HBUD3-SW3B150S-CDGLY 40K 150W

Light efficiency:

159 Lumens/Watt

Light quality:

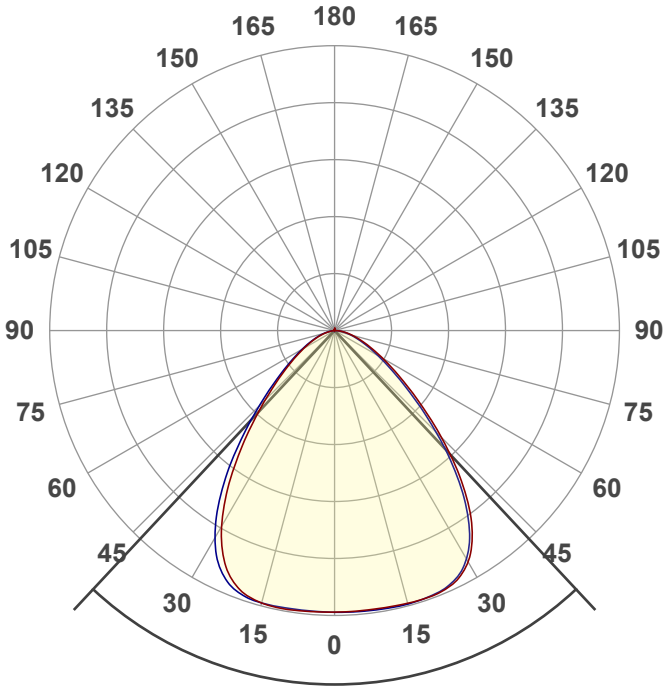
CRI: 75.5

Color temperature:

3854 K

Output: 24274 lm
Peak: 12051 cd

Power: 152.9 W
PF: 1.0



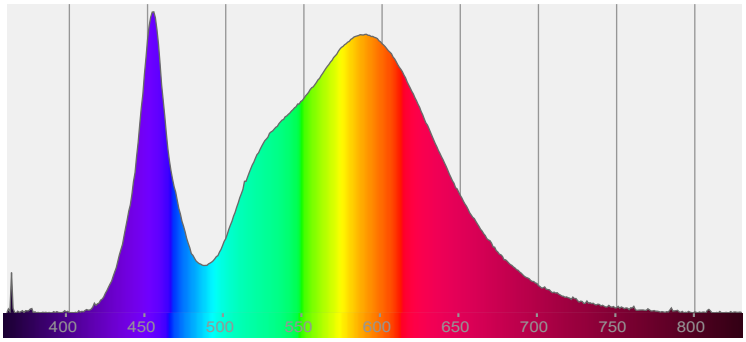
Beam angle 86.1°

CIE 1931
x: 0.386
y: 0.377

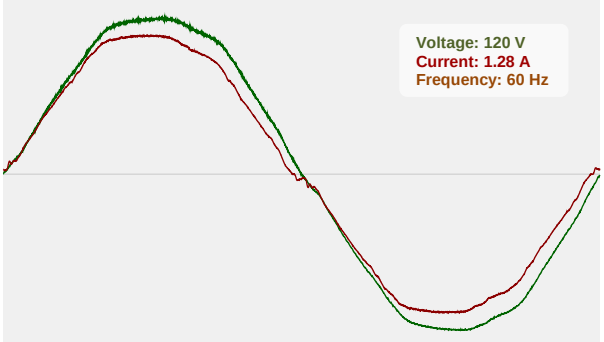
Product name:
HBUD3-SW3B150S-CDGLY 40K 150W

Date and time:
8/30/2024 8:16:48 AM

Spectra



Power



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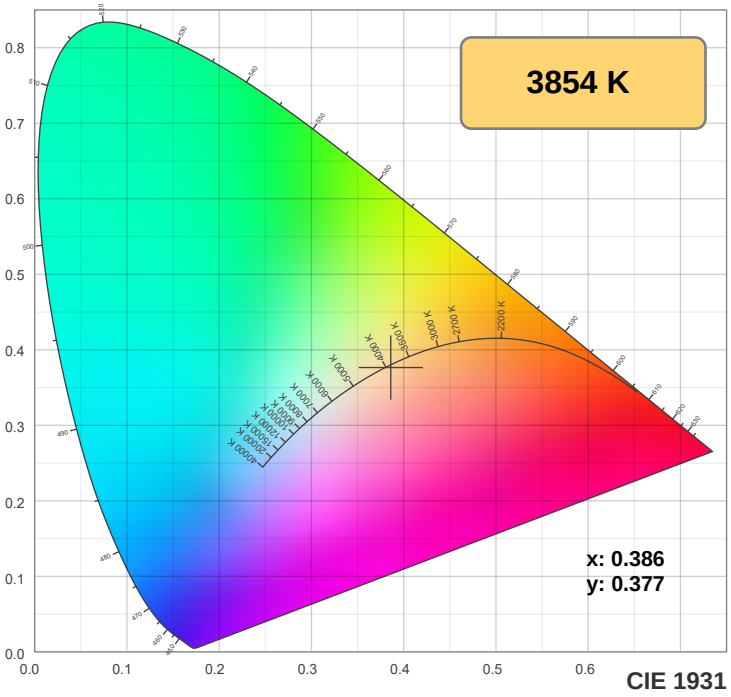
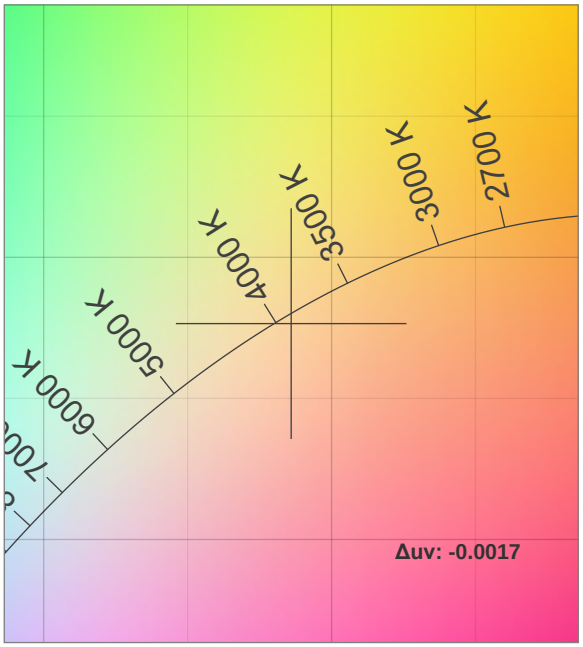
Color Specifications

