ATEX Evaluation and Test Report

ExTR Reference Number..... :	REP107402
ExTR Free Reference Number ..... :	PRJ0070165
Compiled by + signature (ExTL) .... :	Jedd Smith 
Reviewed by + signature (ExTL).... :	Ben Carver 
Endorsed by + signature (ExCB) ... :	Asgeir Holt 
Date of issue ..... :	2025-08-14
Ex Testing Laboratory (ExTL) ..... :	Nemko USA Inc. (Austin)
Address ..... :	1601 N A.W. Grimes Blvd, Suite B Round Rock, Texas 78665
Ex Certification Body (ExCB) ..... :	NEMKO Group AS
Address ..... :	Philip Pedersens vei 11 1366 Lysaker Norway
Applicant's name..... :	Aegex Technologies, LLC
Address ..... :	84 Peachtree St. NW Atlanta GA 30303 USA
Standards associated with this ExTR package ..... :	IEC 60079-0:2017, Edition 7.0, IEC 60079-11:2011, Edition 6.0
Clauses considered ..... :	All clauses considered
Test Report Form Number ..... :	ExTR Cover_11 (released 2025-06)
Related Amendments, Corrigenda or ISHs ..... :	IEC 60079-0:2017/ISH1:2019, ISH2: 2019, COR1:2020
Test item description..... :	Intrinsically Safe Tablet and Docking Station
Model/type reference ..... :	Aegex100M and DS100M
Code (e.g. Ex __ II__ T__)..... :	II 1 GD Ex ia IIC T4 Ga Tamb -20°C to 55°C Ex ia IIIC T135°C Da Um = 20V
Rating..... :	7.2V, IP67

Manufacturer's name ..... :	Aegex Technologies, LLC
Address ..... :	Tildy Zoltán utca 27/1, 7632 Pécs, Hungary
Trademark ..... :	N/A
Certificate No. (optional) ..... :	Nemko 25ATEX1007X
QAN Reference No. (optional) ..... :	SGS24ATEXQ052101

Particulars: Test item vs. Test requirements

Classification of installation and use ..... :	Portable (hand-held)
Ingress protection ..... :	IP67
Rated ambient temperature range (°C)..... :	-20°C to 55°C
Rated service temperature range (°C) for Ex Components ..... :	N/A

General remarks:

This ATEX Report serves to show compliance to the standard(s) indicated and the essential health and safety requirements of the ATEX Directive 2014/34/EU. The verdicts of each Clause in the corresponding standard(s) and Directive are indicated as either "Pass" (complies) or "N/A" (not applicable).

The datasheets for testing administered under this report have either been included in the report or attached as appendixes detailed in the "testing performed" section. The testing and evaluation covers only the test items described.

General product information:

The Aegex100M tablet is a windows based electronic device intended for Zone 0 areas. The product is intended to be always carried within a Leather Sleeve (P/N: APAC-100-01), when in Zone 0 areas. This is required as the enclosure material is Aluminium based, which could lead to friction related hazards. The Tablet and Battery Pack, both incorporate encapsulations.

Model DS100M docking station is a "non-hazardous area accessory" evaluated for charging the Aegex100M in the safe (non-classified) area.

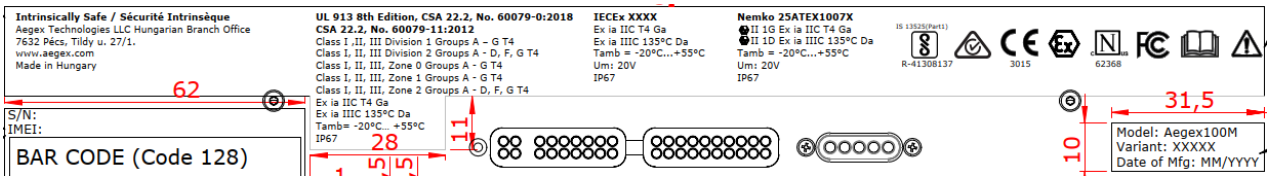
The Aegex100M was evaluated and certified for Group IIB under ExTR US/SNA/ExTR 24.000/00. This ExTR package covers the Aegex100M for Group IIC and the DS100M.

Details of change (applicable only when revising an existing ExTR package):

NA

Copy of Marking Plate:

Aegex100M Tablet



DS100M Docking Station

Maximum input parameters of Docking station:
-U_{max}= 30V DC (Attention, not rated voltage!)
-I_{max}= 15A

Details regarding 'trade agent' / 'local assembler' application in accordance with OD 203:

NA

Testing not fully performed by ExTL staff at the above ExTL address:

The following tests were conducted under ExTR Report US/SNA/ExTR 24.000/00 (Free Reference SUW-4939411-EXTR-001)
5.3.3 – Small Component Temperature Test – 02/16/2024
8.5 – Current Limiting Resistor – 03/22/2024
10.4 – Determination of Loosely Specified Components – 03/07/2024
10.5 - Test for Cells & Batteries – 07/12/2023
26.5.1 – Service Temperature Measurement – 06/19/2024
26.5.3 – Small Component Ignition Test – 02/16/2024, 06/19/2024
26.13 – Surface Resistance Test – 03/11/2024

National differences considered as part of this evaluation:

ATEX Directive 2014/34/EU EN IEC 60079-0:2018, EN 60079-11:2012

"Specific Conditions of Use" / "Schedule of Limitations":

1.DO NOT REMOVE OR REPLACE THE BATTERY PACK IN HAZARDOUS CLASSIFIED AREAS.

2.PRODUCT MUST BE USED WITH BATTERY PACK P/N: AAEB-100-XX, WHERE "XX" ARE PLACE HOLDERS OF THE PART NUMBER FOR FUTURE VERSIONS, FOR CHANGES IN THE PRODUCT THAT DO NOT IMPACT THE SAFETY OR CERTIFICATION OF THE PRODUCT.

3.BATTERY PACK CAN ONLY BE USED AND CHARGED WHILE IT IS ON THE TABLET AEGEX100M. DO NOT ATTEMPT TO CHARGE THE BATTERY IN ANY OTHER MANNER.

4.PRODUCT MUST BE ONLY CHARGED WITH AEGEX CHARGER P/N: AAAK-0XX-01, WHERE XX REPRESENT THE COUNTRY TYPE PLUG AND 01 REPRESENTS VERSION NUMBER.

5.DO NOT OPEN THE SIM / SD CARD PORT IN A HAZARDOUS LOCATION.

6.WHEN IN ZONE 0 LOCATIONS, THE PRODUCT MUST BE USED WITHIN THE CASE PROVIDED BY AEGEX. CASE P/N: APAC-100-01.

7.IT MUST BE TAKEN CARE THAT DURING THE USE OF THE PRODUCT THERE IS NO POSSIBILITY OF FRICTION RESULTING FROM DIRECT CONTACT OF THE PRODUCT ENCLOSURE.

8.PRODUCT MUST BE INSPECTED FOR ANY DAMAGE OR DEFORMATION, WHICH IF PRESENT, THE PRODUCT MUST NOT BE USED IN HAZARDOUS CLASSIFIED AREAS.

9.PRODUCT IS AUTHORIZED TO BE SERVICED ONLY BY AEGEX.

10.DO NOT CHARGE, CONNECT OR DISCONNECT THE AEGEX100M TABLET IN HAZARDOUS • CLASSIFIED AREAS.

11.PRODUCT MUST BE USED WITHOUT ANY ACCESSORIES OR EXTENSIONS WITHIN HAZARDOUS CLASSIFIED AREAS.

Routine tests:

NA

Date(s) of performance for all testing:

26.8 and 26.9 - Thermal Endurance to Heat and Cold – 12/26/2024-01/25/2025
26.4.2 – Impact Test – 01/23/2025, 1/25/2025
26.4.3 – Drop Test – 01/25/2025
26.4.5 - IP Testing – 01/27-01/28/2025
5.3.2.3 - Thermal Rise Test with Dust Layer – 01/29/2025

