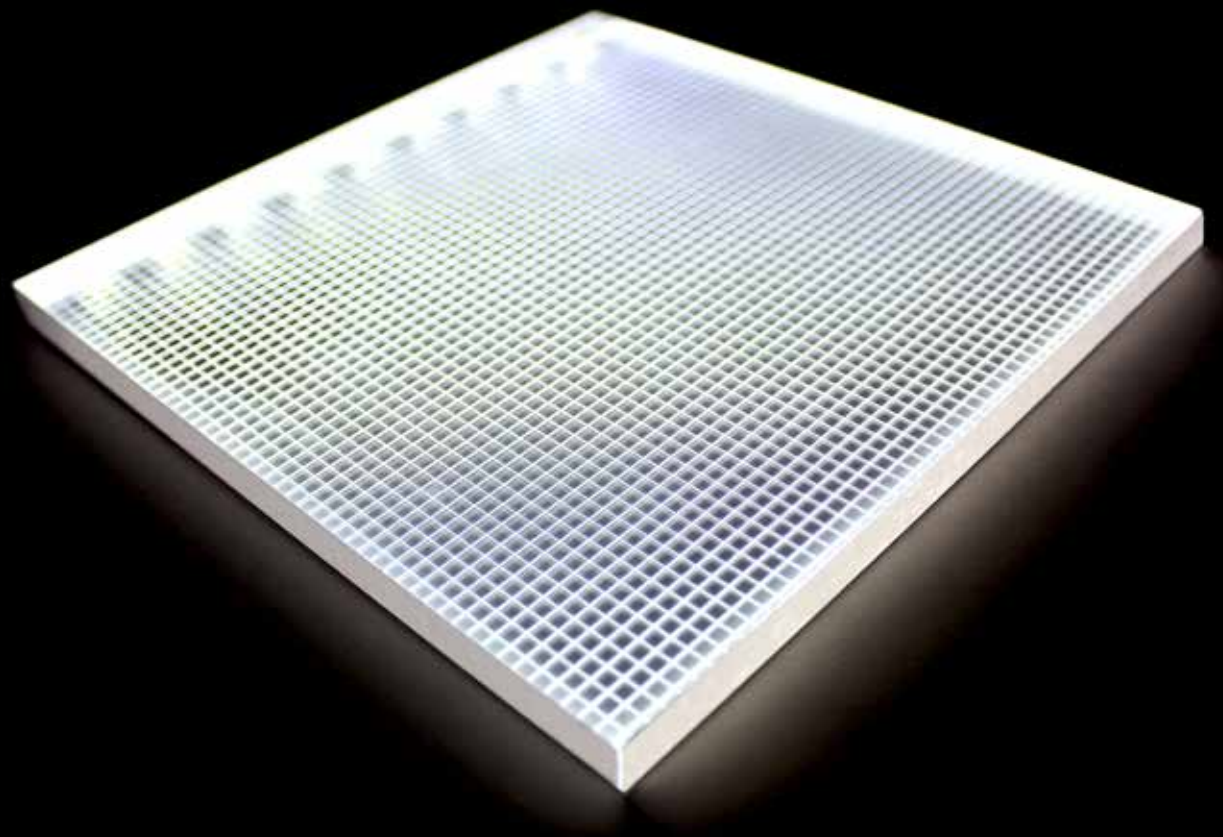
LED LIGHT SHEET

A product from Applelec



LED LIGHT SHEET / TECHNICAL MANUAL

INDEX

1. UNDERSTANDING LED LIGHT SHEET

1.1 Definition of LED Light Sheet
1.2 Features and benefits
1.3 General specifications for white LEDs
1.4 General specifications for RGB colour changing, dynamic/tuneable & RGBW colour changing LEDs
1.5 2D & 3D illustration and list of components
1.6 Part list of 8mm LED Light Sheet, single sided

2. 3D V-CUTTING TECHNOLOGY

2.1 3D V-Cutting Technology

3. COMPONENTS

3.1 Light Guide Plate
- 3.1.1 Specifications
- 3.1.2 Properties

3.2 Standard CRI 2200K LEDs
- 3.2.1 General information
- 3.2.2 Outline and dimensions
- 3.2.3 Specifications

3.3 Standard CRI 2700-6500K LEDs
- 3.3.1 General information
- 3.3.2 Outline and dimensions
- 3.3.3 Specifications

3.4 High CRI 90+ LEDs
- 3.4.1 General information
- 3.4.2 Outline and dimensions
- 3.4.3 Specifications

3.5 LEDs for 3mm LED Light Sheet
- 3.5.1 General information
- 3.5.2 Outline and dimensions
- 3.5.3 Specifications

3.6 RGB LEDs
- 3.6.1 General information
- 3.6.2 Outline and dimensions
- 3.6.3 Specifications

3.7 DYNAMIC/TUNABLE LEDs (2700K-6500K)
- 3.7.1 General information
- 3.7.2 Outline and dimensions
- 3.7.3 Specifications

3.8 LED MODULE
- 3.8.1 Definition of model
- 3.8.2 Specifications

4. TECHNICAL DATA

4.1 Centre surface brightness (LEDs on 1 side)
4.2 Centre surface brightness (LEDs on 2 sides)
4.3 IP67 Rating

5. POWER CORD

5.1 Option 1 - Connect
5.2 Option 2 - DC Power Cord
5.3 Spider Connectors
5.4 XLR Connector
5.5 Wire exit options with old style black wiring

6. GENERAL SAFETY INSTRUCTIONS

6.1 Guide
6.2 General instructions for LED Light Sheet
- 6.2.1 Warnings
- 6.2.2 Electric Wiring
- 6.2.3 Protective Film
- 6.2.4 Cleaning
- 6.2.5 Moving
- 6.2.6 Storage
- 6.2.7 Opening the delivery

7. WARRANTY AND LIMITATION

7.1 Warranty Period

7.2 Operating Condition

7.3 Storage Conditions

7.4 Warranty Coverage
- 7.4.1 What the warranty covers
- 7.4.2 What the warranty does not cover

8. CERTIFICATES & TESTS

8.1 CE
8.2 RoHS
8.3 TUV
8.4 UL
8.5 Fire
8.6 IP67 dust testing
8.7 IP67 water testing
8.8 Accreditations glossary

1. UNDERSTANDING LED LIGHT SHEET

1.1 DEFINITION OF LED LIGHT SHEET

The unique construction of LED Light Sheet harnesses a number of patented processes which unite to create an innovative lighting unit. Produced by combining high intensity LEDs with a patented 3D V-Cutting system, this process allows light to be transmitted uniformly and evenly across the acrylic surface of the unit.

A unified backlighting unit, LED Light Sheet features thermally managed LEDs which are securely embedded inside an acrylic sheet. This second patented process delivers a unit which is robustly constructed and easily installed in comparison to traditional backlighting units in which LED modules are fixed externally to an acrylic sheet. Each LED Light Sheet unit is manufactured in the UK by Applelec to bespoke requirements.

1.2 FEATURES AND BENEFITS

- **Super slim:** The thickness of LED Light Sheet is 8mm
- **Long lifetime and maintenance free:** The longevity of LED Light Sheet is more than 50,000 hours/11years at 12 hours per day.
- **Low power consumption and cost saving:** LED Light Sheet consumes up to 70% less power than T5 fluorescent lamps and up to 30% less energy than CCFL.
- **Eco-friendly product:** LED Light Sheet contains NO mercury or other hazardous materials.
- **Water resistant:** LED Light Sheet is available with an IP67 rating.
- **Bespoke sizes and shapes:** LED Light Sheet can be made into any shape and size up to 3000mm x 1500mm.

1.3 GENERAL SPECIFICATIONS (WHITE LEDS)

ITEM	DESCRIPTION			
Main Material	Clear acrylic (PMMA)			
Thickness	6mm, 8mm, 10mm			3mm
Power Supply	AC / DC 12V / 24V Adaptor			
Working Voltage	DC 12V / DC (24V available on request)			DC 12V
Input Voltage	AC 100 ~ 240V 50/60Hz			
Lighting Source	5630 SMD top view LED	3030 SMD top view LED		3014 SMD top view LED
Luminous Efficacy (LED)	110lm / W	113lm / W	78lm/W (2800K) 86lm/W (3100K) 91.4lm/W (4100K) 96.8lm/W (5200)	90lm / W
Power consumption. Per metre	14W	14W		18W
Colour Temperature	2200K	Series 4: 2700K, 3000K, 3500K, 4100K, 5300K & 6500K (7500K & 9100K available on request)	2800K, 3100K, 4100K, 5200K	5700K
CRI	80+	80+	90+	65
IP Rating	IP54 as standard, IP67 available			IP54 only
Max Size	3000mm x 1500mm			Dependent on application
Weight	Length (m) x width (m) x thickness (mm) x 1.2kg			
Lifetime	More than 50,000			
Warranty on LED Light Sheet	5 years			
Warranty on Acrylic	5 years			

1. UNDERSTANDING LED LIGHT SHEET CONT

1.4 GENERAL SPECIFICATIONS (RGB COLOUR CHANGING & DYNAMIC/TUNEABLE WHITE)

ITEM	DESCRIPTION		
	RGB COLOUR CHANGING	DYNAMIC (TUNEABLE) WHITE	
Main Material	Acrylic (PMMA)		
Thickness	8mm		
Power Supply	AC / DC 12V / 24V Adaptor		
Working Voltage	DC 12V		
Input Voltage	AC 100 ~ 240V 50/60Hz		
Lighting Source	5050 SMD top view LED	3035 SMD top view LED	3035 SMD top view LED
Luminous Efficacy (LED)	35lm / W	92lm / W	121lm / W
Lumens per Metre	444lm / M	2310lm / M	1270lm / M
Power consumption. Per metre	13W	25W	25W
Colour Temperature (CCT)	No Series: RGB	No Series: 2700K - 6500K	No Series: 2200K - 4100K
CRI	-	83	80
IP Rating	IP54 as standard, IP67 available		
Max Size	3000mm x 800mm		
Weight	Length (m) x width (m) x thickness (mm) x 1.2kg		
Lifetime	> 50,000		
IP Rating	IP54 as standard, IP67 available		
Lifetime	More than 50,000 hours		
Warranty on LED Light Sheet	5 years		
Warranty on Acrylic	5 years		

1. UNDERSTANDING LED LIGHT SHEET CONT

1.4 GENERAL SPECIFICATIONS (RGBW COLOUR CHANGING)

ITEM	DESCRIPTION
	RGBW COLOUR CHANGING
Main Material	Acrylic (PMMA)
Thickness	8mm
Power Supply	AC / DC 24V Adaptor
Working Voltage	DC 24V
Model	FT24V520C30_RGB+W (3000K)
Pitch	16mm
Min. Cuttable Length	100mm
Width	6.6mm
Length	520mm
No. of LED	60

ELECTRICAL/OPTICAL CHARACTERISTICS (PER 500MM STRIP)

ITEM	TEST CONDITION	PKG	MIN.	TYP.	MAX	MEASURED BY	REMARKS
Current [A]	24V/Ta=25°/10sec	R	0.070	0.078	0.086	PL2000	
		G	0.077	0.085	0.094		
		B	0.072	0.080	0.088		
		W	0.207	0.230	0.253		
Luminosity [lm]	24V/Ta=25°/10sec	R	36	40	-	PL2000	
		G	113	125	-		
		B	11	12	-		
		W (3000K)	464	515	-		
		W (5700K)	486	540	-		
Colour Rendering Index	24V/Ta=25°/10sec	W	80	83			Ra
CCT[K]	24V/Ta=25°/10sec	W (3000K)		3000			
		W (5700K)		5700			

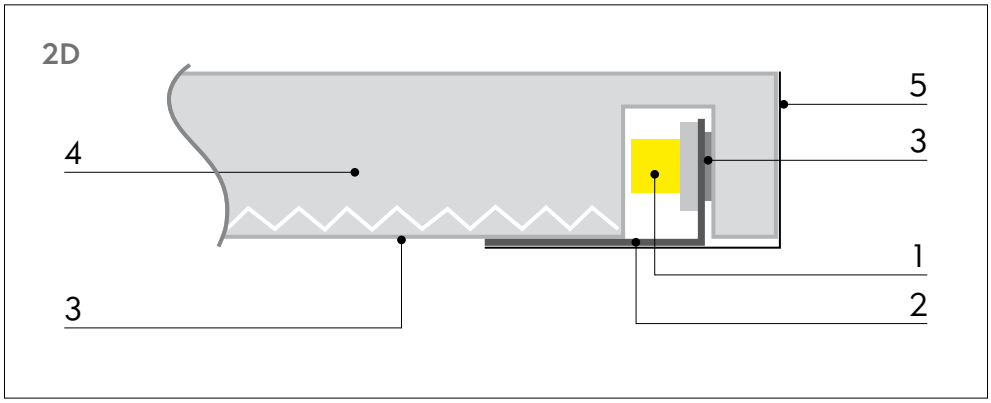
ENVIRONMENTAL CONDITIONS

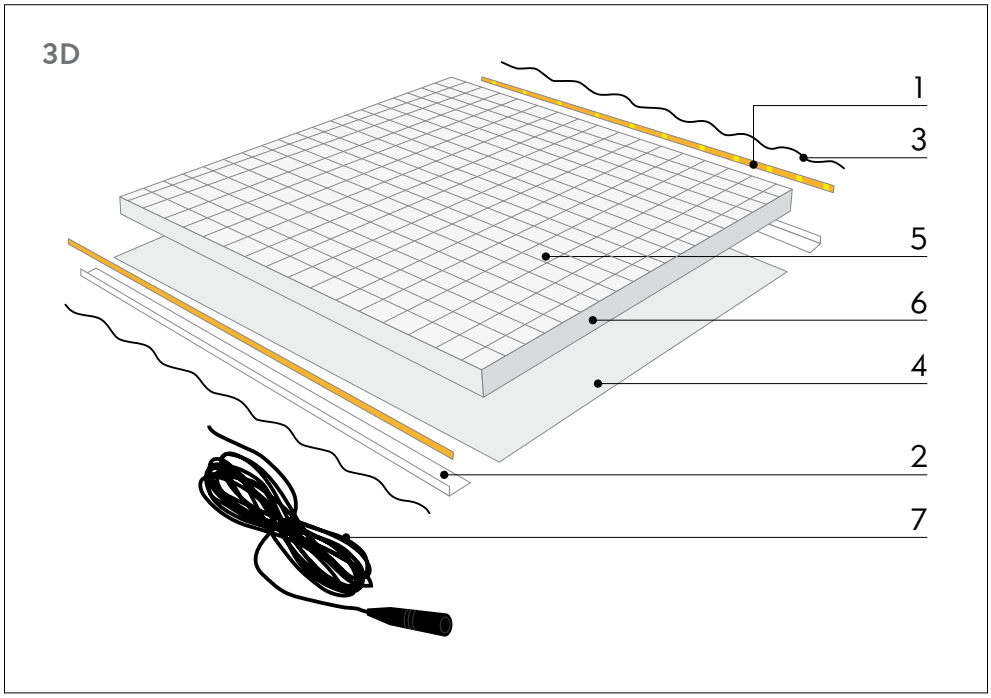
OPERATING TEMPERATURE AT TC-POINT [°C]	STORAGE TEMPERATURE [°C]	STORAGE HUMIDITY [%]	REVERSE VOLTAGE [VDC]
-40 ~ +85°C	-40 ~ +100°C	50 ± 10%	24V

- Exceeding maximum operating and storage temperature will reduce expected life time or destroy the LED module
- Exceeding maximum operating voltage will cause hazardous overload and will be likley to destroy the LED module
- The temperature of the LED module must be measured at the Tc-point according to EN60598-1 in a termally constant status with a temperature sensor or a temperature sensitive label.

