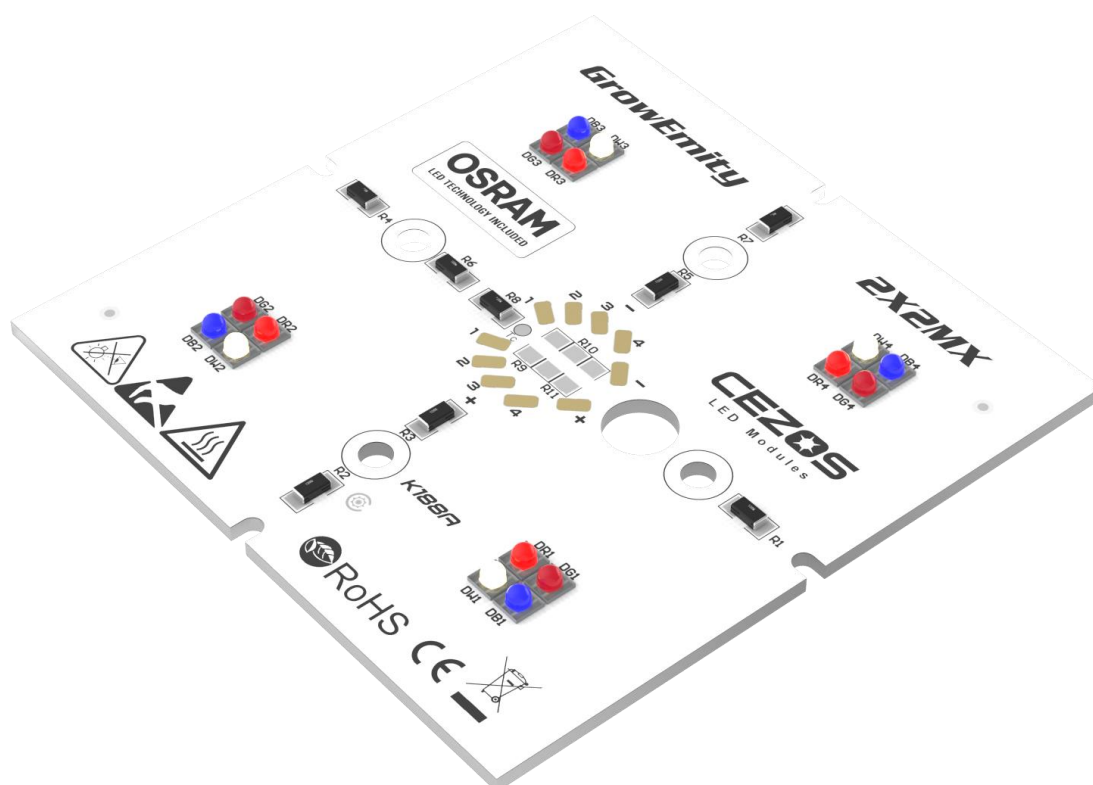


# CEZOS

## *GrowEmity 2x2MX - K188*



The GrowEmity LED light source allows to accelerate plant growth and increase harvest. It is even possible to regulate plant growth and blooming time. Unlike an artificial light sources, LED light sources have specially matched spectrum for specific plants. Additionally, LEDs generate more light and less heat than sodium lamp, allow for lighting from side of plants. LED light sources are used in artificial plantation without daylight.

**Possibility to choose up to four colors from the following (one set of 4 LEDs).**

Colour	$\lambda$ [nm] / CCT [K]	Input Current [mA]	Forward Voltage [V]	Power [W]	Radiant Power [mW] / Luminous Flux [lm]	PPF [ $\mu\text{mol/s}$ ]	PPF/W [ $\mu\text{mol/J}$ ]
RED	625	350	8,4	2,9	329	7,52	2,56
		500	8,8	4,4	466	10,64	2,41
		700	9,3	6,5	645	14,72	2,25
		800	9,6	7,6	728	16,61	2,17
		1000	10,1	10,1	893	20,40	2,02
HYPER RED	657	350	8,6	3,0	1700	9,22	3,06
		500	9,0	4,5	2397	13,00	2,89
		700	9,6	6,7	3247	17,61	2,62
		800	9,9	7,9	3706	20,10	2,53
		1000	10,3	10,3	4463	24,20	2,35
FAR RED	727	350	8,6	3,0	1700	9,22	3,06
		500	7,8	3,9	1495	0,90	0,23
		700	8,3	5,8	2025	1,22	0,21
		800	8,4	6,8	2311	1,40	0,21
		1000	8,9	8,9	2783	1,68	0,19
DEEP BLUE	455	350	11,4	4,0	2540	9,40	2,36
		500	11,6	5,8	3531	13,07	2,25
		700	11,9	8,3	4369	16,17	1,94
		800	12,0	9,6	4826	17,86	1,87
		1000	12,2	12,2	6096	22,56	1,84
BLUE	470	350	11,4	4,0	112	6,48	1,62
		500	11,7	5,9	148	8,56	1,46
		700	12,2	8,5	192	11,08	1,30
		800	12,2	9,8	211	12,19	1,25
		1000	12,6	12,6	249	14,40	1,14
TRUE GREEN	528	350	13,4	4,7	484	4,48	0,95
		500	13,7	6,9	631	5,84	0,85
		700	14,2	9,9	804	7,44	0,75
		800	14,2	11,4	880	8,15	0,72
		1000	14,7	14,7	1033	9,56	0,65
AMBER	617	350	8,4	2,9	357	7,88	2,68
		500	8,8	4,4	502	11,08	2,51
		700	9,4	6,5	685	15,12	2,31
		800	9,6	7,6	769	16,99	2,22
		1000	10,1	10,1	938	20,72	2,05
YELLOW	590	350	8,8	3,1	328	3,48	1,13
		500	9,2	4,6	449	4,76	1,03
		700	9,8	6,8	573	6,08	0,89
		800	9,8	7,9	615	6,52	0,83
		1000	10,4	10,4	697	7,40	0,71
WHITE	5000	350	11,0	3,9	592	7,84	2,04
		500	11,4	5,7	810	10,48	1,84
		700	11,8	8,3	1065	13,60	1,65
		800	11,9	9,5	1171	14,96	1,57
		1000	13,3	13,3	1357	17,34	1,35

Radiant Power for Hyper Red, Far Red, Deep Blue. Luminous flux for rest of colour.

CCT only for White colour.

## CALCULATED PARAMETERS AT $T_j = 25^{\circ}\text{C}$

Name	GrowEmity 2x2MX – K188
Size	70x70 mm
Power Supply Type	Constant Current (CC)
Number Of Channels	4
Power Supply Current	Max. 1000 mA
Far Red LED	OSRAM - GF CSSPM1.24
Red LED	OSRAM - GH CSSPM1.24
Deep Blue LED	OSRAM - GD CSSPM1.14
White LED	OSRAM - GW CSHPM1.PM
Ambient Temperature	0 - 40°C
Material Type / Thickness	MCPCB / 1,5 mm

## GROWEMITY 2x2MX RFBW - K188

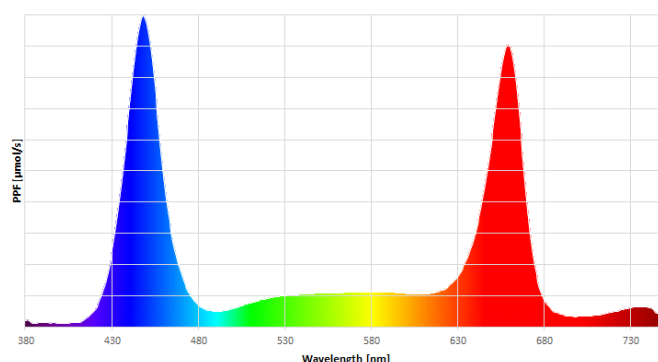
	Input Current [mA]	Forward Voltage [V]	Power [W]	Power [W]	Colour	$\lambda$ [nm] / CCT [K]	Radiant Power [mW] / Luminous Flux [lm]	PPF [ $\mu\text{mol/s}$ ]	PPF/W [ $\mu\text{mol/J}$ ]	PPF [ $\mu\text{mol/s}$ ]	PPF/W [ $\mu\text{mol/J}$ ]	Article Number
GrowEmity 3x11 RFBW - K177	350	8,6	3,0	13,4	RED	657	1700	9,22	3,06	27,10	2,02	Q0-070070-RFBW-C1000-K188
		7,4	2,6		FAR RED	727	1060	0,64	0,25			
		11,4	4,0		DEEP BLUE	455	2540	9,40	2,36			
		11,0	3,9		WHITE	5000	592	7,84	2,04			
	500	9,0	4,5	19,9	RED	657	2397	13,00	2,89	37,45	1,88	Q0-070070-RFBW-C1000-K188
		7,8	3,9		FAR RED	727	1495	0,90	0,23			
		11,6	5,8		DEEP BLUE	455	3531	13,07	2,25			
		11,4	5,7		WHITE	5000	810	10,48	1,84			
	700	9,6	6,7	29,1	RED	657	3247	17,61	2,62	48,60	1,67	Q0-070070-RFBW-C1000-K188
		8,3	5,8		FAR RED	727	2025	1,22	0,21			
		11,9	8,3		DEEP BLUE	455	4369	16,17	1,94			
		11,9	8,3		WHITE	5000	1065	13,60	1,65			
	800	9,9	7,9	33,8	RED	657	3706	20,10	2,53	54,31	1,61	Q0-070070-RFBW-C1000-K188
		8,4	6,8		FAR RED	727	2311	1,40	0,21			
		12,0	9,6		DEEP BLUE	455	4826	17,86	1,87			
		11,9	9,5		WHITE	5000	1171	14,96	1,57			

Parameters were calculated for temperatures  $T_j = 25^{\circ}\text{C}$

Radiant power and wavelength for color LEDs; Luminous flux and color temperature for white LEDs.

Values of these parameters were calculated for default bin and with tolerances of 15%.

Different type of plants have different requirements for the best growth, so to maximized effect, GrowEmity light sources have many sets of LEDs configuration. Most commands LED types are: red, far red, hyper red, blue, deep blue and white with different colour temperature. Some examples are below.

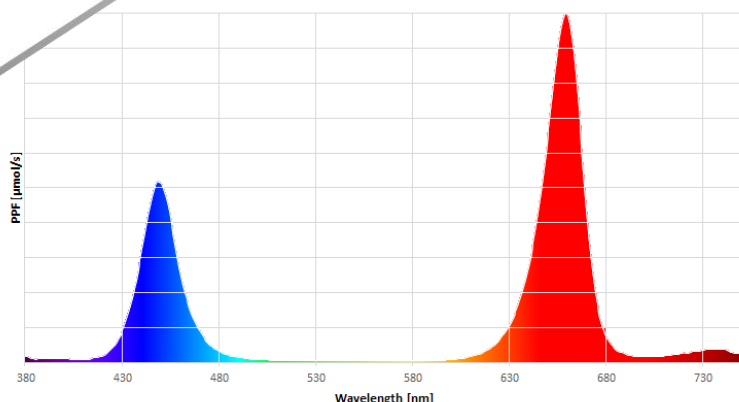
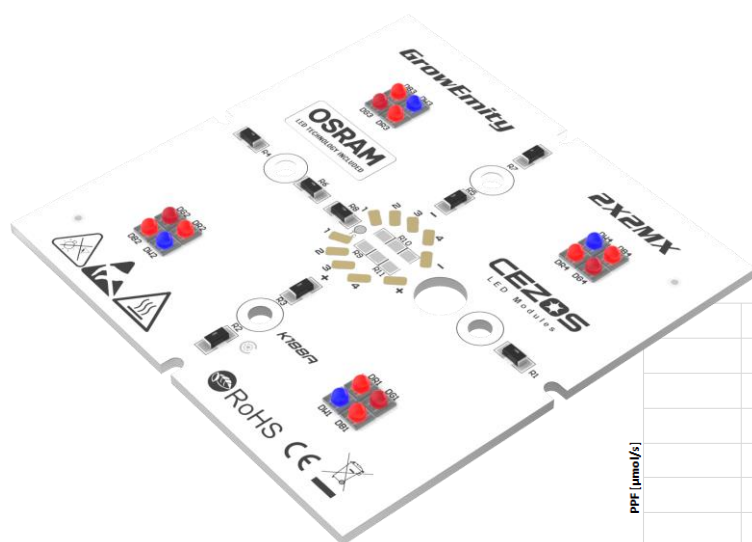


## GROWEMITY 2x2MX RRFB - K188

	Input Current [mA]	Forward Voltage [V]	Power [W]	Total Power [W]	Colour	$\lambda$ [nm]	Radiant Power [mW]	PPF [ $\mu\text{mol/s}$ ]	PPF/W [ $\mu\text{mol/J}$ ]	Total PPF [ $\mu\text{mol/s}$ ]	Total PPF/W [ $\mu\text{mol/J}$ ]	Article Number
GrowEmity 2x2MX RRFB - K188	350	8,6	3,0	12,6	RED	657	1700	9,22	3,06	28,48	2,26	Q0-070070-RRFB-C1000-K188
		8,6	3,0		RED	657	1700	9,22	3,06			
		7,4	2,6		FAR RED	727	1060	0,64	0,25			
		11,4	4,0		DEEP BLUE	455	2540	9,40	2,36			
	500	9,0	4,5	18,7	RED	657	2397	13,00	2,89	39,97	2,14	Q0-070070-RRFB-C1000-K188
		9,0	4,5		RED	657	2397	13,00	2,89			
		7,8	3,9		FAR RED	727	1495	0,90	0,23			
		11,6	5,8		DEEP BLUE	455	3531	13,07	2,25			
	700	9,6	6,7	27,6	RED	657	3247	17,61	2,62	52,61	1,91	Q0-070070-RRFB-C1000-K188
		9,6	6,7		RED	657	3247	17,61	2,62			
		8,3	5,8		FAR RED	727	2025	1,22	0,21			
		11,9	8,3		DEEP BLUE	455	4369	16,17	1,94			
	800	9,9	7,9	32,2	RED	657	3706	20,10	2,53	59,45	1,85	Q0-070070-RRFB-C1000-K188
		9,9	7,9		RED	657	3706	20,10	2,53			
		8,4	6,8		FAR RED	727	2311	1,40	0,21			
		12,0	9,6		DEEP BLUE	455	4826	17,86	1,87			

Parameters were calculated for temperatures  $T_J = 25^\circ\text{C}$

Values of these parameters were calculated for default bin and with tolerances of 15%.



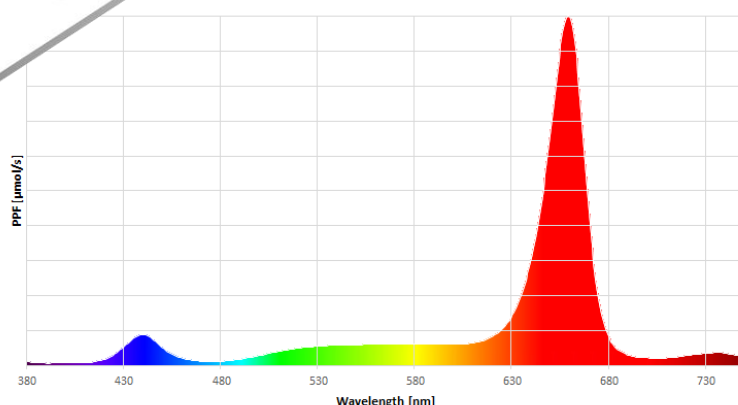
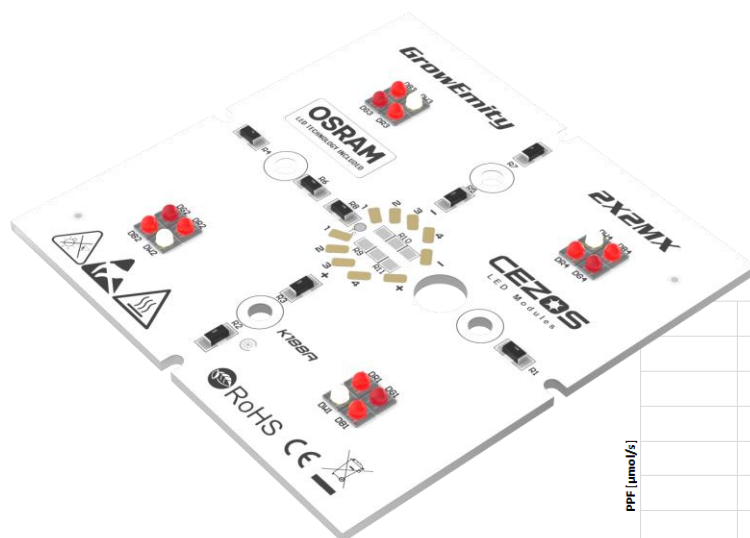
## GROWEMITY 2x2MX RRFW - K188

	Input Current [mA]	Forward Voltage [V]	Power [W]	Total Power [W]	Colour	$\lambda$ [nm] / CCT [K]	Radiant Power [mW] / Luminous Flux [lm]	PPF [ $\mu\text{mol/s}$ ]	PPF/W [ $\mu\text{mol/J}$ ]	Total PPF [ $\mu\text{mol/s}$ ]	Total PPF/W [ $\mu\text{mol/J}$ ]	Article Number
GrowEmity 2x2MX RRFW - K188	350	8,6	3,0	12,5	RED	657	1700	9,22	3,06	26,92	2,16	Q0-070070-RRFW-C1000-K188
		8,6	3,0		RED	657	1700	9,22	3,06			
		7,4	2,6		FAR RED	727	1060	0,64	0,25			
		11,0	3,9		WHITE	5000	592	7,84	2,04			
	500	9,0	4,5	18,6	RED	657	2397	13,00	2,89	37,38	2,01	Q0-070070-RRFW-C1000-K188
		9,0	4,5		RED	657	2397	13,00	2,89			
		7,8	3,9		FAR RED	727	1495	0,90	0,23			
		11,4	5,7		WHITE	5000	810	10,48	1,84			
	700	9,6	6,7	27,5	RED	657	3247	17,61	2,62	50,04	1,82	Q0-070070-RRFW-C1000-K188
		9,6	6,7		RED	657	3247	17,61	2,62			
		8,3	5,8		FAR RED	727	2025	1,22	0,21			
		11,8	8,3		WHITE	5000	1065	13,60	1,65			
	800	9,9	7,9	32,2	RED	657	3706	20,10	2,53	56,55	1,76	Q0-070070-RRFW-C1000-K188
		9,9	7,9		RED	657	3706	20,10	2,53			
		8,4	6,8		FAR RED	727	2311	1,40	0,21			
		11,9	9,5		WHITE	5000	1171	14,96	1,57			

Parameters were calculated for temperatures  $T_J = 25^\circ\text{C}$

Radiant power and wavelength for color LEDs; Luminous flux and color temperature for white LEDs.

Values of these parameters were calculated for default bin and with tolerances of 15%.



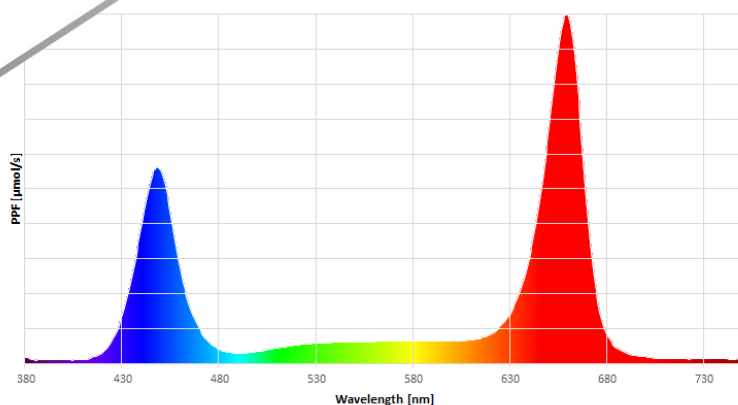
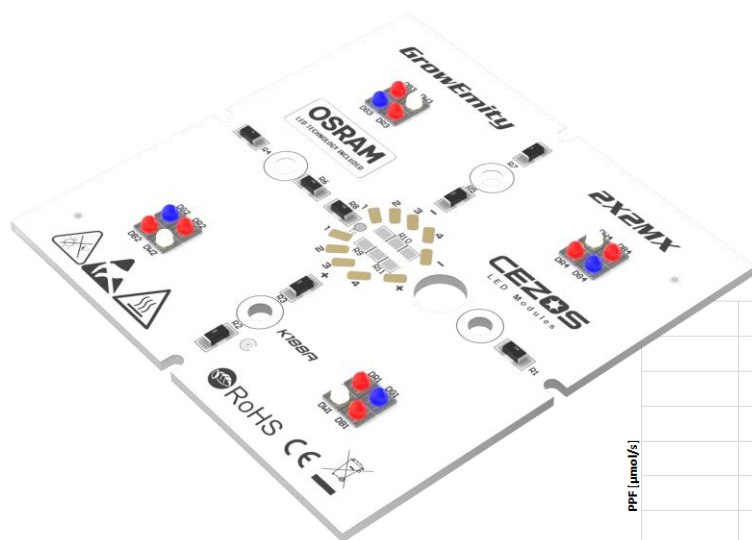
## GROWEMITY 2x2MX RRBW - K188

	Input Current [mA]	Forward Voltage [V]	Power [W]	Power [W]	Colour	$\lambda$ [nm] / CCT [K]	Radiant Power [mW] / Luminous Flux [lm]	PPF [ $\mu\text{mol/s}$ ]	PPF/W [ $\mu\text{mol/J}$ ]	PPF [ $\mu\text{mol/s}$ ]	PPF/W [ $\mu\text{mol/J}$ ]	Article Number
GrowEmity 2x2MX RRBW - K188	350	8,6	3,0	13,9	RED	657	1700	9,22	3,06	35,68	2,57	Q0-070070-RRBW-C1000-K188
		8,6	3,0		RED	657	1700	9,22	3,06			
		11,4	4,0		DEEP BLUE	455	2540	9,40	2,36			
		11,0	3,9		WHITE	5000	592	7,84	2,04			
	500	9,0	4,5	20,5	RED	657	2397	13,00	2,89	49,55	2,42	Q0-070070-RRBW-C1000-K188
		9,0	4,5		RED	657	2397	13,00	2,89			
		11,6	5,8		DEEP BLUE	455	3531	13,07	2,25			
		11,4	5,7		WHITE	5000	810	10,48	1,84			
	700	9,6	6,7	30,0	RED	657	3247	17,61	2,62	64,99	2,17	Q0-070070-RRBW-C1000-K188
		9,6	6,7		RED	657	3247	17,61	2,62			
		11,9	8,3		DEEP BLUE	455	4369	16,17	1,94			
		11,8	8,3		WHITE	5000	1065	13,60	1,65			
	800	9,9	7,9	35,0	RED	657	3706	20,10	2,53	73,02	2,09	Q0-070070-RRBW-C1000-K188
		9,9	7,9		RED	657	3706	20,10	2,53			
		12,0	9,6		DEEP BLUE	455	4826	17,86	1,87			
		11,9	9,5		WHITE	5000	1171	14,96	1,57			

Parameters were calculated for temperatures  $T_J = 25^\circ\text{C}$

Radiant power and wavelength for color LEDs; Luminous flux and color temperature for white LEDs.

