Smlouva o dílo

dle § 2586 a násl. zákona č. 89/2012 Sb., občanský zákoník, ve znění pozdějších předpisů (dále též občanský zákoník)

I.
Účastníci smlouvy

Objednatel:	Obec Milonice
Adresa:	Milonice 59, 679 22 Lipůvka
jednající:	Marcela Nešetřilová
IČO:	00637670
DIČ:	CZ000637670

Dále jen Objednatel

Zhotovitel	LAMA lighting technologies s.r.o.
se sídlem:	Objízdná 1777, Otrokovice, 765 02, Otrokovice 2
jednající:	Miroslav Cejpek
IČO:	286 22 740
zapsaná v Obchodním rejstříku	C 114428 vedená u Krajského soudu v Brně
bankovní spojení:	107-7504800257/0100

II.
Předmět díla

2.1. Předmětem díla je „**OBNOVA SOUSTAVY VEŘEJNÉHO OSVĚTLENÍ MILONICE**". Zhotovitel se zavazuje provést pro objednatele dílo „„**OBNOVA SOUSTAVY VEŘEJNÉHO OSVĚTLENÍ MILONICE**" v rozsahu, jež je specifikován nabídkou (výkazem výměr) a zadávací dokumentace objednatele, které tvoří přílohu č. 1 a 2, které jsou nedílnou součástí této smlouvy.

2.2. Zhotovitel prohlašuje, že k datu podpisu této smlouvy:
- akceptuje všechny podmínky vyplývající ze zadání veřejné zakázky a zadávací dokumentace
- převzal a odsouhlasil objednatelem schválenou zadávací dokumentaci
- seznámil se s podmínkami na místě provádění stavebních prací (pro účely zadávací dokumentace a této smlouvy o dílo je užíván termín „staveniště")
- vyjasnil si předem nejasné podmínky pro realizaci opravy s oprávněnými zástupci objednatele
- zahrnul do kalkulace cen všechny technické, ekonomické a dodací podmínky a všechny náklady díl
- uplatnil v této smlouvě veškeré své požadavky na objednatele.

2.3. Zhotovitel rovněž prohlašuje, že je plně seznámeni se všemi ostatními podmínkami plnění povinností zhotovitele podle této smlouvy, které z ní vyplývají, a které nejsou v

odstavci 2.1. tohoto článku uvedeny výslovně.

2.4. Zhotovitel se seznámil se zadávací dokumentací.

III.
Místo provádění díla

3.1. Místem plnění je obec Milonice

IV.
Doba plnění

4.1. Termín plnění veřejné zakázky je stanoven **do 31.11.2021**. Převzetí staveniště je maximálně do 10 dnů od doručení písemné výzvy.

4.2. Předání celkového kompletního díla bude předáno včetně předání dokumentace skutečného provedení díla se zaměřením GPS přesných bodů, zatřídění komunikací, pasportu VO a protokolu měření osvětlení do délky realizace.

4. 3. Objednatel se zavazuje předat zhotoviteli staveniště včetně všech dokladů pro provedení díla v termínu: do termínu zahájení prací.

V.
Cena předmětu díla

5.1 Nabídková cena je uvedena jako celková v korunách českých, a to v členění bez DPH, DPH a včetně DPH.
Cena je uvedena jako nejvýše přípustná a odpovídá času a místu realizace veřejné zakázky.
Celková cena za provedení díla činí:

Celková cena bez DPH	1 710 674,-	Kč
DPH 21%	359 242,-	Kč
Celková cena včetně DPH	2 069 915,-	Kč

Slovy
dva miliony šedesát devět tisíc devět set patnáct

5.2. Cena díla obsahuje veškeré práce, dodávky, služby, výkony a všechny náklady, kterých je třeba trvale či dočasně k zahájení, provedení, dokončení předmětu této veřejné zakázky, včetně např. nákladů na zařízení staveniště a zábory, dopravní opatření i mimo hranice staveniště, provizorní trafostanici, technické dokumentace provedených oprav.

5.3. Uchazeč provedl ocenění podle výkazů výměr a dokumentace pro výběr zhotovitele, které jsou součástí zadávací dokumentace.

5.4. Pokud nejsou oceněny některé práce a dodávky slovně obsažené ve výkazu výměr, má se za to, že jsou obsaženy v ostatních položkách.

5.5. Veškeré cenové údaje jsou uvedeny jako ceny nejvýše přípustné a aktuální pro realizaci v daném místě a čase.

VI.
Způsob úhrady ceny a platební podmínky

6.1. Cena za dílo bude hrazena na základě měsíční fakturace na základě skutečně uskutečněných prací podle výkazu výměr.

6.2. Každá faktura bude doložena krycím listem a rekapitulací s vyčíslením všech skutečných nákladů prací podle oceněného výkazu výměr včetně DPH. Tuto fakturu je zhotovitel oprávněn vystavit do 14ti dnů po řádném předání a převzetí díla objednatelem a po odstranění případných vad a nedodělků z přejímacího protokolu.

6.3. Faktura vystavená zhotovitelem musí mít náležitosti platného daňového dokladu.

6.4. Splatnost faktury je do 14ti dnů od jejich prokazatelného doručení objednateli. Objednatel není v prodlení s platbou faktury, pokud uhradí fakturu do lhůty splatnosti po jejím obdržení, ale po termínu uvedeném na faktuře jako den splatnosti.

VII.
Smluvní pokuty

7.1. Smluvní pokuta pro případ prodlení zhotovitele s řádným ukončením díla činí 1.000,- Kč za každý den prodlení.

7.2. Smluvní pokuta za nedodržení termínu vyklizení staveniště je 1.000,- Kč za každý den prodlení.

7.3. Smluvní pokuta pro případ prodlení s odstraněním záručních vad se sjednává ve výši 1.000,- Kč za každý den prodlení a za každou vadu, až do doby jejich odstranění.

7.4. Splatnost smluvních pokut je 21 dnů od doručení faktury, a to na základě faktury vystavené oprávněnou smluvní stranou smluvní straně povinné.

VIII.
Práva a povinnosti smluvních stran při provádění díla

8.1. Veškeré komponenty a materiály, které neodpovídají standardům uvedeným v zadávací dokumentaci může zhotovitel použít pouze po písemném odsouhlasení zástupcem objednatele a technického dozoru objednatele.

8.2. Zhotovitel je povinen udržovat na staveništi pořádek a čistotu, je povinen neprodleně odstraňovat odpady a nečistoty vzniklé při provádění díla v souladu se zákonem o odpadech.

8.3. Zhotovitel odpovídá za bezpečnost při práci a ochranu zdraví všech osob v prostoru

staveniště a zajistí, aby osoby zhotovitele a jeho subdodavatelů pohybujících se po staveništi, byly vybaveny ochrannými pracovními pomůckami.

8.4. Vznikne-li v důsledku vadného provádění díla zhotovitelem objednateli škoda, je zhotovitel povinen tuto škodu nahradit. Zhotovitel je povinen postupovat při provádění předmětu díla s náležitou odbornou péčí a podle pokynů objednatele. V případě nevhodnosti pokynů objednatele je zhotovitel povinen na nevhodnost pokynů objednatele písemně upozornit.

8.5. Zhotovitel umožní vstup technickému dozoru objednatele na staveniště i bez předchozího ohlášení.

IX.
Převzetí staveniště

9.1. Staveniště prosté všech právních i faktických vad bránících provádění díla předá objednatel zhotoviteli písemným zápisem. Pokud ze zápisu o předání staveniště vyplynou pro smluvní strany povinnosti neobsažené v této smlouvě, zavazují se splnit je ve lhůtách v zápise dohodnutých. Zhotovitel je povinen při splnění předpokladů uvedených v tomto odstavci staveniště protokolárně v určeném termínu převzít. Neučiní-li tak, považuje se staveniště okamžikem odmítnutí jeho převzetí zhotovitelem za převzaté.

9.2. Stroje, zařízení a materiál, které byly užívány pro plnění díla, odstraní zhotovitel nejpozději při vyklizení staveniště.

9.3. Ode dne převzetí staveniště odpovídá zhotovitel za všechny prostory staveniště po celou dobu provádění díla, a to až do předání a převzetí díla, příp. jeho části, a do likvidace staveniště.

X.
Reklamace

10.1. Zhotovitel se zavazuje, že dílo bude mít vlastnosti stanovené v zadávací dokumentaci (včetně jejích změn a doplňků), v technických normách a předpisech platných v České republice, které se na provedení díla vztahují a vlastnosti a jakost odpovídající účelu této smlouvy, resp. předmětu díla, a to minimálně po dobu 60 měsíců s tím, že na jednotlivé části díla poskytuje zhotovitel záruku takto:

Záruční doba počíná běžet od data písemného předání a převzetí díla objednatelem.

10.2. Zhotovitel zodpovídá za vhodnost použitých materiálů. Materiály, které zhotovitel hodlá použít, musí být před jejich dodávkou předloženy k písemnému odsouhlasení objednateli a technickému dozoru objednatele. Nevyjádří-li se objednatel k jejich použití do 10 pracovních dnů od prokazatelného doručení návrhu zhotovitelem, má se zato, že s jejich použitím souhlasí.

10.3. Vady díla vzniklé v průběhu záruční doby uplatní objednatel (nebo jeho oprávněný zástupce) u zhotovitele písemně, přičemž v reklamaci vadu popíše. Objednatel je oprávněn požadovat odstranění vady opravou, jde-li o vadu opravitelnou, není-li to možné, je oprávněn požadovat odstranění vady nahrazením novou bezvadnou věcí (plněním) nebo požadovat dodatečnou přiměřenou slevu ze sjednané ceny. Sleva bude zúčtována v konečné faktuře.

10.4. Zhotovitel je povinen zahájit bezplatné odstraňování reklamované vady neprodleně a odstranit ji v co nejkratším možném termínu, nejpozději však do 10 pracovních dnů ode dne doručení písemné reklamace, je-li to technicky a technologicky možné, jinak do data dohodnutého smluvními stranami.

10.5. Jestliže zhotovitel neodstraní vady ve lhůtách uvedených v odst. 10.4. tohoto článku je objednatel oprávněn provést tyto práce sám nebo jejich provedením pověřit jinou osobu nebo jejím prostřednictvím zakoupit, vyměnit vadnou či neúplně funkční část díla. Takto vzniklé náklady je zhotovitel povinen uhradit objednateli do 14 dnů ode dne doručení faktury – daňového dokladu. Tímto se zhotovitel nezbavuje odpovědnosti za dílo jako celek ani za jeho jednotlivé části.

10.6. Uplatněním práv ze záruky za jakost nejsou dotčena práva objednatele na uhrazení smluvní pokuty a náhradu škody související s vadným plněním.

XI.
Další ujednání

11.1. Je-li k plnění povinností zhotovitele z této smlouvy třeba činit právní úkony jménem objednatele, objednatel je povinen udělit zhotoviteli písemnou plnou moc, kterou se zhotovitel zavazuje přijmout a jednat dle ní osobně.

11.2. Práva a povinnosti stran vyplývající ze smlouvy přechází v plném rozsahu na jejich právní nástupce.

11.3. Zhotovitel bere na vědomí, že veškeré informace, skutečnosti, veškerá dokumentace týkající se díla je předmětem obchodního tajemství objednatele a tento je považuje za důvěrné ve smyslu ustanovení § 1730 občanského zákoníku. Výjimku tvoří informace vyžádané třetími osobami, jejichž oprávnění vyplývá z příslušných právních předpisů.

XII.
Závěrečná ustanovení

12.1. Pokud tato smlouva nestanoví jinak, řídí se právní vztahy jí založené občanským zákoníkem. Nelze-li některé otázky řešit podle těchto ustanovení, použijí se platné obecně závazné právní předpisy právního řádu České republiky. Případné spory se budou řešit před českými soudy podle platného české právního řádu.

12.2. Změny této smlouvy lze činit pouze po dohodě obou smluvních stran písemně a formou číslovaných dodatků k této smlouvě. Jakékoliv opravy textu platí jen, byly-li parafovány oprávněnými zástupci obou smluvních stran.

12.3. Nestanoví-li tato smlouva, že se oznámení činěná dle této smlouvy druhé smluvní straně mohou provést zápisem ve stavebním deníku, ústně či jiným obdobným způsobem, provádí se oznámení osobním předáním listiny obsahující oznámení pověřenému pracovníku nebo zástupci druhé strany proti podpisu na kopii předávané listiny, a nelze-li tak učinit, jejím zasláním poštou formou doporučeného dopisu s dodejkou. Oznámení je účinné dnem jeho doručení nebo převzetí, případně dnem, kdy bylo převzetí listiny druhou stranou odmítnuto nebo třetím dnem po sdělení pošty, že doporučený dopis, jímž byla listina zaslána druhé straně na adresu uvedenou v této smlouvě, byl pro nepřítomnost adresáta uložen na poště, i když se adresát o uložení nedozvěděl. Toto ustanovení platí přiměřeně i pro doručování jiných listin a podkladů, které mají být předány.

12.4. Tato smlouva je sepsána ve čtyřech identických stejnopisech s platností originálu, z nichž každá smluvní strana obdrží po dvou vyhotoveních.

Příloha č. 1 – Výkaz výměr oceněný
Příloha č. 2 – Technické podmínky dodaných světel

Obec Milonice

OBEC MILONICE
Obecní úřad:
Milonice 59
679 22 (2)
IČ: 00637670

za objednatele:

Marcela Nešetřilová

starostka obce

LAMA lighting technologies s.r.o.
Objízdná 1777
765 02 Otrokovice
Korespondenční adresa:
Vřesinská 2371/33
700 00 Ostrava-Poruba
IČ 28622740

za zhotovitele:

Ing. Miroslav Cejpek

Obchodní ředitel

Položkový rozpočet stavby

Stavba:	OBNOVA SOUSTAVY VEŘEJNÉHO OSVĚTLENÍ	Milonice
Objekt:	Veřejné osvětlení	
Rozpočet:	Veřejné osvětlení	

Objednatel: Obec	Milonice	IČO: 00637670 DIČ:
Zhotovitel:	**LAMA lighting technologies s.r.o.** **Objízdná 1777, Otrokovice, 765 02, Otrokovice 2**	IČO: **286 22 740** DIČ: **CZ28622740**

Rozpis ceny			Celkem
HSV			343 542,10
PSV			0,00
MON			1 312 836,80
Vedlejší náklady			54 295,00
Ostatní náklady			0,00
Celkem			**1 710 673,90**

Rekapitulace daní		
Základ pro sníženou DPH	**15** %	**0,00** CZK
Snížená DPH	**15** %	**0,00** CZK
Základ pro základní DPH	**21** %	**1 710 673,90** CZK
Základní DPH	**21** %	**359 241,52** CZK
Zaokrouhlení		CZK
Cena celkem s DPH		**2 069 915,42** CZK

v dne **14.05.2021**

LAMA lighting technologies s.r.o.
Objízdná 1777
765 02 Otrokovice
Korespondenční adresa:
Vřesinská 2371/33
708 00 Ostrava-Poruba
IČ: 28622740

Za zhotovitele

OBEC MILONICE
Obecní úřad:
Milonice 59
679 22 (2)
IČ: 00637670

Za objednatele

Rekapitulace dílů

Číslo	Název	Typ dílu			Celkem	%
M21	MON	MON			1 312 836,80	76,74
M210	HSV	HSV			343 542,10	20,08
M211	Vedlejší náklady	VN			54 295,00	3,17
ON	Ostatní náklady	ON			0,00	0,00
Cena celkem					1 710 673,90	100

Položkový rozpočet

S:	OBNOVA SOUSTAVY VEŘEJNÉHO OSVĚTLENÍ	Milonice
O:	Veřejné osvětlení	
R:	Veřejné osvětlení	

P.č.	Číslo položky	Název položky	MJ	množství	cena / MJ	Celkem	EFEKT 2020 Způsobilé výdaje [Kč]	EFEKT 2020 Nezpůsobilé výdaje [Kč]
Díl:	1	Zemní práce				134 192,10	0,00	134 192,10
1	174201101R00	Zásyp jam, rýh, šachet bez zhutnění	m3	5,00000	41,00	205,00		205,00
2	131100010RA0	Hloubení nezapažených jam pro stožáry VO	kus	33,00000	680,00	22 440,00		22 440,00
3	141721102R00	Řízené protlačení trub do průměru 15 cm	m	51,00000	1 400,00	71 400,00		71 400,00
4	460010024	vytyčení trasy vedení kabelového podzemního v zastavěném prostoru viz řezy	km	0,17900	962,00	172,20		172,20
5	460010025	zaměření trasy skutečného provedení v zastavěném prostoru	km	0,17900	1 100,00	196,90		196,90
6	460200163	Odkop zeminy ručně s vodorovným přemístěním do 50 m na skládku v hornině třídy 3 a 4	m3	6,00000	203,00	1 218,00		1 218,00
7	460421082-1	Krytí plastovou fólií, š do 50cm	m	943,00000	6,00	5 658,00		5 658,00
8	46047001	Provizorní zajištění potrubí ve výkopech přoi křížení s kabelem	kus	26,00000	44,00	1 144,00		1 144,00
9	460470011	provizorní zajištění kabelů ve výkopech při jejich křížení	kus	28,00000	83,00	2 324,00		2 324,00
10	460510014	kabelové prostupy z trub betonových do rýhy s obsypem, průměru do 15 cm	m	40,00000	80,00	3 200,00		3 200,00
11	460510064	kabelové prostupy z trub plastových do rýhy s obsypem, průměru do 10 cm	m	133,00000	45,00	5 985,00		5 985,00
12	460600021	Vodorovné přemístění horniny jakékoliv třídy do 50 m	m3	38,00000	36,00	1 368,00		1 368,00
13	460560143	Zásyp rýh ručně šířky 35cm, hloubky 60 cm, z horniny třídy 3	m	167,00000	40,00	6 680,00		6 680,00
14	460600031	Příplatek k vodorovnému přemístění za každých dalších 1000 m	m3	581,00000	21,00	12 201,00		12 201,00
Díl:	5	Komunikace				209 350,00	0,00	209 350,00
15	596100041RA0	Chodník z dlažby betonové, podklad štěrkopísek, oprava	m2	60,00000	627,00	37 620,00		37 620,00
16	591211111R00	Kladení dlažby drobné kostky,lože z kamen.tl. 5 cm	m2	40,00000	533,00	21 320,00		21 320,00
17	596215021R00	Chodník z dlažby zámkové, podklad štěrkopísek- oprava	m2	35,00000	653,00	22 855,00		22 855,00
18	584121111RT2	Osazení silničních panelů,lože z kameniva tl. 4 cm, včetně panelu IZD	m2	1,00000	1 357,00	1 357,00		1 357,00
19	578132121R00	Chodník litý asfalt z kameniva jemnozrnný nad 3 m tl. 3 cm + příprava podkladu	m2	81,00000	658,00	53 298,00		53 298,00
20	577000001RAB	Komunikace s asfaltobeton. krytem D1-N-1-III-PII, bez výkopových prací	m2	50,00000	1 458,00	72 900,00		72 900,00
Díl:	M21	Elektromontáže				1 219 519,80	386 765,00	832 754,80
21	210100252R00	Ukončení celoplast. kabelů zákl./pás.do 4x25 mm2	kus	86,00000	210,00	18 060,00		18 060,00
22	34111030R	Kabel silový s Cu jádrem 750 V CYKY 3 x 1,5 mm2	m	505,00000	13,00	6 565,00	6 565,00	
23	741122211	Montáž kabel silový s Cu jádrem 750 V CYKY 3 x 1,5 mm2	m	505,00000	10,00	5 050,00	5 050,00	
24	210220022RT1	Vedení uzemňovací v zemi FeZn, D 8 - 10 mm, včetně drátu FeZn 10 mm	m	12,00000	85,00	1 020,00		1 020,00
25	3457114702R	Trubka kabelová chránička KOPOFLEX KF 09063	m	1 551,00000	35,00	54 285,00		54 285,00
26	35711823R	Skříň rozpojovací pro VO RF 4:3	kus	3,00000	11 210,00	33 630,00		33 630,00
27	35711823R	Skříň rozpojovací pro VO RF 4:4	kus	1,00000	12 805,00	12 805,00		12 805,00
28	35711823R	Skříň rozpojovací pro VO RF 5:4	kus	1,00000	15 125,00	15 125,00		15 125,00

