

Test Report

UN38.3

Name of Sample: Rechargeable Button Cells
CP 1254 A3

Consignor: Goran Kilibarda / Varta Microbattery Ellwangen
Manufacturer: Varta Microbattery

Test Report

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Name of Sample:	Rechargeable Button Cells CP 1254 A3
Sample Reference:	Email from Goran Kilibarda 2016-08-05, FedEx 6092 9507 1403
Test Job Number:	JT60803
Drawing No.:	717635 Rev 401
Customer/Project:	CoinPower
Nominal Voltage:	3.7V
Ampere-hour Rating:	60mAh
Watt-hour Rating:	220mWh

Consignor:	Goran Kilibarda / Varta Microbattery Ellwangen
Manufacturer:	Varta Microbattery
Tracer:	194 602 A

Test Method:	Recommendations on the Transport of Dangerous Goods, UN Manual of Tests and Criteria, Part III, subsection 38.3, Fifth Revised Edition, Amendment 1, 2011 ST/SG/AC.10/11/Rev.5/Amend.1		
Criterion:	Recommendations on the Transport of Dangerous Goods, UN Manual of Tests and Criteria, Part III, subsection 38.3, Fifth Revised Edition, Amendment 1, 2011 ST/SG/AC.10/11/Rev.5/Amend.1		
Sample Appearance:	Cell with wire connector		
Accepted Date:	2016-08-18	Completed Date	2016-09-19
Test Items:	Altitude Simulation, Thermal Test, Vibration, Shock, External Short Circuit, Crush, Forced Discharge		
Conclusion:	The Sample has passed the test items of UN38.3		
Comment:	Cycling method: Charge 60mA (1C) to 4.2V + 4.2V to 1.2mA (0.02C). Discharge 120mA (2C) to 3.0V		

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Test No.	Test Item	Standard requirement / Clause number of Standard	Test Result	
1	Altitude Simulation	UN Manual of Test and Criteria, Section 38.3,4.1 Test T.1	Appendix T1	passed
2	Thermal Test	UN Manual of Test and Criteria, Section 38.3,4.2 Test T.2	Appendix T2	passed
3	Vibration Test	UN Manual of Test and Criteria, Section 38.3,4.3 Test T.3	Appendix T3	passed
4	Shock Test	UN Manual of Test and Criteria, Section 38.3,4.4 Test T.4	Appendix T4	passed
5	External Short Circuit	UN Manual of Test and Criteria, Section 38.3,4.5 Test T.5	Appendix T5	passed
6	Crush Test	UN Manual of Test and Criteria, Section 38.3,4.6 Test T.6	Appendix T6	passed
8	Force Discharge	UN Manual of Test and Criteria, Section 38.3,4.8 Test T.8	Appendix T8	passed
Test Environment Condition		Ambient Temperature: 15°C — 25°C		

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Test No.	1	Test Item.		Altitude Simulation				
		Before Test		After Test		Percentage (%)		Comment
Sample No.	Sample Status	Weight (g)	OCV (V)	Weight (g)	OCV (V)	Mass Loss (Before -After) /Before (%)	OCV (After /Before) (%)	
01	1CYCFULL	1.99	4.17	1.97	4.16	1.31	99.9	P
02	1CYCFULL	1.99	4.19	1.97	4.17	1.06	99.6	P
03	1CYCFULL	1.99	4.18	1.97	4.17	1.09	99.8	P
04	1CYCFULL	1.99	4.18	1.97	4.17	1.05	99.9	P
05	1CYCFULL	1.99	4.18	1.97	4.17	1.13	99.8	P
06	1CYCFULL	1.99	4.18	1.97	4.17	1.14	99.8	P
07	1CYCFULL	1.97	4.17	1.95	4.17	1.03	99.8	P
08	1CYCFULL	1.99	4.17	1.97	4.17	0.95	99.8	P
09	1CYCFULL	1.99	4.18	1.97	4.17	1.04	99.8	P
10	1CYCFULL	1.99	4.18	1.97	4.17	0.94	99.8	P

Note:

L=Leagkage, V=Venting, D=Disassembly, R=Rupture, F=Fire, P=No Leagake, No Venting, No Disassembly, No Rupture, No Fire

Test No.	2	Test Item.		Thermal Test				
		Before Test		After Test		Percentage (%)		Comment
Sample No.	Sample Status	Weight (g)	OCV (V)	Weight (g)	OCV (V)	Mass Loss (Before -After) /Before (%)	OCV (After /Before) (%)	
01	1CYCFULL	1.97	4.16	1.99	4.08	-1.15	98.0	P
02	1CYCFULL	1.97	4.17	1.99	4.09	-1.04	97.9	P
03	1CYCFULL	1.97	4.17	1.99	4.09	-1.04	98.0	P
04	1CYCFULL	1.97	4.17	1.99	4.09	-1.03	98.0	P
05	1CYCFULL	1.97	4.17	1.99	4.09	-0.98	98.0	P
06	1CYCFULL	1.97	4.17	1.99	4.09	-0.99	98.0	P
07	1CYCFULL	1.95	4.17	1.97	4.08	-0.96	98.0	P
08	1CYCFULL	1.97	4.17	1.99	4.09	-0.96	98.0	P
09	1CYCFULL	1.97	4.17	1.99	4.09	-1.03	98.1	P
10	1CYCFULL	1.97	4.17	1.98	4.09	-0.92	98.1	P
Note:								
L=Leagkage, V=Venting, D=Disassembly, R=Rupture, F=Fire, P=No Leagake, No Venting, No Disassembly, No Rupture, No Fire								