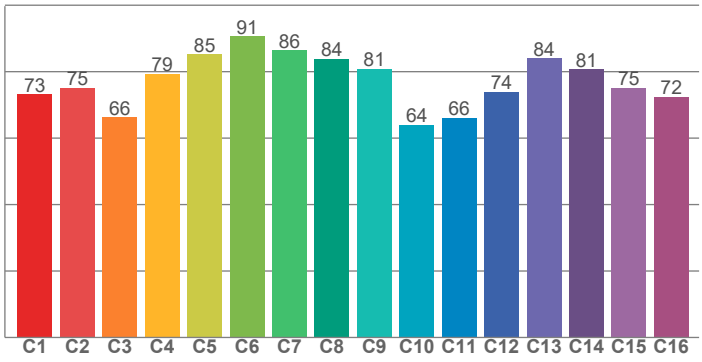


CIE 1931

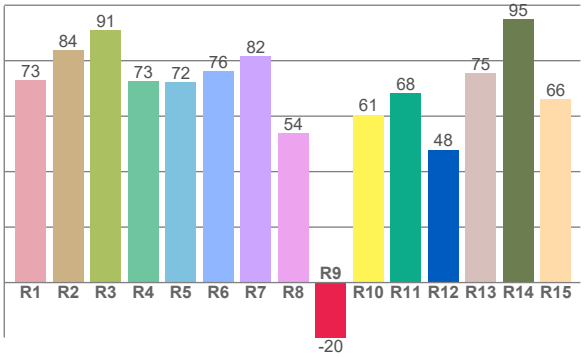


CIE 1931 ZOOM

TM30: 77.0



CRI: 75.5 (R1-R8)



CRI R values, only R1-R8 are used to calculate final CRI value

R1	R2	R3	R4	R5	R6	R7	R8	R9	R10	R11	R12	R13	R14	R15
73.0	83.8	91.0	72.7	72.1	76.3	81.5	53.7	-19.8	60.5	68.2	47.9	75.4	94.9	66.2

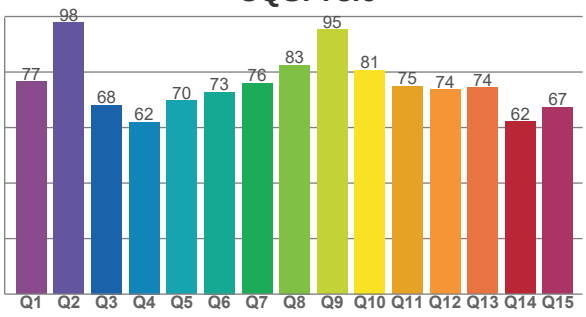
TM30 C values, 16 binned values out of total of 99 C values

C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12	C13	C14	C15	C16
73.2	75.0	66.3	79.4	85.2	90.7	86.5	83.9	80.8	64.1	66.1	73.8	84.0	80.7	75.1	72.3

CQS Q values

Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13	Q14	Q15
76.5	97.8	68.1	62.0	69.7	72.8	76.0	82.6	95.3	80.7	74.9	73.6	74.4	62.1	67.3

CQS: 73.6



Color parameters

Color temperature	Color rendering index	Red component	Color fidelity	Color gamut	Color quality scale	Color coordinate cie 1931	Color coordinate cie 1931	Color coordinate	Color coordinate	Color deviation from black body
CCT	CRI	CRI R9	TM30 Rf	TM30 Rg	CQS	x	y	u	v	Δuv
3854 K	75.5	-19.8	77.0	93.7	73.6	0.386	0.377	0.229	0.335	-0.0017

