

Test report

Number T251-0714/23

Project file: C20211681

Date: 2023-10-02

Pages: 10

Product: Li-ion Battery Pack

Type reference: BP 18 Li 8,0 HP-ASI

Ratings: 18 Vdc
Protection class: III

Trademark: 

Applicant: BMZ Poland Sp. z o.o.
Ul. Alberta Einsteina 9, 44-109 Gliwice, Poland

Manufacturer: BMZ Poland Sp. z o.o.
Ul. Alberta Einsteina 9, 44-109 Gliwice, Poland

Place of manufacture: BMZ Poland Sp. z o.o.
Ul. Alberta Einsteina 9, 44-109 Gliwice, Poland

Summary of testing

Testing method: Antenna pattern measurements

Testing location: SIQ Ljubljana
Mašera-Spasičeva ulica 10, SI-1000 Ljubljana, Slovenia

Remarks: Date of receipt of test items: 2022-03-17
Number of items tested: 1
Date of performance of tests: 2023-06-19
The test results presented in this report relate only to the items tested.
The test items were tested in the condition as received.
The product complies with the requirements of the testing methods.

Tested by: Luka Cvajnar

Approved by: Marjan Mak

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1 GENERAL

| History sheet | | | |
|---------------|--------------|-----------------------------|----------|
| Date | Report No. | Change | Revision |
| 2023-10-02 | T251-0714/23 | Initial Test Report issued. | -- |

Environmental conditions:

Ambient temperature: 15 °C to 35 °C

Relative humidity: 30 % to 60 %

Atmospheric pressure: 860 mbar to 1060 mbar

1.1 Equipment under test

Li-ion Battery Pack

Type: BP 18 Li8,0 HP-ASI

Tested was antenna pattern of the sample below.

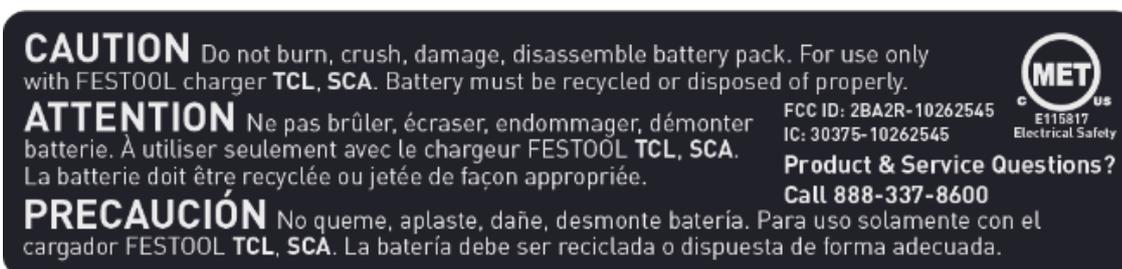


Picture of test sample – BLE Antenna



Copy of marking plate

The artwork below may be only a draft. The use of certification marks on a product must be authorized by the respective NCBs that own these marks.



1.2 Antenna pattern measurement

1.2.1 Test procedure

The radiation pattern for BLE antenna implemented to PCB reference design has been measured in an anechoic chamber with 3 meters test distance. Test results show radiation patterns for two planes, measured with vertical and horizontal polarization of measuring antenna. All measurements were performed at 2402, 2440 and 2480 MHz frequency.



