

LED LINEAR ALLROUND – 5050 GEN. 4 ADVANCED BUILT-IN MODULES



LED LINEAR ALLROUND – 5050 GEN. 4 ADVANCED

MSP SC 2R/Z15/5050 ADV/NTC G4

These modules were designed for built-in into luminaire casings. They enable a modular luminaire design.

The modules are available in four shapes (4, 8, 12 or 16 LEDs).

Typical Applications (depending on the choice of optics)

- Integration in luminaires
- Street lighting, urban street lighting
- Tunnel lighting
- Flood and area lighting
- Indoor lighting
- Industrial lighting for:
 - Production halls
 - Warehouses
- Lighting for sports facilities

LED Linear Allround SMD 5050 Gen. 4 Advanced

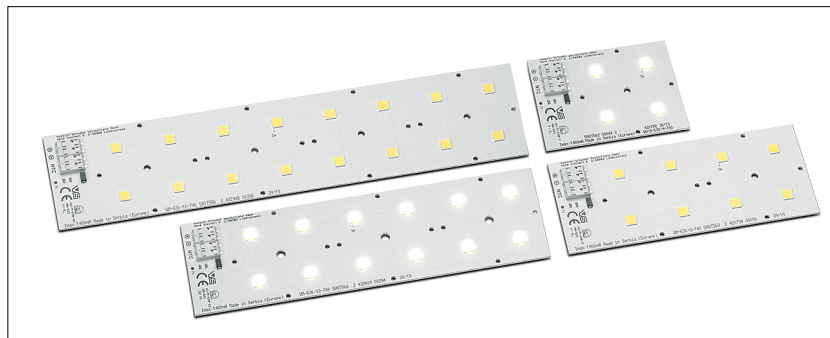
- **HIGHLY EFFICIENT: UP TO 224 LM/W**
AT $T_P = 65^\circ\text{C}$, $I_F = 350\text{ mA}$
- **FLEXIBLE LIGHT DISTRIBUTION BY VARIOUS ATTACHMENT OPTICS**
- **INITIAL COLOUR ACCURACY: 5 SDCM**
- **ON-BOARD SURGE PROTECTION UP TO 10 KV**
(IN COMBINATION WITH VS STREETLIGHT DRIVERS)
- **ENEC AND VDE APPROVED**
(ACC. TO EN 62031)



LED Linear Allround 5050 Gen. 4 Advanced

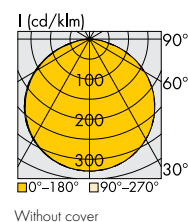
Technical Notes

- LED built-in module for integration into luminaires
- 4, 8, 12 or 16 high-efficiency High Power LEDs
- Dimensions (excl. optics) LxVxH
 - 4 LEDs: 70.6x49.5x5 mm
 - 8 LEDs: 121.4x49.5x5 mm
 - 12 LEDs: 172.2x49.5x5 mm
 - 16 LEDs: 223x49.5x5 mm
- Driving currents: 350mA / 500mA / 700mA / 1050mA / 1200mA
- Push-in terminals for quick and simple wiring
- Suitable for 5050-optimized 2x2 optics made by VS
- Design for optimum thermal management
- Degree of protection: IP00
- ESD protection class 2 (up to 4 kV)
- NTC resistor for external driver feedback of module temperature (type: NCP18xH103J03RB)



Typical Light Distribution Curve

Data are available in .ldt format for download under www.vossloh-schwabe.com.