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TM30 Report

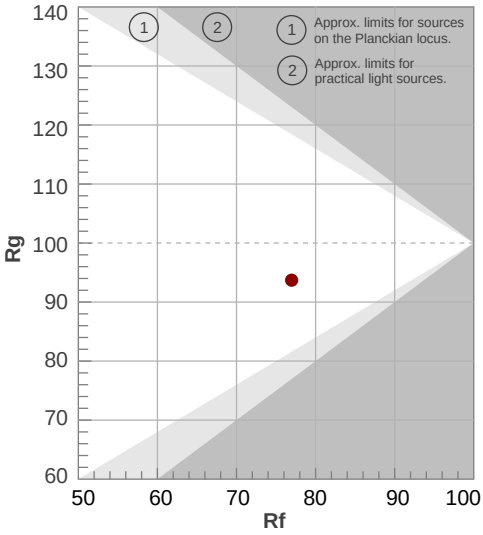
Rf 77.0

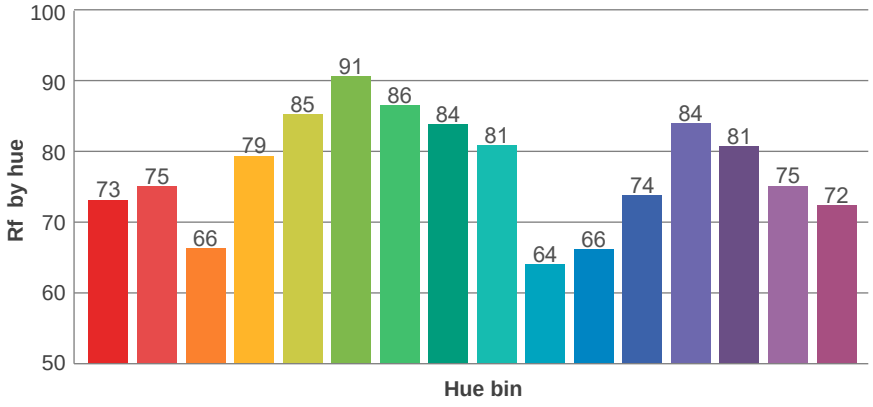
Fidelity index Rf

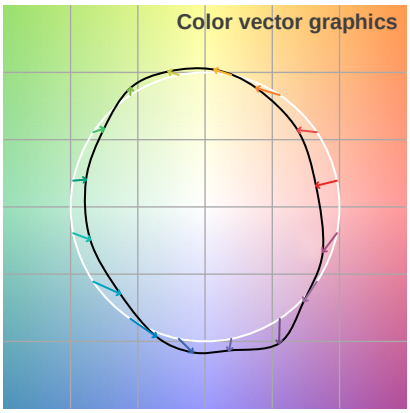
Rg 93.7

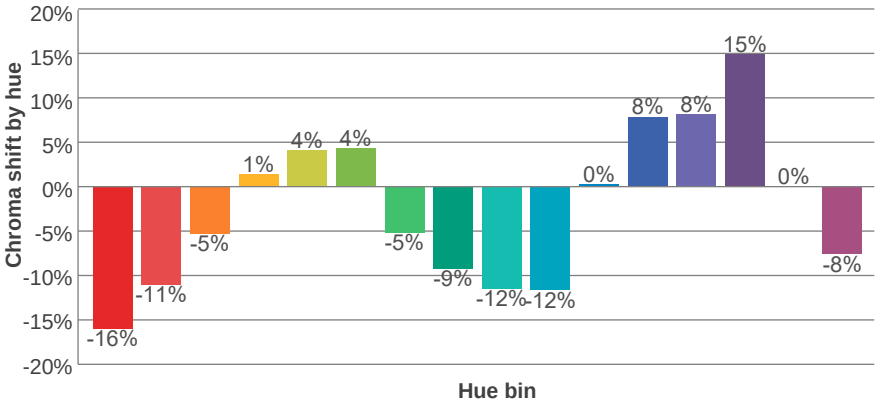
Gammut index Rg

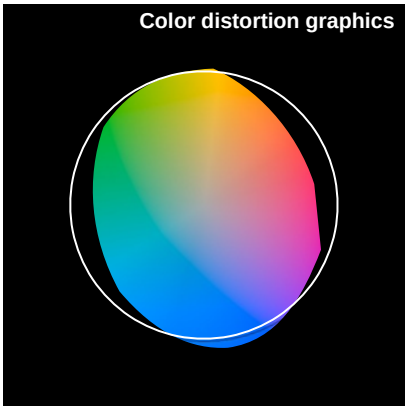
Hue Bin	R_f	Graphic shifts (%) Chroma	Hue
1	73	-16%	-1%
2	75	-11%	9%
3	66	-5%	17%
4	79	1%	13%
5	85	4%	7%
6	91	4%	-3%
7	86	-5%	-7%
8	84	-9%	-3%
9	81	-12%	7%
10	64	-12%	19%
11	66	0%	23%
12	74	8%	12%
13	84	8%	-3%
14	81	15%	-11%
15	75	0%	-18%
16	72	-8%	-16%