Values of these parameters were calculated for default bin and with tolerances of 15%.

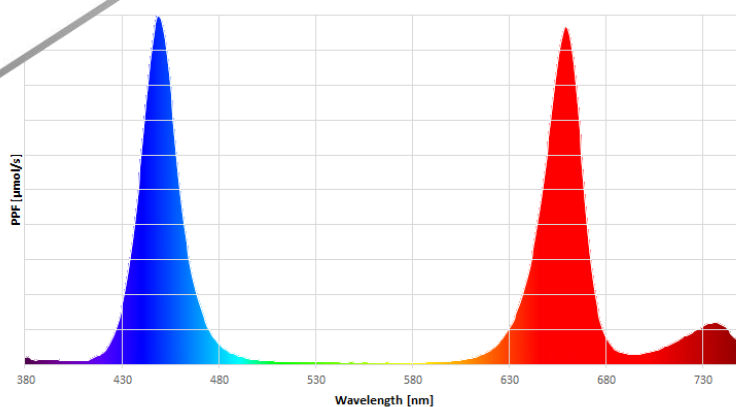
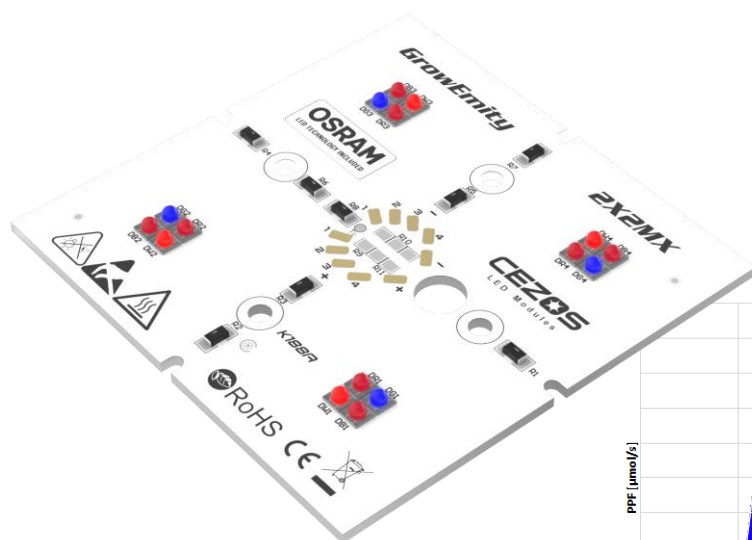


## GROWEMITY 2x2MX RFFB - K188

	Input Current [mA]	Forward Voltage [V]	Power [W]	Total Power [W]	Colour	$\lambda$ [nm]	Radiant Power [mW]	PPF [ $\mu\text{mol/s}$ ]	PPF/W [ $\mu\text{mol/J}$ ]	Total PPF [ $\mu\text{mol/s}$ ]	Total PPF/W [ $\mu\text{mol/J}$ ]	Article Number
GrowEmity 2x2MX RFFB - K188	350	8,6	3,0	12,18	RED	657	1700	9,22	3,06	19,90	1,63	Q0-070070-RFFB-C1000-K188
		7,4	2,6		FAR RED	727	1060	0,64	0,25			
		7,4	2,6		FAR RED	727	1060	0,64	0,25			
		11,4	4,0		DEEP BLUE	455	2540	9,40	2,36			
	500	9,0	4,5	18,1	RED	657	2397	13,00	2,89	27,87	1,54	Q0-070070-RFFB-C1000-K188
		7,8	3,9		FAR RED	727	1495	0,90	0,23			
		7,8	3,9		FAR RED	727	1495	0,90	0,23			
		11,6	5,8		DEEP BLUE	455	3531	13,07	2,25			
	700	9,6	6,7	26,6	RED	657	3247	17,61	2,62	36,22	1,36	Q0-070070-RFFB-C1000-K188
		8,3	5,8		FAR RED	727	2025	1,22	0,21			
		8,3	5,8		FAR RED	727	2025	1,22	0,21			
		11,9	8,3		DEEP BLUE	455	4369	16,17	1,94			
	800	9,9	7,9	31,0	RED	657	3706	20,10	2,53	40,75	1,31	Q0-070070-RFFB-C1000-K188
		8,4	6,8		FAR RED	727	2311	1,40	0,21			
		8,4	6,8		FAR RED	727	2311	1,40	0,21			
		12,0	9,6		DEEP BLUE	455	4826	17,86	1,87			

Parameters were calculated for temperatures  $T_J = 25^\circ\text{C}$

Values of these parameters were calculated for default bin and with tolerances of 15%.



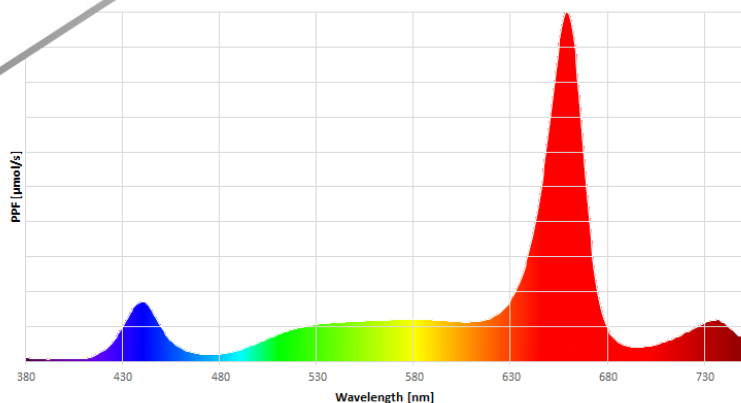
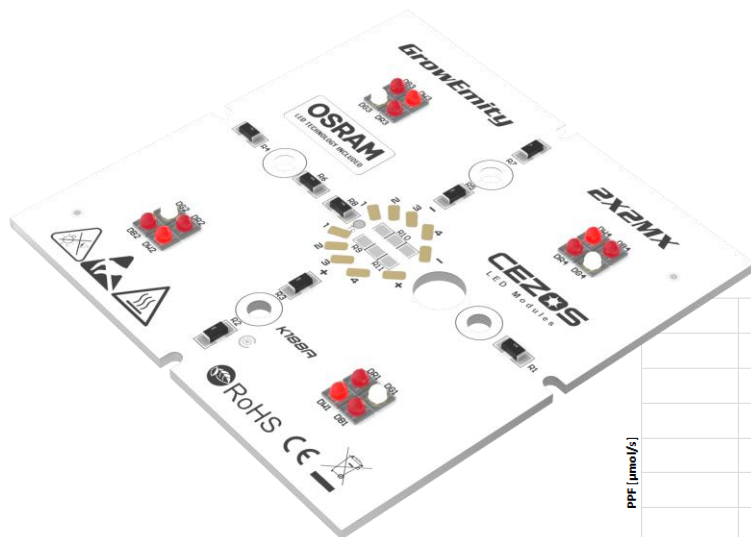
## GROWEMITY 2x2MX RFFW - K188

	Input Current [mA]	Forward Voltage [V]	Power [W]	Total Power [W]	Colour	$\lambda$ [nm] / CCT [K]	Radiant Power [mW] / Luminous Flux [lm]	PPF [ $\mu\text{mol/s}$ ]	PPF/W [ $\mu\text{mol/J}$ ]	Total PPF [ $\mu\text{mol/s}$ ]	Total PPF/W [ $\mu\text{mol/J}$ ]	Article Number
GrowEmity 3x11 RFFW - K177	350	8,6	3,0	12,0	RED	657	1700	9,22	3,06	18,34	1,52	Q0-070070-RFFW-C1000-K188
		7,4	2,6		FAR RED	727	1060	0,64	0,25			
		7,4	2,6		FAR RED	727	1060	0,64	0,25			
		11,0	3,9		WHITE	5000	592	7,84	2,04			
	500	9,0	4,5	18,0	RED	657	2397	13,00	2,89	25,29	1,40	Q0-070070-RFFW-C1000-K188
		7,8	3,9		FAR RED	727	1495	0,90	0,23			
		7,8	3,9		FAR RED	727	1495	0,90	0,23			
		11,4	5,7		WHITE	5000	810	10,48	1,84			
	700	9,6	6,7	26,6	RED	657	3247	17,61	2,62	33,66	1,27	Q0-070070-RFFW-C1000-K188
		8,3	5,8		FAR RED	727	2025	1,22	0,21			
		8,3	5,8		FAR RED	727	2025	1,22	0,21			
		11,8	8,3		WHITE	5000	1065	13,60	1,65			
	800	9,9	7,9	31,0	RED	657	3706	20,10	2,53	37,85	1,22	Q0-070070-RFFW-C1000-K188
		8,4	6,8		FAR RED	727	2311	1,40	0,21			
		8,4	6,8		FAR RED	727	2311	1,40	0,21			
		11,9	9,5		WHITE	5000	1171	14,96	1,57			

Parameters were calculated for temperatures  $T_J = 25^\circ\text{C}$

Radiant power and wavelength for color LEDs; Luminous flux and color temperature for white LEDs.

Values of these parameters were calculated for default bin and with tolerances of 15%.





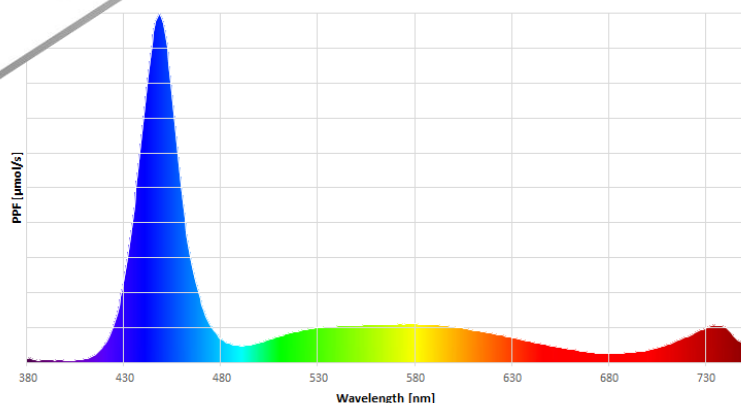
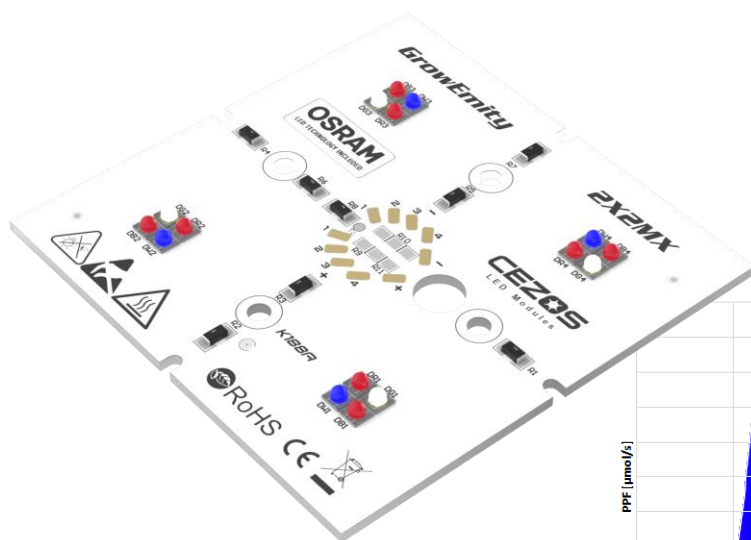
## GROWEMITY 2x2MX FFBW - K188

	Input Current [mA]	Forward Voltage [V]	Power [W]	Total Power [W]	Colour	$\lambda$ [nm] / CCT [K]	Radiant Power [mW] / Luminous Flux [lm]	PPF [ $\mu\text{mol/s}$ ]	PPF/W [ $\mu\text{mol/J}$ ]	Total PPF [ $\mu\text{mol/s}$ ]	Total PPF/W [ $\mu\text{mol/J}$ ]	Article Number
GrowEmity 2x2MX FFBW - K188	350	7,4	2,6	13,0	FAR RED	727	1060	0,64	0,25	18,52	1,42	Q0-070070-FFBW-C1000-K188
		7,4	2,6		FAR RED	727	1060	0,64	0,25			
		11,4	4,0		DEEP BLUE	455	2540	9,40	2,36			
		11,0	3,9		WHITE	5000	592	7,84	2,04			
	500	7,8	3,9	19,3	FAR RED	727	1495	0,90	0,23	25,35	1,31	Q0-070070-FFBW-C1000-K188
		7,8	3,9		FAR RED	727	1495	0,90	0,23			
		11,6	5,8		DEEP BLUE	455	3531	13,07	2,25			
		11,4	5,7		WHITE	5000	810	10,48	1,84			
	700	8,3	5,8	28,2	FAR RED	727	2025	1,22	0,21	32,21	1,14	Q0-070070-FFBW-C1000-K188
		8,3	5,8		FAR RED	727	2025	1,22	0,21			
		11,9	8,3		DEEP BLUE	455	4369	16,17	1,94			
		11,8	8,3		WHITE	5000	1065	13,60	1,65			
	800	8,4	6,8	32,6	FAR RED	727	2311	1,40	0,21	35,61	1,09	Q0-070070-FFBW-C1000-K188
		8,4	6,8		FAR RED	727	2311	1,40	0,21			
		12,0	9,6		DEEP BLUE	455	4826	17,86	1,87			
		11,9	9,5		WHITE	5000	1171	14,96	1,57			

Parameters were calculated for temperatures  $T_J = 25^\circ\text{C}$

Radiant power and wavelength for color LEDs; Luminous flux and color temperature for white LEDs.

Values of these parameters were calculated for default bin and with tolerances of 15%.

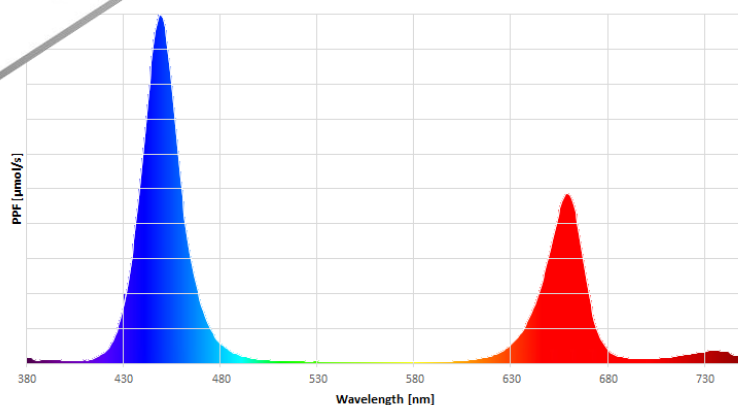
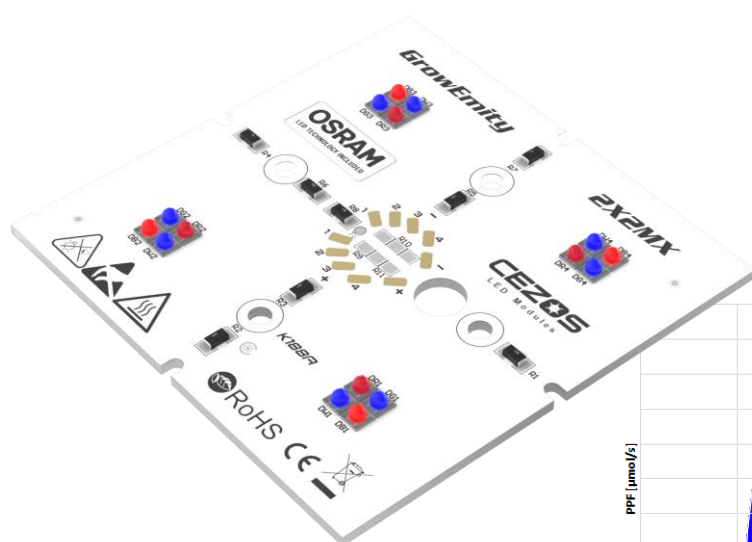


## GROWEMITY 2x2MX RFBB - K188

	Input Current [mA]	Forward Voltage [V]	Power [W]	Total Power [W]	Colour	$\lambda$ [nm]	Radiant Power [mW]	PPF [ $\mu\text{mol/s}$ ]	PPF/W [ $\mu\text{mol/J}$ ]	Total PPF [ $\mu\text{mol/s}$ ]	Total PPF/W [ $\mu\text{mol/J}$ ]	Article Number
GrowEmity 3x11 RFBB - K177	350	8,6	3,0	13,6	RED	657	1700	9,22	3,06	28,66	2,11	Q0-070070-RFBB-C1000-K188
		7,4	2,6		FAR RED	727	1060	0,64	0,25			
		11,4	4,0		DEEP BLUE	455	2540	9,40	2,36			
		11,4	4,0		DEEP BLUE	455	2540	9,40	2,36			
	500	9,0	4,5	20,0	RED	657	2397	13,00	2,89	40,03	2,00	Q0-070070-RFBB-C1000-K188
		7,8	3,9		FAR RED	727	1495	0,90	0,23			
		11,6	5,8		DEEP BLUE	455	3531	13,07	2,25			
		11,6	5,8		DEEP BLUE	455	3531	13,07	2,25			
	700	9,6	6,7	29,1	RED	657	3247	17,61	2,62	51,17	1,76	Q0-070070-RFBB-C1000-K188
		8,3	5,8		FAR RED	727	2025	1,22	0,21			
		11,9	8,3		DEEP BLUE	455	4369	16,17	1,94			
		11,9	8,3		DEEP BLUE	455	4369	16,17	1,94			
	800	9,9	7,9	33,8	RED	657	3706	20,10	2,53	57,21	1,69	Q0-070070-RFBB-C1000-K188
		8,4	6,8		FAR RED	727	2311	1,40	0,21			
		12,0	9,6		DEEP BLUE	455	4826	17,86	1,87			
		12,0	9,6		DEEP BLUE	455	4826	17,86	1,87			

Parameters were calculated for temperatures  $T_J = 25^\circ\text{C}$

Values of these parameters were calculated for default bin and with tolerances of 15%.