1. UNDERSTANDING LED LIGHT SHEET CONT

1.5 2D AND 3D ILLUSTRATION

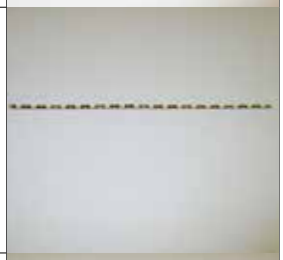




NO.	DESCRIPTION	REMARKS
1	High Intensity Flexible LED Module	110lm/W
2	Aluminium Heat Sink Plate	0.4mm
3	STS Zig Zag Tensioner	5630 only
4	Reflection Sheet	SW03G
5	3D V-Cut Light Guide Plate	PMMA
6	Reflection Tape	FASCAL 400
7	DC Power Cord (or 300mm Connect wire)	20 AWG

1. UNDERSTANDING LED LIGHT SHEET CONT

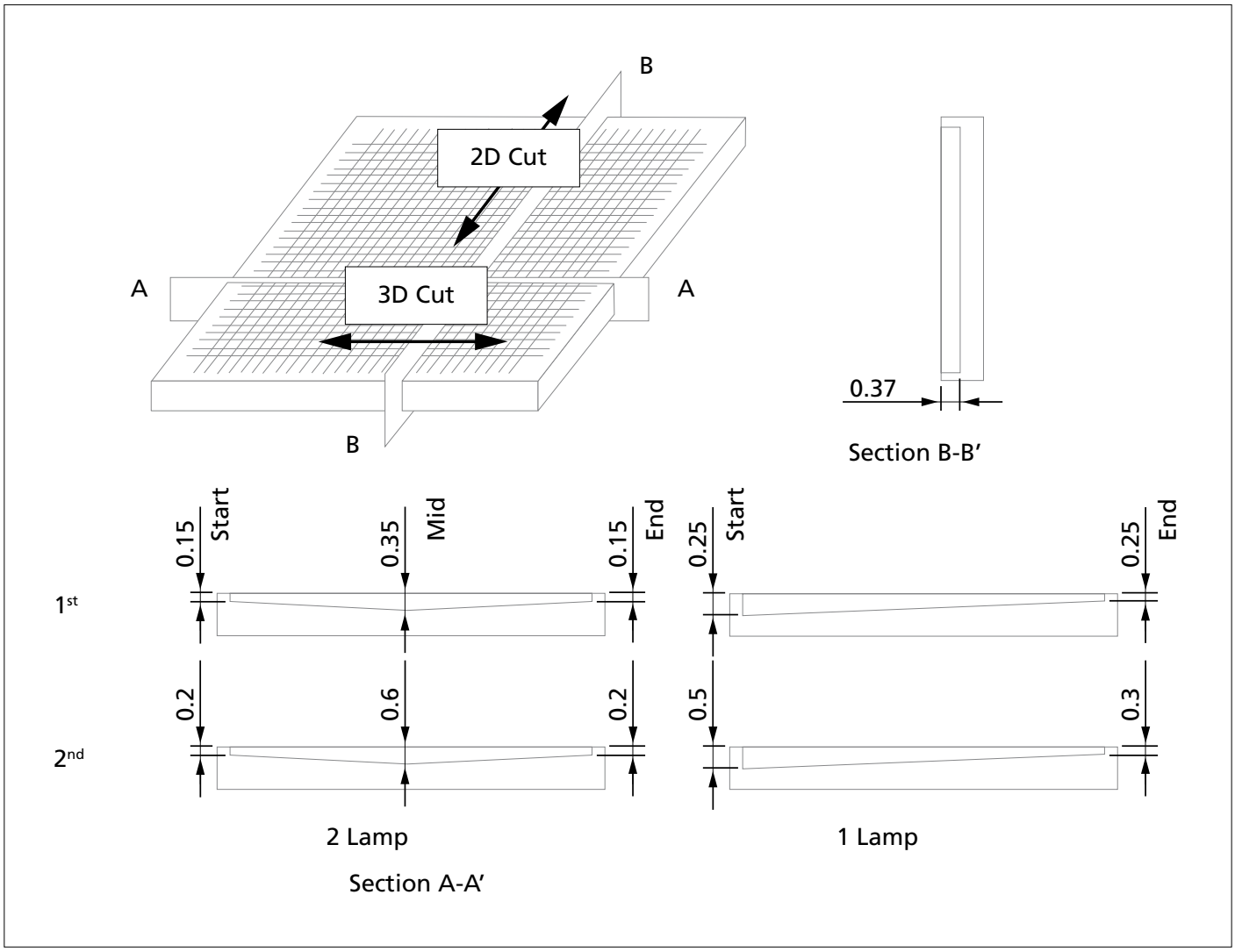
1.6 PART LIST OF LED LIGHT SHEET

PART DESCRIPTION	
Acrylic (PMMA), 8mm	
Reflection Sheet	
Reflection Tape	
5630 SMD Top View LED	
DC Power Cord (20 AWG)	
Aluminium Heat Sink Plate	
Zig zag tensioner	

3D V-CUTTING TECHNOLOGY

2.1 3D V-CUTTING TECHNOLOGY

A significant advantage to LED Light Sheet lies in the production of the Light Guide Plate (LGP). Sourced for its rigidity and light transmission properties, a clear PMMA acrylic is etched with multiple grooves using patented 3D V-cutting technology to create a uniform matrix. This etched matrix acts as a vehicle to transport light from the unit's embedded LEDs across the entire surface of the panel to deliver homogeneous illumination.



3. COMPONENTS

3.1 LIGHT GUIDE PLATE

3.1.1 Specifications

A backlight unit including a light source for emitting light through a light guide plate made of light transmittable acrylic. The light source is located on one or multiple sides of the light guide plate. The light guide plate is provided with a pattern of grooves to guide an optical path, scattering the light emitted from the light source.

3.1.2 Properties

	TEST METHOD	UNIT	DATA
General Properties			
Specific Gravity	D-792		1.19
Water Absorption	D-570	%	0.30
Optical Properties			
Refractive Index	D-542		1.49
Light Transmission	D-1003	%	92.5
Haze	D-1003	%	0.2
Mechanical Properties			
Tensile Strength	D-638	Kg/cm^2	760
Elongation	D-638	%	6
Flexural Strength	D-790	Kg/cm^2	1.170
Flexural Modulus	D-790	Kg/cm^2	32,000
Zod Impact Strength	D-256	Kg cm/cm	2.0
Rockwell Hardness	D-785	M scale	95
Thermal Properties			
Heat Deflection Temperature	D-648	°C	92-96
Vlcat Softening Point	D-1525	°C	110
Specific Heat		Kcal/Kg.°C	0.35
Thermal Conductivity	D-177	Kcal/m.hr.°C	0.18
Shrinkage after Heating	D-1547	%	+2-4
Molding Temperature		°C	150~190
Maximum Usable Temperature		°C	70
Electrical Properties	D-257	Ω/sq	10^{15}
Volume Resistivity	D-150 (10^3Hz)		3.0
Dielectric Constant			

* The above specification provides standard data from acrylic manufacturer.

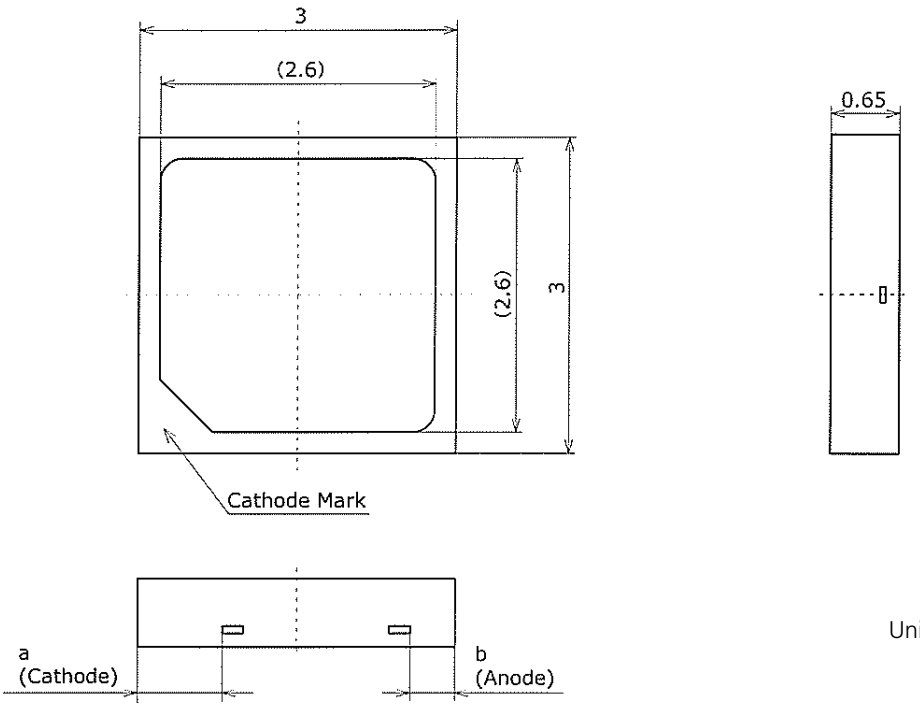
3. COMPONENTS CONT

3.2 STANDARD CRI LEDS (2200K)

3.2.1 General Information

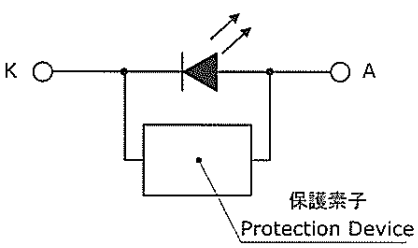
PRODUCER	NICHIA
PRODUCT NAME	2200K: NFSL757GT-V1
DIMENSIONS	3.0mm long x 3.0mm wide x 0.65mm high
FEATURES	1 chip LED

3.2.2 Outline and Dimensions



Unit: mm, tolerance: ±0.2

LED circuit diagram



3. COMPONENTS CONT

3.2.3 Specifications
Dimension & LED Interval

MODEL	LED PITCH	MODULE MIN LENGTH	MODULE WIDTH	MODULE LENGTH	NO. OF LED
FT12V283C18_2200K	16mm	47mm x 6 set	4.4mm	282	18

Electrical/Optical Characteristics per 282mm module

ITEM	CONDITION	CURRENT			CRI	LUMINOSITY (lm)			CCT		
		MIN.	TYP.	MAX.		MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
2200K	12V/Ta=25°C/10 sec	0.322	0.35	0.356	80	360	400		2200	2300	2400
MEASURED BY		FLUKE289			LMS200	LMS200			LMS200		
REMARKS					Ra						

Absolute Maximum Ratings

PARAMETER	SYMBOL	VALUE	UNIT
Forward Current	I_F	180	mA
Pulse Current Forward	I_{FP}	240	mA
Allowable Reverse Current	I_R	85	mA
Power Dissipation	P_D	594	mW
Operating Temperature	T_{opr}	-40~100	°C
Storage Temperature	T_{stg}	-40~100	°C
Junction Temperature	T_j	120	°C

* Absolute Maximum Ratings at T_s=25 °C.
* I_{FP} conditions with pulse width ≤10ms and duty cycle ≤10%.

Initial Electrical/Optical Characteristics

ITEM		SYMBOL	CONDITION	TYP	MAX	UNIT
Forward Voltage		V_F	I_F=65mA	2.87	-	V
R8000	Luminous Flux	Φ_V	I_F=65mA	24.3	-	lm
Chromacity Coordinate	x	-	I_F=65mA	0.5018	-	-
	y	-	I_F=65mA	0.4153	-	-
Thermal Resistance		R_{OJS}	-	13	19	°C/W

* Characteristics at T_s=25°C.
* Luminous flux value as per CIE127:2007 standard.
* Chromacity coordinates as per CIE 1931 chromacity chart.
*R_{OJS} is thermal resistance from junction to T_s measuring point.
(Test board: FR4 board thickness=1.6mm, copper layer thickness=0.07mm).

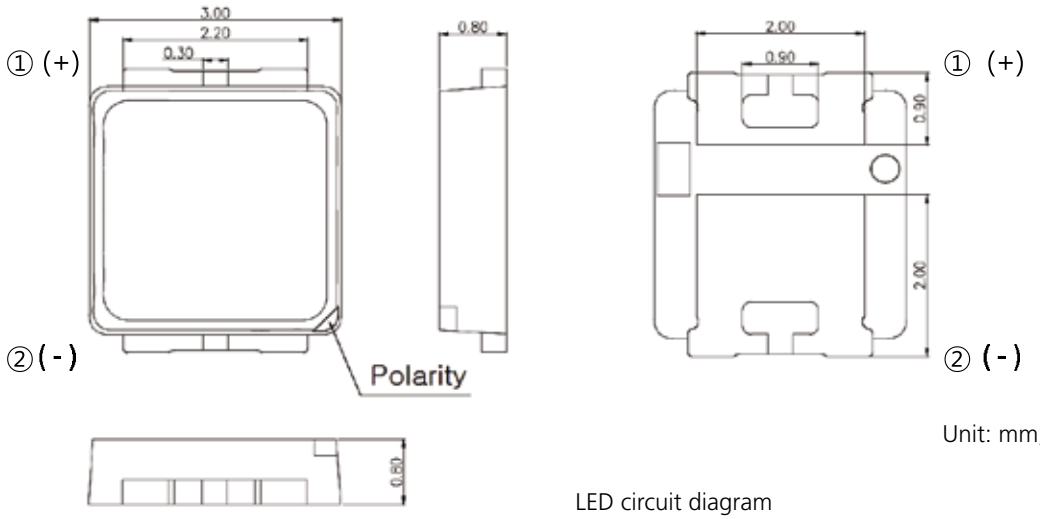
3. COMPONENTS CONT

3.3 STANDARD CRI SERIES 4 LEDS (2700K-9100K)

3.3.1 General Information

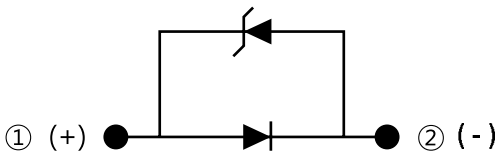
PRODUCT NAME	2700K: LMMTP30B1C2K7Z060-C80 3000K: LMMTP30B1C3K1Z060-C80 3500K: LMMTP30B1C3K5Z060-C80 4100K: LMMTP30B1C4K1Z060-C80 5300K: LMMTP30B1C5K3Z060-C80 6500K: LMMTP30B1C6K5Z060-C80 7500K: LMMTP30B1C7K5Z060-C80 9100K: LMMTP30B1C9K1Z060-C80
DIMENSIONS	3.0mm long x 3.0mm wide x 0.8mm high
FEATURES	1 chip LED

3.3.2 Outline and Dimensions



Unit: mm, tolerance: ±0.1

LED circuit diagram



3.3.3 Specifications

LED PKG MAKER	PKG SIZE	CRI	PKG PER MODULE/ CELL PITCH	INPUT VOLTAGE	INPUT CURRENT	CCT(K)	EFFICIENCY OF CHIP	LED MODULE LUMEN OUTPUT	POWER CONSUMPTION	EFFFICIENCY OF MODULE
LumiMicro	3030	Min 80 (Typ. 82)	18 / 47mm (12v)	12V DC	55mA	2700K 3000K 3500K 4100K 5300K 6500K 7500K 9100K	170~180lm	445lm 9% increase	3.96W	113lm/W

3. COMPONENTS CONT

Dimension & LED Interval

MODEL	LED PITCH	MODULE MIN LENGTH	MODULE WIDTH	MODULE LENGTH	NO. OF LED
FT12V283C18_2700K	16mm	47mm x 6 set	4.4mm	282	18
FT12V283C18_3000K					
FT12V283C18_3500K					
FT12V283C18_4100K					
FT12V283C18_5300K					
FT12V283C18_6500K					
FT12V283C18_7500K					
FT12V283C18_9100K					

Electrical/Optical Characteristics per 282mm module

ITEM	CONDITION	CURRENT			CRI	LUMINOSITY (lm)			CCT	
		MIN.	TYP.	MAX.		MIN.	TYP.	MAX.	MIN.	MAX.
2700K	12V/ Ta=25°C/10 sec	0.304	0.330	0.356	80	374	415	457	2623	2969
3000K						383	425	468	3021	3332
3500K						396	440	484	3565	3844
4100K						414	460	506	3937	4248
5300K						423	470	517	5453	6063
6500K						410	455	501	6420	7334
7500K						405	450	495	7074	8025
9100K						401	445	490	9227	11388
MEASURED BY		FLUKE289			LMS200	LMS200			LMS200	
REMARKS					Ra					

Absolute Maximum Ratings

PARAMETER	SYMBOL	VALUE	UNIT
Forward Current	I_F	150	mA
Power Dissipation	P_d	500	mW
Forward Pulse Current *1	I_{PF-1}	300	mA
Storage Temperature	T_{stg}	-40 ~ +100	°C
Operating Temperature	T_{opr}	-30 ~ +85	°C
Soldering Temperature	T_{sld}	260 (for 10 sec)	°C
Junction Temperature	T_j	120	°C

*1: Forward pulse current: Pulse width < 10msec / Duty ratio < 1/10

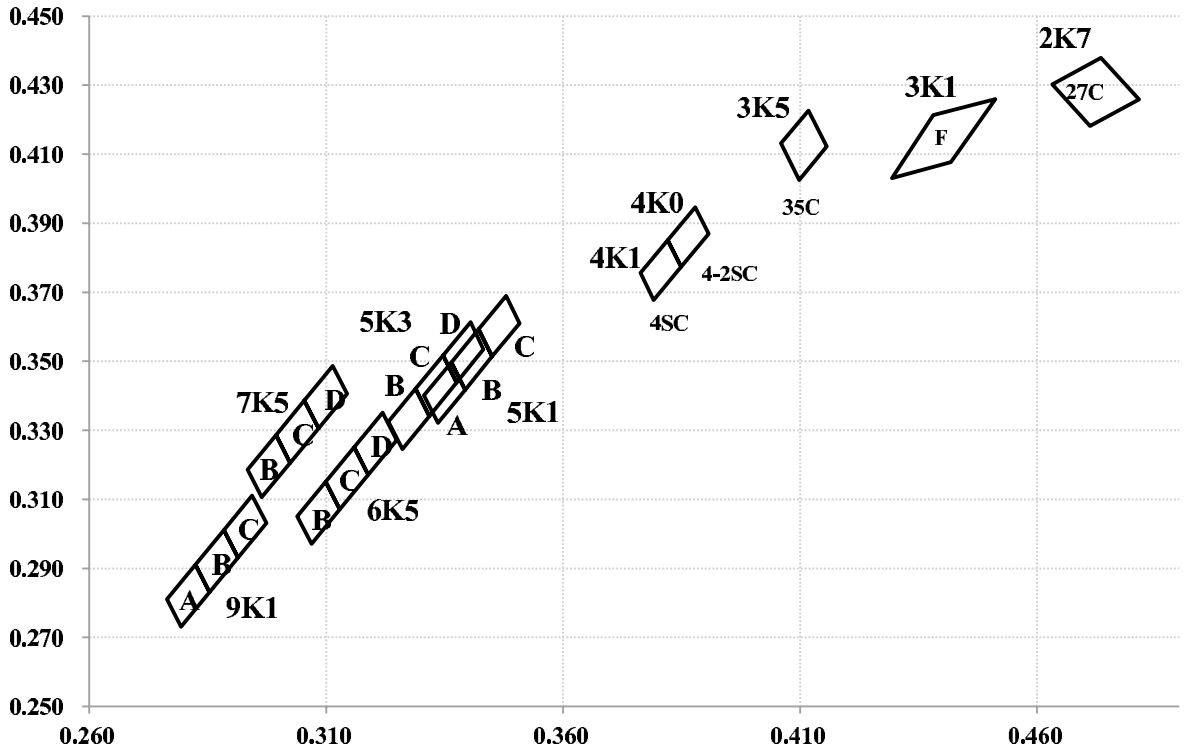
3. COMPONENTS CONT

Electrical / Optical Characteristics

PARAMETER	SYMBOL	CONDITION	MIN.	TYP.	MAX.	UNIT
Forward Voltage	V_F	I_F = 60mA	2.7	-	3.2	V
Reverse Voltage	Vr	I_F = 5mA	0.5	-	1.2	V
Luminous Intensity	Iv	I_F = 60mA	7.5	-	11	cd
Luminous Flux	Φ_V	I_F = 60mA	23.6\	-	-	lm
Colour Rendering Index	Ra	I_F = 60mA	80	-	-	-
Thermal Resistance[1]	$R_{th(J-S)}$	I_F = 60mA	-	-	30	°C/W
ESD		1.5Ω, 100pF	5	-	-	KV