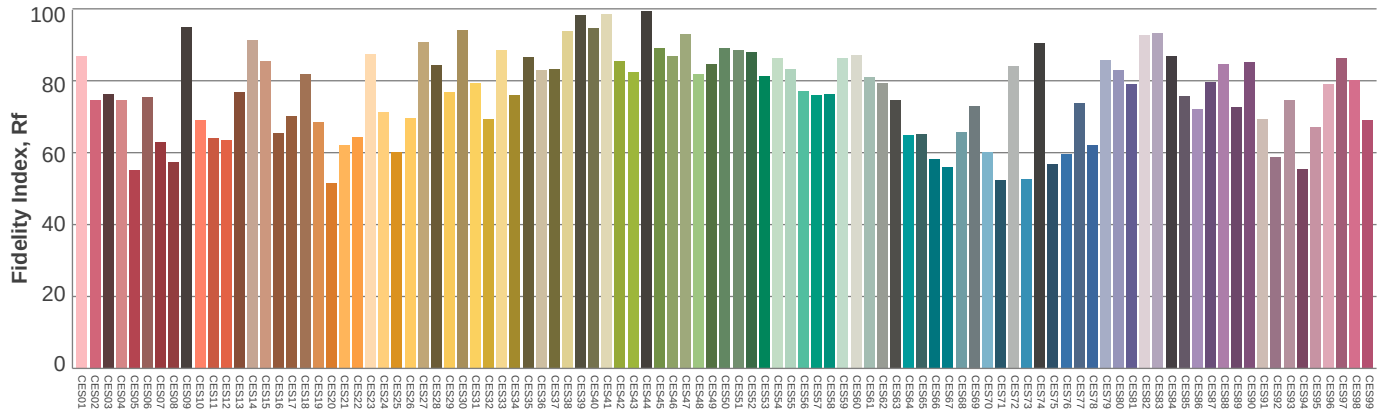












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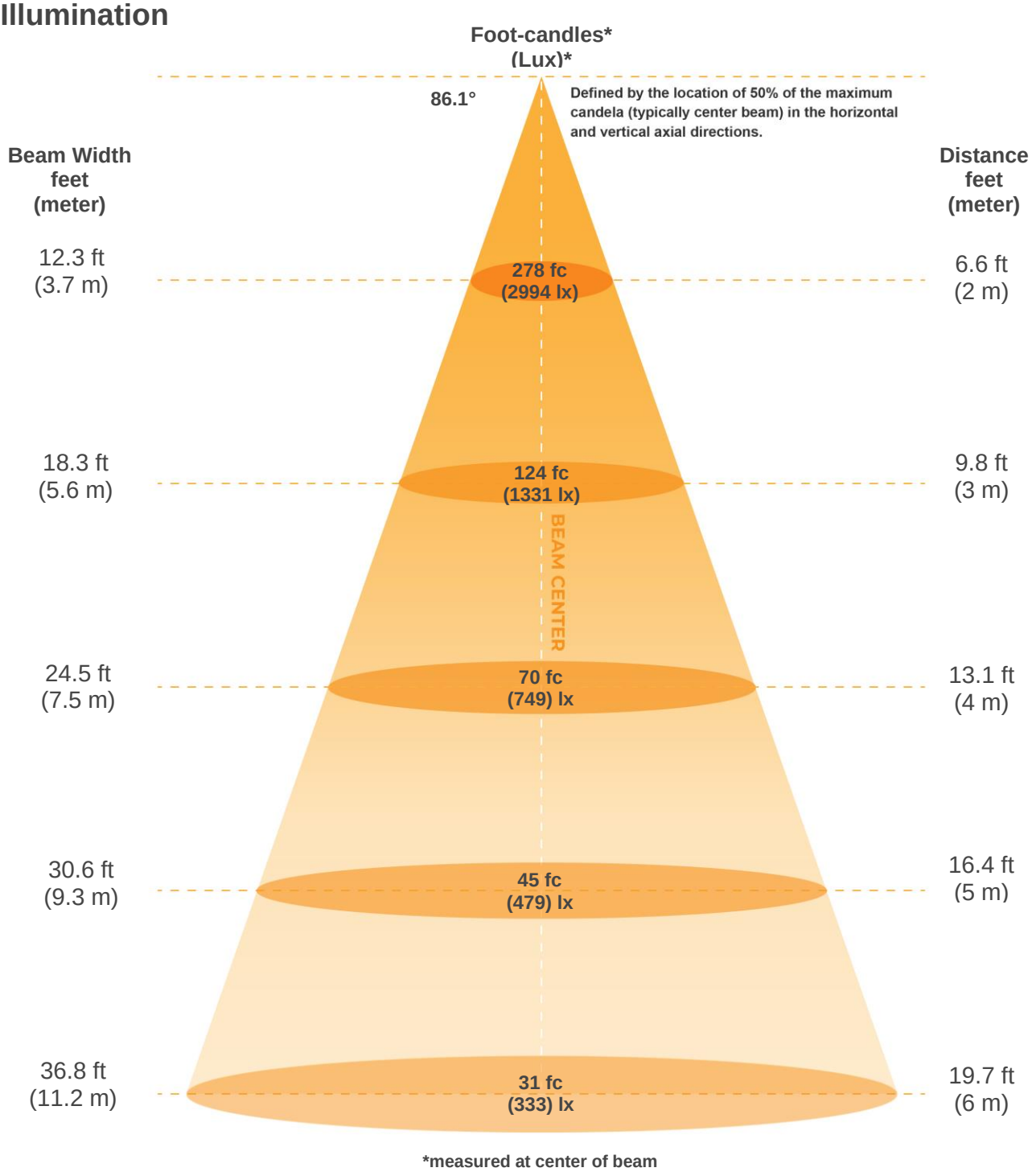
Illumination



Beam intensities from 1-20m

m	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
ft	3.3	6.6	9.8	13.1	16.4	19.7	23	26.2	29.5	32.8	36.1	39.4	42.7	45.9	49.2	52.5	55.8	59.1	62.3	65.6
lux	11978	2994	1331	749	479	333	244	187	148	120	99	83	71	61	53	47	41	37	33	30
fc	1112.8	278.2	123.6	69.5	44.5	30.9	22.7	17.4	13.7	11.1	9.2	7.7	6.6	5.7	4.9	4.3	3.9	3.4	3.1	2.8

Beam angle 50%	Field angle 10%	Cutoff Angle 2.5%	Intensity Ratio in 120° cone	Intensity Ratio in 90° cone
86.1°	132.5°	160.9°	90.7%	73.0%