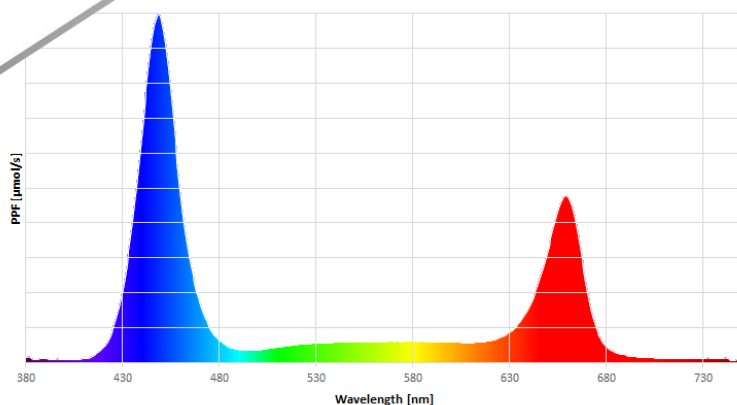
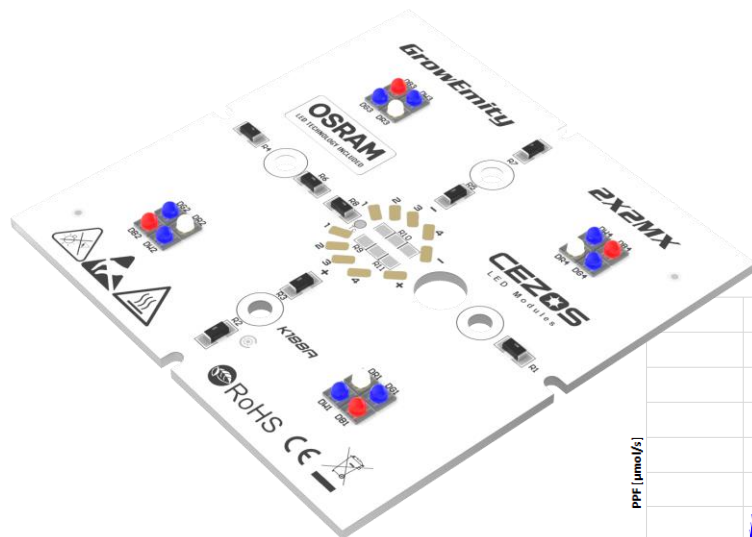
## GROWEMITY 2x2MX RBBW - K188

	Input Current [mA]	Forward Voltage [V]	Power [W]	Total Power [W]	Colour	$\lambda$ [nm] / CCT [K]	Radiant Power [mW] / Luminous Flux [lm]	PPF [ $\mu\text{mol/s}$ ]	PPF/W [ $\mu\text{mol/J}$ ]	Total PPF [ $\mu\text{mol/s}$ ]	Total PPF/W [ $\mu\text{mol/J}$ ]	Article Number
GrowEmity 2x2 RBBW - K188	350	8,6	3,0	14,8	RED	657	1700	9,22	3,06	35,86	2,42	Q0-070070-RBBW-C1000-K188
		11,4	4,0		DEEP BLUE	455	2540	9,40	2,36			
		11,4	4,0		DEEP BLUE	455	2540	9,40	2,36			
		11,0	3,9		WHITE	5000	592	7,84	2,04			
	500	9,0	4,5	21,8	RED	657	2397	13,00	2,89	49,61	2,28	Q0-070070-RBBW-C1000-K188
		11,6	5,8		DEEP BLUE	455	3531	13,07	2,25			
		11,6	5,8		DEEP BLUE	455	3531	13,07	2,25			
		11,4	5,7		WHITE	5000	810	10,48	1,84			
	700	9,6	6,7	31,6	RED	657	3247	17,61	2,62	63,55	2,01	Q0-070070-RBBW-C1000-K188
		11,9	8,3		DEEP BLUE	455	4369	16,17	1,94			
		11,9	8,3		DEEP BLUE	455	4369	16,17	1,94			
		11,8	8,3		WHITE	5000	1065	13,60	1,65			
	800	9,9	7,9	36,6	RED	657	3706	20,10	2,53	70,78	1,93	Q0-070070-RBBW-C1000-K188
		12,0	9,6		DEEP BLUE	455	4826	17,86	1,87			
		12,0	9,6		DEEP BLUE	455	4826	17,86	1,87			
		11,9	9,5		WHITE	5000	1171	14,96	1,57			

Parameters were calculated for temperatures  $T_J = 25^\circ\text{C}$

Radiant power and wavelength for color LEDs; Luminous flux and color temperature for white LEDs.

Values of these parameters were calculated for default bin and with tolerances of 15%.



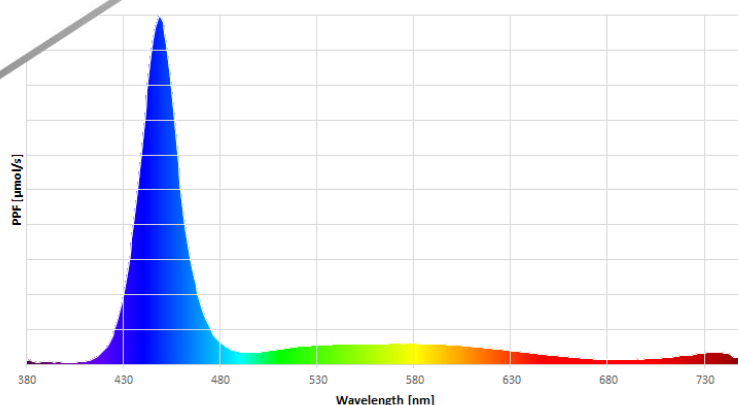
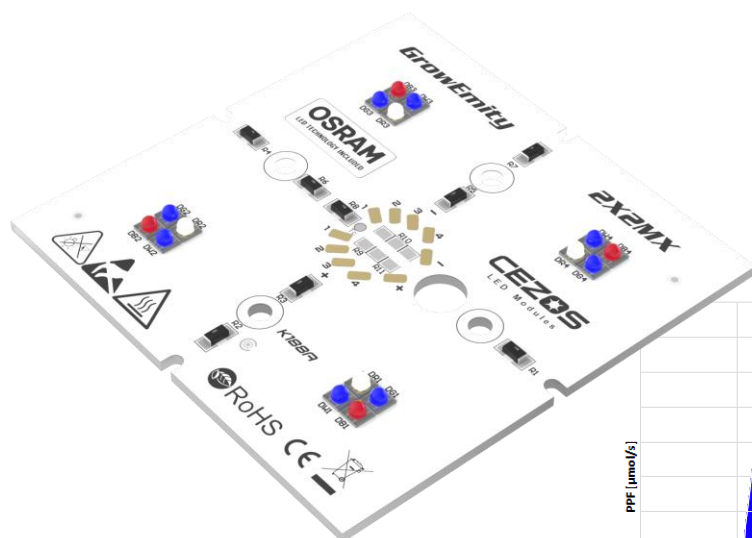
## GROWEMITY 2x2MX FBBW - K188

	Input Current [mA]	Forward Voltage [V]	Power [W]	Total Power [W]	Colour	$\lambda$ [nm] / CCT [K]	Radiant Power [mW] / Luminous Flux [lm]	PPF [ $\mu\text{mol/s}$ ]	PPF/W [ $\mu\text{mol/J}$ ]	Total PPF [ $\mu\text{mol/s}$ ]	Total PPF/W [ $\mu\text{mol/J}$ ]	Article Number
GrowEmity 2x2 FBBW - K188	350	2,6	2,6	14,4	FAR RED	727	1060	0,64	0,25	27,28	1,89	Q0-070070-FBBW-C1000-K188
		4,0	4,0		DEEP BLUE	455	2540	9,40	2,36			
		4,0	4,0		DEEP BLUE	455	2540	9,40	2,36			
		3,9	3,9		WHITE	5000	592	7,84	2,04			
	500	3,9	3,9	21,2	FAR RED	727	1495	0,90	0,23	37,51	1,77	Q0-070070-FBBW-C1000-K188
		5,8	5,8		DEEP BLUE	455	3531	13,07	2,25			
		5,8	5,8		DEEP BLUE	455	3531	13,07	2,25			
		5,7	5,7		WHITE	5000	810	10,48	1,84			
	700	5,8	5,8	30,7	FAR RED	727	2025	1,22	0,21	47,16	1,54	Q0-070070-FBBW-C1000-K188
		8,3	8,3		DEEP BLUE	455	4369	16,17	1,94			
		8,3	8,3		DEEP BLUE	455	4369	16,17	1,94			
		8,3	8,3		WHITE	5000	1065	13,60	1,65			
	800	6,8	6,8	35,4	FAR RED	727	2311	1,40	0,21	52,08	1,47	Q0-070070-FBBW-C1000-K188
		9,6	9,6		DEEP BLUE	455	4826	17,86	1,87			
		9,6	9,6		DEEP BLUE	455	4826	17,86	1,87			
		9,5	9,5		WHITE	5000	1171	14,96	1,57			

Parameters were calculated for temperatures  $T_J = 25^\circ\text{C}$

Radiant power and wavelength for color LEDs; Luminous flux and color temperature for white LEDs.

Values of these parameters were calculated for default bin and with tolerances of 15%.



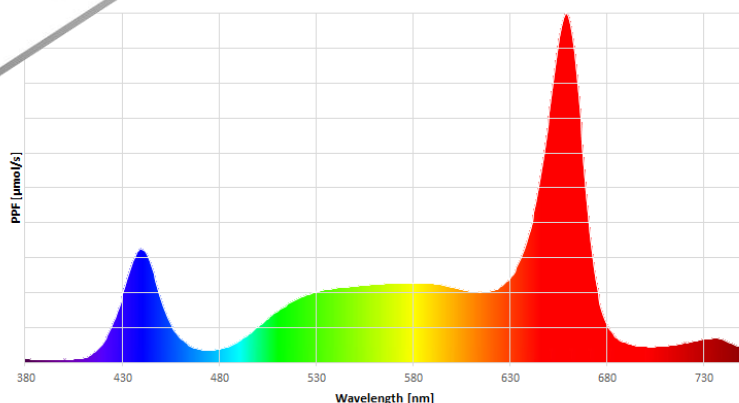
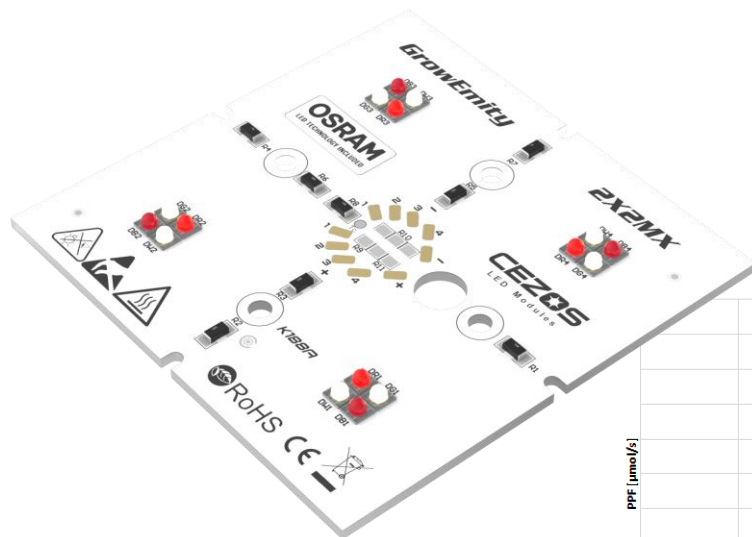
## GROWEMITY 2x2MX RFWW - K188

	Input Current [mA]	Forward Voltage [V]	Power [W]	Total Power [W]	Colour	$\lambda$ [nm] / CCT [K]	Radiant Power [mW] / Luminous Flux [lm]	PPF [ $\mu\text{mol/s}$ ]	PPF/W [ $\mu\text{mol/J}$ ]	Total PPF [ $\mu\text{mol/s}$ ]	Total PPF/W [ $\mu\text{mol/J}$ ]	Article Number
GrowEmity 2x2 RFWW - K188	350	8,6	3,0	13,3	RED	657	1700	9,22	3,06	25,54	1,92	Q0-070070-RFWW-C1000-K188
		7,4	2,6		FAR RED	727	1060	0,64	0,25			
		11,0	3,9		WHITE	5000	592	7,84	2,04			
		11,0	3,9		WHITE	5000	592	7,84	2,04			
	500	9,0	4,5	19,8	RED	657	2397	13,00	2,89	34,86	1,76	Q0-070070-RFWW-C1000-K188
		7,8	3,9		FAR RED	727	1495	0,90	0,23			
		11,4	5,7		WHITE	5000	810	10,48	1,84			
		11,4	5,7		WHITE	5000	810	10,48	1,84			
	700	9,6	6,7	29,0	RED	657	3247	17,61	2,62	46,03	1,59	Q0-070070-RFWW-C1000-K188
		8,3	5,8		FAR RED	727	2025	1,22	0,21			
		11,8	8,3		WHITE	5000	1065	13,60	1,65			
		11,8	8,3		WHITE	5000	1065	13,60	1,65			
	800	9,9	7,9	33,8	RED	657	3706	20,10	2,53	51,41	1,52	Q0-070070-RFWW-C1000-K188
		8,4	6,8		FAR RED	727	2311	1,40	0,21			
		11,9	9,5		WHITE	5000	1171	14,96	1,57			
		11,9	9,5		WHITE	5000	1171	14,96	1,57			

Parameters were calculated for temperatures  $T_J = 25^\circ\text{C}$

Radiant power and wavelength for color LEDs; Luminous flux and color temperature for white LEDs.

Values of these parameters were calculated for default bin and with tolerances of 15%.



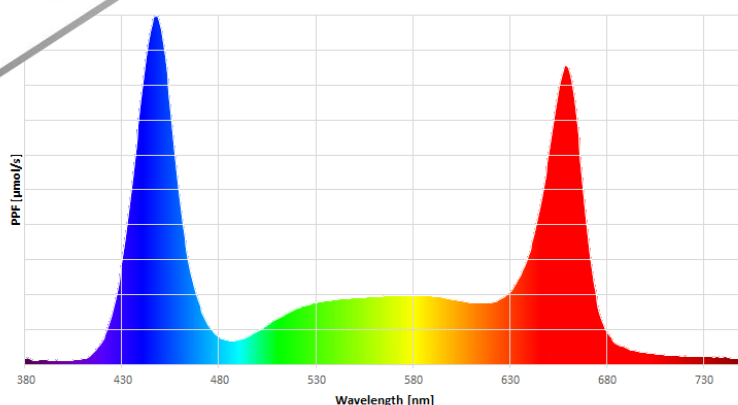
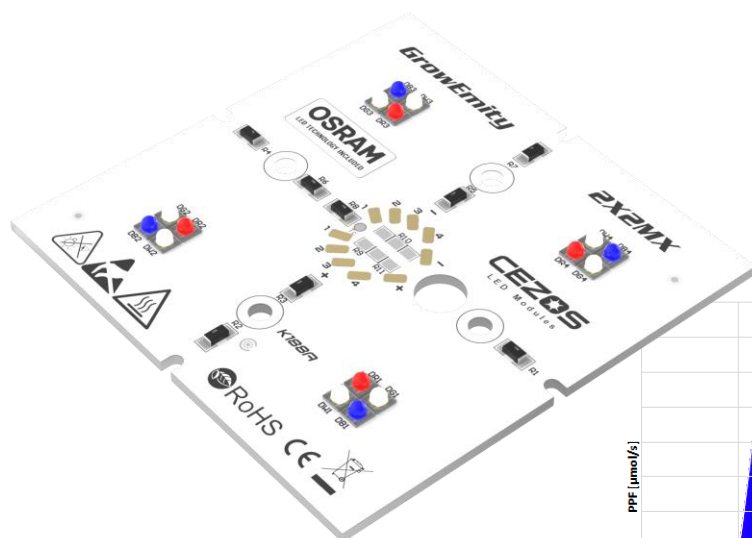
## GROWEMITY 2x2MX RBWW - K188

	Input Current [mA]	Forward Voltage [V]	Power [W]	Total Power [W]	Colour	$\lambda$ [nm] / CCT [K]	Radiant Power [mW] / Luminous Flux [lm]	PPF [ $\mu\text{mol/s}$ ]	PPF/W [ $\mu\text{mol/J}$ ]	Total PPF [ $\mu\text{mol/s}$ ]	Total PPF/W [ $\mu\text{mol/J}$ ]	Article Number
GrowEmity 2x2MX RBWW - K188	350	8,6	3,0	14,7	RED	657	1700	9,22	3,06	34,30	2,33	Q0-070070-RBWW-C1000-K188
		11,4	4,0		DEEP BLUE	455	2540	9,40	2,36			
		11,0	3,9		WHITE	5000	592	7,84	2,04			
		11,0	3,9		WHITE	5000	592	7,84	2,04			
	500	9,0	4,5	21,7	RED	657	2397	13,00	2,89	47,03	2,17	Q0-070070-RBWW-C1000-K188
		11,6	5,8		DEEP BLUE	455	3531	13,07	2,25			
		11,4	5,7		WHITE	5000	810	10,48	1,84			
		11,4	5,7		WHITE	5000	810	10,48	1,84			
	700	9,6	6,7	31,6	RED	657	3247	17,61	2,62	60,98	1,93	Q0-070070-RBWW-C1000-K188
		11,9	8,3		DEEP BLUE	455	4369	16,17	1,94			
		11,8	8,3		WHITE	5000	1065	13,60	1,65			
		11,8	8,3		WHITE	5000	1065	13,60	1,65			
	800	9,9	7,9	36,6	RED	657	3706	20,10	2,53	67,88	1,86	Q0-070070-RBWW-C1000-K188
		12,0	9,6		DEEP BLUE	455	4826	17,86	1,87			
		11,9	9,5		WHITE	5000	1171	14,96	1,57			
		11,9	9,5		WHITE	5000	1171	14,96	1,57			

Parameters were calculated for temperatures  $T_J = 25^\circ\text{C}$

Radiant power and wavelength for color LEDs; Luminous flux and color temperature for white LEDs.

Values of these parameters were calculated for default bin and with tolerances of 15%.



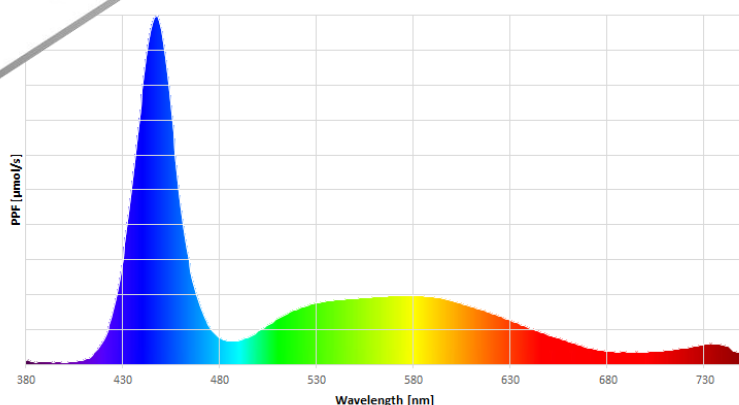
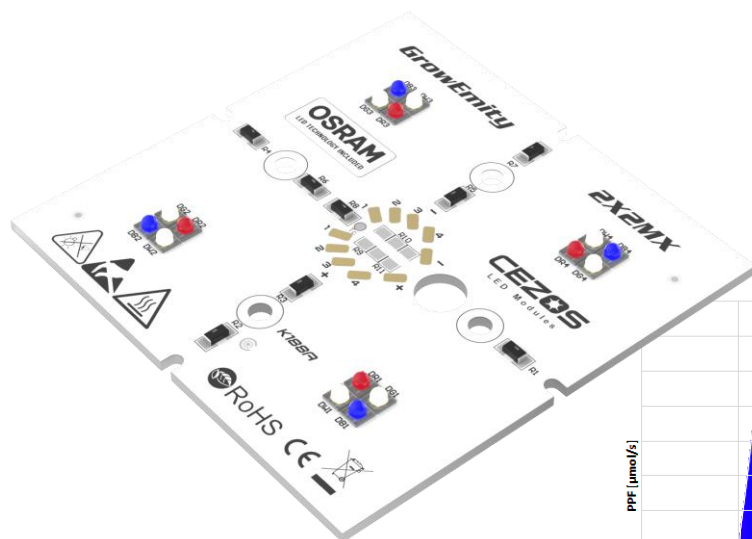
## GROWEMITY 2x2MX FBWW - K188

	Input Current [mA]	Forward Voltage [V]	Power [W]	Total Power [W]	Colour	$\lambda$ [nm] / CCT [K]	Radiant Power [mW] / Luminous Flux [lm]	PPF [ $\mu\text{mol/s}$ ]	PPF/W [ $\mu\text{mol/J}$ ]	Total PPF [ $\mu\text{mol/s}$ ]	Total PPF/W [ $\mu\text{mol/J}$ ]	Article Number
GrowEmity 2x2MX FBWW - K188	350	7,4	2,6	14,3	FAR RED	727	1060	0,64	0,25	25,72	1,80	Q0-070070-FBWW-C1000-K188
		11,4	4,0		DEEP BLUE	455	2540	9,40	2,36			
		11,0	3,9		WHITE	5000	592	7,84	2,04			
		11,0	3,9		WHITE	5000	592	7,84	2,04			
	500	7,8	3,9	21,1	FAR RED	727	1495	0,90	0,23	34,93	1,66	Q0-070070-FBWW-C1000-K188
		11,6	5,8		DEEP BLUE	455	3531	13,07	2,25			
		11,4	5,7		WHITE	5000	810	10,48	1,84			
		11,4	5,7		WHITE	5000	810	10,48	1,84			
	700	8,3	5,8	30,6	FAR RED	727	2025	1,22	0,21	44,59	1,46	Q0-070070-FBWW-C1000-K188
		11,9	8,3		DEEP BLUE	455	4369	16,17	1,94			
		11,8	8,3		WHITE	5000	1065	13,60	1,65			
		11,8	8,3		WHITE	5000	1065	13,60	1,65			
	800	8,4	6,8	35,4	FAR RED	727	2311	1,40	0,21	49,18	1,39	Q0-070070-FBWW-C1000-K188
		12,0	9,6		DEEP BLUE	455	4826	17,86	1,87			
		11,9	9,5		WHITE	5000	1171	14,96	1,57			
		11,9	9,5		WHITE	5000	1171	14,96	1,57			

Parameters were calculated for temperatures  $T_J = 25^\circ\text{C}$

Radiant power and wavelength for color LEDs; Luminous flux and color temperature for white LEDs.

Values of these parameters were calculated for default bin and with tolerances of 15%.