Electrical Characteristics

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

Type	No. of LEDs	Typ. voltage DC					Temperature coefficient [mV/K]	Typ. power consumption				
		350 mA	500 mA	700 mA	1050 mA	1200 mA		350 mA	500 mA	700 mA	1050 mA	1200 mA
		V	V	V	V	V		W	W	W	W	W
LED Linear Allround 5050 Gen. 4 Advanced												
MSP SC 2R/Z15/5050 T/4/yzz ADV/NTC G4	4	10.6	10.8	11.0	11.3	11.4	-3.94	3.7	5.4	7.7	11.9	13.7
MSP SC 2R/Z15/5050 T/8/yzz ADV/NTC G4	8	21.2	21.5	21.9	22.6	22.9	-7.87	7.4	10.8	15.3	23.7	27.4
MSP SC 2R/Z15/5050 T/12/yzz ADV/NTC G4	12	31.8	32.3	32.9	33.9	34.3	-11.81	11.1	16.1	23.0	35.6	41.1
MSP SC 2R/Z15/5050 T/16/yzz ADV/NTC G4	16	42.4	43.0	43.8	45.2	45.7	-15.74	14.8	21.5	30.7	47.4	54.8

Voltage and power consumption tolerance: $\pm 10\%$. Use of external LED constant current driver required.

Maximum Ratings

Exceeding the maximum ratings can lead to destruction of the module.

Type	Operation current mA	Operation temperature range at T_c point		Storage temperature range		Max. allowed repetitive peak current mA
		$^\circ\text{C min.}$	$^\circ\text{C max.}$	$^\circ\text{C min.}$	$^\circ\text{C max.}$	
All types	≤ 1050	-30	+85	-40	+85	2400
	≤ 1200	-30	+75	-40	+85	2400

Operating Life

Lumen degradation	Operating life in hours at stated T_c point temperature											
	$I_f \leq 350 \text{ mA to } I_f 500 \text{ mA}$			$I_f 700 \text{ mA}$			$I_f 1050 \text{ mA}$			$I_f 1200 \text{ mA}$		
	60 $^\circ\text{C}$	70 $^\circ\text{C}$	80 $^\circ\text{C}$	60 $^\circ\text{C}$	70 $^\circ\text{C}$	80 $^\circ\text{C}$	60 $^\circ\text{C}$	70 $^\circ\text{C}$	80 $^\circ\text{C}$	60 $^\circ\text{C}$	70 $^\circ\text{C}$	80 $^\circ\text{C}$
L80/B10	>102.000	>102.000	>102.000	>102.000	>102.000	>102.000	>102.000	>102.000	>102.000	>102.000	>102.000	>102.000
L90/B10	>102.000	>102.000	>102.000	>102.000	>98.000	>92.000	>102.000	>98.000	>91.000	>102.000	>97.000	>91.000

These values do not refer to the colour temperature. | Lxx/Byy (lumen maintenance at xx%, failure rate yy%)

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

LED Linear Allround 5050 Gen. 4 Advanced – Linear Built-in Modules

Optical Characteristics - at $t_p = 65^\circ\text{C}$, $\text{CRI}^{**} \geq 70$

Type	Ref. No.	Colour	Correl. colour temp. K	Luminous flux* (lm) and typ. efficiency (lm/W)									
				350 mA		500 mA		700 mA		1050 mA		1200 mA	
				typ. lm	typ. lm/W	typ. lm	typ. lm/W	typ. lm	typ. lm/W	typ. lm	typ. lm/W	typ. lm	typ. lm/W

LED Linear Allround 5050 Gen. 4 Advanced - 4 LEDs

MSP SC 2R/Z15/5050 T/4/718 ADV/NTC G4	on req.	WW	1800	560	150	790	147	1090	142	1595	134	1800	131
MSP SC 2R/Z15/5050 T/4/722 ADV/NTC G4	on req.	WW	2200	685	185	970	180	1340	174	1955	165	2210	161
MSP SC 2R/Z15/5050 T/4/727 ADV/NTC G4	on req.	WW	2700	750	203	1065	198	1470	191	2145	181	2430	177
MSP SC 2R/Z15/5050 T/4/730 ADV/NTC G4	on req.	WW	3000	775	209	1095	204	1515	197	2210	187	2500	182
MSP SC 2R/Z15/5050 T/4/740 ADV/NTC G4	574616	NW	4000	830	224	1175	219	1625	212	2375	200	2685	196
MSP SC 2R/Z15/5050 T/4/750 ADV/NTC G4	on req.	CW	5000	805	217	1140	212	1575	205	2305	194	2605	190
MSP SC 2R/Z15/5050 T/4/757 ADV/NTC G4	on req.	CW	5700	795	214	1125	209	1555	202	2270	192	2570	187