* Tolerance: VF=±0.1V, Iv=±10%, Chromacity Coordinate= ±0.001, CRI=±2
[1] Thermal Resistance: Rth (junction - Solder)

Colour Coordinates Rank



3. COMPONENTS CONT

Colour Coordinates Rank CONT

91A		91B		91C	
Cx	**Cy**	**Cx**	**Cy**	**Cx**	**Cy**
0.2764	0.2811	0.2824	0.2911	0.2884	0.3011
0.2824	0.2911	0.2884	0.3011	0.2944	0.3111
0.2854	0.2831	0.2914	0.2931	0.2974	0.3031
0.2794	0.2731	0.2854	0.2831	0.2914	0.2931
0.2764	0.2811	0.2824	0.2911	0.2884	0.3011
75B		75C		75D	
Cx	**Cy**	**Cx**	**Cy**	**Cx**	**Cy**
0.2934	0.3186	0.2994	0.3286	0.3054	0.3386
0.2994	0.3286	0.3054	0.3386	0.3114	0.3486
0.3024	0.3206	0.3084	0.3306	0.3144	0.3406
0.2964	0.3106	0.3024	0.3206	0.3084	0.3306
0.2934	0.3186	0.2994	0.3286	0.3054	0.3386
65B		65C		65D	
Cx	**Cy**	**Cx**	**Cy**	**Cx**	**Cy**
0.3039	0.3051	0.3099	0.3151	0.3159	0.3251
0.3099	0.3151	0.3159	0.3251	0.3219	0.3351
0.3129	0.3071	0.3189	0.3171	0.3249	0.3271
0.3069	0.2971	0.3129	0.3071	0.3189	0.3171
0.3039	0.3051	0.3099	0.3151	0.3159	0.3251
53B		53C		53D	
Cx	**Cy**	**Cx**	**Cy**	**Cx**	**Cy**
0.3231	0.3325	0.3289	0.3421	0.3347	0.3517
0.3289	0.3421	0.3347	0.3517	0.3405	0.3613
0.3318	0.3341	0.3375	0.3438	0.3432	0.3535
0.3261	0.3245	0.3318	0.3341	0.3375	0.3438
0.3231	0.3325	0.3289	0.3421	0.3347	0.3517

4SC	
Cx	**Cy**
0.3791	0.3677
0.3763	0.3756
0.3821	0.3851
0.3849	0.3774
0.3791	0.3677
35C	
Cx	**Cy**
0.4060	0.4132
0.4118	0.4226
0.4156	0.4122
0.4098	0.4025
0.4060	0.4132
3K1F	
Cx	**Cy**
0.4118	0.4077
0.4512	0.426
0.4381	0.4213
0.4294	0.4031
0.4418	0.4077
27C	
0.4632	0.4302
0.4735	0.4379
0.4815	0.4259
0.4712	0.4182
0.4632	0.4302

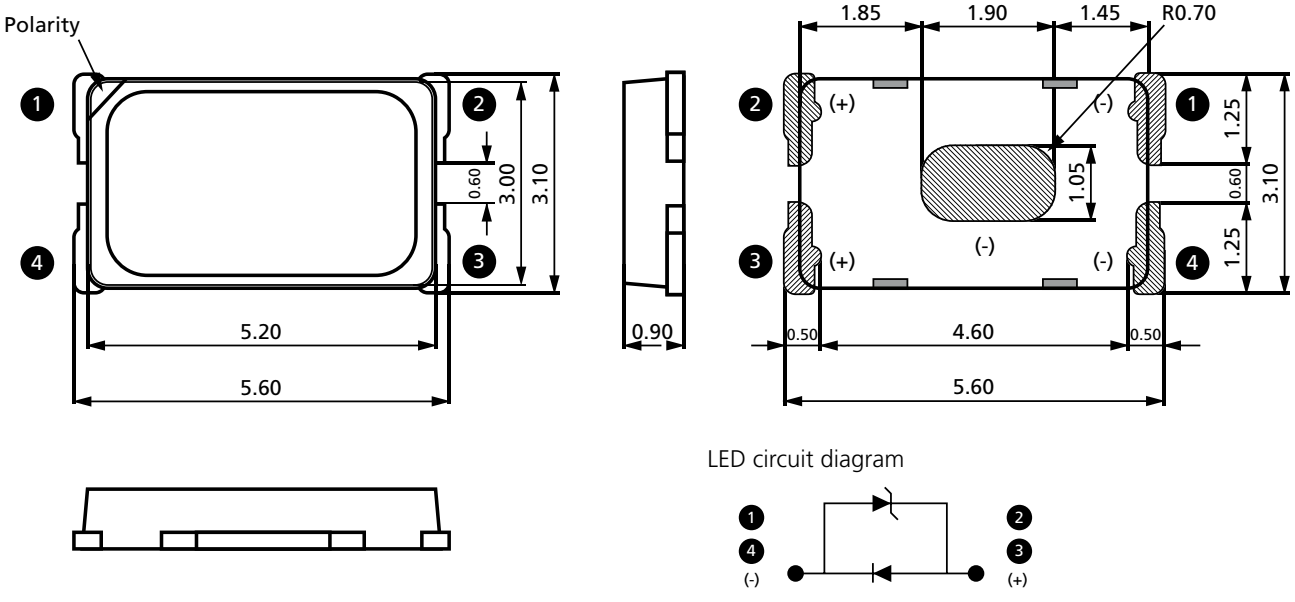
3. COMPONENTS CONT

3.4 HIGH CRI 90+ LEDS

3.4.1 General Information

GENERAL INFORMATION	
PRODUCER	LUMIMICRO Ltd
PRODUCT NAME	5200K: LMLTP5621C5K2Z060-C90 4100K: LMLTP5621C4K1Z060-C90 3100K: LMLTP5621C3K1Z060-C90 2800K: LMLTP5621C2K8Z060-C90
DIMENSIONS	5.6mm long x 3.0mm wide x 0.9mm deep
FEATURES	1 chip LED
VIEWING ANGLE	120°

3.4.2 Outline and Dimensions



Unit: mm, tolerance: ±0.1

3. COMPONENTS CONT

3.4.3 Specifications
Absolute Maximum Ratings

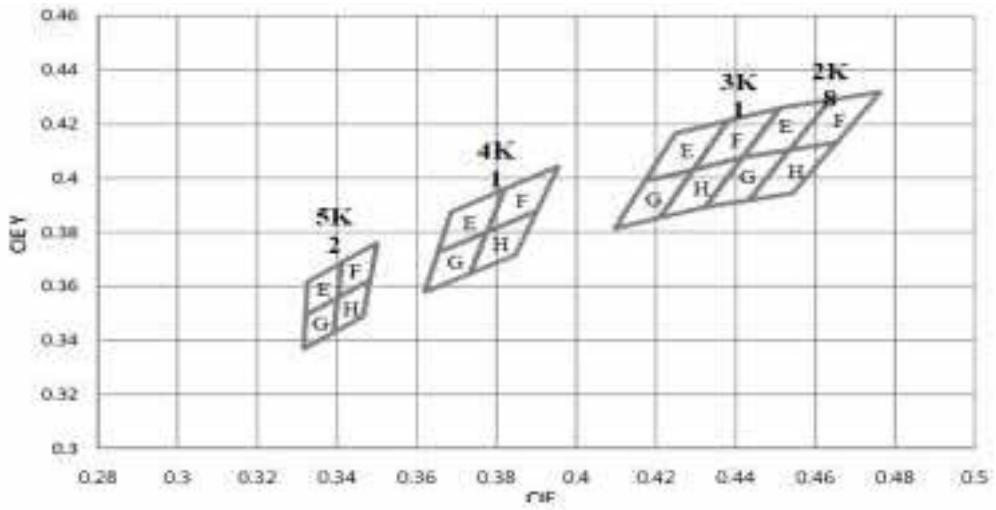
PARAMETER	SYMBOL	VALUE	UNIT
Forward Current	I_F	150	mA
Power Dissipation	P_D	500	mW
Storage Temperature	T_{stg}	-40 ~ +100	°C
Operating Temperature	T_{opr}	-30 ~ +85	°C
Soldering Temperature	T_{sld}	260 (for 10 sec)	°C
Junction Temperature	T_j	120	°C

Electrical / Optical Characteristics

PARAMETER	SYMBOL	CONDITION	MIN.	TYP.	MAX.	UNIT
Forward Voltage	V_F	I_F = 60mA	2.8	-	3.2	V
Reverse Voltage	I_R	V_R = 5V			10	μA
Luminous Intensity	I_V	I_F = 60mA	6.5	-	-	cd
Colour Correlated Temperature	CCT	I_F = 60mA	2800	-	5200	K
Colour Rendering Index	Ra	I_F = 60mA	90			
Viewing Angle	$2\Theta_{1/2}$	I_F = 60mA	-	120	-	deg.
ESD			5	-	-	KV
Thermal Resistance[1]	$R_{th(J-S)}$	I_F = 60mA	-	-	30	°C/W

[1] Thermal Resistance: Rth (junction - Solder)
* Tolerance: V_F=±10%, I_V=±10%, Ra=±2, Chromacity Coordinate: ±0.005

Colour Coordinates Rank



3. COMPONENTS CONT

Colour Coordinates Rank CONT

	5K2E		5K2F		5K2G		5K2H	
	X	**Y**	**X**	**Y**	**X**	**Y**	**X**	**Y**
5200K	0.3413	0.3688	0.3501	0.376	0.3402	0.3558	0.3483	0.3623
	0.3326	0.3616	0.3413	0.3688	0.3321	0.3492	0.3402	0.3558
	0.3321	0.3493	0.3402	0.3558	0.3316	0.3369	0.3391	0.3428
	0.3402	0.3558	0.3483	0.3623	0.3391	0.3428	0.3465	0.3487
	4K1E		4K1F		4K1G		4K1H	
	X	**Y**	**X**	**Y**	**X**	**Y**	**X**	**Y**
4100K	0.3653	0.3726	0.3777	0.3801	0.362	0.3578	0.3734	0.3647
	0.3686	0.3874	0.3821	0.396	0.3653	0.3726	0.3777	0.3801
	0.3821	0.396	0.3956	0.4044	0.3777	0.3801	0.3902	0.388
	0.3777	0.3801	0.3902	0.388	0.3734	0.3647	0.3848	0.3716
	3K1E		3K1F		3K1G		3K1H	
	X	**Y**	**X**	**Y**	**X**	**Y**	**X**	**Y**
3100K	0.4294	0.4031	0.4418	0.4077	0.421	0.3854	0.4323	0.3893
	0.4381	0.4213	0.4512	0.426	0.4294	0.4031	0.4418	0.4077
	0.4249	0.4165	0.4381	0.4213	0.4173	0.399	0.4294	0.4031
	0.4173	0.399	0.4294	0.4031	0.4097	0.3814	0.421	0.3854
	2K8E		2K8F		2K8G		2K8H	
	X	**Y**	**X**	**Y**	**X**	**Y**	**X**	**Y**
2800K	**0.4417**	**0.4077**	**0.4535**	**0.4104**	0.4323	0.3893	**0.4433**	**0.3918**
	0.4512	0.426	0.4638	0.429	0.4417	0.4077	0.4535	0.4104
	0.4638	0.429	0.4763	0.4319	0.4535	0.4104	0.4653	0.4132
	0.4535	0.4104	0.4653	0.4132	0.4433	0.3918	0.4543	0.3944

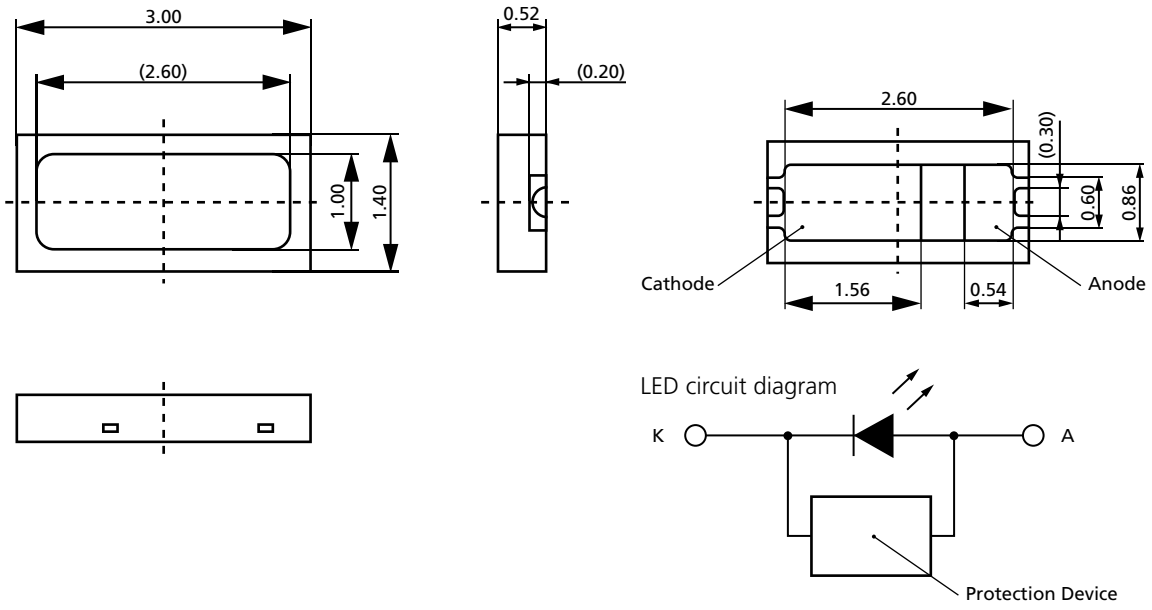
3. COMPONENTS CONT

3.5 LED FOR 3MM LED LIGHT SHEET

3.5.1 General Information

GENERAL INFORMATION	
PRODUCER	NICHIA
PRODUCT NAME	3014/5700K: NESW157BT
DIMENSIONS	3mm long x 1.4mm wide x 0.52mm deep
FEATURES	1 chip LED
VIEWING ANGLE	120°

3.5.2 Outline and Dimensions



Unit: mm, tolerance: ±0.1

3. COMPONENTS CONT

3.5.3 Specifications

Absolute Maximum Ratings

PARAMETER	SYMBOL	VALUE	UNIT
Forward Current	I_F	90	mA
Pulse Forward Current	I_{FP}	120	mA
Allowable Reverse Current	I_R	85	mA
Power Dissipation	P_D	270	mW
Storage Temperature	T_{stg}	-40 ~ +100	°C
Operating Temperature	T_{opr}	-40 ~ +100	°C
Soldering Temperature	T_{sld}	260 (for 10 sec)	°C
Junction Temperature	T_j	120	°C

*Absolute maximum ratings at T_A=25 °C
*I_{FP} conditions with pulse width ≤ 10ms and duty cycle ≤ 10%

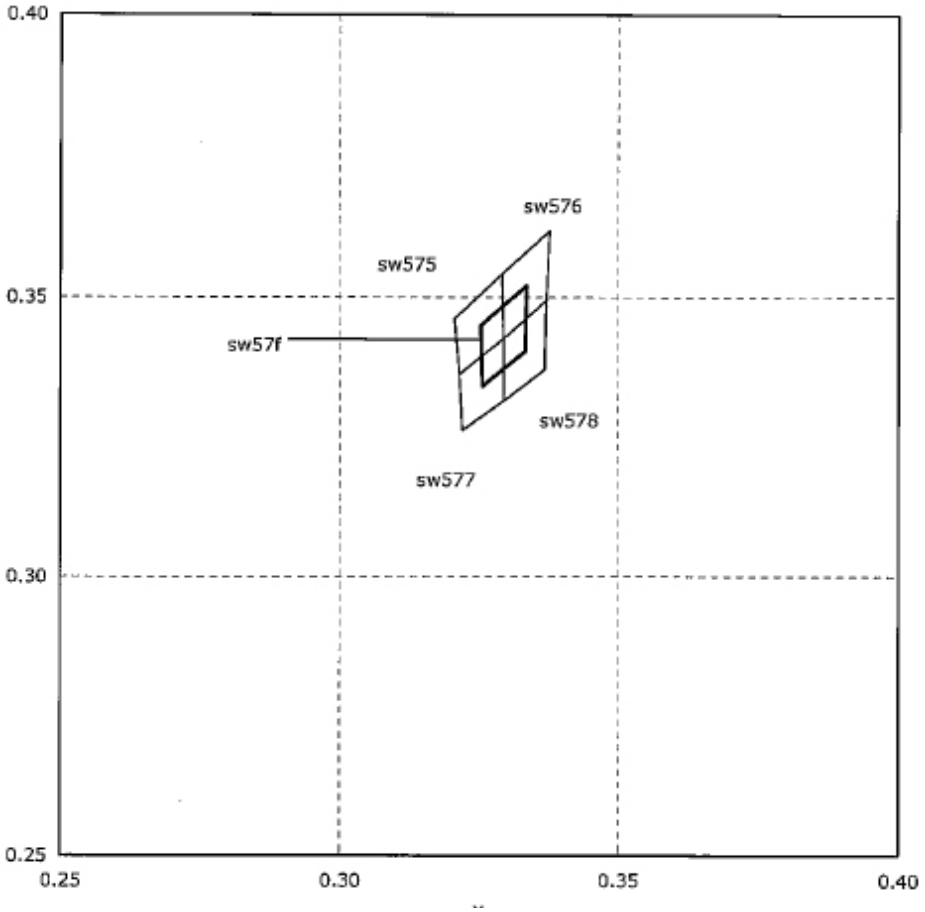
Electrical / Optical Characteristics

PARAMETER	SYMBOL	CONDITION	MIN.	TYP.	MAX.	UNIT
Forward Voltage	V_F	I_F=50mA	-	2.9	-	V
Luminous Intensity	I_V	I_F=50mA	-	6.87	-	cd
Colour Correlated Temperature	CCT	I_F=50mA	-	5700	-	K
Viewing Angle	$2\Theta_{1/2}$	I_F=50mA	-	120	-	deg.
Thermal Resistance[1]	$R_{\Theta JS}$	I_F=50mA	-	22	32	°C/W