Technical Documents			
Title:	Drawing No.:	Rev. Level:	Date:
Aegex100M Docking power supply	AAAK-199-01	01	02 Jul 2024
Schematic dwg of Aegex 100 Main PCBA USB Audio	AAEP-056-08-S01.01	8	07-02-2025
Schematic dwg of Aegex 100 SOC PCBA R2, E3940, 8GB LPDDR4, 256GB	AAEP-057-03-S01.01	3	19-Apr-2023
Schematic dwg of Aegex 100 Sensor PCBA	AAEP-058-07-S01.01	7	07-02-2025
Schematic dwg of Aegex 100 Button PCBA	AAEP-059-05-S01.01	5	15-9-2022
Schematic dwg of Aegex 100 System Bottom Connector FPCA	AAEP-060-02-S01.01	5	2022.08.01
Schematic dwg of Aegex 100 Swift Dock FPCA	AAEP-061-01-S01.01	1	2021.09.30
Schematic dwg of Aegex 100 BMS PCBA	AAEP-062-04-S01.01	4	21-11-2023
Schematic dwg of Aegex 100 BMS PCBA	AAEP-062-05-S01.01	5	21-11-2023
Schematic dwg of Aegex 100 Battery Connector PCBA	AAEP-063-02-S01.01	2	29-07-2022
Schematic dwg of Aegex 100 Battery FPCA	AAEP-064-02-S01.01	2	2022.07.29
Schematic dwg of Aegex 100 Charging connector PCBA	AAEP-069-02-S01.01	2	26-09-2022
Schematic dwg of Aegex 100 Antenna Connector Main PCBA	AAEP-070-01-S01.01	1	02-Sep-2022
Schematic dwg of Aegex 100 Antenna Connector Diversity PCBA	AAEP-071-01-S01.01	1	02-Sep-2022
Schematic dwg of Aegex 100 SAR FPCA	AAEP-072-01-S01.01	1	02-Sep-2022
Schematic dwg of Aegex 100 Protection box PCBA	AAEP-075-03-S01.01	3	2023.09.06
Component layout dwg of Aegex 100 Main PCBA USB Audio	AAEP-056-08-CL01.01	8	07-02-2025
Component layout dwg of Aegex 100 SOC PCBA R2, E3940, 8GB LPDDR4, 256GB	AAEP-057-03-CL01.01	3	19-04-2023
Component layout dwg of Aegex 100 Sensor PCBA	AAEP-058-07-CL01.01	7	07-02-2025
Component layout dwg of Aegex 100 Button PCBA	AAEP-059-05-CL01.01	5	15-09-2022
Component layout dwg of Aegex 100 System Bottom Connector FPCA	AAEP-060-02-CL01.01	2	2022.08.01
Component layout dwg of Aegex 100 Swift Dock FPCA	AAEP-061-01-CL01.01	1	2021.09.30
Component layout dwg of Aegex 100 BMS PCBA	AAEP-062-05-CL01.01	5	28/11/2023
Component layout dwg of Aegex 100 Battery Connector PCBA	AAEP-063-02-CL01.01	2	10/8/2022
Component layout dwg of Aegex 100 Battery FPCA	AAEP-064-02-CL01.01	2	2022.07.29
Component layout dwg of Aegex 100 Charging connector PCBA	AAEP-069-02-CL01.01	2	25/10/2022
Component layout dwg of Aegex 100 Antenna Connector Main PCBA	AAEP-070-01-CL01.01	1	02-09-2022
Component layout dwg of Aegex 100 Antenna Connector Diversity PCBA	AAEP-071-01-CL01.01	1	02-09-2022

Component layout dwg of Aegex 100 SAR FPCA	AAEP-072-01-CL01.01	1	02-09-2022
Component layout dwg of Aegex 100 Protection box PCBA	AAEP-075-03-CL01.01	3	21/9/2023
Aegex100 Charging	AAAK-001-01	01	02 Jul 2024
PCB layout dwg of Aegex 100 Main PCB USB Audio	APEP-056-07-PL01.01	7	12-10-2023
PCB layout dwg of Aegex 100 SOC PCB R2	APEP-057-02-PL01.01	2	2/9/2023
PCB layout dwg of Aegex 100 Sensor PCB	APEP-058-06-PL01.01	6	07.02.2025
PCB layout dwg of Aegex 100 Button PCB	APEP-059-03-PL01.01	3	15-09-2022
PCB layout dwg of Aegex 100 System Bottom Connector FPC	APEP-060-02-PL01.01	2	2022.08.01
PCB layout dwg of Aegex 100 Swift Dock FPC	APEP-061-01-PL01.01	1	2021.09.30
PCB layout dwg of Aegex 100 BMS PCB	APEP-062-04-PL01.01	4	21-11-2023
PCB layout dwg of Aegex 100 Battery Connector PCB	APEP-063-02-PL01.01	2	29-07-2022
PCB layout dwg of Aegex 100 Battery FPC	APEP-064-02-PL01.01	2	2022.07.29
PCB layout dwg of Aegex 100 Charging connector PCB	APEP-069-02-PL01.01	2	26-09-2022
PCB layout dwg of Aegex 100 Antenna Connector Main PCB	APEP-070-01-PL01.01	1	2/9/2023
PCB layout dwg of Aegex 100 Antenna Connector Diversity PCB	APEP-071-01-PL01.01	1	2/9/2023
PCB layout dwg of Aegex 100 SAR FPC	APEP-072-01-PL01.01	1	2/9/2023
PCB layout dwg of Aegex 100 Protection box PCB	APEP-075-03-PL01.01	3	2023.09.06
Aegex100M User Guide	ADPU-017-02-02 (Only Pages 3,4,5, and Appendix 1, 2 and 4)	2	17 Jul 2025
Aegex100M engineering marking document Nemko	DOAA-018-01	01	25 Jun 2025
BOM of Aegex 100 products.xlsx	ADFP-100-08	8	March 11 2025
Aegex 100M Protection Adapter	AAAY-002-02-D01.01	2	29 Sept 2023
Aegex 100M Encapsulated Battery	AAAY-015-03-D01.01	3	21 Nov 2023
Aegex 100M Battery w. INR-18650-M35A	AAEB-100-02-D01.02	2	21 Jun 2024
Aegex 100M IS tablet - E3940, 8GB, 256GB, WLAN, NO CAMERA, Win10	ATA100-M-FB-NC-05-D01.01	5	18 Feb 2025
Aegex 100 IS tablet - E3940, 8GB, 256GB, WLAN, NO CAMERA, Win10	ATA90-SNM-NC-03-D01.01	3	18 Feb 2025
Aegex 100M tablet fixed battery	ATA100-M-FB-06-D01.01	6	18 Feb 2025
Aegex 100 IS tablet - E3940, 8GB, 256GB, WLAN, Win10	ATA90-SNM-05-D01.01	5	17 Feb 2025
Aegex100M IS tablet - E3940, 8GB, 256GB, LTE, NO CAMERA, Win10	ATA100-M-LTE-FB-NC-05-D01.01	5	18 Feb 2025
Aegex 100 IS tablet - E3940, 8GB, 256GB, LTE, NO CAMERA, Win10	ATA90-LTE-NC-03-D01.01	3	18 Feb 2025
Aegex100M IS tablet - E3940, 8GB, 256GB, LTE, Win10	ATA100-M-LTE-FB-05-D01.01	5	17 Feb 2025

Aegex 100 IS tablet - E3940, 8GB, 256GB, LTE, Win10	ATA90-LTE-03-D01.01	3	17 Feb 2025
Aegex 100 Back cover with molds.PDF	ACMP-003-04-D01.02	4	21 Nov 2023
Schematic dwg of Aegex 100 Sensor WLAN PCBA	AAEP-082-02-S01.01	2	07-02-2025
Component layout dwg of Aegex 100 Sensor PCBA (Variant: WLAN)	AAEP-082-02-CL01.01	2	07-02-2025
Aegex100M Intrinsically Safe Design_Spacings	DOAA-032-01	1	31/07/2025
Alternate Construction BOM7 Specific Documents			
Schematic dwg of Aegex 100 Main PCBA USB Audio	AAEP-056-07-S01.01	7	12-10-2023
Schematic dwg of Aegex 100 Sensor PCBA	AAEP-058-06-S01.01	6	01-09-2023
Component layout dwg of Aegex 100 Main PCBA USB Audio	AAEP-056-07-CL01.01	7	12-10-2023
Component layout dwg of Aegex 100 Sensor PCBA	AAEP-058-06-CL01.01	6	15-9-2023
Aegex100M engineering marking document	DOAA-020-01	01	25 Jun 2025
BOM of Aegex 100 products.xlsx	ADFP-100-07	7	March 8 2024
Aegex 100M IS tablet - E3940, 8GB, 256GB, WLAN, NO CAMERA, Win10	ATA100-M-FB-NC-04-D01.01	4	11 Jan 2024
Aegex 100 IS tablet - E3940, 8GB, 256GB, WLAN, NO CAMERA, Win10	ATA90-SNM-NC-02-D01.01	2	11 Jan 2024
Aegex 100M tablet fixed battery	ATA100-M-FB-05-D01.01	5	11 Jan 2024
Aegex 100 IS tablet - E3940, 8GB, 256GB, WLAN, Win10	ATA90-SNM-04-D01.01	4	11 Jan 2024
Aegex100M IS tablet - E3940, 8GB, 256GB, LTE, NO CAMERA, Win10	ATA100-M-LTE-FB-NC-04-D01.01	4	11 Jan 2024
Aegex 100 IS tablet - E3940, 8GB, 256GB, LTE, NO CAMERA, Win10	ATA90-LTE-NC-02-D01.01	2	11 Jan 2024
Aegex100M IS tablet - E3940, 8GB, 256GB, LTE, Win10	ATA100-M-LTE-FB-04-D01.01	4	11 Jan 2024
Aegex 100 IS tablet - E3940, 8GB, 256GB, LTE, Win10	ATA90-LTE-02-D01.01	2	11 Jan 2024

Note: Drawings have revision level embedded in the drawing number

Assembled ATEX Report documents and Additional reference material:
ATEX Evaluation and Test Report Cover
ATEX Report: • EN IEC 60079-0:2018 - Explosive atmospheres Part 0: Equipment General Requirements • EN 60079-11:2012 - Explosive atmospheres - Part 11: Equipment protection by intrinsic safety "i"
ATEX Test Report of Essential Health and Safety Requirements: ATEX Directive 2014/34/EU

ATEX Test Report of Essential Health and Safety Requirements: ATEX Directive 2014/34/EU

