

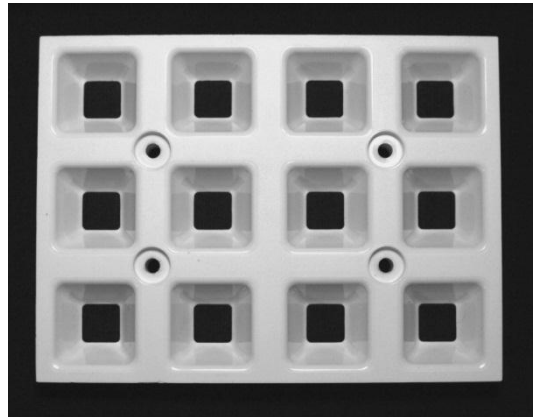


Twelve LED Troffer Reflector F4A-3x4-1-RS

- **White diffuse reflector**
- **12 - up optic in a 3 x 4 array**
- **3-inch x 4-inch footprint**
- **Constructed of highly efficient white Makrolon**
- **Designed for use with Cree XLamp LEDs (XP-E, XP-C, XP-G, XB-D, XT-E, XM-L, XM-L EasyWhite & MC-E)¹**
(Please contact Fraen for suitability of this reflector with other LEDs)

Typical applications are:

- Troffer fixtures
- General interior lighting
- Low bay fixtures
- Commercial lighting
- Architectural lighting
- Retrofit lighting



(1) XLamp and XP-E, XP-C, XP-G, XB-D, XT-E, XM-L, XM-L EasyWhite and MC-E are trademarks of Cree, Inc. For technical specification on Cree XLamp LEDs, please refer to the Cree website (www.cree.com/products/ledlamps.asp).

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For ordering information, please contact:

NAFTA Countries	<p>ARROW Telephone: 1-888-9LIGHT1 email: lightingsolutions@arrow.com</p>
European Countries	<p>Please contact Fraen S.r.l. for distributor's information Email: info@fraen.com</p>



General Characteristics

Materials

Reflector Material	Bayer Makrolon 6265, White
Operating Temperature range	-40° C / + 95° C
Storage Temperature range	-40° C / + 95°C

Please note that flow lines and weld lines on the external surfaces of the reflectors are acceptable if the optical performance of the lens is within the specification described in the section "OPTICAL CHARACTERISTICS"

Scope

This datasheet provides information about the 12-up F4A-3x4-1-RS diffuse white reflector.



Optical Characteristics – On-axis Intensity¹, Beam Angle², Field Angle³

LED	Beam Shape	On-axis Intensity (peak)	Beam Angle (FWHM)	Field Angle (FW10%)
XP-E Warm White	Square	0.52 cd/lm	82.2°	99.9°
XP-E Cool White	Square	0.52 cd/lm	82.2°	100.8°
XP-E Neutral White	Square	0.53 cd/lm	81.7°	99.9°
XP-C Warm White	Square	0.49 cd/lm	82.5°	98.1°
XP-C Cool White	Square	0.51 cd/lm	81.0°	99.8°
XP-C Neutral White	Square	0.51 cd/lm	82.2°	98.9°
XP-G Warm White	Square	0.49 cd/lm	83.6°	101.4°
XP-G Cool White	Square	0.48 cd/lm	83.9°	105.7°
XB-D Warm White	Square	0.51 cd/lm	82.2°	102.4°
XT-E Warm White	Square	0.53 cd/lm	81.7°	102.0°
XT-E Cool White	Square	0.51 cd/lm	82.1°	103.9°
XM-L Warm White	Square	0.52 cd/lm	83.5°	101.0°
XM-L Cool White	Square	0.51 cd/lm	83.5°	102.3°
XM-L Neutral White	Square	0.51 cd/lm	84.0°	101.8°
XM-L EasyWhite (2700°)	Square	0.51 cd/lm	84.4°	101.1°
XM-L EasyWhite (3000°)	Square	0.52 cd/lm	82.5°	101.4°
MC-E Dynamic White	Square	0.57 cd/lm	80.4°	99.7°

- (1) To calculate the on-axis intensity (cd), multiply the on-axis value, above, of the lens (cd/lm) by the total flux (lm) of the Cree XLamp LED used. See “Illumination Calculations” below. Luminous intensity depends on the flux binning and tolerances of the LEDs. Please refer to the Cree XLamp datasheets for more details on flux binning.
- (2) FWHM is the full angle where the beam intensity is half the on-axis peak intensity
- (3) Field angle is the full angle where the beam intensity is 10% of the on-axis peak intensity



Illumination Calculations

To calculate intensity (cd): Find the central spot “on-axis intensity” value in the table above, then multiply this value by the luminous flux (lm) from your LED (refer to the Cree XLamp datasheet for nominal lumen values.) For a more accurate calculation, refer to the intensity “ranking” (binning) tables on the datasheet for the specific LED.