*Characteristics at T_A=25 °C
*$R_{\Theta JS}$ is thermal resistance from junction to T_S measuring point

3. COMPONENTS CONT

Colour Coordinates Rank



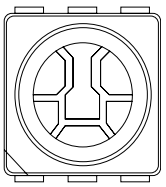
RANK SW575		RANK SW576		RANK SW577	
X	Y	X	Y	X	Y
0.3214	0.3362	0.3293	0.3427	0.3221	0.3261
0.3207	0.3462	0.3293	0.3539	0.321	0.3362
0.3292	0.3539	0.3376	0.3616	0.3293	0.3427
0.3293	0.3427	0.3371	0.3493	0.3294	0.3315

RANK SW578		RANK SW57F	
X	Y	X	Y
0.3294	0.3315	0.3256	0.3342
0.3293	0.3427	0.3252	0.3448
0.3371	0.3493	0.3334	0.3519
0.3366	0.3369	0.3332	0.3401

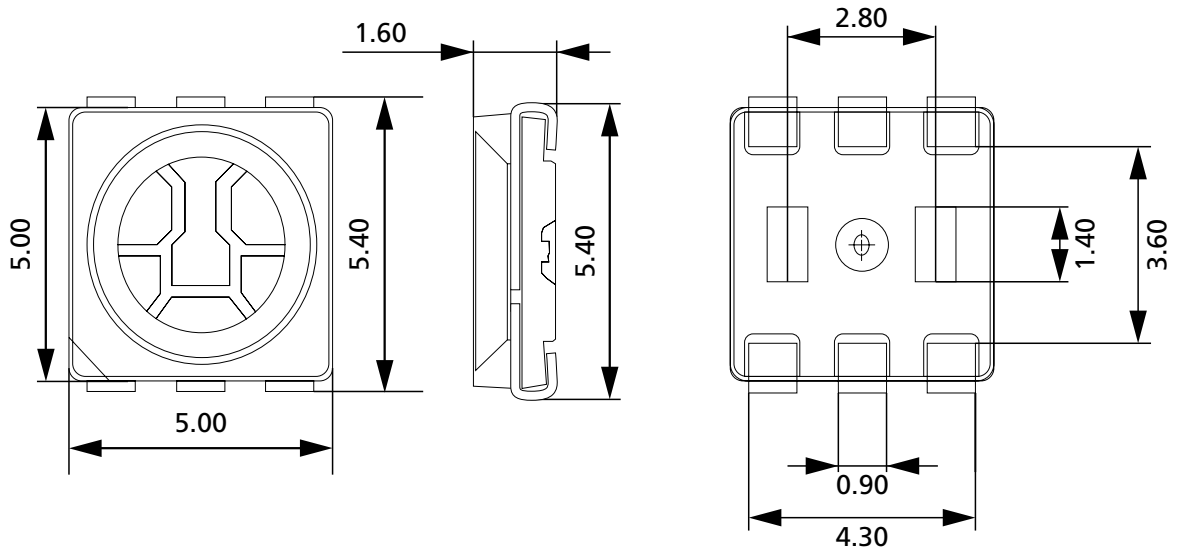
3. COMPONENTS CONT

3.6 LED FOR RGB LED LIGHT SHEET

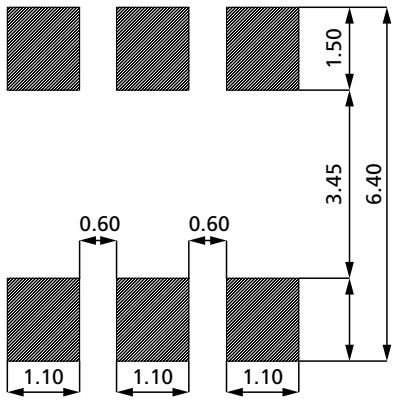
3.6.1 General Information

GENERAL INFORMATION	
PRODUCER	LUMIMICRO Ltd
PRODUCT NAME	LMTP50SPRGB-AS
FEATURES	3 chip LED
VIEWING ANGLE	120°
LED DIMENSIONS	5mm long x 5mm wide x 1.6mm deep
LED STRIP DIMENSIONS	520mm long x 6.4mm high
LED BANK LENGTH	50mm
PITCH	17mm

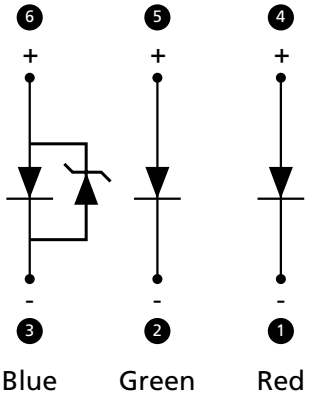
3.6.2 Outline & Dimensions



Recommended solder pattern



LED circuit diagram



Units in mm

3. COMPONENTS CONT

3.6.3 Specifications
Absolute Maximum Ratings

PARAMETER	COLOUR	SYMBOL	VALUE	UNIT
Forward Current	Red	IF	30	mA
	Green			
	Blue			
Power Dissipation	Red	P_d	70	mW
	Green		80	
	Blue		80	
Forward Pulse Current[1]	Red	I_{PF}	150	mA
	Green		60	
	Blue		80	
Reverse Voltage	Full Colour	VR	5	V
Storage Temperature	Full Colour	T_{stg}	-40 ~ +100	°C
Operating Temperature	Full Colour	T_{opr}	-30 ~ +85	°C
Soldering Temperature	Full Colour	T_{sld}	260 (for 10 sec)	°C
ESD Classification	Red	Class 2 (JESD22-A114)		
	Green			
	Blue	Class 3A (JESD22-A114)		

[1] Forward Pulse Current: Pulse Width < 10msec / Duty Ratio < 1/10

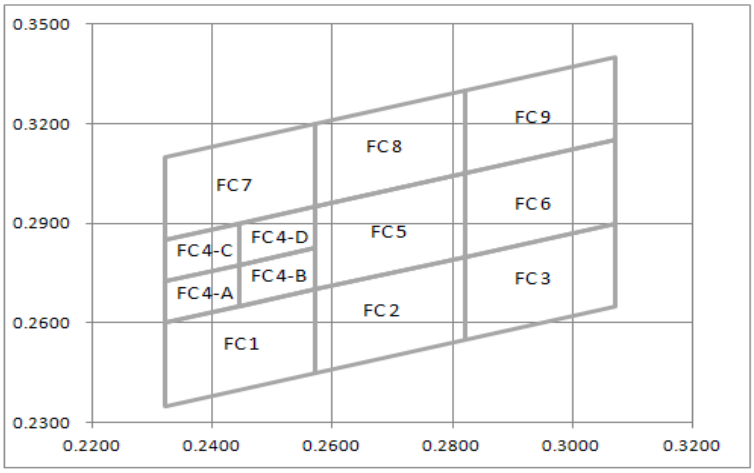
Electrical / Optical Characteristics
Electro/Optical Characteristics [Condition: 20mA / Chips - Ta = 25°C]

PARAMETER	SYMBOL	COLOUR	MIN.	TYP	MAX.	UNIT
Forward Voltage	V_F	Red	1.8	-	2.4	V
		Green	2.8	-	3.6	
		Blue	2.8	-	3.6	
Dominant Wavelength	Dw	Red	618	-	628	nm
		Green	524	-	534	
		Blue	459	-	469	
Luminous Intensity	Iv	R: IF 16mA (10.1mA)[1]	1500	2500	3500	mcd
		G: IF 25mA (13.3mA)[1]				
		B: IF 10mA (6.6mA)[1]				
Luminous Intensity	Iv	Red	540	800	-	mcd
		Green	1100	1500	-	
		Blue	200	300	-	

Tolerance: VF= ±0.01V, Iv= ±10%, Dw= ±2nm, chromacity coordinate = ±0.01
[1]: RGB White mixing 30mA Current Sum

3. COMPONENTS CONT

Colour Coordinates Rank

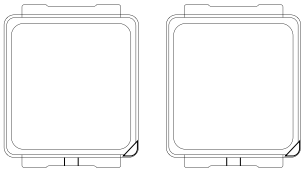


FC1		FC2		FC3	
X	**Y**	**X**	**Y**	**X**	**Y**
0.2320	0.2600	0.2570	0.2700	0.2820	0.2800
0.2570	0.2700	0.2820	0.2800	0.3070	0.2900
0.2570	0.2450	0.2820	0.2550	0.3070	0.2650
0.2320	0.2350	0.2570	0.2450	0.2820	0.2550
FC4-A		**FC4-B**		**FC4-C**	
X	**Y**	**X**	**Y**	**X**	**Y**
0.2320	0.2725	0.2445	0.2775	0.2320	0.2850
0.2445	0.2775	0.2570	0.2825	0.2445	0.2900
0.2445	0.2650	0.2570	0.2700	0.2445	0.2775
0.2320	0.2600	0.2445	0.2650	0.2320	0.2725
FC4-D		**FC5**		**FC6**	
X	**Y**	**X**	**Y**	**X**	**Y**
0.2445	0.2900	0.2570	0.2950	0.2820	0.3050
0.2570	0.2950	0.2820	0.3050	0.3070	0.3150
0.2570	0.2825	0.2820	0.2800	0.3070	0.2900
0.2445	0.2775	0.2570	0.2700	0.2820	0.2800
FC7		**FC8**		**FC9**	
X	**Y**	**X**	**Y**	**X**	**Y**
0.2320	**0.3100**	**0.2570**	**0.3200**	0.2820	0.3300
0.2570	0.3200	0.2820	0.3300	0.3070	0.3400
0.2570	0.2950	0.2820	0.3050	0.3070	0.3150
0.2320	0.2850	0.2570	0.2950	0.2820	0.3050

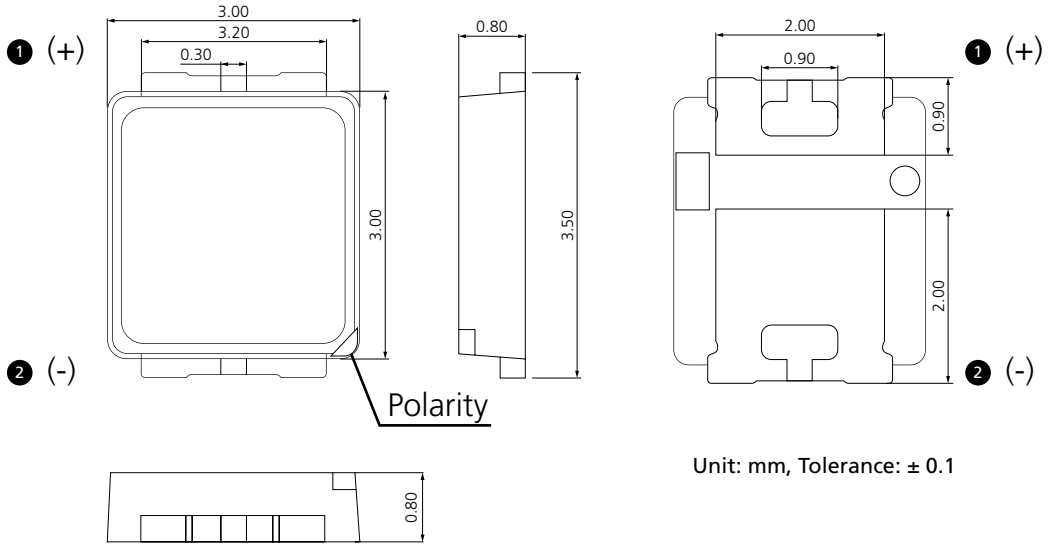
3. COMPONENTS CONT

3.7 LED FOR DYNAMIC/TUNEABLE LED LIGHT SHEET (2700K-6500K) 2200K - 4100K available on request

3.7.1 General Information

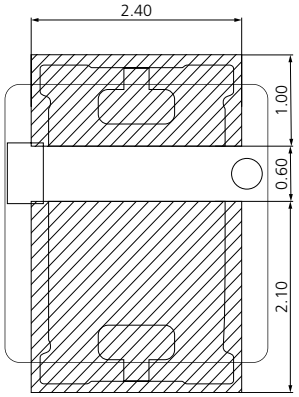
GENERAL INFORMATION	
PRODUCER	LUMIMICRO Ltd
PRODUCT NAME	LMLTP30B1CWHZ060-C80
DIMENSIONS	3mm wide x 3.5mm high x 0.8mm deep
FEATURES	Individual LED chips (warm & cool)
VIEWING ANGLE	120°

3.7.2 Outline & Dimensions

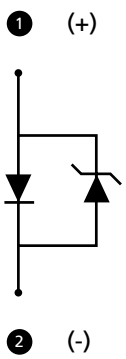


Unit: mm, Tolerance: ± 0.1

Recommend Solder Pattern



LED Circuit Diagram



3. COMPONENTS CONT

3.7.3 Specifications
Absolute Maximum Ratings

PARAMETER	SYMBOL	VALUE	UNIT
Forward Current	I_F	150	mA
Power Dissipation	P_d	500	mW
Forward Pulse Current *1	I_{PF-1}	300	mA
Storage Temperature	T_{stg}	-40 ~ +100	V
Operating Temperature	T_{opr}	-40 ~ +80	°C
Soldering Temperature	T_{sld}	260 (for 10 sec)	°C
Junction Temperature	T_j	120	°C

*1 Forward pulse current: Pulse width <10msec / duty ratio <1/10

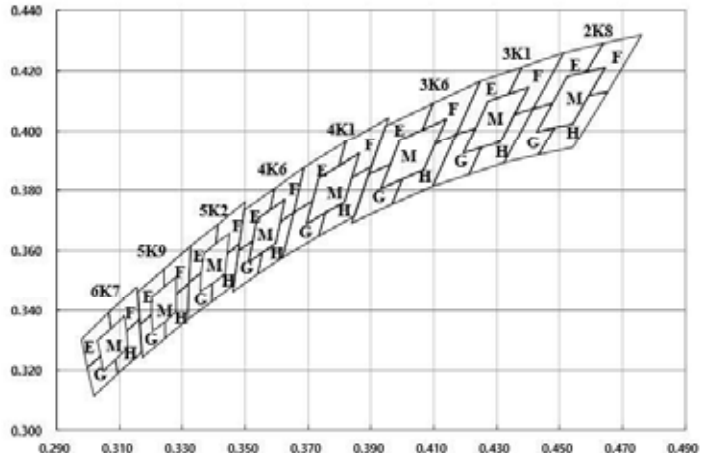
Electrical / Optical Characteristics

PARAMETER	SYMBOL	CONDITION	MIN	TYP	MAX	UNIT
Forward Voltage	V_F	I_F=60mA	2.7	-	3.2	V
Reverse Voltage	Vr	I_F=5mA	0.5	-	1.2	V
Luminous Intensity	Iv	I_F=60mA	6.0	-	11.5	cd
Luminous Flux	Φ_v	I_F=60mA	18.9	-	-	lm
Colour Correlated Temperature	CCT	I_F=60mA	2800	-	6700	K
Colour Rendering Index	Ra	I_F=60mA	80	-	-	-
Viewing Angle	$2\Theta_{1/2}$	I_F=60mA	-	120	-	deg.
ESD		1.5Ω,100pF	5	-	-	KV
Thermal Resistance[1]	$R_{th(J-S)}$	I_F=60mA	-	-	30	°C/W

[1] Thermal resistance: Rth (junction - solder)

* Tolerance: VF=±0.1V, Iv=±10%, chromacity coordinate=±0.01, CRI=±2

Colour Coordinates Rank



3. COMPONENTS CONT

6K7E		6K7F		6K7G		6K7H		6K7M	
X	Y	X	Y	X	Y	X	Y	X	Y
0.2978	0.3304	0.3066	0.3392	0.2998	0.3209	0.3094	0.3187	0.3031	0.3297
0.2998	0.3209	0.3073	0.3339	0.3018	0.3113	0.3171	0.3261	0.3048	0.3198
0.3039	0.3247	0.3116	0.3382	0.3094	0.3187	0.3163	0.3371	0.3127	0.3275
0.3031	0.3297	0.3122	0.3328	0.3087	0.3237	0.3122	0.3328	0.3116	0.3382
0.3073	0.3339	0.3163	0.3371	0.3048	0.3198	0.3127	0.3275		
0.3066	0.3392	0.3155	0.3481	0.3039	0.3247	0.3087	0.3237		

5K9E		5K9F		5K9G		5K9H		5K9M	
X	Y	X	Y	X	Y	X	Y	X	Y
0.3157	0.3462	0.3241	0.3539	0.3165	0.3353	0.3244	0.3306	0.3201	0.3442
0.3165	0.3353	0.3326	0.3616	0.3172	0.3243	0.3316	0.3369	0.3206	0.3329
0.3204	0.3386	0.3321	0.3493	0.3244	0.3306	0.3321	0.3493	0.3281	0.3396
0.3201	0.3442	0.3282	0.3456	0.3243	0.3363	0.3282	0.3456	0.3283	0.3516
0.3242	0.3479	0.3283	0.3516	0.3206	0.3329	0.3281	0.3396		
0.3241	0.3539	0.3242	0.3479	0.3204	0.3386	0.3243	0.3363		