Clause	Requirement – Test	Result – Remark	Verdict
EN IEC 60079-0:2018			
Annex ZA	Normative references to international publications with their corresponding European publications	Considered as such.	Pass
Annex ZY	Additional Information relating to the European ATEX Directive 2014/34/EU		
ZY.1	Equipment Groups and Categories	The equipment groups and categories indicated match the appropriate EPL.	Pass
ZY.2	Instructions	Standard reference is not required in the installation manual.	N/A
ZY.3	Marking		
ZY.3.1	(ATEX marking)	Equipment is marked	Pass
ZY.3.2	(Marking must include manufacturers name)	The marking includes the manufacturers name.	Pass
ZY.4	Fans (“Room ventilating fans” is to be supplemented by the requirements given in EN 14986)	Equipment does not use ventilating fans.	N/A
ZY.5	Significant changes between this European Standard and EN 60079-0:2012+A11:2013	Considered as such.	Pass
Annex ZZ	Relationship between this European Standard and the Essential Requirements of 2014/34/EU (Annex II) aimed to be covered		
ZZ	ER 1.0.1 to 1.2.2, 1.2.4, 1.2.6, 1.2.7, 1.3.1 to 1.3.3, 1.4.1, 1.4.2, 1.6.4, and 2.0.1 to 2.3.2	These Essential Requirements are covered by the IEC EN 60079-0 Report.	Pass
EN 60079-11:2012			
Annex ZA	Normative references to international publications with their corresponding European publications	Considered as such.	Pass
Annex ZZ	Coverage of Essential Requirements of EU Directives		
ZZ	ER 1.0.1 indent 2, ER 1.0.2 (partly), ER 1.0.3 (partly), ER 1.0.4 (partly), ER 1.0.5 (partly), ER 1.0.6 (partly), ER 1.1 (partly), ER 1.2.1 (partly), ER 1.2.2 (partly), ER 1.2.4 (partly), ER 1.2.6 (partly), ER 1.2.8 (partly), ER 1.3.1 (partly), ER 1.4 (partly), ER 2.0.1.1 to ER 2.0.1.4, ER 2.0.2.1 (partly), ER 2.0.2.2, ER 2.0.2.3, ER 2.1.1.1 to ER 2.1.1.3, ER 2.1.2.1 to ER 2.1.2.4, ER 2.2.1.1 to ER 2.2.1.3, ER 2.2.2.1 to ER 2.2.2.4, ER 2.3.1.1, ER 2.3.1.2, ER 2.3.2.1 to ER 2.3.2.3	These Essential Requirements are covered by the IEC 60079-11 ExTR. See the National Differences of EN IEC 60079-0:2018 for all additional Essential Requirements.	Pass
Essential Requirements of 2014/34/EU (Annex II)			

1.2.3	Enclosed structures and prevention of leaks	Equipment does not contain flammable gas or dust.	N/A
1.2.5	Additional means of protection	Equipment not exposed to external stresses which could impede the protection.	N/A
1.2.8	Overloading of equipment	Mechanical equipment.	N/A
1.2.9	Flameproof enclosure system	Flameproof protection method not used.	N/A
1.3.4	Hazards arising from overheating	No risks due to friction or moving parts.	N/A
1.3.5	Hazards arising from pressure compensation operations	No pressure related operations present.	N/A
1.5	Requirements in respect of safety-related devices		
1.5.1	Safety devices must function independently of any measurement and/or control devices required for operation	Equipment safety is not reliant on control or measurement.	Pass
1.5.2	In the event of a safety device failure, equipment and/or protective systems shall, wherever possible, be secured.	None used.	N/A
1.5.3	Emergency stop controls of safety devices must, as far as possible, be fitted with restart lockouts. A new start command may take effect on normal operation only after the restart lockouts have been intentionally reset.	No such devices present.	N/A
1.5.4	Control and display units (ergonomics)	None present.	N/A
1.5.5	Requirements in respect of devices with a measuring function for explosion protection	None present.	N/A
1.5.6	Where necessary, it must be possible to check the reading accuracy and serviceability of devices with a measuring function.	None present.	N/A
1.5.7	The design of devices with a measuring function must incorporate a safety factor	None present.	N/A
1.5.8	Risks arising from software (faults)	None present.	N/A
1.6	Integration of safety requirements relating to the system		
1.6.1	Manual override must be possible	The equipment is not a system.	N/A
1.6.2	Emergency shutdown system energy dispersion	The equipment is not a system.	N/A
1.6.3	Hazards arising from power failure (maintaining additional risks independently)	The equipment is not a system.	N/A
1.6.5	Placing of warning devices as parts of equipment	The equipment is not a system.	N/A
3	Supplementary requirements in respect of protective systems		
3.0.1	Dimensions	Not a protective system.	N/A
3.0.2	Design and positioning	Not a protective system.	N/A
3.0.3	Power failure	Not a protective system.	N/A

3.0.4	Outside interference	Not a protective system.	N/A
3.1.1	Characteristics of materials	Not a protective system.	N/A
3.1.2	Resisting or containing explosions	Not a protective system.	N/A
3.1.3	Accessories	Not a protective system.	N/A
3.1.4	Pressure in peripheral equipment	Not a protective system.	N/A
3.1.5	Pressure relief systems (when exceeding structural strength)	Not a protective system.	N/A
3.1.6	Explosion suppression system (reaction time)	Not a protective system.	N/A
3.1.7	Explosion decoupling systems (reaction time)	Not a protective system.	N/A
3.1.8	Alarm integration	Not a protective system.	N/A

TEST REPORT
IEC 60079-0
Explosive atmospheres – Part 0: Equipment – General requirements

ExTR Reference Number..... :	REP107402
ExTR Free Reference Number ..... :	PRJ0070165
Compiled by + signature (ExTL) .... :	Jedd Smith 
Reviewed by + signature (ExTL).... :	Ben Carver 
Date of issue ..... :	2025-08-05
Ex Testing Laboratory (ExTL)..... :	Nemko USA Inc. (Austin)
Address ..... :	1601 N A.W. Grimes Blvd, Suite B Round Rock, Texas 78665
Applicant's name..... :	Aegex Technologies, LLC
Address ..... :	84 Peachtree St. NW Atlanta GA 30303 USA
Standard..... :	IEC 60079-0:2017, Edition 7.0
Test procedure..... :	IECEx System
Test Report Form Number ..... :	ExTR60079-0-7J_DS (released 2024-11)
Related Amendments, Corrigenda or ISHs	N/A

Possible test case verdicts:

- test case does not apply to the test item .....:N / A

- test item does meet the requirement .....:Pass

General remarks:
The test results presented in this Ex Test Report relate only to the item or product tested.

- "(see Attachment #)" refers to additional information appended to this document.
- "(see appended table)" refers to a table appended to this document.
- Throughout this document, a point "." is used as the decimal separator.

The technical content of this Ex Test Report shall not be reproduced except in full without the written approval of the Issuing ExCB and ExTL.

IEC 60079-0			
Clause	Requirement – Test	Result – Remark	Verdict
1	Scope		
DS 2024/002	Non-electricals	Not applicable to product	NA
DS 2021/004	Assemblies	Not an assembly	NA
2	Normative references		
3 **DS 2020/002**	Terms and definitions		
4	Equipment grouping		
4.1	General	REFER TO SECTION 4.2 AND 4.3. EX IA IIC T4 GA TAMB -20°C TO +55°C	Pass
4.2	Group I	EVALUATED FOR GROUP IIC. NOT INTENDED & EVALUATED FOR GROUP I	NA
4.3	Group II	Ex ia IIC T4 Ga	Pass
4.4	Group III	Reference test data, product meets T4	Pass
4.5	Equipment for a particular explosive gas atmosphere	Not evaluated for particular explosive atmosphere.	NA
5 **DS 2016/002** **DS 2015/011A**	Temperatures		
5.1	Environmental influences		
5.1.1	Ambient temperature	Tamb -20°C to +55°C	Pass
5.1.2 **DS 2022/002**	External source of heating or cooling	None	NA

IEC 60079-0			
Clause	Requirement – Test	Result – Remark	Verdict
5.2 **DS 2020/006**	Service temperature	The Service Temperature performed per most onerous configuration of product under normal operation in accordance with ordinary locations requirements, recorded within report SUW-4938411-CB-01. Report SUW-4939411-TDS-009, is constructed referencing this data. Additionally, Service Temperature of the tablet with the encapsulation was performed under the report SUW-4939411-TDS-009 as well, in accordance with IEC 60079-0, 7th Ed. Under this test, a maximum service temperature of 68.48°C when corrected to an ambient of 55°C. The temperature observed at the surface of the (Battery Pack) encapsulation, Sika, was 64.28°C (at 55°C ambient).	Pass

5.3	Maximum surface temperature		
5.3.1	Determination of maximum surface temperature	Reference SUW-4939411-EXTR-001	Pass
5.3.2	Limitation of maximum surface temperature		
5.3.2.1	Group I electrical equipment	Not intended for Group I	NA
5.3.2.2	Group II electrical equipment	Refer to section 5.3.1.	Pass
5.3.2.3	Group III electrical equipment		
5.3.2.3.1 **DS 2020/006**	Maximum surface temperature for EPL Da	200mm dust layer was used, reference test data	Pass
5.3.2.3.2	Maximum surface temperature for EPL Db	Not for Db	NA
5.3.2.3.3	Maximum surface temperature determined without a layer of dust for EPL Dc	Not for Dc	NA
5.3.3	Small component temperature for Group I or Group II electrical equipment	Reference SUW-4939411-EXTR-001	Pass
5.3.4	Component temperature of smooth surfaces for Group I or Group II electrical equipment	No Smooth Surfaces considered under this evaluation.	NA

