



TMU040003ELXXXA



350 mA CONSTANT CURRENT LED DC MODULE, 1.5" LINEAR, 305 LUMENS

- ✓ High Density, high brightness chip array for use in Class 2 Linear applications
- ✓ Constant current for maximum efficacy
- ✓ On-board connector for ease of assembly
- ✓ Available in standard CCT's
- ✓ Dimmable when used with a dimmable driver
- ✓ 80 CRI standard and 90 CRI available

General Specifications

Nominal Operating Voltage @ Max Current ^①	6.1V @ 450mA
Max Input Current	450 mA
Nominal DC Power Consumption @ Max Current	2.9W
Initial Lumens Output @ Max Current	375 lumens @ 4000K / 80 CRI / 25°C
Beam Angle	120°
CRI	80, 90
Storage Temperature Range	-35 to +100°C / -31 to +212°F
Operating Ambient Temperature Range (Ta)	-35 to +45°C / -31 to +113°F
Maximum Case Temperature (Tc)	L70: Tc max=85°C (Ts=90°C) / L90: Tc max=55°C (Ts=60°C)
Estimated Lumen Maintenance ^②	L70: 50,000Hrs / L90: 17,000Hrs
Color Consistency	Binning per ANSI C78.377-2008 @ 25°C; 4 SDCM
Overall Size	1.5" x 0.94" x 0.22" (including connector)
PCB Material / Module weight	FR-4 / 3 g
PCB Part Number #	N/A
Maximum Screw Installation Torque	25 inch - ounces
Thermal Management	None
Safety/Compliance	cURus (File # E351548) Class 2 Lighting System RoHS Compliant
Energy Efficiency Label (EEI-Label)	N/A
Warranty	5 years @ Max. Tc from date of manufacture

^① Measured electrical data per UL file

^② TM-21 Reported Numbers



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Part Numbering Matrix

<u>T</u>	<u>M</u>	<u>U</u>	<u>040</u>	<u>003</u>	<u>E</u>	<u>L</u>	<u>8</u>	<u>40</u>	<u>A</u>
Type M = Module (UL Class 2)	Control Type U = None			Max. Power 003 = 3W	PCB Material E = FR-4 + Connector	Shape L = Linear	CRI 8 = 80 9 = 90	Color Temperature 27 = 2700K 30 = 3000K 35 = 3500K 40 = 4000K 50 = 5000K	

Electrical and Optical Specifications

LED Module Part Number	Number of LED	Input Current	Nom. Fwd. Voltage	Nom. Rated Power	Nom. Lum. Flux @ 4000K / 90 CRI	Nom. Lum. Flux @ 4000K / 80 CRI	Nom. Efficacy @ 4000K / 80 CRI
TMU040003ELx40A	6	300 mA	6.0 VDC	1.8W	215 lm	270 lm	150 lm/W
		350 mA	6.1 VDC	2.1W	245 lm	305 lm	145 lm/W
		400 mA	6.3 VDC	2.5W	270 lm	340 lm	136 lm/W
		450 mA ^④	6.4 VDC	2.9W	300 lm	375 lm	129 lm/W

CCT & CRI vs. Luminous Flux

	2700K	3000K	3500K	4000K	5000K
CRI 80(R9> 0)	0.94	0.96	0.97	1.00	1.03
CRI 90(R9>50)	0.73	0.79	0.80	0.82	0.85

NOTES:

- 1) Performance based on Tc mod = 25°C. See thermal de-rating chart (pg. 4) for higher temperature operation
- 2) Standard lumen output and efficacy is calculated for standard options. Reference CCT & CRI vs Luminous Flux chart for lumen ratio calculation.
- 3) Specifications are subject to change without notice.
- 4) The LED DC Module can be configure with different LED chip quantities, series and parallel design configurations to meet a specific design requirement. Contact Fulham for further assistance.

- ③ Standard Product offering (All other options are made to order with MOQ and lead time)
- ④ Indicates maximum rated current. Modules may be operated at a current less than or equal to this value.