Example calculations:

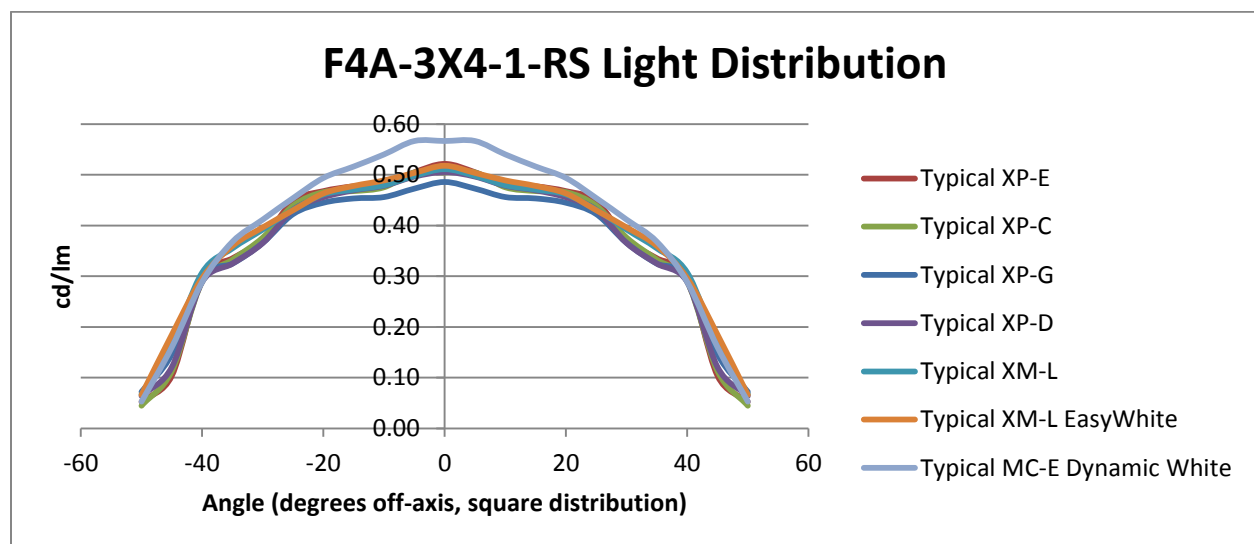
If the Fraen F4A-3x4-1-RS is used on a Cree Neutral White XM-L driven at 700 mA, the typical luminous flux of the LED is 250 lumens.

The calculation is: $(0.51 \text{ cd/lm}) \times (250 \text{ lumens}) = 127.5 \text{ candela on-axis intensity (one LED)}$.

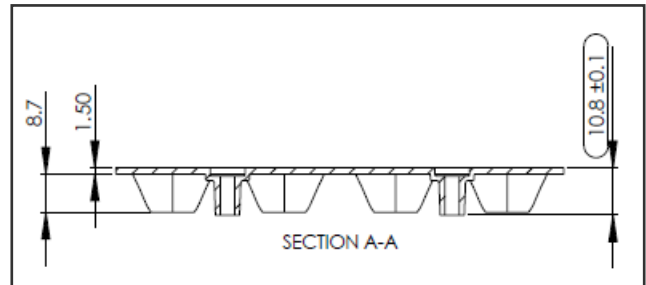
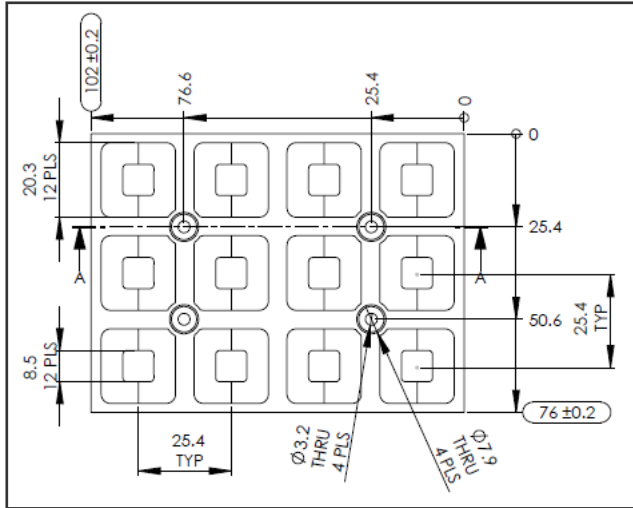
For 12 LEDs with a F4A-3X4-1-RS reflector: $12 \text{ LEDs} \times 127.5 \text{ candela/LED} = 1530 \text{ candela peak on-axis intensity}$.

One candela at 1-meter distance produces 1 Lux. This means the peak illuminance at 1 meter will be 1530 lux. The illuminance decreases as a function of the distance squared, so at 2 meters the peak illuminance will be $1530 / (2^2) = 383 \text{ lux}$. At 3 meters distance, the peak illuminance will be $1530 / (3^2) = 170 \text{ lux}$.

The beam angle specified in the table above is 84 degrees FWHM (full angular width measured where the beam intensity equals half the on-axis maximum intensity.) This means at 42 degrees off-axis (half of 84 degrees), the intensity should be half of 1530 candela, or 765 candela.



Mechanical Characteristics



F4A-3x4-1-RS – Front and Section Views



Ordering Part Numbers

F4A-3x4-1-RS

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Rev	Date	Author	Description
00	29February2012	J. Gilbert	Initial release