6	Requirements for all electrical equipment		

6.1	General	Equipment meets requirement of this standard and intrinsic safety under IEC 60079-11	Pass

IEC 60079-0			
Clause	Requirement – Test	Result – Remark	Verdict
6.2	Mechanical strength of equipment	This section is excluded except when IEC 60079-11, 6th ed. 6.1.2.3a) & 6.1.3 a) (Annex F) is applied. Annex F is not applied, and 6.1.3 a) of IEC 60079-11, not used.	NA
6.3	Opening times	Excluded by Table 1 of IEC 60079-11, 6th Ed.	NA
6.4	Circulating currents in enclosures (e.g. of large electric machines)	Excluded by Table 1 of IEC 60079-11, 6th Ed.	NA
6.5	Gasket retention	Not intended to be opned	NA
6.6	Electromagnetic and ultrasonic energy radiating equipment		
6.6.1	General	The maximum power is the LTE Module which has a combined power of 1.3W<2W for Group IIC, reference SUW-4939411-EXTR-001 for details	Pass
6.6.2	Radio frequency sources	The maximum power is the LTE Module which has a combined power of 1.3W<2W for Group IIC, reference SUW-4939411-EXTR-001 for details	Pass
6.6.3	Ultrasonic sources	None	NA
6.6.4 **DS 2018/004**	Lasers, luminaires, and other non-divergent continuous wave optical sources	There are no Lasers, Luminaries, non-divergent continuous wave optical sources. Product incorporates two sources of light, one a screen and a flashlight. Neither of these are with intent for illumination nor aren't converging on a focal point. Conclusively, no radiation sources for with ignition hazard has been considered. Thus, IEC 60079-28 isn't applicable.	NA
7	Non-metallic enclosures and non-metallic parts of enclosures		
7.1	General		
7.1.1	Applicability	Reference SUW-4939411-TDS-006.	Pass
7.1.2	Specification of materials		
7.1.2.1	General	This section is excluded except when IEC 60079-11, 6th ed. 6.1.2.3a) & 6.1.3 a) (Annex F) is applied. Annex F is not applied, and 6.1.3 a) of IEC 60079-11, not used.	NA
7.1.2.2	Plastic materials	This section is excluded except when IEC 60079-11, 6th ed. 6.1.2.3a) & 6.1.3 a) (Annex F) is applied. Annex F is not applied, and 6.1.3 a) of IEC 60079-11, not used.	NA

IEC 60079-0			
Clause	Requirement – Test	Result – Remark	Verdict
7.1.2.3	Elastomers	This section is excluded except when IEC 60079-11, 6th ed. 6.1.2.3a) & 6.1.3 a) (Annex F) is applied. Annex F is not applied, and 6.1.3 a) of IEC 60079-11, not used.	NA
7.1.2.4	Materials used for cementing	Cementing not incorporated within this product	NA

7.2	Thermal endurance		
7.2.1	Tests for thermal endurance	This section is excluded except when IEC 60079-11, 6th ed. 6.1.2.3a) & 6.1.3 a) (Annex F) is applied. Annex F is not applied, and 6.1.3 a) of IEC 60079-11, not used.	NA
7.2.2	Material selection	This section is excluded except when IEC 60079-11, 6th ed. 6.1.2.3a) & 6.1.3 a) (Annex F) is applied. Annex F is not applied, and 6.1.3 a) of IEC 60079-11, not used.	NA
7.2.3	Alternative qualification of elastomeric sealing O-rings	This section is excluded except when IEC 60079-11, 6th ed. 6.1.2.3a) & 6.1.3 a) (Annex F) is applied. Annex F is not applied, and 6.1.3 a) of IEC 60079-11, not used.	NA

7.3 **DS 2023/001**	Resistance to ultraviolet light	This section is excluded except when IEC 60079-11, 6th ed. 6.1.2.3a) & 6.1.3 a) (Annex F) is applied. Annex F is not applied, and 6.1.3 a) of IEC 60079-11, not used.	NA

7.4	Electrostatic charges on external non-metallic materials		
7.4.1	Applicability	Reference SUW-4939411-EXTR-001 for details	Pass
7.4.2	Avoidance of a build-up of electrostatic charge for Group I or Group II	Reference SUW-4939411-EXTR-001 for details	Pass
7.4.3	Avoidance of a build-up of electrostatic charge for Group III	Hand held devices do not apply	Pass

7.5	Attached external conductive parts	Product is made of metal enclosure	NA

8	Metallic enclosures and metallic parts of enclosures

8.1	Material composition	Reference 8.3	Pass

8.2	Group I	Not for Group I	NA

<table>
<tr><td colspan="4">IEC 60079-0</td></tr>
<tr><td>Clause</td><td>Requirement – Test</td><td>Result – Remark</td><td>Verdict</td></tr>
<tr><td>8.3</td><td>Group II</td><td>Refer to Justification of compliance for enclosure and the Encapsulant, for material composition.
Product uses machined Aluminum 6063 for enclosure.

<table><tr><th colspan="2">Material composition of the tablet housing:</th></tr><tr><th>Property</th><th>Value</th></tr><tr><td>Aluminum</td><td>97.5 - 99.35 %</td></tr><tr><td>Chromium</td><td>0 - 0.1 %</td></tr><tr><td>Copper</td><td>0 - 0.1 %</td></tr><tr><td>Iron</td><td>0 - 0.35 %</td></tr><tr><td>Magnesium</td><td>0.45 - 0.9 %</td></tr><tr><td>Manganese</td><td>0 - 0.1 %</td></tr><tr><td>Silicon</td><td>0.2 - 0.6 %</td></tr><tr><td>Titanium</td><td>0 - 0.1 %</td></tr><tr><td>Zinc</td><td>0 - 0.1 %</td></tr><tr><td>Others</td><td>0 – 0.15 %</td></tr></table>
<table><tr><th colspan="2">Material composition of the battery housing:</th></tr><tr><th>Property</th><th>Value</th></tr><tr><td>Aluminum</td><td>Balance</td></tr><tr><td>Manganese</td><td>0.0 - 0.1 %</td></tr><tr><td>Iron</td><td>0 - 0.4 %</td></tr><tr><td>Copper</td><td>0 - 0.1%</td></tr><tr><td>Magnesium</td><td>2.2 - 2.8 %</td></tr><tr><td>Silicon</td><td>0 - 0.25 %</td></tr><tr><td>Zinc</td><td>0.0 - 0.1 %</td></tr><tr><td>Chromium</td><td>0.15 - 0.35%</td></tr><tr><td>Others</td><td>0 - 0.15%</td></tr></table>
X CONDITION: WHEN IN ZONE 0 LOCATIONS, THE PRODUCT MUST BE USED WITHIN THE CASE PROVIDED BY AEGEX. CASE P/N: APAC-100-01. IT MUST
BE TAKEN CARE THAT DURING THE USE OF THE PRODUCT THERE IS NO POSSIBILITY OF FRICTION RESULTING FROM DIRECT CONTACT OF THE PRODUCT ENCLOSURE.</td><td>Pass</td></tr>
<tr><td>8.4</td><td>Group III</td><td>Reference 8.3 above</td><td>Pass</td></tr>
<tr><td>8.5</td><td>Copper Alloys</td><td>No copper alloys used</td><td>NA</td></tr>
<tr><td>9</td><td colspan="3">Fasteners</td></tr>
</table>

IEC 60079-0			
Clause	Requirement – Test	Result – Remark	Verdict
9.1	General	No parts necessary to prevent access	NA
9.2	Special fasteners	No parts necessary to prevent access	NA
9.3	Holes for special fasteners		
9.3.1	Thread engagement	No parts necessary to prevent access	NA
9.3.2	Tolerance and clearance	No parts necessary to prevent access	NA
9.4	Hexagon socket set screws	No parts necessary to prevent access	NA
10	Interlocking devices	No interlocks used	NA
11	Bushings	No bushing used	NA
12	(Reserved for future use)		
13 **DS 2014/001** **DS 2021/006**	Ex Components		
13.1	General	No Ex components	NA
13.2	Mounting	No Ex components	NA
13.3	Internal mounting	No Ex components	NA
13.4	External mounting	No Ex components	NA
13.5 **DS 2020/002**	Ex Component certificate	No Ex components	NA
14	Connection facilities		
14.1	General	Excluded per IEC 60079-11 under table 1 for Group II equipment.	NA
14.2	Type of protection	Excluded per IEC 60079-11 under table 1 for Group II equipment.	NA
14.3	Creepage and clearance	Excluded per IEC 60079-11 under table 1 for Group II equipment.	NA

IEC 60079-0			
Clause	Requirement – Test	Result – Remark	Verdict
15	Connection facilities for earthing or bonding conductors		
15.1	Equipment requiring earthing or bonding		
15.1.1	Internal earthing	Excluded per IEC 60079-11 under table 1 for Group II equipment.	NA
15.1.2	External bonding	Excluded per IEC 60079-11 under table 1 for Group II equipment.	NA
15.2	Equipment not requiring earthing	Excluded per IEC 60079-11 under table 1 for Group II equipment.	NA
15.3	Size of protective earthing conductor connection	Excluded per IEC 60079-11 under table 1 for Group II equipment.	NA
15.4	Size of equipotential bonding conductor connection	Excluded per IEC 60079-11 under table 1 for Group II equipment.	NA
15.5	Protection against corrosion	Excluded per IEC 60079-11 under table 1 for Group II equipment.	NA
15.6	Secureness of electrical connections	Excluded per IEC 60079-11 under table 1 for Group II equipment.	NA
15.7	Internal earth continuity plate	Excluded per IEC 60079-11 under table 1 for Group II equipment.	NA
16 **DS 2017/001**	Entries into enclosures		
16.1	General	This section is excluded except when IEC 60079-11, 6th ed. 6.1.2.3a) & 6.1.3 a) (Annex F) is applied. Annex F is not applied, and 6.1.3 a) of IEC 60079-11, not used.	NA
16.2	Identification of entries	This section is excluded except when IEC 60079-11, 6th ed. 6.1.2.3a) & 6.1.3 a) (Annex F) is applied. Annex F is not applied, and 6.1.3 a) of IEC 60079-11, not used.	NA
16.3	Cable glands	This section is excluded except when IEC 60079-11, 6th ed. 6.1.2.3a) & 6.1.3 a) (Annex F) is applied. Annex F is not applied, and 6.1.3 a) of IEC 60079-11, not used.	NA