29	35711823R	Skříň rozpojovací pro VO RF 6:5	kus	1,00000	18 511,00	18 511,00			18 511,00
30	210204011R00	Montáž stožár osvětlovací ocelový délky do 12 m	kus	33,00000	1 450,00	47 850,00			47 850,00
31	31672152.AR	Stožár bezpat. přechodový v=6m, žárové zinkování	kus	1,00000	5 350,00	5 350,00			5 350,00
32	31672152.AR	Stožár bezpat. silniční v=8m, žárové zinkování	kus	20,00000	5 100,00	102 000,00			102 000,00
33	31672152.AR	Stožár bezpat. sadový v=6m, žárové zinkování	kus	13,00000	4 350,00	56 550,00			56 550,00
34	35712269R	Skříň zapínací VO, v pilíři, hl jistič 3x25A, s přepěťovou ochranou	kus	1,00000	29 000,00	29 000,00	29 000,00		
35	1111111	Podružný elektromateriál	kus	33,00000	110,00	3 630,00			3 630,00
36	34844550R	Svítidlo pro úsek č.1	kus	14,00000	7 000,00	98 000,00	98 000,00		
37	34844550R	Svítidlo pro úsek č.2	kus	11,00000	6 500,00	71 500,00	71 500,00		
38	34844550R	Svítidlo pro úsek č.3	kus	13,00000	6 500,00	84 500,00	84 500,00		
39	34844550R	Svítidlo pro úsek č.4	kus	7,00000	6 700,00	46 900,00	46 900,00		
40	210202013R00	Montáž svítidlo venkovní	kus	45,00000	450,00	20 250,00	20 250,00		
41	210204103R00	Montáž výložník ocelový 1ramenný do 35 kg	kus	23,00000	250,00	5 750,00			5 750,00
42	210204201RT1	Elektrovýzbroj stožáru pro 2 okruhy, včetně svorkovnice	kus	33,00000	1 350,00	44 550,00			44 550,00
43	31677040R	Výložník na bandimex 200/60	kus	2,00000	350,00	700,00			700,00
44	31677040R	Výložník pro silniční stožár 76mm délka=1500	kus	20,00000	650,00	13 000,00			13 000,00
45	31677040R	Výložník přechodový pro stožár 76mm délka=2000	kus	1,00000	950,00	950,00			950,00
46	210190051R00	Montáž rozvaděče	kus	1,00000	2 500,00	2 500,00	2 500,00		
47	210190051R00	Montáž rozpojovací skříně	kus	6,00000	1 637,00	9 822,00			9 822,00
48	210120103R00	Patrona nožová PC	kus	64,00000	5,20	332,80			332,80
49	358251010R	Pojistka výkonová nízkoztrátová PHNA 000 10 A	kus	7,00000	111,00	777,00			777,00
50	358251011R	Pojistka výkonová nízkoztrátová PHNA 000 16 A	kus	27,00000	111,00	2 997,00			2 997,00
51	358251012R	Pojistka výkonová nízkoztrátová PHNA 000 20 A	kus	9,00000	111,00	999,00			999,00
52	358251010R	Pojistka zkratová	kus	18,00000	106,00	1 908,00			1 908,00
53	11111111	Montážní plošina na autopod. 12,5 m MP13, včetně dopravy	Sh	30,00000	750,00	22 500,00	22 500,00		
54	210220022	montáž uzemňovacího vedení vodičů FeZn pomocí svorek v zemi drátem	m	1 279,00000	36,00	46 044,00			46 044,00
55	354410730	Drát průměr 10mm FeZn	kg	793,00000	42,00	33 306,00			33 306,00
56	741110312-rkp40	Montáž trubka ochranná do krabic plastová tuhá přes 40 do 90mm uložená volně	m	1 551,00000	42,00	65 142,00			65 142,00
57	741122222	montáž kabel Cu plný kulatý žíla 4x10mm2 uložený volně	m	1 637,00000	22,00	36 014,00			36 014,00
58	341110760	kabel silový s Cu jádrem CYKY 4 x 10 mm2	m	1 637,00000	90,00	147 330,00			147 330,00
59	741132103	ukončení kabelů 3x1,5 až 4 mm2 smršťovací záklopkou nebo páskem bez letování	kus	2,00000	62,00	124,00			124,00
60	741132133	ukončení kabelů 4x10 až 16 mm2 smršťovací záklopkou nebo páskem bez letování	kus	86,00000	130,00	11 180,00			11 180,00
61	741420021	Montáž svorka hromosvodová 2 šrouby	kus	144,00000	74,00	10 656,00			10 656,00
62	354418850	svorka spojovací pro lano D8-10mm	kus	144,00000	9,50	1 368,00			1 368,00
63	745904112	příplatek k montáži kabelů za zatažení vodiče a kabelu do 2,2kg	m	1 631,00000	19,00	30 989,00			30 989,00
Díl:	M46					93 317,00	0,00		93 317,00
64	460620012R00	Provizorní úprava terénu v přírodní hornině 2	m2	191,00000	35,00	6 685,00			6 685,00
65	460200203RT2	Výkop kabelové rýhy 50/20 cm hor.3, ruční výkop rýhy	m	12,00000	75,00	900,00			900,00
66	460420022R00	Zřízení kabelového lože v rýze š. do 65 cm z písku	m	12,00000	61,00	732,00			732,00
67	460080001R00	Betonový základ pro stožáry	kus	34,00000	2 500,00	85 000,00			85 000,00
Díl:	VN	Vedlejší náklady				54 295,00	44 500,00		9 795,00
68	005121010R	Vybudování zařízení staveniště	Soubor	1,00000	1 500,00	1 500,00			1 500,00

69	005231010R	Zkoušky a revize, včetně vyhotovení revizní zprávy	Soubor	1,00000	20 000,00	20 000,00	20 000,00	
70	00523	Vyhotovení protokolu o ověření osv. kom.	Soubor	1,00000	24 500,00	24 500,00	24 500,00	
71	00523	Ekologická likvidace svítidel a světelných zdrojů	Soubor	43,00000	65,00	2 795,00		2 795,00
72	00523	Aktualizace pasportu VO	Soubor	1,00000	2 500,00	2 500,00		2 500,00
73	00523	Vyhotovení ZVA	Soubor	1,00000	3 000,00	3 000,00		3 000,00

Díl:	**CELKEM**	**1 710 673,90**

	Rekapitulace	Podíl		bez DPH		s DPH
1	Celkové výdaje	100%	Kč	1 710 673,90		2 069 915,42
2	z toho způsobilé výdaje	25%	Kč	431 265,00		521 830,65
3	z toho nezpůsobilé výdaje	75%	Kč	1 279 408,90		1 548 084,77
4	Způsobilé výdaje	100%	Kč	431 265,00		521 830,65
5	Z toho výdaje na osvětlovací soustavu	100%	Kč	431 265,00		521 830,65
6	z toho výdaje na řídící systém	0%	Kč	0,00		0,00

LAMA
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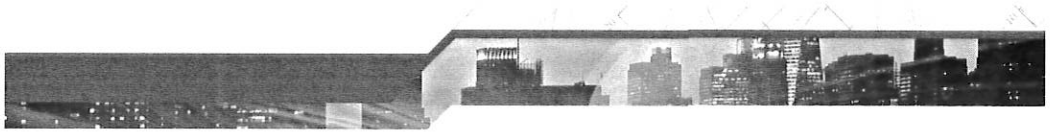


LED STREET LIGHT

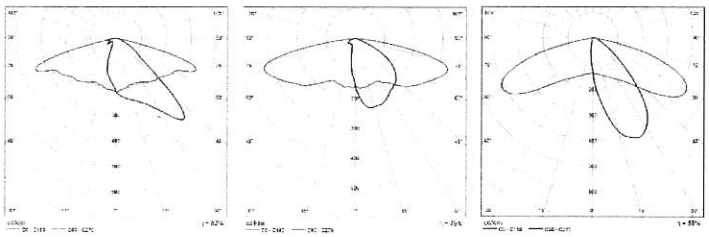
Svítidlo klasického typu určené pro veřejné osvětlení. Vyznačuje se tenkým tělem, vysokou účinností a otevíráním bez pomocí nářadí. Svítidlo je možné instalovat na výložník nebo na dřík sloupu. Široké uplatnění pomocí velkého množství optik. Výkon je možné měnit v rozpětí 0-180W.

Certifikáty

Charakteristika

označení	příkon	účinnost	světelný tok	CCT	CRI	rozměry
ST-1916-SL-G-2700	10 W	150 lm/W	1500 lm	2700 K	70Ra	466x222x109mm
ST-1916-SL-G-2700	15 W	150 lm/W	2250 lm	2700 K	70Ra	466x222x109mm
ST-1916-SL-G-2700	20 W	150 lm/W	3000 lm	2700 K	70Ra	466x222x109mm
ST-1916-SL-G-2700	25 W	150 lm/W	3750 lm	2700 K	70Ra	466x222x109mm
ST-1916-SL-G-2700	30 W	150 lm/W	4500 lm	2700 K	70Ra	466x222x109mm
ST-1916-SL-G-2700	35 W	150 lm/W	5250 lm	2700 K	70Ra	466x222x109mm
ST-1916-SL-G-2700	40 W	150 lm/W	6000 lm	2700 K	70Ra	466x222x109mm
ST-1916-SL-G-2700	45 W	150 lm/W	6750 lm	2700 K	70Ra	466x222x109mm
ST-1916-SL-G-2700	50 W	150 lm/W	7500 lm	2700 K	70Ra	466x222x109mm
ST-1916-SL-G-2700	60 W	150 lm/W	9000 lm	2700 K	70Ra	466x222x109mm
ST-1916-SL-G-2700	70 W	150 lm/W	10500 lm	2700 K	70Ra	466x222x109mm
ST-1916-SL-G-2700	80 W	150 lm/W	12000 lm	2700 K	70Ra	466x222x109mm
ST-1916-SL-G-2700	100 W	150 lm/W	15000 lm	2700 K	70Ra	466x222x109mm
ST-1916-SL-G-2700	120 W	150 lm/W	18000 lm	2700 K	70Ra	466x222x109mm
ST-1916-SL-G-2700	150 W	150 lm/W	22500 lm	2700 K	70Ra	466x222x109mm
ST-1916-SL-G-2700	180 W	150 lm/W	27000 lm	2700 K	70Ra	466x222x109mm

Fotometrie



Vlastnosti produktu

LED · MW · LUMILEDS · L70B50 100 000h · IP66 · IK 08

LUMILEDS

Lumileds
IESNA LM-80 Test Report

Lumileds

IESNA LM-80 Test Report

1. Description of LED light sources tested

LUXEON 5050 with nominal CCT of 2700K (L150-2780502400000).

2. Package Pictures

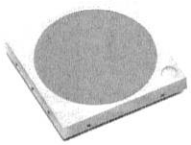


Figure 1. Picture of the LUXEON 5050.

3a. Projected L_{70} extrapolations per IESNA TM-21-11

	If = 200mA
Ts = 105°C	120,577
Ts = 85°C	153,833

3b. Reported L_{70} extrapolations per IESNA TM-21-11

	If = 200mA
Ts = 105°C	> 42,000
Ts = 85°C	> 42,000

4. Applicable LUXEON® Series part number(s)

This Test Report applies to the following LUXEON part numbers*:

Product Family	Part Number	Color
LUXEON 5050	L150-26705024SCP00	white
LUXEON 5050	L150-33705024SCP00	white
LUXEON 5050	L150-40705024SCP00	white
LUXEON 5050	L150-44705024SCP00	white
LUXEON 5050	L150-3070502400000	white
LUXEON 5050	L150-4070502400000	white
LUXEON 5050	L150-5070502400000	white
LUXEON 5050	L150-5770502400000	white
LUXEON 5050	L150-2780502400000	white
LUXEON 5050	L150-3080502400000	white
LUXEON 5050	L150-4080502400000	white
LUXEON 5050	L150-5080502400000	white
LUXEON 5050	L150-2790502400000	white
LUXEON 5050	L150-3090502400000	white
LUXEON 5050	L150-4090502400000	white
LUXEON 5050	L150-27700500600000	white
LUXEON 5050	L150-3070500600000	white
LUXEON 5050	L150-4070500600000	white
LUXEON 5050	L150-5070500600000	white
LUXEON 5050	L150-5770500600000	white
LUXEON 5050	L150-6570500600000	white
LUXEON 5050	L150-2780500600000	white
LUXEON 5050	L150-3080500600000	white
LUXEON 5050	L150-3580500600000	white
LUXEON 5050	L150-4080500600000	white
LUXEON 5050	L150-5080500600000	white
LUXEON 5050	L150-6580500600000	white
LUXEON 5050	L150-2790500600000	white
LUXEON 5050	L150-3090500600000	white
LUXEON 5050	L150-3590500600000	white
LUXEON 5050	L150-4090500600000	white
LUXEON 3535L HE PLUS	L135-2770SA35000P1	white

LUXEON 3535L HE PLUS	L135-3070SA35000P1	white
LUXEON 3535L HE PLUS	L135-3570SA35000P1	white
LUXEON 3535L HE PLUS	L135-4070SA35000P1	white
LUXEON 3535L HE PLUS	L135-5070SA35000P1	white
LUXEON 3535L HE PLUS	L135-5770SA35000P1	white
LUXEON 3535L HE PLUS	L135-3570SA35000P1	white
LUXEON 3535L HE PLUS	L135-2780SA35000P1	white
LUXEON 3535L HE PLUS	L135-3080SA35000P1	white
LUXEON 3535L HE PLUS	L135-3580SA35000P1	white
LUXEON 3535L HE PLUS	L135-4080SA35000P1	white
LUXEON 3535L HE PLUS	L135-5080SA35000P1	white
LUXEON 3535L HE PLUS	L135-5780SA35000P1	white
LUXEON 3535L HE PLUS	L135-6580SA35000P1	white
LUXEON 3535L HE PLUS	L135-2790SA35000P1	white
LUXEON 3535L HE PLUS	L135-3090SA35000P1	white
LUXEON 3535L HE PLUS	L135-3590SA35000P1	white
LUXEON 3535L HE PLUS	L135-4090SA35000P1	white
LUXEON 3535L HE PLUS	L135-5090SA35000P1	white
LUXEON 3535L HE PLUS	L135-5790SA35000P1	white
LUXEON 3535L HE PLUS	L135-6590SA35000P1	white
LUXEON 3535L HE PLUS	L135-2780CA35000P1	white
LUXEON 3535L HE PLUS	L135-3080CA35000P1	white
LUXEON 3535L HE PLUS	L135-3580CA35000P1	white
LUXEON 3535L HE PLUS	L135-4080CA35000P1	white
LUXEON 3535L HE PLUS	L135-5080CA35000P1	white
LUXEON 3535L HE PLUS	L135-5780CA35000P1	white
LUXEON 3535L HE PLUS	L135-6580CA35000P1	white

Please note LUXEON 5050 6V parts have an equivalent drive current I_f' that can be determined as follows: $I_f' = I_f * 4$ and voltage $V_f' = V_f/4$. Also note that LUXEON 3535L HE PLUS drive current I_f'' can be determined as follows: $I_f'' = I_f * 2$ and voltage $V_f'' = V_f/8$.

5. Number of LED light sources tested

20 units.

6. Dates Tests Started

2016/12/12.

7. Date Report First Issued

2017/10/23.

8. Mechanical Drawing

For detailed mechanical drawings, please see the LUXEON 5050 datasheet.

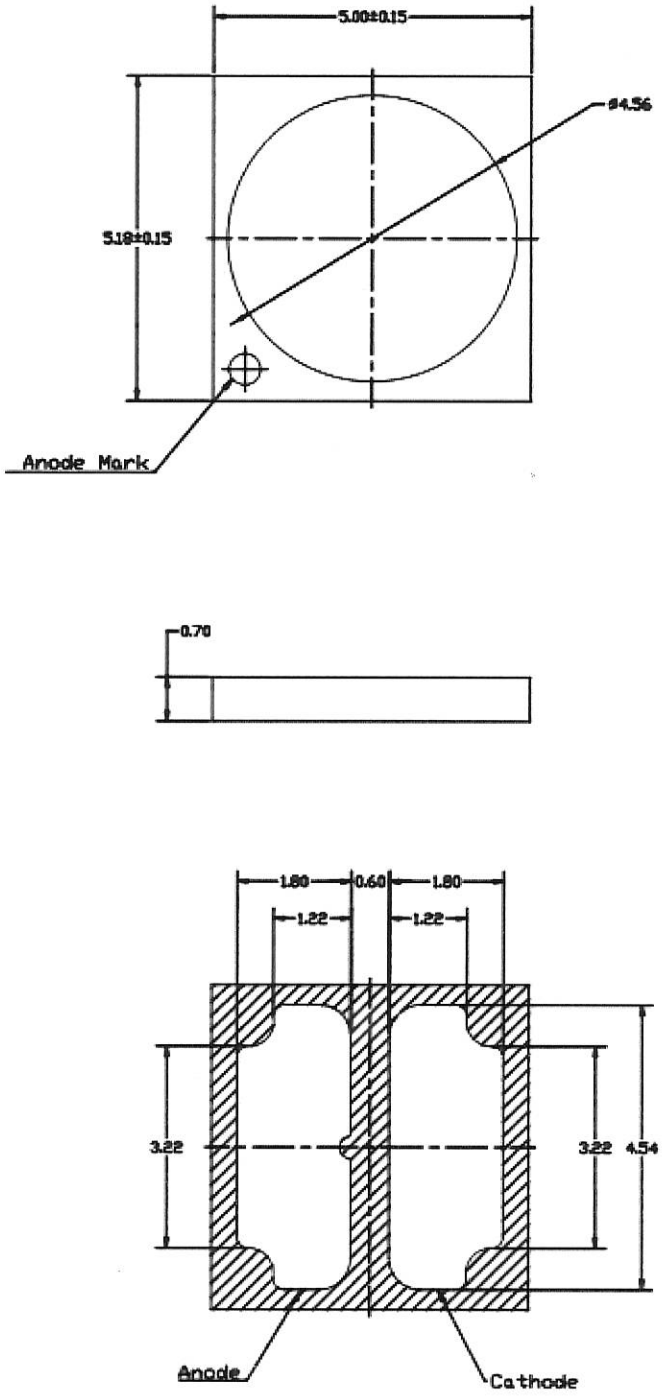


Figure 2. Mechanical drawings for the LUXEON 5050 (all dimensions in millimeters).

9. T_s Measurement Point

The circular pad in the bottom side of LUXEON 5050 corresponds to the recommended temperature measurement point T_s, see Figure 3.

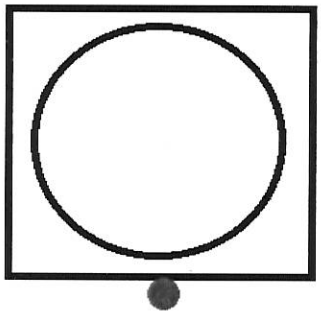


Figure 3. The recommended T_s point is located in the bottom of LUXEON 5050.

For further information on measuring the in-situ T_s, please see LUXEON 5050 Application Brief.

10. Description of auxiliary equipment

Reliability stress boards are mounted in a thermal chamber which provides liquid N2 cooling and has a controlled air temperature.

11. Operating Cycle

LUXEON 5050 LEDs are driven with a constant direct current (DC).

12. Ambient conditions including airflow, temperature, and relative humidity

Case temperature (Ts): controlled to within -2°C

Surrounding air temperature: controlled to within -5°C of Ts

Humidity: < 65 RH, No forced air flow.

13. Case and ambient temperatures

See Section 3.

14. Drive current of the LED light source during lumen maintenance test

See tables.

15. Initial luminous flux and forward voltage at photometric measurement current

See tables.

16. Lumen maintenance for data for each individual light source along with median value, standard deviation, minimum and maximum lumen maintenance value for all of the light sources

See tables.

17. Observation of LED light source failures including the failure conditions and time of failure

No failures observed.

18. LED light source monitoring interval

Units were tested at 0 and every 1000 hours thereafter.

19. Photometric measurement uncertainty

Long-term measurement uncertainty is based on reproducibility tests done over a period of one year, calculated to k = 2 coverage (i.e. 95% coverage)

Uncertainty of light output is U=1.59%. Uncertainy of correlated color temperature is U=21K.

20. Chromaticity shift reported over the measurement time

See tables.

21. Sampling Method/Sample size

Tested samples are selected to be representative of the overall LED population. LED sample size is indicated in Section 5 of this report.

22. ISO 17025-2005 Accreditation

SINGAPORE LABORATORY ACCREDITATION SCHEME | SINGAPORE ACCREDITATION COUNCIL

Number **LA-2016-0634-E**

Date of Issue **14 December 2016**

Date of Expiry: **13 December 2020**

Certificate of Accreditation

This certifies that

Lumileds Malaysia Sdn. Bhd.
Reliability Test Laboratory
No. 3, Lintang Bayan Lepas 8,
Phase 4, Bayan Lepas Industrial Park
11900, Penang, Malaysia

is accredited by the Singapore Accreditation Council to

ISO / IEC 17025 : 2005

for specific scope within the field of

Electrical Testing

as detailed in the attached schedule.

Chairman

This Certificate is awarded subject to the organisation's compliance with the stated criteria and terms and conditions laid down by the Singapore Accreditation Council.

This Certificate may not be reproduced except with the written permission of the Chairman.

Notes

Data is for reference only and is not an endorsement to exceed the datasheet operating conditions.

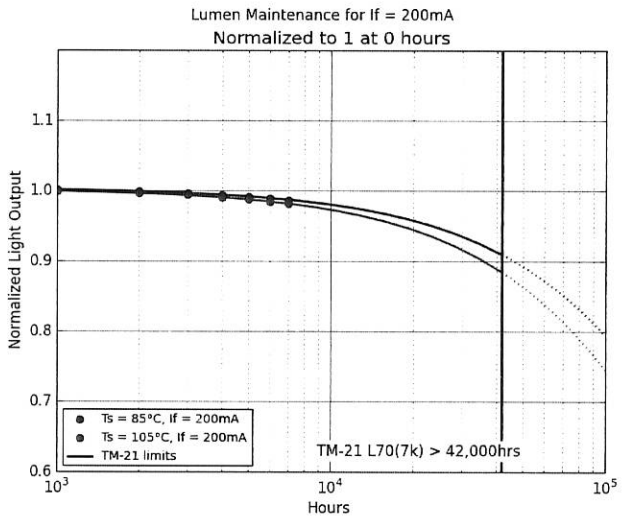
The TM-21 extrapolations are based on the IESNA TM-21-11 technical memorandum. The TM-21 lumen maintenance model is based on the flux data normalized to 1 at 0 hours and the use of an exponential model for flux (time):

Flux(time) = B exp[-alpha*time], where normally B ≡ 1, and alpha > 0.

An L70 extrapolation less than 0 means that the model predicts an increasing flux output with time, i.e. alpha < 0 (see graphs). Generally, this means that additional test time is needed to determine the long-term lumen maintenance behavior.