5K2E		5K2F		5K2G		5K2H		5K2M	
X	Y	X	Y	X	Y	X	Y	X	Y
0.3326	0.3616	0.3413	0.3688	0.3321	0.3493	0.3483	0.3623	0.3366	0.3589
0.3321	0.3493	0.3501	0.3760	0.3316	0.3369	0.3465	0.3487	0.3450	0.3657
0.3362	0.3525	0.3483	0.3623	0.3391	0.3428	0.3391	0.3428	0.3435	0.3524
0.3366	0.3589	0.3443	0.3591	0.3396	0.3493	0.3396	0.3493	0.3358	0.3462
0.3408	0.3623	0.3450	0.3657	0.3358	0.3462	0.3435	0.3524		
0.3413	0.3688	0.3408	0.3623	0.3362	0.3525	0.3443	0.3591		

4K6E		4K6F		4K6G		4K6H		4K6M	
X	Y	X	Y	X	Y	X	Y	X	Y
0.3498	0.3736	0.3592	0.3805	0.3480	0.3601	0.3611	0.3695	0.3535	0.3702
0.3592	0.3805	0.3686	0.3874	0.3524	0.3633	0.3655	0.3726	0.3625	0.3768
0.3580	0.3735	0.3655	0.3726	0.3513	0.3563	0.3620	0.3578	0.3596	0.3623
0.3535	0.3702	0.3611	0.3695	0.3554	0.3593	0.3541	0.3521	0.3513	0.3563
0.3524	0.3633	0.3625	0.3768	0.3541	0.3521	0.3554	0.3593		
0.3480	0.3601	0.3580	0.3735	0.3462	0.3462	0.3596	0.3623		

4K1E		4K1F		4K1G		4K1H		4K1M	
X	Y	X	Y	X	Y	X	Y	X	Y
0.3686	0.3874	0.3821	0.3960	0.3653	0.3726	0.3840	0.3841	0.3734	0.3840
0.3821	0.3960	0.3956	0.4044	0.3715	0.3764	0.3902	0.3880	0.3864	0.3921
0.3799	0.3881	0.3902	0.3880	0.3696	0.3688	0.3848	0.3716	0.3815	0.3761
0.3734	0.3840	0.3840	0.3841	0.3756	0.3725	0.3734	0.3647	0.3696	0.3688
0.3715	0.3764	0.3864	0.3921	0.3734	0.3647	0.3756	0.3725		
0.3653	0.3726	0.3799	0.3881	0.3620	0.3578	0.3815	0.3761		

3K6E		3K6F		3K6G		3K6H		3K6M	
X	Y	X	Y	X	Y	X	Y	X	Y
0.3946	0.4015	0.4098	0.4090	0.3892	0.3853	0.4103	0.3955	0.3992	0.3970
0.4098	0.4090	0.4249	0.4165	0.3963	0.3887	0.4173	0.3990	0.4138	0.4042
0.4065	0.4006	0.4173	0.3990	0.3933	0.3804	0.4097	0.3814	0.4068	0.3869
0.3992	0.3970	0.4103	0.3955	0.4000	0.3837	0.3968	0.3752	0.3933	0.3804
0.3963	0.3887	0.4138	0.4042	0.3968	0.3752	0.4000	0.3837		
0.3892	0.3853	0.4065	0.4006	0.3839	0.3690	0.4068	0.3869		

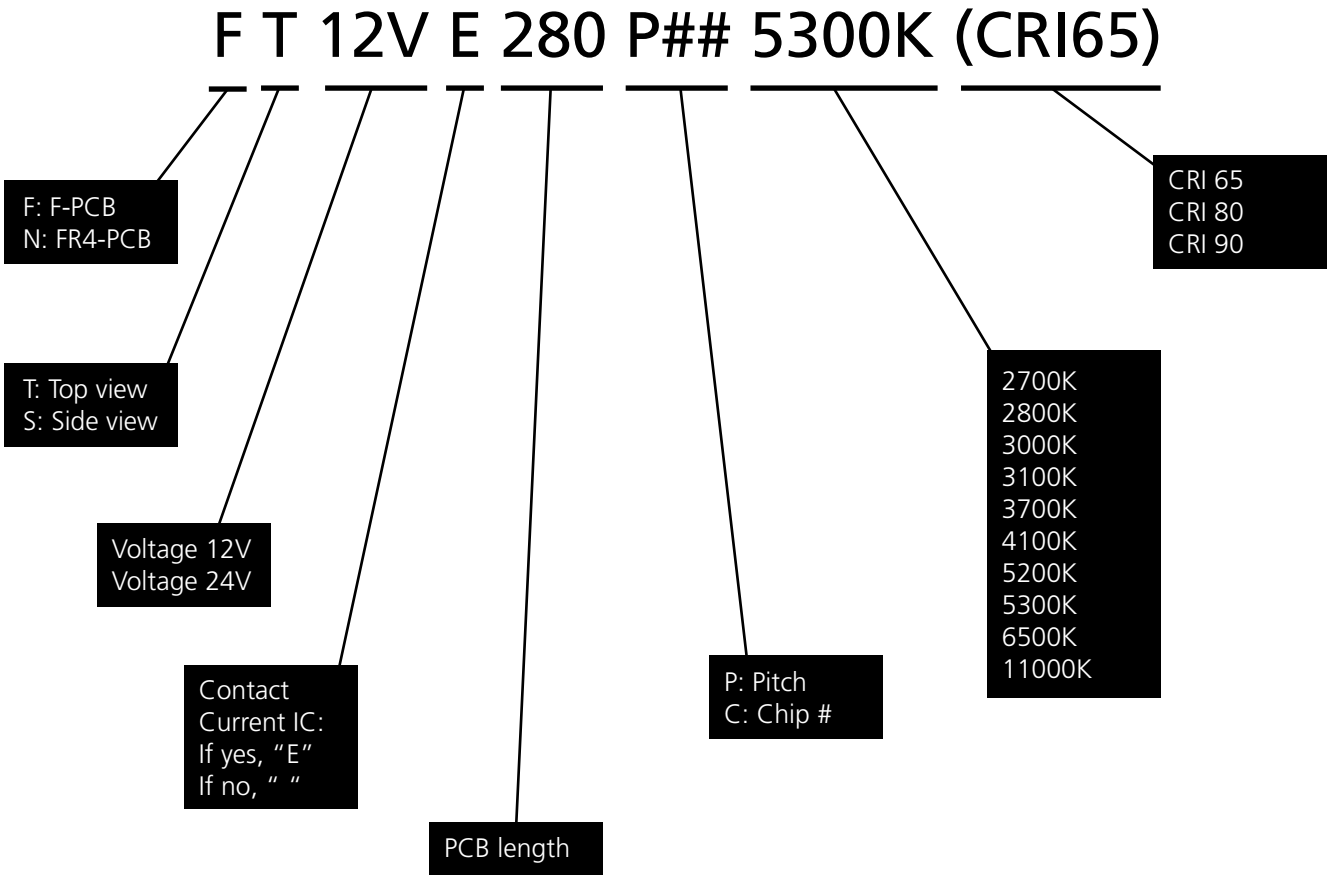
3K1E		3K1F		3K1G		3K1H		3K1M	
X	Y	X	Y	X	Y	X	Y	X	Y
0.4249	0.4165	0.4381	0.4213	0.4173	0.3990	0.4356	0.4055	0.4274	0.4100
0.4381	0.4213	0.4512	0.4260	0.4234	0.4011	0.4418	0.4077	0.4401	0.4145
0.4338	0.4123	0.4418	0.4077	0.4194	0.3922	0.4323	0.3893	0.4311	0.3964
0.4274	0.4100	0.4356	0.4055	0.4252	0.3943	0.4210	0.3854	0.4194	0.3922
0.4234	0.4011	0.4401	0.4145	0.4210	0.3854	0.4252	0.3943		
0.4173	0.3990	0.4338	0.4123	0.4097	0.3814	0.4311	0.3964		

2K8E		2K8F		2K8G		2K8H		2K8M	
X	Y	X	Y	X	Y	X	Y	X	Y
0.4512	0.4260	0.4638	0.4290	0.4417	0.4077	0.4594	0.4118	0.4526	0.4183
0.4638	0.4290	0.4763	0.4319	0.4476	0.4090	0.4653	0.4132	0.4647	0.4211
0.4586	0.4197	0.4653	0.4132	0.4427	0.3998	0.4543	0.3944	0.4541	0.4025
0.4526	0.4183	0.4594	0.4118	0.4484	0.4011	0.4433	0.3918	0.4427	0.3998
0.4476	0.4090	0.4647	0.4211	0.4433	0.3918	0.4484	0.4011		
0.4417	0.4077	0.4586	0.4197	0.4323	0.3893	0.4541	0.4025		

3. COMPONENTS CONT

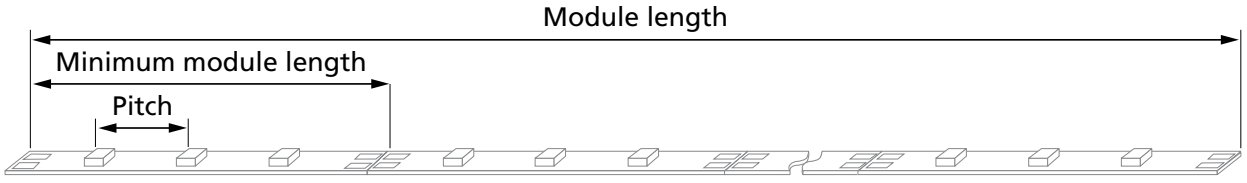
3.8 LED MODULE

3.8.1 Definition of Model



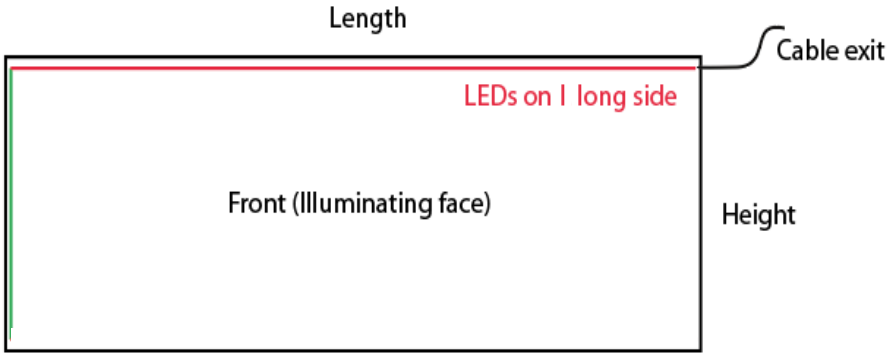
3.8.2 Specifications

	LENGTH	LED PITCH	NO. OF LEDS	REMARK
FT12V280P16	46.7 x 6 = 280	15mm	18	5630 LED module used in 6, 8, 10mm panels. Standard Output
FT12V283C24	35 x 8 + 3 = 283	11mm	24	3014 LED module used in 4mm panel. Standard Output
FT12V500P16	50 x 10 = 500	16mm	30	5050 LED module RGB used in 10mm panel
FT12V500P8	25 x 20 = 500	8mm	60	3230 LED module 2in1 type used in 10mm panel



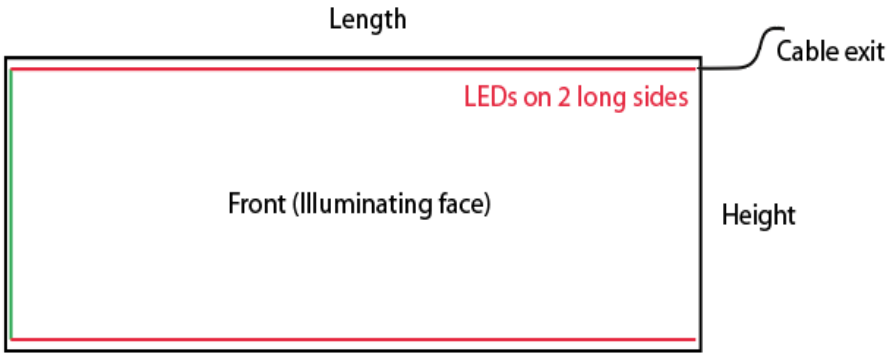
4. TECHNICAL DATA

4.1 CENTRE SURFACE BRIGHTNESS
(8mm, standard 18 chip)



LEDS on 1 side (based on 600mm length)

COLOUR TEMPERATURE	HEIGHT MM												
	100	200	300	400	500	600	700	800	900	1000	1100	1200	1300
2700K	10,873	6,300	3,651	2,653	2,116	1,775	1,538	1,362	1,226	1,117	1,029	954	891
3000K	11,235	6,510	3,773	2,742	2,186	1,834	1,589	1,407	1,267	1,155	1,063	986	921
3500K	11,416	6,615	3,833	2,786	2,221	1,864	1,614	1,430	1,287	1,173	1,080	1,002	936
4100K	12,584	7,292	4,225	3,071	2,449	2,054	1,780	1,576	1,419	1,293	1,190	1,104	1,031
5300K	12,866	7,455	4,320	3,140	2,503	2,100	1,819	1,611	1,451	1,322	1,217	1,129	1,054
6500K	12,504	7,245	4,198	3,051	2,433	2,041	1,768	1,566	1,410	1,285	1,183	1,097	1,025



LEDS on 2 sides (based on 600mm length)

COLOUR TEMPERATURE	HEIGHT MM												
	100	200	300	400	500	600	700	800	900	1000	1100	1200	1300
2700K	21,745	12,600	7,301	5,306	4,231	3,549	3,075	2,723	2,451	2,234	2,057	1,908	1,782
3000K	22,470	13,020	7,545	5,483	4,372	3,667	3,177	2,814	2,533	2,309	2,125	1,971	1,841
3500K	22,832	13,230	7,666	5,571	4,442	3,727	3,228	2,859	2,574	2,346	2,159	2,003	1,871
4100K	25,168	14,584	8,450	6,141	4,897	4,108	3,559	3,152	2,837	2,586	2,380	2,208	2,062
5300K	25,732	14,910	8,640	6,279	5,006	4,200	3,638	3,222	2,901	2,644	2,434	2,258	2,108
6500K	25,007	14,490	8,396	6,102	4,865	4,081	3,536	3,132	2,819	2,570	2,365	2,194	2,049

4. TECHNICAL DATA

4.3 IP67 RATINGS

LED Light Sheet has a resistance that acheives an Ingress Protection Test rating of IP54 as standard. An IP67 rating is available by request. LED Light Sheet can be completely protected from dust and sustain certain periods of immersion under pressure.

UNDERSTANDING IP RATINGS

Example of rating: IP67

FIRST NUMBER (PROTECTION AGAINST SOLID OBJECTS)	DEFINITION	SECOND NUMBER (PROTECTION AGAINST LIQUIDS)	DEFINITION
0	No protection	0	No protection
1	Protected against solid objects over 50mm (e.g. accidental touch by hands)	1	Protection against vertically falling drops of water
2	Protected against solid objects over 12mm (e.g. fingers)	2	Protected against direct sprays up to 15° from the vertical
3	Protected against solid objects over 2.5mm (e.g. tools and wires)	3	Protected against direct sprays up to 60° from the vertical
4	Protect against solid objects over 1mm (e.g. tool, wires and small wires)	4	Protected against sprays from all directions - limited ingress permitted
5	Protected against dust - limited ingress (no harmful deposit)	5	Protected against low pressure jets if water from all directions - limited ingress permitted
6	Totally protected against dust	6	Protected against strong jets of water e.g. for use on shipdecks - limited ingres permitted
		7	Protected against the effects of temporary immersion between 15cm and 1m. Duration of test: 30 minutes
		8	Protected against long periods of immersion under pressure

5. POWER CORD

5.1 OPTION 1 - CONNECT

Supplied as standard



Connect is a small, power-to-luminaire system designed to meet the lighting industry's need for a compact, easy-to-install interconnecting solution.

The system can be used for simple or complex wiring solutions and features a range of white wires and component parts that connect and disconnect with ease. Robust yet incredibly slim, the standard 7.5mm male connector can easily fit through an 8mm opening compared to other connectors which require much larger spaces.

Each Applelec product, including LED Light Sheet, wired with the Connect system features a 300mm wire fitted with a male connector. This 300mm wire connects to a 1200mm wire with a female connector which is fitted to a power supply or supplied with a bare-end to create a standard length of 1500mm. Extension wires in a choice of 500mm, 1000mm, 1500mm and 2000mm lengths can be added between the product and its power supply to a maximum length of 5000mm (up to 5A). All cables are BASEC and UKAS approved.

An inventive selection of splitters ensures the Connect wiring system is highly flexible and these include a T-splitter, 2-way splitter and 6-way splitter. Using a crimping tool, the versatile T-splitter can be attached to any wire, anywhere in the system (subject to calculated power travelling to existing wired lighting units) to create a 'branch' which feeds a newly added luminaire.

Using a simple plug and play principle, Connect from Applelec is easy to use, install and adjust.