IEC 60079-0			
Clause	Requirement – Test	Result – Remark	Verdict
16.4	Blanking elements	This section is excluded except when IEC 60079-11, 6th ed. 6.1.2.3a) & 6.1.3 a) (Annex F) is applied. Annex F is not applied, and 6.1.3 a) of IEC 60079-11, not used.	NA
16.5	Thread adapters	This section is excluded except when IEC 60079-11, 6th ed. 6.1.2.3a) & 6.1.3 a) (Annex F) is applied. Annex F is not applied, and 6.1.3 a) of IEC 60079-11, not used.	NA
16.6 **DS 2018/002**	Temperature at branching point and entry point	This section is excluded except when IEC 60079-11, 6th ed. 6.1.2.3a) & 6.1.3 a) (Annex F) is applied. Annex F is not applied, and 6.1.3 a) of IEC 60079-11, not used.	NA
16.7	Electrostatic charges of cable sheaths	This section is excluded except when IEC 60079-11, 6th ed. 6.1.2.3a) & 6.1.3 a) (Annex F) is applied. Annex F is not applied, and 6.1.3 a) of IEC 60079-11, not used.	NA
17	Supplementary requirements for electric machines		
17	Supplementary requirements for electric machines	Excluded per IEC 60079-11 under table 1 for Group II equipment.	NA
18	Supplementary requirements for switchgear		
18	Supplementary requirements for switchgear	Excluded per IEC 60079-11 under table 1 for Group II equipment.	NA
19	Reserved for future use		
20 **DS 2020/007**	Supplementary requirements for external plugs, socket outlets and connectors for field wiring connection		
20.1	General	Excluded per IEC 60079-11 under table 1 for Group II equipment.	NA
20.2	Explosive gas atmospheres	Excluded per IEC 60079-11 under table 1 for Group II equipment.	NA
20.3	Explosive dust atmospheres	Excluded per IEC 60079-11 under table 1 for Group II equipment.	NA

IEC 60079-0			
Clause	Requirement – Test	Result – Remark	Verdict
20.4	Energized plugs	Excluded per IEC 60079-11 under table 1 for Group II equipment.	NA
21	Supplementary requirements for luminaires		
21.1 **DS 2020/001**	General	Excluded per IEC 60079-11 under table 1 for Group II equipment.	NA
21.2	Covers for luminaires of EPL Mb, EPL Gb, or EPL Db	Excluded per IEC 60079-11 under table 1 for Group II equipment.	NA
21.3	Covers for luminaires of EPL Gc or EPL Dc	Excluded per IEC 60079-11 under table 1 for Group II equipment.	NA
21.4	Sodium lamps	Excluded per IEC 60079-11 under table 1 for Group II equipment.	NA
22	Supplementary requirements for caplights and handlights		
22.1	Group I caplights	Not a caplight or handlight	NA
22.2	Group II and Group III caplights and handlights	Not a caplight or handlight	NA
23	Equipment incorporating cells and batteries		
23.1	General	The product incorporates a Battery Pack, with Li-Ion Cells, in the configuration 2S1P. There are 2 packs which are operating within the product, one at a time. Cells are connected series to form a battery pack.	Pass
23.2	Interconnection of cells to form batteries	Excluded (IEC 60079-11 Table 1 – Applicability of specific clauses of IEC 60079-0)	NA

IEC 60079-0			
Clause	Requirement – Test	Result – Remark	Verdict
23.3 **DS 2019/002**	Cell types	Cells incorporated are Molicel INR-18650-M35A. The cells were subjected to short circuit testing in accordance with IEC 60079-11, 6th Ed. No Leakage Observed. Refer to 5.3.1 of this ExTR for more details. The cell is secondary in nature, Li-Ion Cell is made of Lithium Cobalt Oxide as Positive Electrode and Carbon as Negative Electrode. The Nominal and Maximum Voltages are 3.60V, 4.20V respectively. For cell to be compliant, cells comply with requirements of DS 2019/002 Tag Decision, which indicates that the cell is compliant against IEC 62133-2. Cell is compliant per report CBBDMJ-WTW-P22120266 001, issued by DEKRA Certification B.V.	Pass
23.4	Cells in a battery	Only one type of cell considered in this product, within the battery pack	Pass
23.5	Ratings of batteries	Approved Battery Pack designed by manufacturer of the end product. Battery Pack is appropriately operated, in accordance with rating.	Pass
23.6	Interchangeability	Primary and secondary cells/batteries not used together inside this equipment. No interchangeability concerns.	NA
23.7	Charging of primary batteries	There are no primary cells	NA
23.8	Leakage	Refer to SGS Test report: SUW-4939411-TDS-003. It was observed that there were no fume or leakage of electrolyte during the short circuit test.	Pass
23.9	Connections	User cannot change the battery. Aegex installs the battery per battery manufacturer's recommended electrical connection method	Pass
23.10	Orientation	Construction prevents wrong orientation	Pass
23.11	Replacement of cells or batteries	Not replaceable	NA

IEC 60079-0			
Clause	Requirement – Test	Result – Remark	Verdict
23.12	Replaceable battery pack	Replacement not permissible in hazardous classified areas. Warning per 29.13 b) present. WARNING: DO NOT OPEN WHEN AN EXPLOSIVE ATMOSPHERE IS PRESENT Battery Pack must have a label with Manufacturer Name, Type Identification and "USE ONLY ON…" followed by the type identification of the intended equipment. The identification of Battery Pack must be stated in Tablet Instruction Manual, and the procedure for Battery Pack replacement must be iterated as well.	Pass
24	Documentation	Refer to Cover Sheet for list of documents considered under scheduled drawings.	Pass
25	Compliance of prototype or sample with documents	Samples of equipment provided for type verifications and tests comply with the manufacturer's documents referenced in Clause 24.	Pass
26 **DS 2017/005**	Type tests		
26.1	General	Refer to SGS Test report: SUW-4939411-TDS and this document	Pass
26.2	Test configuration	Refer to SGS Test report: SUW-4939411-TDS and this document	Pass
26.3	Tests in explosive test mixtures	Refer to SGS Test report: SUW-4939411-TDS and this document	Pass
26.4	Tests of enclosures		
26.4.1	Order of tests		
26.4.1.1	Metallic enclosures, metallic parts of enclosures and glass parts of enclosures	This section is excluded except when IEC 60079-11, 6th ed. 6.1.2.3a) & 6.1.3 a) (Annex F) is applied. Annex F is not applied, and 6.1.3 a) of IEC 60079-11, not used.	NA
26.4.1.2	Non-metallic enclosures or non-metallic parts of enclosures		
26.4.1.2.1	General	This section is excluded except when IEC 60079-11, 6th ed. 6.1.2.3a) & 6.1.3 a) (Annex F) is applied. Annex F is not applied, and 6.1.3 a) of IEC 60079-11, not used.	NA

IEC 60079-0			
Clause	Requirement – Test	Result – Remark	Verdict
26.4.1.2.2	Group I equipment	This section is excluded except when IEC 60079-11, 6th ed. 6.1.2.3a) & 6.1.3 a) (Annex F) is applied. Annex F is not applied, and 6.1.3 a) of IEC 60079-11, not used.	NA
26.4.1.2.3	Group II and Group III equipment	Reference test data for details	Pass
26.4.2 **DS 2020/001**	Resistance to impact	Reference test data for details	Pass
26.4.3	Drop test	Reference test data for details	Pass
26.4.4	Acceptance criteria	Reference test data for details	Pass
26.4.5 **DS 2012/003**	Degree of protection (IP) by enclosures		
26.4.5.1	Test procedure	Reference test data for details	Pass
26.4.5.2	Acceptance criteria	Reference test data for details	Pass

26.5	Thermal tests		
26.5.1	Temperature measurement		
26.5.1.1	General	Reference SGS test data	Pass
26.5.1.2	Service temperature	Refer to section 5.2	Pass
26.5.1.3 **DS 2024/001**	Maximum surface temperature	Refer to section 5.3	Pass
26.5.2	Thermal shock test	Due to the temperature observed, test was considered to be not applicable	NA
26.5.3	Small component ignition test (Group I and Group II)		
26.5.3.1	General	Reference SGS report SUW-5135299-TDS-001a and SUW-4939411-TDS-008	Pass
26.5.3.2	Procedure	Reference SGS report SUW-5135299-TDS-001a and SUW-4939411-TDS-008	Pass
26.5.3.3	Acceptance criteria	Reference SGS report SUW-5135299-TDS-001a and SUW-4939411-TDS-008	Pass

26.6	Torque test for bushings		
26.6.1	Test procedure	No bushings used	NA
26.6.2	Acceptance criteria	No bushings used	NA

26.7	Non-metallic enclosures or non-metallic parts of enclosures		
26.7.1	General	Reference test data	Pass
26.7.2	Test temperatures	Reference test data	Pass

26.8 **DS 2020/003A**	Thermal endurance to heat	Reference test data, testing conducted at 80°C, 90%	Pass