1.3 Test results BLE Antenna

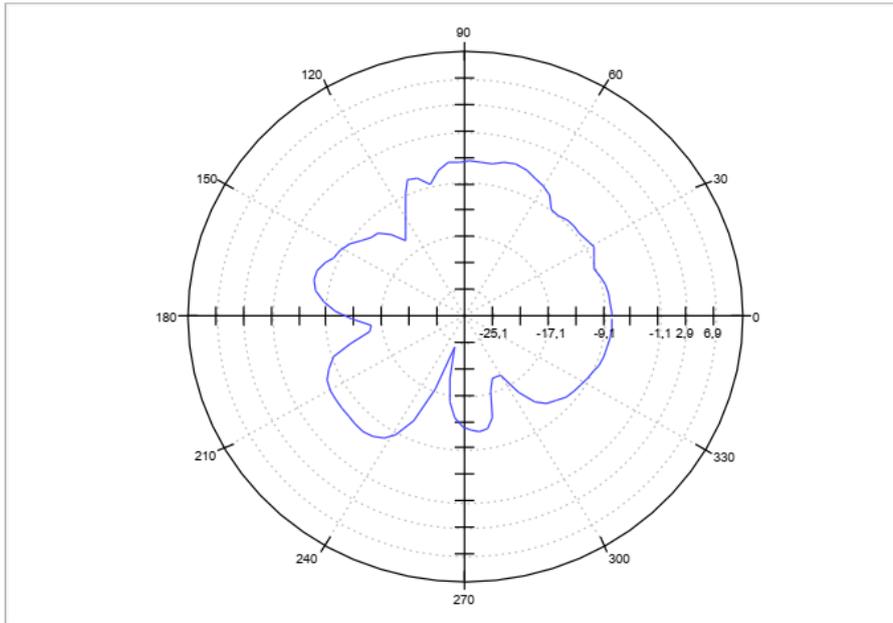
EUT Information

EUT: BP 18 Li 8,0 HP-ASI
 Operating mode: TX 2402 MHz 4 dBm

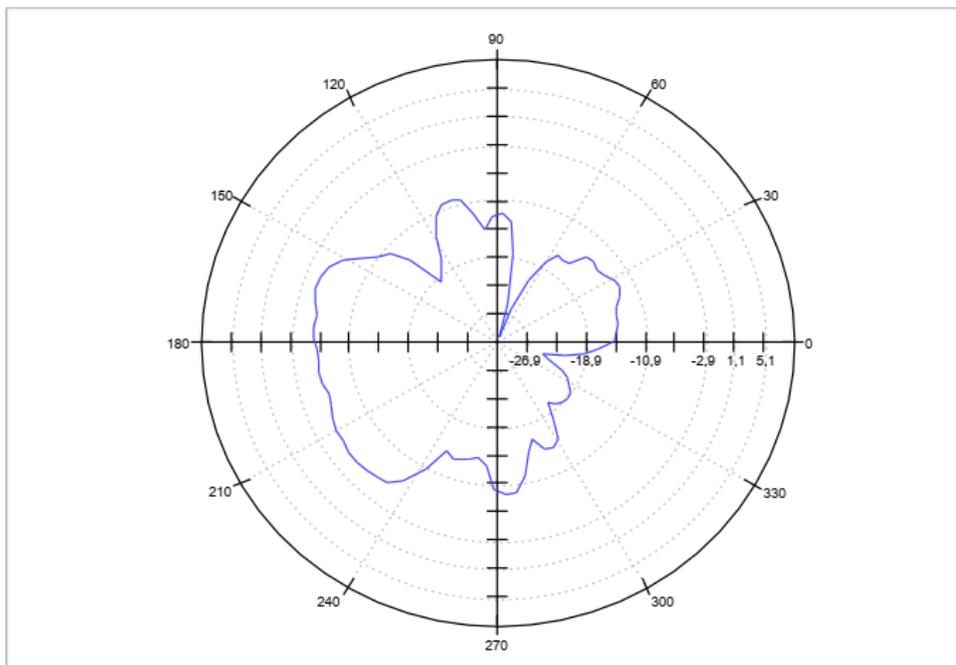
AziChart MinMax Eval

| Frequency (MHz) | Max. Value (dBm) | Azimuth max. (deg) | Pol max. | Min. Value (dBm) | Azimuth min. (deg) | Pol min. |
|-----------------|------------------|--------------------|----------|------------------|--------------------|----------|
| 2402.000000 | -4.95 | 72 | H | -30.16 | 72 | V |

Azimuth Chart: Horizontal



Azimuth Chart: Vertical



EUT Information

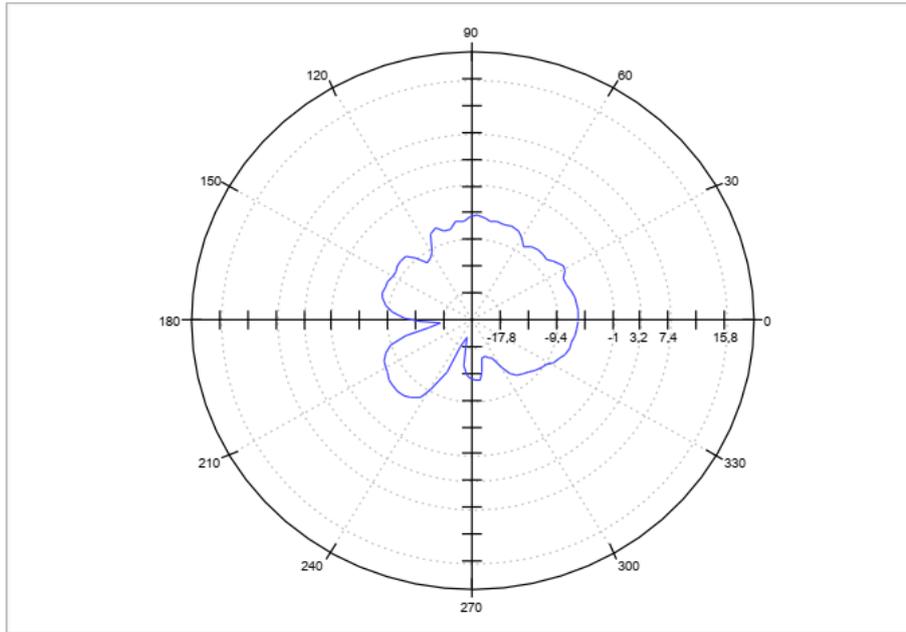
EUT:
Operating mode:

BP 18 Li 8,0 HP-ASI
TX 2440 MHz 4 dBm

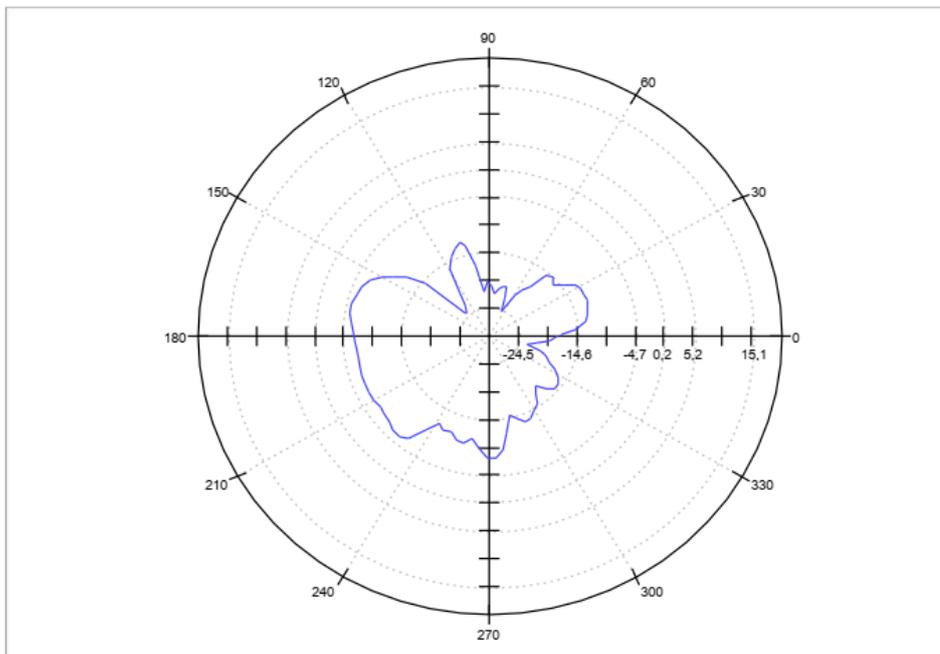
AziChart MinMax Eval

| Frequency (MHz) | Max. Value (dBm) | Azimuth max. (deg) | Pol max. | Min. Value (dBm) | Azimuth min. (deg) | Pol min. |
|-----------------|------------------|--------------------|----------|------------------|--------------------|----------|
| 2440.000000 | -5.33 | 166 | V | -24.44 | 64 | V |