Key Features

- BASEC and UKAS approved
- Compact 7.5mm connectors; fits through 8mm opening
- Plug-and-play principle; easy and quick to install
- Flexible, interconnecting solution
- White cables and connectors
- Four extension lengths: 500mm, 1000mm, 1500mm, 2000mm
- 5000mm lengths possible in one wiring run
- T-splitter, 2-way splitter and 6-way splitter
- 3 year warranty

Components



Male connector with 300mm wire to product



500mm, 1000mm, 1500mm, 2000mm & 3000mm extension wire



2-way splitter



6-way splitter



T-splitter



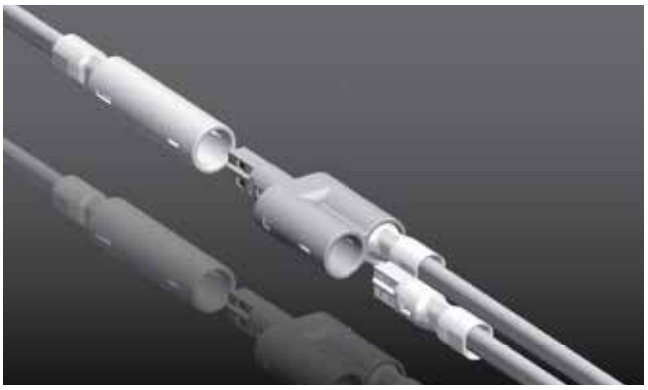
Female connector with 1200mm wire and power supply

5. POWER CORD CONT

Plug-and-play wiring



Male and female connectors fit together easily

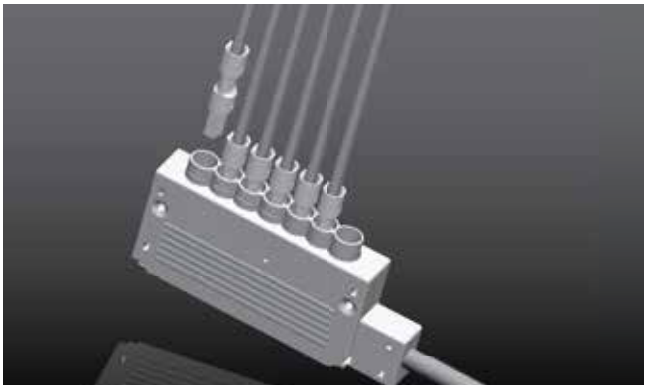


Connect and disconnect with ease

Expand the power system and easily split power for two lamps with the 2-way splitter



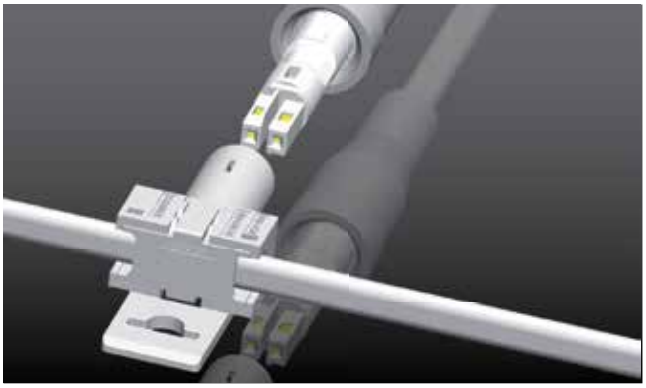
Ensure the two ridges at the top of the male connector are inserted into the corresponding grooves within the female connector



6-way splitter to power six lamps



Interior detail of the female connector



The T-splitter can be placed anywhere on the cable

Multiple T-splitters can be placed on the cable

5. POWER CORD CONT

5.1 OPTION 1 - CONNECT

Conductor: Class 5 flexible plain copper conductors to BS EN 60228:2005 (previously S6360)
Insulation: PVC (Polyvinyl Chloride) TI2 to BS7655
Sheath: PVC (Polyvinyl Chloride) TM2 to BS7655
Sheath colour: White
Voltage rating: 300/300V
Temperature rating: 0°C to +70°C
Minimum bending radius: 6 x overall diameter
Standards: BS6500



Specification

ELAND PART NO.	NO. OF CORES X NOMINAL CROSS SECTIONAL AREA (MM^2)	NOMINAL THICKNESS OF INSULATION (MM)	NOMINAL THICKNESS OF SHEATH (MM)	NOMINAL OVERALL DIAMETER (MM)	NOMINAL WEIGHT (KG/KM)
A3Y020075*FLAT	2 x 0.75	0.5	0.6	3.30 x 5.40	37

Conductors. Class 5 flexible Copper Conductors for Single Core and Multi-Core cables

Table in accordance with BS EN 60228:2005 (previously BS6360)

NOMINAL CROSS SECTIONAL AREA (MM^2)	MAXIMUM DIAMETER OF WIRES IN CONDUCTOR (MM)	MAXIMUM RESISTANCE OF CONDUCTOR AT 20°C	
		PLAIN WIRES (OHMS/KM)	METAL-COATED WIRES (OHMS/KM)
0.75	0.21	26.00	26.70

Electrical Characteristics. Current Carrying Capacity (amperes): and Mass Supportable (kg)

Table in accordance with BS EN 60228:2005 (previously BS6360)

CONDUCTOR CROSS SECTIONAL AREA MM^2	CURRENT CARRYING CAPACITY		MAXIMUM MASS SUPPORTABLE BY TWIN FLEXIBLE CORD (SEE REGULATIONS 522.7.2 AND 559.6.1.5) A
	SINGLE PHASE AC (AMPS)	THREE PHASE AC (AMPS)	
0.75	6	6	3

Rating factor for ambient temperature. 60°C thermoplastic or thermosetting insulated cords:

AMBIENT	35°C	40°C	45°C	50°C	55°C(AMPS)
Rating Factor	0.91	0.82	0.71	0.58	0.41

The above table is in accordance with Table 4F3A of the 17th Edition of IEE Wiring Regulations.

Voltage Drop (per ampere per metre)

Conductor operating temperature: 60°C*. The below table is in accordance with Table 4F3B of the 17th Edition of IEE Wiring Regulations.

CONDUCTOR CROSS SECTIONAL AREA (MM^2)	DC OR SINGLE PHASE AC (MV/A/M)	THREE PHASE AC (MV/A/M)
0.75	62	54

The information contained within this datasheet is for guidance only. When selecting accessories such as cleats, glands, etc please note that actual cable dimensions may vary due to manufacturing tolerances.

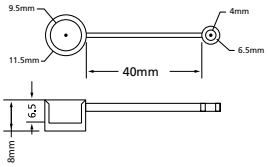
5. POWER CORD CONT.

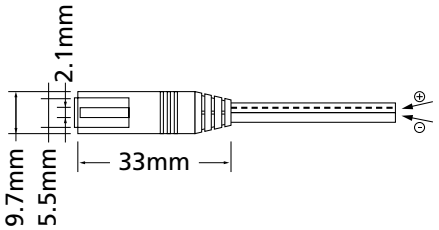
5.2 OPTION 2 - DC POWER CORD
(available on request)

Type 'Y' attachment:
If the external flexible cable or cord of this luminaire is damaged it shall be exclusively replaced by the manufacturer or their service agent or a similar qualified person in order to avoid a hazard.



ITEM/TYPE	PROPERTY	TYPICAL DATA
DC Cable	DC jack +, - pin	Bronze/nickel-plated
	Jack moulding	PVC
	Cable	PVC + copper
	DC jack +, - pin	5.5Ø * 2.1Ø
	Cable	20, 22, 24AWG
	Length	1.5m, 3m
	Colour	All black

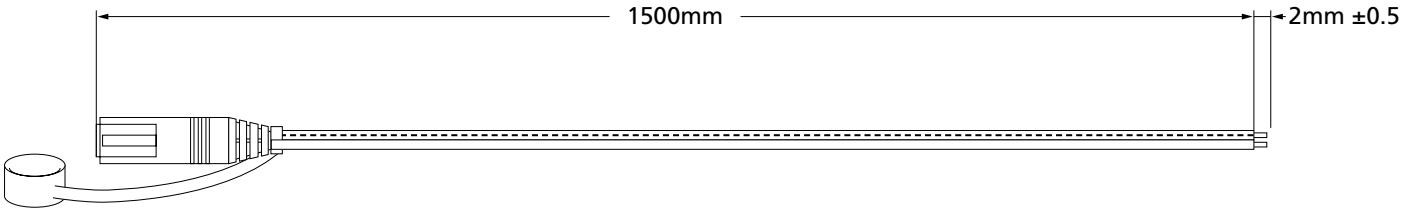




UL Certificate







5. POWER CORD CONT.

5.3 SPIDER CONNECTOR

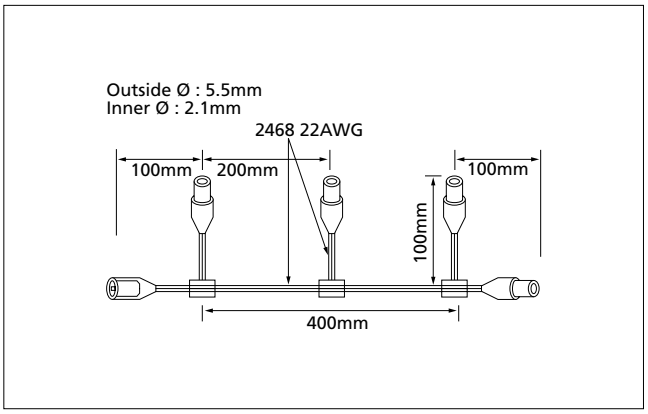


Allowing up to four LED Light Sheet panels to be linked together and run from a single power supply, spider connectors are available in two wire lengths. The short four-port spider links together panels positioned in close proximity, whilst the long spider features four-ports, each with a wiring range of 1500mm.

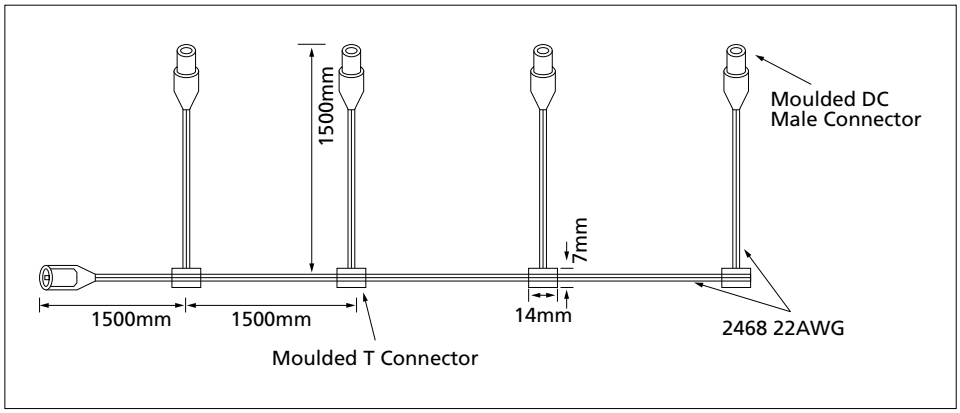
Energy efficiency is maximized by utilising the LED load on the driver, whilst reducing the number of driver units required overall. Testing has been completed to ensure voltage drops do not occur when using the spider connectors with LED Light Sheet and that even over distance the unit's brightness is not affected

Note: Not all ports can be used for every project, please refer to your quotation for the wattage of the panel(s) and the wattage of the power supply

4 Way Short Spider Connector



4 Way Long Spider Connector



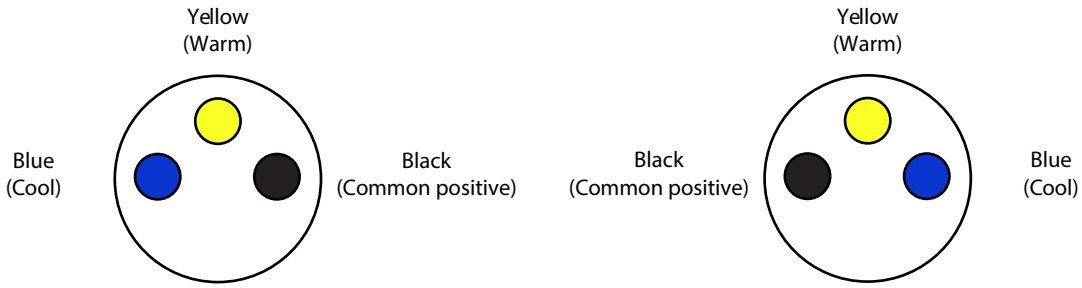
5. POWER CORD CONT.

5.4 XLR Connector

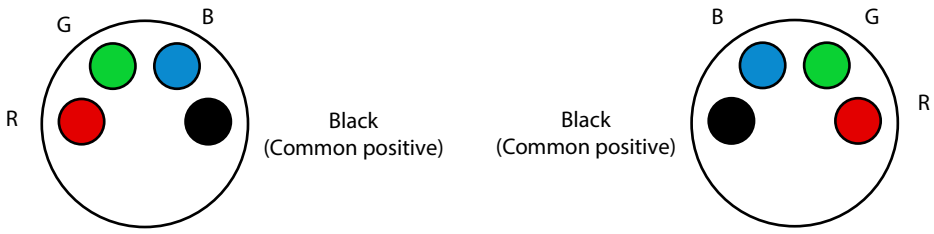


When you order your LED Light Sheet with tuneable white LED's we will supply it with wire tails with three pin XLR connectors. When we supply it with RBG colour changing LED's we will use a four pin XLR connector. If you have had your tuneable / RGB LED Light Sheet supplied with bare wire ends please see the XLR connector diagram below.

Tuneable white XLR connector wiring diagram



RGB colour changing XLR connector wiring diagram

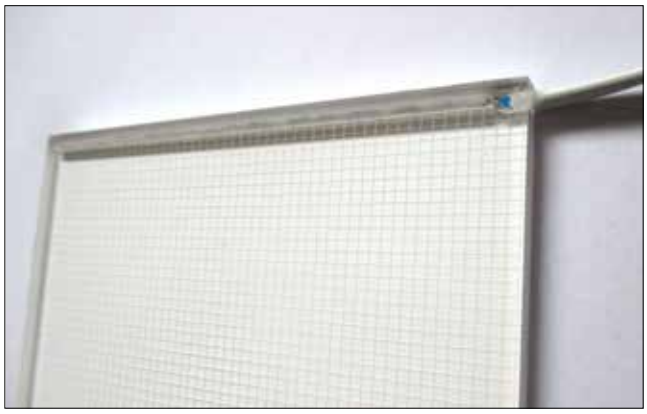


5. POWER CORD CONT.

5.5 WIRE EXIT OPTIONS

Connect Wire

Out of the edge of the panel (as standard)



Out of the back of the panel



Out of the face of the panel



Notched panel wire exit available on request.

5.5 WIRE EXIT OPTIONS

Old Style Wiring

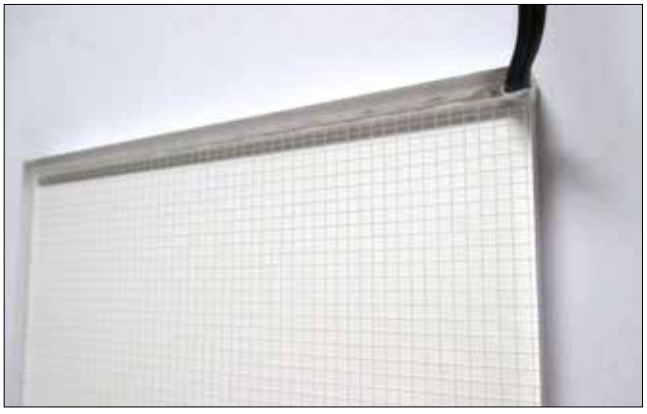
Out of the edge of the panel (as standard)



Out of the back of the panel



Out of the face of the panel



6. GENERAL SAFETY INSTRUCTIONS

6.1 GUIDE

Thank you for purchasing LED Light Sheet. This technical manual explains the necessary precautions and technical specifications of the product, and includes further information on warranty procedures. The information given in this technical manual should be sufficient for the end-user to handle LED Light Sheet safely.

Please be fully familiarised with the information included in this technical manual before beginning installation or use of LED Light Sheet. LED Light Sheet ("we","LED Light Sheet") is not liable for any damages of any kind resulting from the purchase, use or misuse of, or inability to use the product or arising directly or indirectly from the use, or loss of use of the product, or from the original purchaser's ("you", "purchaser") lack of knowledge or comprehension, including incidental, special, consequential or similar damages, or loss of anticipated profits or benefits. Also be aware that LED Light Sheet is not liable for damages arising from any sort (including negligence or gross negligence) on the part of the purchaser or faults in this technical manual. If in doubt please contact Applelec.

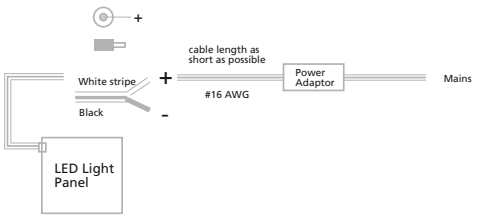
6.2 GENERAL INSTRUCTIONS FOR LED LIGHT SHEET

6.2.1 Warnings

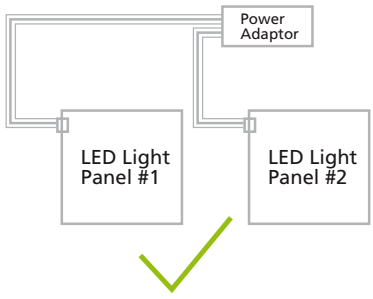
1. The light source contained in this luminaire shall only be replaced by the manufacturer or his service agent or a similar qualified person.
2. **DO NOT** disassemble LED Light Sheet.
3. **DO NOT** apply AC power or any other DC power to LED Light Sheet which is described in the quotation paperwork.
4. **DO NOT** drop or bend LED Light Sheet.
5. **DO NOT** tamper with LED Light Sheet from its original form.
6. **DO NOT** pull on the power wire.
7. **DO NOT** adhere graphics directly to LED Light Sheet.
8. Make sure LED Light Sheet is functioning correctly prior to assembly with or without other products.
9. When handling LED Light Sheet or any of its components prior to assembly, always wear cotton gloves or the equivalent to prevent scratching or staining (e.g. fingerprints) on the LGP.
10. **DO NOT** use any form of alcohol or solvent to clean the LGP or any component in direct contact with the LGP.
11. **DO NOT** cover the metal heat sink. The exposed metal on the back of the LED Light Sheet panel allows the heat generated by the LED to be dissipated thus cooling the LED over time maximising longevity.
12. **DO NOT** remove the aluminium heat sink plate from the LED Light Sheet.