Normalized Flux Statistics for I_f = 200mA

		0hrs	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs	alpha	B	L70
	median =	1.0000	0.9989	0.9963	0.9933	0.9896	0.9875	0.9845	0.9818			
Ts=Tair=105°C	average =	1.0000	0.9991	0.9960	0.9931	0.9900	0.9872	0.9842	0.9814	2.9743e-06	1.0020	120,577
	st dev =	0.0000	0.0015	0.0018	0.0023	0.0025	0.0020	0.0019	0.0024	TM-21 L70(7k) > 42,000hrs		
	min =	1.0000	0.9971	0.9920	0.9876	0.9859	0.9830	0.9802	0.9771			
	max =	1.0000	1.0017	0.9983	0.9963	0.9941	0.9901	0.9870	0.9858			
	median =	1.0000	1.0009	0.9983	0.9964	0.9939	0.9922	0.9891	0.9868			
Ts=Tair=85°C	average =	1.0000	1.0010	0.9982	0.9963	0.9938	0.9918	0.9890	0.9867	2.3391e-06	1.0032	153,833
	st dev =	0.0000	0.0013	0.0017	0.0016	0.0017	0.0020	0.0017	0.0021	TM-21 L70(7k) > 42,000hrs		
	min =	1.0000	0.9986	0.9944	0.9932	0.9905	0.9881	0.9855	0.9821			
	max =	1.0000	1.0030	1.0011	0.9989	0.9965	0.9949	0.9920	0.9917			



Delta u'v' for I_f = 200mA

		0hrs	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs
	median =	0.0000	0.0004	0.0010	0.0014	0.0016	0.0020	0.0022	0.0025
Ts=Tair=105°C	average =	0.0000	0.0005	0.0010	0.0014	0.0016	0.0019	0.0022	0.0025
	st dev =	0.0000	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
	min =	0.0000	0.0002	0.0009	0.0013	0.0015	0.0018	0.0021	0.0022
	max =	0.0000	0.0008	0.0011	0.0017	0.0018	0.0020	0.0025	0.0027
	median =	0.0000	0.0004	0.0007	0.0009	0.0011	0.0016	0.0018	0.0023
Ts=Tair=85°C	average =	0.0000	0.0004	0.0007	0.0009	0.0011	0.0016	0.0018	0.0023
	st dev =	0.0000	0.0001	0.0001	0.0001	0.0001	0.0001	0.0002	0.0002
	min =	0.0000	0.0002	0.0005	0.0007	0.0009	0.0014	0.0016	0.0019
	max =	0.0000	0.0007	0.0009	0.0010	0.0014	0.0017	0.0022	0.0025

Luminous Flux [lm] data for tested units
$T_s = T_{air} = 85°C$, $I_f = 200mA$; $T_s \geq 83°C$ and $T_{air} \geq 80°C$ in compliance with LM-80-08

	CCT (t=0)	0hrs	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs
1	2842K	711.300	713.400	711.600	710.100	708.800	707.200	705.000	702.500
2	2798K	733.400	732.400	729.300	728.400	726.600	724.700	722.800	720.300
3	2826K	716.700	718.800	716.300	713.900	713.100	711.300	710.000	708.600
4	2821K	729.900	730.500	728.400	727.300	726.900	725.200	723.700	721.300
5	2832K	743.800	743.600	741.600	740.600	738.800	738.100	735.900	734.600
6	2813K	732.200	733.100	730.800	730.100	727.300	724.200	723.400	721.800
7	2826K	730.300	731.000	728.300	727.700	725.000	723.800	722.800	721.600
8	2792K	743.900	744.000	743.000	741.200	739.800	738.000	735.600	733.700
9	2822K	716.000	715.700	713.800	712.600	711.400	710.200	707.700	706.700
10	2826K	729.100	730.500	728.300	727.000	725.200	724.000	721.200	719.500
11	2803K	728.300	728.100	726.000	725.400	723.900	722.200	720.600	717.700
12	2832K	745.500	746.000	743.300	740.700	738.400	736.900	735.500	733.600
13	2817K	722.100	723.200	720.100	718.600	716.100	714.000	713.100	712.000
14	2827K	705.900	706.400	705.400	702.500	701.500	699.400	696.400	694.900
15	2823K	713.500	714.900	712.900	710.900	707.400	706.600	705.500	703.600
16	2835K	701.900	703.500	702.700	701.100	698.500	698.300	696.300	696.100
17	2833K	729.300	729.600	726.500	725.700	724.300	723.800	721.300	721.000
18	2812K	729.000	731.100	728.300	727.900	726.000	725.000	721.700	719.300
19	2812K	723.900	723.200	722.800	722.000	720.600	719.300	716.600	715.900
20	2810K	734.800	735.900	735.400	733.700	731.200	729.300	726.400	723.500

Normalized Luminous Flux data for tested units
$T_s = T_{air} = 85°C$, $I_f = 200mA$; $T_s \geq 83°C$ and $T_{air} \geq 80°C$ in compliance with LM-80-08

	CCT (t=0)	0hrs	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs
1	2842K	1.0000	1.0030	1.0004	0.9983	0.9965	0.9942	0.9911	0.9876
2	2798K	1.0000	0.9986	0.9944	0.9932	0.9907	0.9881	0.9855	0.9821
3	2826K	1.0000	1.0029	0.9994	0.9961	0.9950	0.9925	0.9907	0.9887
4	2821K	1.0000	1.0008	0.9979	0.9964	0.9959	0.9936	0.9915	0.9882
5	2832K	1.0000	0.9997	0.9970	0.9957	0.9933	0.9923	0.9894	0.9876
6	2813K	1.0000	1.0012	0.9981	0.9971	0.9933	0.9891	0.9880	0.9858
7	2826K	1.0000	1.0010	0.9973	0.9964	0.9927	0.9911	0.9897	0.9881
8	2792K	1.0000	1.0001	0.9988	0.9964	0.9945	0.9921	0.9888	0.9863
9	2822K	1.0000	0.9996	0.9969	0.9953	0.9936	0.9919	0.9884	0.9870
10	2826K	1.0000	1.0019	0.9989	0.9971	0.9947	0.9930	0.9892	0.9868
11	2803K	1.0000	0.9997	0.9968	0.9960	0.9940	0.9916	0.9894	0.9854
12	2832K	1.0000	1.0007	0.9970	0.9936	0.9905	0.9885	0.9866	0.9840
13	2817K	1.0000	1.0015	0.9972	0.9952	0.9917	0.9888	0.9875	0.9860
14	2827K	1.0000	1.0007	0.9993	0.9952	0.9938	0.9908	0.9865	0.9844
15	2823K	1.0000	1.0020	0.9992	0.9964	0.9915	0.9903	0.9888	0.9861
16	2835K	1.0000	1.0023	1.0011	0.9989	0.9952	0.9949	0.9920	0.9917
17	2833K	1.0000	1.0004	0.9962	0.9951	0.9931	0.9925	0.9890	0.9886
18	2812K	1.0000	1.0029	0.9990	0.9985	0.9959	0.9945	0.9900	0.9867
19	2812K	1.0000	0.9990	0.9985	0.9974	0.9954	0.9936	0.9899	0.9889
20	2810K	1.0000	1.0015	1.0008	0.9985	0.9951	0.9925	0.9886	0.9846

CIE 1976 u' data for tested units
$T_s = T_{air} = 85°C$, $I_f = 200mA$; $T_s \geq 83°C$ and $T_{air} \geq 80°C$ in compliance with LM-80-08

	CCT (K)	0hrs	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs
1	2842K	0.2568	0.2561	0.2564	0.2564	0.2564	0.2561	0.2557	0.2555
2	2798K	0.2583	0.2577	0.2580	0.2580	0.2579	0.2578	0.2572	0.2570
3	2826K	0.2574	0.2569	0.2572	0.2571	0.2570	0.2569	0.2563	0.2562
4	2821K	0.2575	0.2570	0.2571	0.2570	0.2569	0.2568	0.2562	0.2561
5	2832K	0.2571	0.2567	0.2570	0.2568	0.2568	0.2566	0.2560	0.2559
6	2813K	0.2577	0.2573	0.2575	0.2574	0.2573	0.2572	0.2562	0.2563
7	2826K	0.2572	0.2568	0.2571	0.2568	0.2568	0.2567	0.2560	0.2559
8	2792K	0.2585	0.2581	0.2585	0.2583	0.2583	0.2581	0.2576	0.2574
9	2822K	0.2575	0.2571	0.2573	0.2571	0.2571	0.2570	0.2564	0.2563
10	2826K	0.2574	0.2570	0.2572	0.2570	0.2570	0.2569	0.2563	0.2562
11	2803K	0.2580	0.2577	0.2579	0.2577	0.2577	0.2576	0.2571	0.2569
12	2832K	0.2572	0.2569	0.2569	0.2568	0.2568	0.2567	0.2561	0.2559
13	2817K	0.2577	0.2573	0.2575	0.2573	0.2573	0.2572	0.2566	0.2564
14	2827K	0.2574	0.2571	0.2573	0.2571	0.2571	0.2569	0.2564	0.2562
15	2823K	0.2576	0.2573	0.2574	0.2573	0.2573	0.2571	0.2567	0.2565
16	2835K	0.2562	0.2560	0.2561	0.2559	0.2559	0.2558	0.2553	0.2550
17	2833K	0.2570	0.2566	0.2568	0.2566	0.2567	0.2565	0.2560	0.2559
18	2812K	0.2578	0.2573	0.2575	0.2573	0.2574	0.2572	0.2568	0.2565
19	2812K	0.2576	0.2572	0.2575	0.2573	0.2574	0.2572	0.2567	0.2565
20	2810K	0.2580	0.2577	0.2578	0.2576	0.2577	0.2575	0.2570	0.2568

CIE 1976 v' data for tested units
$T_s = T_{air} = 85°C$, $I_f = 200mA$; $T_s \geq 83°C$ and $T_{air} \geq 80°C$ in compliance with LM-80-08

	CCT (K)	0hrs	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs
1	2842K	0.5232	0.5230	0.5228	0.5225	0.5222	0.5219	0.5218	0.5214
2	2798K	0.5252	0.5249	0.5243	0.5244	0.5239	0.5236	0.5234	0.5232
3	2826K	0.5237	0.5236	0.5230	0.5229	0.5225	0.5221	0.5220	0.5217
4	2821K	0.5242	0.5241	0.5234	0.5234	0.5231	0.5227	0.5224	0.5222
5	2832K	0.5238	0.5237	0.5231	0.5230	0.5229	0.5223	0.5221	0.5217
6	2813K	0.5249	0.5249	0.5243	0.5241	0.5238	0.5234	0.5233	0.5229
7	2826K	0.5246	0.5245	0.5239	0.5237	0.5235	0.5231	0.5231	0.5225
8	2792K	0.5256	0.5255	0.5250	0.5248	0.5246	0.5242	0.5243	0.5237
9	2822K	0.5239	0.5237	0.5232	0.5230	0.5228	0.5224	0.5224	0.5218
10	2826K	0.5237	0.5235	0.5229	0.5229	0.5227	0.5222	0.5223	0.5217
11	2803K	0.5256	0.5255	0.5248	0.5248	0.5246	0.5242	0.5242	0.5236
12	2832K	0.5234	0.5233	0.5227	0.5226	0.5223	0.5219	0.5220	0.5215
13	2817K	0.5241	0.5240	0.5235	0.5233	0.5230	0.5226	0.5226	0.5222
14	2827K	0.5234	0.5232	0.5228	0.5226	0.5223	0.5219	0.5219	0.5214
15	2823K	0.5233	0.5233	0.5227	0.5226	0.5223	0.5218	0.5219	0.5214
16	2835K	0.5272	0.5272	0.5267	0.5266	0.5263	0.5259	0.5259	0.5254
17	2833K	0.5241	0.5239	0.5235	0.5233	0.5231	0.5226	0.5227	0.5225
18	2812K	0.5246	0.5245	0.5239	0.5237	0.5234	0.5230	0.5231	0.5229
19	2812K	0.5256	0.5255	0.5250	0.5249	0.5246	0.5241	0.5242	0.5241
20	2810K	0.5242	0.5241	0.5236	0.5235	0.5232	0.5228	0.5228	0.5226

Delta u'v' data for tested units
$T_s = T_{air} = 85°C$, $I_f = 200mA$; $T_s \geq 83°C$ and $T_{air} \geq 80°C$ in compliance with LM-80-08

	[redacted]	0hrs	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs
1	2842K	0.0000	0.0007	0.0006	0.0008	0.0011	0.0015	0.0018	0.0022
2	2798K	0.0000	0.0007	0.0009	0.0009	0.0014	0.0017	0.0021	0.0024
3	2826K	0.0000	0.0005	0.0007	0.0009	0.0013	0.0017	0.0020	0.0023
4	2821K	0.0000	0.0005	0.0009	0.0009	0.0013	0.0017	0.0022	0.0024
5	2832K	0.0000	0.0004	0.0007	0.0009	0.0009	0.0016	0.0020	0.0024
6	2813K	0.0000	0.0004	0.0006	0.0009	0.0012	0.0016	0.0022	0.0024
7	2826K	0.0000	0.0004	0.0007	0.0010	0.0012	0.0016	0.0019	0.0025
8	2792K	0.0000	0.0004	0.0006	0.0008	0.0010	0.0015	0.0016	0.0022
9	2822K	0.0000	0.0004	0.0007	0.0010	0.0012	0.0016	0.0019	0.0024
10	2826K	0.0000	0.0004	0.0008	0.0009	0.0011	0.0016	0.0018	0.0023
11	2803K	0.0000	0.0003	0.0008	0.0009	0.0010	0.0015	0.0017	0.0023
12	2832K	0.0000	0.0003	0.0008	0.0009	0.0012	0.0016	0.0018	0.0023
13	2817K	0.0000	0.0004	0.0006	0.0009	0.0012	0.0016	0.0019	0.0023
14	2827K	0.0000	0.0004	0.0006	0.0009	0.0011	0.0016	0.0018	0.0023
15	2823K	0.0000	0.0003	0.0006	0.0008	0.0010	0.0016	0.0017	0.0022
16	2835K	0.0000	0.0002	0.0005	0.0007	0.0009	0.0014	0.0016	0.0022
17	2833K	0.0000	0.0004	0.0006	0.0009	0.0010	0.0016	0.0017	0.0019
18	2812K	0.0000	0.0005	0.0008	0.0010	0.0013	0.0017	0.0018	0.0021
19	2812K	0.0000	0.0004	0.0006	0.0008	0.0010	0.0016	0.0017	0.0019
20	2810K	0.0000	0.0003	0.0006	0.0008	0.0010	0.0015	0.0017	0.0020

Forward Voltage [V] data for tested units
$T_s = T_{air} = 85°C$, $I_f = 200mA$; $T_s \geq 83°C$ and $T_{air} \geq 80°C$ in compliance with LM-80-08

	[redacted]	0hrs	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs
1	2842K	24.970	25.000	24.980	24.980	24.980	24.980	24.970	24.980
2	2798K	24.670	24.660	24.640	24.650	24.650	24.640	24.650	24.640
3	2826K	24.890	24.910	24.880	24.900	24.870	24.870	24.870	24.870
4	2821K	24.980	25.000	24.980	25.000	24.980	24.970	24.970	24.970
5	2832K	25.660	25.690	25.660	25.680	25.680	25.650	25.650	25.630
6	2813K	25.050	25.070	25.050	25.060	25.050	25.040	25.030	25.030
7	2826K	25.330	25.350	25.330	25.340	25.320	25.320	25.310	25.300
8	2792K	25.310	25.320	25.320	25.310	25.310	25.300	25.290	25.280
9	2822K	24.990	25.000	24.990	24.990	24.990	24.980	24.970	24.970
10	2826K	24.930	24.950	24.930	24.940	24.930	24.930	24.920	24.920
11	2803K	24.990	25.010	24.980	25.000	25.000	24.990	24.990	24.980
12	2832K	25.380	25.400	25.390	25.390	25.370	25.370	25.370	25.370
13	2817K	25.000	25.020	25.010	25.010	25.000	24.990	24.980	24.990
14	2827K	24.930	24.950	24.950	24.940	24.930	24.920	24.920	24.920
15	2823K	25.250	25.260	25.240	25.240	25.230	25.220	25.240	25.230
16	2835K	25.130	25.180	25.170	25.160	25.160	25.150	25.160	25.150
17	2833K	25.100	25.130	25.110	25.110	25.100	25.090	25.110	25.140
18	2812K	24.700	24.740	24.710	24.730	24.700	24.690	24.710	24.740
19	2812K	24.840	24.860	24.860	24.870	24.850	24.830	24.850	24.880
20	2810K	24.910	24.930	24.930	24.930	24.930	24.910	24.920	24.950

Luminous Flux [lm] data for tested units

$T_s = T_{air} = 105°C$, $I_f = 200mA$; $T_s \geq 103°C$ and $T_{air} \geq 100°C$ in compliance with LM-80-08

	CCT (t=0)	0hrs	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs
1	2802K	713.900	712.500	711.800	711.000	709.700	706.400	704.300	702.900
2	2834K	737.300	735.400	734.500	732.600	731.400	728.700	725.500	721.700
3	2815K	737.000	736.700	733.700	731.000	728.700	726.800	725.600	724.500
4	2821K	744.600	743.700	742.500	740.800	739.700	737.200	734.700	734.000
5	2788K	721.600	721.800	720.100	718.700	716.700	713.800	712.200	709.100
6	2834K	714.000	712.800	711.700	708.700	706.700	704.700	701.300	699.500
7	2822K	707.600	706.100	705.000	703.000	700.600	699.700	697.100	694.600
8	2821K	723.600	723.000	719.200	716.900	715.700	713.300	711.000	709.200
9	2813K	712.600	710.500	709.600	707.300	704.900	704.300	700.900	698.300
10	2802K	749.900	748.700	746.200	743.600	740.300	739.500	737.500	734.400
11	2822K	713.800	713.400	711.400	709.400	705.600	703.800	702.400	702.200
12	2816K	723.800	721.700	718.000	714.800	713.700	711.500	709.600	707.200
13	2812K	747.100	746.000	742.600	740.700	737.300	735.400	733.800	731.000
14	2816K	735.000	736.200	733.000	731.800	729.000	726.200	724.600	721.700
15	2824K	738.900	738.800	736.100	733.000	729.800	728.500	727.700	727.000
16	2819K	752.300	753.600	751.000	748.400	745.300	743.800	741.700	739.800
17	2818K	757.600	755.400	751.800	749.500	746.900	745.800	742.600	741.100
18	2828K	720.200	721.100	719.000	717.500	715.100	712.400	709.500	707.400
19	2809K	710.800	710.100	707.800	705.900	703.300	701.100	700.200	697.100
20	2808K	742.100	742.700	740.700	738.700	736.600	733.900	730.600	728.800

Normalized Luminous Flux data for tested units

$T_s = T_{air} = 105°C$, $I_f = 200mA$; $T_s \geq 103°C$ and $T_{air} \geq 100°C$ in compliance with LM-80-08

	CCT (t=0)	0hrs	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs
1	2802K	1.0000	0.9980	0.9971	0.9959	0.9941	0.9895	0.9866	0.9846
2	2834K	1.0000	0.9974	0.9962	0.9936	0.9920	0.9883	0.9840	0.9788
3	2815K	1.0000	0.9996	0.9955	0.9919	0.9887	0.9862	0.9845	0.9830
4	2821K	1.0000	0.9988	0.9972	0.9949	0.9934	0.9901	0.9867	0.9858
5	2788K	1.0000	1.0003	0.9979	0.9960	0.9932	0.9892	0.9870	0.9827
6	2834K	1.0000	0.9983	0.9968	0.9926	0.9898	0.9870	0.9822	0.9797
7	2822K	1.0000	0.9979	0.9963	0.9935	0.9901	0.9888	0.9852	0.9816
8	2821K	1.0000	0.9992	0.9939	0.9907	0.9891	0.9858	0.9826	0.9801
9	2813K	1.0000	0.9971	0.9958	0.9926	0.9892	0.9884	0.9836	0.9799
10	2802K	1.0000	0.9984	0.9951	0.9916	0.9872	0.9861	0.9835	0.9793
11	2822K	1.0000	0.9994	0.9966	0.9938	0.9885	0.9860	0.9840	0.9837
12	2816K	1.0000	0.9971	0.9920	0.9876	0.9860	0.9830	0.9804	0.9771
13	2812K	1.0000	0.9985	0.9940	0.9914	0.9869	0.9843	0.9822	0.9785
14	2816K	1.0000	1.0016	0.9973	0.9956	0.9918	0.9880	0.9859	0.9819
15	2824K	1.0000	0.9999	0.9962	0.9920	0.9877	0.9859	0.9848	0.9839
16	2819K	1.0000	1.0017	0.9983	0.9948	0.9907	0.9887	0.9859	0.9834
17	2818K	1.0000	0.9971	0.9923	0.9893	0.9859	0.9844	0.9802	0.9782
18	2828K	1.0000	1.0012	0.9983	0.9963	0.9929	0.9892	0.9851	0.9822
19	2809K	1.0000	0.9990	0.9958	0.9931	0.9894	0.9864	0.9851	0.9807
20	2808K	1.0000	1.0008	0.9981	0.9954	0.9926	0.9890	0.9845	0.9821

CIE 1976 u' data for tested units
$T_s = T_{air} = 105°C$, $I_f = 200mA$; $T_s \geq 103°C$ and $T_{air} \geq 100°C$ in compliance with LM-80-08

	[redacted]	0hrs	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs
1	2802K	0.2582	0.2579	0.2580	0.2577	0.2577	0.2576	0.2571	0.2570
2	2834K	0.2569	0.2565	0.2567	0.2564	0.2564	0.2563	0.2558	0.2555
3	2815K	0.2577	0.2572	0.2575	0.2571	0.2572	0.2571	0.2566	0.2563
4	2821K	0.2576	0.2570	0.2573	0.2570	0.2571	0.2570	0.2565	0.2562
5	2788K	0.2587	0.2582	0.2584	0.2581	0.2581	0.2580	0.2575	0.2572
6	2834K	0.2570	0.2563	0.2566	0.2562	0.2563	0.2562	0.2557	0.2555
7	2822K	0.2573	0.2568	0.2571	0.2568	0.2568	0.2567	0.2562	0.2560
8	2821K	0.2568	0.2565	0.2566	0.2563	0.2564	0.2563	0.2557	0.2556
9	2813K	0.2576	0.2572	0.2573	0.2570	0.2571	0.2569	0.2564	0.2563
10	2802K	0.2582	0.2578	0.2579	0.2576	0.2576	0.2576	0.2571	0.2570
11	2822K	0.2573	0.2569	0.2570	0.2567	0.2568	0.2566	0.2561	0.2560
12	2816K	0.2575	0.2570	0.2572	0.2569	0.2570	0.2569	0.2563	0.2562
13	2812K	0.2577	0.2574	0.2574	0.2572	0.2572	0.2571	0.2565	0.2566
14	2816K	0.2577	0.2573	0.2574	0.2571	0.2571	0.2570	0.2565	0.2565
15	2824K	0.2573	0.2570	0.2571	0.2567	0.2567	0.2567	0.2561	0.2562
16	2819K	0.2575	0.2572	0.2573	0.2570	0.2570	0.2570	0.2564	0.2563
17	2818K	0.2576	0.2572	0.2574	0.2570	0.2570	0.2569	0.2564	0.2564
18	2828K	0.2570	0.2568	0.2570	0.2565	0.2566	0.2565	0.2559	0.2559
19	2809K	0.2580	0.2573	0.2576	0.2572	0.2573	0.2572	0.2566	0.2566
20	2808K	0.2579	0.2574	0.2577	0.2573	0.2574	0.2573	0.2567	0.2567

CIE 1976 v' data for tested units
$T_s = T_{air} = 105°C$, $I_f = 200mA$; $T_s \geq 103°C$ and $T_{air} \geq 100°C$ in compliance with LM-80-08

	[redacted]	0hrs	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs
1	2802K	0.5249	0.5248	0.5240	0.5237	0.5235	0.5231	0.5230	0.5231
2	2834K	0.5243	0.5242	0.5234	0.5231	0.5228	0.5225	0.5224	0.5221
3	2815K	0.5246	0.5243	0.5236	0.5233	0.5231	0.5227	0.5228	0.5224
4	2821K	0.5237	0.5234	0.5226	0.5223	0.5222	0.5218	0.5219	0.5215
5	2788K	0.5255	0.5252	0.5245	0.5241	0.5239	0.5236	0.5236	0.5233
6	2834K	0.5239	0.5237	0.5230	0.5225	0.5224	0.5221	0.5220	0.5217
7	2822K	0.5250	0.5248	0.5241	0.5237	0.5236	0.5232	0.5231	0.5228
8	2821K	0.5274	0.5274	0.5264	0.5262	0.5260	0.5257	0.5256	0.5255
9	2813K	0.5254	0.5253	0.5244	0.5241	0.5239	0.5236	0.5235	0.5233
10	2802K	0.5248	0.5248	0.5238	0.5235	0.5232	0.5229	0.5229	0.5226
11	2822K	0.5249	0.5248	0.5239	0.5235	0.5232	0.5230	0.5229	0.5226
12	2816K	0.5253	0.5251	0.5243	0.5239	0.5237	0.5234	0.5234	0.5231
13	2812K	0.5251	0.5249	0.5241	0.5237	0.5236	0.5232	0.5232	0.5230
14	2816K	0.5242	0.5241	0.5233	0.5229	0.5226	0.5224	0.5223	0.5221
15	2824K	0.5245	0.5243	0.5236	0.5232	0.5230	0.5227	0.5225	0.5224
16	2819K	0.5246	0.5245	0.5237	0.5233	0.5231	0.5228	0.5227	0.5224
17	2818K	0.5243	0.5241	0.5234	0.5229	0.5227	0.5224	0.5223	0.5221
18	2828K	0.5250	0.5249	0.5241	0.5238	0.5234	0.5233	0.5231	0.5229
19	2809K	0.5243	0.5240	0.5233	0.5228	0.5227	0.5225	0.5222	0.5220
20	2808K	0.5251	0.5249	0.5241	0.5238	0.5237	0.5232	0.5230	0.5230

