TESTING
No. L3110

TEST REPORT

Reference No.	:	WTF13F0503375S
Applicant	:	LED Hong Kong Ltd.
Address	:	No.204, Walok Industrial Building, SanMei Street, FoTan New Territory Hong Kong
Manufacturer	:	The same as above
Address	:	The same as above
Product Name	:	Dimmable LED Downlight
Model No.	:	See model list on page 3
Standards	:	Luminaires Part 2-2: Recessed luminaires IEC 60598-2-2:1996+A1:1997 used in conjunction with IEC 60598-1:2008, and with Australian Deviation IEC 62031:2008 LED modules for general lighting-Safety specifications
Date of Receipt sample	:	2013-04-22
Date of Test	:	2013-04-22 to 2013-05-04
Date of Issue	:	2013-05-04
Test Report Form No.	:	WSL-6059822A-02A
Test Result	:	**Pass***

*Remarks:

The results shown in this test report refer only to the sample(s) tested, this test report cannot be reproduced, except in full, without prior written permission of the company. The report would be invalid without specific stamp of test institute and the signatures of compiler and approver.

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Approved by:

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Test item description	:	Recessed luminaires
Trade Mark	:	---
Model/Type reference	:	See model list on page 3
Ratings	:	See model list on page 3

Copy of marking plate:

Model No.: R10WDLCW-01
240 V~ 50/60 Hz
IP 44 only for lamp parts

Made in china

On the luminaries exterior surface outside the ceiling

Note: the marking labels for other models are identical as above, expect the model No.

Summary of testing:

1. Full tests are performed on R10WDLCW-01. Construction check for all models had been done.
2. The tests result complied with the requirements of the standards mentioned in page one.
3. Only the most unfavorable results are recorded in this report.

Test items particulars:

Classification of installation and use..... : Recessed mounting

Supply Connection..... : Terminal block

..... :

Possible test case verdicts:

- test case does not apply to the test object..... : N (Not applicable)
- test object does meet the requirement..... : P (Pass)
- test object does not meet the requirement..... : F (Fail)

General remarks:

"(see remark #)" refers to a remark appended to the report.
"(see appended table)" refers to a table appended to the report.
Throughout this report a point is used as the decimal separator.

General product information:

1. These products are Class II recessed luminaires.
2. All models are identical, except model name.
3. 240 V~, 50/60 Hz, for other details see model list below.

Item	Model	Input of LED	IP degree for lamp parts	IP degree for LED driver
1	R10WDLCW-01	DC 22V,300mA	IP44	IP20
2	R10WDLWW-01	DC 22V,300mA	IP44	IP20
3	R10WDLCW-15	DC 22V,300mA	IP44	IP20
4	R10WDLWW-15	DC 22V,300mA	IP44	IP20
5	R10WDLCWNZ-01	DC 22V,300mA	IP44	IP20
6	R10WDLWWNZ-01	DC 22V,300mA	IP44	IP20
7	R10WDLCWNZ-15	DC 22V,300mA	IP44	IP20
8	R10WDLWWNZ-15	DC 22V,300mA	IP44	IP20

IEC 60598-2-2			
Clause	Requirement + Test	Result - Remark	Verdict

2.2 (0)	**GENERAL TEST REQUIREMENTS**		**P**
2.2 (0.1)	Information for luminaire design considered	Yes ☒ No ☐	—
2.2 (0.3)	More sections applicable .....:	Yes ☐ No ☒	—

2.4 (2)	**CLASSIFICATION**		**P**
2.4 (2.2)	Type of protection .....:	Class II	—
2.4 (2.3)	Degree of protection (Requirement: Ordinary) .....:	IP 44	—
2.4 (2.4)	Luminaire suitable for direct mounting on normally flammable surfaces .....:	Yes ☒ No ☐	—
	Luminaire not suitable for direct mounting on normally flammable surfaces .....:	Yes ☐ No ☒	—
2.4 (2.5)	Luminaire for normal use .....:	Yes ☒ No ☐	—
	Luminaire for rough service .....:	Yes ☐ No ☒	—

2.5 (3)	**MARKING**		P
2.5 (3.2)	Mandatory markings	See copy of marking plate	P
	Position of the marking		P
	Format of symbols/text		P
2.5 (3.3)	Additional information		P
	Language of instructions	In English	P
2.5 (3.3.1)	Combination luminaires		N
2.5 (3.3.2)	Nominal frequency in Hz	50/60 Hz	P
2.5 (3.3.3)	Operating temperature		N
2.5 (3.3.4)	Symbol or warning notice		N
2.5 (3.3.5)	Wiring diagram		N
2.5 (3.3.6)	Special conditions		N
2.5 (3.3.7)	Metal halide lamp luminaire – warning		N
2.5 (3.3.8)	Limitation for semi-luminaires		N
2.5 (3.3.9)	Power factor and supply current		N
2.5 (3.3.10)	Suitability for use indoors also		N
2.5 (3.3.11)	Luminaires with remote control	No remote control used	N
2.5 (3.3.12)	Clip-mounted luminaire – warning		N
2.5 (3.3.13)	Specifications of protective shields		N
2.5 (3.3.14)	Symbol for nature of supply	~	P
2.5 (3.3.15)	Rated current of socket outlet	No socket outlet used	N
2.5 (3.3.16)	Rough service luminaire		N

