

Product Information Bulletin

# HF<sup>2</sup>X

Hi-Flux 2nd Generation Module



**The new OSRAM SYLVANIA HF<sup>2</sup>X LED module for spotlighting applications.**

With the addition of its new HF<sup>2</sup>X LED modules, OSRAM SYLVANIA is rapidly bridging the gap between the requirements of white light illumination and the capabilities of LED technology. These new modules offer bright and intense light for specialty illumination, including architectural, retail and solar luminaires and fixtures.

The HF<sup>2</sup>X LED modules consist of a hi-flux LED on a metal core circuit board, which acts as a heatsink, and has an integrated optic. It comes pre-wired with polarized wires for easy installation.

In continuing its leadership in the lighting industry by providing complete system solutions, OSRAM SYLVANIA offers OPTOTRONIC® constant current power supplies to operate the new HF<sup>2</sup>X modules.

**Application Information**

**Applications**

Task lighting – reading lights, under cabinet lighting  
Accent lighting – outdoor/landscape lighting  
Shelf lighting  
Display case lighting  
Vehicle cabin lighting – RV, truck, boat, airplane  
Solar powered installations

- Compact hi-flux LED light source with an on-board optic for spot-lighting applications
- Sleek, innovative design for compact fixtures
- Better efficacy than incandescent or halogen light sources
- No ultraviolet or infrared radiation
- Available with optional integrated optics in 12°, 30°, 60° and 120°
- Optimal operation with OPTOTRONIC, constant current power supplies (Literature ordering code ECS052R2)
- Service life of up to 50,000 hours when temperature at Tc-point is maintained at 40°C
- ROHS compliant
- Pre-wired with 7.9 in. polarized conductors

**Product Availability**

Product	Wattage	Color
HF <sup>2</sup> X/120/W3-854	1.2	White-5400K
HF <sup>2</sup> X/60/W3-854	1.2	White- 5400K
HF <sup>2</sup> X/12/W3-854	1.2	White- 5400K
HF <sup>2</sup> X/30/W3-854	1.2	White- 5400K
HF <sup>2</sup> X/12/W3-733	1.2	White-3300K
HF <sup>2</sup> X/120/W3-733	1.2	White-3300K
HF <sup>2</sup> X/30/W3-733	1.2	White-3300K
HF <sup>2</sup> X/60/W3-733	1.2	White-3300K
HF <sup>2</sup> X/120/W3-847	1.2	White-4700K
HF <sup>2</sup> X/12/W3-847	1.2	White-4700K
HF <sup>2</sup> X/30/W3-847	1.2	White-4700K
HF <sup>2</sup> X/60/W3-847	1.2	White-4700K

**Compatible Power Supplies & Controls**

OT9/100-120/350 E (NAED 51525)  
OT9/10-24/350 DIM E (NAED 51526)  
OT3/120-240/350 (NAED51524)

## Maximum Ratings For HF<sup>2</sup>X

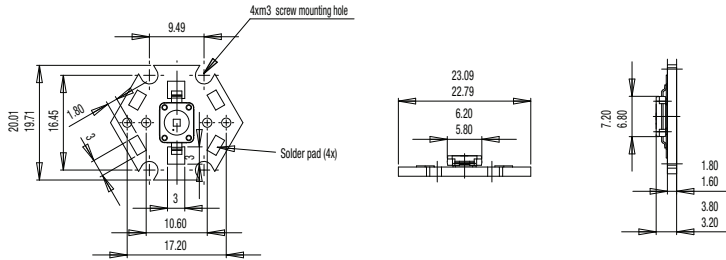
Parameter	Rating
Operating Temperature at T <sub>c</sub> -Point	-30...+85°C (-22...+149°F)
Storage Temperature	-40...+90°C (-40...+185°F)
Maximum Allowable Current (dc)	0.5 A
Maximum Reverse Voltage	0 V

Notes:

