LINE HIGH BRIGHTNESS 1,500 LM TO 6,000 LM

LUGA LINE HIGH BRIGHTNESS – RETAIL AND INDUSTRIAL LIGHTING

Typical Applications

DML128/12B*HC**

- Integration in reflector luminaires
- Retail lighting
- Downlights
- Industrial lighting for:
  - Production halls
  - Warehouses

LUGA Line HB

- **3,000 LM TO 5,000 LM (PER 280 MM) FOR SHOP LIGHTING**
- **6,000 LM FOR INDUSTRIAL APPLICATIONS**
- **HIGHLY EFFICIENT: UP TO 178 LM/W**
- **HIGH ELECTRICAL ISOLATION DUE TO CERAMIC COB TECHNOLOGY**
- **SPECIAL AND STANDARD COLOURS: CRI80 / CRI90 + PEARL WHITE**

LIGHTING SOLUTIONS

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LUGA Line HB – up to 2000 lm

Technical Notes

- LED module for integration into luminaires
- Dimensions: 280x15 mm
- Use of external LED constant current driver

Electrical Characteristics

at t_p = 65 °C

Type	Typ. voltage DC					Typ. power consumption				
	350 mA V	500 mA	700 mA	1050 mA V	1400 mA V	350 mA W	500 mA W	700 mA W	1050 mA W	1400 mA W
DML128***HC	33.0	33.9	35.1	37.1	38.9	11.6	17.0	24.6	38.9	54.5
DML12B***HC	32.6	33.2	34.0	35.4	36.7	11.4	16.6	23.8	37.2	51.4

Voltage and power tolerance: ±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 °C min.	°C max.	Storage temperature range °C min.	°C max.	Max. allowed repetitive peak current mA
DML128***HC	≤ 1400	–40	+95	–40	+100	1600
DML12B***HC	≤ 1400	–40	+95	–40	+100	2400

Operating Life

at t_p = 65 °C

Lumen maintenance	DML128***HC IF 500 mA	IF 700 mA	IF 1050 mA	IF 1400 mA	DML12B***HC IF 500 mA	IF 700 mA	IF 1050 mA	IF 1400 mA
L90/B10	63,000 hrs.	60,000 hrs.	54,000 hrs.	47,000 hrs.	66,000 hrs.	63,000 hrs.	59,000 hrs.	54,000 hrs.
L80/B10	88,000 hrs.	85,000 hrs.	79,000 hrs.	72,000 hrs.	91,000 hrs.	88,000 hrs.	84,000 hrs.	79,000 hrs.
L70/B10	98,000 hrs.	95,000 hrs.	89,000 hrs.	82,000 hrs.	>100,000 hrs.	98,000 hrs.	94,000 hrs.	89,000 hrs.

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LUGA Line Ceramic (HB)

Optical Characteristics
at t_p = 65 °C

Type	Ref. No.	Colour	Correlated colour temp.* K	Typ. luminous flux** and efficiency at 350 mA lm	350 mA lm/W	500 mA lm	500 mA lm/W	700 mA lm	700 mA lm/W	1050 mA lm	1050 mA lm/W	1400mA lm	1400mA lm/W	Typ. beam angle °	Typ. CRI R_a	Photo-metric code
DML128C27HC	**565899**	warm white	2700	1805	156	2535	149	3465	141	4965	128	6300	116	120	82	827/349
DML128C30HC	**565900**	warm white	3000	1940	168	2725	161	3730	152	5345	137	6780	124	120	83	830/349
DML128C35HC	**565902**	neutral white	3500	1970	170	2765	163	3780	154	5415	139	6875	126	120	84	835/349
DML128C40HC	**565903**	neutral white	4000	2005	173	2815	166	3850	157	5520	142	7005	129	120	84	840/349
DML128C50HC	**565904**	cool white	5000	2025	175	2845	168	3890	158	5575	143	7080	130	120	84	850/349
DML12BC27HC	**565910**	warm white	2700	1805	158	2555	154	3510	147	5075	137	6485	126	120	82	827/349
DML12BC30HC	**565911**	warm white	3000	1945	170	2745	165	3775	158	5460	147	6975	136	120	83	830/349
DML12BC35HC	**565913**	neutral white	3500	1975	173	2790	168	3830	161	5545	149	7080	138	120	84	835/349
DML12BC40HC	**565914**	neutral white	4000	2010	176	2840	171	3905	164	5645	152	7210	140	120	84	840/349
DML12BC50HC	**565915**	cool white	5000	2030	178	2870	173	3945	166	5705	153	7285	142	120	84	850/349

* Colour tolerance: 3 MacAdam | ** Production tolerance of luminous flux and efficiency: ± 10 % | Min. CRI R_a: > 80
Minimum order quantity: 60 pcs.