Delta u'v' data for tested units

$T_s = T_{air} = 105°C$, $I_f = 200mA$; $T_s \geq 103°C$ and $T_{air} \geq 100°C$ in compliance with LM-80-08

	[redacted]	0hrs	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs
1	2802K	0.0000	0.0003	0.0009	0.0013	0.0015	0.0019	0.0022	0.0022
2	2834K	0.0000	0.0004	0.0009	0.0013	0.0016	0.0019	0.0022	0.0026
3	2815K	0.0000	0.0006	0.0010	0.0014	0.0016	0.0020	0.0021	0.0026
4	2821K	0.0000	0.0007	0.0011	0.0015	0.0016	0.0020	0.0021	0.0026
5	2788K	0.0000	0.0006	0.0010	0.0015	0.0017	0.0020	0.0022	0.0027
6	2834K	0.0000	0.0007	0.0010	0.0016	0.0017	0.0020	0.0023	0.0027
7	2822K	0.0000	0.0005	0.0009	0.0014	0.0015	0.0019	0.0022	0.0026
8	2821K	0.0000	0.0003	0.0010	0.0013	0.0015	0.0018	0.0021	0.0022
9	2813K	0.0000	0.0004	0.0010	0.0014	0.0016	0.0019	0.0022	0.0025
10	2802K	0.0000	0.0004	0.0010	0.0014	0.0017	0.0020	0.0022	0.0025
11	2822K	0.0000	0.0004	0.0010	0.0015	0.0018	0.0020	0.0023	0.0026
12	2816K	0.0000	0.0005	0.0010	0.0015	0.0017	0.0020	0.0022	0.0026
13	2812K	0.0000	0.0004	0.0010	0.0015	0.0016	0.0020	0.0022	0.0024
14	2816K	0.0000	0.0004	0.0009	0.0014	0.0017	0.0019	0.0022	0.0024
15	2824K	0.0000	0.0004	0.0009	0.0014	0.0016	0.0019	0.0023	0.0024
16	2819K	0.0000	0.0003	0.0009	0.0014	0.0016	0.0019	0.0022	0.0025
17	2818K	0.0000	0.0004	0.0009	0.0015	0.0017	0.0020	0.0023	0.0025
18	2828K	0.0000	0.0002	0.0009	0.0013	0.0016	0.0018	0.0022	0.0024
19	2809K	0.0000	0.0008	0.0011	0.0017	0.0017	0.0020	0.0025	0.0027
20	2808K	0.0000	0.0005	0.0010	0.0014	0.0015	0.0020	0.0024	0.0024

Forward Voltage [V] data for tested units

$T_s = T_{air} = 105°C$, $I_f = 200mA$; $T_s \geq 103°C$ and $T_{air} \geq 100°C$ in compliance with LM-80-08

	[redacted]	0hrs	1000hrs	2000hrs	3000hrs	4000hrs	5000hrs	6000hrs	7000hrs
1	2802K	24.860	24.870	24.860	24.880	24.870	24.860	24.860	24.870
2	2834K	25.270	25.270	25.260	25.290	25.280	25.260	25.260	25.260
3	2815K	25.210	25.220	25.200	25.210	25.210	25.200	25.220	25.200
4	2821K	24.980	24.990	24.970	24.990	24.990	24.970	24.990	24.980
5	2788K	25.130	25.150	25.130	25.140	25.130	25.120	25.140	25.130
6	2834K	25.210	25.230	25.220	25.220	25.220	25.210	25.220	25.220
7	2822K	24.830	24.850	24.840	24.840	24.860	24.830	24.840	24.840
8	2821K	25.150	25.170	25.140	25.160	25.180	25.150	25.160	25.160
9	2813K	24.950	24.970	24.950	24.960	24.980	24.940	24.950	24.960
10	2802K	24.910	24.940	24.890	24.910	24.890	24.880	24.900	24.890
11	2822K	24.870	24.890	24.870	24.890	24.870	24.860	24.880	24.880
12	2816K	24.630	24.630	24.620	24.630	24.620	24.620	24.630	24.630
13	2812K	25.250	25.250	25.240	25.260	25.240	25.230	25.240	25.260
14	2816K	24.990	25.000	25.000	25.030	24.990	24.990	25.000	25.010
15	2824K	24.970	24.990	24.990	24.990	24.970	24.970	24.970	24.980
16	2819K	24.660	24.680	24.680	24.670	24.650	24.660	24.660	24.670
17	2818K	25.050	25.060	25.050	25.080	25.040	25.040	25.040	25.050
18	2828K	24.670	24.610	24.610	24.620	24.590	24.600	24.590	24.600
19	2809K	25.370	25.390	25.380	25.380	25.370	25.380	25.380	25.370
20	2808K	24.980	24.990	24.980	24.990	25.000	24.970	24.970	24.980

Disclaimer

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Company Information

Lumileds is a leading provider of power LEDs for everyday lighting applications. The company's records for light output, efficacy and thermal management are direct results of the ongoing commitment to advancing solid-state lighting technology and enabling lighting solutions that are more environmentally friendly, help reduce CO2 emissions and reduce the need for power plant expansion. Lumileds LUXEON LEDs are enabling never before possible applications in outdoor lighting, shop lighting, home lighting, digital imaging, display and automotive lighting.

Lumileds is a fully integrated supplier, producing core LED material in all three base colors, (red, green, blue) and white. Lumileds has R & D centers in San Jose, California and in the Netherlands, and production capabilities in San Jose, Singapore and Penang, Malaysia. Founded in 1999, Lumileds is the high flux LED technology leader and is dedicated to bridging the gap between solid-state technology and the lighting world. More information about the company's LUXEON LED products and solid-state lighting technologies can be found at www.lumileds.com.

Appendix: Additional Projected Extrapolations per IESNA TM-21-11

Projected L_{75} extrapolations per IESNA TM-21-11

	If = 200mA
Ts = 105°C	97,380
Ts = 85°C	124,337

Projected L_{80} extrapolations per IESNA TM-21-11

	If = 200mA
Ts = 105°C	75,682
Ts = 85°C	96,745

Projected L_{85} extrapolations per IESNA TM-21-11

	If = 200mA
Ts = 105°C	55,299
Ts = 85°C	70,826

Projected L_{90} extrapolations per IESNA TM-21-11

	If = 200mA
Ts = 105°C	36,082
Ts = 85°C	46,390

Projected L_{95} extrapolations per IESNA TM-21-11

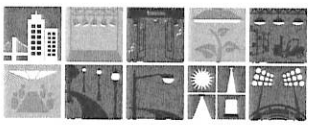
	If = 200mA
Ts = 105°C	17,904
Ts = 85°C	23,275

Projected L_{100} extrapolations per IESNA TM-21-11

	If = 200mA
Ts = 105°C	0
Ts = 85°C	1,355

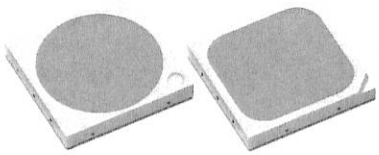
LUMILEDS

ILLUMINATION



LUXEON 5050

High efficacy and superior robustness in a multi-die, high power package, enabling cost-effective system design



LUXEON 5050 is a multi-die, high power package that provides high luminance from a super robust package to enable cost effective, single optic and directional fixture designs. LUXEON 5050 uses an industry standard 5050 surface mount package with a small Light Emitting Surface (LES). LUXEON 5050 comes in 70CRI, 80CRI and 90CRI with a wide range of CCTs, and offers hot-color targeting to ensure that the LEDs are within color target at application conditions of 85°C.

FEATURES AND BENEFITS

- Superior lm/W enables outstanding efficacy in end application
- Extremely reliable package design affirms long lifetime in harsh environments [1]
- Robust coating design for enhanced sulfur protection capability (LUXEON 5050 Square LES) [1]
- Two voltage configurations are compatible with low cost high efficacy drivers
- Low R_{th} enables effective thermal dissipation design for higher efficiency
- Hot-color targeting ensures color is within ANSI bin at 85°C
- 3-step and 5-step MacAdam ellipse binning structure ensures excellent color uniformity

1. Refer to reliability datasheet for more details.

PRIMARY APPLICATIONS

- High Bay
- Low Bay
- Floodlights
- Wall Pack
- More...

c UL us No. E507562 RoHS COMPLIANT

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General Product Information

Product Test Conditions

LUXEON 5050 LEDs are tested with a 20ms monopulse specified below at a junction temperature, T_j, of 25°C. Forward voltage and luminous flux are binned at a T_j of 25°C, while color is hot-targeted at a T_j of 85°C.

160mA – LUXEON 5050 (Round LES) – 24V and LUXEON 5050 (Square LES) – 30V
640mA – LUXEON 5050 (Round LES) – 6V
800mA – LUXEON 5050 (Square LES) – 6V

Part Number Nomenclature

Part numbers for LUXEON 5050 follow the convention below:

L 1 5 0 – **A A B B** 5 0 **C C** 0 0 0 **D** 0

Where:

A A – designates nominal ANSI CCT (22=2200K, 27=2700K, 30=3000K, 35=3500K 40=4000K, 50=5000K, 57=5700K, 65=6500K)

B B – designates minimum CRI (70=70CRI, 80=80CRI, 90=90CRI)

C C – designates voltage (06=6V, 24=24V, 30=30V)

D – designates product type (0=Round LES, S=Square LES)

Therefore, the following part number is used for a LUXEON 5050 Square LES, 3000K 80CRI, 30V:

L 1 5 0 – **3 0 8 0** 5 0 **3 0** 0 0 0 **S** 0

Lumen Maintenance

Please contact your local Sales Representative or Lumileds Technical Solutions Manager for more information about the long-term performance of this product.

Environmental Compliance

Lumileds LLC is committed to providing environmentally friendly products to the solid-state lighting market. LUXEON 5050 is compliant to the European Union directives on the restriction of hazardous substances in electronic equipment, namely the RoHS Directive 2011/65/EU and REACH Regulation (EC) 1907/2006. Lumileds LLC will not intentionally add the following restricted materials to its products: lead, mercury, cadmium, hexavalent chromium, polybrominated biphenyls (PBB) or polybrominated diphenyl ethers (PBDE).

Performance Characteristics

Product Selection Guide

Table 1. Product performance of LUXEON 5050 at specified test current, T_j=25°C.

PRODUCT	NOMINAL CCT [1]	MINIMUM CRI [2, 3]	LUMINOUS FLUX [2, 3] (lm)		TYPICAL LUMINOUS EFFICACY (lm/W)	TEST CURRENT (mA)	PART NUMBER
			MINIMUM	TYPICAL			
LUXEON 5050 (Round LES) 24V	2200K	70	515	568	145	160	L150-2270502400000
	2700K	70	535	620	158	160	L150-2770502400000
	3000K	70	553	640	163	160	L150-3070502400000
	3500K	70	600	652	166	160	L150-3570502400000
	4000K	70	580	675	172	160	L150-4070502400000
	5000K	70	580	672	171	160	L150-5070502400000
	5700K	70	570	661	169	160	L150-5770502400000
	6500K	70	570	655	167	160	L150-6570502400000
	2200K	80	440	500	128	160	L150-2280502400000
	2700K	80	500	572	146	160	L150-2780502400000
	3000K	80	516	595	152	160	L150-3080502400000
	3500K	80	527	605	154	160	L150-3580502400000
	4000K	80	539	630	161	160	L150-4080502400000
	5000K	80	539	630	161	160	L150-5080502400000
	5700K	80	539	630	161	160	L150-5780502400000
	6500K	80	539	617	157	160	L150-6580502400000
	2700K	90	414	475	121	160	L150-2790502400000
	3000K	90	428	490	125	160	L150-3090502400000
	3500K	90	445	510	130	160	L150-3590502400000
	4000K	90	456	530	135	160	L150-4090502400000
	5000K	90	456	530	135	160	L150-5090502400000
	5700K	90	456	530	135	160	L150-5790502400000
LUXEON 5050 (Round LES) 6V	2200K	70	515	568	145	640	L150-2270500600000
	2700K	70	535	620	158	640	L150-2770500600000
	3000K	70	553	640	163	640	L150-3070500600000
	3500K	70	600	652	166	640	L150-3570500600000
	4000K	70	580	675	172	640	L150-4070500600000
	5000K	70	580	672	171	640	L150-5070500600000
	5700K	70	570	661	169	640	L150-5770500600000
	6500K	70	570	655	167	640	L150-6570500600000
	2200K	80	440	500	128	640	L150-2280500600000
	2700K	80	500	572	146	640	L150-2780500600000
	3000K	80	516	595	152	640	L150-3080500600000
	3500K	80	527	605	154	640	L150-3580500600000
	4000K	80	539	630	161	640	L150-4080500600000
	5000K	80	539	630	161	640	L150-5080500600000
	5700K	80	539	630	161	640	L150-5780500600000
	6500K	80	539	617	157	640	L150-6580500600000
	2700K	90	414	475	121	640	L150-2790500600000
	3000K	90	428	490	125	640	L150-3090500600000
	3500K	90	445	510	130	640	L150-3590500600000
	4000K	90	456	530	135	640	L150-4090500600000
	5000K	90	456	530	135	640	L150-5090500600000
	5700K	90	456	530	135	640	L150-5790500600000

Table 1 continued on next page:

1. Correlated color temperature is not targeted at T=85°C.
2. Luminous flux and CRI are based upon mounted package on highly reflective surface at T=25°C. Typical CRI is approximately 2 points higher than the minimum CRI specified, but this is not guaranteed.
3. Lumileds maintains a tolerance of ±2 on CRI and ±7% on luminous flux measurements.

Table 1. Product performance of LUXEON 5050 at specified test current, T_j=25°C, Continued.

PRODUCT	NOMINAL CCT [1]	MINIMUM CRI [2, 3]	LUMINOUS FLUX [2, 3] (lm)		TYPICAL LUMINOUS EFFICACY (lm/W)	TEST CURRENT (mA)	PART NUMBER
			MINIMUM	TYPICAL			
LUXEON 5050 (Square LES) 30V	2200K	70	621	690	141	160	L150-2270503000OS0
	2700K	70	693	770	158	160	L150-2770503000OS0
	3000K	70	720	800	164	160	L150-3070503000OS0
	3500K	70	729	810	166	160	L150-3570503000OS0
	4000K	70	743	825	169	160	L150-4070503000OS0
	5000K	70	743	825	169	160	L150-5070503000OS0
	5700K	70	738	820	168	160	L150-5770503000OS0
	6500K	70	720	800	164	160	L150-6570503000OS0
	2200K	80	586	630	129	160	L150-2280503000OS0
	2700K	80	650	695	142	160	L150-2780503000OS0
	3000K	80	665	715	147	160	L150-3080503000OS0
	3500K	80	679	730	150	160	L150-3580503000OS0
	4000K	80	700	750	154	160	L150-4080503000OS0
	5000K	80	702	755	155	160	L150-5080503000OS0
	5700K	80	700	750	154	160	L150-5780503000OS0
	6500K	80	688	740	152	160	L150-6580503000OS0
	2700K	90	558	600	123	160	L150-2790503000OS0
	3000K	90	586	630	129	160	L150-3090503000OS0
	3500K	90	600	640	131	160	L150-3590503000OS0
	4000K	90	609	655	134	160	L150-4090503000OS0
	5000K	90	618	665	136	160	L150-5090503000OS0
	5700K	90	605	650	133	160	L150-5790503000OS0
LUXEON 5050 (Square LES) 6V	2200K	70	621	690	141	800	L150-2270500600OS0
	2700K	70	693	770	158	800	L150-2770500600OS0
	3000K	70	720	800	164	800	L150-3070500600OS0
	3500K	70	729	810	166	800	L150-3570500600OS0
	4000K	70	743	825	169	800	L150-4070500600OS0
	5000K	70	743	825	169	800	L150-5070500600OS0
	5700K	70	738	820	168	800	L150-5770500600OS0
	6500K	70	720	800	164	800	L150-6570500600OS0
	2200K	80	586	630	129	800	L150-2280500600OS0
	2700K	80	650	695	142	800	L150-2780500600OS0
	3000K	80	665	715	147	800	L150-3080500600OS0
	3500K	80	679	730	150	800	L150-3580500600OS0
	4000K	80	700	750	154	800	L150-4080500600OS0
	5000K	80	702	755	155	800	L150-5080500600OS0
	5700K	80	700	750	154	800	L150-5780500600OS0
	6500K	80	688	740	152	800	L150-6580500600OS0
	2700K	90	558	600	123	800	L150-2790500600OS0
	3000K	90	586	630	129	800	L150-3090500600OS0
	3500K	90	600	640	131	800	L150-3590500600OS0
	4000K	90	609	655	134	800	L150-4090500600OS0
	5000K	90	618	665	136	800	L150-5090500600OS0
	5700K	90	605	650	133	800	L150-5790500600OS0

Notes for Table 1:
1. Correlated color temperature is not targeted at T=85°C.
2. Luminous flux and CRI are based upon mounted package on highly reflective surface at T=25°C. Typical CRI is approximately 2 points higher than the minimum CRI specified, but this is not guaranteed.
3. Lumileds maintains a tolerance of ±2 on CRI and ±7% on luminous flux measurements.

Optical Characteristics

Table 2. Optical characteristics for LUXEON 5050 at test current, T_j=25°C.

PART NUMBER	TYPICAL TOTAL INCLUDED ANGLE [1]	TYPICAL VIEWING ANGLE [2]
L150-xxxx50xx000x0	138°	116°

Notes for Table 2:
1. Total angle at which 90% of total luminous flux is captured.
2. Viewing angle is the off axis angle from the LED centerline where the luminous intensity is ½ of the peak value.

Electrical and Thermal Characteristics

Table 3. Electrical and thermal characteristics for LUXEON 5050 at test current, T_j=25°C.

PART NUMBER	FORWARD VOLTAGE [1] (V_f)			TYPICAL TEMPERATURE COEFFICIENT OF FORWARD VOLTAGE [2] (mV/°C)	TYPICAL THERMAL RESISTANCE—JUNCTION TO SOLDER PAD (°C/W)
	MINIMUM	TYPICAL	MAXIMUM		
L150-xxxx502400000	23.5	24.4	26.5	-12	2.4
L150-xxxx500600000	5.8	6.1	6.6	-3	2.4
L150-xxxx5030000S0	29.0	30.5	32.0	-15	1.4
L150-xxxx5006000S0	5.8	6.1	6.6	-3	1.4

Notes for Table 3:
1. Lumileds maintains a tolerance of ±1% on forward voltage measurements.
2. Measured between 25°C and 85°C.

Absolute Maximum Ratings

Table 4. Absolute maximum ratings for LUXEON 5050.

PARAMETER	MAXIMUM PERFORMANCE
DC Forward Current [1, 2]	240mA for L150-xxxx502400000 800mA for L150-xxxx500600000 240mA for L150-xxxx5030000S0 1000mA for L150-xxxx5006000S0
Peak Pulsed Forward Current [1, 3]	300mA for L150-xxxx502400000 1000mA for L150-xxxx500600000 300mA for L150-xxxx5030000S0 1250mA for L150-xxxx5006000S0
LED Junction Temperature [1] (DC & Pulse)	125°C
ESD Sensitivity (ANSI/ESDA/JEDEC JS-001-2012)	Class 2
Operating Case Temperature [1]	105°C
LED Storage Temperature	-40°C to 105°C
Allowable Reflow Cycles	3
Reverse Voltage ($V_{reverse}$)	LUXEON LEDs are not designed to be driven in reverse bias

Notes for Table 4:
1. Proper current derating must be observed to maintain the junction temperature below the maximum allowable junction temperature.
2. Residual periodic variations due to power conversion from alternating current (AC) to direct current (DC), also called "ripple," are acceptable if the following conditions are met:
   - The frequency of the ripple current is 100Hz or higher
   - The average current for each cycle does not exceed the maximum allowable DC forward current
   - The maximum amplitude of the ripple does not exceed the maximum peak pulsed forward current
3. At 10% duty cycle with pulse width of 10ms.

Characteristic Curves

Spectral Power Distribution Characteristics

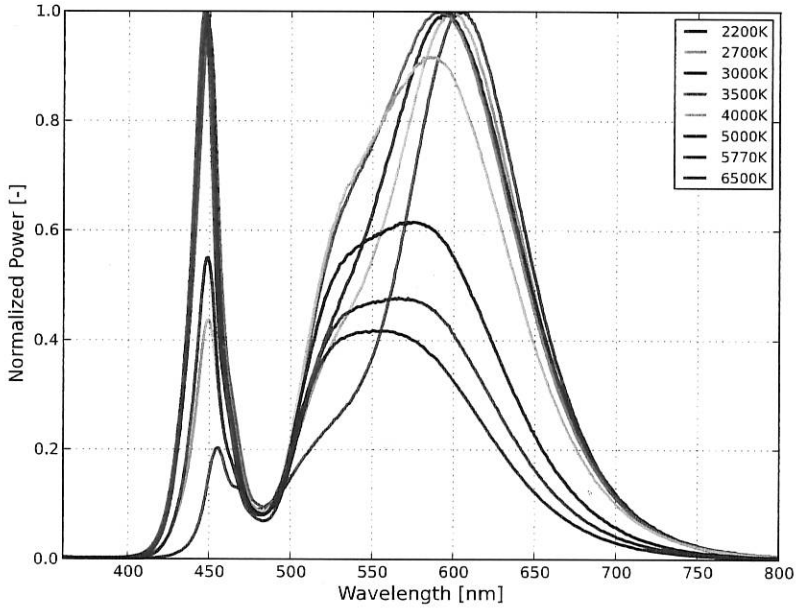


Figure 1a. Typical normalized power vs. wavelength for L150-xx7050xx000x0 at test current, T_j=25°C.