IEC 60079-0			
Clause	Requirement – Test	Result – Remark	Verdict
26.9	Thermal endurance to cold	Reference test data, test conducted at -25°C	Pass
26.10	Resistance to UV light		
26.10.1	General	The enclosure is metal	NA
26.10.2	Light exposure	The enclosure is metal	NA
26.10.3	Acceptance criteria	The enclosure is metal	NA
26.11	Resistance to chemical agents for Group I equipment	Not for Group I	NA
26.12	Earth continuity	Handheld	NA
26.13	Surface resistance test of parts of enclosures of non-metallic materials	Refer to SGS Test Data Sheet SUW-4939411-TDS-007	Pass
26.14	Measurement of capacitance		
26.14.1	General	Not required	NA
26.14.2	Test procedure	Not required	NA
26.15	Verification of ratings of ventilating fans	None used	NA
26.16	Alternative qualification of elastomeric sealing O-rings	Not required	NA
26.17	Transferred charge test		
26.17.1	Test equipment	Not required	NA
26.17.2	Test sample	Not required	NA
26.17.3	Test procedure	Not required	NA
27	Routine tests	Noe required	NA
28	Manufacturer's responsibility		
28.1	Conformity with the documentation	Manufacturer responsibility	Pass
28.2 **DS 2020/002** **DS 2021/005**	Certificate	A certificate will be provided	Pass

IEC 60079-0			
Clause	Requirement – Test	Result – Remark	Verdict
28.3	Responsibility for marking	Manufacturer responsibility	Pass

29 **DS 2012/005A** **DS 2017/007** **DS 2021/005** **DS 2021/006**	Marking Note: Optional IP rating marked as noted in DS 2012/005A. Note: DS 2017/007 does not apply. Note: DS 2021/005 does not apply. Note: DS 2021/006 does not apply.

29.1	Applicability	The marking has been applied following demonstration of full compliance with the applied standards.	Pass
29.2	Location	Refer to drawing DOAA-001-01 for location of application.	Pass
29.3	General	Refer to Document DOAA-001-01	Pass
29.4	Ex marking for explosive gas atmospheres	“ia” marked	Pass
29.5	Ex marking for explosive dust atmospheres	Ex ia IIIC T135°C Da marked	Pass
29.6	Combined types (or levels) of protection	Combination not used	NA
29.7	Multiple types of protection	Only one used	NA
29.8	Ga equipment using two independent Gb types (or levels) of protection	Only one used	NA
29.9	Boundary wall	No boundary wall	NA
29.10 **DS 2004/006A** **DS 2012/006A** **DS 2012/008** **DS 2023/002**	Ex Components	No Ex components	NA
29.11	Small Ex Equipment and small Ex Components	Not small equipment	NA

IEC 60079-0			
Clause	Requirement – Test	Result – Remark	Verdict
29.12	Extremely small Ex Equipment and extremely small Ex Components	Not small equipment	NA
29.13	Warning markings	Refer to Drawing DOAA-018-01	Pass
29.14	Cells and batteries	No replaceable cells or batteries employed	NA
29.15	Electric machines operated with a converter	Excluded per IEC 60079-11 under table 1 for Group II equipment	NA
29.16	Examples of marking	INFO	NA
30 **DS 2021/006**	Instructions		
30.1	General	Instructions provided	Pass
30.2	Cells and batteries	No replaceable cells or batteries employed within the product	NA
30.3	Electrical machines	Not an electric machine	NA
30.4	Ventilating fans	None	NA
30.5	Cable glands	No cable glands	NA
Annex A (Normative) **DS 2017/001**	Supplementary requirements for cable glands		
A	Supplementary requirements for cable glands	Excluded (IEC 60079-11 Table 1 – Applicability of specific clauses of IEC 60079-0)	NA
Annex B (Normative)	Requirements for Ex Components		
Table B.1	Applicability of clauses to Ex Components	Excluded (IEC 60079-11 Table 1 – Applicability of specific clauses of IEC 60079-0)	NA
Annex C (Informative)	Example of rig for resistance to impact test		

IEC 60079-0			
Clause	Requirement – Test	Result – Remark	Verdict

Annex D (Informative)	Electric machines connected to converters

Annex E (Informative)	Temperature evaluation of electric machines

Annex F (Informative)	Guideline flowchart for tests of non-metallic enclosures or non-metallic parts of enclosures (26.4)

Annex G (Informative)	Guidance flowchart for tests of cable glands

Annex H (Informative)	Shaft voltages resulting in motor bearing or shaft brush sparking Discharge energy calculation

Measurement Section, including Additional Narrative Remarks (as deemed applicable)

NA

TEST REPORT
IEC 60079-11
Explosive atmospheres – Part 11: Equipment protection by intrinsic safety "i"

ExTR Reference Number .....:	REP107402
ExTR Free Reference Number.....:	PRJ0070165
Compiled by + signature (ExTL).....:	Jedd Smith
Reviewed by + signature (ExTL) ....:	Ben Carver
Date of issue.....:	2025-08-05
Ex Testing Laboratory (ExTL) .....:	Nemko USA Inc. (Austin)
Address .....:	1601 N A.W. Grimes Blvd, Suite B Round Rock, Texas 78665
Applicant's name .....:	Aegex Technologies, LLC
Address .....:	84 Peachtree St. NW Atlanta GA 30303 USA
Standard .....:	IEC 60079-11:2011, Edition 6.0
Test procedure .....:	IECEx System
Test Report Form Number .....:	ExTR60079-11_6B_DS (released 2021-10)

Instructions for Intended Use of Ex Test Report:
An Ex Test Report provides a clause-by-clause documentation of the initial evaluation and testing that verified compliance of an item or product with an IEC, ISO, ISO/IEC or IEC/IEEE Ex standard or technical specification. This Ex Test Report is part of an ExTR package that may include other Ex Test Report, Addendum, National Differences and Partial Testing documents, along with a single ExTR Cover. An Ex Test Report is to be compiled and reviewed by the ExTL. The Issuing ExCB indicates final approval of the Ex Test Report as part of the overall ExTR package on the associated ExTR Cover.

Possible test case verdicts:

- test case does not apply to the test item ..... :N / A

- test item does meet the requirement ..... :Pass

General remarks:
The test results presented in this Ex Test Report relate only to the item or product tested.

- "(see Attachment #)" refers to additional information appended to this document.
- "(see appended table)" refers to a table appended to this document.
- Throughout this document, a point "." is used as the decimal separator.

The technical content of this Ex Test Report shall not be reproduced except in full without the written approval of the Issuing ExCB and ExTL.

IEC 60079-11			
Clause	Requirement – Test	Result – Remark	Verdict
1	Scope		
2 **DS 2010/006A**	Normative references		
3	Terms and definitions		
4	Grouping and classification of intrinsically safe apparatus and associated apparatus	Ex ia IIB T4 Ga TAMB -20°C to +55°C	Pass
5	Levels of protection and ignition compliance requirements of electrical apparatus		
5.1	General	Equipment evaluated to ia requirements.	Pass
5.2	Level of protection "ia"	Refer to Appendix A.1 of SUW-4939411-ExTR-001 for details.	Pass
5.3	Level of protection "ib"	Not for ib	NA
5.4	Level of protection "ic"	Not for ic	NA
5.5	Spark ignition compliance	Refer to Appendix A.2 of SUW-4939411-ExTR-001 and appendix of this document for details.	Pass
5.6	Thermal ignition compliance		
5.6.1	General	Refer to Appendix A.3 of SUW-4939411-ExTR-001 for details.	Pass
5.6.2 **DS 2015/009** **DS 2015/016A**	Temperature for small components for Group I and Group II	Refer to Appendix A.3.1 of SUW-4939411-ExTR-001 for details.	Pass
5.6.3	Wiring within intrinsically safe apparatus for Group I and Group II	Refer to Appendix A.3.2 of SUW-4939411-ExTR-001 for details.	Pass
5.6.4	Tracks on printed circuit boards for Group I and Group II	Refer to Appendix A.3.3 of SUW-4939411-ExTR-001 for details.	Pass
5.6.5 **DS 2020/006**	Intrinsically safe apparatus and component temperature for Group III	Refer to test results for details.	Pass

IEC 60079-11			
Clause	Requirement – Test	Result – Remark	Verdict
5.7	Simple apparatus	Not a simple apparatus	NA
6	Apparatus construction		
6.1	Enclosures		
6.1.1	General	6.1.2.2 applies (Table 5), for requirements to be met per Group II, IP 64 is met by enclosure after the performance of Impact and Drop. Refer test data.	Pass
6.1.2	Enclosures for Group I or Group II apparatus		
6.1.2.1	General	6.1.2.2 applies (Table 5)	Pass
6.1.2.2	Apparatus complying with Table 5	All sections comprising of circuit assessment also incorporate spacing evaluation with Gerber File Snippets showing compliance with the requirements under Table 5 reference SGS report SUW-4939411-ExTR-001.	Pass
6.1.2.3 **DS 2019/006**	Apparatus complying with Annex F	Annex F is not applied.	NA
6.1.3	Enclosures for Group III apparatus	Table 5 used and product meets IP64 requirements, reference test data	Pass
6.2	Facilities for connection of external circuits		
6.2.1	Terminals	Complies with the values in Table 5. Refer to A.1.2.13 of SUW-4939411-ExTR-001.	Pass
6.2.2	Plugs and sockets	No interchangeable plugs and sockets.	NA
6.2.3	Determination of maximum external inductance to resistance ratio (*Lo/Ro*) for resistance limited power source	Refer to A.1.2.13 of SUW-4939411-ExTR-001	Pass
6.2.4	Permanently connected cable	Not this type of product.	NA
6.2.5	Requirements for connections and accessories for IS apparatus when located in the non-hazardous area	Refer to A.1.2.13, A.1.2.6 and A.1.2.9 of SUW-4939411-ExTR-001	Pass
6.3	Separation distances		