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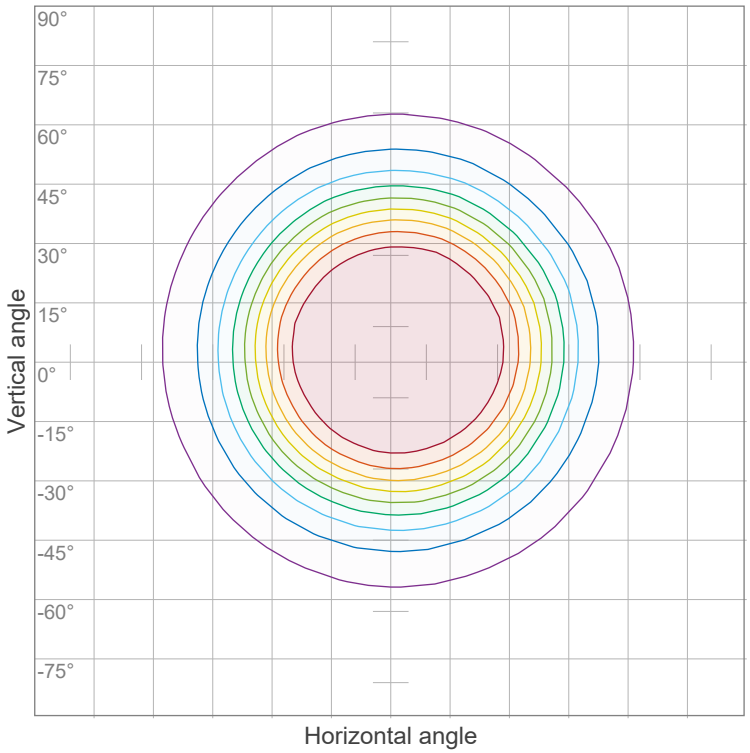
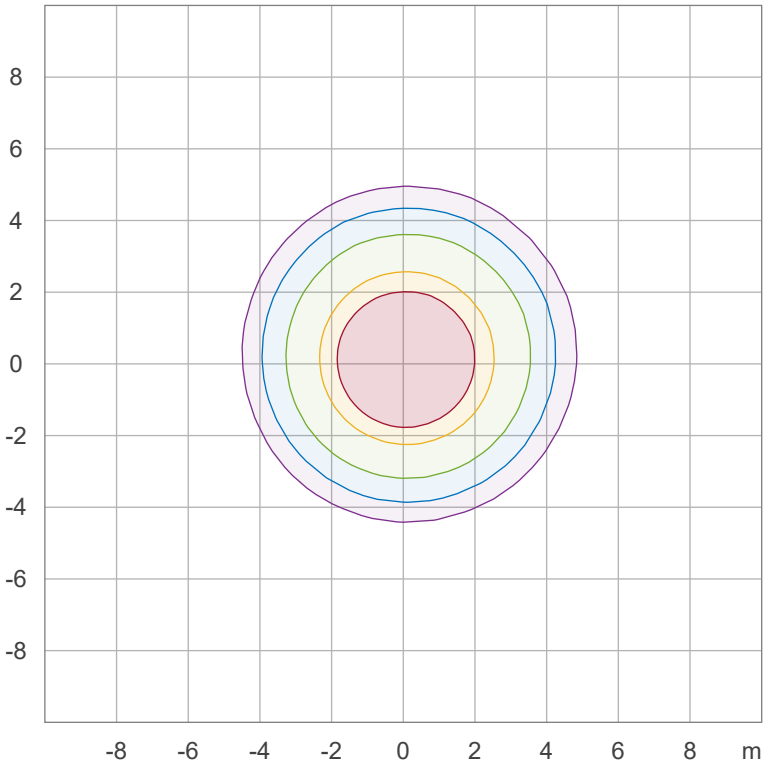
Iso-intensity Diagram (Iso-candela)



90 %	10846.0 cd
80 %	9640.9 cd
70 %	8435.8 cd
60 %	7230.7 cd
50 %	6025.6 cd
40 %	4820.5 cd
30 %	3615.3 cd
20 %	2410.2 cd
10 %	1205.1 cd

Peak intensity: 12051.2 cd
Number of c-planes: 16

Iso-illuminance Diagram (Iso-lux)



50.0 %	665.6 lx
30.0 %	399.4 lx
10.0 %	133.1 lx
5.0 %	66.6 lx
3.0 %	39.9 lx

Peak illuminance: 1331.3 lx
Mounting height: 3.0 m
Number of c-planes: 16

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Light Planning – UGR table

Uncorrected, comprehensive UGR table according to 117-1995

Reflectances										
ρ Ceiling	70	70	50	50	30	70	70	50	50	30
ρ Walls	50	30	50	30	30	50	30	50	30	30
ρ Floor	20	20	20	20	20	20	20	20	20	20
Room size H = mounting height above eye level X Y	Viewed Crosswise (Viewing direction orthogonal to lamp length axis)					Viewed Endwise (Viewing direction parallel to lamp length axis)				
n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a

Variations with the observer position for the luminaire spacings, S:

n/a	n/a	n/a
n/a	n/a	n/a
n/a	n/a	n/a

UGR data could not be calculated due to missing dimensions. Goto Edit->Photometric->Dimensions and set the fixture/lamp dimensions.