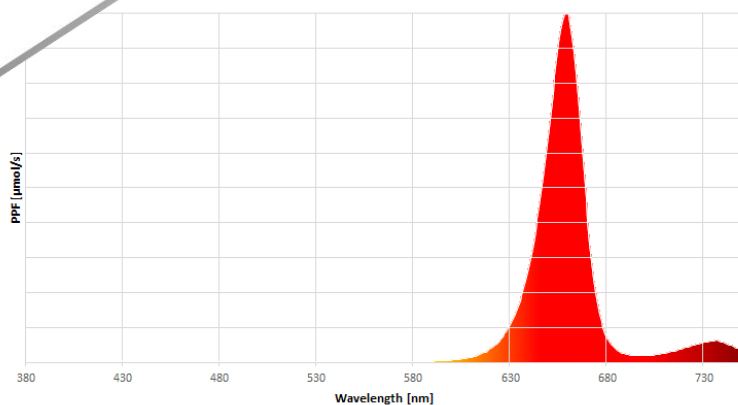
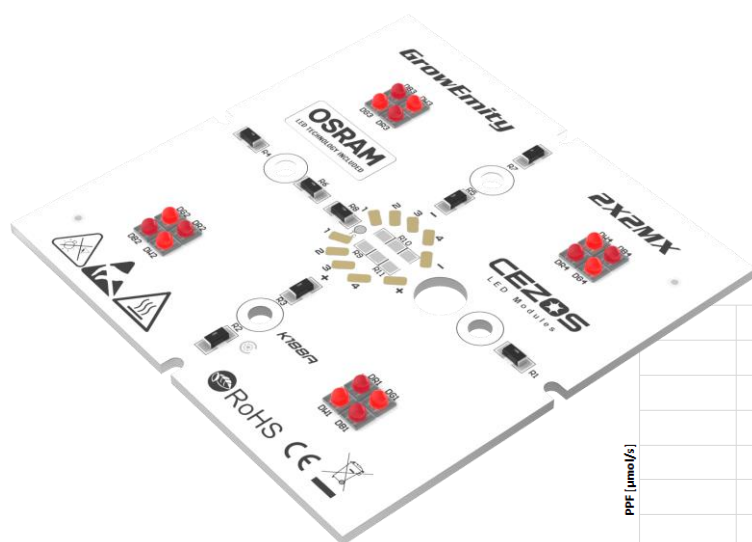


## GROWEMITY 2x2MX RRFF - K188

	Input Current [mA]	Forward Voltage [V]	Power [W]	Total Power [W]	Colour	$\lambda$ [nm]	Radiant Power [mW]	PPF [ $\mu\text{mol/s}$ ]	PPF/W [ $\mu\text{mol/J}$ ]	Total PPF [ $\mu\text{mol/s}$ ]	Total PPF/W [ $\mu\text{mol/J}$ ]	Article Number
GrowEmity 2x2MX RRFF - K188	350	8,6	3,0	11,2	RED	657	1700	9,22	3,06	19,72	1,76	Q0-070070-RRFF-C1000-K188
		8,6	3,0		RED	657	1700	9,22	3,06			
		7,4	2,6		FAR RED	727	1060	0,64	0,25			
		7,4	2,6		FAR RED	727	1060	0,64	0,25			
	500	9,0	4,5	16,8	RED	657	2397	13,00	2,89	27,81	1,66	Q0-070070-RRFF-C1000-K188
		9,0	4,5		RED	657	2397	13,00	2,89			
		7,8	3,9		FAR RED	727	1495	0,90	0,23			
		7,8	3,9		FAR RED	727	1495	0,90	0,23			
	700	9,6	6,7	25,0	RED	657	3247	17,61	2,62	37,67	1,50	Q0-070070-RRFF-C1000-K188
		9,6	6,7		RED	657	3247	17,61	2,62			
		8,3	5,8		FAR RED	727	2025	1,22	0,21			
		8,3	5,8		FAR RED	727	2025	1,22	0,21			
	800	9,9	7,9	29,4	RED	657	3706	20,10	2,53	42,99	1,46	Q0-070070-RRFF-C1000-K188
		9,9	7,9		RED	657	3706	20,10	2,53			
		8,4	6,8		FAR RED	727	2311	1,40	0,21			
		8,4	6,8		FAR RED	727	2311	1,40	0,21			

Parameters were calculated for temperatures  $T_J = 25^\circ\text{C}$

Values of these parameters were calculated for default bin and with tolerances of 15%.



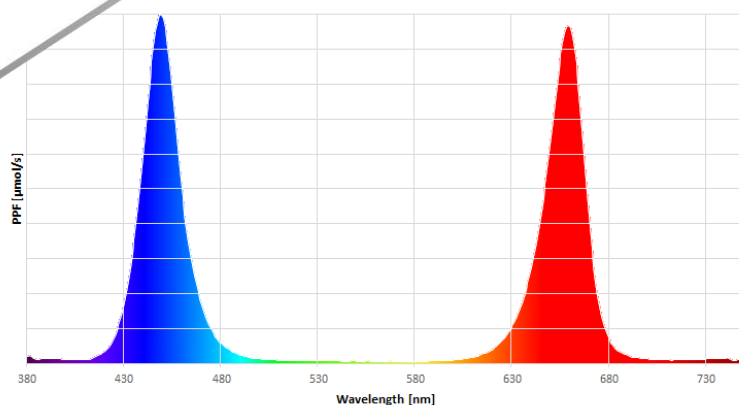
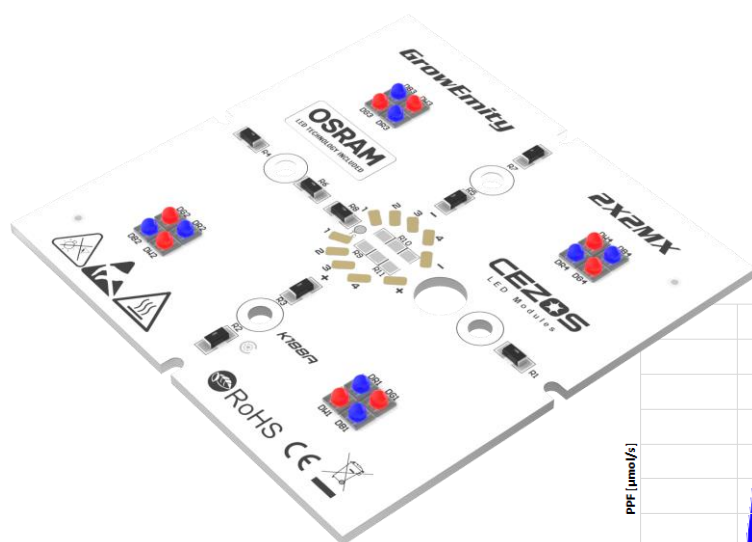


## GROWEMITY 2x2MX RRBB - K188

	Input Current [mA]	Forward Voltage [V]	Power [W]	Total Power [W]	Colour	$\lambda$ [nm]	Radiant Power [mW]	PPF [ $\mu\text{mol/s}$ ]	PPF/W [ $\mu\text{mol/J}$ ]	Total PPF [ $\mu\text{mol/s}$ ]	Total PPF/W [ $\mu\text{mol/J}$ ]	Article Number
GrowEmity 2x2MX RRBB - K188	350	8,6	3,0	14,0	RED	657	1700	9,22	3,06	37,24	2,66	Q0-070070-RRBB-C1000-K188
		8,6	3,0		RED	657	1700	9,22	3,06			
		11,4	4,0		DEEP BLUE	455	2540	9,40	2,36			
		11,4	4,0		DEEP BLUE	455	2540	9,40	2,36			
	500	9,0	4,5	20,6	RED	657	2397	13,00	2,89	52,13	2,53	Q0-070070-RRBB-C1000-K188
		9,0	4,5		RED	657	2397	13,00	2,89			
		11,6	5,8		DEEP BLUE	455	3531	13,07	2,25			
		11,6	5,8		DEEP BLUE	455	3531	13,07	2,25			
	700	9,6	6,7	30,1	RED	657	3247	17,61	2,62	67,56	2,25	Q0-070070-RRBB-C1000-K188
		9,6	6,7		RED	657	3247	17,61	2,62			
		11,9	8,3		DEEP BLUE	455	4369	16,17	1,94			
		11,9	8,3		DEEP BLUE	455	4369	16,17	1,94			
	800	9,9	7,9	35,0	RED	657	3706	20,10	2,53	75,92	2,17	Q0-070070-RRBB-C1000-K188
		9,9	7,9		RED	657	3706	20,10	2,53			
		12,0	9,6		DEEP BLUE	455	4826	17,86	1,87			
		12,0	9,6		DEEP BLUE	455	4826	17,86	1,87			

Parameters were calculated for temperatures  $T_J = 25^\circ\text{C}$

Values of these parameters were calculated for default bin and with tolerances of 15%.



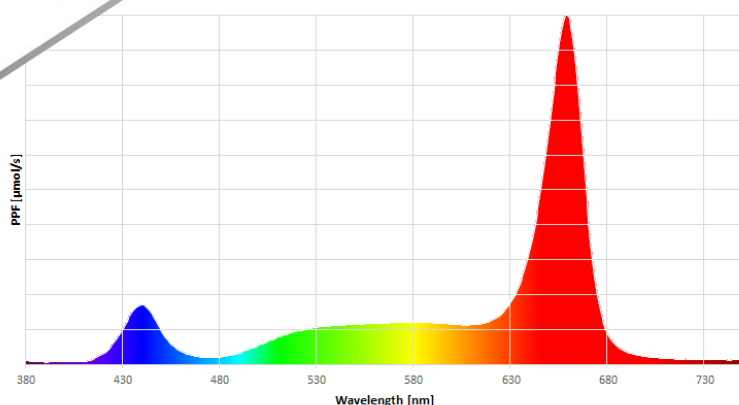
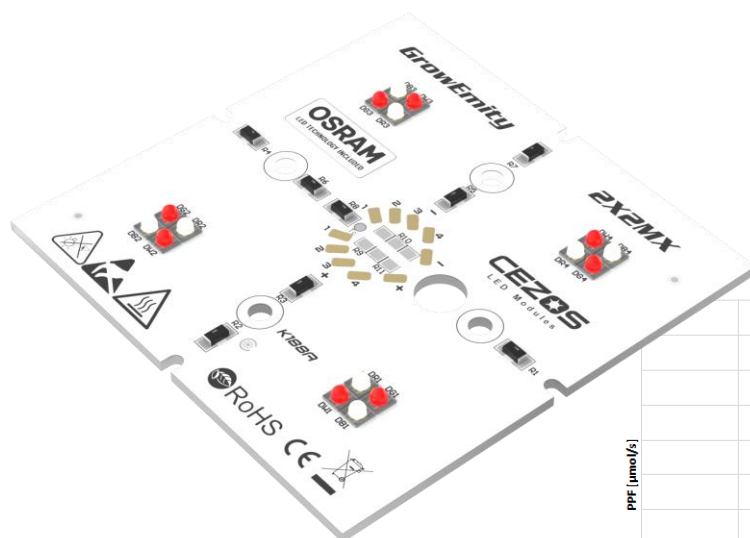
## GROWEMITY 2x2MX RRWW - K188

	Input Current [mA]	Forward Voltage [V]	Power [W]	Total Power [W]	Colour	$\lambda$ [nm] / CCT [K]	Radiant Power [mW] / Luminous Flux [lm]	PPF [ $\mu\text{mol/s}$ ]	PPF/W [ $\mu\text{mol/J}$ ]	Total PPF [ $\mu\text{mol/s}$ ]	Total PPF/W [ $\mu\text{mol/J}$ ]	Article Number
GrowEmity 2x2 RRWW - K188	350	8,6	3,0	13,7	RED	657	1700	9,22	3,06	34,12	2,49	Q0-070070-RRWW-C1000-K188
		8,6	3,0		RED	657	1700	9,22	3,06			
		11,0	3,9		WHITE	5000	592	7,84	2,04			
		11,0	3,9		WHITE	5000	592	7,84	2,04			
	500	9,0	4,5	20,4	RED	657	2397	13,00	2,89	46,96	2,30	Q0-070070-RRWW-C1000-K188
		9,0	4,5		RED	657	2397	13,00	2,89			
		11,4	5,7		WHITE	5000	810	10,48	1,84			
		11,4	5,7		WHITE	5000	810	10,48	1,84			
	700	9,6	6,7	30,0	RED	657	3247	17,61	2,62	62,42	2,08	Q0-070070-RRWW-C1000-K188
		9,6	6,7		RED	657	3247	17,61	2,62			
		11,8	8,3		WHITE	5000	1065	13,60	1,65			
		11,8	8,3		WHITE	5000	1065	13,60	1,65			
	800	9,9	7,9	34,9	RED	657	3706	20,10	2,53	70,12	2,01	Q0-070070-RRWW-C1000-K188
		9,9	7,9		RED	657	3706	20,10	2,53			
		11,9	9,5		WHITE	5000	1171	14,96	1,57			
		11,9	9,5		WHITE	5000	1171	14,96	1,57			

Parameters were calculated for temperatures  $T_J = 25^\circ\text{C}$

Radiant power and wavelength for color LEDs; Luminous flux and color temperature for white LEDs.

Values of these parameters were calculated for default bin and with tolerances of 15%.

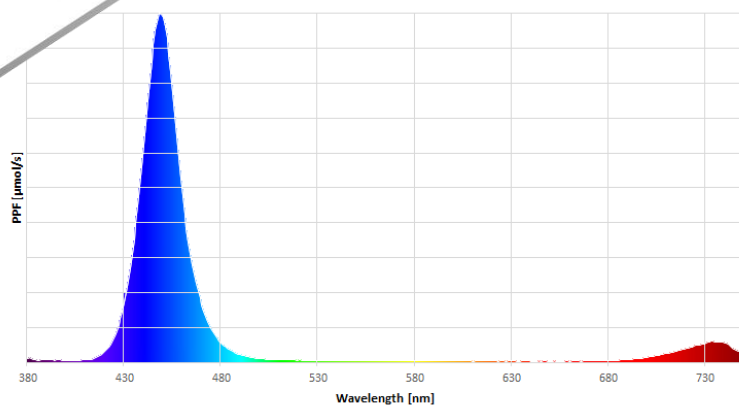
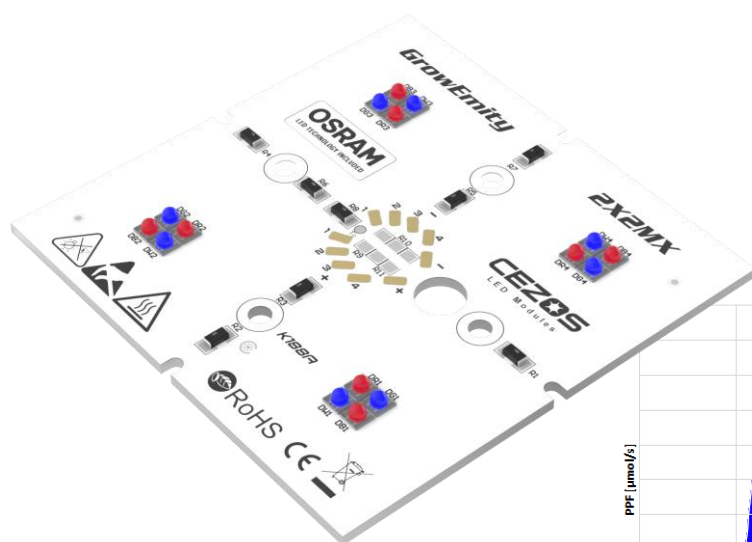


## GROWEMITY 2x2MX FFBB - K188

	Input Current [mA]	Forward Voltage [V]	Power [W]	Total Power [W]	Colour	$\lambda$ [nm]	Radiant Power [mW]	PPF [ $\mu\text{mol/s}$ ]	PPF/W [ $\mu\text{mol/J}$ ]	Total PPF [ $\mu\text{mol/s}$ ]	Total PPF/W [ $\mu\text{mol/J}$ ]	Article Number
GrowEmity 2x2MX FFBB - K188	350	7,4	2,6	13,2	FAR RED	727	1060	0,64	0,25	20,08	1,53	QO-070070-FFBB-C1000-K188
		7,4	2,6		FAR RED	727	1060	0,64	0,25			
		11,4	4,0		DEEP BLUE	455	2540	9,40	2,36			
		11,4	4,0		DEEP BLUE	455	2540	9,40	2,36			
	500	7,8	3,9	19,4	FAR RED	727	1495	0,90	0,23	27,94	1,44	QO-070070-FFBB-C1000-K188
		7,8	3,9		FAR RED	727	1495	0,90	0,23			
		11,6	5,8		DEEP BLUE	455	3531	13,07	2,25			
		11,6	5,8		DEEP BLUE	455	3531	13,07	2,25			
	700	8,3	5,8	28,2	FAR RED	727	2025	1,22	0,21	34,78	1,23	QO-070070-FFBB-C1000-K188
		8,3	5,8		FAR RED	727	2025	1,22	0,21			
		11,9	8,3		DEEP BLUE	455	4369	16,17	1,94			
		11,9	8,3		DEEP BLUE	455	4369	16,17	1,94			
	800	8,4	6,8	32,6	FAR RED	727	2311	1,40	0,21	38,51	1,18	QO-070070-FFBB-C1000-K188
		8,4	6,8		FAR RED	727	2311	1,40	0,21			
		12,0	9,6		DEEP BLUE	455	4826	17,86	1,87			
		12,0	9,6		DEEP BLUE	455	4826	17,86	1,87			

Parameters were calculated for temperatures  $T_J = 25^\circ\text{C}$

Values of these parameters were calculated for default bin and with tolerances of 15%.



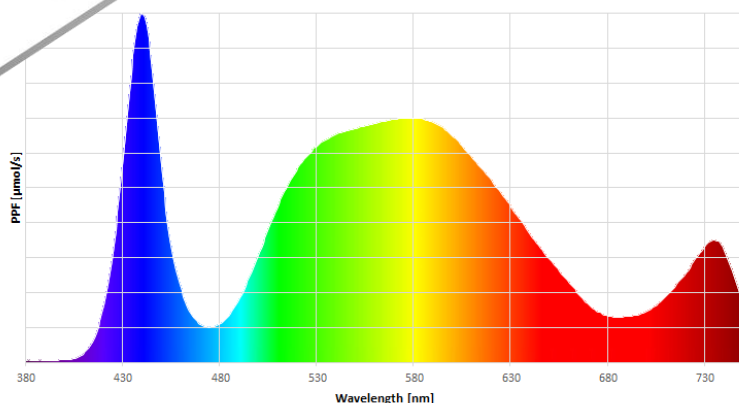
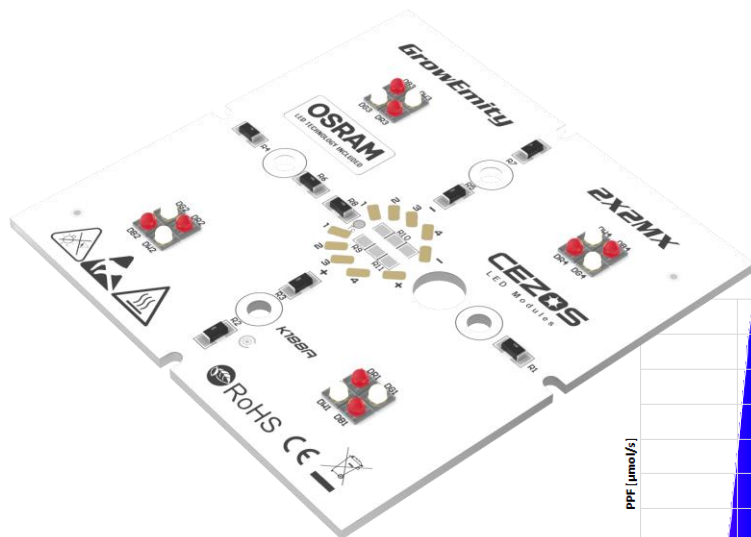
## GROWEMITY 2x2MX FFWW - K188

	Input Current [mA]	Forward Voltage [V]	Power [W]	Total Power [W]	Colour	$\lambda$ [nm] / CCT [K]	Radiant Power [mW] / Luminous Flux [lm]	PPF [ $\mu\text{mol/s}$ ]	PPF/W [ $\mu\text{mol/J}$ ]	Total PPF [ $\mu\text{mol/s}$ ]	Total PPF/W [ $\mu\text{mol/J}$ ]	Article Number
GrowEmity 2x2MX FFWW - K188	350	7,4	2,6	12,9	FAR RED	727	1060	0,64	0,25	16,96	1,32	Q0-070070-FFWW-C1000-K188
		7,4	2,6		FAR RED	727	1060	0,64	0,25			
		11,0	3,9		WHITE	5000	592	7,84	2,04			
		11,0	3,9		WHITE	5000	592	7,84	2,04			
	500	7,8	3,9	19,2	FAR RED	727	1495	0,90	0,23	22,76	1,19	Q0-070070-FFWW-C1000-K188
		7,8	3,9		FAR RED	727	1495	0,90	0,23			
		11,4	5,7		WHITE	5000	810	10,48	1,84			
		11,4	5,7		WHITE	5000	810	10,48	1,84			
	700	8,3	5,8	28,1	FAR RED	727	2025	1,22	0,21	29,64	1,05	Q0-070070-FFWW-C1000-K188
		8,3	5,8		FAR RED	727	2025	1,22	0,21			
		11,8	8,3		WHITE	5000	1065	13,60	1,65			
		11,8	8,3		WHITE	5000	1065	13,60	1,65			
	800	8,4	6,8	32,6	FAR RED	727	2311	1,40	0,21	32,71	1,00	Q0-070070-FFWW-C1000-K188
		8,4	6,8		FAR RED	727	2311	1,40	0,21			
		11,9	9,5		WHITE	5000	1171	14,96	1,57			
		11,9	9,5		WHITE	5000	1171	14,96	1,57			

Parameters were calculated for temperatures  $T_J = 25^\circ\text{C}$

Radiant power and wavelength for color LEDs; Luminous flux and color temperature for white LEDs.

