

No.: 2016-04-01-268

Issuer's name: VARTA Microbattery Pte Ltd

Issuer's address: 300 Tampines Avenue 5, #05-01, Tampines Junction, Singapore 529653

Object of the declaration: Article: 2S2P/LIC 18650-29EC PCM S WC – SOC 30%
Material no.: 717565
VKB no.: 56636 904 013

The object of the declaration described above is in conformity with the requirements of the following documents:

Documents No.	Title	Edition / Date of issue
ST/SG/AC.10/11/Rev.5/ Amend.1	Recommendations on the Transport of Dangerous Goods, UN Manual of Tests and Criteria, Part III, subsection 38.3	2011

Additional information:

In original VARTA packaging the products comply with the following special provisions of international transport regulations:

- IATA DGR: Packing Instruction 965 Section IB (max. 30 % state of charge)
(Transportations of cells or batteries packed with equipment or contained in equipment have to follow Packing Instructions 966 or 967 Section II.)
- ADR/RID/ADN/IMDG Code: Special Provision 188
- DOT / 49 CFR: §173.185 (c)

Singapore, 01 April 2016

(place and date of issue)



(company stamp)



(signature)

(Low Chee Leong)
Manager
Technical Support

UN38.3 TEST REPORT

In accordance to the requirements of the following documents:

<u>Documents No.</u>	<u>Title</u>	<u>Edition / Date of issue</u>
ST/SG/AC.10/11/Rev.5	Recommendations on the Transport of Dangerous Goods, UN Manual of Tests and Criteria, Part III, subsection 38.3	2009

Article : EXPLORER 510
Model : 2S2P/LIC 18650-29EC PCM S WC
Drawing No. : 717565
VKB No. : 56636 904 013
Nominal Voltage : 7.3V
Nominal Capacity : 5700 mAh
Watt-hour rating : 42Wh



Technical Support : Low Chee Leong

Date : 2017-09-04

Brands of
VARTA Microbattery:

Test Method and Results:

Test Item	Test Method	Criteria	Test Result
T1. Altitude simulation	Store at 11.6kPa for 6h, at 20±5°C	No mass loss	Pass
T2. Thermal test	(75±2°C, 6h ↔ -40±2°C, 6h, change in max 30 min) for 10 cycles, then store at 20±5°C for 24h	No leakage	Pass
T3. Vibration	(7Hz ↔ 200Hz, 15 min), 12 cycles, 3 directions (x, y, z), with logarithmic sweep, 1g at 7Hz and 8g at 200Hz	No venting No disassembly No rupture	
T4. Shock	Half sine shock (peak acceleration 150g, duration 6ms) at 6 directions (±x, ±y, ±z), 3 shocks each	No fire Residual OCV ≥ 90%	Pass
T5. External short circuit	0.1Ω external short-circuit at 55±2°C, continue for 1h after returning at 55±2°C, observe for further 6h	Max. temperature ≤ 170°C No disassembly No rupture, No fire	Pass
T7. Overcharge	Overcharge current shall be twice max continuous charge current. If Voltage <18V, overcharge voltage is 2 times max charge voltage or 22V whichever is lesser), 24h, 7days observation	No disassembly, No fire within 7 days	Pass

Note: Tests T6 Impact and T8 Forced Discharge are for cell only, and not for battery pack.

Remark: This battery of drawing number #717565 is the same battery as drawing number #712710, except that #717565 is now with maximum 30% SoC (State of Charge) – for compliance with the current IATA transportation requirements. The test results of #712710 are therefore valid for #717565.

Brands of
VARTA Microbattery:

UN38.3 Test Report – Appendix T1

Test No.	1	Test Item.		Altitude Simulation				
		Before Test		After Test		Percentage (%)		Comment
Test No.	Sample Status	Weight (g)	OCV (V)	Weight (g)	OCV (V)	Mass Loss (Before -After) /Before (%)	OCV (After /Before) (%)	
01	1CYCFULL	205	8.16	205	8.16	0.00	100	P
02	1CYCFULL	205	8.16	205	8.16	0.00	100	P
03	1CYCFULL	205	8.17	205	8.17	0.00	100	P
04	1CYCFULL	205	8.17	205	8.16	0.00	100	P
05	50CYCFULL	212	8.15	212	8.15	0.00	100	P
06	50CYCFULL	212	8.15	212	8.15	0.00	100	P
07	50CYCFULL	211	8.15	211	8.15	0.00	100	P
08	50CYCFULL	211	8.15	211	8.15	0.00	100	P