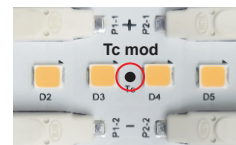
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Thermal Specifications

With Connectors

Storage Temperature Range	-35 to +100°C / -31 to +212°F
Operating Ambient Temperature Range (Ta)	-35 to +45°C / -31 to +113°F
Maximum Case Temperature (Tc)	L70: Tc max=85°C(Ts=90°C) / L90: Tc max=55°C(Ts=60°C)



Thermal De-Rating: Tc vs. Luminous Flux vs. Forward Voltage



Module Case Temperature (Tc)	Luminous Flux Multiplier	Total Vf Multiplier
25°C	1.000	1.000
30°C	1.000	0.991
35°C	0.997	0.982
40°C	0.993	0.973
45°C	0.993	0.964
50°C	0.990	0.953
55°C	0.987	0.944
60°C	0.987	0.935
65°C	0.984	0.926
70°C	0.984	0.917
75°C	0.980	0.908
80°C	0.977	0.899
85°C	0.977	0.889
90°C	0.974	0.880
95°C	0.970	0.862
100°C	0.967	0.853



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Certification Chart

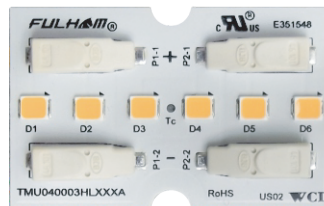
Model	TMU040003ELXXXA
Classification	
	YES
	YES
Energy Efficiency Label (EEI-Label)	N/A
Class 2 Lighting System	YES

Energy Star™ TM-21 Calculator Data

Tc Module	Reported L70	Reported L90
55°C	52,000 Hrs	17,000 Hrs
85°C	50,000 Hrs	16,000 Hrs
105°C	33,000 Hrs	10,000 Hrs

Tc Module	Calculated L70	Calculated L90
55°C	52,000 Hrs	17,000 Hrs
85°C	50,000 Hrs	16,000 Hrs
105°C	33,000 Hrs	10,000 Hrs

Product Image: 1.5" Linear DC Module



Top View

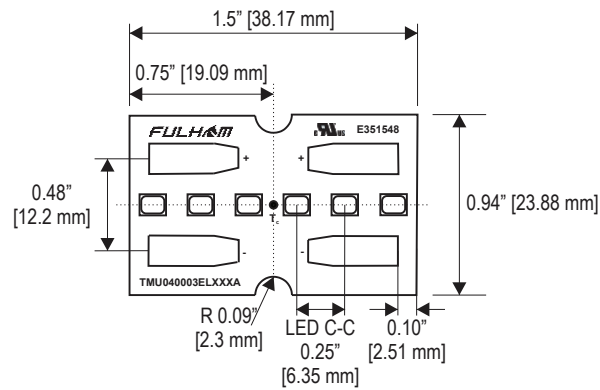


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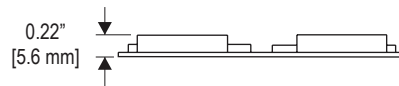


Mechanical Drawings

Top View



Side View





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Guidelines

Termination Notes

- Connector Type: BJB Single Pole SMD Terminal Block, Part #: 46.101.1001
- URus Rating: 9A/300V; cUR Rating: 3A/300V
- Use solid wire size 24 – 18 AWG, rated at a minimum 50V, minimum 105°C, and stripped to length 8 mm (0.31 inches).
- To release wire, twist and pull the wire simultaneously.



Optional Accessories - Interconnect Pins

- Single Interconnect Pin: Wago Part Number 2060-951
- Metal pin(s) to interconnect LED modules that are compatible with connector.
- For more detail information, please visit Wago's website: <http://www.wago.com/infomaterial/pdf/60291132.pdf>



Fastening Notes

- If fastening by screw hole, use any screw with diameter less than 0.185 in (4.7mm). Use all available screw holes to ensure good contact between back side of module and mounting surface. Refer to max specified torque for installation. Suggested screw sizes: #6 or M4 Pan Head screw.
- If fastening using double-sided tape, start with clean, oil-free and dust-free surface. Peel backing and place LED module on mounting surface. Firmly press down on the module to ensure good adherence. Follow the double-side tape manufacturer's installation instructions.
- BJB P2F (Push-to-Fix) fixing elements for PCBs can be used to fasten LED modules to mounting surface. Reference BJB's website for ordering information and specific model to use: <http://www.bjb.com/index.php?pid=376706&lid=10>.