Values of these parameters were calculated for default bin and with tolerances of 15%.



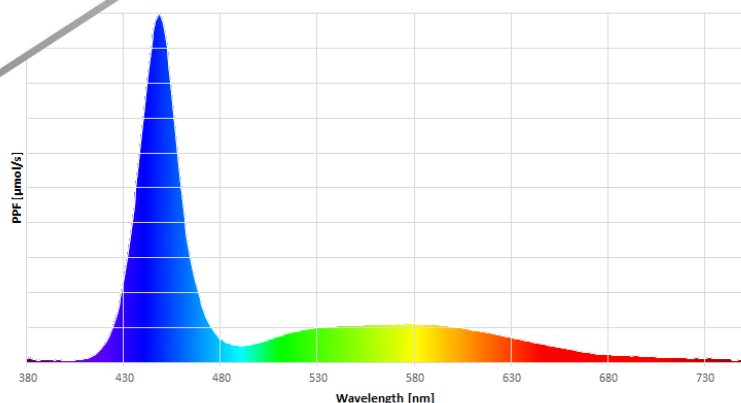
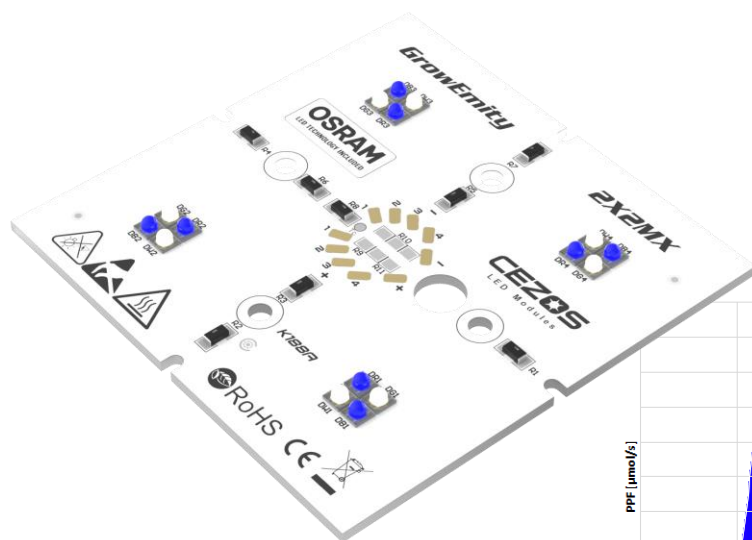
## GROWEMITY 2x2MX BBWW - K188

	Input Current [mA]	Forward Voltage [V]	Power [W]	Total Power [W]	Colour	$\lambda$ [nm] / CCT [K]	Radiant Power [mW] / Luminous Flux [lm]	PPF [ $\mu\text{mol/s}$ ]	PPF/W [ $\mu\text{mol/J}$ ]	Total PPF [ $\mu\text{mol/s}$ ]	Total PPF/W [ $\mu\text{mol/J}$ ]	Article Number
GrowEmity 2x2MX BBWW - K188	350	11,4	4,0	15,7	DEEP BLUE	455	2540	9,40	2,36	34,48	2,20	Q0-070070-BBWW-C1000-K188
		11,4	4,0		DEEP BLUE	455	2540	9,40	2,36			
		11,0	3,9		WHITE	5000	592	7,84	2,04			
		11,0	3,9		WHITE	5000	592	7,84	2,04			
	500	11,6	5,8	23,0	DEEP BLUE	455	3531	13,07	2,25	47,09	2,05	Q0-070070-BBWW-C1000-K188
		11,6	5,8		DEEP BLUE	455	3531	13,07	2,25			
		11,4	5,7		WHITE	5000	810	10,48	1,84			
		11,4	5,7		WHITE	5000	810	10,48	1,84			
	700	11,9	8,3	33,2	DEEP BLUE	455	4369	16,17	1,94	59,54	1,80	Q0-070070-BBWW-C1000-K188
		11,9	8,3		DEEP BLUE	455	4369	16,17	1,94			
		11,8	8,3		WHITE	5000	1065	13,60	1,65			
		11,8	8,3		WHITE	5000	1065	13,60	1,65			
	800	12,0	9,6	38,2	DEEP BLUE	455	4826	17,86	1,87	65,64	1,72	Q0-070070-BBWW-C1000-K188
		12,0	9,6		DEEP BLUE	455	4826	17,86	1,87			
		11,9	9,5		WHITE	5000	1171	14,96	1,57			
		11,9	9,5		WHITE	5000	1171	14,96	1,57			

Parameters were calculated for temperatures  $T_J = 25^\circ\text{C}$

Radiant power and wavelength for color LEDs; Luminous flux and color temperature for white LEDs.

Values of these parameters were calculated for default bin and with tolerances of 15%.

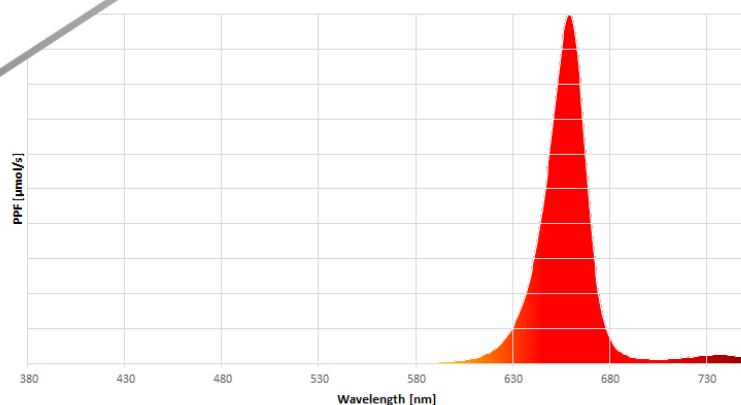
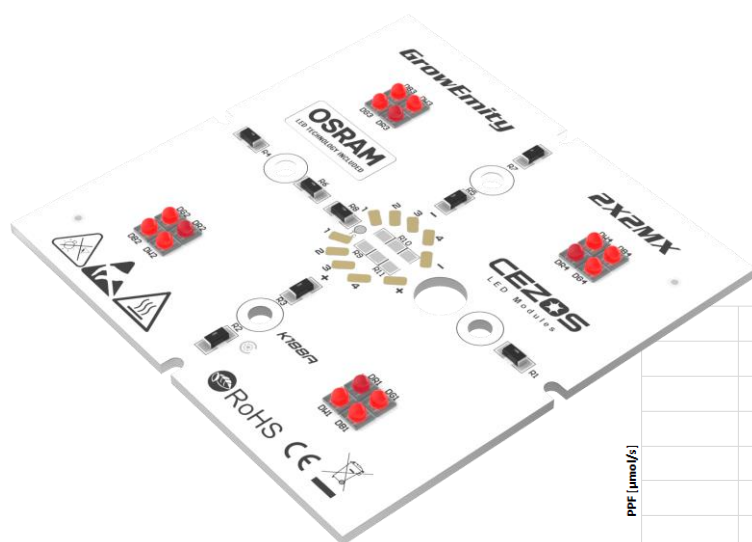


## GROWEMITY 2x2MX RRRF - K188

	Input Current [mA]	Forward Voltage [V]	Power [W]	Total Power [W]	Colour	$\lambda$ [nm]	Radiant Power [mW]	PPF [ $\mu\text{mol/s}$ ]	PPF/W [ $\mu\text{mol/J}$ ]	Total PPF [ $\mu\text{mol/s}$ ]	Total PPF/W [ $\mu\text{mol/J}$ ]	Article Number
GrowEmity 2x2MX RRRF - K188	350	8,6	3,0	11,6	RED	657	1700	9,22	3,06	28,30	2,44	Q0-070070-RRRF-C1000-K188
		8,6	3,0		RED	657	1700	9,22	3,06			
		8,6	3,0		RED	657	1700	9,22	3,06			
		7,4	2,6		FAR RED	727	1060	0,64	0,25			
	500	9,0	4,5	17,4	RED	657	2397	13,00	2,89	39,90	2,29	Q0-070070-RRRF-C1000-K188
		9,0	4,5		RED	657	2397	13,00	2,89			
		9,0	4,5		RED	657	2397	13,00	2,89			
		7,8	3,9		FAR RED	727	1495	0,90	0,23			
	700	9,6	6,7	26,0	RED	657	3247	17,61	2,62	54,05	2,08	Q0-070070-RRRF-C1000-K188
		9,6	6,7		RED	657	3247	17,61	2,62			
		9,6	6,7		RED	657	3247	17,61	2,62			
		8,3	5,8		FAR RED	727	2025	1,22	0,21			
	800	9,9	7,9	30,6	RED	657	3706	20,10	2,53	61,69	2,02	Q0-070070-RRRF-C1000-K188
		9,9	7,9		RED	657	3706	20,10	2,53			
		9,9	7,9		RED	657	3706	20,10	2,53			
		8,4	6,8		FAR RED	727	2311	1,40	0,21			

Parameters were calculated for temperatures  $T_J = 25^\circ\text{C}$

Values of these parameters were calculated for default bin and with tolerances of 15%.

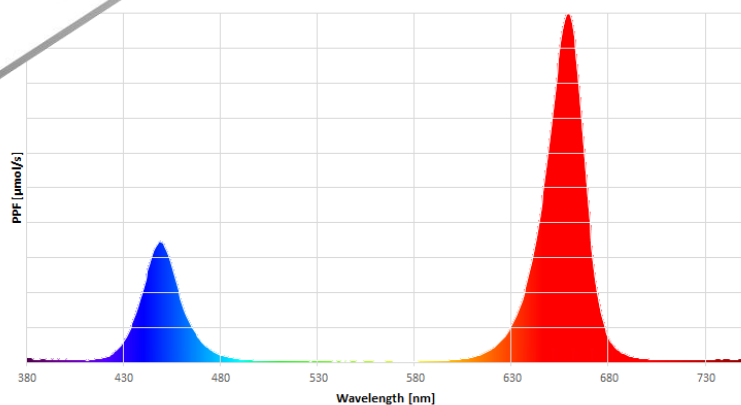
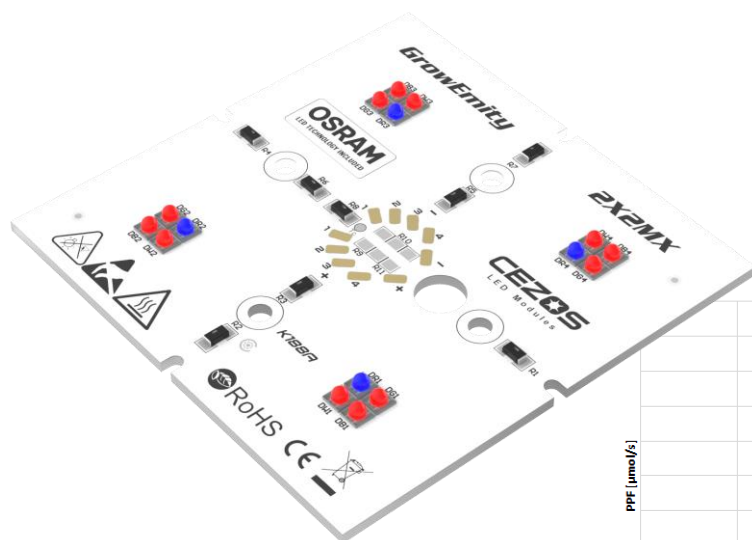


## GROWEMITY 2x2MX RRRB - K188

	Input Current [mA]	Forward Voltage [V]	Power [W]	Total Power [W]	Colour	$\lambda$ [nm]	Radiant Power [mW]	PPF [ $\mu\text{mol/s}$ ]	PPF/W [ $\mu\text{mol/J}$ ]	Total PPF [ $\mu\text{mol/s}$ ]	Total PPF/W [ $\mu\text{mol/J}$ ]	Article Number
GrowEmity 2x2MX RRRB - K188	350	8,6	3,0	13,0	RED	657	1700	9,22	3,06	37,06	2,85	Q0-070070-RRRB-C1000-K188
		8,6	3,0		RED	657	1700	9,22	3,06			
		8,6	3,0		RED	657	1700	9,22	3,06			
		11,4	4,0		DEEP BLUE	455	2540	9,40	2,36			
	500	9,0	4,5	19,3	RED	657	2397	13,00	2,89	52,07	2,70	Q0-070070-RRRB-C1000-K188
		9,0	4,5		RED	657	2397	13,00	2,89			
		9,0	4,5		RED	657	2397	13,00	2,89			
		11,6	5,8		DEEP BLUE	455	3531	13,07	2,25			
	700	9,6	6,7	28,5	RED	657	3247	17,61	2,62	69,00	2,42	Q0-070070-RRRB-C1000-K188
		9,6	6,7		RED	657	3247	17,61	2,62			
		9,6	6,7		RED	657	3247	17,61	2,62			
		11,9	8,3		DEEP BLUE	455	4369	16,17	1,94			
	800	9,9	7,9	33,4	RED	657	3706	20,10	2,53	78,16	2,34	Q0-070070-RRRB-C1000-K188
		9,9	7,9		RED	657	3706	20,10	2,53			
		9,9	7,9		RED	657	3706	20,10	2,53			
		12,0	9,6		DEEP BLUE	455	4826	17,86	1,87			

Parameters were calculated for temperatures  $T_J = 25^\circ\text{C}$

Values of these parameters were calculated for default bin and with tolerances of 15%.



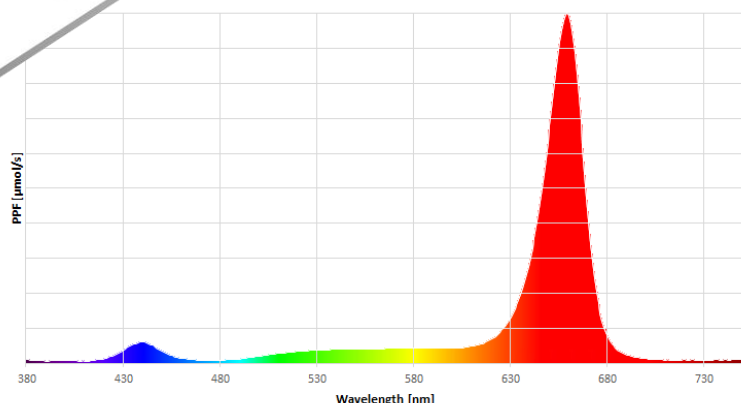
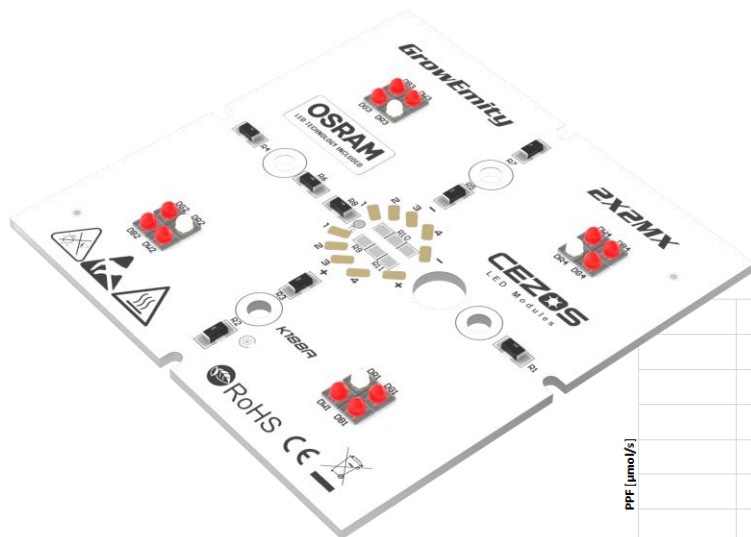
## GROWEMITY 2x2MX RRRW - K188

	Input Current [mA]	Forward Voltage [V]	Power [W]	Total Power [W]	Colour	$\lambda$ [nm] / CCT [K]	Radiant Power [mW] / Luminous Flux [lm]	PPF [ $\mu\text{mol/s}$ ]	PPF/W [ $\mu\text{mol/J}$ ]	Total PPF [ $\mu\text{mol/s}$ ]	Total PPF/W [ $\mu\text{mol/J}$ ]	Article Number
GrowEmity 2x2 RRRW - K188	350	8,6	3,0	12,9	RED	657	1700	9,22	3,06	35,50	2,76	Q0-070070-RRRW-C1000-K188
		8,6	3,0		RED	657	1700	9,22	3,06			
		8,6	3,0		RED	657	1700	9,22	3,06			
		11,0	3,9		WHITE	5000	592	7,84	2,04			
	500	9,0	4,5	19,2	RED	657	2397	13,00	2,89	49,48	2,58	Q0-070070-RRRW-C1000-K188
		9,0	4,5		RED	657	2397	13,00	2,89			
		9,0	4,5		RED	657	2397	13,00	2,89			
		11,4	5,7		WHITE	5000	810	10,48	1,84			
	700	9,6	6,7	28,4	RED	657	3247	17,61	2,62	66,43	2,34	Q0-070070-RRRW-C1000-K188
		9,6	6,7		RED	657	3247	17,61	2,62			
		9,6	6,7		RED	657	3247	17,61	2,62			
		11,8	8,3		WHITE	5000	1065	13,60	1,65			
	800	9,9	7,9	33,3	RED	657	3706	20,10	2,53	75,26	2,26	Q0-070070-RRRW-C1000-K188
		9,9	7,9		RED	657	3706	20,10	2,53			
		9,9	7,9		RED	657	3706	20,10	2,53			
		11,9	9,5		WHITE	5000	1171	14,96	1,57			

Parameters were calculated for temperatures  $T_J = 25^\circ\text{C}$

Radiant power and wavelength for color LEDs; Luminous flux and color temperature for white LEDs.

Values of these parameters were calculated for default bin and with tolerances of 15%.



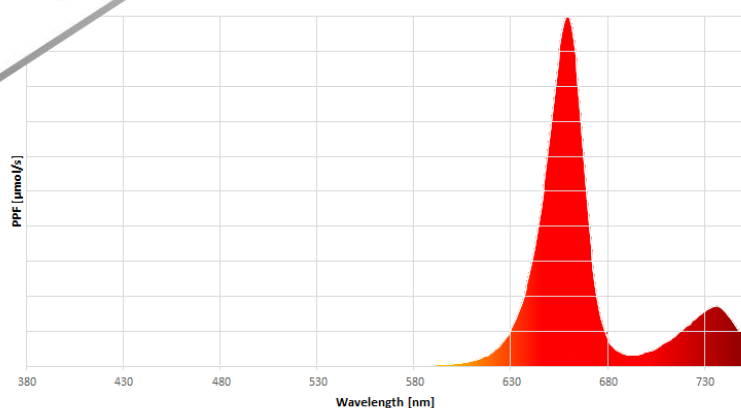
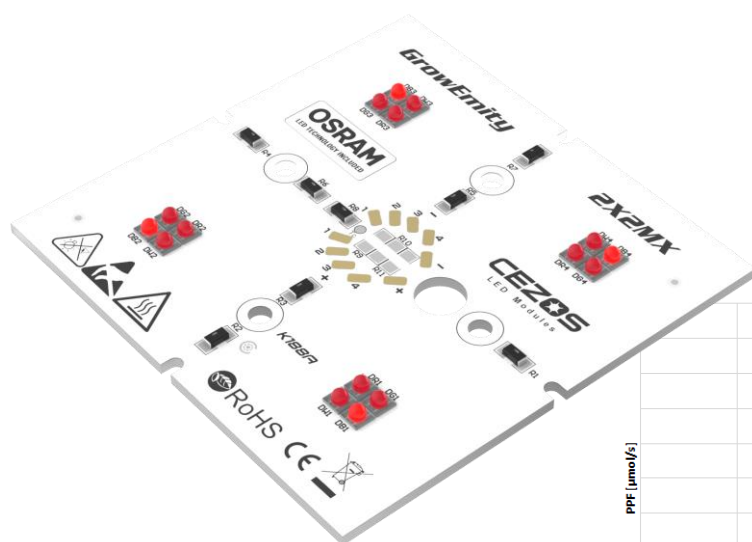


## GROWEMITY 2x2MX RFFF - K188

	Input Current [mA]	Forward Voltage [V]	Power [W]	Total Power [W]	Colour	$\lambda$ [nm]	Radiant Power [mW]	PPF [ $\mu\text{mol/s}$ ]	PPF/W [ $\mu\text{mol/J}$ ]	Total PPF [ $\mu\text{mol/s}$ ]	Total PPF/W [ $\mu\text{mol/J}$ ]	Article Number
GrowEmity 2x2MX RFFF - K188	350	8,6	3,0	10,8	RED	657	1700	9,22	3,06	11,14	1,03	Q0-070070-RFFF-C1000-K188
		7,4	2,6		FAR RED	727	1060	0,64	0,25			
		7,4	2,6		FAR RED	727	1060	0,64	0,25			
		7,4	2,6		FAR RED	727	1060	0,64	0,25			
	500	9,0	4,5	16,2	RED	657	2397	13,00	2,89	15,71	0,97	Q0-070070-RFFF-C1000-K188
		7,8	3,9		FAR RED	727	1495	0,90	0,23			
		7,8	3,9		FAR RED	727	1495	0,90	0,23			
		7,8	3,9		FAR RED	727	1495	0,90	0,23			
	700	9,6	6,7	24,1	RED	657	3247	17,61	2,62	21,28	0,88	Q0-070070-RFFF-C1000-K188
		8,3	5,8		FAR RED	727	2025	1,22	0,21			
		8,3	5,8		FAR RED	727	2025	1,22	0,21			
		8,3	5,8		FAR RED	727	2025	1,22	0,21			
	800	9,9	7,9	28,2	RED	657	3706	20,10	2,53	24,29	0,86	Q0-070070-RFFF-C1000-K188
		8,4	6,8		FAR RED	727	2311	1,40	0,21			
		8,4	6,8		FAR RED	727	2311	1,40	0,21			
		8,4	6,8		FAR RED	727	2311	1,40	0,21			

Parameters were calculated for temperatures  $T_J = 25^\circ\text{C}$

Values of these parameters were calculated for default bin and with tolerances of 15%.