LED Linear Allround 5050 Gen. 4 Advanced - 8 LEDs

MSP SC 2R/Z15/5050 T/8/718 ADV/NTC G4	on req.	WW	1800	1115	150	1580	147	2180	142	3185	134	3605	131
MSP SC 2R/Z15/5050 T/8/722 ADV/NTC G4	on req.	WW	2200	1370	185	1940	180	2675	174	3910	165	4425	161
MSP SC 2R/Z15/5050 T/8/727 ADV/NTC G4	on req.	WW	2700	1500	203	2125	198	2935	191	4295	181	4855	177
MSP SC 2R/Z15/5050 T/8/730 ADV/NTC G4	on req.	WW	3000	1550	209	2190	204	3025	197	4425	187	5005	182
MSP SC 2R/Z15/5050 T/8/740 ADV/NTC G4	574617	NW	4000	1660	224	2355	219	3250	212	4750	200	5370	196
MSP SC 2R/Z15/5050 T/8/750 ADV/NTC G4	on req.	CW	5000	1610	217	2280	212	3150	205	4605	194	5210	190
MSP SC 2R/Z15/5050 T/8/757 ADV/NTC G4	on req.	CW	5700	1590	214	2250	209	3105	202	4545	192	5140	187

LED Linear Allround 5050 Gen. 4 Advanced - 12 LEDs

MSP SC 2R/Z15/5050 T/12/718 ADV/NTC G4	on req.	WW	1800	1675	150	2370	147	3270	142	4780	134	5405	131
MSP SC 2R/Z15/5050 T/12/722 ADV/NTC G4	on req.	WW	2200	2055	185	2910	180	4015	174	5870	165	6635	161
MSP SC 2R/Z15/5050 T/12/727 ADV/NTC G4	on req.	WW	2700	2255	203	3190	198	4405	191	6440	181	7285	177
MSP SC 2R/Z15/5050 T/12/730 ADV/NTC G4	on req.	WW	3000	2320	209	3290	204	4540	197	6635	187	7505	182
MSP SC 2R/Z15/5050 T/12/740 ADV/NTC G4	574618	NW	4000	2495	224	3530	219	4870	212	7125	200	8055	196
MSP SC 2R/Z15/5050 T/12/750 ADV/NTC G4	on req.	CW	5000	2420	217	3425	212	4725	205	6910	194	7815	190
MSP SC 2R/Z15/5050 T/12/757 ADV/NTC G4	on req.	CW	5700	2385	214	3375	209	4660	202	6815	192	7705	187

LED Linear Allround 5050 Gen. 4 Advanced - 16 LEDs

MSP SC 2R/Z15/5050 T/16/718 ADV/NTC G4	on req.	WW	1800	2230	150	3160	147	4360	142	6375	134	7210	131
MSP SC 2R/Z15/5050 T/16/722 ADV/NTC G4	on req.	WW	2200	2740	185	3875	180	5350	174	7825	165	8850	161
MSP SC 2R/Z15/5050 T/16/727 ADV/NTC G4	on req.	WW	2700	3005	203	4255	198	5870	191	8585	181	9710	177
MSP SC 2R/Z15/5050 T/16/730 ADV/NTC G4	on req.	WW	3000	3095	209	4385	204	6050	197	8850	187	10005	182
MSP SC 2R/Z15/5050 T/16/740 ADV/NTC G4	574619	NW	4000	3325	224	4705	219	6495	212	9500	200	10740	196
MSP SC 2R/Z15/5050 T/16/750 ADV/NTC G4	on req.	CW	5000	3225	217	4565	212	6300	205	9210	194	10415	190
MSP SC 2R/Z15/5050 T/16/757 ADV/NTC G4	574650	CW	5700	3180	214	4500	209	6215	202	9085	192	10275	187