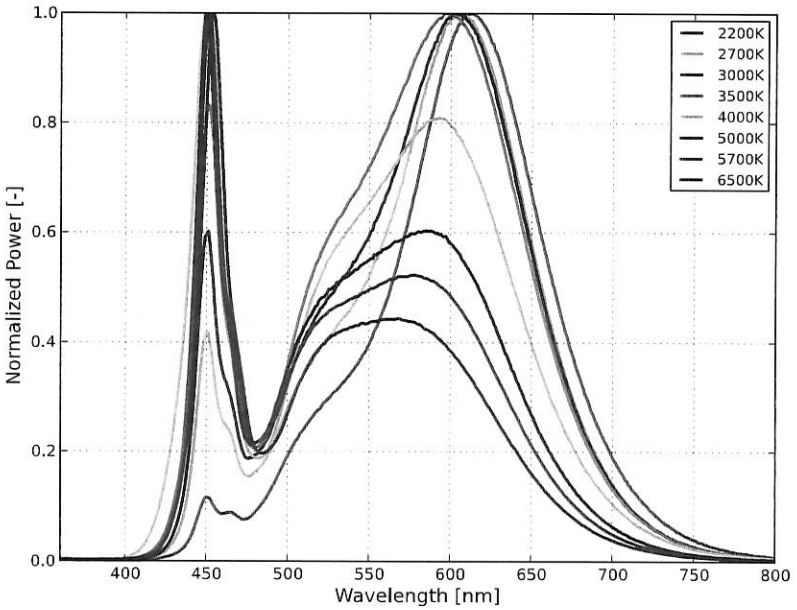


Figure 1b. Typical normalized power vs. wavelength for L150-xx8050xx000x0 at test current, T_j=25°C.

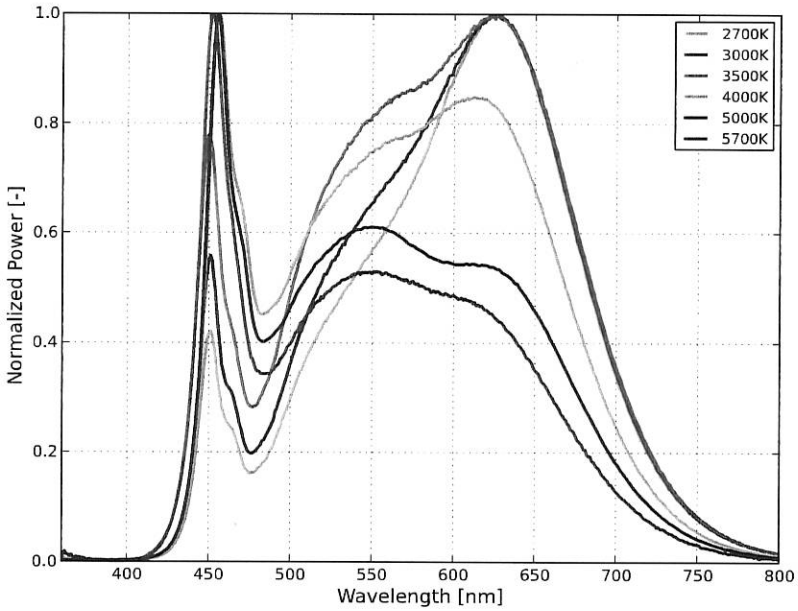


Figure 1c. Typical normalized power vs. wavelength for L150-xx9050xx000x0 at test current, T_j=25°C.

Light Output Characteristics

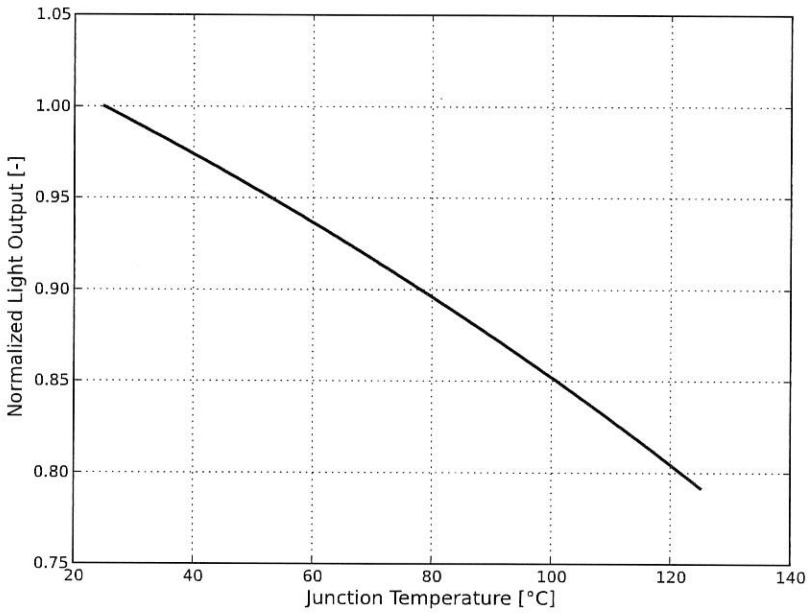


Figure 2. Typical normalized light output vs. junction temperature for L150-xxxx50xx000x0 at specified test current.

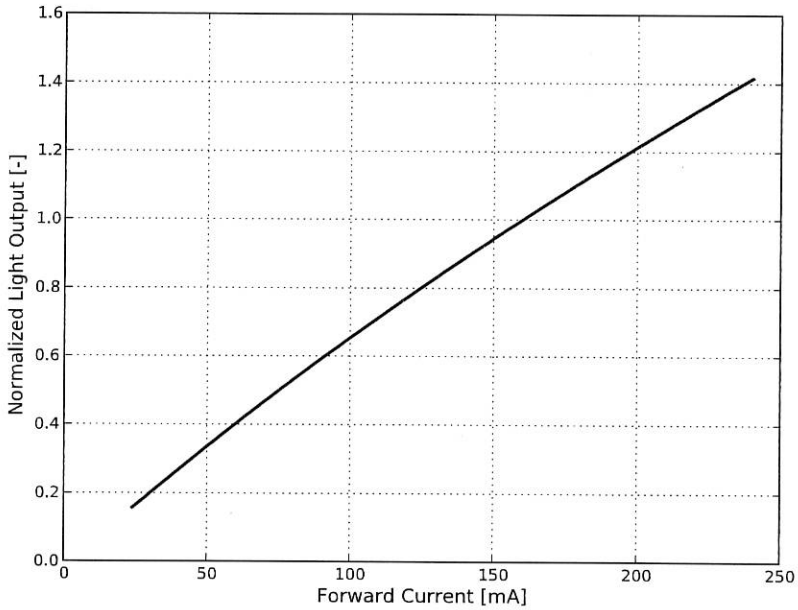


Figure 3a. Typical normalized light output vs. forward current for L150-xxxx50xx000x0, T_j=25°C.

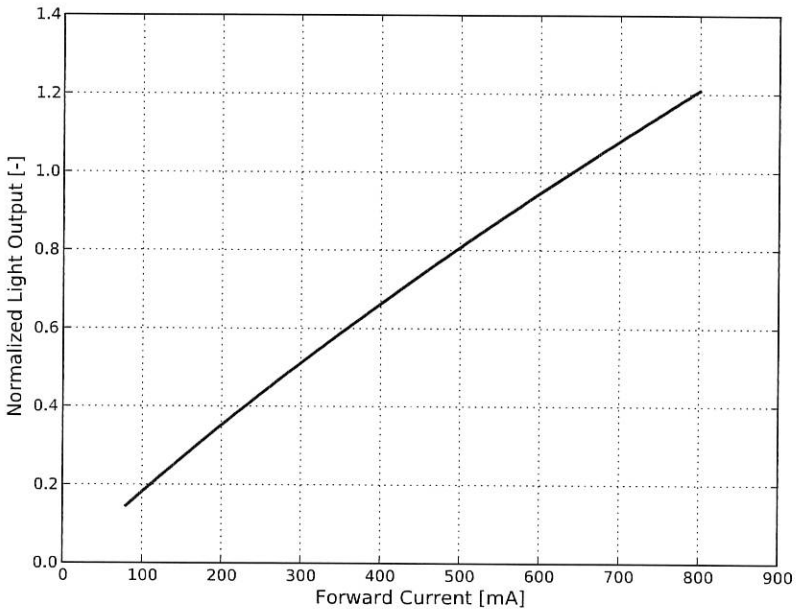


Figure 3b. Typical normalized light output vs. forward current for L150-xxxx500600000, T_j=25°C.

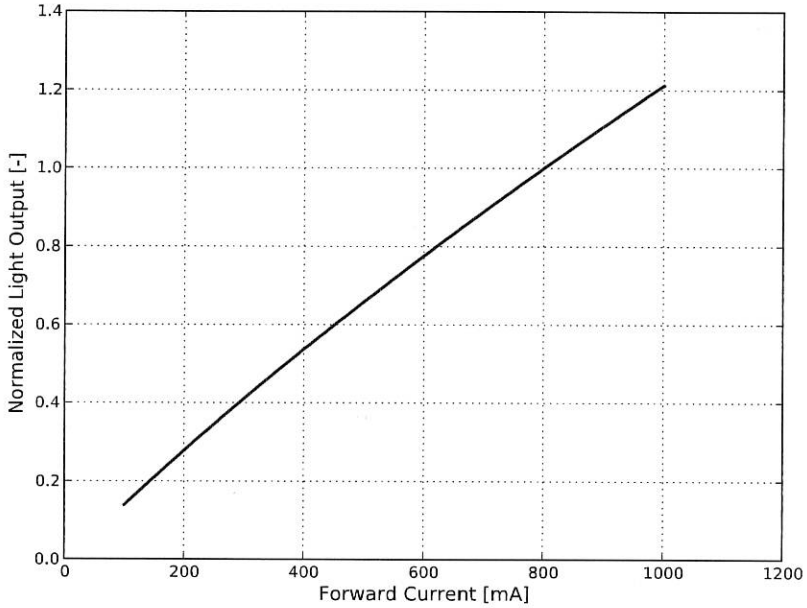


Figure 3c. Typical normalized light output vs. forward current for L150-xxxx5006000S0, T_j=25°C.

Forward Current Characteristics

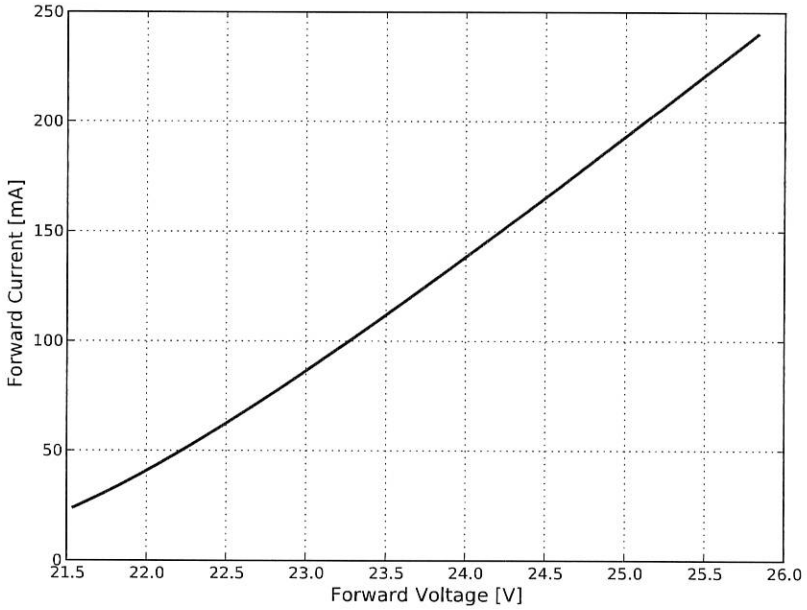


Figure 4a. Typical forward current vs. forward voltage for L150-xxxx502400000, T_j=25°C.

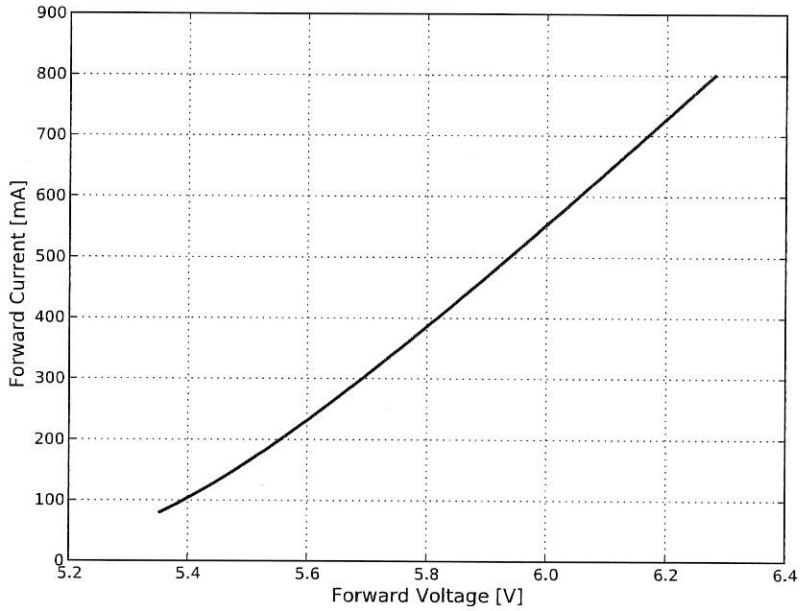


Figure 4b. Typical forward current vs. forward voltage for L150-xxxx500600000, T_j=25°C.

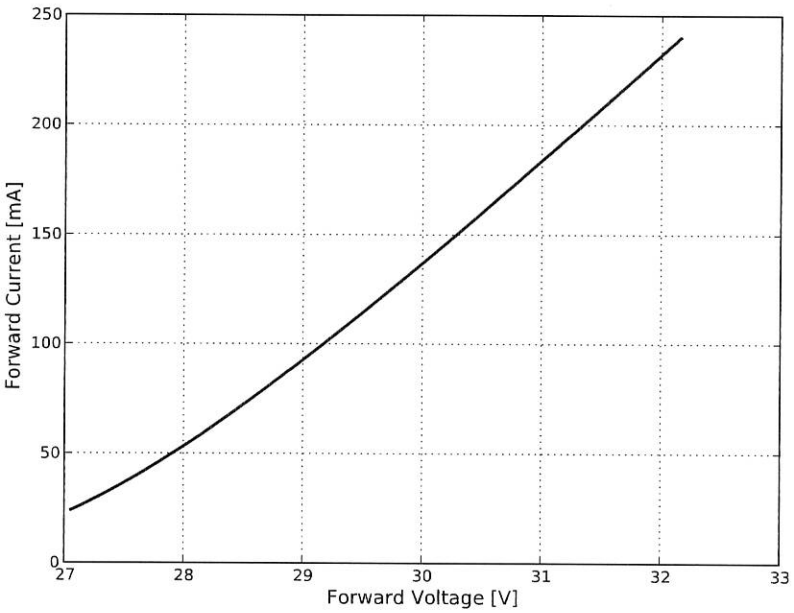


Figure 4c. Typical forward current vs. forward voltage for L150-xxxx5030000S0, Tj=25°C.

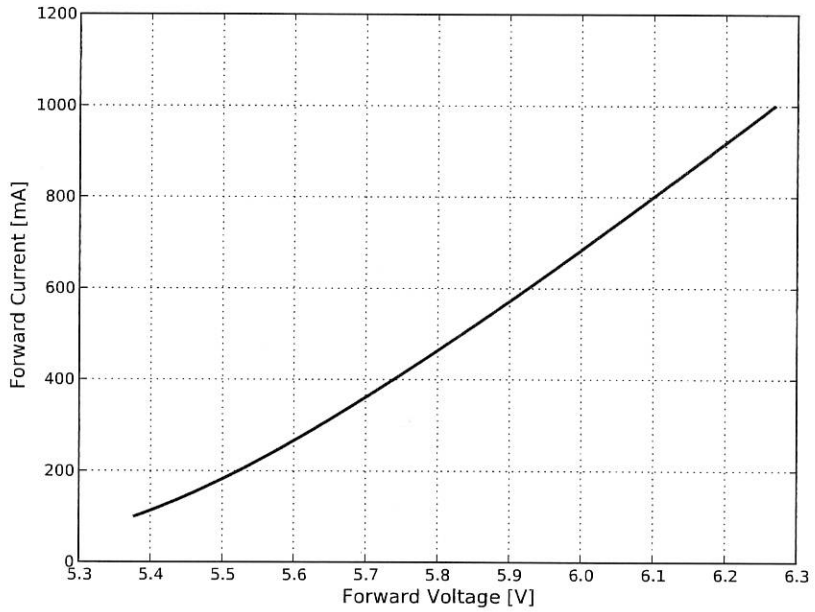


Figure 4d. Typical forward current vs. forward voltage for L150-xxxx5006000S0, T_j=25°C.

Radiation Pattern Characteristics

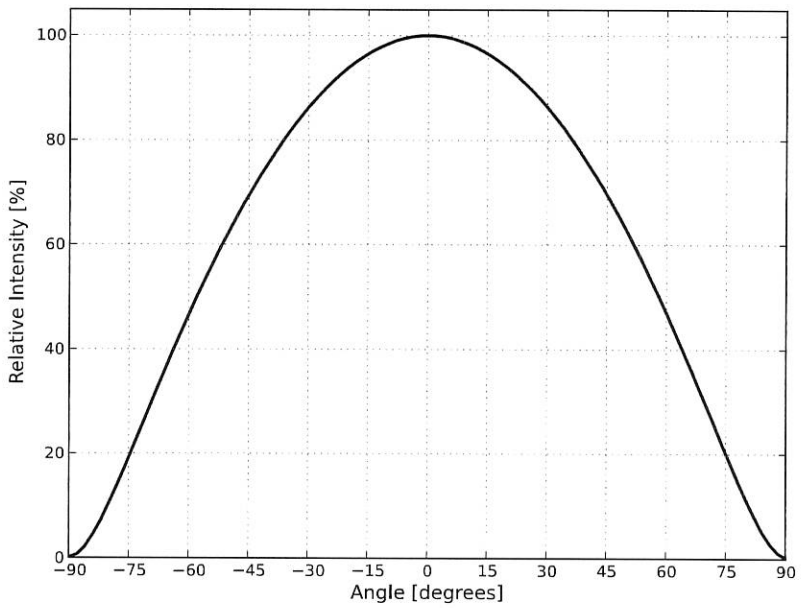


Figure 5. Typical radiation pattern for L150-xxxx50xx000x0 at specified test current, T_j=25°C.

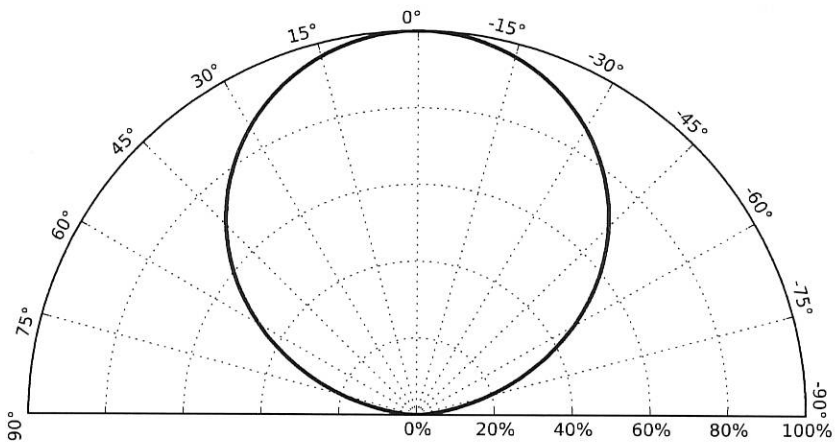


Figure 6. Typical polar radiation pattern for L150-xxxx50xx000x0 at specified test current, T_j=25°C.

Product Bin and Labeling Definitions

Decoding Product Bin Labeling

In the manufacturing of semiconductor products, there are variations in performance around the average values given in the technical datasheet. For this reason, Lumileds bins LED components for luminous flux or radiometric power, color point, peak or dominant wavelength and forward voltage.

LUXEON 5050 (Round LES) LEDs are labeled using a 4-digit alphanumeric CAT code following the format below:

A B C C

Where:

- **A** – designates luminous flux bin (example: L=600 to 650 lm, M=650 to 700 lm)
- **B** – designates color bin (example: 3=3 SDCM, 5=5 SDCM parts)
- **C C** – designates forward voltage bin (example: A1, A2, B1, B2)

Therefore, a LUXEON 5050 (Round LES) with a lumen range of 600 to 650 lm, color bin of 3 and forward voltage range of 23.5 to 24.2V has the following CAT code:

L 3 A 1

LUXEON 5050 (Square LES) LEDs are labeled using a 4-digit alphanumeric CAT code following the format below:

A B B C

Where:

A – designates luminous flux bin (example: L=600 to 650 lm, M=650 to 700 lm)

B B – designates color bin: (example: 83=2700K and 3 SDCM, 35=5000K and 5 SDCM)

C – designates forward voltage bin (example: A, B, C, D)

Therefore, a LUXEON 5050 (Square LES) with a lumen range of 600 to 650 lm, color bin of 83 and forward voltage range of 29.0 to 30.0V has the following CAT code:

L 8 3 A

Luminous Flux Bins

Table 5 lists the standard luminous flux bins for LUXEON 5050 LEDs. Although several bins are outlined, product availability in a particular bin varies by production run and by product performance. Not all bins are available in all CCTs.

Table 5. Luminous flux bin definitions for LUXEON 5050, T_j=25°C.

BIN	LUMINOUS FLUX[1] (lm)	
	MINIMUM	MAXIMUM
G	400	450
H	450	500
J	500	550
K	550	600
L	600	650
M	650	700
N	700	750
P	750	800
Q	800	850
R	850	900
S	900	950
T	950	1000

Notes for Table 5:
1. Lumileds maintains a tolerance of ±7% on luminous flux measurements.

Color Bin Definitions

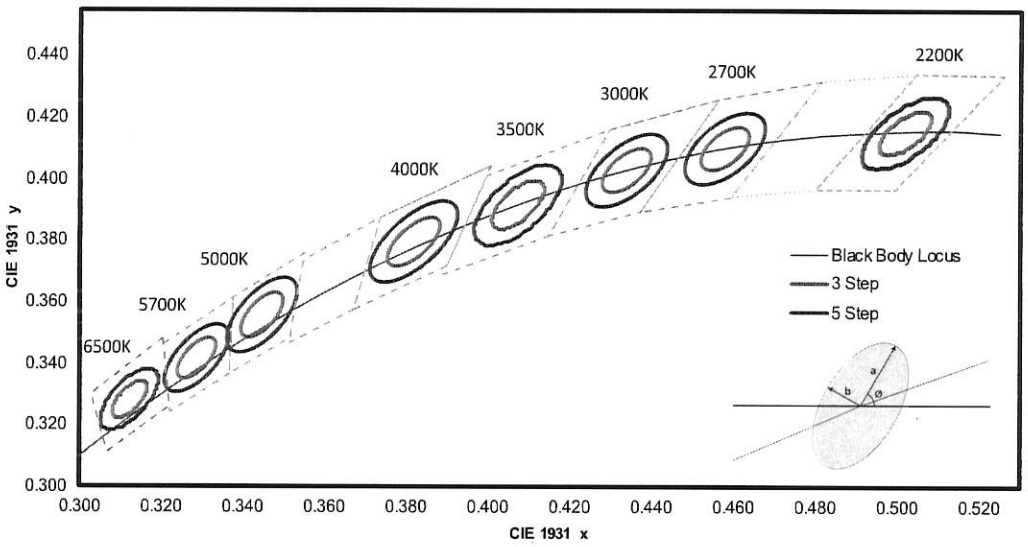


Figure 7. 3- and 5-step MacAdam ellipse illustration for hot-color targeting expected at 85°C.