Coefficients of Utilization

Ceiling reflectance	80			70			50			30			10			0		
Wall reflectance	70	50	30	10	70	50	30	10	50	30	10	50	30	10	50	30	10	0
Floor reflectance	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	0
RCR	(RCR: Room Cavity Ratio)					Room Values are expressed as percentage of Lumen delivered to the task surface												
0	119	119	119	119	116	116	116	116	111	111	111	106	106	106	102	102	102	99
1	111	107	104	101	108	105	102	99	101	98	96	97	95	93	93	92	90	88
2	103	96	91	86	100	94	89	85	91	87	83	88	84	81	85	82	79	77
3	95	87	80	74	93	85	79	74	82	77	72	79	75	71	77	73	70	68
4	89	78	71	65	86	77	70	65	75	69	64	72	67	63	70	66	62	60
5	82	71	63	58	80	70	63	57	68	62	57	66	61	56	64	59	56	54
6	77	65	57	52	75	64	57	51	62	56	51	61	55	50	59	54	50	48
7	72	60	52	46	70	59	51	46	57	51	46	56	50	46	55	49	45	43
8	67	55	47	42	66	54	47	42	53	46	42	52	46	41	51	45	41	39
9	63	51	43	38	62	50	43	38	49	43	38	48	42	38	47	42	38	36
10	59	47	40	35	58	47	40	35	46	39	35	45	39	35	44	38	35	33

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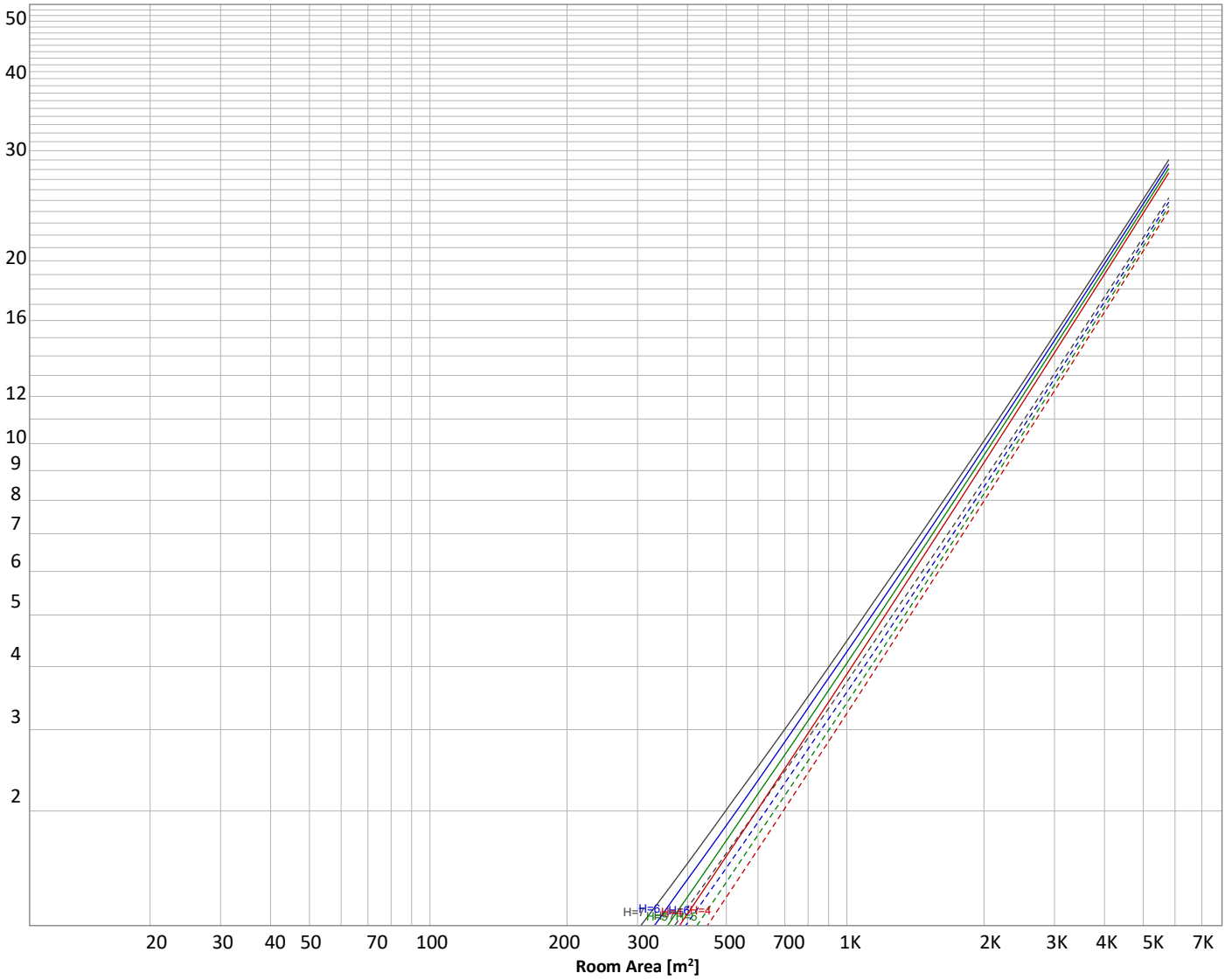
Luminaire budgetary diagram

Uncorrected, comprehensive UGR table according to 117-1995

LAMPS (number of lamps)



Conditions

H = Room height	Flux = 24274 lm		ρ(%)		
H_{down} = Lamp distance from ceiling =	0.00 m	Line type	Ceiling reflectance	Wall reflectance	Floor reflectance
H_{work} = Work area height from floor =	0.00 m	----------	70	50	30
E_{work} = Average lux on work area =	100 lx	————	50	30	20

Zonal Lumen Summary

0°-10°	10°-20°	20°-30°	30°-40°	40°-50°	50°-60°	60°-70°	70°-80°	80°-90°
1144 lm	3397 lm	5255 lm	5616 lm	4155 lm	2449 lm	1339 lm	633 lm	157 lm