Test No.	3	Test Item.		Vibration Test				
		Before Test		After Test		Percentage (%)		Comment
Sample No.	Sample Status	Weight (g)	OCV (V)	Weight (g)	OCV (V)	Mass Loss (Before -After) /Before (%)	OCV (After /Before) (%)	
01	1CYCFULL	1.99	4.08	1.99	4.08	-0.01	100.0	P
02	1CYCFULL	1.99	4.09	1.99	4.09	-0.17	100.0	P
03	1CYCFULL	1.99	4.09	1.99	4.09	-0.09	100.0	P
04	1CYCFULL	1.99	4.09	2.00	4.09	-0.22	100.0	P
05	1CYCFULL	1.99	4.09	1.99	4.09	-0.11	100.0	P
06	1CYCFULL	1.99	4.09	1.99	4.09	-0.07	100.0	P
07	1CYCFULL	1.97	4.08	1.97	4.08	-0.25	100.0	P
08	1CYCFULL	1.99	4.09	2.00	4.09	-0.19	100.0	P
09	1CYCFULL	1.99	4.09	1.99	4.09	-0.14	100.0	P
10	1CYCFULL	1.98	4.09	1.99	4.09	-0.19	100.0	P
Note:								
L=Leagkage, V=Venting, D=Disassembly, R=Rupture, F=Fire, P=No Leagake, No Venting, No Disassembly, No Rupture, No Fire								

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(Shock Test at 150g 6ms, 3 shocks for 6 directions)

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(External Short-Circuit Test at 55°C, with < 0.1 ohm)

Test No.	5	Test Item.	External Short circuit Test
Sample No.	Sample Status	Max External Temperature (°C)	Comment
01	1CYCFULL	98.7	P
02	1CYCFULL	96.9	P
03	1CYCFULL	99.4	P
04	1CYCFULL	101.4	P
05	1CYCFULL	98.8	P
06	1CYCFULL	95.5	P
07	1CYCFULL	95.3	P
08	1CYCFULL	97.1	P
09	1CYCFULL	94.3	P
10	1CYCFULL	103.8	P
Note: L=Leakage, V=Venting, D=Disassembly, R=Rupture, F=Fire, P=No Disassembly, No Rupture & No Fire and Cell Temperature Not Exceeding 170°C			

UN38.3 Test Report — Appendix T6

(Crush Test, with 13kN force)

Test No.	6	Test Item.	Crush Test
Sample No.	Sample Status	Max External Temperature (°C)	Comment
11	1CYC50%	58.90	P
12	1CYC50%	52.90	P
13	1CYC50%	51.70	P
14	1CYC50%	54.90	P
15	1CYC50%	57.70	P
Note:			
L=Leakage, V=Venting, D=Disassembly, R=Rupture, F=Fire, P=No Leakage, No Venting			

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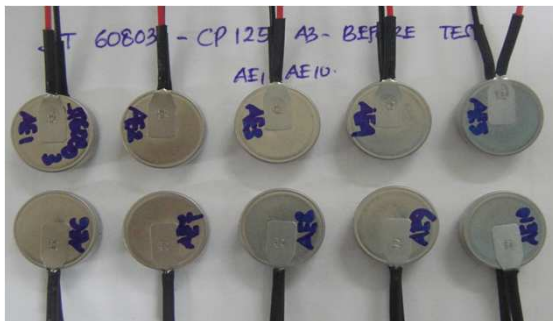
(Forced Discharge Test at 12Vdc with initial current equal to the maximum discharge current)

Test No.	8	Test Item.		Forced Discharge Test		
		Before Test		After Test		
Sample No.	Sample Status	Weight (g)	OCV (V)	Weight (g)	OCV (V)	Comment
16	1CYC FD	1.98	3.62	1.98	0.01	P
17	1CYC FD	1.99	3.62	1.99	0.00	P
18	1CYC FD	2.00	3.62	1.99	0.00	P
19	1CYC FD	1.99	3.62	1.99	0.05	P
20	1CYC FD	1.99	3.62	1.99	0.00	P
21	1CYC FD	1.99	3.62	1.99	0.01	P
22	1CYC FD	2.00	3.62	1.99	0.00	P
23	1CYC FD	1.99	3.62	1.98	0.00	P
24	1CYC FD	1.97	3.62	1.97	0.00	P
25	1CYC FD	1.98	3.62	1.98	0.00	P
26	50CYC FD	1.99	3.62	1.98	0.00	P
27	50CYC FD	1.99	3.62	1.99	0.00	P
28	50CYC FD	2.00	3.62	1.99	0.00	P
29	50CYC FD	2.00	3.62	1.99	0.00	P
30	50CYC FD	1.99	3.62	1.98	0.00	P
31	50CYC FD	2.00	3.62	1.99	0.00	P
32	50CYC FD	2.01	3.62	2.00	0.00	P
33	50CYC FD	2.01	3.62	2.00	0.00	P
34	50CYC FD	1.99	3.62	1.98	0.00	P
35	50CYC FD	2.00	3.62	1.98	0.00	P
Note:						
L=Leakage, V=Venting, D=Disassembly, R=Rupture, F=Fire, P=No Disassembly, No Fire						

UN38.3 Test Report — Appendix P

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Before Test



After Test