Table 6. 3- and 5-step MacAdam ellipse color bin definitions for LUXEON 5050 at test current, hot-color targeted at T_j=85°C.

NOMINAL CCT	COLOR SPACE	CENTER POINT[1] (cx, cy)	MAJOR AXIS, a	MINOR AXIS, b	ELLIPSE ROTATION ANGLE, θ	LUXEON 5050 (ROUND LES) COLOR BIN CODE	LUXEON 5050 (SQUARE LES) COLOR BIN CODE
2200K	Single 3-step MacAdam ellipse	(0.5018, 0.4153)	0.00863	0.00398	49.27°	3	A3
2700K	Single 3-step MacAdam ellipse	(0.4578, 0.4101)	0.00810	0.00420	53.70°	3	83
3000K	Single 3-step MacAdam ellipse	(0.4338, 0.4030)	0.00834	0.00408	53.22°	3	73
3500K	Single 3-step MacAdam ellipse	(0.4073, 0.3917)	0.00927	0.00414	54.00°	3	63
4000K	Single 3-step MacAdam ellipse	(0.3818, 0.3797)	0.00939	0.00402	53.72°	3	53
5000K	Single 3-step MacAdam ellipse	(0.3447, 0.3553)	0.00822	0.00354	59.62°	3	33
5700K	Single 3-step MacAdam ellipse	(0.3287, 0.3417)	0.00745	0.00320	59.09°	3	23
6500K	Single 3-step MacAdam ellipse	(0.3123, 0.3282)	0.00669	0.00285	58.57°	3	13
2200K	Single 5-step MacAdam ellipse	(0.5018, 0.4153)	0.01438	0.00663	49.27°	5	A5
2700K	Single 5-step MacAdam ellipse	(0.4578, 0.4101)	0.01350	0.00700	53.70°	5	85
3000K	Single 5-step MacAdam ellipse	(0.4338, 0.4030)	0.01390	0.00680	53.22°	5	75
3500K	Single 5-step MacAdam ellipse	(0.4073, 0.3917)	0.01545	0.00690	54.00°	5	65
4000K	Single 5-step MacAdam ellipse	(0.3818, 0.3797)	0.01565	0.00670	53.72°	5	55
5000K	Single 5-step MacAdam ellipse	(0.3447, 0.3553)	0.01370	0.00590	59.62°	5	35
5700K	Single 5-step MacAdam ellipse	(0.3287, 0.3417)	0.01243	0.00533	59.09°	5	25
6500K	Single 5-step MacAdam ellipse	(0.3123, 0.3282)	0.01115	0.00475	58.57°	5	15

Notes for Table 6:
1. Lumileds maintains a tolerance of ±0.005 on x and y coordinates in the CIE 1931 color space

Forward Voltage Bins

Table 7. Forward voltage bin definitions for LUXEON 5050, T_j=25°C.

PART NUMBER	BIN	FORWARD VOLTAGE [1] (V_f)	
		MINIMUM	MAXIMUM
L150-xxxx502400000	A1	23.5	24.2
	A2	24.2	25.0
	B1	25.0	25.8
	B2	25.8	26.5
L150-xxxx500600000	A1	5.8	6.0
	A2	6.0	6.2
	B1	6.2	6.4
	B2	6.4	6.6
L150-xxxx5030000S0	A	29.0	30.0
	B	30.0	31.0
	C	31.0	32.0
L150-xxxx5006000S0	A	5.8	6.0
	B	6.0	6.2
	C	6.2	6.4
	D	6.4	6.6

Notes for Table 7:
1. Lumileds maintains a tolerance of ±0.1V on forward voltage measurements.

Mechanical Dimensions

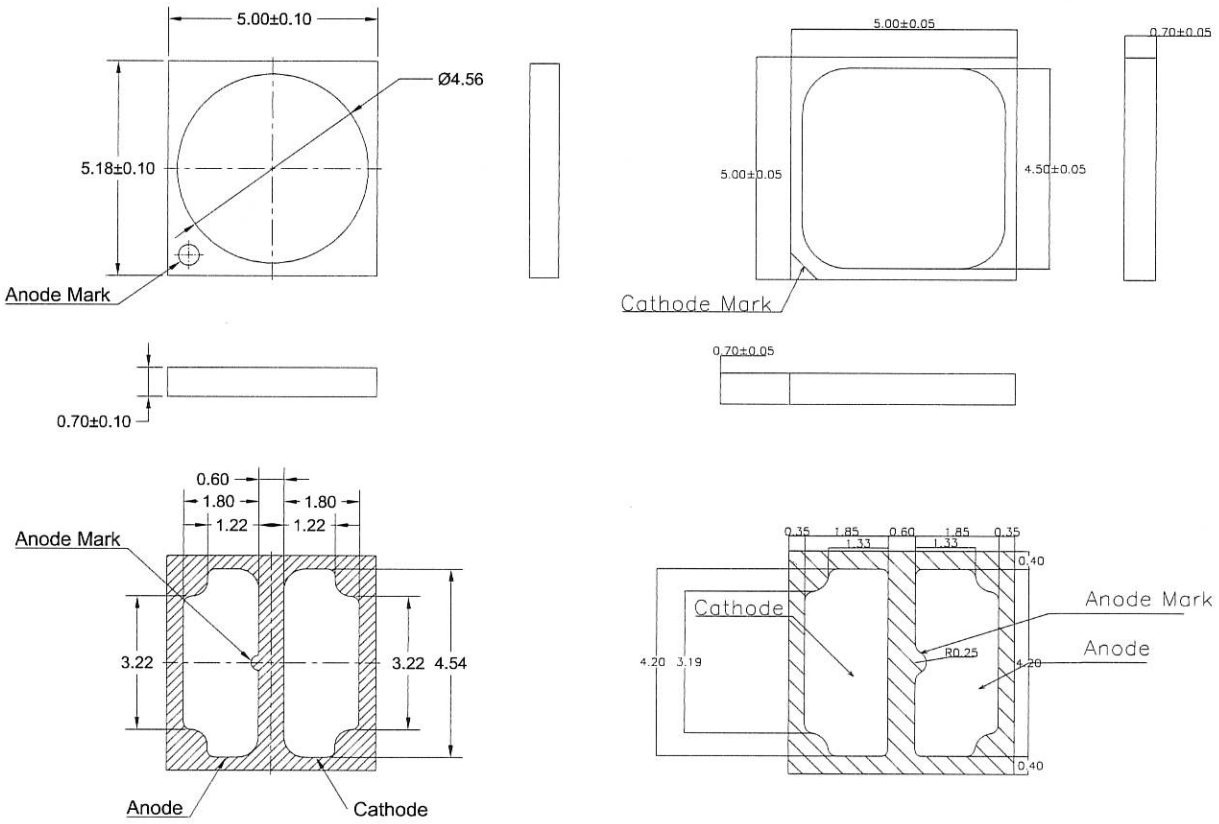


Figure 8. Mechanical dimensions for LUXEON 5050 (Round LES), left, and LUXEON 5050 (Square LES), right.

Notes for Figure 8:
1. Drawings are not to scale.
2. All dimensions are in millimeters.

Reflow Soldering Guidelines

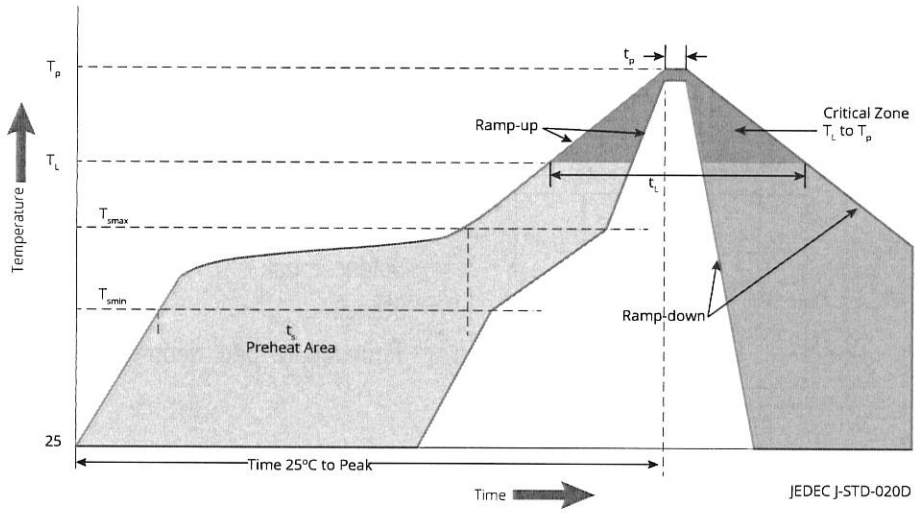


Figure 9. Visualization of the acceptable reflow temperature profile as specified in Table 8.

Table 8. Reflow profile characteristics for LUXEON 5050.

PROFILE FEATURE	LEAD-FREE ASSEMBLY
Preheat Minimum Temperature (T_{smin})	150°C
Preheat Maximum Temperature (T_{smax})	200°C
Preheat Time (t_{smin} to t_{smax})	60 to 180 seconds
Ramp-Up Rate (T_L to T_p)	3°C / second maximum
Liquidous Temperature (T_L)	217°C
Time Maintained Above Temperature T_L (t_L)	60 to 150 seconds
Peak / Classification Temperature (T_p)	260°C
Time Within 5°C of Actual Peak Temperature (t_p)	20 to 40 seconds
Ramp-Down Rate (T_p to T_L)	6°C / second maximum
Time 25°C to Peak Temperature	8 minutes maximum

JEDEC Moisture Sensitivity

Table 9. Moisture sensitivity levels for LUXEON 5050.

LEVEL	FLOOR LIFE		SOAK REQUIREMENTS STANDARD	
	TIME	CONDITIONS	TIME	CONDITIONS
3	168 Hours	≤30°C / 60% RH	192 Hours +5 / -0	30°C / 60% RH

Solder Pad Design

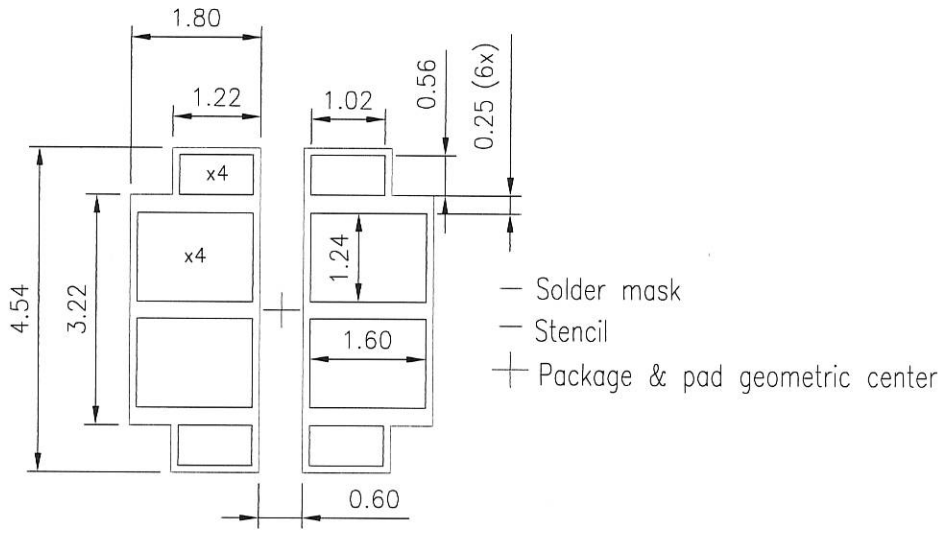


Figure 10. Recommended PCB solder pad layout for LUXEON 5050 (Round LES) and LUXEON 5050 (Square LES).

Notes for Figure 10:
1. Drawings are not to scale.
2. All dimensions are in millimeters.
3. Refer to application brief AB174 for additional details regarding recommended PCB layout design.

Packaging Information

Pocket Tape Dimensions

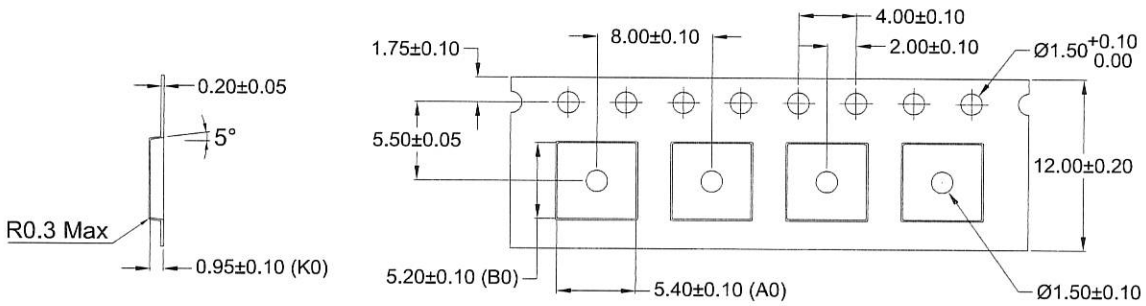
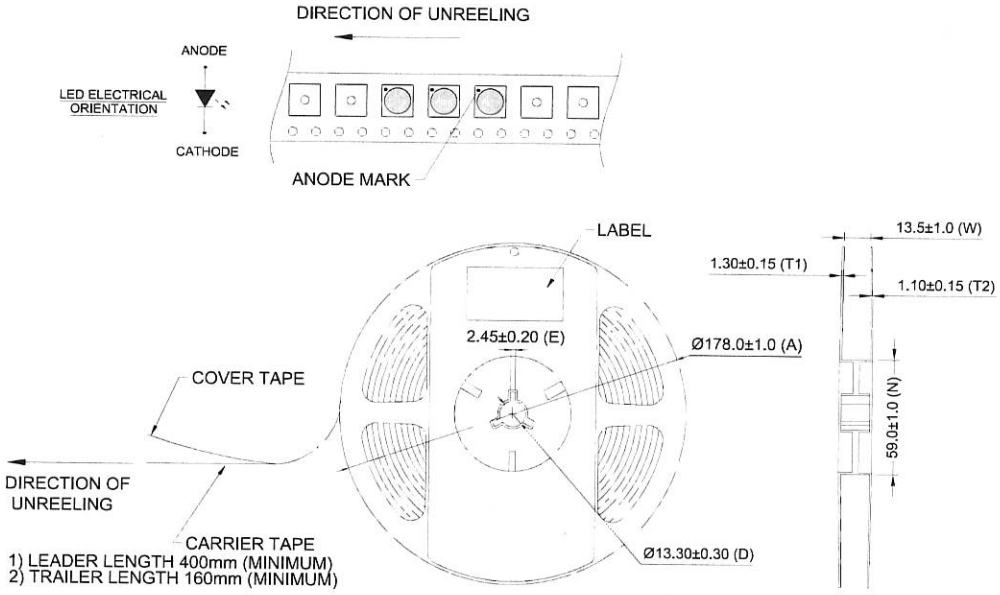


Figure 11. Pocket tape dimensions for LUXEON 5050 (Round LES) and LUXEON 5050 (Square LES).

Notes for Figure 11:
1. Drawings are not to scale.
2. All dimensions are in millimeters.

Reel Dimensions



12a. Reel dimensions for LUXEON 5050 (Round LES).

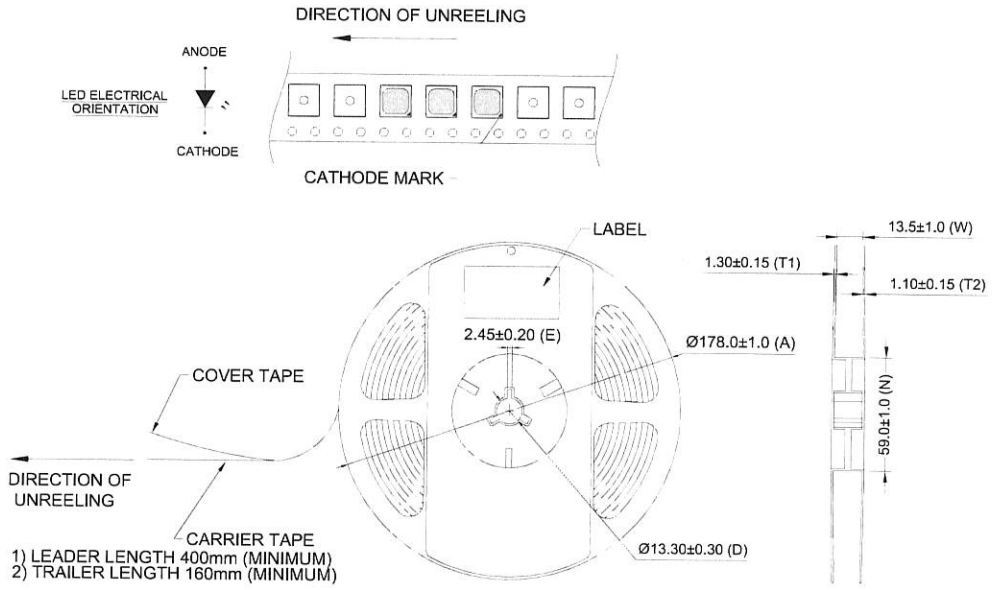


Figure 12b. Reel dimensions for LUXEON 5050 (Square LES).

Notes for Figures 12a and 12b:
1. Drawings are not to scale.
2. All dimensions are in millimeters.

About Lumileds

Companies developing automotive, mobile, IoT and illumination lighting applications need a partner who can collaborate with them to push the boundaries of light. With over 100 years of inventions and industry firsts, Lumileds is a global lighting solutions company that helps customers around the world deliver differentiated solutions to gain and maintain a competitive edge. As the inventor of Xenon technology, a pioneer in halogen lighting and the leader in high performance LEDs, Lumileds builds innovation, quality and reliability into its technology, products and every customer engagement. Together with its customers, Lumileds is making the world better, safer, more beautiful—with light.

To learn more about our lighting solutions, visit lumileds.com.

LUMILEDS

DS174 LUXEON 5050
Product Datasheet 20201120

Návod k použití

PRODUKT:

VEŘEJNÉ LED OSVĚTLENÍ

TYP: ST-1916-SL-G-2700

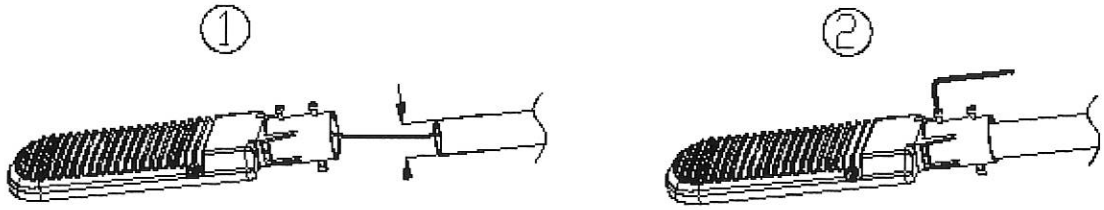
UPOZORNĚNÍ:

- Před instalací výrobku si nejprve pečlivě přečtěte tento návod.
- Nepřipojujte svítidlo k elektrické síti před odstraněním ochranného obalu.
- Instalaci svítidla provádějte vždy až po odpojení svítidla od hlavního napájení.
- Zajistěte řádné uzemnění svítidla.
- Nepoužívejte svítidlo v prostředí, které vykazuje teplotu a vlhkost mimo rozsah stanovený výrobcem jako provozní. Použitím svítidla v takovémto prostředí se výrazně snižuje jeho životnost.
- K čištění svítidla nepoužívejte korozivní chemikálie neďb rozpouštědla, která mohou poškodit povrchovou úpravu nebo ochrannou vrstvu svítidla. Nepoužívejte vysokotlaké čističe.
- Instalaci a údržbu svítidla musí vždy provádět pouze osoba s platnou kvalifikací dle vyhlášky č.50/1978 Sb.
- Nepoužívejte svítidlo v případě, že došlo k poškození svítidla nebo přívodního kabelu a jeho izolace. Kontrolu svítidla a kabeláže doporučujeme provádět pravidelně.

Vstupní napětí	AC 230V
Pracovní teplota	-30˚ ~ 50˚C
Krytí	IP 66

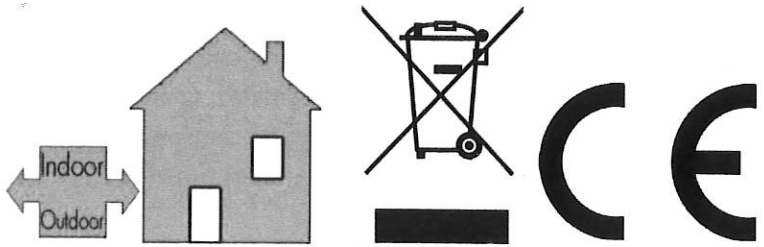
POSTUP MONTÁŽE:

- Přívodní kabel zaveďte do stožáru/výložníku pro VO
- Svítidlo nasaďte na dřík výložníku a poté utáhněte zajišťovací šrouby (M8) pomocí imbusového klíče.
- Zkontrolujte dotažení šroubů tak, aby nemohlo dojít k uvolnění svítidla.



VAROVÁNÍ

Při instalaci svítidla vždy dbejte na bezpečnost a vyvarujte se riziku vzniku požáru a elektrického šoku způsobeným nesprávným postupem při instalaci svítidla. Zapojení svítidla vždy přenechte osobám s příslušnou kvalifikací.