90°-100°	100°-110°	110°-120°	120°-130°	130°-140°	140°-150°	150°-160°	160°-170°	170°-180°
13.3 lm	12.2 lm	14.6 lm	17.7 lm	19.7 lm	19.4 lm	16.9 lm	11.8 lm	4.26 lm

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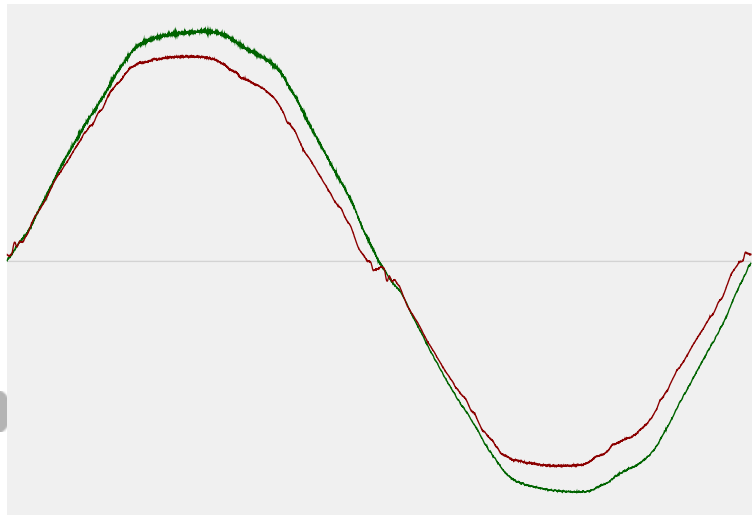
Power Details

Input Power

Power feed to light source	152.9 W
Frequency of input power	60 Hz
RMS Input voltage feed, V_{RMS}	120 V
RMS Input current feed, I_{RMS}	1.28 A
Volt-Ampere or apparent power = V_{RMS}*I_{RMS}	153.33 VA
Displacement factor of AC power feed	1.0
Power factor of AC current feed	1.0
Total harmonic distortion of the current	4.72%
Total harmonic distortion of the voltage	2.75%

Input Power Curve



Efficiency

Radiated power efficiency 46.3%

Lumen efficiency 159 lm/W

Stabilization Details

Warmup Conditions

Stable period	15 min
Stable change max	2.0%
Minimum time	15 min

Color Temperature Change

CCT start	3796 K
CCT shift	+58 K
CCT end	3854 K

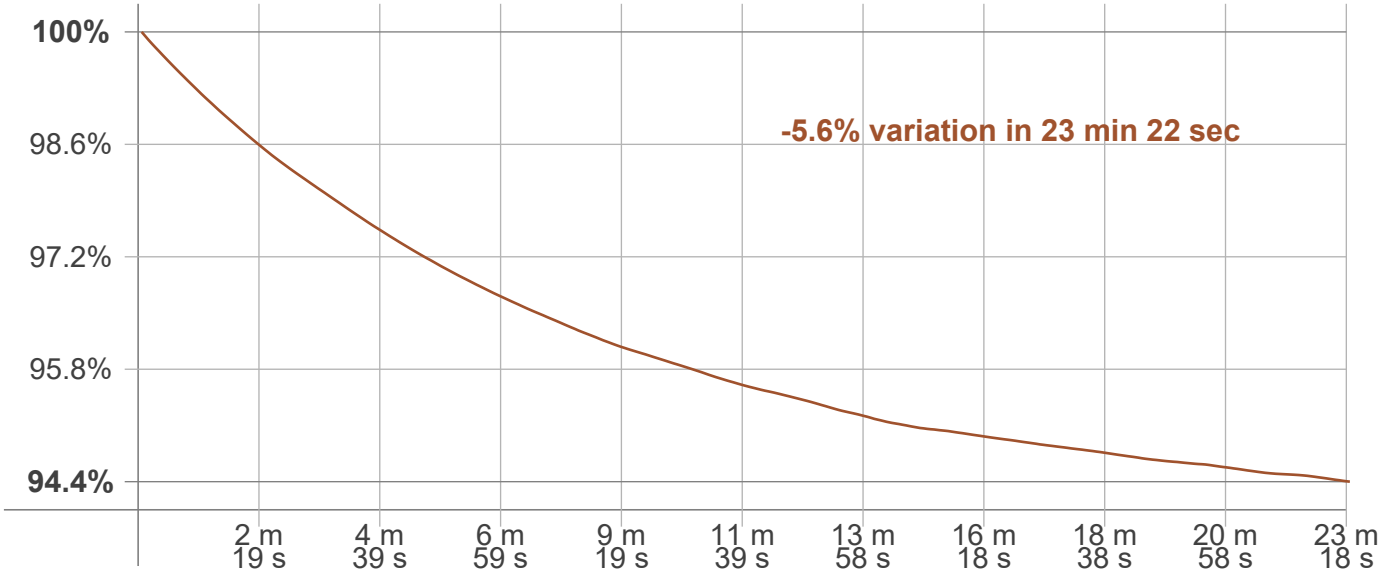
Warmup Result

Total warmup time	Lamp stabilized in 23 min 22 sec
Warmup variation	-5.7%

Output Change

Output start	25679 lm
Output change	-1405 lm
Output end	24274 lm

Stabilization Curve



Flicker /TLA details

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Flicker Meter Type	Viso Systems LabFlicker
Frequency of input power	60 Hz
Flicker/TLA sample rate	20000 samples/s