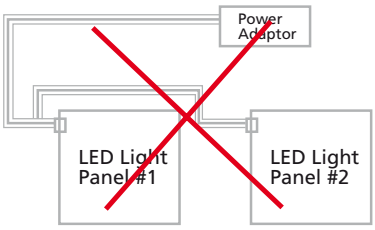
6.2.2 Electric Wiring

1. LED Light Sheet is powered by a DC 12V (constant voltage) adaptor. Warranty is void if any other adaptor that is not approved by LED Light Sheet is used. Some bespoke projects however, may operate on a different voltage which would be confirmed and advised at the quotation stage.
2. Any adjusted cord from the adaptor to LED Light Sheet should be kept as short as possible to avoid a voltage drop of LED Light Sheet, unless specified and supplied by Applelec.

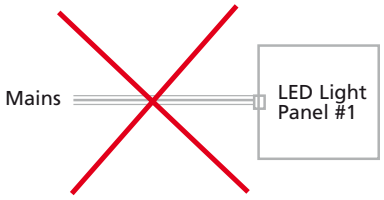


3. One adaptor can supply power to multiple LED Light Sheet units providing the total wattage is less than the capacity of the adaptor. Multiple LED Light Sheet units may be connected by using a spider connector cable.
4. If multiple LED Light Sheet units are wired to one adaptor, connect them in "parallel" not as a "series" to avoid voltage drop and maximize light output.





5. Never apply AC power directly to LED Light Sheet as this will instantly damage or blow the LEDs.



6.2.3 Protective Film

Prior to installation of LED Light Sheet please ensure the clear protective film has been removed from the face of the unit. Failure to remove the protective film will affect the brightness, clarity and even illumination of LED Light Sheet.

6. GENERAL SAFETY CONT

6.2.4 Cleaning

1. White cotton gloves should be worn to prevent scratches or fingerprints on the acrylic surface.

2. If fingerprints or other substances are visible on the acrylic surface, gently wipe off with a non abrasive cloth soaked in a watered down thinner.

3. With the cross section cut by a laser, the acrylic surface may crack if excessively exposed to thinner or alcohol.

6.2.5 Moving

1. Please **DO NOT HANDLE** the acrylic plate as below when lifting up. The LED module embedded within the acrylic plate will be damaged, and the solder pads fractured.



2. LED Light Sheet should be placed on a clean and flat surface. (See picture below)



The longer side of LED Light Sheet should be lifted up slowly. **DO NOT** bend LED Light Sheet when lifting. Lift LED Light Sheet in a vertical position, keeping the unit straight and supporting each corner to maintain rigidity. (See picture below).



6.2.6 Storage

Store LED Light Sheet in a dry area on a plain surface. Always keep LED Light Sheet covered to protect it from moisture and dust. Keep LED Light Sheet away from children.

6.2.7 Opening the delivery

Please note that the product may be damaged if the packaging is opened with a craft knife or a sharp edged tool.

7. WARRANTY

7.1 WARRANTY PERIOD

(based on use within recommended operated conditions)

LED Light Sheet – 5 years (based on use within the appropriate operating conditions, see 7.2)
Light Guide Plate – 5 years
Power supplies – 2-5 years
(please see our warranty terms and conditions available on request or via our website).

7.2 OPERATING CONDITIONS

Operating temperature:

Indoor/IP54: -10~40°C
Outdoor/IP67: -20~50°C

Operating humidity: 5~95%.
Operating time: 12 hours/day.

7.3 STORAGE CONDITIONS

Storage temperature:

Indoor/IP54: -10~40°C
Outdoor/IP67: -20~50°C

Storage humidity: 5~95%.

7.4 WARRANTY COVERAGE

7.4.1 What the warranty covers

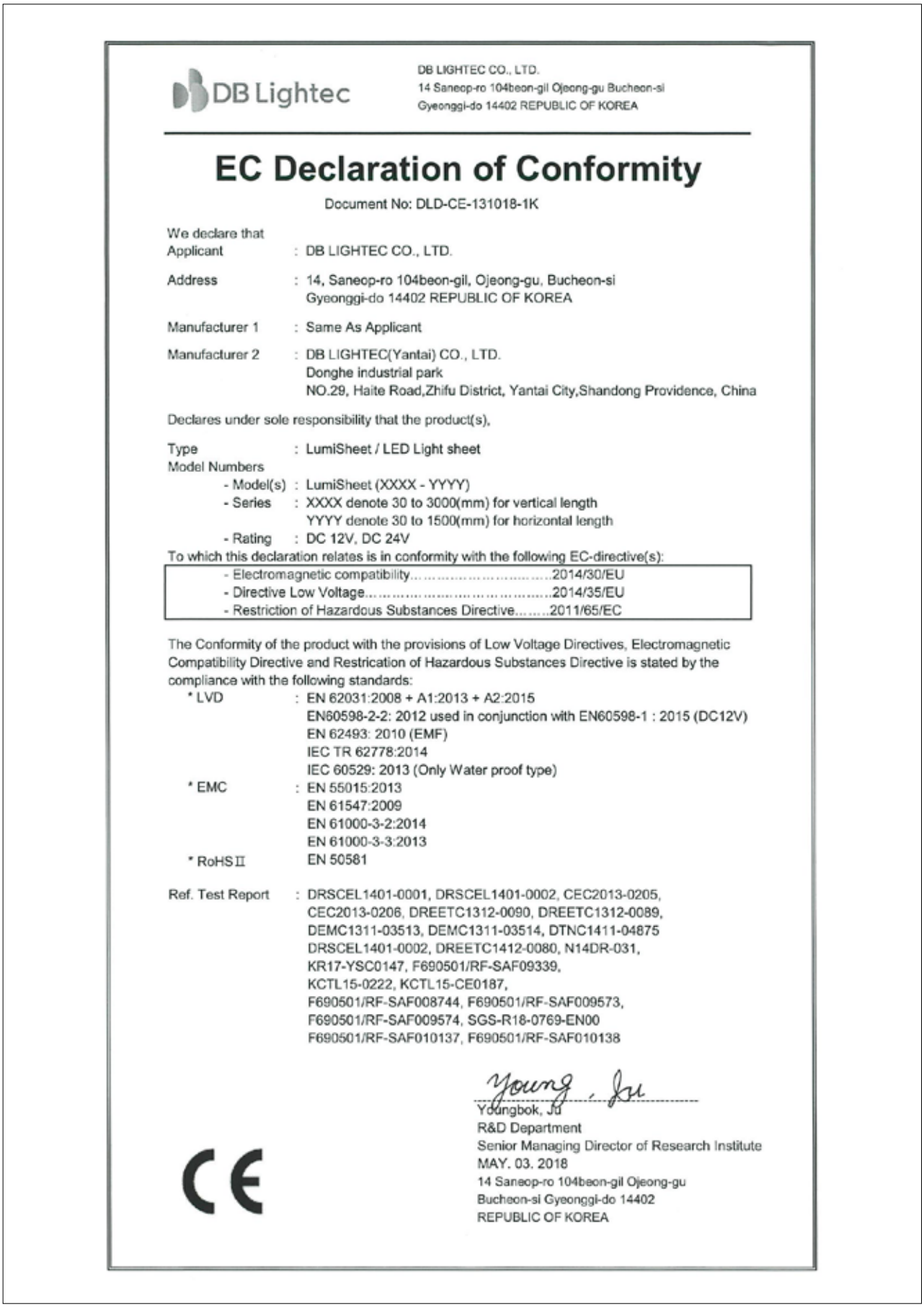
LED Light Sheet and parts are warranted against defects in materials and workmanship from the date of purchase for the warranty period, provided it is used under normal conditions. During this period, defective products will be repaired or replaced without charge: the LED Light Sheet panel must be returned for this work to be carried out. Under no circumstance will liability be accepted for any special, indirect, incidental or consequential or damages loss owing to failure of the product.

7.4.2 What the warranty does not cover

1. Defects in materials and workmanship after expiry of the warranty period
2. Damage caused by the following
   - Accident, abuse, misuse, misapplication, natural disaster
   - Repair or attempted repair by anyone not authorised by Applelec
   - Using improper power supply
   - Inappropriate use not in accordance with instruction
   - Heavy shock
   - Normal wear

8. CERTIFICATES & TESTS

8.1 CE



DB Lightec

DB LIGHTEC CO., LTD.
14 Saneop-ro 104beon-gil Ojeong-gu Bucheon-si
Gyeonggi-do 14402 REPUBLIC OF KOREA

EC Declaration of Conformity

Document No: DLD-CE-131018-1K

We declare that

Applicant : DB LIGHTEC CO., LTD.

Address : 14, Saneop-ro 104beon-gil, Ojeong-gu, Bucheon-si
Gyeonggi-do 14402 REPUBLIC OF KOREA

Manufacturer 1 : Same As Applicant

Manufacturer 2 : DB LIGHTEC(Yantai) CO., LTD.
Donghe industrial park
NO.29, Haite Road,Zhifu District, Yantai City,Shandong Providence, China

Declares under sole responsibility that the product(s),

Type : LumiSheet / LED Light sheet

Model Numbers

- Model(s) : LumiSheet (XXXX - YYYY)
- Series : XXXX denote 30 to 3000(mm) for vertical length
  YYYY denote 30 to 1500(mm) for horizontal length
- Rating : DC 12V, DC 24V

To which this declaration relates is in conformity with the following EC-directive(s):

- Electromagnetic compatibility.....2014/30/EU
- Directive Low Voltage.....2014/35/EU
- Restriction of Hazardous Substances Directive.....2011/65/EC

The Conformity of the product with the provisions of Low Voltage Directives, Electromagnetic Compatibility Directive and Restrication of Hazardous Substances Directive is stated by the compliance with the following standards:

* LVD : EN 62031:2008 + A1:2013 + A2:2015
  EN60598-2-2: 2012 used in conjunction with EN60598-1 : 2015 (DC12V)
  EN 62493: 2010 (EMF)
  IEC TR 62778:2014
  IEC 60529: 2013 (Only Water proof type)
* EMC : EN 55015:2013
  EN 61547:2009
  EN 61000-3-2:2014
  EN 61000-3-3:2013
* RoHS II EN 50581

Ref. Test Report : DRSCEL1401-0001, DRSCEL1401-0002, CEC2013-0205, CEC2013-0206, DREETC1312-0090, DREETC1312-0089, DEMC1311-03513, DEMC1311-03514, DTNC1411-04875 DRSCEL1401-0002, DREETC1412-0080, N14DR-031, KR17-YSC0147, F690501/RF-SAF09339, KCTL15-0222, KCTL15-CE0187, F690501/RF-SAF008744, F690501/RF-SAF009573, F690501/RF-SAF009574, SGS-R18-0769-EN00 F690501/RF-SAF010137, F690501/RF-SAF010138

Youngbok, Ju
R&D Department
Senior Managing Director of Research Institute
MAY. 03. 2018
14 Saneop-ro 104beon-gil Ojeong-gu
Bucheon-si Gyeonggi-do 14402
REPUBLIC OF KOREA

CE

8. CERTIFICATES & TESTS CONT

8.2 RoHS

applelec™
Signs | Display | Lighting | Components

Non-use Warranty for Chemical Substances Contained in Products

We guarantee that our distributed products do not contain the chemical substances listed below, including cases where their contents is below the maximum concentration value and they shall not be applied when they are used in the exempted applications of the RoHS Directive (2002/95/EC).

This warranty letter is applied to the following series

Company Name: Applelec / Dongbu

Object Product: LED Light Sheet / Lumi Sheet

Chemical Substances List:

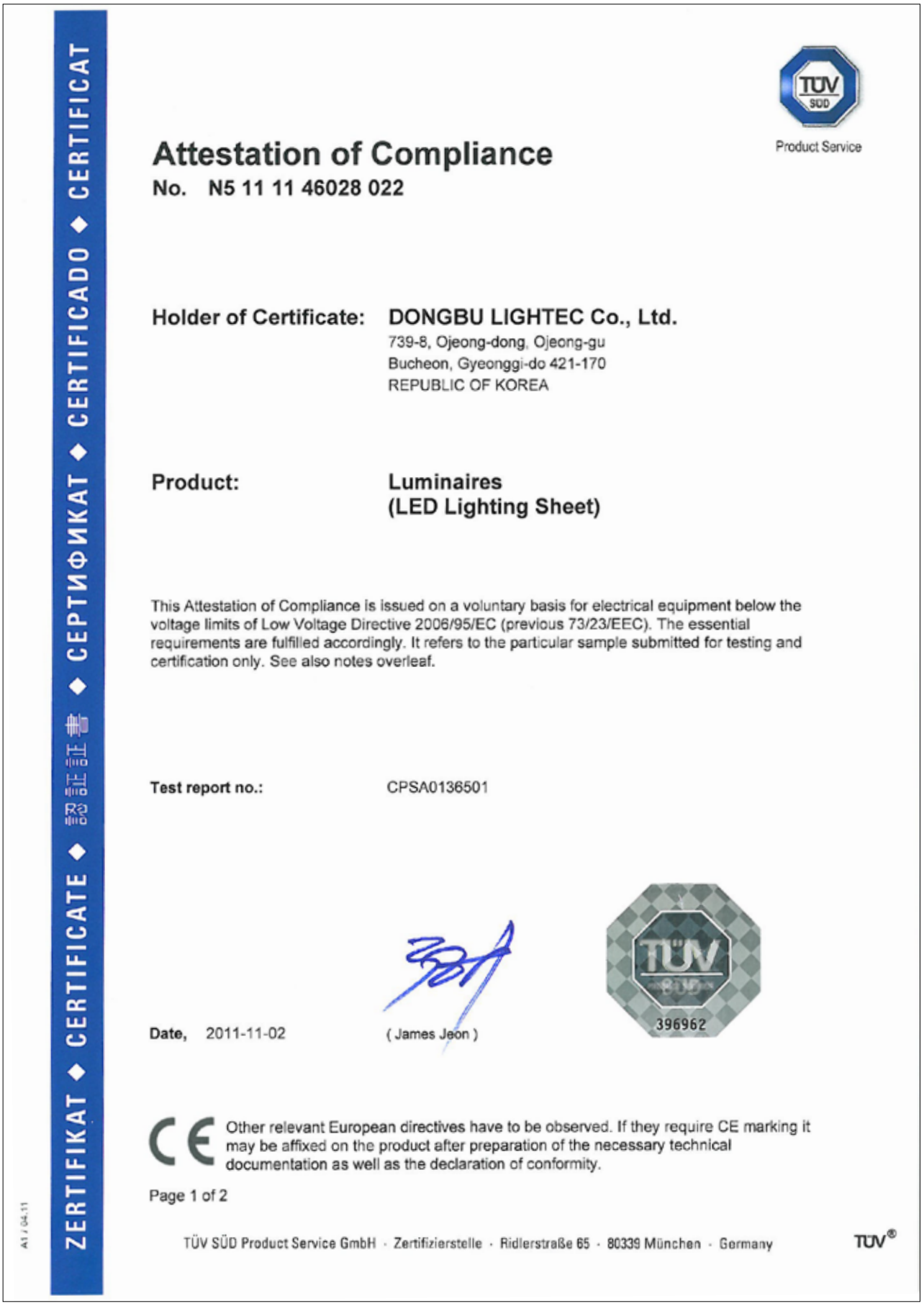
Substances	Maximum concentration value
Cadium and its compounds	100 ppm
Lead and its compounds	1000 ppm
Mercury and its compounds	1000 ppm
Hexavalent chromium compounds	1000 ppm
PBB (Polybrominates Biphenyls)	1000 ppm
PBDE (Polybrominated Diphenylethers)	1000 ppm

Representative: Carl Eastwood

C. Eastwood

8. CERTIFICATES & TESTS CONT

8.3 TUV



ZERTIFIKAT ◆ CERTIFICATE ◆ 認証書 ◆ СЕРТИФИКАТ ◆ CERTIFICADO ◆ CERTIFICAT

TÜV SÜD Product Service

Attestation of Compliance

No. N5 11 11 46028 022

Holder of Certificate: **DONGBU LIGHTEC Co., Ltd.**
739-8, Ojeong-dong, Ojeong-gu
Bucheon, Gyeonggi-do 421-170
REPUBLIC OF KOREA

Product: **Luminaires**
(LED Lighting Sheet)

This Attestation of Compliance is issued on a voluntary basis for electrical equipment below the voltage limits of Low Voltage Directive 2006/95/EC (previous 73/23/EEC). The essential requirements are fulfilled accordingly. It refers to the particular sample submitted for testing and certification only. See also notes overleaf.

Test report no.: CPSA0136501

Date, 2011-11-02

(James Jeon)

TÜV SÜD 396962

CE Other relevant European directives have to be observed. If they require CE marking it may be affixed on the product after preparation of the necessary technical documentation as well as the declaration of conformity.