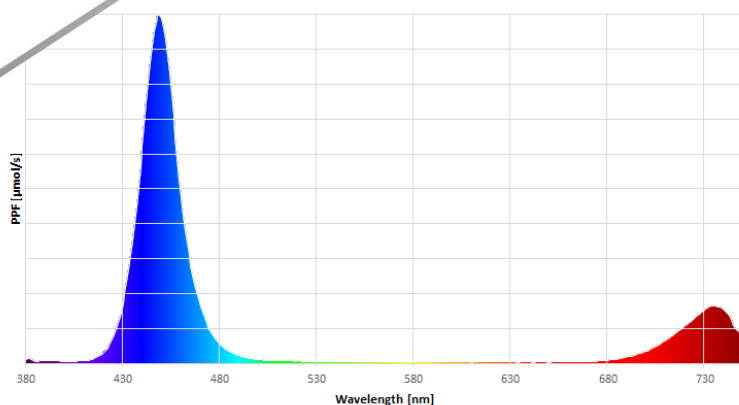
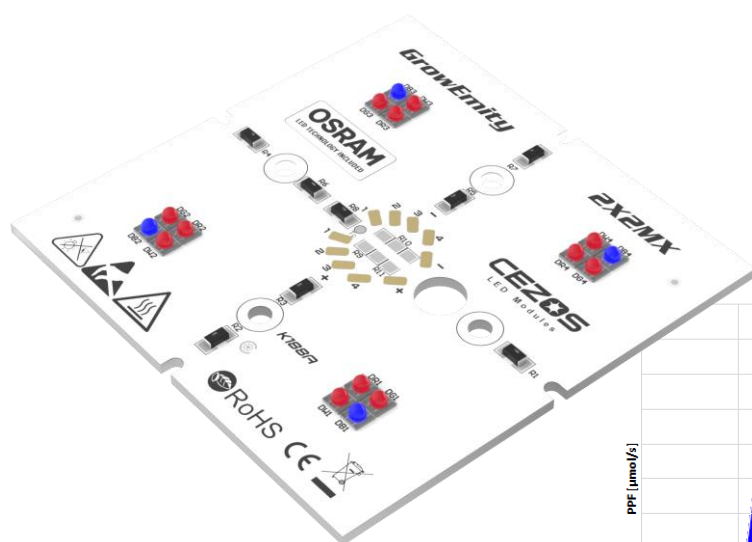


## GROWEMITY 2x2MX FFFB - K188

	Input Current [mA]	Forward Voltage [V]	Power [W]	Total Power [W]	Colour	$\lambda$ [nm]	Radiant Power [mW]	PPF [ $\mu\text{mol/s}$ ]	PPF/W [ $\mu\text{mol/J}$ ]	Total PPF [ $\mu\text{mol/s}$ ]	Total PPF/W [ $\mu\text{mol/J}$ ]	Article Number
GrowEmity 2x2MX FFFB - K188	350	7,4	2,6	11,8	FAR RED	727	1060	0,64	0,25	11,32	0,96	Q0-070070-FFFB-C1000-K188
		7,4	2,6		FAR RED	727	1060	0,64	0,25			
		7,4	2,6		FAR RED	727	1060	0,64	0,25			
		11,4	4,0		DEEP BLUE	455	2540	9,40	2,36			
	500	7,8	3,9	17,5	FAR RED	727	1495	0,90	0,23	15,77	0,90	Q0-070070-FFFB-C1000-K188
		7,8	3,9		FAR RED	727	1495	0,90	0,23			
		7,8	3,9		FAR RED	727	1495	0,90	0,23			
		11,6	5,8		DEEP BLUE	455	3531	13,07	2,25			
	700	8,3	5,8	25,7	FAR RED	727	2025	1,22	0,21	19,84	0,77	Q0-070070-FFFB-C1000-K188
		8,3	5,8		FAR RED	727	2025	1,22	0,21			
		8,3	5,8		FAR RED	727	2025	1,22	0,21			
		11,9	8,3		DEEP BLUE	455	4369	16,17	1,94			
	800	8,4	6,8	29,8	FAR RED	727	2311	1,40	0,21	22,05	0,74	Q0-070070-FFFB-C1000-K188
		8,4	6,8		FAR RED	727	2311	1,40	0,21			
		8,4	6,8		FAR RED	727	2311	1,40	0,21			
		12,0	9,6		DEEP BLUE	455	4826	17,86	1,87			

Parameters were calculated for temperatures  $T_J = 25^\circ\text{C}$

Values of these parameters were calculated for default bin and with tolerances of 15%.



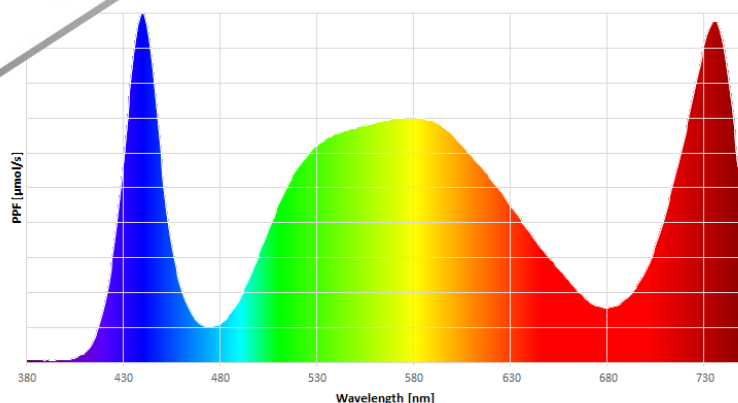
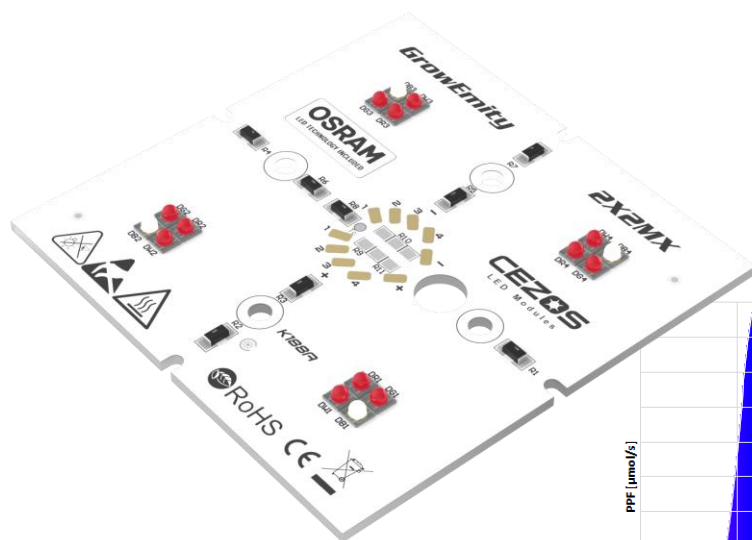
## GROWEMITY 2x2MX FFFW - K188

	Input Current [mA]	Forward Voltage [V]	Power [W]	Total Power [W]	Colour	$\lambda$ [nm] / CCT [K]	Radiant Power [mW] / Luminous Flux [lm]	PPF [ $\mu\text{mol/s}$ ]	PPF/W [ $\mu\text{mol/J}$ ]	Total PPF [ $\mu\text{mol/s}$ ]	Total PPF/W [ $\mu\text{mol/J}$ ]	Article Number
GrowEmity 2x2MX FFFW - K188	350	7,4	2,6	11,6	FAR RED	727	1060	0,64	0,25	9,76	0,84	Q0-070070-FFFW-C1000-K188
		7,4	2,6		FAR RED	727	1060	0,64	0,25			
		7,4	2,6		FAR RED	727	1060	0,64	0,25			
		11,0	3,9		WHITE	5000	592	7,84	2,04			
	500	7,8	3,9	17,4	FAR RED	727	1495	0,90	0,23	13,19	0,76	Q0-070070-FFFW-C1000-K188
		7,8	3,9		FAR RED	727	1495	0,90	0,23			
		7,8	3,9		FAR RED	727	1495	0,90	0,23			
		11,4	5,7		WHITE	5000	810	10,48	1,84			
	700	8,3	5,8	25,6	FAR RED	727	2025	1,22	0,21	17,27	0,67	Q0-070070-FFFW-C1000-K188
		8,3	5,8		FAR RED	727	2025	1,22	0,21			
		8,3	5,8		FAR RED	727	2025	1,22	0,21			
		11,8	8,3		WHITE	5000	1065	13,60	1,65			
	800	8,4	6,8	29,8	FAR RED	727	2311	1,40	0,21	19,15	0,64	Q0-070070-FFFW-C1000-K188
		8,4	6,8		FAR RED	727	2311	1,40	0,21			
		8,4	6,8		FAR RED	727	2311	1,40	0,21			
		11,9	9,5		WHITE	5000	1171	14,96	1,57			

Parameters were calculated for temperatures  $T_J = 25^\circ\text{C}$

Radiant power and wavelength for color LEDs; Luminous flux and color temperature for white LEDs.

Values of these parameters were calculated for default bin and with tolerances of 15%.

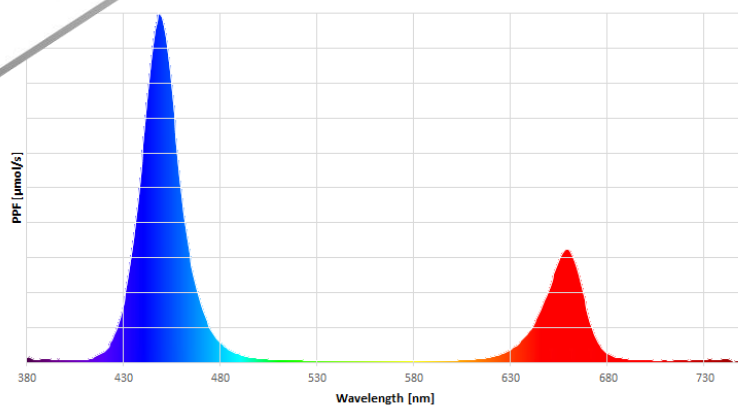
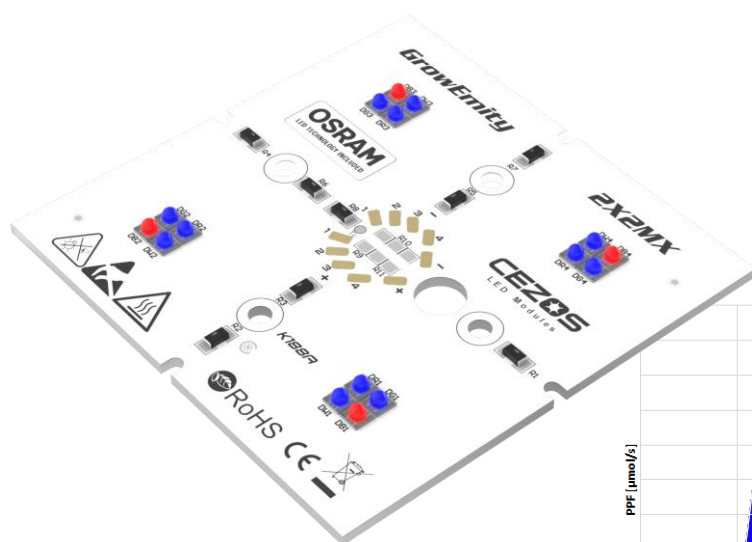


## GROWEMITY 2x2MX RBBB - K188

	Input Current [mA]	Forward Voltage [V]	Power [W]	Total Power [W]	Colour	$\lambda$ [nm]	Radiant Power [mW]	PPF [ $\mu\text{mol/s}$ ]	PPF/W [ $\mu\text{mol/J}$ ]	Total PPF [ $\mu\text{mol/s}$ ]	Total PPF/W [ $\mu\text{mol/J}$ ]	Article Number
GrowEmity 2x2MX RBBB - K188	350	8,6	3,0	15,0	RED	657	1700	9,22	3,06	37,42	2,50	Q0-070070-RBBB-C1000-K188
		11,4	4,0		DEEP BLUE	455	2540	9,40	2,36			
		11,4	4,0		DEEP BLUE	455	2540	9,40	2,36			
		11,4	4,0		DEEP BLUE	455	2540	9,40	2,36			
	500	9,0	4,5	21,9	RED	657	2397	13,00	2,89	52,20	2,38	Q0-070070-RBBB-C1000-K188
		11,6	5,8		DEEP BLUE	455	3531	13,07	2,25			
		11,6	5,8		DEEP BLUE	455	3531	13,07	2,25			
		11,6	5,8		DEEP BLUE	455	3531	13,07	2,25			
	700	9,6	6,7	31,7	RED	657	3247	17,61	2,62	66,11	2,09	Q0-070070-RBBB-C1000-K188
		11,9	8,3		DEEP BLUE	455	4369	16,17	1,94			
		11,9	8,3		DEEP BLUE	455	4369	16,17	1,94			
		11,9	8,3		DEEP BLUE	455	4369	16,17	1,94			
	800	9,9	7,9	36,6	RED	657	3706	20,10	2,53	73,68	2,01	Q0-070070-RBBB-C1000-K188
		12,0	9,6		DEEP BLUE	455	4826	17,86	1,87			
		12,0	9,6		DEEP BLUE	455	4826	17,86	1,87			
		12,0	9,6		DEEP BLUE	455	4826	17,86	1,87			

Parameters were calculated for temperatures  $T_J = 25^\circ\text{C}$

Values of these parameters were calculated for default bin and with tolerances of 15%.

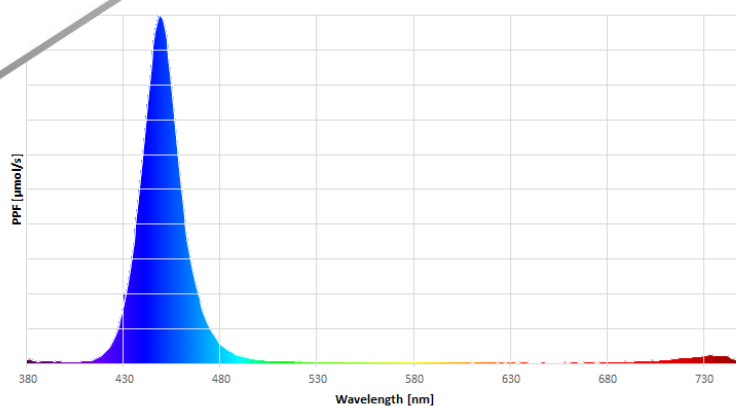
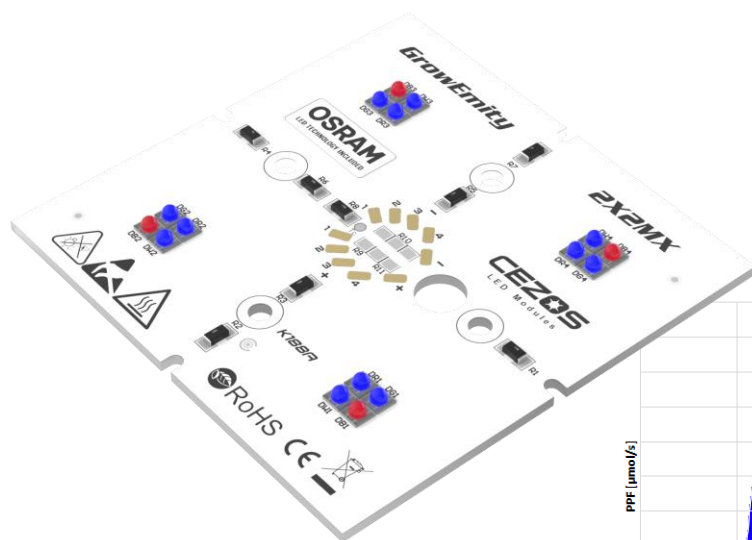


## GROWEMITY 2x2MX FB8B - K188

	Input Current [mA]	Forward Voltage [V]	Power [W]	Total Power [W]	Colour	$\lambda$ [nm]	Radiant Power [mW]	PPF [ $\mu\text{mol/s}$ ]	PPF/W [ $\mu\text{mol/J}$ ]	Total PPF [ $\mu\text{mol/s}$ ]	Total PPF/W [ $\mu\text{mol/J}$ ]	Article Number
GrowEmity 2x2MX FB8B - K188	350	7,4	2,6	14,6	FAR RED	727	1060	0,64	0,25	28,84	1,98	Q0-070070-FB8B-C1000-K188
		11,4	4,0		DEEP BLUE	455	2540	9,40	2,36			
		11,4	4,0		DEEP BLUE	455	2540	9,40	2,36			
		11,4	4,0		DEEP BLUE	455	2540	9,40	2,36			
	500	7,8	3,9	21,3	FAR RED	727	1495	0,90	0,23	40,10	1,88	Q0-070070-FB8B-C1000-K188
		11,6	5,8		DEEP BLUE	455	3531	13,07	2,25			
		11,6	5,8		DEEP BLUE	455	3531	13,07	2,25			
		11,6	5,8		DEEP BLUE	455	3531	13,07	2,25			
	700	8,3	5,8	30,7	FAR RED	727	2025	1,22	0,21	49,73	1,62	Q0-070070-FB8B-C1000-K188
		11,9	8,3		DEEP BLUE	455	4369	16,17	1,94			
		11,9	8,3		DEEP BLUE	455	4369	16,17	1,94			
		11,9	8,3		DEEP BLUE	455	4369	16,17	1,94			
	800	8,4	6,8	35,5	FAR RED	727	2311	1,40	0,21	54,98	1,55	Q0-070070-FB8B-C1000-K188
		12,0	9,6		DEEP BLUE	455	4826	17,86	1,87			
		12,0	9,6		DEEP BLUE	455	4826	17,86	1,87			
		12,0	9,6		DEEP BLUE	455	4826	17,86	1,87			

Parameters were calculated for temperatures  $T_J = 25^\circ\text{C}$

Values of these parameters were calculated for default bin and with tolerances of 15%.



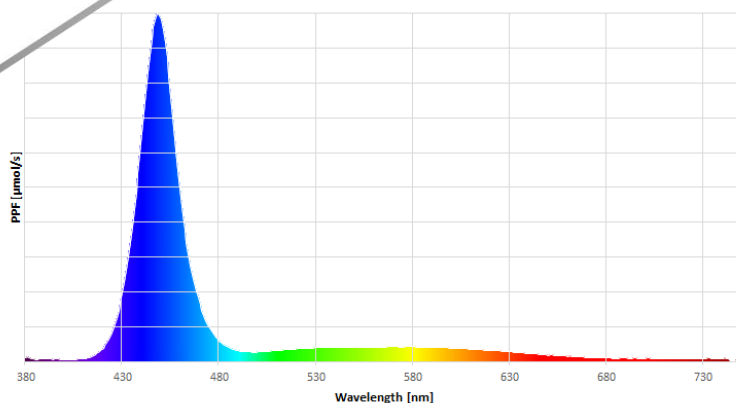
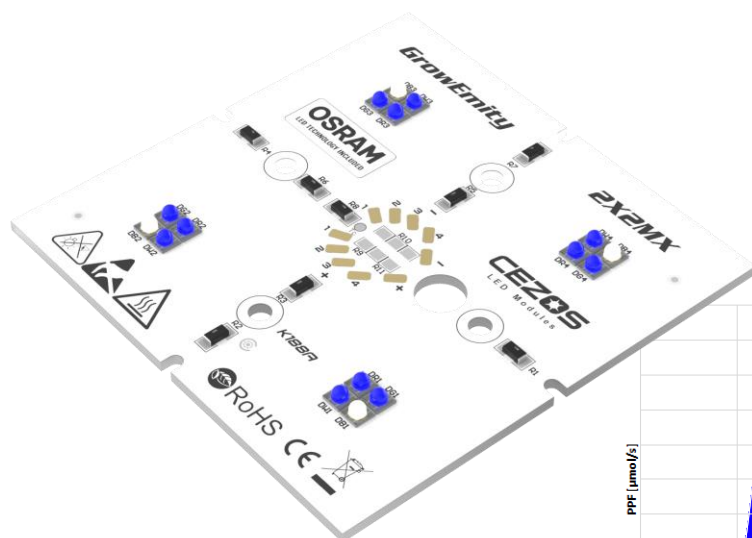
## GROWEMITY 2x2MX BBBW - K188

	Input Current [mA]	Forward Voltage [V]	Power [W]	Total Power [W]	Colour	$\lambda$ [nm] / CCT [K]	Radiant Power [mW] / Luminous Flux [lm]	PPF [ $\mu\text{mol/s}$ ]	PPF/W [ $\mu\text{mol/J}$ ]	Total PPF [ $\mu\text{mol/s}$ ]	Total PPF/W [ $\mu\text{mol/J}$ ]	Article Number
GrowEmity 2x2MX BBBW - K188	350	11,4	4,0	15,8	DEEP BLUE	455	2540	9,40	2,36	36,04	2,28	Q0-070070-BBBW-C1000-K188
		11,4	4,0		DEEP BLUE	455	2540	9,40	2,36			
		11,4	4,0		DEEP BLUE	455	2540	9,40	2,36			
		11,0	3,9		WHITE	5000	592	7,84	2,04			
	500	11,6	5,8	23,1	DEEP BLUE	455	3531	13,07	2,25	49,68	2,15	Q0-070070-BBBW-C1000-K188
		11,6	5,8		DEEP BLUE	455	3531	13,07	2,25			
		11,6	5,8		DEEP BLUE	455	3531	13,07	2,25			
		11,4	5,7		WHITE	5000	810	10,48	1,84			
	700	11,9	8,3	33,2	DEEP BLUE	455	4369	16,17	1,94	62,10	1,87	Q0-070070-BBBW-C1000-K188
		11,9	8,3		DEEP BLUE	455	4369	16,17	1,94			
		11,9	8,3		DEEP BLUE	455	4369	16,17	1,94			
		11,8	8,3		WHITE	5000	1065	13,60	1,65			
	800	12,0	9,6	38,2	DEEP BLUE	455	4826	17,86	1,87	68,54	1,79	Q0-070070-BBBW-C1000-K188
		12,0	9,6		DEEP BLUE	455	4826	17,86	1,87			
		12,0	9,6		DEEP BLUE	455	4826	17,86	1,87			
		11,9	9,5		WHITE	5000	1171	14,96	1,57			

Parameters were calculated for temperatures  $T_J = 25^\circ\text{C}$

Radiant power and wavelength for color LEDs; Luminous flux and color temperature for white LEDs.