Azimuth Chart: Horizontal



Azimuth Chart: Vertical





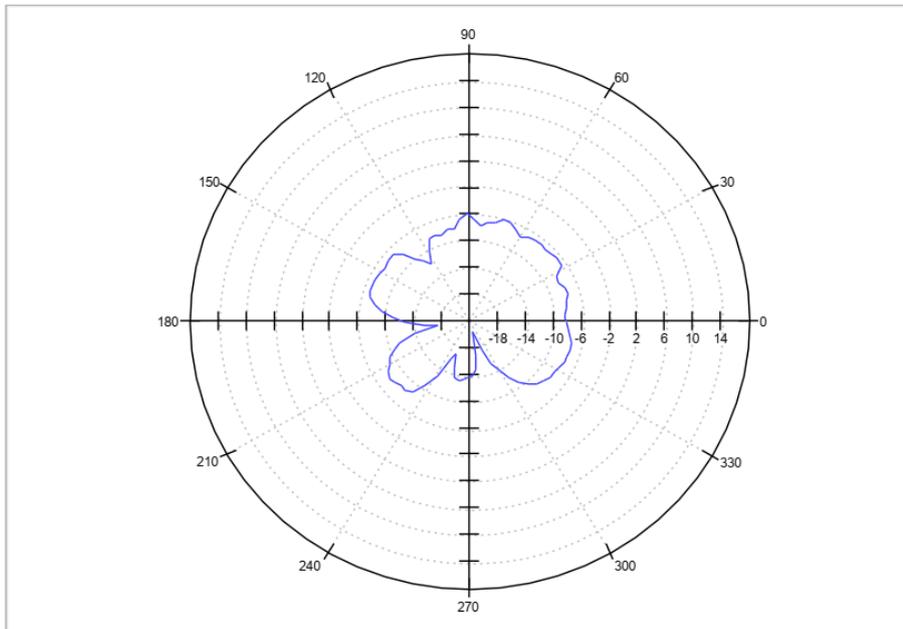
EUT Information

EUT: BP 18 Li 8,0 HP-ASI
 Operating mode: TX 2480 MHz 4 dBm

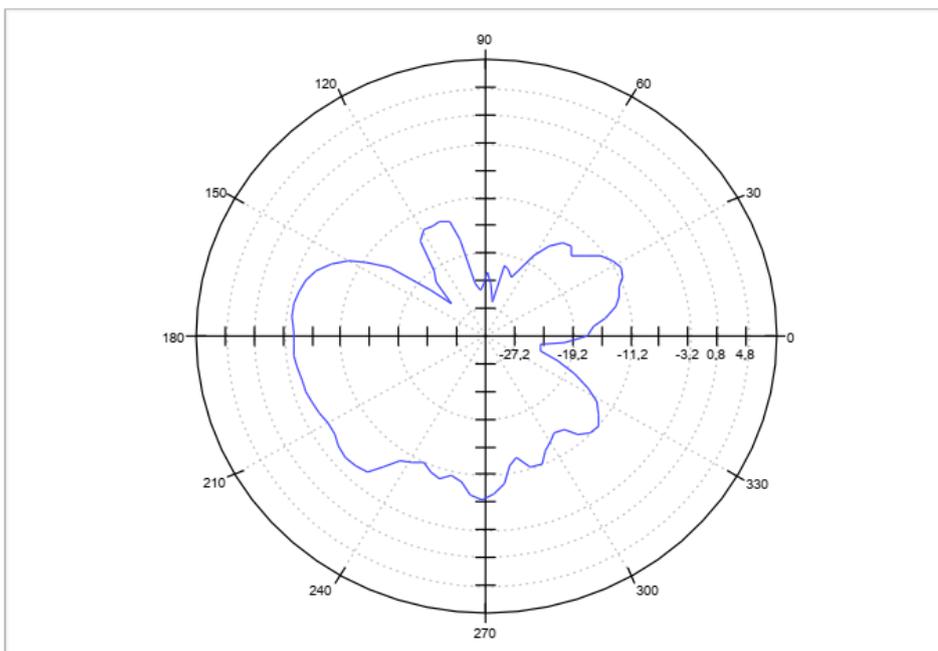
AziChart MinMax Eval

| Frequency (MHz) | Max. Value (dBm) | Azimuth max. (deg) | Pol max. | Min. Value (dBm) | Azimuth min. (deg) | Pol min. |
|-----------------|------------------|--------------------|----------|------------------|--------------------|----------|
| 2480.000000 | -4.34 | 170 | V | -26.21 | 80 | V |

Azimuth Chart: Horizontal



Azimuth Chart: Vertical



1.4 Maximum BLE antenna gain

| DUT Frequency (MHz) | Maximum antenna gain (dBi) |
|---------------------|----------------------------|
| 2402.000000 | -4.95 |
| 2440.000000 | -5.33 |
| 2480.000000 | -4.34 |



2 USED TEST EQUIPMENT

Antenna pattern measurement

| Manufacturer | Model No. | Used | Calibrated | Calibrated until |
|--|-----------|------|------------|------------------|
| Comtest engineering, SAC2 (together with controlling equipment) | SAC 3m | X | 2022-04-14 | 2025-04-14 |
| Maturo, Turn table (2 m diameter) | TT 2.0 SI | X | / | / |
| Maturo, Bore-sight antenna mast | BAM-4.0-P | X | / | / |
| Maturo, positioning equipment | NCD | X | / | / |
| Rohde & Schwarz, RFI receiver | ESW 44 | X | 2023-03-09 | 2024-09-09 |
| R&S, Ultra Broadband Antenna | HL562E | / | 2020-09-30 | 2023-09-30 |
| R&S, Horn Antenna | HF907 | X | 2020-08-21 | 2023-08-21 |