Page 1 of 2

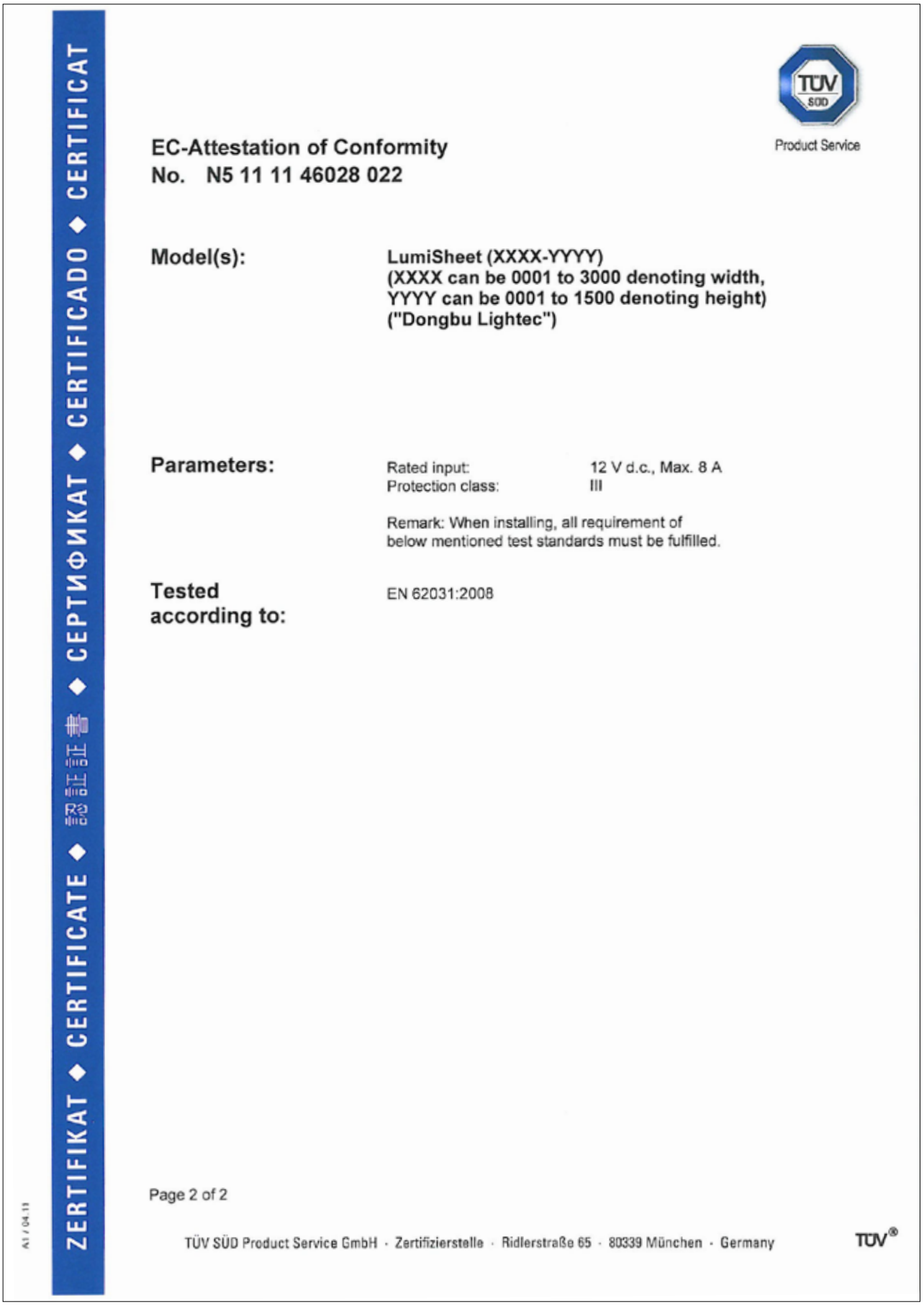
TÜV SÜD Product Service GmbH · Zertifizierstelle · Ridlerstraße 65 · 80339 München · Germany

TÜV®

A1 / 04.11

8. CERTIFICATES & TESTS CONT

8.3 TUV CONT



ZERTIFIKAT ◆ CERTIFICATE ◆ 認証書 ◆ СЕРТИФИКАТ ◆ CERTIFICADO ◆ CERTIFICAT

A1 / 04.11

TÜV SÜD Product Service

EC-Attestation of Conformity
No. N5 11 11 46028 022

Model(s): **LumiSheet (XXXX-YYYY)**
(XXXX can be 0001 to 3000 denoting width,
YYYY can be 0001 to 1500 denoting height)
("Dongbu Lightec")

Parameters:

Rated input:	12 V d.c., Max. 8 A
Protection class:	III

Remark: When installing, all requirement of below mentioned test standards must be fulfilled.

Tested according to: EN 62031:2008

Page 2 of 2

TÜV SÜD Product Service GmbH · Zertifizierstelle · Ridlerstraße 65 · 80339 München · Germany

TÜV®

8. CERTIFICATES & TESTS CONT

8.4 UL

ONLINE CERTIFICATIONS DIRECTORY

IFDR2.E325001
Low-voltage Lighting Systems, Power Units, Luminaires and Fittings - Component

Page Bottom

Low-voltage Lighting Systems, Power Units, Luminaires and Fittings - Component

See General Information for Low-voltage Lighting Systems, Power Units, Luminaires and Fittings - Component

FAWOO TECHNOLOGY E325001
2BL 6LT OJEONG-INDUSTRIAL COMPLEX
OJEONG-DONG OJEONG-GU
BUCHEON-SI, GYEONGGI-DO 421-170 REPUBLIC OF KOREA

Low voltage lighting system - Component, Model Lumisheet.

Marking: Company name or tradename/trademark "FAWOO", , model designation and the Recognized Component Mark .
Last Updated on 2009-09-18

Questions? Notice of Disclaimer Page Top

Copyright ?2009 Underwriters Laboratories Inc.®

The appearance of a company's name or product in this database does not in itself assure that products so identified have been manufactured under UL's Follow-Up Service. Only those products bearing the UL Mark should be considered to be Listed and covered under UL's Follow-Up Service. Always look for the Mark on the product.

UL permits the reproduction of the material contained in the Online Certification Directory subject to the following conditions: 1. The Guide Information, Designs and/or Listings (files) must be presented in their entirety and in a non-misleading manner, without any manipulation of the data (or drawings). 2. The statement "Reprinted from the Online Certifications Directory with permission from Underwriters Laboratories Inc." must appear adjacent to the extracted material. In addition, the reprinted material must include a copyright notice in the following format: "Copyright © 2009 Underwriters Laboratories Inc.®"

An independent organization working for a safer world with integrity, precision and knowledge

8. CERTIFICATES & TESTS CONT

8.4 UL CONT

ONLINE CERTIFICATIONS DIRECTORY

UYMR2.E332576
Sign Accessories - Component

Page Bottom

Sign Accessories - Component

See General Information for Sign Accessories - Component

FAWOO TECHNOLOGY E332576
739-8 OJEONG-DONG OJEONG-GU
BUCHEON-SI, GYEONGGI-DO 421-170 REPUBLIC OF KOREA

Class 2 LED module, Model Lumisheet.

Marking: Company name and model designation.
Last Updated on 2009-09-29

Questions? Notice of Disclaimer Page Top

Copyright ?2009 Underwriters Laboratories Inc.®

The appearance of a company's name or product in this database does not in itself assure that products so identified have been manufactured under UL's Follow-Up Service. Only those products bearing the UL Mark should be considered to be Listed and covered under UL's Follow-Up Service. Always look for the Mark on the product.

UL permits the reproduction of the material contained in the Online Certification Directory subject to the following conditions: 1. The Guide Information, Designs and/or Listings (files) must be presented in their entirety and in a non-misleading manner, without any manipulation of the data (or drawings). 2. The statement "Reprinted from the Online Certifications Directory with permission from Underwriters Laboratories Inc." must appear adjacent to the extracted material. In addition, the reprinted material must include a copyright notice in the following format: "Copyright © 2009 Underwriters Laboratories Inc.®"

An independent organization working for a safer world with integrity, precision and knowledge

8. CERTIFICATES & TESTS CONT

8.5 FIRE



Fire Data Sheet

applelec

Product. Light Guide Plate (LGP) as used in Applelec LED Lightsheet products.	**Material Specification**. PMMA cast acrylic. **Poly(methyl methacrylate)**
General Fire Assessment.	Both cast and extruded Acrylic burn more or less like hardwood with very little smoke generation. Its combustion gasses are non-toxic and non-corrosive. **PMMA** burns with a bright flame, virtually without smoke. Under normal circumstances, combustion only gives rise to carbon dioxide and water. Due to the material's chemical composition (carbon, hydrogen and oxygen), no acutely toxic substances like phosgene, acid vapours and sulphur dioxide can form, even in a real fire. Since the material does not contain any halogens, no dioxins can form either. Typically **PMMA products** will comply with the Euro Class E which confirms the low smoke levels of acrylic materials.
General Classification	Classification E, according to the 'Euro-Norm' (DIN EN SO 11925:2:2002-7) B2, with no burning droplets, according to DIN 4102 (Germany) M4 (no droplets) According to NF92500 + (France) The results of tests for fire propagation when tested to BS 476 Part 7 confirm that acrylic achieves a class 3 classification (UK) This material can thus be classified category TP (b) according to BS2782, method 508A for thermoplastics material defined by Building Regulations (UK) Its standard glow wire resistance is IIIa orBH3 to DIN VDE 0304, Part 3 The UL Flammability is UL 94 HB

General Note.

It is strongly dependant on the individual countries fire regulations if acrylic can be used in buildings as walls, roofs or ground.

The use of acrylic outside a building as facade elements or part of the store front is less critical. We recommend individual solutions and projects are discussed with your local authority.

Page 1 of 1

8. CERTIFICATES & TESTS CONT

8.6 IP67 DUST TESTING

parc
Unit 10 Caddsdown Industrial Park
Clovelly Road Bideford Devon EX39 3DX
Telephone: +44(0)1237 421255
Facsimile: +44(0) 1237 423541
Email: info@parcsw.co.uk
Web site: www.parcsw.co.uk

TEST REPORT

Customer Confidential

ENVIRONMENTAL TEST REPORT NO.3500-1

APPLELEC SIGN COMPONENTS
APPLEBY HOUSE
WALKER TERRACE
BRADFORD
YORKSHIRE
BD4 7HP

DATE : 15 JUNE 2011

2379

This report shall not be reproduced, except in full, without the written approval of the testing laboratory

Product Assessment and Reliability Centre Ltd. performs all of its product testing under a rigorous laboratory management system. We are accredited by UKAS to BS EN ISO/IEC 17025:2005, the "General requirements for the competence of testing and calibration laboratories". Details of our UKAS accredited tests and a copy of our UKAS Schedule of Accreditation are available upon request. Tests marked "non-UKAS" are currently not covered by our UKAS 17025:2005 accreditation. All testing, whether UKAS or non-UKAS, is performed within the same laboratory management system and to the same levels of calibration and traceability.

The results contained in this report relate only to the samples submitted.

Doc Ref: TR3_Rev_D

parc

TEST REPORT

Customer Confidential

Report No	Requested By	Customer Details
3500 -1	Ian Drinkwater	Applelec Sign Components Appleby House Walker Terrace Bradford West Yorkshire BD4 7HP

Date Samples Received	Date Started	Date Finished	Date of Issue
26/05/11	01/06/11	02/06/11	15/06/11

Product Description:

2 off LED Light Sheet units, denoted as samples 1 – 2 by PARC.

Tests Performed and Test Specifications:

Process 1 – Dust Ingress in accordance with BS EN 60598:2008, IP6X

Disposal of Samples:

Upon completion of testing the samples were returned to the customer.

Report Summary:

Sample Nos 1 & 2 were subjected to a dust ingress test, no signs of ingress were noted and both samples functioned correctly after the test had been completed.

2379

Distribution: I.Drinkwater, PARC File **Test Engineer: N.Edwards**

Approved: S.Wort (Senior Test Engineer)

Any opinions or interpretations expressed within this report, together with tests marked 'Non UKAS' are not included in the UKAS Accreditation Schedule for this Laboratory

1.0 Sample Content

2 off LED Light Sheet units, denoted as samples 1 – 2 by PARC.

2.0 Equipment Used

Equipment Used	PARC ID No	Calibration due date
Weiss ST1000 Dust Chamber	2	08/06/11
Fluke Thermometer	59	13/10/11
Thermocouple	502	20/04/12

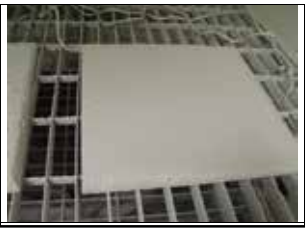
3.0 Initial Inspection

Upon receipt the samples were given a function check and both samples operated correctly. The samples were also given a visual inspection (Non UKAS), it was noted that sample no 2 had some scratches on the inside surface of the glass plate.

4.0 Test Procedure

Process 1 – Dust Ingress in accordance with BS EN 60598:2008, IP6X.
The samples were switched on and allowed to stabilise to their normal working temperature. Once stabilised 1 minute duration of exposure to dust is started followed by 3 hours with the samples unpowered.













Inspection photos

5.0 Report Summary

The samples were subjected to the test regime outlined in this report.

No ingress of dust was noted on either sample and both samples functioned correctly after the test had been completed.

End of Report.

8. CERTIFICATES & TESTS CONT

8.7 IP67 WATER TESTING

parc
Unit 10 Caddsdown Industrial Park
Clovelly Road Bideford Devon EX39 3DX
Telephone: +44(0)1237 421255
Facsimile: +44(0) 1237 423541
Email: info@parcsw.co.uk
Web site: www.parcsw.co.uk

TEST REPORT

Customer Confidential

ENVIRONMENTAL TEST
REPORT NO. 3500-2

APPLELEC SIGN COMPONENTS
APPLEBY HOUSE
WALKER TERRACE
BRADFORD
YORKSHIRE
BD4 7HP

DATE : 15 JUNE 2011

2379

This report shall not be reproduced, except in full, without the written approval of the testing laboratory

Product Assessment and Reliability Centre Ltd. performs all of its product testing under a rigorous laboratory management system. We are accredited by UKAS to BS EN ISO/IEC 17025:2005, the "General requirements for the competence of testing and calibration laboratories". Details of our UKAS accredited tests and a copy of our UKAS Schedule of Accreditation are available upon request. Tests marked "non-UKAS" are currently not covered by our UKAS 17025:2005 accreditation. All testing, whether UKAS or non-UKAS, is performed within the same laboratory management system and to the same levels of calibration and traceability.

The results contained in this report relate only to the samples submitted.

Doc Ref: TR3_Rev_D



parc
Unit 10 Caddsdown Industrial Park
Clovelly Road Bideford Devon EX39 3DX
Telephone: +44 (0) 1237 421255
Facsimile: +44 (0) 1237 421541
e-mail: info@parcsw.co.uk Website: www.parcsw.co.uk

TEST REPORT

Customer Confidential

Page 1 of 3

Report No	Requested By	Customer Details
3500-2	Ian Drinkwater	Applelec Sign Components Appleby House Walker Terrace Bradford West Yorkshire BD4 7HP

Date Samples Received	Date Started	Date Finished	Date of Issue
26/05/11	01/06/11	02/06/11	15/06/11

Product Description:

2 off LED Light Sheet units, denoted as samples 3 & 4 by PARC.

Tests Performed and Test Specifications:

Process 1 – Water Ingress in accordance with BS EN 60598:2008, IPX7

Disposal of Samples:

Upon completion of testing the samples were returned to the customer.

Report Summary:

Sample Nos 3 & 4 were subjected to a water ingress test, no signs of ingress were noted and both samples functioned correctly after the test had been completed.

2379

Distribution: I.Drinkwater, PARC File **Test Engineer: N.Edwards**

Approved: S.Wort (Senior Test Engineer)

Any opinions or interpretations expressed within this report, together with tests marked 'Non UKAS' are not included in the UKAS Accreditation Schedule for this Laboratory.

1.0 Sample Content

2 off LED Light Sheet units, denoted as samples 3 – 4 by PARC.

2.0 Equipment Used

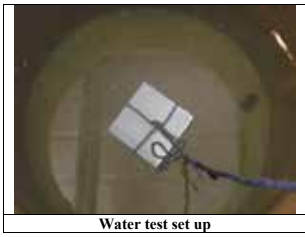
Equipment Used	PARC ID No	Calibration due date
Water immersion tank	282	N/A
Fluke Thermometer	59	13/10/11
Thermocouple	502	20/04/12
RS Timer	427	21/04/12

3.0 Initial Inspection

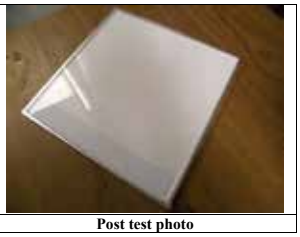
Upon receipt the samples were given a function check and both samples operated correctly. The samples were also given a visual inspection (Non UKAS), no signs of wear or damage was noted.

4.0 Test Procedure

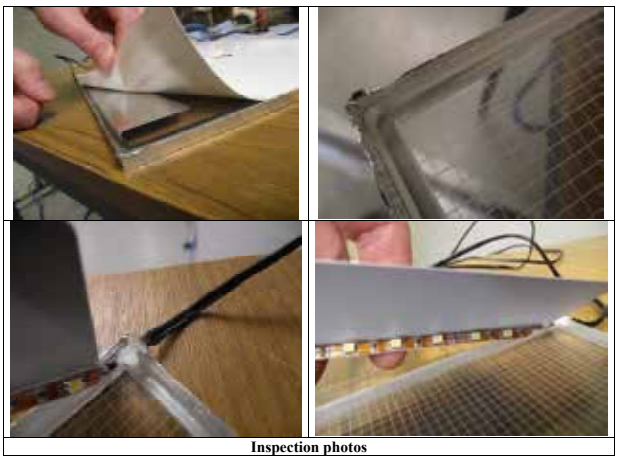
Process 1 – Water Ingress in accordance with BS EN 60598:2008, IPX7.
The sample was powered on and allowed to stabilise to normal working temperature.
The sample was then turned off and submerged in the water tank to a depth of 1metre and for a duration of 30 minutes.



Water test set up



Post test photo



Inspection photos

5.0 Report Summary

The samples were subjected to the test regime outlined in this report.

No ingress of water was noted on either sample and both samples functioned correctly after the test had been completed.

End of Report.

8. CERTIFICATES & TESTS CONT

8.8 ACCREDITATIONS GLOSSARY

MARK	MEANING
	CE. Meets the standard of conformity for products sold within the European Economic Area.
	UL. Conforms to the UL's safety requirements.
	RoHS. Conforms to the Restriction of Hazardous Substances Directive.
	TÜV Rheinland certification. Meets TÜV Rheinland's safety requirements and quality standards.
	SASO COC. Mark to certify that the product complies with the relevant Saudi Arabian technical regulations and national standards.
	Recycling. Is a recyclable material.
	Energy Efficiency grading. Holds the most efficient energy rating.
	KC. Meets Korea's product safety requirements.
	PSE. Meets Japan's product safety requirements.
	PCT. Meets Russian safety requirements.



LED LIGHT SHEET

A product from Applelec

Applelec, Unit 1, Wharfedale Business Park
Shetcliffe Lane, Bradford, West Yorkshire BD4 9RW