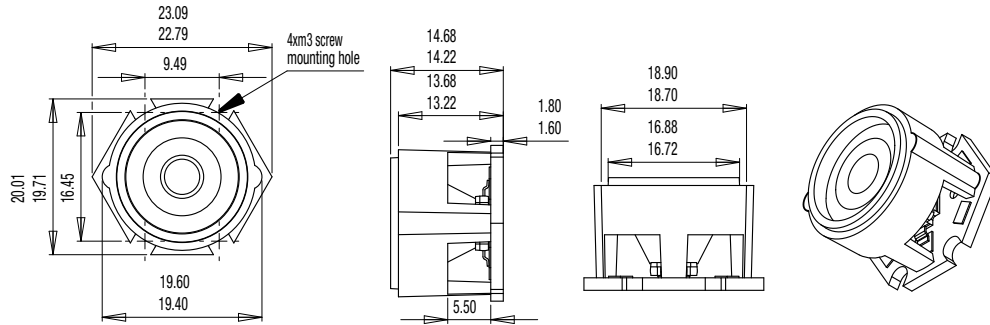
1. Exceeding maximum ratings may damage the LED module and pose potential safety hazards.
2. Elevated operating temperatures can be expected to negatively impact service life in terms of lumen output.
3. Incorrect wiring (i.e. reverse polarity) with constant current power supplies may damage the LED module.
4. Not intended for use with constant voltage power supplies.

## Dimensions All dimensions are in mm unless otherwise noted

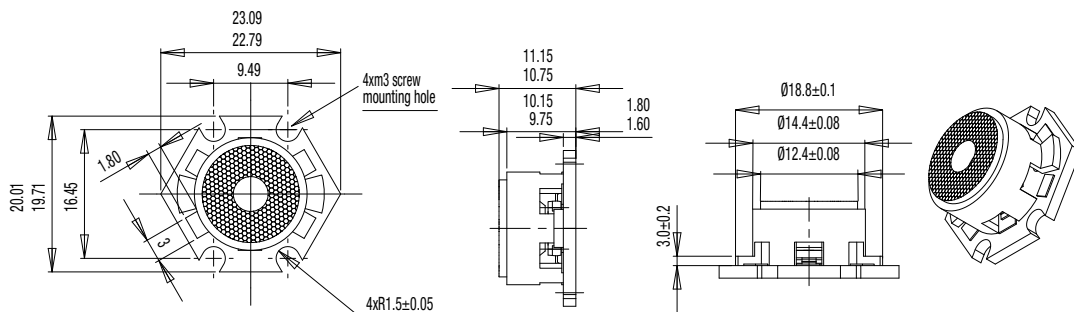
### HF<sup>2</sup>X without Lens Option – 120° Option



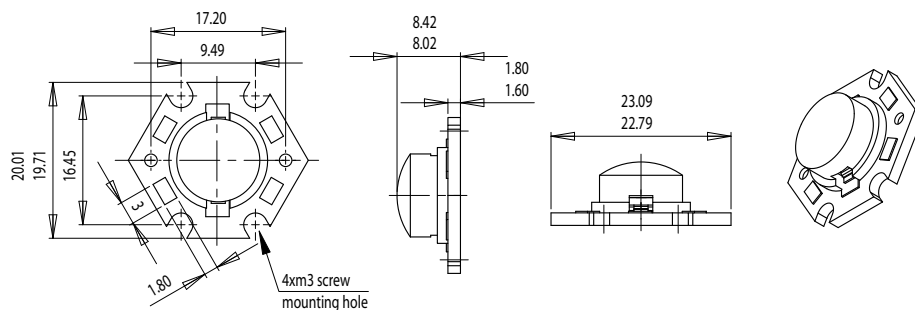
### HF<sup>2</sup>X with Lens Option – 12° Lens Option



### HF<sup>2</sup>X with Lens Option – 30° Lens Option



### HF<sup>2</sup>X with Lens Option – 60° Lens Option



## Safety Information

**WARNING: ONLY QUALIFIED PERSONNEL SHOULD PERFORM INSTALLATION.**

**TO AVOID ELECTRICAL SHOCK OR COMPONENT DAMAGE, DISCONNECT POWER BEFORE ATTEMPTING INSTALLATION OF THE POWER SUPPLIES AND/OR MODULES.**

Failure to install the power supplies and/or LED modules in accordance with the National Electric Code (NEC), all applicable Federal, State and local electric codes as well as the specific Underwriter's Laboratories (UL) safety standards for the installation, location and application may cause serious personal injury, death, property damage and/or product malfunction. These instructions are guidelines for installation of OSRAM LED modules and power supplies. Installation requirements may vary depending on the application. Licensed electricians should provide all installation services for connection of both primary and secondary (input/output) of the power supplies.