Note:

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

UN38.3 Test Report – Appendix T2

Test No.	2	Test Item.		Thermal Test				
		Before Test		After Test		Percentage (%)		Comment
Test No.	Sample Status	Weight (g)	OCV (V)	Weight (g)	OCV (V)	Mass Loss (Before -After) /Before (%)	OCV (After /Before) (%)	
01	1CYCFULL	204	8.16	205	8.07	0.00	99	P
02	1CYCFULL	205	8.16	205	8.07	0.00	99	P
03	1CYCFULL	204	8.17	205	8.09	0.00	99	P
04	1CYCFULL	205	8.16	205	8.09	0.00	99	P
05	50CYCFULL	212	8.15	211	8.07	0.00	99	P
06	50CYCFULL	212	8.15	211	8.07	0.00	99	P
07	50CYCFULL	211	8.15	212	8.07	0.00	99	P
08	50CYCFULL	211	8.15	211	8.07	0.00	99	P

Note:

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

UN38.3 Test Report – Appendix T3

Test No.	3	Test Item.		Vibration Test				
		Before Test		After Test		Percentage (%)		Comment
Test No.	Sample Status	Weight (g)	OCV (V)	Weight (g)	OCV (V)	Mass Loss (Before -After) /Before (%)	OCV (After /Before) (%)	
01	1CYCFULL	205	8.07	205	8.07	0.00	100	P
02	1CYCFULL	205	8.07	205	8.07	0.00	100	P
03	1CYCFULL	205	8.09	205	8.09	0.00	100	P
04	1CYCFULL	205	8.09	205	8.09	0.00	100	P
05	50CYCFULL	211	8.07	211	8.06	0.00	100	P
06	50CYCFULL	211	8.07	211	8.06	0.00	100	P
07	50CYCFULL	212	8.07	212	8.07	0.00	100	P
08	50CYCFULL	211	8.07	211	8.06	0.00	100	P

Note:

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

UN38.3 Test Report – Appendix T4

Test No.	4	Test Item.		Shock Test				
		Before Test		After Test		Percentage (%)		Comment
Test No.	Sample Status	Weight (g)	OCV (V)	Weight (g)	OCV (V)	Mass Loss (Before -After) /Before (%)	OCV (After /Before) (%)	
01	1CYCFULL	205	8.07	205	8.07	0.00	100	P
02	1CYCFULL	205	8.07	205	8.07	0.00	100	P
03	1CYCFULL	205	8.09	205	8.09	0.00	100	P
04	1CYCFULL	205	8.09	205	8.09	0.00	100	P
05	50CYCFULL	211	8.06	211	8.06	0.00	100	P
06	50CYCFULL	211	8.06	211	8.06	0.00	100	P
07	50CYCFULL	212	8.07	212	8.06	0.00	100	P
08	50CYCFULL	211	8.06	211	8.06	0.00	100	P

Note:

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

UN38.3 Test Report – Appendix T5

Test No.	5	Test Item.	External Short circuit Test
Test No.	Sample Status	Max External Temperature (°C)	Comment
01	1CYCFULL	54.0	P
02	1CYCFULL	54.1	P
03	1CYCFULL	54.0	P
04	1CYCFULL	54.2	P
05	50CYCFULL	56.4	P
06	50CYCFULL	56.2	P
07	50CYCFULL	56.2	P
08	50CYCFULL	56.5	P
Note: L=Leakage, V=Venting, D=Disassembly, R=Rupture, F=Fire, P=No Disassembly, No Rupture & No Fire			

UN38.3 Test Report – Appendix T7

Test No.	7	Test Item.		Over Charge Test		
		Before Test		After Test		
Test No.	Sample Status	Weight (g)	OCV (V)	Weight (g)	OCV (V)	Comment
01	1CYCFULL	205	8.17	205	8.15	P
02	1CYCFULL	205	8.16	205	8.14	P
03	1CYCFULL	205	8.17	205	8.15	P
04	1CYCFULL	205	8.17	205	8.15	P
05	50CYCFULL	211	8.15	212	8.12	P
06	50CYCFULL	211	8.15	211	8.12	P
07	50CYCFULL	212	8.15	211	8.12	P
08	50CYCFULL	212	8.15	211	8.13	P
Note: L=Leagkage, V=Venting, D=Disassembly, R=Rupture, F=Fire, P=No Disassembly, No Fire						

UN38.3 Test Report — Appendix P



Before Test

After Test