Environmental Rating

- LED DC Modules are rated for dry locations.

Electrostatic Sensitive Product (ESD)

- Fulham LED products should be handled with proper measures to protect against any potential ESD damage.
- When servicing, personnel should be ground and direct contact with LED should be avoided.

Thermal Management

- Proper thermal management should be employed to ensure life and reliability of product. Max Tc of module should not be exceeded.
- Use of thermal grease, paste, pad, or other material interface is highly recommended.

Polarity Notes

- LED DC Modules are polarity sensitive.
- Ensure that "positive" from LED Driver is connected to "positive" of LED modules and that "negative" from LED Driver is connected to "negative" of LED modules.
- Polarities of modules are marked with "+" for positive and "-" for negative.

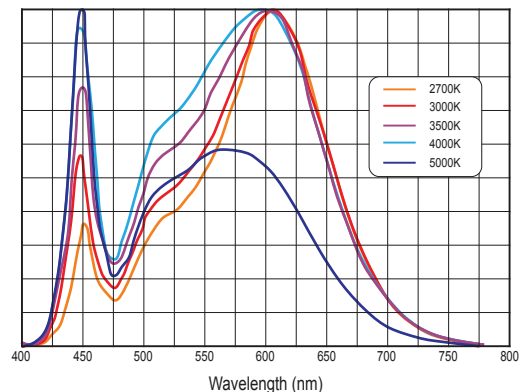
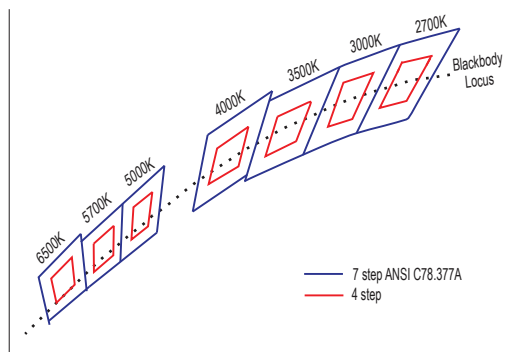


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Color and Binning

Optical Spectrum



NOTES:

- 1) The Color and Binning and Optical Spectrum charts are for reference only. For more detailed info, contact factory.
- 2) Reference Samsung Chromaticity Diagram for Color and Binning. Binning per ANSI C78.377-2008 @ 25°C; 4 SDCM.
- 3) The Optical Spectrum values vary depending on product type and color rank.
- 4) Driver not included.



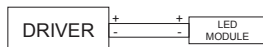
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Compatible Fulham LED Drivers