1. The LED module itself and all its components must not be subjected to mechanical stress.
2. Assembly must not damage or destroy conducting paths on the circuit board.
3. Installation of LED modules (with power supplies) should adhere to all applicable electrical and safety standards. Only qualified personnel should perform installations.
4. Correct electrical polarity needs to be observed. Wrong polarity may destroy the module.
5. Serial/electrical connection is recommended for the HF<sup>2</sup>X modules. Parallel electrical connection is not recommended. Unbalanced voltage drop can cause hazardous overload and damage the LED module.
6. Ensure that the power supply is of adequate power to operate the total load. For the OT 09/100-120/350E, OT09/10-24/350DIM/E and OT3/120-240/350 power supplies, the maximum number of HF<sup>2</sup>X modules per OT9 watt power supply is 6 modules and 3 modules per OT3 watt power supply.
7. Pay attention to standard ESD precautions when installing the module.
8. Dimming of the HF<sup>2</sup>X is possible using the Pulse Width Modulation (PWM) functionality of the OPTOTRONIC OT 09/10-24/350 DIM/E. Dimming through the regulation of current amplitude will result in a spectral color shift.
9. Damage by corrosion will not be honored as a materials defect claim. It is the user's responsibility to provide suitable protection against corrosive agents such as moisture, condensation and other harmful elements.
10. Modules may be hot to the touch. Use caution when handling.

The LED Module incorporates no protection against short circuits, overload or overheating. Therefore it is absolutely necessary to operate the modules with an electronically stabilized power supply offering protection against the above mentioned safety risks.

**OSRAM OPTOTRONIC power supplies are specifically designed with protection features for safe operation.**

When using power supplies other than OPTOTRONIC the following basic safety features are required in addition to any other application specific concerns and local safety codes:

- Short circuit protection
- Overload protection
- Overheat protection
- Correct output voltage, including consideration for ripple and spikes.

## Assembly Information/Application Notes

1. The module should be in good thermal contact with the designed metallic mounting surface. Use of an appropriate heat sink compound is recommended to eliminate air gaps. The LED module can be mounted using m3 screws and the screw holes/slots on the metal core circuit board.
2. To obtain maximum LED-lifetime please read carefully the recommended procedures concerning thermal management in our application note "Lifetime of LED-modules" before beginning construction of luminaires. This application note is available from your OSRAM SYLVANIA representative.
3. Module is intended for use with 350 mA constant current drive condition as is provided by the OT9/100-120/350, OT9/10-24/350 DIM E and OT3/120-240/350 (see PIB ECS052R2 for details). The module is not intended for use with constant voltage power supplies, including other OSRAM LED power supplies.
4. Installation of the HF<sup>2</sup>X must provide for thermal management to avoid premature failure of the product and to obtain expected service life. Service life (i.e. lumen depreciation) is primarily a function of LED temperature which is to be monitored on the circuit board at the designated "Tc-Point".
5. There is no exact installation prescription to obtaining an appropriate Tc-Point temperature because every fixture design is different. In general, the HF<sup>2</sup>X module should be mounted on a clean, flat metal surface with enough surface area to transfer the heat from the module to the surrounding air. The metal surface can be part of a conventional finned heat sink or can be part of the mass of the fixture itself.
6. Concerning fixture design, it is important to understand that once heat is transferred to a "heat sink", that heat must still be allowed to escape the "system". A heat sink transferring the thermal energy to the inside of an enclosed cavity may ultimately be of little use.
7. The fixture maker's strategy should be to design a prototype fixture and test that fixture in an appropriate ambient environment while monitoring the temperature at the Tc-Point which should be allowed enough time to reach thermal equilibrium. In the end, the heat sink areas from the chart below only represent a starting point for initial design work while the Tc-Point temperature serves as the empirical test of proper thermal management. Tc-Point temperature can be measured with a standard thermocouple in direct contact with the circuit board at the Tc-Point or by use of ML4C Series non-reversible OMEGALABELS ([www.omega.com](http://www.omega.com)) or equivalent.