IEC 60598-2-2			
Clause	Requirement + Test	Result - Remark	Verdict
2.5 (3.3.17)	Mounting instruction for type Y, type Z and some type X attachments		N
2.5 (3.3.18)	Non-ordinary luminaires with PVC cable		N
2.5 (3.3.19)	rotective conductor current in instruction if applicable		N
2.5 (3.3.20)	Provided with information if not intended to be mounted within arms reach		P
2.5 (3.4)	Test with water	Rubbing lightly for 15 s	P
	Test with hexane	Rubbing lightly for 15 s	P
	Legible after test		P
	Label attached		P
2.5.1 (-)	Warning notice, if not suitable for insulating ceiling		P
2.6 (4)	**CONSTRUCTION**		P
2.6 (4.2)	Components replaceable without difficulty		N
2.6 (4.3)	Wireways smooth and free from sharp edges		P
2.6 (4.4)	Lampholders		N
2.6 (4.4.1)	Integral lampholder		N
2.6 (4.4.2)	Wiring connection		N
2.6 (4.4.3)	Lampholder for end-to-end mounting		N
2.6 (4.4.4)	Positioning		N
	- pressure test (N) .....:	---	N
	After test the lampholder comply with relevant standard sheets and show no damage		N
	After test on single-capped lampholder the lampholder have not moved from its position and show no permanent deformation		N
	- bending test (Nm) .....:	-----	N
	After test the lampholder have not moved from its position and show no permanent deformation		N
2.6 (4.4.5)	Peak pulse voltage		N
2.6 (4.4.6)	Centre contact		N
2.6 (4.4.7)	Parts in rough service luminaires resistant to tracking		N
2.6 (4.4.8)	Lamp connectors		N
2.6 (4.4.9)	Caps and bases correctly used		N
2.6 (4.5)	Starter holders		N
	Starter holder in luminaires other than class II	No starter holder used	N

IEC 60598-2-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Starter holder class II construction		N
2.6 (4.6)	Terminal blocks		N
	Tails		N
	Unsecured blocks		N
2.6 (4.7)	Terminals and supply connections		P
2.6 (4.7.1)	Contact to metal parts		P
2.6 (4.7.2)	Test 8 mm live conductor		N
	Test 8 mm earth conductor		N
2.6 (4.7.3)	Terminals for supply conductors		P
2.6 (4.7.3.1)	Welded connections:		N
	- stranded or solid conductor		N
	- spot welding		N
	- welding between wires		N
	- Type Z attachment		N
	- mechanical test according to 15.8.2		N
	- electrical test according to 15.9		N
	- heat test according to 15.9.2.3 and 15.9.2.4		N
2.6 (4.7.4)	Terminals other than supply connection		N
2.6 (4.7.5)	Heat-resistant wiring/sleeves		N
2.6 (4.7.6)	Multi-pole plug		N
	- test at 30 N		N
2.6 (4.8)	Switches:		N
	- adequate rating		N
	- adequate fixing		N
	- polarized supply		N
	- compliance with 61058-1 for electronic switches		N
2.6 (4.9)	Insulating lining and sleeves		N
2.6 (4.9.1)	Retainement		N
	Method of fixing.....:	---	N
2.6 (4.9.2)	Insulated linings and sleeves		N
	Resistant to a temperature > 20 °C to the wire temperature or		N
	a) & c) Insulation resistance and electric strength		N
	b) Ageing test. Temperature (°C).....:	---	N
2.6 (4.10)	Insulation of Class II luminaires		P

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Clause	Requirement + Test	Result - Remark	Verdict
2.6 (4.10.1)	No contact, mounting surface – accessible metal parts – wiring of basic insulation		P
	Safe installation fixed luminaires		P
	Capacitors and switches		N
	Interference suppression capacitors according to IEC 60384-14		N
2.6 (4.10.2)	Assembly gaps:		N
	- not coincidental		N
	- no straight access with test probe		N
2.6 (4.10.3)	Retainment of insulation:		P
	- fixed		P
	- unable to be replaced; luminaire inoperative		P
	- sleeves retained in position		N
	- lining in lampholder		N
2.6 (4.11)	Electrical connections		P
2.6 (4.11.1)	Contact pressure		P
2.6 (4.11.2)	Screws:		N
	- self-tapping screws		N
	- thread-cutting screws		N
2.6 (4.11.3)	Screw locking:		N
	- spring washer		N
	- rivets		N
2.6 (4.11.4)	Material of current-carrying parts	> 50 % Cu	P
2.6 (4.11.5)	No contact to wood		P
2.6 (4.11.6)	Electro-mechanical contact systems		N
2.6 (4.12)	Mechanical connections and glands		N
2.6 (4.12.1)	Screws not made of soft metal		N
	Screws of insulating material		N
	Torque test: torque (Nm); part .....:	---	N
2.6 (4.12.2)	Screws with diameter < 3 mm screwed into metal	No such screw	N
2.6 (4.12.4)	Locked connections:		N
	- fixed arms; torque (Nm) .....:	---	N
	- lampholder; torque (Nm).....:	---	N
	- push-button switches; torque 0,8 Nm .....:	---	N
2.6 (4.12.5)	Screwed glands; force (N) .....:	---	N
2.6 (4.13)	Mechanical strength		P

IEC 60598-2-2			
Clause	Requirement + Test	Result - Remark	Verdict
2.6 (4.13.1)	Impact tests:		P
	- fragile parts; energy (Nm) ..... :	---	N
	- other parts; energy (Nm)..... :	Enclosure: 0.35 Nm	P
	1) live parts		P
	2) linings		N
	3) protection		P
	4) covers		N
2.6 (4.13.3)	Straight test finger	Enclosure: 30 N	P
2.6 (4.13.4)	Rough service luminaires		N
	- IP54 or higher		N
	a) fixed		N
	b) hand-held		N
	c) delivered with a stand		N
	d) for temporary installations and suitable for mounting on a stand		N
2.6 (4.13.6)	Tumbling barrel		N
2.6 (4.14)	Suspensions and adjusting devices		P
2.6 (4.14.1)	Mechanical load:		P
	A) four times the weight		P
	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
	Fixed luminaire or independent control gear without fixing devices		N
2.6 (4.14.2)	Load to flexible cables		N
	Mass (kg) ..... :	---	N
	Stress in conductors (N/mm²) ..... :	---	N
	Mass (kg) of semi-luminaire ..... :	---	N
	Bending moment (Nm) of semi-luminaire ..... :	---	N
2.6 (4.14.3)	Adjusting devices:		N
	- flexing test; number of cycles ..... :	---	N
	- strands broken		N
	- electric strength test afterwards		N