1800, 2200, 2700 and 3000K = warm white (WW), 4000 K = neutral white (NW), 5000 and 5700 K = cool white (CW)

* Colour tolerance: 5 MacAdam | ** Production tolerance of luminous flux and efficiency: $\pm 10\%$

Optical Characteristics - at $t_p = 65^\circ\text{C}$, $\text{CRI}^{**} \geq 80$

Type	Ref. No.	Colour	Correl. colour temp. K	Luminous flux* (lm) and typ. efficiency (lm/W)									
				350 mA		500 mA		700 mA		1050 mA		1200 mA	
				typ. lm	typ. lm/W	typ. lm	typ. lm/W	typ. lm	typ. lm/W	typ. lm	typ. lm/W	typ. lm	typ. lm/W

LED Linear Allround 5050 Gen. 4 Advanced - 4 LEDs

MSP SC 2R/Z15/5050 T/4/830 ADV/NTC G4	on req.	WW	3000	705	190	1000	186	1380	180	2015	170	2280	166
MSP SC 2R/Z15/5050 T/4/840 ADV/NTC G4	on req.	NW	4000	750	202	1060	197	1460	190	2135	180	2415	176

LED Linear Allround 5050 Gen. 4 Advanced - 8 LEDs

MSP SC 2R/Z15/5050 T/8/830 ADV/NTC G4	on req.	WW	3000	1410	190	1995	186	2755	180	4030	170	4560	166
MSP SC 2R/Z15/5050 T/8/840 ADV/NTC G4	on req.	NW	4000	1495	202	2120	197	2925	190	4275	180	4835	176

LED Linear Allround 5050 Gen. 4 Advanced - 12 LEDs

MSP SC 2R/Z15/5050 T/12/830 ADV/NTC G4	on req.	WW	3000	2115	190	2995	186	4135	180	6045	170	6835	166
MSP SC 2R/Z15/5050 T/12/840 ADV/NTC G4	on req.	NW	4000	2245	202	3175	197	4385	190	6410	180	7250	176

LED Linear Allround 5050 Gen. 4 Advanced - 16 LEDs

MSP SC 2R/Z15/5050 T/16/830 ADV/NTC G4	on req.	WW	3000	2820	190	3995	186	5515	180	8060	170	9115	166
MSP SC 2R/Z15/5050 T/16/840 ADV/NTC G4	on req.	NW	4000	2990	202	4235	197	5845	190	8550	180	9670	176

1800, 2200, 2700 and 3000K = warm white (WW), 4000 K = neutral white (NW), 5000 and 5700 K = cool white (CW)

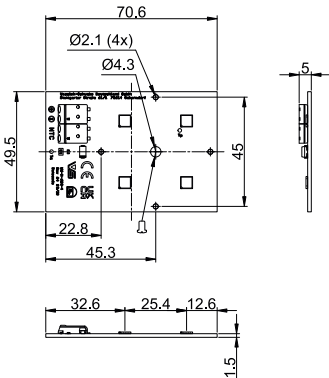
* Colour tolerance: 5 MacAdam | ** Production tolerance of luminous flux and efficiency: $\pm 10\%$

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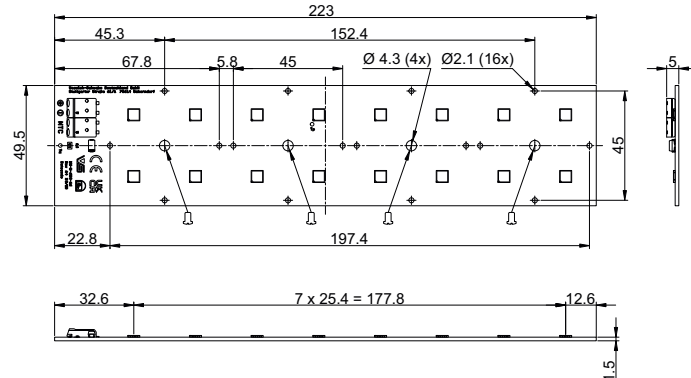
LED Linear Allround 5050 Gen. 4 Advanced – Linear Built-in Modules