## Ordering and Specification Information

Item Number	Ordering Description	Power (watts)	Operating Current (mA)	Viewing Angle	Lumens	Intensity (Cd)	Color Temperature
70184	HF²X/120/W3-854	1.2	350	120	45	15	White- 5400K
70191	HF²X/60/W3-854	1.2	350	60		33	White- 5400K
70201	HF²X/12/W3-854	1.2	350	12		675	White- 5400K
70202	HF²X/30/W3-854	1.2	350	30		110	White- 5400K
70192	HF²X/12/W3-733	1.2	350	12		45	White- 3300K
70164	HF²X/120/W3-733	1.2	350	120	33	10	White- 3300K
70193	HF²X/30/W3-733	1.2	350	30		75	White- 3300K
70194	HF²X/60/W3-733	1.2	350	60		22	White- 3300K
70190	HF²X/120/W3-847	1.2	350	120	*	*	White- 4700K
70174	HF²X/12/W3-847	1.2	350	12	*	*	White- 4700K
70176	HF²X/30/W3-847	1.2	350	30	*	*	White- 4700K
70189	HF²X/60/W3-847	1.2	350	60	*	*	White- 4700K

\* Data TBD

Packaging Notes: Case qty - 120 pcs. Minimum order qty - 6 pcs.

## Power Supply Ordering Information

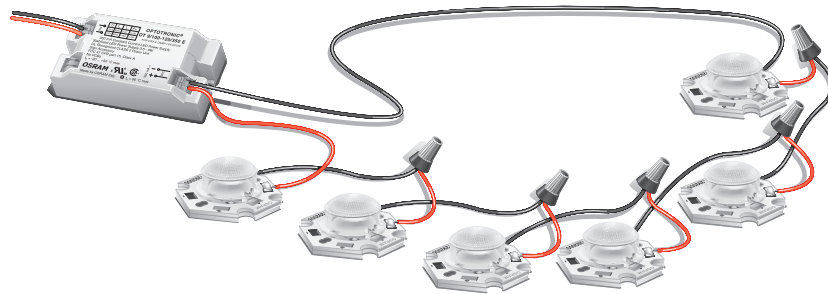
LED Description	OPTOTRONIC® 3W (51524) No. of Modules	OPTOTRONIC 9W (51525) No. of Modules	OPTOTRONIC 9W (51526) No. of Modules
HF²X/120/W3-XXX†	3	6	6
HF²X/12/W3-XXX†	3	6	6
HF²X/30/W3-XXX†	3	6	6
HF²X/60/W3-XXX†	3	6	6

† XXX represents color temperature designation. Consult Ordering and Specification Information table above for specific details.

## Ordering Guide

HF²X	/	120	/	W3-854
HF²X		Beam Angle		Color code – Color Temperature
LED module		12, 30, 60 and 120		W3-854= White, 5400 K

## Wiring Diagrams



OSRAM SYLVANIA  
National Customer  
Service and Sales Center  
18725 N. Union Street  
Westfield, IN 46074

### Industrial Commercial

Phone: 1-800-255-5042  
Fax: 1-800-255-5043

### National Accounts

Phone: 1-800-562-4671  
Fax: 1-800-562-4674

### OEM/Specialty Markets

Phone: 1-800-762-7191  
Fax: 1-800-762-7192

### Display/Optic

Phone: 1-888-677-2627  
Fax: 1-800-762-7192

In Canada  
OSRAM SYLVANIA LTD.  
Headquarters  
2001 Drew Road  
Mississauga, ON L5S 1S4

### Industrial Commercial

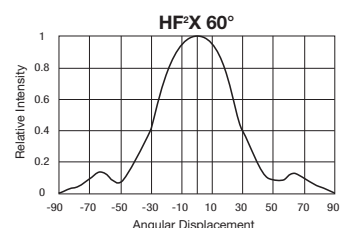
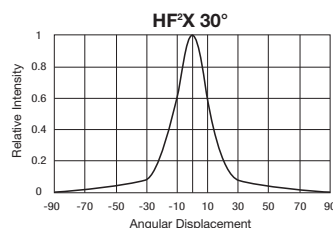
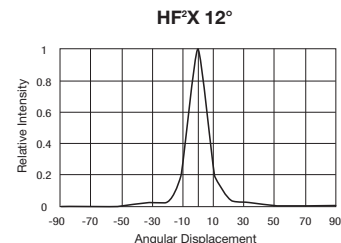
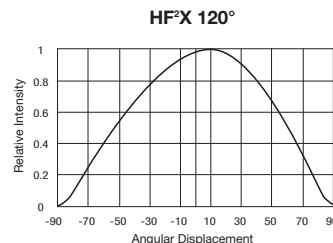
Phone: 1-800-263-2852  
Fax: 1-800-667-6772

### Special Markets

Phone: 1-800-265-2852  
Fax: 1-800-667-6772

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## Optical Specifications and Performance



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