Values of these parameters were calculated for default bin and with tolerances of 15%.



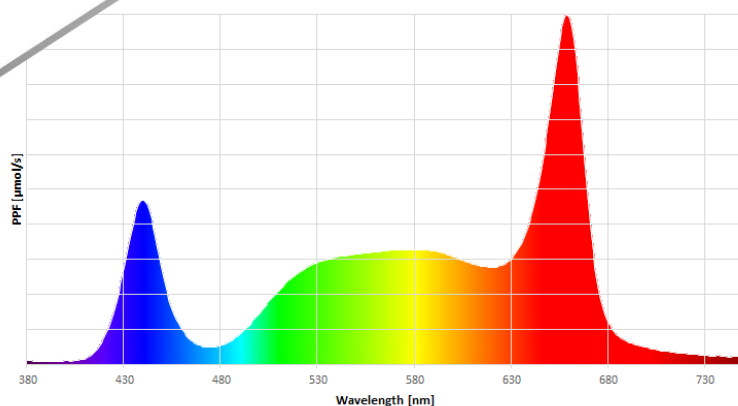
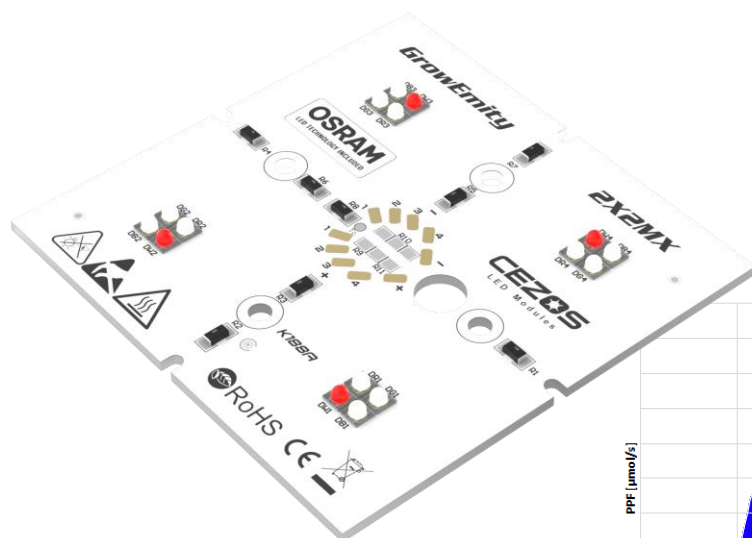
## GROWEMITY 2x2MX RWWW - K188

	Input Current [mA]	Forward Voltage [V]	Power [W]	Total Power [W]	Colour	$\lambda$ [nm] / CCT [K]	Radiant Power [mW] / Luminous Flux [lm]	PPF [ $\mu\text{mol/s}$ ]	PPF/W [ $\mu\text{mol/J}$ ]	Total PPF [ $\mu\text{mol/s}$ ]	Total PPF/W [ $\mu\text{mol/J}$ ]	Article Number
GrowEmity 2x2MX RWWW - K188	350	8,6	3,0	14,6	RED	657	1700	9,22	3,06	32,74	2,25	Q0-070070-RWWW-C1000-K188
		11,0	3,9		WHITE	5000	592	7,84	2,04			
		11,0	3,9		WHITE	5000	592	7,84	2,04			
		11,0	3,9		WHITE	5000	592	7,84	2,04			
	500	9,0	4,5	21,6	RED	657	2397	13,00	2,89	44,44	2,06	Q0-070070-RWWW-C1000-K188
		11,4	5,7		WHITE	5000	810	10,48	1,84			
		11,4	5,7		WHITE	5000	810	10,48	1,84			
		11,4	5,7		WHITE	5000	810	10,48	1,84			
	700	9,6	6,7	31,5	RED	657	3247	17,61	2,62	58,41	1,85	Q0-070070-RWWW-C1000-K188
		11,8	8,3		WHITE	5000	1065	13,60	1,65			
		11,8	8,3		WHITE	5000	1065	13,60	1,65			
		11,8	8,3		WHITE	5000	1065	13,60	1,65			
	800	9,9	7,9	36,5	RED	657	3706	20,10	2,53	64,98	1,78	Q0-070070-RWWW-C1000-K188
		11,9	9,5		WHITE	5000	1171	14,96	1,57			
		11,9	9,5		WHITE	5000	1171	14,96	1,57			
		11,9	9,5		WHITE	5000	1171	14,96	1,57			

Parameters were calculated for temperatures  $T_J = 25^\circ\text{C}$

Radiant power and wavelength for color LEDs; Luminous flux and color temperature for white LEDs.

Values of these parameters were calculated for default bin and with tolerances of 15%.



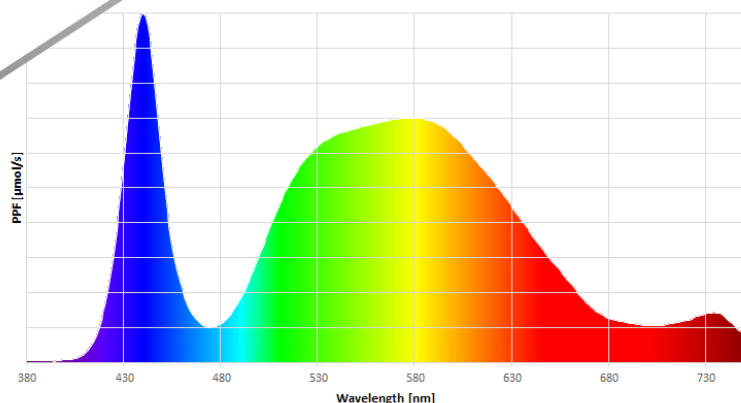
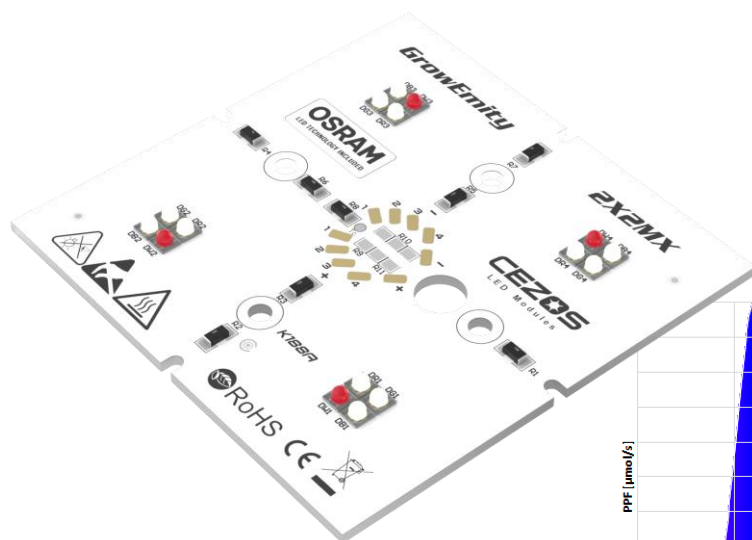
## GROWEMITY 2x2MX FWWW - K188

	Input Current [mA]	Forward Voltage [V]	Power [W]	Total Power [W]	Colour	$\lambda$ [nm] / CCT [K]	Radiant Power [mW] / Luminous Flux [lm]	PPF [ $\mu\text{mol/s}$ ]	PPF/W [ $\mu\text{mol/J}$ ]	Total PPF [ $\mu\text{mol/s}$ ]	Total PPF/W [ $\mu\text{mol/J}$ ]	Article Number
GrowEmity 2x2MX FWWW - K188	350	7,4	2,6	14,1	FAR RED	727	1060	0,64	0,25	24,16	1,71	Q0-070070-FWWW-C1000-K188
		11,0	3,9		WHITE	5000	592	7,84	2,04			
		11,0	3,9		WHITE	5000	592	7,84	2,04			
		11,0	3,9		WHITE	5000	592	7,84	2,04			
	500	7,8	3,9	21,0	FAR RED	727	1495	0,90	0,23	32,34	1,54	Q0-070070-FWWW-C1000-K188
		11,4	5,7		WHITE	5000	810	10,48	1,84			
		11,4	5,7		WHITE	5000	810	10,48	1,84			
		11,4	5,7		WHITE	5000	810	10,48	1,84			
	700	8,3	5,8	30,6	FAR RED	727	2025	1,22	0,21	42,02	1,37	Q0-070070-FWWW-C1000-K188
		11,8	8,3		WHITE	5000	1065	13,60	1,65			
		11,8	8,3		WHITE	5000	1065	13,60	1,65			
		11,8	8,3		WHITE	5000	1065	13,60	1,65			
	800	8,4	6,8	35,4	FAR RED	727	2311	1,40	0,21	46,28	1,31	Q0-070070-FWWW-C1000-K188
		11,9	9,5		WHITE	5000	1171	14,96	1,57			
		11,9	9,5		WHITE	5000	1171	14,96	1,57			
		11,9	9,5		WHITE	5000	1171	14,96	1,57			

Parameters were calculated for temperatures  $T_J = 25^\circ\text{C}$

Radiant power and wavelength for color LEDs; Luminous flux and color temperature for white LEDs.

Values of these parameters were calculated for default bin and with tolerances of 15%.





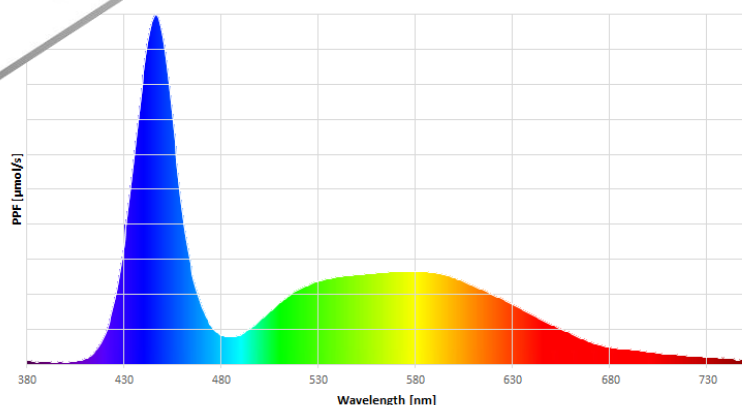
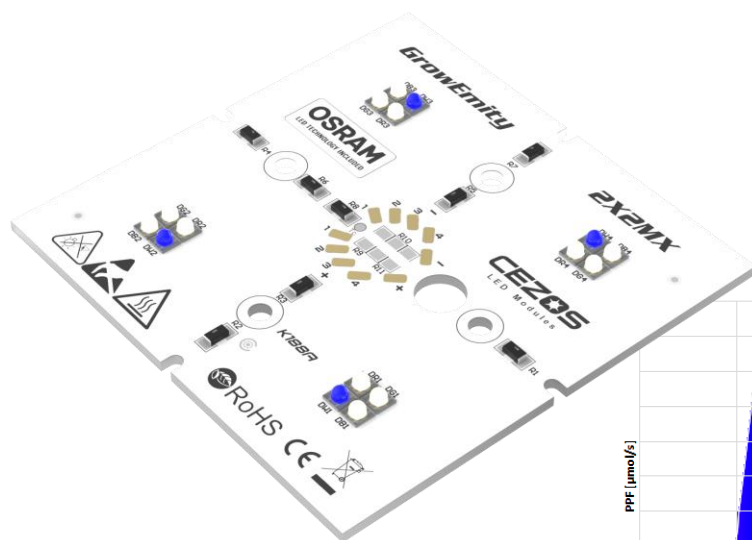
## GROWEMITY 2x2MX BWWW - K188

	Input Current [mA]	Forward Voltage [V]	Power [W]	Total Power [W]	Colour	$\lambda$ [nm] / CCT [K]	Radiant Power [mW] / Luminous Flux [lm]	PPF [ $\mu\text{mol/s}$ ]	PPF/W [ $\mu\text{mol/J}$ ]	Total PPF [ $\mu\text{mol/s}$ ]	Total PPF/W [ $\mu\text{mol/J}$ ]	Article Number
GrowEmity 3x11 BWWW - K177	350	11,4	4,0	15,5	DEEP BLUE	455	2540	9,40	2,36	32,92	2,12	LO-278053-BWWW-C1000-K177
		11,0	3,9		WHITE	5000	592	7,84	2,04			
		11,0	3,9		WHITE	5000	592	7,84	2,04			
		11,0	3,9		WHITE	5000	592	7,84	2,04			
	500	11,6	5,8	22,9	DEEP BLUE	455	3531	13,07	2,25	44,51	1,94	LO-278053-BWWW-C1000-K177
		11,4	5,7		WHITE	5000	810	10,48	1,84			
		11,4	5,7		WHITE	5000	810	10,48	1,84			
		11,4	5,7		WHITE	5000	810	10,48	1,84			
	700	11,9	8,3	33,1	DEEP BLUE	455	4369	16,17	1,94	56,97	1,72	LO-278053-BWWW-C1000-K177
		11,8	8,3		WHITE	5000	1065	13,60	1,65			
		11,8	8,3		WHITE	5000	1065	13,60	1,65			
		11,8	8,3		WHITE	5000	1065	13,60	1,65			
	800	12,0	9,6	38,2	DEEP BLUE	455	4826	17,86	1,87	62,74	1,64	LO-278053-BWWW-C1000-K177
		11,9	9,5		WHITE	5000	1171	14,96	1,57			
		11,9	9,5		WHITE	5000	1171	14,96	1,57			
		11,9	9,5		WHITE	5000	1171	14,96	1,57			

Parameters were calculated for temperatures  $T_J = 25^\circ\text{C}$

Radiant power and wavelength for color LEDs; Luminous flux and color temperature for white LEDs.

Values of these parameters were calculated for default bin and with tolerances of 15%.

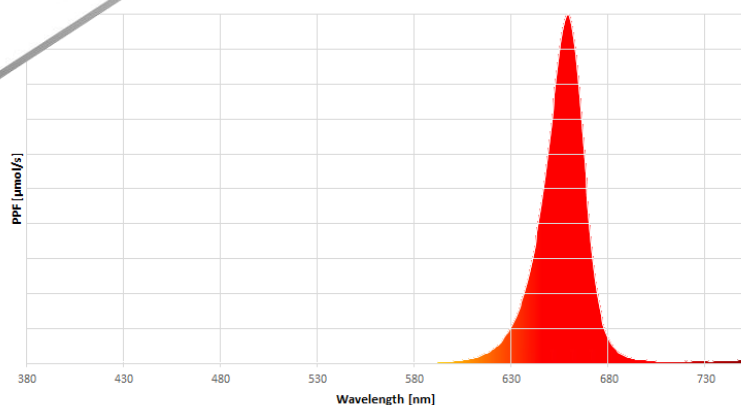
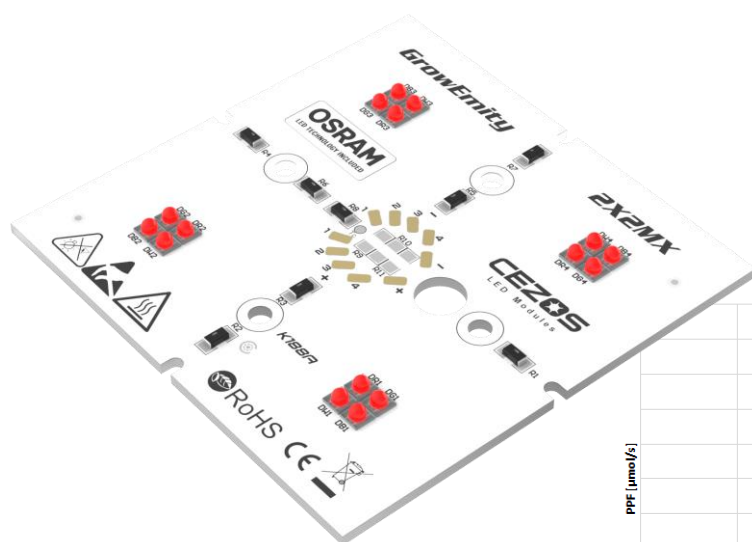


## GROWEMITY 2x2MX RRRR - K188

	Input Current [mA]	Forward Voltage [V]	Power [W]	Total Power [W]	Colour	$\lambda$ [nm]	Radiant Power [mW]	PPF [ $\mu\text{mol/s}$ ]	PPF/W [ $\mu\text{mol/J}$ ]	Total PPF [ $\mu\text{mol/s}$ ]	Total PPF/W [ $\mu\text{mol/J}$ ]	Article Number
GrowEmity 2x2MX RRRR - K188	350	8,6	3,0	12,0	RED	657	1700	9,22	3,06	36,88	3,06	Q0-070070-RRRR-C1000-K188
		8,6	3,0		RED	657	1700	9,22	3,06			
		8,6	3,0		RED	657	1700	9,22	3,06			
		8,6	3,0		RED	657	1700	9,22	3,06			
	500	9,0	4,5	18,0	RED	657	2397	13,00	2,89	52,00	2,89	Q0-070070-RRRR-C1000-K188
		9,0	4,5		RED	657	2397	13,00	2,89			
		9,0	4,5		RED	657	2397	13,00	2,89			
		9,0	4,5		RED	657	2397	13,00	2,89			
	700	9,6	6,7	26,9	RED	657	3247	17,61	2,62	70,44	2,62	Q0-070070-RRRR-C1000-K188
		9,6	6,7		RED	657	3247	17,61	2,62			
		9,6	6,7		RED	657	3247	17,61	2,62			
		9,6	6,7		RED	657	3247	17,61	2,62			
	800	9,9	7,9	31,7	RED	657	3706	20,10	2,53	80,40	2,53	Q0-070070-RRRR-C1000-K188
		9,9	7,9		RED	657	3706	20,10	2,53			
		9,9	7,9		RED	657	3706	20,10	2,53			
		9,9	7,9		RED	657	3706	20,10	2,53			

Parameters were calculated for temperatures  $T_J = 25^\circ\text{C}$

Values of these parameters were calculated for default bin and with tolerances of 15%.