Mechanical dimensions

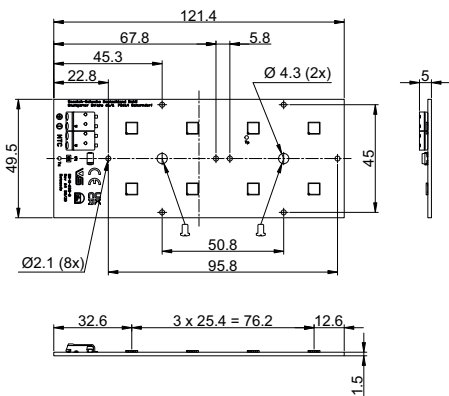
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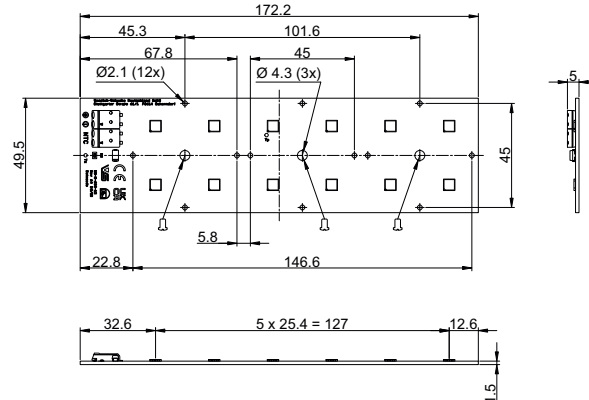
MSP SC 2R/Z15/5050 T/16/yz ADV/NTC G4



MSP SC 2R/Z15/5050 T/8/yz ADV/NTC G4

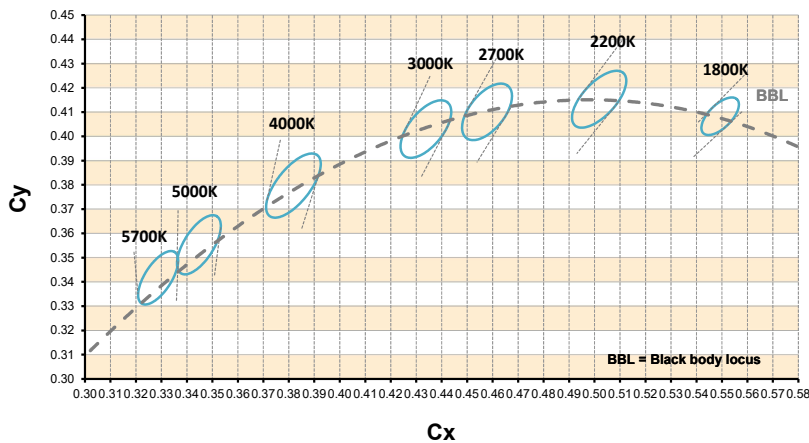


MSP SC 2R/Z15/5050 T/12/yz ADV/NTC G4



All holes Ø 2.1 mm are fixing holes for optics. | All holes Ø 4.3 mm are fixing holes for PCB.

Bins



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Nomenclature example

MSP SC 2R/Z15/5050 T/4/740 ADV/NTC G4

- Generation
- NTC Including
- Advanced
- CCT
 - 18 = 1800 K
 - 22 = 2200 K
 - 27 = 2700 K
 - 30 = 3000 K
 - 40 = 4000 K
 - 50 = 5000 K
 - 57 = 5700 K
- CRI
 - 7 = 70 CRI minimum
 - 8 = 80 CRI minimum
- Number of LEDs
- Connection
 - T = Top
- Type of LED
- Shape
 - Check drawing
- Technology
 - SC = SMD Constant Current
- Product Line
 - P = Prime
- Product Area & Shape
 - MS = Module Street

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. Safety regulations acc. to EN 60598 has to be observed. Installation must be carried out in a voltage-free state (i.e. disconnection from the mains).