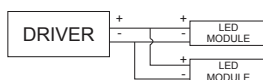
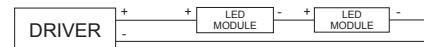
Fulham Part Number	Driver Description	# of Modules per Driver	Total Nominal Module Lumen Output and Wattage @ 4000K/80CRI/25°C	Wiring Diagram	HotSpot2 Compatible
TC11200350-6C	350 mA, 6W CC Driver, 120VAC Input	1	305 lm, 2.1W	A	N/A
		2	610 lm, 4.2W	B	FHS2-UNV-36L, FHS2-UNV-56S
TCD11200350-11C	350 mA, 11W CC Driver, 120VAC Input, TRIAC Dimmable	3	915 lm, 6.3W	B	FHS2-UNV-36L, FHS2-UNV-56S
		4	1220 lm, 8.4W		
		5	1525 lm, 10.5W		
TC11200350-15C	350 mA, 15W CC Driver, 120VAC Input	5	1525 lm, 10.5W	B	FHS2-UNV-36L, FHS2-UNV-56S
		6	1830 lm, 12.6W		
		7	2135 lm, 14.7W		
T1T11200350-15L	350 mA, 15W CC Driver, 120VAC Input, TRIAC Dimmable	4	1220 lm, 8.4W	B	FHS2-UNV-36L, FHS2-UNV-56S
		5	1525 lm, 10.5W		
		6	1830 lm, 12.6W		
T1M1UNV0350-15L/F	350 mA, 15W CC Driver, Universal Input, 0-10V Dimmable	4	1220 lm, 8.4W	B	FHS2-UNV-36L, FHS2-UNV-56S
		5	1525 lm, 10.5W		
		6	1830 lm, 12.6W		
T1T11200350-17CB	350 mA, 17W CC Driver, 120VAC Input, TRIAC Dimmable	5	1525 lm, 10.5W	B	FHS2-UNV-36L, FHS2-UNV-56S
		6	1830 lm, 12.6W		
		7	2135 lm, 14.7W		
TCD11200700-9C	700 mA, 9W CC Driver, 120VAC Input, TRIAC Dimmable	2 (2p)	610 lm, 4.2W	C	FHS2-UNV-36L, FHS2-UNV-56S
		4 (2s,2p)	1220 lm, 8.4W	D	FHS2-UNV-36L, FHS2-UNV-56S
T1T11200700-9C	700 mA, 9W CC Driver, 120VAC Input, TRIAC Dimmable	4 (2s,2p)	1220 lm, 8.4W	D	FHS2-UNV-36L, FHS2-UNV-56S
T1T11200700-18CA	700 mA, 18W CC Driver, 120VAC Input, TRIAC Dimmable	6 (3s,2p), 8 (4s,2p)	1830 lm, 12.6W 2440 lm, 16.8W	D	FHS2-UNV-36L, FHS2-UNV-56S
		8 (4s,2p), 10 (5s,2p)	2440 lm, 16.8W 3050 lm, 21W		
T1T11200700-30C/L	700 mA, 30W CC Driver, 120VAC Input, TRIAC Dimmable	12 (6s,2p)	3660 lm, 25.2W	D	FHS2-UNV-36L, FHS2-UNV-56S
		8 (4s,2p), 10 (5s,2p)	2440 lm, 16.8W 3050 lm, 21W	D	FHS2-UNV-36L, FHS2-UNV-56S
T1M1UNV0700-30L/F	700 mA, 30W CC Driver, Universal Input, 0-10V Dimmable	12 (6s,2p)	3660 lm, 25.2W	D	FHS2-UNV-36L, FHS2-UNV-56S
		4 (2s,2p)	1220 lm, 8.4W	D	N/A
FHSAC1-UNV-40BLS/C/L	Programmable, 40W CC Driver + Emergency System, Universal Input, 0-10V Dimmable (Set to 700 mA)	16 (8s,2p)	4880 lm, 33.6W		

Wiring Diagram



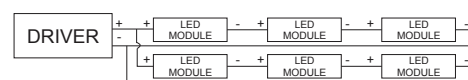
A - Single Channel Driver, 1 LED Module connected

B - Single Channel Driver LED modules connected in series



C - Single Channel Driver, LED Modules connected in parallel

D - Single Channel Driver LED Modules connected in series & parallel



NOTES:

- 1) Subject to rated loading conditions.
- 2) Lumen output and efficacy data is based on 4000K 80CRI, refer to CCT and CRI vs. Luminous Flux table for other options.
- 3) Modules are polarity sensitive. Ensure that "positive" from LED Driver is connected to "positive" of LED modules and that "negative" from LED Driver is connected to "negative" of LED modules.
- 4) List is subject to change without notice.
- 5) Connect 0-10V dimmer only to 0-10V dimmable drivers.
- 6) Modules wired in a series-parallel combination is designated by (Xs,Yp), where X is the number of modules wired in series and Y is the number of modules wired in parallel.
- 7) Total nominal module lumen output and wattage does not include driver efficiency. Please refer to LED driver spec sheet to calculate overall system efficacy.