

APPLICATION FOR LOW VOLTAGE DIRECTIVE

On Behalf of

TELBIX PTY LTD

LED Downlight


**Model: DL REVO 110-830;DL REVO 110-830D;
DL REVO 110-850;DL REVO 110-850D**

Prepared For : TELBIX PTY LTD

93 Blair Street Broadmeadows Vic 3047



Date of Test : May 12, 2015 to May 18,2015
Date of Report : May 21,2015
Report Number : ED150511024S

TEST REPORT Amendment A to AS/NZS 60598.2.2 Part 2.2: Particular requirement s– Recessed luminaires	
Report reference No.....	ED150511024S
Tested by.....	Bill Li
Approved by	Eric Duan
Date of issue	May 21, 2015
Contents	10 pages
	
Testing laboratory	
Name	DONGGUAN EMTEK CO., LTD.
Address	No.281, Guantai Road, Nancheng District, Dongguan, Guangdong, China.
Testing location	Same as above
Client	
Applicant name	TELBIX PTY LTD
Address	93 Blair Street Broadmeadows Vic 3047
Test specification	
Standard	AS/NZS 60598.2.2:2001/AMD A
Test procedure	Safety
Procedure deviation	N.A
Non-standard test method	N.A
Test item	
Description.....	LED Downlight
Trademark	N/A
Model and/or type reference	DL REVO 110-830;DL REVO 110-830D;DL REVO 110-850; DL REVO 110-850D;
Rating(s)	Please see general information for details

Test item particulars	See "General product information"										
Possible test case verdicts:											
- test case does not apply to the test object.....	N/A (not applicable)										
- test object does meet the requirement.....	P (Pass)										
- test object does not meet the requirement.....	F (Fail)										
Testing											
Date of receipt of test item	May 11, 2015										
Date (s) of performance of tests	May 18, 2015 to May 20,2015										
General remarks:											
<p>The test results presented in this report relate only to the object tested. This report shall not be reproduced, except in full, without the written approval of the Issuing testing laboratory. "(see Enclosure #)" refers to additional information appended to the report. "(see appended table)" refers to a table appended to the report. List of test equipment must be kept on file and available for review. Throughout this report a comma (point) is used as the decimal separator.</p>											
General product information:											
Four models are covered in this test report. There is no difference among those products except model name.											
<table border="1"> <thead> <tr> <th>Model No.</th> <th>Input</th> </tr> </thead> <tbody> <tr> <td>DL REVO 110-830</td> <td>240V,50/60Hz,10W</td> </tr> <tr> <td>DL REVO 110-830D</td> <td>240V,50/60Hz,10W</td> </tr> <tr> <td>DL REVO 110-850</td> <td>240V,50/60Hz,10W</td> </tr> <tr> <td>DL REVO 110-850D</td> <td>240V,50/60Hz,10W</td> </tr> </tbody> </table>	Model No.	Input	DL REVO 110-830	240V,50/60Hz,10W	DL REVO 110-830D	240V,50/60Hz,10W	DL REVO 110-850	240V,50/60Hz,10W	DL REVO 110-850D	240V,50/60Hz,10W	
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DL REVO 110-850D	240V,50/60Hz,10W										

Copy of marking plate

Marking on enclosure (these markings are samples)

Note:

- The above markings are the minimum requirements required by the safety standard. For the final production, the additional markings which do not give rise to misunderstanding may be added.
- The model no. can be replaced by others listed in this report.
- The height of WEEE marking is at least 7 mm respectively.

Summary of testing:

Relevant test as specified by the applicant as below been tested according to standard AS/NZS 60598.2.2:2001/AMD A and found to comply with the requirements as stated in the standard as listed. And the model DL REVO 110-850D has been chosen to subject the test.

AS/NZS 60598.2.2:2001 Amendment A			
Clause	Requirement + Test	Result - Remark	Verdict
2.3	Definitions		
2.3.1	"C" Closed recessed luminaire		
2.3.2	"CA" (Closed and abutted allowing side contact with insulation) recessed luminaire		
2.3.3	"NON IC" (No contact and no covering with insulation) recessed luminaire		
2.3.4	"IC" (Insulation contact) recessed luminaire		
2.3.5	"IC-F" (Insulation contact – fire resistant) recessed luminaire		
2.3.6	MIC – Minimum insulation clearance	MIC: 25mm	
2.3.7	SCB – Side clearance to building element	SCB: 50mm	
2.3.8	HCB – Height clearance to building element	HCB: 50mm	
2.3.9	SCI – Side clearance to insulation	--	
2.3.10	Building insulation		
2.4	Classification of luminaires		
	- Luminaires shall be classified in accordance with the provisions of AS/NZS 60598.1 and the following.		P
2.4.1	Classification according to the degree of contact between the luminaire and building insulation around it		P
	a) IC-F – building insulation that can safely be continuously exposed to 90°C allowed to abut and cover the luminaire.		N/A
	b) IC – building insulation that can safely be continuously exposed to 90°C allowed to abut and cover the luminaire.		P
	c) CA 80 – building insulation that can safely be continuously exposed to 90°C allowed to abut the luminaire.		N/A
	d) CA 135 – building insulation that can safely be continuously exposed to temperatures up to 150°C allowed to abut the luminaire.		N/A
	e) NON IC – luminaire not suitable for covering or abutting with building insulation.		N/A
2.5	Marking		P
2.5.1	Insulating ceiling IC-F mark		N/A
2.5.2	Insulating ceiling IC mark		P

AS/NZS 60598.2.2:2001 Amendment A			
Clause	Requirement + Test	Result - Remark	Verdict
2.5.3	Insulating ceiling CA 80 mark		N/A
2.5.4	Insulating ceiling CA 135 mark		N/A
2.5.5	Insulating ceiling NON IC mark		N/A
2.5.6	Restriction on use of luminaires		N/A
2.5.7	Luminaires supplied with control gear		N/A
2.6	Construction		
2.6.1	Thermal protectors		N/A
	If thermal protectors are used to meet the requirements of Annex ZA they shall comply with the safety requirements specified in IEC 60730-1		N/A
	-self-resetting thermal cut-outs-----10000		N/A
	-voltage maintained non-self-resetting thermal cut-outs-----1000		N/A
	- other non-self-resetting thermal cut-outs----30		N/A
2.6.2	Protection against building insulation contact for Type IC-F IC, CA 80 and CA 135 recessed luminaires		P
	For IC-F recessed luminaires compliance is determined by applying the test of clause 13.2 for first characteristic numeral 4 of IEC 60529. Additionally, there shall be no openings in horizontal surfaces, or surfaces within 20 degrees of the horizontal, on the top of the recessed luminaire.		N/A
	For IC, CA 80 and CA 135 recessed luminaires compliance is determined by applying the test probe 1 of IEC 61032 with a force of $3N \pm 10\%$ to all surfaces and all openings excluding the opening for the light output. The temperature of any part of the reflector, bracketry, body, lamp or lampholder which the probe contacts shall not exceed 80°C for IC and CA 80 type luminaires or 135°C for CA 135 type luminaires.		P
	For Type IC recessed luminaires that do not have a thermal protector it shall not be possible for the test probe to contact the lamp or the lampholder.	No thermal protector used	N/A
2.6.3	Building insulation abutting or covering luminaires		P
	a) Maintain its dimensions and structural integrity when exposed to the maximum surface temperature of the class of luminaire, being 150°C in the case of CA-135 luminaires and 90°C in the case of IC-F, IC and CA-80 luminaires;		P

AS/NZS 60598.2.2:2001 Amendment A			
Clause	Requirement + Test	Result - Remark	Verdict
	b) When intended to be in contact with IC, CA 80 and CA 135 recessed luminaires, withstand a 30 s needle flame test carried out in accordance with AS/NZS 60695.11.5 with the flame applied to all surfaces of the sample.		P
2.10	External and internal wiring		
	For IC-F recessed luminaires the tests of 2.12 shall be conducted with two supply cables fitted		N/A
2.12	Endurance tests and thermal tests		
	For Type IC-F, IC, CA 80 and CA 135 recessed luminaires the requirements of Annex ZA also apply		P
ZA	Annex ZA (Normative)		
ZA.1	Type IC-F, IC, CA 80 and CA 135 recessed luminaires shall be subjected to the following tests and operated as described in clause 12.4.1 of AS/NZS 60598.1. The test shall be conducted on a separate sample to that used for the tests of AS/NZS 60598.1.		P
ZA.2	The test sample is mounted in a wooden test box with internal dimensions 1200 mm (L) x 450 mm (W) by 300 mm (H) and a base thickness of 15 to 20 mm. The test sample is mounted 75mm from one wall and centrally in the other horizontal dimension. See figure ZA.1.		P
ZA.3	For CA 80 and CA 135 luminaires the test box is filled with a single piece of approximately 200 mm thick glass wool thermal insulation having a thermal resistivity (R-value) of 3.2 such that it closely abuts the test sample without compressing or deforming the insulation.		N/A
	- For IC-F and IC luminaires the test box is completely filled with glass wool thermal insulation fully contacting the luminaire.		P
ZA.4	Three thermocouples, T1, are mounted on the side of the test box 75 mm from the test sample at the hottest locations. The thermocouples shall be in a vertical plane through the centreline of the test sample. One thermocouple, T2, is positioned on the ceiling of the test box directly above the test sample at the hottest location and a further thermocouple, T3, is positioned on the mounting ring.		P
ZA.5	Normal test		

AS/NZS 60598.2.2:2001 Amendment A																		
Clause	Requirement + Test	Result - Remark	Verdict															
	-The test sample is fitted with the hottest recommended lamp and the test sample operated for six hours or until the fixture has stabilised thermally.		P															
	During the test the hottest point on the outer surface of the test sample where it is abutted by insulation (for example, the reflector, bracketry or body) shall be determined, T4, and the temperature measured.		P															
	<p>- The maximum temperature at any thermocouple shall not exceed the values in table ZA.1.</p> <p>Additionally, the limits of table 12.1 of AS/NZS 60958.1 shall not be exceeded during the test.</p> <p>Table ZA.1 – Normal test – Maximum thermocouple temperature</p> <table border="1"> <thead> <tr> <th>Thermocouple reference (figure ZA.1)</th> <th>IC-F</th> <th>IC</th> <th>CA 80</th> <th>CA 135</th> </tr> </thead> <tbody> <tr> <td>T1, T2, T3</td> <td>90°C</td> <td>90°C</td> <td>90°C</td> <td>90°C</td> </tr> <tr> <td>T4</td> <td>80°C</td> <td>80°C</td> <td>80°C</td> <td>135°C</td> </tr> </tbody> </table> <p>Thermal protectors shall not operate during the test.</p>	Thermocouple reference (figure ZA.1)	IC-F	IC	CA 80	CA 135	T1, T2, T3	90°C	90°C	90°C	90°C	T4	80°C	80°C	80°C	135°C	See annex 7	P
Thermocouple reference (figure ZA.1)	IC-F	IC	CA 80	CA 135														
T1, T2, T3	90°C	90°C	90°C	90°C														
T4	80°C	80°C	80°C	135°C														
ZA.6	Abnormal test 1																	
	<p>The maximum temperature of any thermocouple shall not exceed the values in table ZA.2.</p> <p>Table ZA.2 – Abnormal test 1 – Maximum thermocouple temperatures</p> <table border="1"> <thead> <tr> <th>Thermocouple reference (figure ZA.1)</th> <th>IC-F</th> <th>IC</th> <th>CA 80</th> <th>CA 135</th> </tr> </thead> <tbody> <tr> <td>T1, T2, T3</td> <td>90°C</td> <td>90°C</td> <td>90°C</td> <td>90°C</td> </tr> <tr> <td>T4</td> <td>90°C</td> <td>90°C</td> <td>90°C</td> <td>150°C</td> </tr> </tbody> </table> <p>If a thermal protector operates during this test, the test is repeated on a second sample. This second test shall be terminated in the same mode unless the test is otherwise satisfactorily completed</p>	Thermocouple reference (figure ZA.1)	IC-F	IC	CA 80	CA 135	T1, T2, T3	90°C	90°C	90°C	90°C	T4	90°C	90°C	90°C	150°C		N/A
Thermocouple reference (figure ZA.1)	IC-F	IC	CA 80	CA 135														
T1, T2, T3	90°C	90°C	90°C	90°C														
T4	90°C	90°C	90°C	150°C														
ZA.7	Replacement lamps test		N/A															
	All luminaires with E27 or B22 lampholders shall meet one of the following requirements;	No such luminaire	N/A															
	a) The luminaires uses thermal protection to comply with the abnormal test of ZA.6;		N/A															
	b) The luminaire is provided with a warning label as per ZA.8;		N/A															
	c) The luminaire design does not accept any other lamp type or wattage than that specified by the manufacturer; or		N/A															
	d) The luminaire complies with the test of ZA.7.1.		N/A															

AS/NZS 60598.2.2:2001 Amendment A																		
Clause	Requirement + Test	Result - Remark	Verdict															
ZA7.1	The test sample shall be fitted with a 100 W test lamp and operated for six hours.		N/A															
	<p>-The maximum temperature at any thermocouple shall not exceed the values in table ZA.2 during the entire test except that if a thermal protector is fitted it shall operate within one hour and the maximum temperature at any thermocouple shall not exceed the values in table ZA.3 during the entire test.</p> <p>Table ZA.3 – Abnormal test 2 – Maximum thermocouple temperatures</p> <table border="1"> <thead> <tr> <th>Thermocouple reference (figure ZA.1)</th> <th>IC-F</th> <th>IC</th> <th>CA 80</th> <th>CA 135</th> </tr> </thead> <tbody> <tr> <td>T1, T2, T3</td> <td>110°C</td> <td>110°C</td> <td>110°C</td> <td>110°C</td> </tr> <tr> <td>T4</td> <td>110°C</td> <td>110°C</td> <td>110°C</td> <td>150°C</td> </tr> </tbody> </table>	Thermocouple reference (figure ZA.1)	IC-F	IC	CA 80	CA 135	T1, T2, T3	110°C	110°C	110°C	110°C	T4	110°C	110°C	110°C	150°C		N/A
Thermocouple reference (figure ZA.1)	IC-F	IC	CA 80	CA 135														
T1, T2, T3	110°C	110°C	110°C	110°C														
T4	110°C	110°C	110°C	150°C														
	- After all the above tests that are relevant the luminaire shall withstand the tests of Section 10 of AS/NZS 60598.1.		N/A															
ZA.8	Wrong lamp warning label		N/A															
	<p>A durable label of a size and with the substance of the wording depicted in figure ZA.2 shall be affixed to the luminaire such that it is clearly visible when a replacement lamp is being fitted. The lettering shall be black on a yellow background.</p> <div style="border: 2px solid black; padding: 5px; text-align: center;"> <p>WARNING DANGER OF FIRE</p> <p>Do not exceed the lamp rating or use an alternate lamp type to that specified</p> </div> <p>Figure ZA.2 – Wrong lamp warning label</p>		N/A															

AS/NZS 60598.2.2:2001 Amendment A			
Clause	Requirement + Test	Result - Remark	Verdict

	ANNEX 2: temperature measurements, thermal tests of Section annex ZA		P
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Type reference	DL REVO 110-850D					
Lamp used.....	Integral LED modules					
Lamp control gear used	Approved LED driver					
Mounting position of luminaire	On the black recessed box and ceiling					
Supply wattage (W).....	9.9W/9.8W					
Supply current (A)	0.086A/0.073A					
Calculated power factor	0.564/0.432					
Table: measured temperatures corrected for ta = 25 °C:						
- abnormal operating mode	The test box is Completely filled with glass wool insulation					
- test 1: rated voltage	--					
- test 2: 1,06 times rated voltage or 1,05 times rated wattage.....	240Vx1,06=254.4V;					
- 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.....	240Vx1,1=264V;					
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
T1	--	32.6	--	90	36.5	90
T2	--	33.7	--	90	36.3	90
T3	--	49.8	--	90	56.4	90
T4	--	62.3	--	80	72.5	90

Pictures

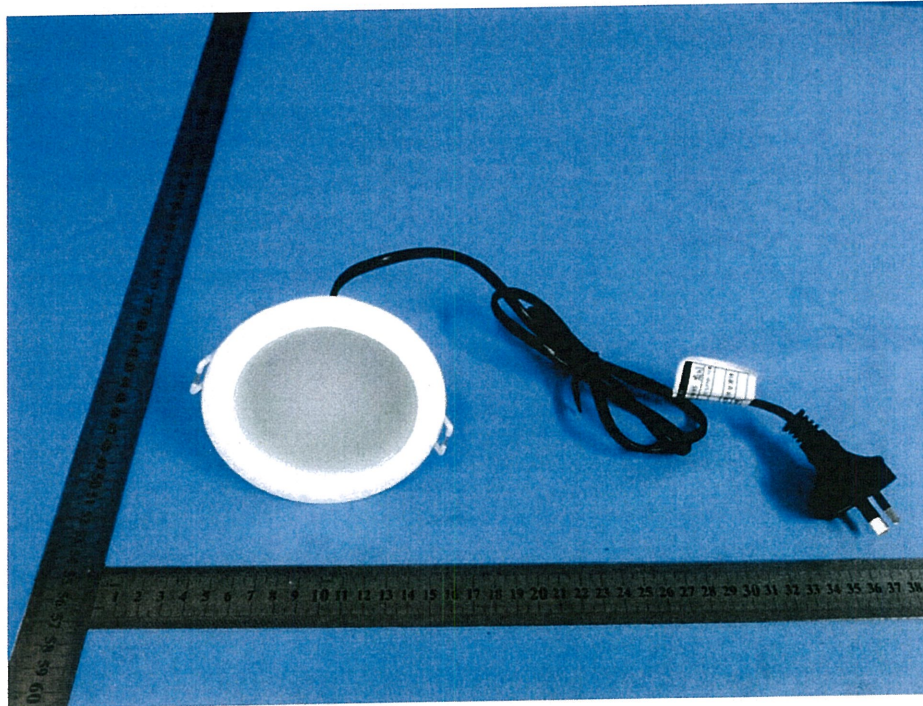


Figure 1: Front view