IEC 60079-11			
Clause	Requirement – Test	Result – Remark	Verdict
6.3.1	General	All sections comprising of circuit assessment also incorporate spacing evaluation with Gerber File Snippets showing compliance with the requirements under Table 5.	Pass
6.3.2	Separation of conductive parts	Refer to SUW-4939411-ExTR-001 for Spacings Evaluation of Mainboard under encapsulation.	Pass
6.3.2.1	Distances according to Table 5	Refer to SUW-4939411-ExTR-001 section for Spacings Evaluation of Mainboard under Encapsulation and Evaluation of Components Under No Encapsulation.	Pass
6.3.2.2	Distances according to Annex F	Annex F not applied.	NA
6.3.3	Voltage between conductive parts	Product is Battery Powered and is intended to be intrinsically safe. The external parameter Um has been incorporated during assessment of the protective components. There are no galvanically separated parts of the product. The spacings between the parts of a circuit are performed in accordance with Table 5. The voltage rails considered are based on maximum voltage levels that can be observed within the product per fault considerations of Clause 5.	Pass
6.3.4	Clearance	No insulating partitions incorporated.	NA
6.3.5	Separation distances through casting compound	Casting Compound used and complied with the requirements of 6.6. This is applicable to the hard material used for encapsulating the BMS and the soft encapsulant inside the tablet.	Pass
6.3.5.1	General	Reference 6.3.5.2-6.3.5.3	Pass
6.3.5.2	Protection against spark ignition while in the hazardous area	The docking station is not used in the hazardous area only in non-hazardous area	NA
6.3.5.3	Protection of components on which intrinsic safety depends	The docking station has components that are relied on, reference assessment below Countable fault analysis of 5.2, thermal or spark ignition considerations are not required for the non-hazardous area accessory. Spacings are met under coating	Pass
6.3.6	Separation distances through solid insulation	No Solid insulation	NA
6.3.7	Composite separations	No such separations considered for assessment.	NA
6.3.8	Creepage distance	All sections comprising of circuit assessment also incorporate spacing evaluation with Gerber File Snippets showing compliance with the requirements under Table 5.	Pass

IEC 60079-11			
Clause	Requirement – Test	Result – Remark	Verdict
6.3.9	Distance under coating	All sections comprising of circuit assessment also incorporate spacing evaluation with Gerber File Snippets showing compliance with the requirements under Table 5. Applicable only to the protection box PCB as it uses conformal coating. Type and method of coating specified in the schedule drawings as required.	Pass
6.3.10	Requirements for assembled printed circuit boards	Rules of spacings assessment for PCBs followed	Pass
6.3.11	Separation by earthed screens	No earthed screens	NA
6.3.12	Internal wiring	All internal wiring is present under encapsulation	Pass
6.3.13	Dielectric strength requirement	The equipment is battery powered so insulation from earth is not applicable. Dielectric test is not applicable.	NA
6.3.14	Relays	No relays in the equipment	NA

6.4	Protection against polarity reversal	Reverse polarization is mechanically not possible.	NA

6.5	Earth conductors, connections and terminals	The earth is the battery negative pole. In case of “earth disconnect” the circuit is disconnected.	NA

6.6	Encapsulation

IEC 60079-11			
Clause	Requirement – Test	Result – Remark	Verdict
6.6.1	General	Product uses 2 types of encapsulations, **SS5061, Silicone Solutions** and **SikaBiresin® RE 461 POLYOL / SikaBiresin® RE 101 ISOCYANATE.** The first one refenced above is used in the tablet, and the latter is used only the BMS Section. Service temperature of **SS5061, Silicone Solutions is** -40°C to 250°C, whereas the **SikaBiresin® RE 461 POLYOL / SikaBiresin® RE 101 ISOCYANATE** has a service temperature of -50 to 130°C. It must be noted that, the use of the latter is to also form a partial enclosure for the BMS, thus has been tested to Impact Test and Mechanical Strength per Section 10.6.1 of IEC 60079-0, 7th Ed. under **SUW-4939411-TDS-006**. The temperature test on small components under encapsulation has been recorded in **SUW-5135299-TDS-001a** and **SUW-4939411-TDS-008**. In this test, it was observed that no damage to the encapsulation material occurred when fault was applied. For additional justifications and details, refer to Section 5.3.1 of IEC 60079-0, 7th Ed. The encapsulation materials thus, have been used for exclusion of explosive atmospheres and thermal reduction for compliance of components under fault. This is for areas under 10V, resulting no requirement to declare the CTI Value.	Pass
6.6.2	Encapsulation used for the exclusion of explosive atmospheres	The use of encapsulation for exclusion is present and section 6.3.5 is met. The use of encapsulation is considered of the type casting compound for this application. For more details refer to 6.3.5.	Pass

7	Components on which intrinsic safety depends

7.1 **DS 2004/003** **DS 2018/005A**	Rating of components	Refer to Appendix A.4 of SUW-4939411-ExTR-001 for details.	Pass

7.2	Connectors for internal connections, plug-in cards and components	Product isn't intended to be connected or disconnected in Hazardous Classified Areas; however, connection options are present when product is outside classified areas. For this, schedule drawing AAAK-001-01 is present to identify exact connecting parts. Thus, incorrect connection isn't possible, and no connectors incorporated on which Intrinsic Safety depends.	Pass

IEC 60079-11			
Clause	Requirement – Test	Result – Remark	Verdict
7.3	Fuses	Several Fuses used throughout the circuit as protective. Fuses referenced under respective sections for BMS, Section under Encapsulation, Section under No Encapsulation and Display Protection. Section under No Encapsulation relies on Cold Fuse Resistance, which has been recorded under **SUW-4939411-TDS-006**.	Pass

7.4	Primary and secondary cells and batteries		
7.4.1	General	Product uses secondary type Li-Ion cells to form a 2S1P Battery Pack. The product incorporates 2 such battery packs, intended to be used one at a time. The Li-Ion Cell is the Molicel INR-18650-M35A. The cells were subjected to short circuit testing in accordance with IEC 60079-11, 6th Ed. under **SUW-49394411-TDS-003a**. No Leakage Observed. Refer to 5.3.1 of this ExTR for more details. The cell is secondary in nature, Li-Ion Cell is made of Lithium Cobalt Oxide as Positive Electrode and Carbon as Negative Electrode. The Nominal and Maximum Voltages are 3.60V, 4.20V respectively.	Pass
7.4.2 **DS 2010/003**	Battery construction	All cells incorporated are sealed in nature.	Pass
7.4.3	Electrolyte leakage and ventilation	Refer to 7.4.1.	Pass
7.4.4	Cell voltages	Refer 7.4.1, IEC 60079-0 used to determine cell type and voltages.	Pass
7.4.5	Internal resistance of cell or battery	Internal Resistance of the cell not used for evaluation.	NA
7.4.6	Batteries in equipment protected by other types of protection	No other type of protection used.	NA
7.4.7	Batteries used and replaced in explosive atmospheres	User cannot change the battery.	NA

IEC 60079-11			
Clause	Requirement – Test	Result – Remark	Verdict
7.4.8	Batteries used but not replaced in explosive atmospheres	The Battery Pack itself is encapsulated which also acts as an enclosure due to compound's hardness. This enclosure has been subjected to mechanical testing per IEC 60079-0, 7th Ed., recorded under SUW-4939411-TDS-006. Therefore, pack complies with protection as indicated under 7.4.7 of this standard. Additionally, equipment is marked with the following: **WARNING – DO NOT REPLACE BATTERY WHEN AN EXPLOSIVE ATMOSPHERE IS PRESENT** **WARNING – DO NOT OPEN WHEN AN EXPLOSIVE ATMOSPHERE IS PRESENT** Or equivalent used.	Pass
7.4.9	External contacts for charging batteries	**WARNING – DO NOT CHARGE THE BATTERY IN HAZARDOUS LOCATION.** Or equivalent used.	Pass
7.5 **DS 2015/007**	Semiconductors		
7.5.1	Transient effects	Transient voltages higher than the *U*m = 20V are not considered due to the assessment in clause 6.2.5.	NA
7.5.2	Shunt voltage limiters	Refer to A.1.2.12a and A.1.2.13 of SUW-4939411-ExTR-001	Pass
7.5.3	Series current limiters	Refer to A.1.2.13 of SUW-4939411-ExTR-001	Pass
7.6 **DS 2012/009** **DS 2016/002**	Failure of components, connections and separations	Refer to A.1.2 of SUW-4939411-ExTR-001	Pass
7.7	Piezo-electric devices	No piezo-electric device in the equipment	NA
7.8	Electrochemical cells for the detection of gases	No electrochemical cells have been used.	NA
8	Infallible components, infallible assemblies of components and infallible connections on which intrinsic safety depends		
8.1	Level of Protection "ic"	Not intended for a level of protection "ic".	NA