LVD TEST REPORT

Product name:	LED Lamp
Model:	ST-1916-SL-G-2700
Prepared For:	
Prepared By:	**Shanghai OUTAO Testing Technology Service Co., Ltd.** Suite 26D, Meliliyuan Mansion, No 358 Yan'an Road (W), Jing'an District, Shanghai, China
Date of Report:	December 18th, 2020
Report No.:	LVD-OUTAO131204

TEST REPORT **EN 60598 -1& EN 60598-2-3** **Luminaires** **Part 2-3: Particular requirements** **Luminaires for road and street lights**	
Report Reference No.	: LVD-OUTAO131204
Complied by(+signature)	: Leo Li
Approved by(+signature)	: Jimmy Xie
Test Date	: December 8th to 18th, 2013
Contect	: 27 pages
Testing laboratory name	: Shanghai OUTAO Testing and Technology Service Co., Ltd
Address	: Suite 26D, Meiliyuan Mansion, NO 358 Yan'an Road (W), Jing'an District, Shanghai, China
Applicant's name	:
Address	:
Test specification	
Standard	: EN 60598-2-3:2003+A1:2011 & EN 60598-1:2008+A11:2011
Test procedure	: CE LVD
Non-standard test method	: N/A
Test result	: Comply with EN 60598-2-3:2003 &EN 60598-1:2008+A11:2011
Product name	: LED Lamp
Manufacturer	: Same as Applicant
Trade mark	:
Test model	: ST-1916-SL-G-2700
Applicable model	: ST-1916-SL-G-2700
Rating	: AC230V, 50HZ, 100 W
Notes P= Pass, conformity with requirement F= Fai, Not conformity with requirement NA= Not applicable, meaning this item is not applicable this equipment	

General remarks

This report shall not be reproduced except in full without written approval of the testing laboratory.
The test results presented in this report relate only to the item(s) tested.
"(see remark #)" refers to a remark appended to the report.
"(see Annex #)" refers to an annex appended to the report
Clause numbers between brackets refer to clauses in IEC60598-1 (EN 60598-1).
Throughout this report a comma isused as the decimal separator.

Brief description of the test sample:
The equipment is a LED Lamp for general use.

Copy of Nameplate

HPPQ2+ LED lamp **230V/50 Hz** **100 W**

Made in China

EN 60598-1 & EN 60598-2-3			
Cl.	Requirement – Test	Results	Verdict
3.1 (0)	SCOPE		P
3.4 (2)	CLASSIFICATION		P
(2.2)	Type of protection.....:	Class II	-
(2.3)	Degree of protection.....:	IP X6	-
(2.4)	Portable of handheld luminaire.....:	No	-
	Fixes luminaire suitable for normally flammable surfaces.....:	Yes	-
	Fixed luminaire suitable for non-combustible materials only.....:	No	-
(2.5)	Luminaire for normal use.....:	Yes	-
	Luminaire for rough service.....:	No	-
3.5 (3)	MARKING		P
(3.2)	Mandatory markings		P
	Position of the marking	On the enclosure	P
	Format of symbols/text		P
(3.3)	Additional information		P
	Language of instructions	English	P
(3.3.1)	Combination luminaires	Not combination luminaire	N
(3.3.2)	Nominal frequency in Hz	50Hz	P
(3.3.3)	Operating temperature		N
(3.3.4)	Symbol of warning notice		N
(3.3.5)	Wiring diagram		N
(3.3.6)	Special conditions		N
(3.3.7)	Metal halid lamp luminaire – warning		N
(3.3.8)	Limitation for semi-luminaire		N
(3.3.9)	Power factor and supply current		N
(3.3.10)	Suitability for use indoors		N
(3.3.11)	Luminaires with remote control	No remote control	N
(3.3.12)	Clip-mounted luminaire – warning	Fixed luminaire	N

EN 60598-1 & EN 60598-2-3			
Cl.	Requirement – Test	Results	Verdict
(3.3.13)	Specifications of protective shields		N
(3.3.14)	Symbol for nature of supply	-	P
(3.3.15)	Rated current of socket outlet	Not provided socket outlet	N
(3.3.16)	Rough service luminaire		N
(3.3.17)	Mounting instruction for type Y, type Z and some type X attachments	Type Y attachment	P
(3.3.18)	Non-ordinary luminaires with PVC cable		N
(3.3.101)	Terminal block supplied with luminaire		N
(3.4)	Test with water	15s with water	P
	Test with hexane	15s with hexane	P
	Legible after test	The marking is legible	P
	Label attached	The Marking not be easily removable and shows no curling	P
3.5(-)	In addition information shall provided in instruction		N
	a) Design attitude		N
	b) Weight		N
	c) Overall dimensions		N
	d) Wind force (mounting more than 8m)		N
	e) The range of cross-sectional areas of suspension wire		N
	f) Indoor use		N
	g) Dimension of compartment		N
	h) Torque		N

3.6 (4)	CONSTRUCTION		P
3.6.1(-)	All luminaires shall have protection against ingrsee of mistureof at least IPX3		P
	Other		N
3.6.2(-)	Luminaires for suspension on span wire		N
3.6.3(-)	Attached and external parts shall with stand wind speed of 150km/h		N

EN 60598-1 & EN 60598-2-3			
Cl.	Requirement – Test	Results	Verdict
3.6.3.1(-)	Static force test		N
3.6.4(-)	A single lampholder shall adequate support		N
3.6.5(-)	Glass covers		N
3.6.6(-)	Adequate sapce for connection compartment		N
3.6.7(-)	Column integrate luminaires shall comply with ISO standards		N
3.6.8(-)	The door of column-intergrated luminaires shall against corrosion		N
	- Cable enter slot shall not less than 50mm x 150mm		N
	- The path from slot to compartment shall not less than 50 mm		N
3.6 (4.2)	Components replaceable without difficulty		P
3.6 (4.3)	Wireways smooth and free from sharps edges		P
3.6 (4.4)	Lampholders		N
3.6 (4.4.1)	Integral lampholders		N
3.6 (4.4.2)	Wiring connection		N
3.6 (4.4.3)	Lampholder for end-to-end mounting		N
3.6 (4.4.4)	Positioning		N
3.6 (4.4.5)	Peak pulse voltage		N
3.6 (4.4.6)	Centre contact		N
3.6 (4.4.7)	Rough service luminaires		N
3.6 (4.4.8)	Lamp connectors	No lamp connector provided	N
3.6 (4.5)	Starter holders		
	Starter holder in luminaires other than classII		N
	Starter holder class II construction		N
3.6 (4.6)	Terminal blocks		N
	Tails		N
	Unsecured blocks		N
3.6 (4.7)	Terminals and supply connections		N
3.6 (4.7.1)	Contact to metal parts		N

EN 60598-1 & EN 60598-2-3			
Cl.	Requirement – Test	Results	Verdict
3.6 (4.7.2)	Test 8 mm live conductor		N
	Test 8 mm earth conductor		N
3.6 (4.7.3)	Terminals for supply conductors		N
3.6 (4.7.4)	Terminals other than supply connection		N
3.6 (4.7.5)	Heat – resistant wiring/sleeves		P
3.6 (4.7.6)	Multi-pole plug		N
3.6 (4.8)	Switches:		N
	- Adequate rating	No switch	N
	- Adequate fixing		N
	- Polarized supply		N
3.6 (4.9)	Insulating lining and sleeves		P
3.6 (4.9.1)	Retainment		P
	Method of fixing.....:		P
3.6 (4.9.2)	Insulated linings and sleeves		P
	a) & c) Insulation resistance and electric strength		P
	b) Ageing test. Temperature (°C).....:		P
3.6 (4.10)	Insulation of class II luminaires		P
3.6 (4.10.1)	No contact, mounting surface – accessible metal parts – wiring of basic luminaires		P
	Safe installation fixed luminaires		P
	Capacitors		N
	Interference suppression capacitors according to IEC 60384-14	No such capacitor	N
3.6 (4.10.2)	Assembly gaps		N
	- Not coincidental		N
	- No straight access with test probe		N
3.6 (4.10.3)	Retainment of insulation		P
	- fixed		P
	- unable to be replaced; luminaire inoperative		P
	- sleeves retained in positions		P
	- lining in lampholder		P
3.6 (4.11)	Electrical connections		P

EN 60598-1 & EN 60598-2-3			
Cl.	Requirement – Test	Results	Verdict
3.6 (4.11.1)	Contact pressure	Not transmitted throught insulating material	P
3.6 (4.11.2)	Screws		P
	- self-tapping screws		P
	- thread-cutting screws		N
	- at least two self-tapping screws		N
3.6 (4.11.3)	Screw locking		P
	- spring washer		P
	- rivets		P
3.6 (4.11.4)	Material of current-carrying parts	Copper conductor used	P
3.6 (4.11.5)	No contact to wood	No wood material in the luminaire	P
3.6 (4.11.6)	Electro-mechanical contact systems	No such systems	N
3.6 (4.12)	Mechanical connections and glands		P
3.6 (4.12.1)	Screws not made of soft metal		P
	Screws of insulating material		N
	Torque test: torque (Nm); part.....:		P
	Torque test: torque (Nm); part.....:		N
	Torque test: torque (Nm); part.....:		N
3.6 (4.12.2)	Screws with diameter < 3 mm screwed into metal		N
3.6 (4.12.4)	Locked connections:		N
	- fixed arms; torque (Nm).....:		N
	- lampholder; torque (Nm).....:		N
	- push-button switches; torque 0,8 Nm.....:		N
3.6 (4.12.5)	Screwed glands; force (N).....:		N
3.6 (4.13)	Mechanical strength		P
3.6 (4.13.1)	Impact test:		P
	- fragile parts; energy (Nm).....:	0,5 Nm	P
	- other parts; energy (Nm).....:	Enclosure : 0,70 Nm	P
	1) live parts	Mot access	P
	2) linings	Not impaired	P

EN 60598-1 & EN 60598-2-3			
Cl.	Requirement – Test	Results	Verdict
	3) protection	Continue to afford the degree of protection against ingress of dust, solid object and moisture	P
	4) covers	No break	P
3.6 (4.13.3)	Straight test finger	Can't touch with live part with 30 N	P
3.6 (4.13.4)	Rough service luminaires		N
	a) fixed	Ordinary luminaire	N
	b) hand-held		N
	c) delivered with a stand		N
	d) for temporary installations and suitable for mounting on a stand		N
3.6 (4.13.6)	Tumbling barrel		N
3.6 (4.14)	Suspension and adjusting devices		N
3.6 (4.14.1)	Mechanical load:		N
	a) four times the weight	Not suspended luminaire	N
	b) torque 2,5 Nm		N
	c) bracket arm; bending moment (Nm).....:		N
	d) load track -mounted luminaires		N
	e) clip – mounted luminaires, glass-shelve. Thickness (mm).....:		N
	Metal rod. Diameter (mm).....:		N
3.6 (4.14.2)	Load to flexibe cables		N
	Mass (kg).....:	Not suspended by flexible cables	N
	Stress in conductor (N/mm^2).....:		N
	Semi-luminaires – mass (kg)		N
	Semi-luminaires – bending moment (Nm)...:		N
3.6 (4.14.3)	Adjusting devices:		N
	- flexing test; number of cycles.....:	No adjusting devices	N
	- strands broken		N
	- electric strength test afterwards		N

3.6 (4.14.4)	Telescopic tubes: cords not fixed to tube; no strain on conductors	No telescopic tubes	N

EN 60598-1 & EN 60598-2-3			
Cl.	Requirement – Test	Results	Verdict
3.6 (4.14.5)	Guide pulleyes	No guide pulleyes	N
3.6 (4.14.6)	Strain on socket-outlets		N
3.6 (4.15)	Flammable materials:		P
	- glow-wire test 650 °C		P
	- spacing ≥ 30 mm		N
	- screen withstanding test of 13.3.1		N
	- screen dimensions		N
	- no fiercely burning material		N
	- thermal protection		N
	- electronic circuits exempted		N
3.6 (4.15.2)	Luminaires made og thermoplastic material with lamp control gear		P
	a) construction		P
	b) temperature sensing control		N
	c) surface temperature		P
3.6 (4.16)	Luminaires marked with F-symbol		N
	No lamp control gear	(compliance with section 12)	P
3.6 (4.16.1)	Lamp control gear spacing:		P
	- spacing 35 mm		N
	- spacing 10 mm		N
3.6 (4.16.2)	Thermal protection		N
	- in lamp control gear		N
	- external		N
	- fixed position		N
	- temperature marked lamp control gear		N
3.6 (4.16.3)	"F" curve measured	(see 12.6)	N
3.6 (4.17)	Drain holes		N
	Clearance at least 5 mm		N
3.6 (4.18)	Resistance to corrosion:		P
3.6 (4.18.1)	- ruresistance		P
3.6 (4.18.2)	- season cracking in copper		P
3.6 (4.18.3)	- corrosion of aluminium		P

EN 60598-1 & EN 60598-2-3			
Cl.	Requirement – Test	Results	Verdict
3.6 (4.19)	Ignitors compatible with ballast		N
3.6 (4.20)	Rough service vibration.....:	Ordinary service luminaire	N
3.6 (4.21)	Protective shield:		N
3.6 (4.21.1)	Shield fitted		N
3.6 (4.21.2)	Particles from a shattering lamp not impair safety		N
3.6 (4.21.3)	No direct path		N
3.6 (4.21.4)	Impact test on shield		N
	Glow-wire test on lamp compartment		N
3.6 (4.22)	Attachments to lamps	No attachments	N
3.6 (4.23)	Semi-luminaires comply class II		N
3.6 (4.24)	UV radiation		N
3.6 (4.25)	No sharp point or edges	No sharp points or edges	P
3.6 (4.26)	Short-circuit protection:		N
3.6 (4.26.1)	Uninsulated accessible SELV parts		N
3.6 (4.26.2)	Short-circuit test		N
3.6 (4.26.3)	Test chain according to IEC 61032		N

3.7 (11)	CREEPAGE DISTANCES AND CLEARANCES		P
	Working voltage (V).....:	230V	-
	Voltage from	Sinusoidal	-
	PTI	<600	-
	Rated pulse voltage (kV).....:	--	-
	(1) Current-carrying parts of different polarity: cr (mm); cl (mm).....:	Cr>2,5mm, Cl>1,5mm	P
	(2) Current-carrying parts and accessible parts: cr (mm); cl (mm).....:	Cr>5mm, Cl>3mm	P
	(3) Parts becoming live due to breakdown of basic insulation and metal parts: cr (mm); cl (mm).....:		N

	(4) Outer surface of cable where it is clamped and metal parts: cr (mm); cl (mm).....:		N
	(5) Current-carrying parts of switches and metal parts, after removal of insulation: cr (mm); cl (mm).....:		N

EN 60598-1 & EN 60598-2-3			
Cl.	Requirement – Test	Results	Verdict
	(6) Current-carrying parts and supporting surface: cr (mm); cl (mm).....:	Cr>5mm, Cl>3mm	P

3.8(7)	PROVISION FOR EARTHING		N
3.8(7.2.1 +7.2.3)	Accessible metal parts		N
	Metal parts in contact with supporting surface		N
	Resistance < 0,5 Ω		N
	Two self – tapping screws used		N
	Thread – forming screwa		N
	Connector earthing first		N
3.8.1(-)	The attachment of fixed parts of termials shall not rotated when clamped part is removed		N
3.8 (7.2.2 + 7.2.3)	Earth continuity in joints etc.		N
3.8 (7.2.4)	Locking of clamping means		N
	Compliance with 4.7.3		N
3.8 (7.2.5)	Earth terminal integral part of connector socket		N
3.8 (7.2.6)	Earth terminal adjacent to mains terminals		N
3.8 (7.2.7)	Electrolytic corrosion of the earth terminal		N
3.8 (7.2.8)	Material of earth terminal		N
	Contact surface bare metal		N
3.8 (7.2.10)	Class II luminaire for looping – in		N
3.8 (7.2.11)	Earthing core coloured green – yellow		N
	Length of earth conductor		N

3.9 (14)	TERMINALS	N

	Separately approved; component list		N
	Part of the luminaire		N
(-)	The cross – sectional area s of conduct for erminals for supply connection shall comply Table 14.1 of IEC 60598-1		

EN 60598-1 & EN 60598-2-3			
Cl.	Requirement – Test	Results	Verdict
	Exclude provision of supply cable		N

3.9 (15)	TERMINALS		N
	Separately approved; component list		N
	Part of the luminaire		N

3.10 (5)	EXTERNAL AND INTERNAL WIRING		P
3.10.1 (-)	A cord anchorage		N
	Test		N
	Mounted high than 20m and weight than 4kg		N
3.10 (5.2)	Supply connection and external wirring		P
3.10 (5.2.1)	Means of connection.....:		P
3.10 (5.2.2)	Type of cable.....:		P
	Nominal cross-sectional area (mm^2).....:		N
3.10 (5.2.3)	Type of attachment, X, Y or Z	Type Y attachment	P
3.10 (5.2.5)	Type Z not connected to screws		N
3.10 (5.2.6)	Cable entries:		P
	- Suitable for introduction		P
	- Adequate degree of protection		P
3.10 (5.2.7)	Cable entries through rigid material have rounded edges		P
1.10 (5.2.8)	Insulating bushings:		N
	- Suitably fixed		N
	- Material in bushings		N
	- Tubes or guards made of insulating material		N
3.10 (5.2.9)	Locking of screwed bushing		N
3.10 (5.2.10)	Cord anchorage:		N
	- Covering protected from abrasion		N
	- Clear how to be effective		N

EN 60598-1 & EN 60598-2-3			
Cl.	Requirement – Test	Results	Verdict
	- No mechanical or thermal stress		N
	- No tying of cables into knots etc.		N
	- Insulating material or lining		N
3.10 (5.2.10.1)	Cord anchorage for type X attachment:		N
	a) At least one part fixed		N
	b) Types of cable		N
	c) No damaging of the cable		N
	d) Whole cable can be mounted		N
	e) No touching of clamping screws		N
	f) Metal screw not directly on cable		N
	g) Replacement without special tool		N
	Glands not used as anchorages		N
	Labyrinth type anchorages		N
3.10 (5.2.10.2)	Adequate cord anchorage for type Y and type Z attachment		P
3.10 (5.2.10.3)	Tests:		N
	- Impossible to push cable; unsafe		N
	- Pull test: 25 times; pull (N).....:		N
	- Torque test: torque (Nm).....:		N
	- Displacement ≤ 2 mm		N
	- No movement of conductor		N
	- No damage of cable or cord		N
3.10 (5.2.11)	External wiring passing into luminaire		N
3.10 (5.2.12)	Looping – in terminals		N
3.10 (5.2.13)	Wire ends not tinned		N
	Wire ends tinned: no cold flow		N

3.10 (5.2.14)	Mains plug same protection		N

EN 60598-1 & EN 60598-2-3			
Cl.	Requirement – Test	Results	Verdict
	Class III luminaire plug		N
3.10 (5.2.15)	Colour code low voltage		N
3.10 (5.2.16)	Appliance inlets (IEC 60320)		N
	Appliance couplers of class II type		N
3.10 (5.3)	Internal wiring		P
3.10 (5.3.1)	Internal wiring of suitable size and type		P
	Though wiring		P
	- Not delivered/mounting instruction		P
	- Factory assembled		P
	- Socket outlet loaded (A).....:		N
	- Temperatures.....:		P
	Green – yellow for earth only		N
3.10 (5.3.1.1)	Internal wiring connected directly to fixed wiring		P
	Cross-sectional area (mm^2).....:		P
	Insulation thickness		P
	Extra insulation added where necessary		N
3.10 (5.3.1.2)	Internal wiring connected to fixed wiring via internal current-limiting device		N
	Adequate cross-sectional area and insulation thickness		N
3.10 (5.2.1.3)	Double or reinforced insulation for class II		P
3.10 (5.2.1.4)	Conductors without insulation		N
3.10 (5.2.1.5)	SELV current-carrying parts		N

3.10 (5.2.1.6)	Insulation thickness other than PVC or rubber		N

EN 60598-1 & EN 60598-2-3			
Cl.	Requirement – Test	Results	Verdict
3.10 (5.3.2)	Sharp edges etc.	Inner wire can't touch the sharp edges, rivets and similar components	P
	No moving parts of switches etc.	No moving parts used	N
	Joints, raising/lowering devices	No such devices	N
	Telescopic tubes etc.	No telescopic tubes etc.	N
	No twisting over 360°		P
3.10 (5.3.3)	Openings	No openings	N
	Bushings not removable		N
	Bushings in sharp openings		N
	Cables with protective sheath		N
3.10 (5.3.4)	Joints and junctions effectively insulated	No joints and junctions	N
3.10 (5.3.5)	Strain on internal wiring		N
3.10 (5.3.6)	Wire carriers	The equipment is fixed luminaire	N
3.10 (5.3.7)	Wire ends not tinned		N
	Wire ends tinned: no cold flow		N

3.11 (8)	PROTECTION AGAINST ELECTRIC SHOCK		P
3.11 (8.2.1)	Live parts not accessible	No access of live part in normal use	P
	Protection in any position		P
	Double-ended tungsten filament lamp		N
	Insulation lacquer not reliable	No insulation laxquer and similar materials	N

		as protection against electric shock	
	Double-ended high-pressure discharge lamp		N
3.11 (8.2.2)	Portable luminaire adjusted in most unfavourable position	Fixed luminaire	N
3.11 (8.2.3)	Class II luminaire:		N
	- Basic insulated metal parts not accessible during starter or lamp replacement		N

EN 60598-1 & EN 60598-2-3			
Cl.	Requirement – Test	Results	Verdict
	- Basic insulation not accessible other than during starter or lamp replacement		N
	- Glass protective shields not udes as supplementary insulation		N
	Class I luminaire with BC lampholder		N
3.11 (8.2.4)	Portable luminaire:		N
	- Protection independent of supporting surface		N
	- Terminal block completely covered		N
3.11 (8.2.6)	Covers reliably secured		N
3.11 (8.2.7)	Discharging of capacitors ≥ 0,5 µF		N
	Portable plug connected luminaire with capacitor		N
	Other plug connected luminaire with capacitor		N
	Discharge device on or within capacitor		N
	Discharge device mounted separately		N

3.12 (12)	ENDURANCE TEST AND THERMAL TEST		P
3.12.1 (-)	The limit shall deducted 10°C the tables of section 12 of IEC 60598-1		P
	Test ambient at ta+ 5°C for outdoor use		P
3.12.2 (-)	IP greater than IP20		P
3.12 (12.3)	Endurance test:		P
	- Mounting – position.....:	Normal position	-
	- Test temperature (°C).....:	35°C	-
	- Total duration (h).....:	168h	-

	- Supply voltage: Un factor; calculated voltage (V).....:	253V	-
	- Lamp used.....:		-
3.12 (12.3.2)	After endurance test:		P
	-no part unserviceable		P
	-luminaire not unsafe		P
	-no damage to track system	No track system	N

EN 60598-1 & EN 60598-2-3			
Cl.	Requirement – Test	Results	Verdict
	-Marking legible	Marking still legible and shows no curling	P
	-no cracks, deformation etc.		P
3.12 (12.4)	Thermal test (normal operating)	(see Annex 2)	P
3.12 (12.5)	Thermal test (abnormal operation)	(see Annex 2)	N
3.12 (12.6)	Thermal test (failed lamp control gear condition):		N
3.12 (12.6.1)	-case of abnormal conditions.....:		N
	-electronic lamp control gear		N
	-measured winding temperature (°C) at 1,1 Un.....:		-
	-measured mounting surface temperature (°C) at 1,1 Un.....:		N
	-calculated mounting surface temperature (°C).....:		N
	-track-mounted luminaires		N
3.12 (12.6.2)	Temperature sensing control		N
	-case of abnormal conditions.....:	No temperature sensing control	-
	-thermal link		N
	-manual reset cut-out		N
	-auto reset cut-out		N
	-measured mounting surface temperature (°C):		N
	-track-mounted luminaires		N
3.12 (12.7)	Thermal test (failed lamp control gear in plastic luminaires):		N
	-case of abnormal conditions.....:		-