- LED built-in modules must not be subjected to any undue mechanical stress, e. g.:
 - handle LED modules carefully
 - avoid shear and compressive forces onto the optics during handling and installation
 - avoid vibrations of more than 2 kHz, 40 G
- The module must be fixed onto a thermally conductive surface with 1 to 4 M3 screws (respectively M4). Max. allowed torque for M3: 0.5 Nm and M4: 1.2 Nm
 - In case of using VS 2x2-array lenses the max. allowed torque to be applied to the screws M3 is 0.5 Nm and for M4 it is 1.4 Nm.
 - In this regard please observe also the usage of proper thermal interface material. Make sure not to go below the min. contact pressure needed. The installation instructions of the selected interface materials have to be followed.
- The wiring can be done by solid or stranded wires having a cross section of 0.2–0.75 mm²; stripped length of lead ends of 7–9 mm. For inserting/removing stranded wires press lightly on the push button.
- When installing/screwing the module into a luminaire, please ensure that the cables are not squeezed between luminaire/heat sink and LED module. Also ensure that the mounting surface is clean and flat. For a reliable thermal attachment, we recommend the mounting surface flatness of ≤ 0.2 mm.
- Safe operation only possible by the use of external constant current sources ($I_{\max}$, see table "Electrical Characteristics").
- Operation is dependent on constant current drivers that should provide the following protective measures:
 - short-circuit protection
 - overload protection
 - overheating protection
- Please ensure the correct polarity of the leads prior to commissioning. Reversed polarity can destroy the modules.
- The maximum output of the power supply must be observed.
- For optimal load of used constant current driver the modules can only 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.
- The clearance and creepage distances of LED modules MSP SC 2R/Z15/5050 T/x/yz ADV/NTC G4 are designed for working voltages up to 500 V DC (basic insulation) acc. to EN 62031/EN 60598.
- If a system consists of multiple LED Linear Allround modules connected to a single driver, only one module will be monitored by the NTC. That means that one module is in "master" mode operated and the rest are operated in "slave" mode.
- Please ensure standard ESD (electrostatic discharge) protection measures are employed when handling and installing LED modules. Electrostatic discharge can damage LEDs.
- To ensure problem-free operation, the specified maximum temperature at the t_c and t_p point (see "Operating Life") must be observed (measured in accordance with EN 60598-1). To satisfy this point, it is necessary to put measures in place to ensure any heat is dissipated from the LED module to the environment.
- To ensure good thermal contact, it is recommended to use proper thermal interface material (e.g. thermal paste, phase change or thermal pads).
- When mounting LED Linear Allround modules directly on the luminaire housing, we recommend to use aluminum of at least 3 mm thickness. Thicker material will improve the heatflow through the luminaire, resulting in a lower t_p temperature on the module itself.
- Use anodised or painted surfaces rather than blank surfaces to enhance the heat-transfer via thermal radiation.
- Try to limit as far as possible the number of thermal interfaces in the primary heat path towards ambient air. For the primary heat path use solely materials with high thermal conductivity (e.g. aluminum).
- To ensure problem-free operation, the specified maximum temperature at the t_c and t_p 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.
- The LED Linear Allround modules are built-in modules and have no IP-classification (IP00). They are not designed for operation in "open air". 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.
- A parallel connection of the modules is not allowed.
- 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. Rating in accordance with IEC / TR 62778: risk group 1. As long as subsequent table is fulfilled:

Type	Max. operating current mA	Max. color temperature K	Limit illuminance (E_{thr}) for higher operating currents to be risk group 2 lx
All types	1200	5700	1014.3

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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.