Measurement time

PstLM	180 sec
All other indices	1.2 sec

Flicker indices according to Illuminating Engineering Society (IES)

Flicker frequency	109.89 Hz
Percent Flicker	0.52 %
Flicker index	0

Flicker indices per California Energy Commission (CEC) 2016b

JA8/10 40 Hz	0.13 %
JA8/10 90 Hz	0.18 %
JA8/10 200 Hz	0.31 %
JA8/10 400 Hz	0.41 %
JA8/10 1000 Hz	0.5 %

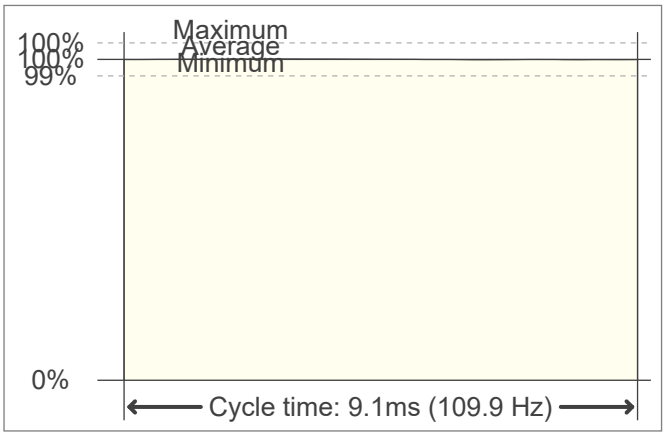
TLA indices (re IEC TR 61547-1, IEC 61000-3-3 and IEC 61000-4-15)

PstLM value (F < 80 Hz)	0.09
SVM value (80 < F < 2000 Hz)	0

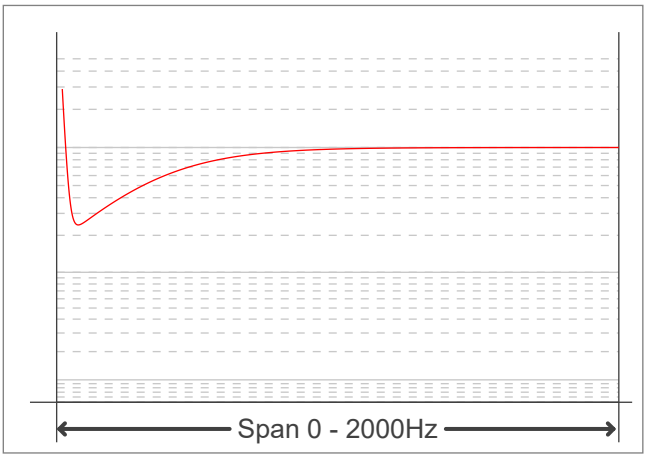
Flicker indices according to Lighting Research Center (2015)

Perception metric, Assist Mp	0.08

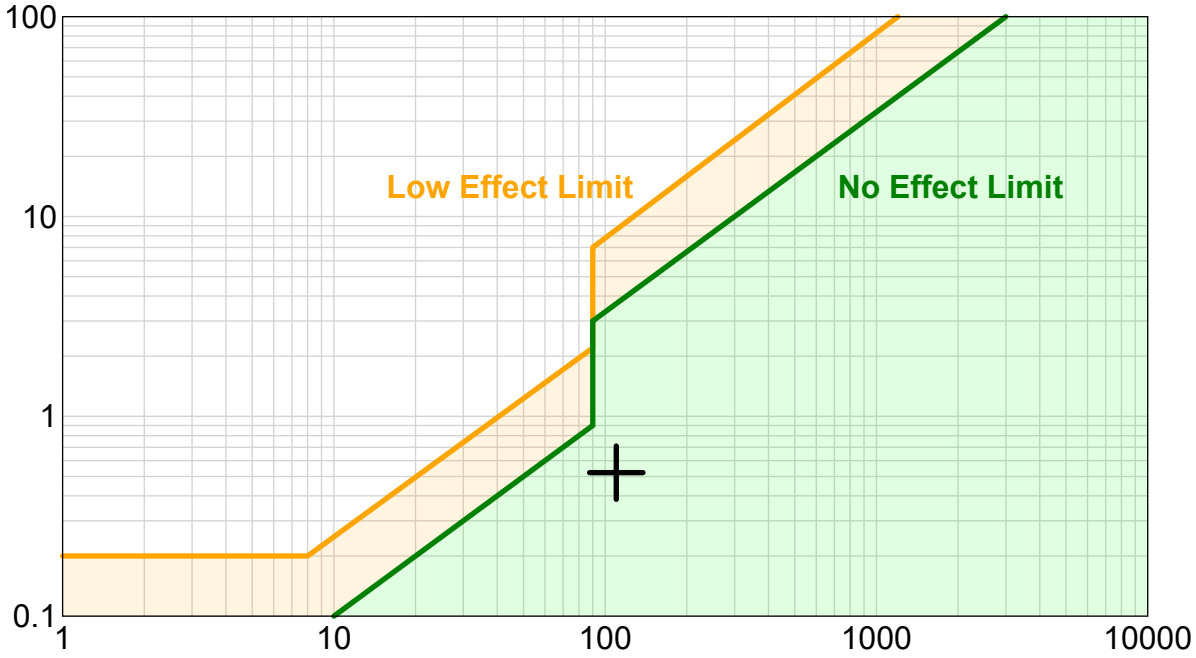
Flicker frame (frame of one flicker period in time domain)



Flicker FFT (flicker curve in frequency domain)



IEEE 1789 Frequency/modulation plot



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