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Clause	Requirement + Test	Result - Remark	Verdict
2.6 (4.14.4)	Telescopic tubes: cords not fixed to tube; no strain on conductors		N
2.6 (4.14.5)	Guide pulleys		N
2.6 (4.14.6)	Strain on socket-outlets		N
2.6 (4.15)	Flammable materials:		P
	- glow-wire test 650 °C		N
	- spacing ≥ 30 mm		N
	- screen withstanding test of 13.3.1		N
	- screen dimensions		N
	- no fiercely burning material		P
	- thermal protection		N
	- electronic circuits exempted		N
2.6 (4.15.2)	Luminaires made of thermoplastic material with lamp control gear		N
	a) construction		N
	b) temperature sensing control		N
	c) surface temperature		N
2.6 (4.16)	Luminaires for mounting on normally flammable surfaces		P
	No lamp control gear		N
2.6 (4.16.1)	Lamp control gear spacing:		N
	- spacing 35 mm		N
	- spacing 10 mm		N
2.6 (4.16.2)	Thermal protection:		P
	- in lamp control gear		P
	- external		N
	- fixed position		N
	- temperature marked lamp control gear		N
2.6 (4.16.3)	Design to satisfy the test of 12.6	(see 12.6)	N
2.6 (4.17)	Drain holes		N
	Clearance at least 5 mm		N
2.6 (4.18)	Resistance to corrosion:		P
2.6 (4.18.1)	- rust-resistance		N
2.6 (4.18.2)	- season cracking in copper		P
2.6 (4.18.3)	- corrosion of aluminium		N
2.6 (4.19)	Ignitors compatible with ballast	No ignitors used	N
2.6 (4.20)	Rough service vibration		N

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Clause	Requirement + Test	Result - Remark	Verdict
2.6 (4.21)	Protective shield:		N
2.6 (4.21.1)	Shield fitted		N
	Shield of glass if tungsten halogen lamps		N
2.6 (4.21.2)	Particles from a shattering lamp not impair safety		N
2.6 (4.21.3)	No direct path		N
2.6 (4.21.4)	Impact test on shield		N
	Glow-wire test on lamp compartment		N
2.6 (4.22)	Attachments to lamps		N
2.6 (4.23)	Semi-luminaires comply Class II		N
2.6 (4.24)	UV radiation for tungsten halogen lamps and metal halide lamps (Annex P)		N
2.6 (4.25)	No sharp point or edges		P
2.6 (4.26)	Short-circuit protection:		N
2.6 (4.26.1)	Uninsulated accessible SELV parts		N
2.6 (4.26.2)	Short-circuit test		N
2.6 (4.26.3)	Test chain according to Figure 29		N
2.7 (11)	**CREEPAGE DISTANCES AND CLEARANCES**		P
	Working voltage (V).....:	Max.240 V~	—
	Voltage form	Sinusoidal ☒ Non-sinusoidal ☐	—
	PTI	< 600 ☒ > 600 ☐	—
	Impulse withstand category (Normal category II) (Category III Annex U)	Category II ☒ Category III ☐	—
	Rated pulse voltage (kV).....:	---	—
	(1) Current-carrying parts of different polarity: cr (mm); cl (mm).....:	Approved independent SELV output electronic controlgear	P
	(2) Current-carrying parts and accessible parts: cr (mm); cl (mm).....:	Approved independent SELV output electronic controlgear	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) Not used		—
	(6) Current-carrying parts and supporting surface: cr (mm); cl (mm).....:	Approved independent SELV output electronic controlgear	P

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Clause	Requirement + Test	Result - Remark	Verdict

2.8 (7)	**PROVISION FOR EARTHING**		N
2.8 (7.2.1 + 7.2.3)	Accessible metal parts	Class II	N
	Metal parts in contact with supporting surface		N
	Resistance < 0,5 Ω		N
	Two self-tapping screws used		N
	Thread-forming screws		N
	Thread-forming screw used in a grove		N
	Earth makes contact first		N
2.8 (7.2.2 + 7.2.3)	Earth continuity in joints etc.		N
2.8 (7.2.4)	Locking of clamping means		N
	Compliance with 4.7.3		N
	Terminal blocks with integrated screwless earthing contacts tested according Annex V		N
2.8 (7.2.5)	Earth terminal integral part of connector socket		N
2.8 (7.2.6)	Earth terminal adjacent to mains terminals		N
2.8 (7.2.7)	Electrolytic corrosion of the earth terminal		N
2.8 (7.2.8)	Material of earth terminal		N
	Contact surface bare metal		N
2.8 (7.2.10)	Class II luminaire for looping-in		N
	Double or reinforced insulation to functional earth		N
2.8 (7.2.11)	Earthing core coloured green-yellow		N
	Length of earth conductor		N

2.9 (14)	**SCREW TERMINALS**		**N**
	Separately approved; component list	(see Annex 1)	N
	Part of the luminaire	(see Annex 3)	N

2.9 (15)	**SCREWLESS TERMINALS AND ELECTRICAL CONNECTIONS**		**N**
	Separately approved; component list	(see Annex 1)	N
	Part of the luminaire	(see Annex 4)	N

2.10 (5)	**EXTERNAL AND INTERNAL WIRING**		**P**
2.10 (5.2)	Supply connection and external wiring		P
2.10 (5.2.1)	Means of connection .....:	Connecting leads	P

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Clause	Requirement + Test	Result - Remark	Verdict
2.10 (5.2.2)	Type of cable.....:	---	N
	Nominal cross-sectional area (mm²).....:	---	N
	Cables equal to IEC 60227 or IEC 60245		N
2.10 (5.2.3)	Type of attachment, X, Y or Z		N
2.10 (5.2.5)	Type Z not connected to screws		N
2.10 (5.2.6)	Cable entries:		N
	- suitable for introduction		N
	- adequate degree of protection		N
2.10 (5.2.7)	Cable entries through rigid material have rounded edges		N
2.10 (5.2.8)	Insulating bushings:		N
	- suitably fixed		N
	- material in bushings		N
	- material not likely to deteriorate		N
	- tubes or guards made of insulating material		N
2.10 (5.2.9)	Locking of screwed bushings		N
2.10 (5.2.10)	Cord anchorage:		N
	- covering protected from abrasion		N
	- clear how to be effective		N
	- no mechanical or thermal stress		N
	- no tying of cables into knots etc.		N
	- insulating material or lining		N
2.10 (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 anchorage		N
	Labyrinth type anchorages		N
2.10 (5.2.10.2)	Adequate cord anchorage for type Y and type Z attachment		N
2.10 (5.2.10.3)	Tests:		N

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Clause	Requirement + Test	Result - Remark	Verdict
	- 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 conductors		N
	- no damage of cable or cord		N
2.10 (5.2.11)	External wiring passing into luminaire		N
2.10 (5.2.12)	Looping-in terminals		N
2.10 (5.2.13)	Wire ends not tinned		N
	Wire ends tinned: no cold flow		N
2.10 (5.2.14)	Mains plug same protection		N
	Class III luminaire plug		N
2.10 (5.2.16)	Appliance inlets (IEC 60320)		N
	Appliance couplers of class II type		N
2.10 (5.2.17)	No standardized interconnecting cables properly assembled		N
2.10 (5.2.18)	Used plug in accordance with		N
	- IEC 60083		N
	- other standard		N
2.10 (5.3)	Internal wiring		P
2.10 (5.3.1)	Internal wiring of suitable size and type	(see Annex 1)	P
	Through wiring		N
	- not delivered/ mounting instruction		N
	- factory assembled		N
	- socket outlet loaded (A) .....:	---	N
	- temperatures .....:	---	N
	Green-yellow for earth only		N
2.10 (5.3.1.1)	Internal wiring connected directly to fixed wiring		P
	Cross-sectional area (mm²).....:	(see Annex 1)	P
	Insulation thickness		P
	Extra insulation added where necessary		N
2.10 (5.3.1.2)	Internal wiring connected to fixed wiring via internal current-limiting device		P
	Adequate cross-sectional area and insulation thickness		P
2.10 (5.3.1.3)	Double or reinforced insulation for class II		P
2.10 (5.3.1.4)	Conductors without insulation		N

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Clause	Requirement + Test	Result - Remark	Verdict
2.10 (5.3.1.5)	SELV current-carrying parts		P
2.10 (5.3.1.6)	Insulation thickness other than PVC or rubber	PVC	N
2.10 (5.3.2)	Sharp edges etc.		P
	No moving parts of switches etc.		N
	Joints, raising/lowering devices		N
	Telescopic tubes etc.		N
	No twisting over 360°		N
2.10 (5.3.3)	Insulating bushings:		N
	- suitable fixed		N
	- material in bushings		N
	- material not likely to deteriorate		N
	- cables with protective sheath		N
2.10 (5.3.4)	Joints and junctions effectively insulated		N
2.10 (5.3.5)	Strain on internal wiring		N
2.10 (5.3.6)	Wire carriers		N
2.10 (5.3.7)	Wire ends not tinned		P
	Wire ends tinned: no cold flow		N
2.11 (8)	**PROTECTION AGAINST ELECTRIC SHOCK**		P
2.11 (8.2.1)	Live parts not accessible with standard test finger		P
	Basic insulated parts not used on the outer surface without appropriate protection		P
	Basic insulated parts not accessible with standard test finger on portable and adjustable luminaires		N
	Basic insulated parts not accessible with Ø 50 mm probe from outside, within arms reach, on wall mounted luminaires		N
	Lamp and starterholders in portable and adjustable luminaires comply with double or reinforced insulation requirements		N
	Basic insulation only accessible under lamp or starter replacement		N
	Protection in any position		P
	Double-ended tungsten filament lamp		N
	Insulation lacquer not reliable		N
	Double-ended high pressure discharge lamp		N
	Relevant warning according to 3.2.18 fitted to the luminaire		N

IEC 60598-2-2			
Clause	Requirement + Test	Result - Remark	Verdict

2.11 (8.2.2)	Portable luminaire adjusted in most unfavourable position		N
2.11 (8.2.3)	a) Class II luminaire:		P
	- basic insulated metal parts not accessible during starter or lamp replacement		P
	- basic insulation not accessible other than during starter or lamp replacement		P
	- glass protective shields not used as supplementary insulation		N
	b) BC lampholder of metal in class I luminaires shall be earthed		N
	c) Class III luminaires with exposed SELV parts:		N
	Ordinary luminaire:		N
	- touch current		N
	- no-load voltage		N
	Other than ordinary luminaire:		N
	- nominal voltage		N
2.11 (8.2.4)	Portable luminaire:		N
	- protection independent of supporting surface		N
	- terminal block completely covered		N
2.11 (8.2.5)	Compliance with the standard test finger or relevant probe		P
2.11 (8.2.6)	Covers reliably secured		P
2.11 (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

2.12 (12)	**ENDURANCE TEST AND THERMAL TEST**		--
2.12 (12.3)	Endurance test:		P
	- mounting-position.....:	As in normal use	—
	- test temperature (°C) .....:	35 °C	—
	- total duration (h).....:	240 h	—
	- supply voltage: Un factor; calculated voltage (V):	1.1U_R=264.0 V ; I=0.039 A; P=9.1W; cosφ=0.883	—
	- lamp used.....:	LED integral	—
2.12 (12.3.2)	After endurance test:		P

IEC 60598-2-2			
Clause	Requirement + Test	Result - Remark	Verdict
	- no part unserviceable		P
	- luminaire not unsafe		P
	- no damage to track system		N
	- marking legible		P
	- no cracks, deformation etc.		P
2.12 (12.4)	Thermal test (normal operation)	(see Annex 2)	P
2.12 (12.5)	Thermal test (abnormal operation)	(see Annex 2)	N
2.12 (12.6)	Thermal test (failed lamp control gear condition):		N
2.12 (12.6.1)	Through wiring or looping-in wiring loaded by a current of (A) .....:	---	—
	- case of abnormal conditions .....:	---	—
	- electronic lamp control gear		N
	- measured winding temperature (°C): at 1,1 U_n ..:		—
	- measured mounting surface temperature (°C) at 1,1 U_n.....:	---	N
	- calculated mounting surface temperature (°C) ..:	---	N
	- track-mounted luminaires		N
2.12 (12.6.2)	Temperature sensing control		N
	- case of abnormal conditions .....:	---	—
	- thermal link		N
	- manual reset cut-out		N
	- auto reset cut-out		N
	- measured mounting surface temperature (°C) ...:	---	N
	- track-mounted luminaires		N
2.12 (12.7)	Thermal test (failed lamp control gear in plastic luminaires):		N
2.12 (12.7.1)	Luminaire without temperature sensing control		N
2.12 (12.7.1.1)	Luminaire with fluorescent lamp ≤ 70W		N
	Test method 12.7.1.1 or Annex V .....:	---	—
	Test according to 12.7.1.1:		N
	- case of abnormal conditions		—
	- Ballast failure at supply voltage (V) .....:	---	—
	- Components retained in place after the test		N
	- Test with standard test finger after the test		N
	Test according to Annex V:		N
	- case of abnormal conditions		—

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Clause	Requirement + Test	Result - Remark	Verdict
	- measured winding temperature (°C): at 1,1 U_n...:		—
	- measured temperature of fixing point/exposed part (°C): at 1,1 U_n.....:	---	—
	- calculated temperature of fixing point/exposed part (°C).....:	---	—
	Ball-pressure test:		N
	- part tested; temperature (°C) .....:	---	N
	- part tested; temperature (°C) .....:	---	N
2.12 (12.7.1.2)	Luminaire with discharge lamp, fluorescent lamp > 70W, transformer > 10 VA		N
	- case of abnormal conditions		—
	- measured winding temperature (°C): at 1,1 U_n...:		—
	- measured temperature of fixing point/exposed part (°C): at 1,1 U_n.....:	---	—
	- calculated temperature of fixing point/exposed part (°C).....:	---	—
	Ball-pressure test:		N
	- part tested; temperature (°C) .....:	---	N
	- part tested; temperature (°C) .....:	---	N
2.12 (12.7.1.3)	Luminaire with short circuit proof transformers ≤ 10 VA		N
	- case of abnormal conditions		—
	- Components retained in place after the test		N
	- Test with standard test finger after the test		N
2.12 (12.7.2)	Luminaire with temperature sensing control		N
	- thermal link	Yes ☐ No ☐	—
	- manual reset cut-out	Yes ☐ No ☐	—
	- auto reset cut-out	Yes ☐ No ☐	—
	- case of abnormal conditions		—
	- highest measured temperature of fixing point/exposed part (°C): .....:	---	—
	Ball-pressure test:		N
	- part tested; temperature (°C) .....:	---	N
	- part tested; temperature (°C) .....:	---	N

2.13 (9)	**RESISTANCE TO DUST, SOLID OBJECTS AND MOISTURE**	--
2.13 (9.2)	Tests for ingress of dust, solid objects and moisture:	P

IEC 60598-2-2			
Clause	Requirement + Test	Result - Remark	Verdict
	- classification according to IP.....:	IP 44 for lamp parts	—
	- mounting position during test.....:	Acc. to user manual	—
	- fixing screws tightened; torque (Nm) .....:	-----	—
	- tests according to clauses.....:	9.2.0 and 9.2.5	—
	- electric strength test afterwards	See section 10	P
	a) no deposit in dust-proof luminaire		N
	b) no talcum in dust-tight luminaire		N
	c) no trace of water on current-carrying 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		N
	f) no contact with live parts (IP 2X)		N
	f) no entry into enclosure (IP 3X and IP 4X)		P
	f) no contact with live parts (IP3X and IP4X)		P
	g) no trace of water on part of lamp requiring protection from splashing water		P
	h) no damage of protective shield or glass envelope		N
2.13 (9.3)	Humidity test 48 h	R.H.: 93 %, 25 °C	P
2.14 (10)	**INSULATION RESISTANCE AND ELECTRIC STRENGTH**		P
2.14 (10.2.1)	Insulation resistance test		P
	Cable or cord covered by metal foil or replaced by a metal rod of mm Ø .....:	Metal foil	—
	Insulation resistance (MΩ)		—
	SELV:		P
	- between current-carrying parts of different polarity.....:	---	N
	- between current-carrying parts and mounting surface.....:	$R_{insulation}$ > 100 MΩ	P
	- between current-carrying parts and metal parts of the luminaire.....:	$R_{insulation}$ > 100 MΩ	P
	Other than SELV:		P
	- between live parts of different polarity .....:	$R_{insulation}$ > 100 MΩ	P
	- between live parts and mounting surface .....:	$R_{insulation}$ > 100 MΩ	P

IEC 60598-2-2			
Clause	Requirement + Test	Result - Remark	Verdict
	- between live parts and metal parts .....:	$R_{insulation}$ > 100 MΩ	P
	- between live parts of different polarity through action of a switch.....:	---	N
2.14 (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:		P
	- between current-carrying parts of different polarity.....:	---	N
	- between current-carrying parts and mounting surface.....:	500 V	P
	- between current-carrying parts and metal parts of the luminaire.....:	500 V	P
	Other than SELV:		P
	- between live parts of different polarity .....:	1480 V	P
	- between live parts and mounting surface .....:	2960 V	P
	- between live parts and metal parts .....:	2960 V	P
	- between live parts of different polarity through action of a switch.....:	---	N
2.14 (10.3)	Touch current (mA) .....:	Max. 0.03 mA < 0.7 mA	P
	Protective conductor current .....:	---	N

2.15 (13)	**RESISTANCE TO HEAT, FIRE AND TRACKING**		
2.15 (13.2.1)	Ball-pressure test:		
	- part tested; temperature (°C).....:	LED board, 125 °C, 1.0 mm	P
	- part tested; temperature (°C).....:	Connector, 125 °C, 1.0 mm	P
2.15 (13.3.1)	Needle flame test (10 s):		
	- part tested.....:	---	N
2.15 (13.3.2)	Glow-wire test (650°C):		
	- part tested.....:	See Australian deviation	P
2.15 (13.4.1)	Tracking test:		N
	- part tested.....:	---	N

IEC 60598-2-2			
Clause	Requirement + Test	Result - Remark	Verdict

ANNEX 1	**Components**					**P**
object/part No.	code	manufacturer/ trademark	type/model	technical data	Standard	mark(s) of conformity
LED board	B	SHUNDE JUNDA ELECTRONIC CO LTD	JD-D	130°C	--	UL E173873
LED	C	LIGHTNING	T3B00SL (C、W)A	80 mA	--	Tested with appliance
LED driver	B	CAPTAIN GROUP LIMITED	CPT-PS300	Input:220-240,50/60Hz,0.1A;Output:DC9-48V,0.3A,t_a:50°C, t_c:70°C, Independent, Class II	AS/NZS 61347.1 IEC 61347-2-13	SAA120912EA
Output wire for LED driver and lead wire for LED	B	SHENZHEN YIMEITE ELECTRIC CABLE CO LTD	2464	300VAC,80°C,20 AWG	--	UL E318342

The codes above have the following meaning:
A - The component is replaceable with another one, also certified, with equivalent characteristics
B - The component is replaceable if authorised by the test house
C - Integrated component tested together with the appliance
D - Alternative component

IEC 60598-2-2			
Clause	Requirement + Test	Result - Remark	Verdict

ANNEX 2	**Temperature measurements, thermal tests of Section 12**	

	Type reference .....:	R10WDLCW-01	—
	Lamp used.....:	Integral LED	—
	Lamp control gear used .....:	CPT-PS300	—
	Mounting position of luminaire .....:	Acc. to user manual	—
	Supply wattage (W).....:	8.7	—
	Supply current (A) .....:	0.040	—
	Calculated power factor .....:	0.86	—
	Table: measured temperatures corrected for t_a = 25 °C:		P
	- abnormal operating mode :	Short-circuited LED	—
	- test 1: rated voltage	-----	—
	- test 2: 1,06 times rated voltage or 1,05 times rated wattage.....	1,06 times rated voltage	—
	- test 3: Load on wiring to socket-outlet, 1,06 times voltage or 1,05 times wattage	-----	—
	- test 4: 1,1 times rated voltage or 1,05 times rated wattage.....	1,1 times rated voltage	—
	Through wiring or looping-in wiring loaded by a current of A during the test	-----	—

temperature (°C) of part	Clause 12.4 – normal				Clause 12.5 – abnormal	
	test 1	test 2	test 3	limit	test 4	limit
Input cable for LED driver	--	34.6	--	90	--	--
Output cable for LED driver	--	47.4	--	80	--	--
LED driver top outside	--	47.4	--	t_c70	58.0	Ref.
LED board	--	59.9	--	Ref.	--	--
Connector	--	39.0	--	Ref.	--	--
Internal wire near LED board	--	51.0	--	80	--	--
Mounting surface (flammable surface)	--	42.1	--	90	48.6	130
Surface illuminated by lamp(0.1m)	--	28.5	--	90	45.8	130
Ambient	--	25.0	--	--	25.0	--

IEC 60598-2-2			
Clause	Requirement + Test	Result - Remark	Verdict

ANNEX 3	**Screw terminals (part of the luminaire)**	**N**

(14)	SCREW TERMINALS		N
(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 (mm²).....:		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
	Pull test; pull (N).....:		N
(14.4.8)	Without undue damage		N

ANNEX 4	**Screwless terminals (part of the luminaire)**	**N**

(15)	**SCREWLESS TERMINALS**		—
(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

IEC 60598-2-2			
Clause	Requirement + Test	Result - Remark	Verdict
(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 in 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 (4 N, 4 samples)….:	-----	N
(15.5.1.2)	Pull test pin or tab terminals (4 N, 4 samples)……:	-----	N
	Insertion force not exceeding 50 N		N
(15.5.2)	Permanent connections: pull-off test (20 N)		N
(15.6)	Electrical tests		
	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 (4 samples).....:	-----	N
	Voltage drop (mV) after 50th alt. 100th cycle (4 samples).....:	-----	N
	After ageing, voltage drop (mV) after 10th alt. 25th cycle (4 samples) .....:	-----	N
	After ageing, voltage drop (mV) after 50th alt. 100th cycle (4 samples) .....:	-----	N
(15.7)	Terminals external wiring		N
	Terminal size and rating		N
(15.8.1)	Pull test spring-type terminals or welded connections (4 samples); pull (N) .....:	-----	N
	Pull test pin or tab terminals (4 samples); pull (N) .....:	-----	N
(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	-----	N
	Voltage drop after 10th alt. 25th cycle		N
	Max. allowed voltage drop (mV).....:	-----	—

IEC 60598-2-2			
Clause	Requirement + Test	Result - Remark	Verdict

terminal	1	2	3	4	5	6	7	8	9	10
voltage drop (mV)	---	---	---	---	---	---	---	---	---	---
	Voltage drop after 50th alt. 100th cycle									N
	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									N
	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									N
	Max. allowed voltage drop (mV).....:					-----				—
terminal	1	2	3	4	5	6	7	8	9	10
voltage drop (mV)	---	---	---	---	---	---	---	---	---	---

Australian deviation			
Clause	Requirement + Test	Result - Remark	Verdict

ANNEX 5	**Australian deviation (AS/NZS 60598.2.2)**	**P**

2.5 (3)	**Marking**		
(3.3.12)	Terminations shall be clearly marked or otherwise identified -In Australia, luminaries with non-detachable flexible cables or cords which are intended to be connected to the supply via a socket-outlet and which are not fitted with a plug are not permitted.		P
(3.3)	Additional information -Instructions and other texts required by this Standard shall be written in English. Compliance is checked by inspection.		P
(3.3.7)	Luminaires provided with metal halide lamps -To avoid potential unsafe lamp failure, the luminaire should be switched off at least once a week.		N
(3.3.10)	Indoor and outdoor use		N

2.6 (4)	**CONSTRUCTION**		
(4.4.1)	Integral lampholder -G5 lampholders are assessed for access to live parts during lamp replacements and with the lamp removed.		N
(4.16)	Luminaires marked with F-symbol -Luminaires not marked with the warning symbol, shall comply with one of the following requirements of 4.16.1, 4.16.2 or 4.16.3. Table 4.6 gives guidance on when to use the symbol or warning notice	F-symbol is deleted acc. to IEC 60598-1:2008	P

2.10 (5)	**EXTERNAL AND INTERNAL WIRING**		
(5.2.1)	Means of connection : -Portable luminaries with non detachable cables or cords shall be fitted with plugs complying with AS/NZS 3112. The plug portion of the luminaire with integral pins shall comply with Appendix J of AS/NZS 3112. Also see note under Clause 3.2.12.		N
(5.2.16)	Appliance inlets -Installation couplers complying with AS/NZS 61535.1(Int) are an acceptable alternative in Australia and New Zealand.		N

2.11 (8)	**PROTECTION AGAINST ELECTRIC SHOCK**	

Australian deviation			
Clause	Requirement + Test	Result - Remark	Verdict
(8.2.1)	Live parts not accessible -For testing G5 lampholders, see Clause 4.4.1		N
(8.2.4)	Portable luminaire: For Class I portable luminaries and luminaire for wall mounting within arm's reach (see Clause 1.4.12 of AS/NZS 3000), terminal blocks shall be completely covered and it shall not be possible to touch basic insulation unless opened for replacement of lamps or replaceable control gear.		N
2.12 (12)	**ENDURANCE TEST AND THERMAL TEST**		
(12.4.1)	Note: Luminaire manufacturers are advised to consider maximum ambient air temperature of a component such as starting device, electronic ballast or converter etc.		N
2.15 (13)	**RESISTANCE TO HEAT, FIRE AND TRACKING**		
(13.3.1)	Parts of insulating material retaining current-carrying parts in position shall withstand the test glow-wire at 750 ºC:		
	- part tested ..... :	---	N
	- part tested ..... :	---	N
(13.3.2)	Parts of insulating material which do not retain live parts in position, but which provide protection against electric shock, and parts of insulating material retaining SELV parts in position shall withstand the glow-wire test at 650 ºC:		
	- part tested ..... :	LED board, connector	P
(13.3.3)	During the application of the glow-wire tests of sub clauses 13.3.1 and 13.3.2, the height and duration of the flames are measured.	No flame produced	

IEC 62031			
Clause	Requirement + Test	Result - Remark	Verdict
ANNEX 6	**LED modules for general lighting – Safety specifications IEC 62031: 2008**		**P**
4	**GENERAL REQUIREMENTS**		P
4.4	Integral modules treated as part of luminaires defined in clause 0.5 of IEC 60598-1		P
4.5	Independent modules complies with requirements in IEC 60598-1		N
6	**CLASSIFICATION**		
	Built-in module ..... :	Yes ☐ No ☒	—
	Independent module..... :	Yes ☐ No ☒	—
	Integral module ..... :	Yes ☒ No ☐	—
	For Integral module; Note to 1.2.1 in IEC 60598-1 applies.		P
13	**FAULT CONDITIONS**		P
13.1	In compliance with IEC 61347-1 (clause numbers between parentheses refer to IEC 61347-1)		P
	When operated under fault conditions the LED-module:		P
	- does not emit flames or molten material		P
	- does not produce flammable gases		P
	- protection against accidental contact not impaired		P
	Thermally protected controlgear does not exceed the marked temperature value		N
	Fault conditions: capacitors, resistors or inductors without proof of compliance with relevant specifications have been short-circuited or disconnected		N
- (14.1)	Short-circuit of creepage distances and clearances if less than specified in clause 16 in Part 1 (except between live parts and accessible metal parts)		N
	Distances on printed boards provided with coating according to IEC 60664-3		N
- (14.2)	Short-circuit or interruption of semiconductor devices	LED	P
- (14.3)	Short-circuit across insulation consisting of lacquer, enamel or textile		N
- (14.4)	Short-circuit across electrolytic capacitors		N
- (14.5)	During the tests, a five-layer tissue paper, where the test specimen is wrapped, does not ignite		P
	After the tests the insulation resistance with d.c. 500 V (MΩ) are ≥ 1 MΩ ..... :	100 MΩ	P

IEC 62031			
Clause	Requirement + Test	Result - Remark	Verdict
	Temperature declared thermally protected LED-modules fulfil the requirements in Annex C of IEC 61437-1		N
13.2	Module withstands overpower condition >15 min.		P
	Module with automatic protective device or power limiter, test performed 15 min. at limit.		N
	During the tests, tissue paper, spread below module, does not ignite		P
15	**CONSTRUCTION**		P
	Wood, cotton, silk, paper and similar fibrous material not used as insulation		P
A	**ANNEX A - TESTS**		P
	All tests performed in accordance with the advice given in Annex H of IEC 61347-1, if applicable		P

========== End of Test Report ==========

Photo Documentation

Reference No.: WTF13F0503375S

Model: R10WDLCW-01

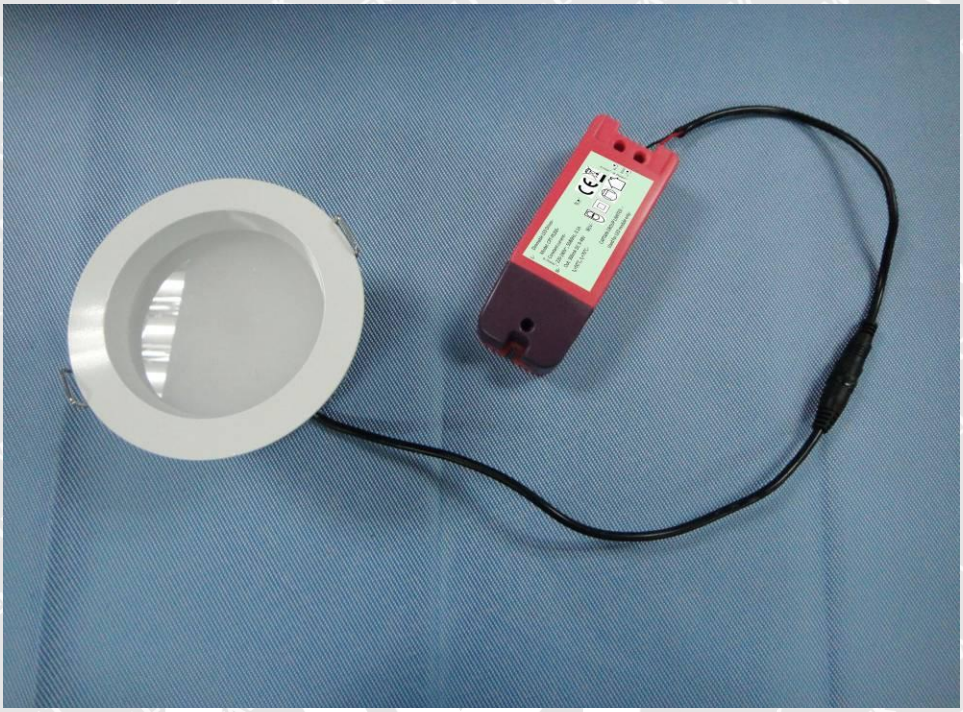

Photo 1

Photo 2

Photo Documentation

Reference No.: WTF13F0503375S

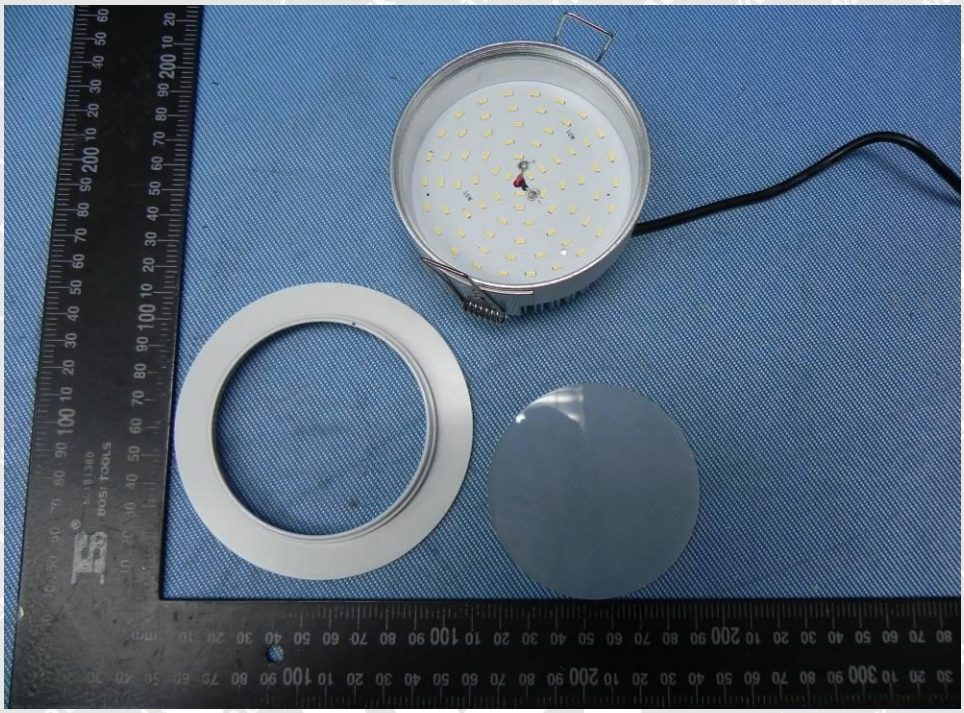

Photo 3

Photo 4

Photo Documentation

Reference No.: WTF13F0503375S

Photo 5

Photo 6