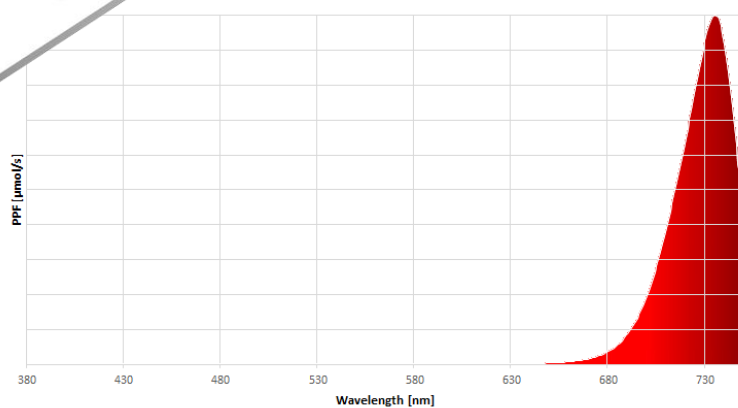
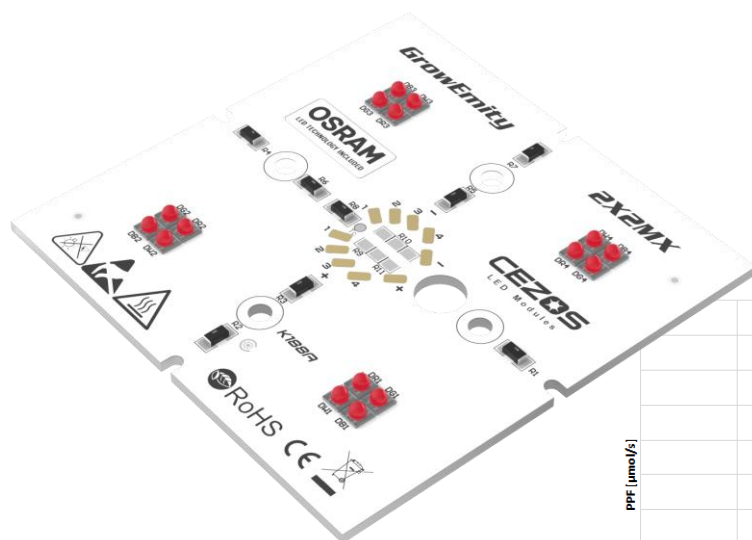


## GROWEMITY 2x2MX FFFF- K188

	Input Current [mA]	Forward Voltage [V]	Power [W]	Total Power [W]	Colour	$\lambda$ [nm]	Radiant Power [mW]	PPF [ $\mu\text{mol/s}$ ]	PPF/W [ $\mu\text{mol/J}$ ]	Total PPF [ $\mu\text{mol/s}$ ]	Total PPF/W [ $\mu\text{mol/J}$ ]	Article Number
GrowEmity 2x2MX FFFF- K188	350	7,4	2,6	10,4	FAR RED	727	1060	0,64	0,25	2,56	0,25	QO-070070-FFFF-C1000-K188
		7,4	2,6		FAR RED	727	1060	0,64	0,25			
		7,4	2,6		FAR RED	727	1060	0,64	0,25			
		7,4	2,6		FAR RED	727	1060	0,64	0,25			
	500	7,8	3,9	15,6	FAR RED	727	1495	0,90	0,23	3,61	0,23	QO-070070-FFFF-C1000-K188
		7,8	3,9		FAR RED	727	1495	0,90	0,23			
		7,8	3,9		FAR RED	727	1495	0,90	0,23			
		7,8	3,9		FAR RED	727	1495	0,90	0,23			
	700	8,3	5,8	23,2	FAR RED	727	2025	1,22	0,21	4,89	0,21	QO-070070-FFFF-C1000-K188
		8,3	5,8		FAR RED	727	2025	1,22	0,21			
		8,3	5,8		FAR RED	727	2025	1,22	0,21			
		8,3	5,8		FAR RED	727	2025	1,22	0,21			
	800	8,4	6,8	27,0	FAR RED	727	2311	1,40	0,21	5,58	0,21	QO-070070-FFFF-C1000-K188
		8,4	6,8		FAR RED	727	2311	1,40	0,21			
		8,4	6,8		FAR RED	727	2311	1,40	0,21			
		8,4	6,8		FAR RED	727	2311	1,40	0,21			

Parameters were calculated for temperatures  $T_j = 25^\circ\text{C}$

Values of these parameters were calculated for default bin and with tolerances of 15%.

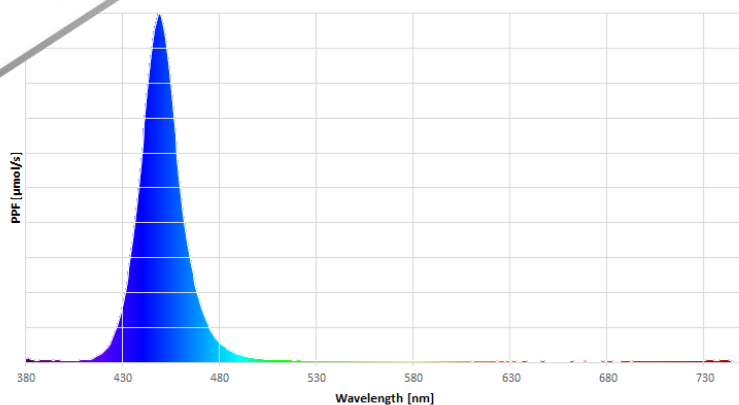
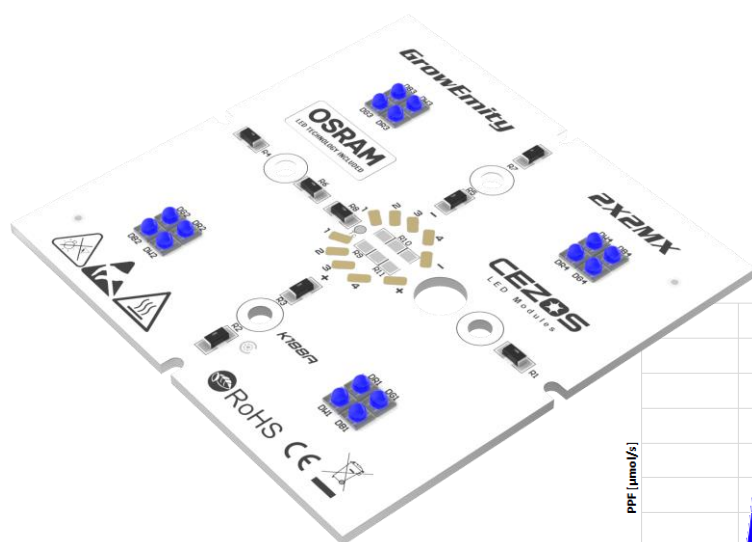


## GROWEMITY 2x2MX BBBB - K188

	Input Current [mA]	Forward Voltage [V]	Power [W]	Total Power [W]	Colour	$\lambda$ [nm]	Radiant Power [mW]	PPF [ $\mu\text{mol/s}$ ]	PPF/W [ $\mu\text{mol/J}$ ]	Total PPF [ $\mu\text{mol/s}$ ]	Total PPF/W [ $\mu\text{mol/J}$ ]	Article Number
GrowEmity 2x2MX BBBB - K188	350	11,4	4,0	16,0	DEEP BLUE	455	2540	9,40	2,36	37,60	2,36	Q0-070070-BBBB-C1000-K188
		11,4	4,0		DEEP BLUE	455	2540	9,40	2,36			
		11,4	4,0		DEEP BLUE	455	2540	9,40	2,36			
		11,4	4,0		DEEP BLUE	455	2540	9,40	2,36			
	500	11,6	5,8	23,2	DEEP BLUE	455	3531	13,07	2,25	52,26	2,25	Q0-070070-BBBB-C1000-K188
		11,6	5,8		DEEP BLUE	455	3531	13,07	2,25			
		11,6	5,8		DEEP BLUE	455	3531	13,07	2,25			
		11,6	5,8		DEEP BLUE	455	3531	13,07	2,25			
	700	11,9	8,3	33,3	DEEP BLUE	455	4369	16,17	1,94	64,67	1,94	Q0-070070-BBBB-C1000-K188
		11,9	8,3		DEEP BLUE	455	4369	16,17	1,94			
		11,9	8,3		DEEP BLUE	455	4369	16,17	1,94			
		11,9	8,3		DEEP BLUE	455	4369	16,17	1,94			
	800	12,0	9,6	38,3	DEEP BLUE	455	4826	17,86	1,87	71,44	1,87	Q0-070070-BBBB-C1000-K188
		12,0	9,6		DEEP BLUE	455	4826	17,86	1,87			
		12,0	9,6		DEEP BLUE	455	4826	17,86	1,87			
		12,0	9,6		DEEP BLUE	455	4826	17,86	1,87			

Parameters were calculated for temperatures  $T_J = 25^\circ\text{C}$

Values of these parameters were calculated for default bin and with tolerances of 15%.

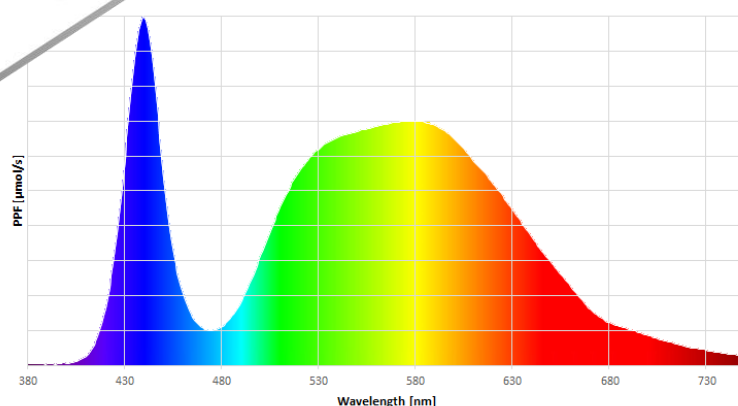
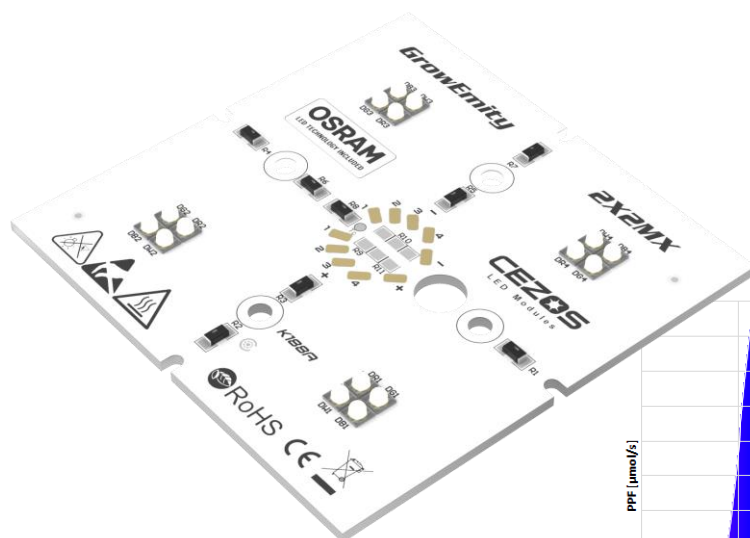


## GROWEMITY 2x2MX MONO - K188

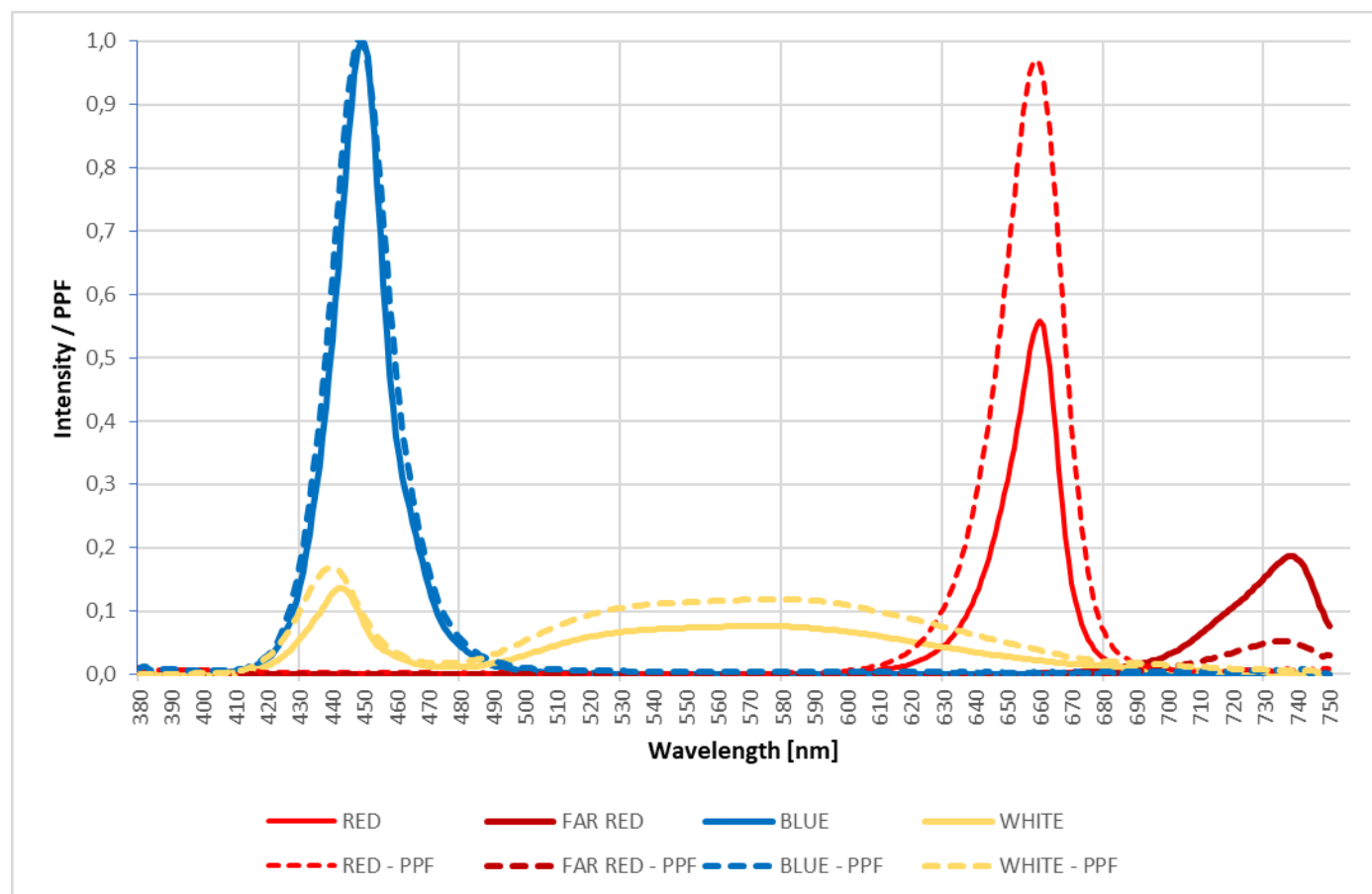
	Input Current [mA]	Forward Voltage [V]	Power [W]	Total Power [W]	Colour	CCT [K]	Luminous Flux [lm]	PPF [ $\mu\text{mol/s}$ ]	PPF/W [ $\mu\text{mol/J}$ ]	Total PPF [ $\mu\text{mol/s}$ ]	Total PPF/W [ $\mu\text{mol/J}$ ]	Article Number
GrowEmity 2x2MX MONO - K188	350	11,0	3,9	15,4	WHITE	5000	592	7,84	2,04	31,36	2,04	Q0-070070-MONO-C1000-K188
		11,0	3,9		WHITE	5000	592	7,84	2,04			
		11,0	3,9		WHITE	5000	592	7,84	2,04			
		11,0	3,9		WHITE	5000	592	7,84	2,04			
	500	11,4	5,7	22,8	WHITE	5000	810	10,48	1,84	41,92	1,84	Q0-070070-MONO-C1000-K188
		11,4	5,7		WHITE	5000	810	10,48	1,84			
		11,4	5,7		WHITE	5000	810	10,48	1,84			
		11,4	5,7		WHITE	5000	810	10,48	1,84			
	700	11,8	8,3	33,0	WHITE	5000	1065	13,60	1,65	54,40	1,65	Q0-070070-MONO-C1000-K188
		11,8	8,3		WHITE	5000	1065	13,60	1,65			
		11,8	8,3		WHITE	5000	1065	13,60	1,65			
		11,8	8,3		WHITE	5000	1065	13,60	1,65			
	800	11,9	9,5	38,1	WHITE	5000	1171	14,96	1,57	59,84	1,57	Q0-070070-MONO-C1000-K188
		11,9	9,5		WHITE	5000	1171	14,96	1,57			
		11,9	9,5		WHITE	5000	1171	14,96	1,57			
		11,9	9,5		WHITE	5000	1171	14,96	1,57			

Parameters were calculated for temperatures  $T_j = 25^\circ\text{C}$

Values of these parameters were calculated for default bin and with tolerances of 15%.



### SPECTRUM OF LEDs



Spectrum graph of the red, far red, blue and white LEDs at 350 mA current. Spectrum can be changed by choosing LEDs and power output.

GrowEmity modules can be ordered as ready unit with heat-sink and optic. Couple of units can be mounted together, to create the GrowEmity light source with the same or different type of LEDs configuration. It ensures better efficiency and flexibility of GrowEmity lighting system. For the GrowEmity 2x2MX – K188 are recommended:

- **COMPATIBLE HEAT-SINK :**

COOLBLOCK ® SQ-01-2x2MX MechaTronix

- **COMPATIBLE OPTIC :**

CS14632\_STRADA-2X2MX-DWC

CS14764\_STRADA-2X2MX-VSM

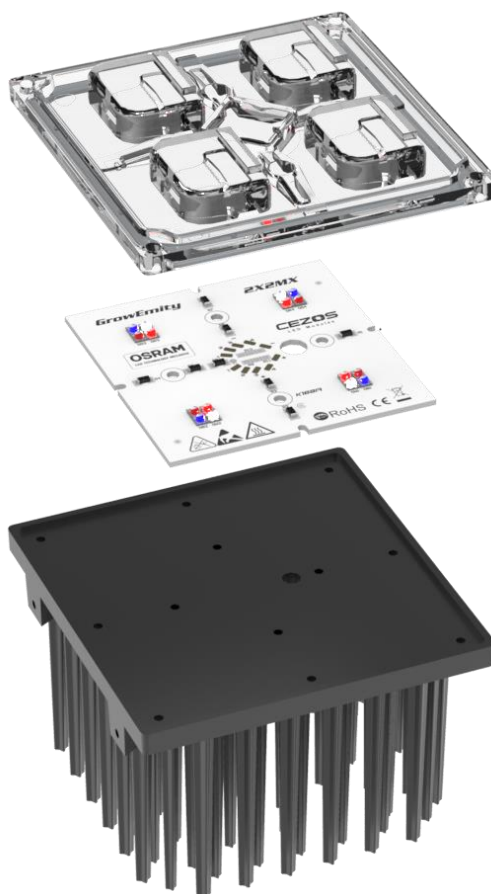
CS14841\_STRADA-2X2MX-SCL

CS15389\_STRADA-2X2MX-T2-S

CS14713\_HB-2X2MX-W

CS14840\_HB-2X2MX-M

FN14825\_STRADA-2X2MXS-DWC2



Almost half of the input power is converted to heat, which means that GrowEmity light sources must be mounted to a heat-sink with thermal tape for better heat dissipation.

## **COOLING**

GrowEmity light source isn't self-cooling and additional heat-sink is required. The lifetime of the light source depends on the operating temperature and used LEDs. The temperature should be measured in the middle of the board. The temperature can be measured with thermocouple or simple temperature probe. Lifetime of LEDs decreases with the rise of temperature and luminous intensity in higher temperatures may be lower than nominal. Construction of the lamp or any place of installation should ensure correct heat dissipation from LED light sources. Overheat can damage or destroy some elements or entire LED light source. Never use overheated light source again as it may be damaged and can cause losses or even fire. We are not responsible for any loss, or damage resulting from overheating! Guarantee become void in such cases.

## **SAFETY**

LED light source can change light intensity, but even dimmed LEDs generate high-intensity light. Looking into LEDs beam is unhealthy and may cause irreversible injury to eye's retina. Never look into the beam without protection glasses with an appropriate filter. Additionally, they may change LEDs light intensity almost immediately. If people are photosensitive, LEDs light may be a trigger to epileptic seizures and alter the perception, especially when light change very fast.

LED light source can work on high power supply current, so never touch components and wires of LED light source when power supply is on.



**PROTECTION MEASURES AGAINST DAMAGE**

LED light sources are delicate, even small mechanical stress may damage them. Such stresses should be avoided. If it is impossible, it should be kept to the minimum. Mechanical stresses such as pressure, bending, breaking, drilling, etc. may cause irreversible damage. Damaged LED light source aren't suitable for use.

Electrostatic Discharge (ESD) is a serious threat to electronics devices. The human body can accumulate very high electrostatic charge which can decrease the lifetime of electronics significantly and in worst cases may destroy electronic components. To avoid damages use of electrostatic protection is required. It is needed to follow ESD precautions during manipulation of these devices. Do not touch electronic components directly to avoid damages. Observe the official regulations for electrical devices (like DIN, VDE, EN). It is necessary to isolate components like controllers, LED light sources, power supply, wires etc. from any metal parts which can conduct electrostatic charges or cause a short circuit. LED light source aren't equipped with short circuit protection. During a short circuit, very high current is flowing from a power supply and can destroy it, causing risk of fire. Electronics must not be modified. Any modification causes loss of guarantee. The electric wiring/connection must comply with all current and valid national requirements, be constructed by a certified electrical tradesman, and comply with all the requirements set forth in this manual. We are not responsible for any loss, or damage resulting from electrostatic voltage discharge and a short circuit caused by inappropriate handling or wrong construction of the lamp! Guarantee become void in such cases.

Additionally LED light source can be damaged by some chemical substances. Depends on elements the damage may be different. It is important not to use chemical substances like acids, organic acids, sulphur, alkalis, organic solvents, mineral oils, vegetable oils and synthetic oils, etc. We are not responsible for any loss, or damage resulting from improper use of LED light source! Guarantee become void in such cases.

Do not operate LED light source when they aren't working properly. If LED light source are working incorrectly, turn off a power supply. Damaged LED light source may cause electric shock or short circuit.

**CONTACT**

CEZOS

81-534 Gdynia POLAND,

Olgerda 88/b

tel. +48 58 664 88 61

[cezos@cezos.com](mailto:cezos@cezos.com)

[www.cezos.com](http://www.cezos.com)

Subject to errors and technical changes.