3.12 (12.7.1)	-measured winding temperature (°C) at 1,1 Un.....:		-
	-measured temperature of fixing point / exposed part (°C) at 1,1 Un.....:		N
	-calculated temperature of fixing point/ exposed part (°C) at 1,1 Un.....:		N
3.12 (12.7.2)	Temperature sensing control		N

EN 60598-1 & EN 60598-2-3			
Cl.	Requirement – Test	Results	Verdict
	-thermal link		N
	-manual reset cut-out		N
	-auto reset cut-out		N
	-measured temperature of fixing point/exposed part (°C) .....:		N

3.13(9)	RESISTANCE TO DUST, SOLID OBJECTS AND MOISTURE		P
3.13.1(-)	Tests for ingress of dust, solid objects and moisture:		P
3.13 (9.2)	Tests for ingress of dust, solid objects and moisture:		P
	-classification according to IP.....:	IP X6	-
	-mounting positions during test.....:		-
	-fixing screws tightened; torque (Nm).....:		-
	-test according to clauses.....:		-
	-electric strength test afterwards		P
	a)no deposit in dust-proof luminaire		P
	b)no talcum in dust-tight luminaire		P
	c)no trace of water on current-carrynig parts or where it could become a hazard		P
	d)i)for luminaires without drain holes – no water entry		P
	d)ii)for luminaires with drain holes – no hazardous water entry		N
	e)no water in watertight luminaire		P
	f)no contact with live parts (IP 2X)		N
	f)no entry into enclosure (IP 3X and IP 4X)		N
3.13 (9.3)	Humidity test 48 h	R.H.:93% T:25°C	P

3.14 (10)	INSULATION RESISTANCE AND ELECTRIC STREGTH	P
3.14 (10.2.1)	Insulation resistance test	P
	Insulation resistance (MΩ):	P

EN 60598-1 & EN 60598-2-3			
Cl.	Requirement – Test	Results	Verdict
	SELV		N
	-between current-carrying parts of different polarity.....:		N
	-between current-carrying parts and mounting surface.....:		N
	--between current-carrying parts and metal parts of the luminaire.....:		N
	Other than SELV:		P
	-between live parts of different polarity.....:	>100 MΩ	P
	-between live parts and mounting surface.:	>100 MΩ	P
	-between live parts and enclosure.....:	>100 MΩ	P
	-between live parts of different polarity through action of a switch.....:		N
3.14 (10.2.2)	Electric strength test		P
	Dummy lamp		N
	Luminaires with ignitors after 24 h test		N
	Luminaires with manual ignitors		N
	Test voltage (V):		P
	SELV:		N
	-between current-carrying parts of different polarity.....:		N
	-between current-carrying parts and mounting surface.....:		N
	--between current-carrying parts and metal parts of the luminaire.....:		N
	Other than SELV:		P

	-between live parts of different polarity.....:	1460V	P
	-between live parts and mounting surface.:	2920V	P
	-between live parts and enclosure.....:	2920V	P
	-between live parts of different polarity through action of a switch.....:		N

EN 60598-1 & EN 60598-2-3			
Cl.	Requirement – Test	Results	Verdict
3.14 (10.3.1)	Leakage current (Ma).....:	0.266 mA < 0.7 mA	P

3.15 (13)	RESISTANCE TO HEAT, FIRE AND TRACKING		P
3.15 (13.2.1)	Ball-pressure test:		P
	-part tested; temperature (°C).....:	PCB: 125°C	P
	-part tested; temperature (°C).....:	Bobbin: 125°C	P
3.15 (13.3.1)	Needle flame test (10 s):		P
	-part tested.....:	The duration of burning not exceed 30s after removal of test flame, and no any burning drop not ignite tissue paper	P
	-part tested.....:	The duration of burning not exceed 30s after removal of test flame, and no any burning drop not ignite tissue paper	P
3.15 (13.3.2)	Glow wire test (650°C)		P
	-part tested.....:	PCB	P
	-part tested.....:	Bobbin	P

3.15 (13.4.1)	Tracking test: part tested.....:		N
	COMMON MODIFICATIONS		N
(3.3.101+ 5.2.1)	For luminaires connected by tails, information about terminal block		N
(5.2.2)	Cables equal to HD 21 S2 or HD 22 S2		N

ZB	ANNEX ZB, SPECIAL NATIONAL CONDITIONS	N
(2.2)	Class 0 not accepted	N

EN 60598-1 & EN 60598-2-3			
Cl.	Requirement – Test	Results	Verdict
(3.3)	DK: power supply cord with label		N
	IT: warning label on Class 0 luminaire		N
(4.5.1)	DK: socket-outlets		N
(4.5.1)	FR: socket-outlets		N
(5.2.1)	DK, FI, SE, GB: type of plug		N

ZC	ANNEC ZC, NATIONAL DEVIATIONS				N
(13.3)	DK: Needle flame test or glow-wire test 750°C for luminaires in access routes				N
(13.3)	GB: Requirements according to United Kingdom Building Regulation				N
(13.3.2)	FR: Glow-wire test 850°C alt. 750°C for luminaires in premises open to public and workers				N
	ANNEX 1: components				
Object/ part No.	Manufacturer/ trademark	Type/model	Technical data	Standard	Mark(s) of conformity
Internal wire	Various	Various	105°C	--	UL
PCB	Various	Various	130°C	--	UL
	ANNEX 2: temperature measurements, thermal tests of Section 12				P
	Type reference.....:		DR-100W		-
	Lamp used.....:		100W		-
	Lamp control gear used.....:				-
	Mounting position of luminaire.....:		Normal position		-
	Supply wattage (W).....:				-
	Supply current (A).....:				-
	Calculated power factor.....:				-

	Table: measured temperatures corrected for ta = 25 °C		-
	-abnormal operating mode.....:	No abnormal mode	-
	-test 1: rated voltage.....:	--	-
	-test 2: 1,06 times rated volrage or 1,05 times rated wattage.....:	243.8V	-
	-test 3: Load on wiring to socket-outlet,1,06 times voltage or 1,05 times wattage.....:	--	-

EN 60598-1 & EN 60598-2-3							
Cl.	Requirement – Test				Results		Verdict
	-test 4: 1,1 times rated voltage or 1,05 times rated wattage.....:				--		-
Temperature (°C) of part		Clause 12.4 – normal			Clause 12.5 – abnormal		
		Test 1	Test 2	Test 3	Limits	Test 4	Limit
Internal wire			50.3		105		
PCB			60.4		130		
Enclosure outside			32.6		90		
Ambient			23.7		--		
	ANNEX 3: screw terminals (part of the luminaire)						P
(14)	SCREW TERMINALS						-
(14.2)	Type of terminal.....:						-
	Rated current (A).....:						-
(14.3.2.1)	One or more conductors						N
(14.3.2.2)	Special preparation						N
(14.3.2.3)	Terminal size						N
	Cross-sectional area (mm^2).....:						N
(14.3.3)	Conductor space (mm).....:						N
(14.4)	Mechanical tests						N
(14.4.1)	Minimum distance						N
(14.4.2)	Cannot slip out						N
(14.4.3)	Special preparation						N
(14.4.4)	Nominal diameter of thread (metric ISO thread).:						N
	External wiring						N
	No soft metal						N
(14.4.5)	Corrosion						N

(14.4.6)	Nominal diameter of thread (mm).....:		N
	Torque (Nm).....:		N
(14.4.7)	Between metal surfaces		N
	Lug terminal		N
	Mantle terminal		N

EN 60598-1 & EN 60598-2-3			
Cl.	Requirement – Test	Results	Verdict
	Pull test; pull (N).....:		N
14.4.8)	Without undue damage		N

	ANNEX 4: SCREWLESS TERMINALS (PART OF THE LUMINAIRE)		N
(15)	SCREWLESS TERMINALS		N
(15.2)	Type of terminal.....:		-
	Rated current (A).....:		-
(15.3.1)	Material		N
(15.3.2)	Clamping		N
(15.3.3)	Stop		N
(15.3.4)	Unprepared conductors		N
(15.3.5)	Pressure on insulating material		N
(15.3.6)	Clear connection method		N
(15.3.7)	Clamping independently		N
(15.3.8)	Fixed on position		N
(15.3.10)	Conductor size		N
	Type of conductor		N
(15.5.1)	Terminals internal wiring		N
(15.5.1.1)	Pull test spring -type terminals (4N, 4 samples)		N
(15.5.1.2)	Pull test pin or tab terminals (4N, 4 samplesú		N
	Insertion force not exceeding 50 N		N
(15.5.2)	Permanent connections: pull-off test (20 N)		N
(15.6)	Electrical tests		N
	Voltage drop (mV) after 1 h (4 samples).....:		N
	Voltage drop of two inseparable joints		N

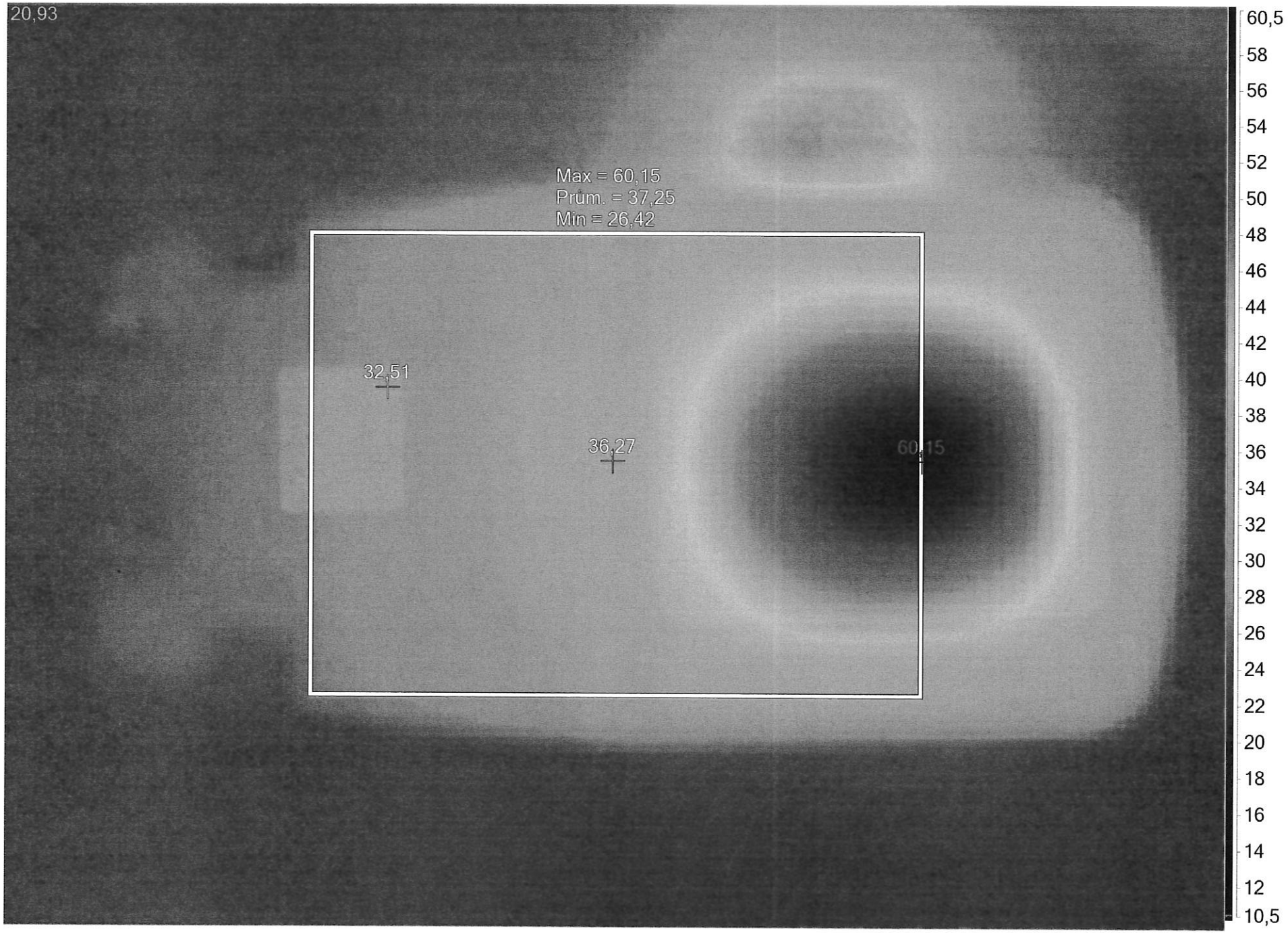
	Number of cycles.....:		-
	Voltage drop (mV) after 10th alt. 25th cycle (4samples).....:		N
	Voltage drop (mV) after 50th alt. 100th cycle (4samples).....:		N
	After ageing, voltage drop (mV) after 10th alt. 25th cycle (4samples).....:		N

EN 60598-1 & EN 60598-2-3										
Cl.	Requirement – Test					Results			Verdict	
	After ageing, voltage drop (mV) after 50th alt. 100th cycle (4 samples).....:								N	
(15.7)	Terminal external wiring								N	
	Terminal size and rating								N	
(15.8.1)	Pull test spring-type terminals (4 samples); pull (N)								N	
	Pill test pin or tab terminals (4 samples);pull (N)								B	
(15.9)	Contact resistance test								N	
	Voltage drop (mV) after 1 h								N	
Terminal	1	2	3	4	5	6	7	8	9	10
Voltage drop (mV)										
	Voltage drop of two inseparable joints									
	Voltage drop after 10th alt. 25th cycle									
	Max. allowed voltage drop (mV).....:								-	
Terminal	1	2	3	4	5	6	7	8	9	10
Voltage drop (mV)										
	Voltage drop after 50th alt. 100th cycle									
	Max. allowed voltage drop (mV).....:								-	
Terminal	1	2	3	4	5	6	7	8	9	10
Voltage drop (mV)										
	Continued ageing: Voltage drop after 10th alt. 25th cycle									
	Max. allowed voltage drop (mV).....:								-	
Terminal	1	2	3	4	5	6	7	8	9	10
Voltage drop (mV)										
	Continued ageing: Voltage drop after 50th alt. 100th cycle									
	Max. allowed voltage drop (mV).....:								-	

Terminal	1	2	3	4	5	6	7	8	9	10
Voltage drop (mV)										

Test Equipment	Manufacturer	Model	Serial No.	Last Cal.	Cal. Due Date
EFT Source	EM-TEST	USC 500M6	0701-15	2012.05.13	2014.05.12
Note: All testing were performed using internationally recognized standards. All test instruments were calibrated.					

SIGNED BY: Allen Xi'a **ENGINEER** **REVIEWED BY:** **REVIEWER**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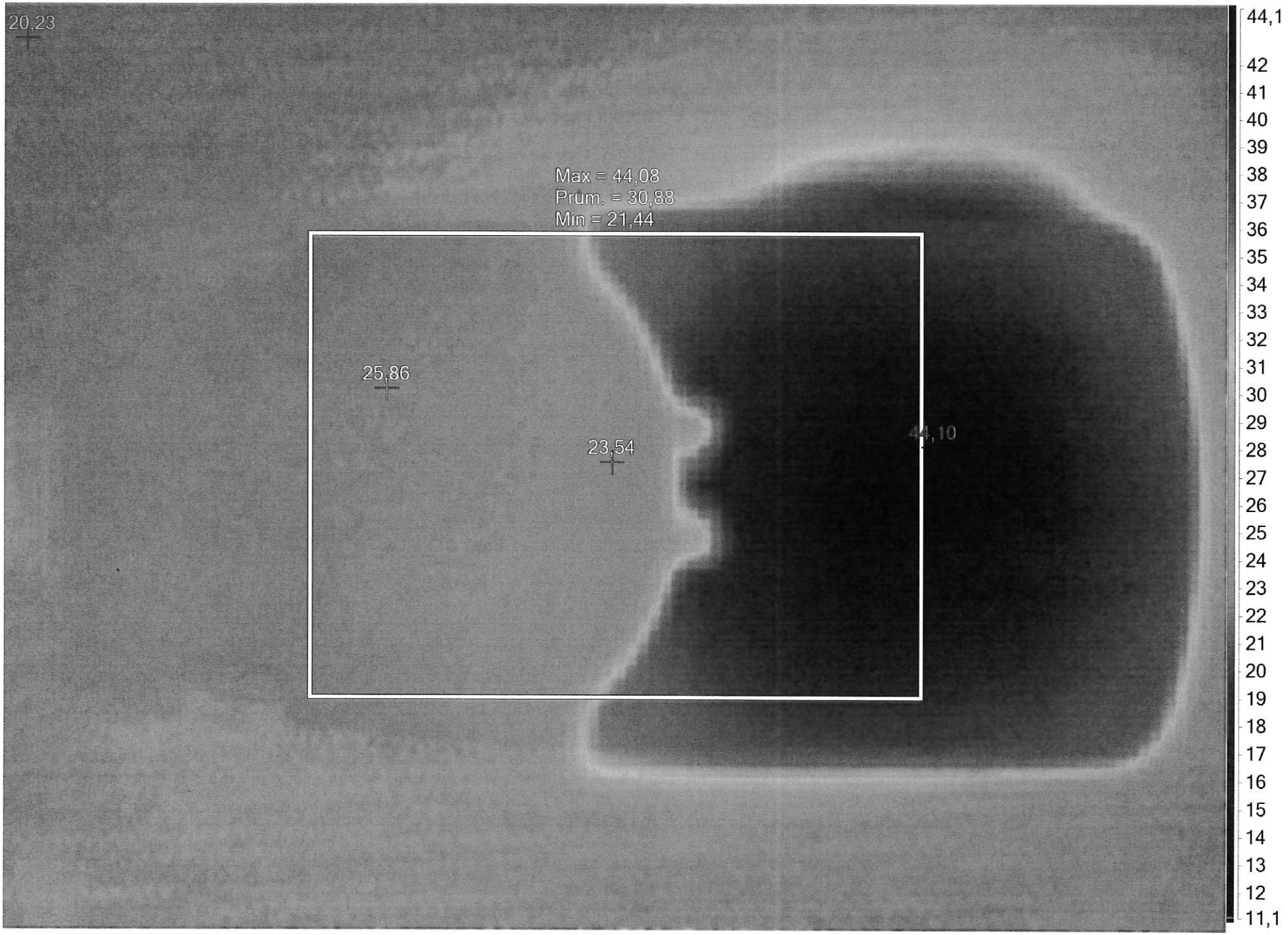
Prům. = 37,25
Min = 26,42
32,51
36,27
60,15
60,5
58
56
54
52
50
48
46
44
42
40
38
36
34
32
30
28
26
24
22
20
18
16
14
12
10,5
°C


20,23
Max = 44,08
Prům. = 30,88
Min = 21,44
25,86
23,54
44,10
44,1
42
41
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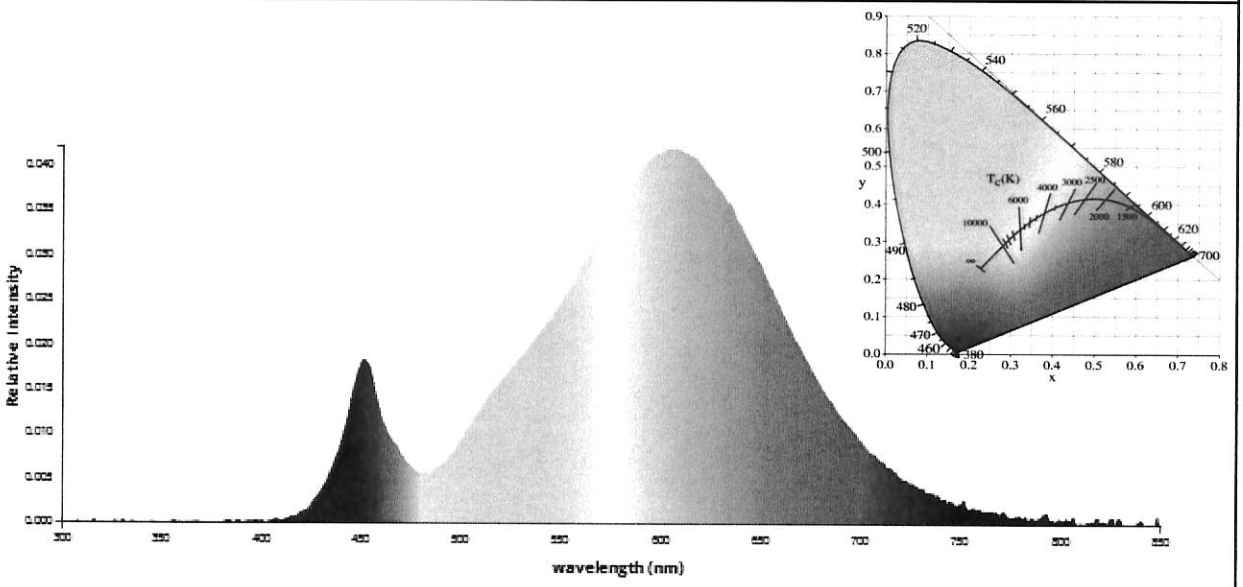
34
33
32
31
30
29
28
27
26
25
24
23
22
21
20
19
18
17
16
15
14
13
12
11,1
°C

LED Integrated testing System

TEST REPORT

testovací nástroj		LED spektrální analýza			
zařízení, přístroj		LED testovací systém-spektrocolorometr			
certifikáty		CE, RoHS LVD test report			
		Model	ST-1916-SL-G-2700	Vlhkost	45%
		Teplota	25°C	Datum	22.01.2018



	Spektrum	Elektrické veličiny		
λ (peak)	589.6 nm	I (test)	133.4 mA	
λ (main)	601.3 nm	Vf	230.20 V	
λ (centroid)	578.6 nm	ϕv	4530.15 lm	
λ (center)	569.9 nm	účinnost	151.214 lm/W	
šířka pásma	20.0 nm	P	30.1 W	
barva světla	2687 K	PFC	0.980	
CIE (x, y)	0.4569, 0.4236	R1:74.2	R2:78.2	R3:79.2
CIE (u, v)	0.3657 , 0.3954	R4:74.1	R5:72.2	R6:67.8
Ra	81.2	R7:80.8	R8:63.0	R9:-18.1
čistota	0.011	R10:45.0	R11:77.8	R12:39.4
		R13:73.9	R14:88.0	R15:70.0

poznámka: