

AS2293.3-2005 App D

Duration (Thermal) Test Report



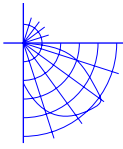
Cat No. : 2625

“RAZOR” 24M Dali LED Double sided Exit Sign

Prepared for: Maco Lighting Pty Ltd



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Contact Joshua Newell

Client Maco Lighting Pty Ltd
Australian Microelectronic Centre
1 Clunies Ross Court
Eight Mile Plains QLD 4113

Luminaire Tested 2625
"RAZOR" 24M Dali LED double sided Exit Sign :-DALI
Permanently Maintained

Represented Luminaires 2620 "RAZOR" 24M LED double sided Exit Sign :-STD
2621 "RAZOR" 24M ST LED double sided Exit Sign :-Self Test
2622 "RAZOR" 24M Wireless LED double sided Exit Sign :-Wireless

Nature of tests To measure the duration achieved under the conditions specified in AS2293.3-2005 appendix D1. Lamps used for test were as supplied.

Procedure The luminaire was mounted onto a simulated ceiling/wall in a thermal test chamber per Australian Standard AS3137 and then operated under the conditions specified in Appendix D1 of AS2293-2005. Temperature measurements were made using fine wire thermocouples attached to the components listed. Battery temperature, voltage, current and lamp sensing were made using a 6½ digit data acquisition unit connected to a controlling computer. Power to the luminaire was from a computer controlled stabilised ($\pm 0.1\%$) ac power supply.

Compliance Summary Complies with tested requirements (refer pages 6,7)

Minimum duration achieved 2 hours 18 mins (hot cycle No.3)

Photometric test voltage 3.590 Vdc @ 394 mA (hot cycle No.2)

Maximum battery temp. 46.2 °C (hot cycle No.1)

Uncertainties Estimated uncertainties in measurement for this test are:

$\pm 0.1\%$	AC voltage
$\pm 0.01\%$	DC voltage
$\pm 0.1\%$	DC current
$\pm 2^{\circ}\text{C}$	Temperature
$\pm 30 \text{ sec.}$	Time

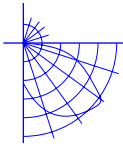
Date of test commencement 5th November 2009

Authorised Signatory

M Price

Date of report 18th November 2009
Report version 1.8 24 June 2008





Luminaire details

Hot Cycle

Mains lamp operation. On
Mounting Ceiling / Surface
Diffuser Blade

Cold Cycle

Mains lamp operation. On
Mounting Ceiling / Surface
Diffuser Blade

Inverter/control pack

Manufacturer Maco Lighting Pty Ltd
Catalogue No. RAZOR LED V6 02/2009

Luminaire rated Voltage 240V 50Hz

Ballast(s) Integral with Inverter

P.F Capacitor Not present

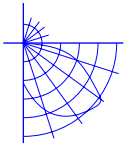
Lamp(s)

Manufacturer Maco Lighting Pty Ltd
Catalogue No. 2951
Quantity 18
Description White LED S.M.D. On PCB mounted in upper housing of sign.

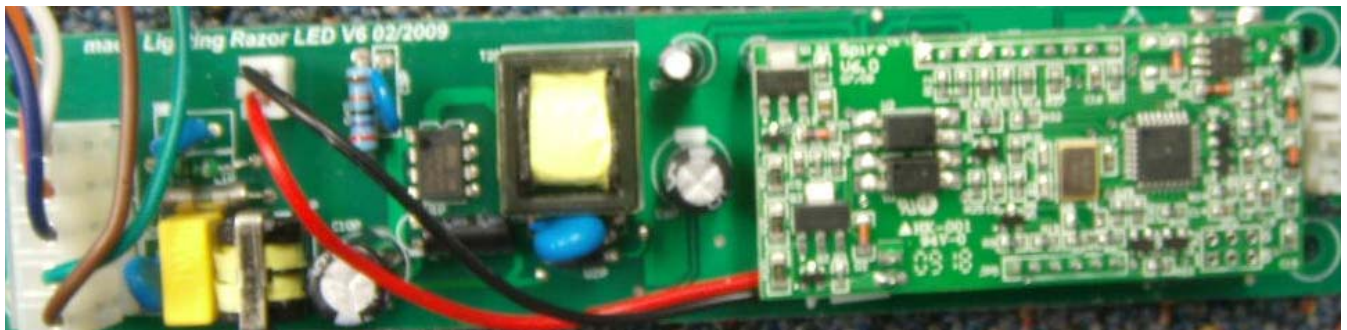
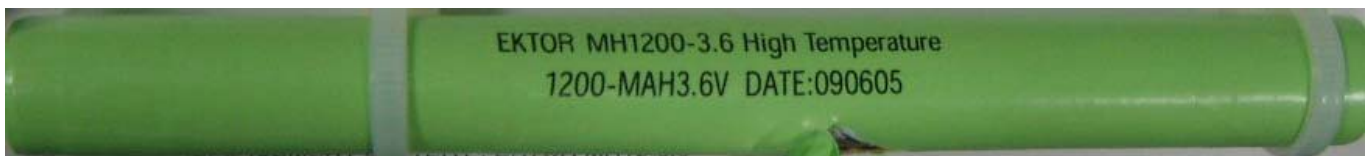
Battery pack / cells (Data as supplied by the submitter Doc No. MACO007)

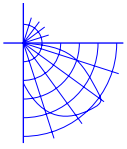
Cell type	NiMH "A" cell High Temperature		
IEC Compliance	Evidence cited Document No. GNRL 022		
Cell manufacturer	BST Power		
Cell catalogue No.	H-AA1200BT		
Battery pack manufacturer	EKTOR		
Battery pack Cat. No.	1200-MAH3.6V		
No of cells	3	Max. charge current	120 mA
Capacity	1200 mAh	Max. discharge current	1200 mA
Nominal voltage	1.2 V/cell	Max. charge voltage	1.6 V/cell
Max. surface temperature	70 °C	Min. discharge voltage	0.6 V/cell





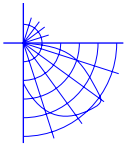
Photographs showing components





Photographs showing component layout





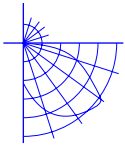
High Temperature Test Results (40°C Ambient)

Parameter	Range	Hot cycle 1 (72hr)	Hot Cycle 2 (16hr)	Hot cycle 3 (16hr)
Charge Cycle				
Mean AC supply voltage(Vac)	n/a	254.3	227.8	225.4
Max. charge voltage (Vdc)	< 4.80	4.316	4.171	4.182
Max. charge current (mA)	< 120	75	77	77
Max. battery temperature (°C)	70	46.2	44.2	44.1
Charge amp hours (Ahr)	n/a	3.7	0.9	0.9
Emergency lamp status	ON	ON	ON	ON
Discharge Cycle				
Discharge duration (Hr:min)	≥ 2:00	3:48	2:19	2:18
2 hr battery voltage (Vdc)	> 1.80	3.780	3.590	3.592
2 hr battery current (mA)	< 1200	368	394	393
Amp hours to cut-off (Ahr)	n/a	1.4	0.9	0.9
Cut-off voltage (Vdc)	> 1.80	2.815	2.767	2.805
Max. discharge current (mA)	< 1200	464	464	464
Emergency lamp status	ON	ON	ON	ON
Battery drain current 15 mins after cut-off (mA) (C/1000)	< 1.2	0.1	0.1	0.0

Compliance summary for high temperature cycle tests

Sample meets limits stated in above table	YES (complies)
Emergency lamp(s) ON continuously during discharge	YES (complies)
Emergency lamp(s) remained disconnected from battery for 15 min after cut-off	YES (complies)





Low Temperature Test Results (10°C Ambient)

Parameter	Range	Cold cycle 1 (16hr)	Cold cycle 2 (16hr)	Cold cycle 3 (16hr)
Charge Cycle				
Mean AC supply voltage(Vac)	n/a	225.7	225.6	225.6
Max. charge voltage (Vdc)	< 4.80	4.212	4.213	4.216
Max. charge current (mA)	< 120	71	72	71
Max. battery temperature (°C)	70	15.3	15.1	15.1
Charge amp hours (Ahr)	n/a	0.9	0.9	0.9
Emergency lamp status	ON	ON	ON	ON
Discharge Cycle				
Discharge duration (Hr:min)	≥ 2:00	2:33	2:38	2:39
2 hr battery voltage (Vdc)	> 1.80	3.702	3.721	3.725
2 hr battery current (mA)	< 1200	340	337	338
Amp hours to cut-off (Ahr)	n/a	0.8	0.9	0.9
Cut-off voltage (Vdc)	> 1.80	3.190	3.177	3.188
Max. discharge current (mA)	< 1200	388	385	388
Emergency lamp status	ON	ON	ON	ON
Battery drain current 15 mins after cut-off (mA) (C/1000)	< 1.2	0.1	0.1	0.0

Compliance summary for low temperature cycle tests

Sample meets limits stated in above table	YES (complies)
Emergency lamp(s) ON continuously during discharge	YES (complies)
Emergency lamp(s) remained disconnected from battery for 15 min after cut-off	YES (complies)