LUGA Line Ceramic (HB) – Pearl White

Optical Characteristics
at t_p = 65 °C

Type	Ref. No.	Colour	Correlated colour temp.* K	Typ. luminous flux** and efficiency at 350 mA lm	350 mA lm/W	500 mA lm	500 mA lm/W	700 mA lm	700 mA lm/W	1050 mA lm	1050 mA lm/W	1400 mA lm	1400 mA lm/W	Typ. beam angle °	Typ. CRI lm/W	Photo-metric code
DML128C31HPC	**565901**	pearl white	3100	1890	164	2655	157	3625	148	5195	133	6595	121	120	84	831/349
DML128S31HPC	**565907**	pearl white	3100	1565	135	2200	130	3005	122	4305	111	5465	100	120	95	931/349
DML12BC31HPC	**565912**	pearl white	3100	1895	166	2675	161	3680	154	5320	143	6795	132	120	84	831/349
DML12BS31HPC	**565918**	pearl white	3100	1570	137	2215	133	3045	128	4405	118	5625	110	120	95	931/349

* Colour tolerance: 3 MacAdam | ** Production tolerance of luminous flux and efficiency: ± 10 % | Min. CRI R_a: > 90/> 80
Minimum order quantity: 60 pcs.

LUGA Line Ceramic (HB) – HiCRI

Optical Characteristics
at t_p = 65 °C

Type	Ref. No.	Colour	Correlated colour temp.* K	Typ. luminous flux** and efficiency at 350 mA lm	350 mA lm/W	500 mA lm	500 mA lm/W	700 mA lm	700 mA lm/W	1050 mA lm	1050 mA lm/W	1400 mA lm	1400 mA lm/W	Typ. beam angle °	Typ. CRI lm/W	Photo-metric code
DML128D27HC	**565905**	warm white	2700	1490	129	2095	124	2860	116	4100	105	5205	95	120	95	927/349
DML128S30HC	**565906**	warm white	3000	1540	133	2160	127	2955	120	4235	109	5375	99	120	95	930/349
DML128S35HC	**565908**	neutral white	3500	1625	141	2280	134	3115	127	4465	115	5670	104	120	95	935/349
DML128S40HC	**565909**	neutral white	4000	1685	146	2370	140	3240	132	4645	119	5890	108	120	95	940/349
DML12BD27HC	**565916**	warm white	2700	1495	131	2115	127	2905	122	4205	113	5370	105	120	95	927/349
DML12BS30HC	**565917**	warm white	3000	1545	135	2180	131	2995	126	4335	117	5535	108	120	95	930/349
DML12BS35HC	**565919**	neutral white	3500	1630	143	2305	139	3165	133	4580	123	5845	114	120	95	935/349
DML12BS40HC	**565920**	neutral white	4000	1690	148	2385	144	3280	138	4740	128	6055	118	120	95	940/349

* Colour tolerance: 3 MacAdam | ** Production tolerance of luminous flux and efficiency: ± 10 % | Min. CRI R_a: > 90
Minimum order quantity: 60 pcs.

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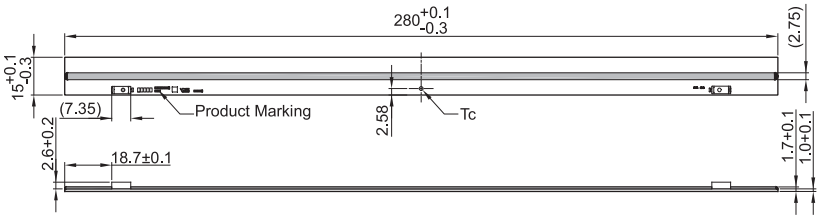
LUGA Line HB

DMS128/12B

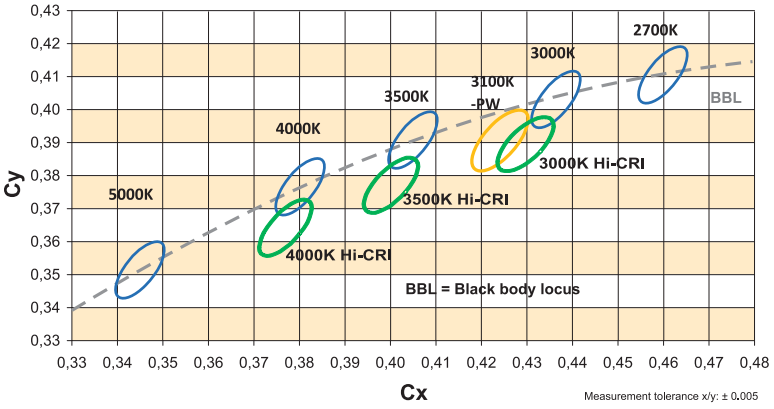


The clearance and creepage distances are designed for working voltages up to:

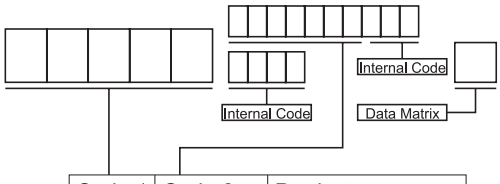
Type	Basic insulation	Reinforced insulation
DML 128/12B***HC	235 V DC	60 V DC

Thickness of PCB is included in calculation.

Bins LUGA Line HB



Product Code



Code 1	Code 2	Product name
27CCH	128C27H	DML128C27HC
30CCH	128C30H	DML128C30HC
35CCH	128C35H	DML128C35HC
40CCH	128C40H	DML128C40HC
50CCH	128C50H	DML128C50HC
31CCH	128C31H	DML128C31HPC
27DCH	128D27H	DML128D27HC
30SCH	128S30H	DML128S30HC
35SCH	128S35H	DML128S35HC
40SCH	128S40H	DML128S40HC
31SCH	128S31H	DML128S31HPC
27CCH	12BC27H	DML12BC27HC
30CCH	12BC30H	DML12BC30HC
35CCH	12BC35H	DML12BC35HC
40CCH	12BC40H	DML12BC40HC
50CCH	12BC50H	DML12BC50HC
31CCH	12BC31H	DML12BC31HPC
27DCH	12BD27H	DML12BD27HC
30SCH	12BS30H	DML12BS30HC
35SCH	12BS35H	DML12BS35HC
40SCH	12BS40H	DML12BS40HC
31SCH	12BS31H	DML12BS31HPC

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LUGA Line HB

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.
- Adequate anti-static electricity measures, including the use of conductive shoes, ionizers, work bench grounding, wrist straps, flooring and stools sould be used.
- 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
  - avoid any pressure on the light emitting 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
- Please ensure the correct polarity of the leads prior to commissioning. Reversed polarity can destroy the modules.
- LED modules will be connected with two on-board push-in terminals (Hirose KN27A).
- Safety regulations acc. to EN 60598 (or further standards) has to be observed if the maximum output voltage exceed the permitted touchable value.
- The following points must be observed when connecting LED modules in parallel:
  - All LED strings that are wired in parallel must contain the same number of LEDs (symmetrical loading).
  - Owing to differing forward biases, there can be a difference of up to 10% in brightness between modules connected in parallel.
  - All modules that are wired in parallel must be thermally connected (same temperatures at all LED modules).
- 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.
- Measurement tolerances (in addition to production tolerance):
  - luminous flux: ± 7%
  - voltage: ± 3%
  - CRI: ± 1%
- Products equipped with adhesive transfer tape must only be applied to dry and clean surfaces that are free from grease, oil, silicone or other soiling. It is therefore recommended to clean the substrate with isopropyl alcohol (IPA). Please ensure a full-surface bond over the entire contact area when sticking the module to the substrate.
  The following substances are regarded as critical for creating an adhesive bond:
  – Polyefins (polyethylene, polypropylene)
  – Rubber
  – Powder-coated materials
  – Silicone rubber
  – Teflon
  Owing to the varying application options and different types of surface as well as ambient conditions, VS accepts no liability for the quality of the adhesive bond achieved when mounting these products. Prior to sticking a VS product care must be taken to check whether the material in question is actually suitable for the intended purpose under consideration of all possible application-relevant influences. Supplementary holders must be used if necessary.
- 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.
- Due to the manufacturing process, the PCBs of the LED assembly modules can have sharp edges and corners. Care must therefore be taken during handling and installation to avoid injury.
- For optimal load of used constant current driver the modules can be connected in series. The quantity of LED modules is limited by the sum of forward voltage and the capacity of used constant current driver. Safety regulations acc. to EN 60598 has to be observed if the sum of forward voltage exceed the permitted touchable value.
- 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. 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: 2008.
  Assessment of risk groups in acc. with IEC/TR 62778: risk group 1

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Applied Standards

EN 62031
LED modules for general lighting – Safety specifications
EN 62471
Photobiological safety of lamps and lamp systems

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.

LED Constant Current Drivers

Please visit our homepage for details for suitable
LED constant current drivers: www.vossloh-schwabe.com

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