IEC 60079-11			
Clause	Requirement – Test	Result – Remark	Verdict
8.2	Mains transformers		
8.2.1	General	No mains transformers are part of the equipment.	NA
8.2.2	Protective measures	Reference 8.2.1	NA
8.2.3	Transformer construction	Reference 8.2.1	NA
8.2.4	Transformer type tests	Reference 8.2.1	NA
8.2.5	Routine test of mains transformers	Reference 8.2.1	NA
8.3	Transformers other than mains transformers	Reference 8.2.1	NA
8.4	Infallible windings		
8.4.1	Damping windings	No damping windings used for assessment.	NA
8.4.2	Inductors made by insulated conductors	No damping windings used for assessment.	NA
8.5	Current-limiting resistors	Refer to A.1.2.13, A.1.1 and A.1.2 of SUW-4939411-ExTR-001	Pass
8.6 DS 2003/003	Capacitors		
8.6.1	Blocking capacitors	No Blocking or Filter capacitors used for assessment.	NA
8.6.2	Filter capacitors	No Blocking or Filter capacitors used for assessment.	NA
8.7	Shunt safety assemblies		
8.7.1	General	Refer to assessment In report SUW-4939411-ExTR-001 Encapsulation and Display Protection.	Pass
8.7.2	Safety shunts	Refer to assessment In report SUW-4939411-ExTR-001 Encapsulation and Display Protection.	Pass
8.7.3	Shunt voltage limiters	Refer to assessment In report SUW-4939411-ExTR-001 Encapsulation and Display Protection.	Pass
8.8	Wiring, printed circuit board tracks, and connections	Refer to assessment In report SUW-4939411-ExTR-001 for Spacings Assessment for Protective (A.1.2.4, A.1.2.5, A.1.2.8, A.1.2.9, A.1.2.10, A.1.2.11, A.1.2.12 and A.1.2.13).	Pass

IEC 60079-11			
Clause	Requirement – Test	Result – Remark	Verdict
8.9	Galvanically separating components		
8.9.1	General	None Employed.	NA
8.9.2	Isolating components between intrinsically safe and non-intrinsically safe circuits	None Employed.	NA
8.9.3	Isolating components between separate intrinsically safe circuits	None Employed.	NA
9	Supplementary requirements for specific apparatus		
9.1	Diode safety barriers		
9.1.1	General	None Employed.	NA
9.1.2	Construction		
9.1.2.1	Mounting	None Employed.	NA
9.1.2.2	Facilities for connection to earth	None Employed.	NA
9.1.2.3	Protection of components	None Employed.	NA
9.2	FISCO apparatus	No FISCO Apparatus.	NA
9.3	Handlights and caplights	Not a handlight or caplight	NA
10	Type verifications and type tests		
10.1 **DS 2013/002**	Spark ignition test		
10.1.1	General	Refer to Appendix A.2 for details.	Pass
10.1.2	Spark test apparatus	Spark test was not required as compliance observed via comparison method.	NA
10.1.3	Test gas mixtures and spark test apparatus calibration current		
10.1.3.1	Explosive test mixtures suitable for tests with a safety factor of 1.0 and calibration current of the spark test apparatus	Spark test was not required as compliance observed via comparison method.	NA

IEC 60079-11			
Clause	Requirement – Test	Result – Remark	Verdict
10.1.3.2	Explosive test mixtures suitable for tests with a safety factor of 1.5 and calibration current of the spark test apparatus	Spark test was not required as compliance observed via comparison method.	NA
10.1.4	Tests with the spark test apparatus		
10.1.4.1	Circuit test	Spark test was not required as compliance observed via comparison method.	NA
10.1.4.2 **DS 2018/005A**	Safety factors	Spark test was not required as compliance observed via comparison method.	NA
10.1.5	Testing considerations		
10.1.5.1	General	Spark test was not required as compliance observed via comparison method.	NA
10.1.5.2	Circuits with both inductance and capacitance	Refer to Appendix A.2.4 for details.	NA
10.1.5.3	Circuits using shunt short-circuit (crowbar) protection	Refer to Appendix A.2.5 for details.	NA
10.1.5.4	Results of spark test	Spark test was not required as compliance observed via comparison method.	NA

10.2	Temperature tests	Refer to 5.3.1 of IEC 60079-0, 7th Ed.	Pass

10.3	Dielectric strength tests	Not a line powered product, this section isn't applicable.	NA

10.4	Determination of parameters of loosely specified components	This section used for cells, voltage clamp circuits and fuses. Refer to assessment In report SUW-4939411-ExTR-001	Pass

10.5	Tests for cells and batteries		
10.5.1	General	Cells incorporated are Li-Ion 18650 cells, used to form a Battery Pack. These cells are covered with encapsulation within an enclosure to form the Battery Pack. The cells have been subjected to testing as required under this clause.	Pass
10.5.2	Electrolyte leakage test for cells and batteries	Refer to Test report **SUW-4939411-TDS-003a** It was observed that there were no fume or leakage of electrolyte during the test.	Pass

IEC 60079-11			
Clause	Requirement – Test	Result – Remark	Verdict
10.5.3	Spark ignition and surface temperature of cells and batteries	Refer to Test report: SUW-4939411-TDS-003a, Compliant with T4.	Pass
10.5.4	Battery container pressure tests	Refer to Test report: **SUW-4939411-TDS-003a** No pressure test needed	Pass

10.6	Mechanical tests		
10.6.1	Casting compound	Tested under **SUW-4939411-TDS-006.**	Pass
10.6.2	Determination of the acceptability of fuses requiring encapsulation	The encapsulant does not impact the performance of the fuses.	NA
10.6.3	Partitions	No partitions used.	NA

10.7	Tests for intrinsically safe apparatus containing piezoelectric devices	No piezoelectric devices used.	NA

10.8	Type tests for diode safety barriers and safety shunts	No exposure of transients considered to the safety shunts within the tablet, due to the presence of assessed circuitry providing protection or limitation to parameter observed by the tablet as input	NA

10.9	Cable pull test	No cables intended to be connected or disconnected in classified areas.	NA

10.10	Transformer tests	No transformers that the intrinsic safety depend on.	NA

10.11	Optical isolators tests		
10.11.1	General	No optical isolators used for assessment.	NA
10.11.2	Thermal conditioning, dielectric and carbonisation test	Reference 10.11.1	NA
10.11.2.1	Overload test at the receiver side	Reference 10.11.1	NA
10.11.2.2	Overload test at the transmitter side	Reference 10.11.1	NA
10.11.2.3	Thermal conditioning and dielectric strength test	Reference 10.11.1	NA

IEC 60079-11			
Clause	Requirement – Test	Result – Remark	Verdict
10.11.2.4	Carbonisation test		
10.11.2.4.1	Receiver side	Reference 10.11.1	NA
10.11.2.4.2	Transmitter side	Reference 10.11.1	NA
10.11.3	Dielectric and short-circuit test	Reference 10.11.1	NA
10.11.3.1	General	Reference 10.11.1	NA
10.11.3.2	Pre-test dielectric	Reference 10.11.1	NA
10.11.3.3	Short-circuit current test	Reference 10.11.1	NA
10.11.3.4	Current limited short-circuit current test	Reference 10.11.1	NA
10.11.3.5	Dielectric strength test	Reference 10.11.1	NA

10.12	Current carrying capacity of infallible printed circuit board connections	Not used	NA

11	Routine verifications and tests		

11.1	Routine tests for diode safety barriers		
11.1.1	Completed barriers	None employed.	NA
11.1.2	Diodes for 2-diode “ia” barriers	None employed.	NA

11.2	Routine tests for infallible transformers	No infallible transformers used for assessment.	NA

12	Marking		

12.1	General	Refer to Cover Page for Marking	Pass
12.2	Marking of connection facilities	Input parameters assessed and used for connection of charger to the charging circuit when it is not in Hazardous Classified Areas. Refer to Charging Port (X1), USB Connection (X2) and HDMI Connection (X3).	Pass

IEC 60079-11			
Clause	Requirement – Test	Result – Remark	Verdict
12.3	Warning markings	Refer to Controlled document pages of the Aegex100M User Guide AEG-DPU-0002-01-01. • **• DO NOT CHARGE, CONNECT OR DISCONNECT THE AEGEX100M TABLET IN HAZARDOUS CLASSIFIED AREAS.** • **• DO NOT REMOVE OR REPLACE THE BATTERY PACK IN HAZARDOUS CLASSIFIED AREAS. PRODUCT MUST BE USED WITH BATTERY PACK P/N: AAEB-100-XX WHERE "XX" ARE PLACE HOLDERS OF THE PART NUMBER FOR FUTURE VERSIONS, FOR CHANGES IN THE PRODUCT THAT DO NOT IMPACT THE SAFETY OR CERTIFICATION OF THE PRODUCT.** • **• BATTERY PACK CAN ONLY BE USED AND CHARGED WHILE IT IS ON THE TABLET AEGEX100M. DO NOT ATTEMPT TO CHARGE THE BATTERY IN ANY OTHER MANNER.** • **• PRODUCT MUST BE ONLY CHARGED WITH AEGEX CHARGER P/N: AAAK-0XX-01, WHERE XX REPRESENT THE COUNTRY TYPE PLUG AND 01 REPRESENTS VERSION NUMBER.** • **• PRODUCT MUST BE USED WITHOUT ANY ACCESSORIES OR EXTENSIONS WITHIN HAZARDOUS CLASSIFIED AREAS.** • **• DO NOT OPEN THE SIM / SD CARD PORT IN A HAZARDOUS LOCATION.** • **• WHEN IN ZONE 0 LOCATIONS, THE PRODUCT MUST BE USED WITHIN THE CASE PROVIDED BY AEGEX. CASE P/N: APAC-100-01.** • **• IT MUST BE TAKEN CARE THAT DURING THE USE OF THE PRODUCT THERE IS NO POSSIBILITY OF FRICTION RESULTING FROM DIRECT CONTACT OF THE PRODUCT ENCLOSURE.** • **• PRODUCT IS AUTHORIZED TO BE SERVICED ONLY BY AEGEX.**	
12.4	Examples of marking	Markings employed are in reference with examples of marking provided within the standard.	Pass

13	Documentation	Refer to Cover Sheet.	Pass

Annex A (Normative)	Assessment of intrinsically safe circuits		
A.1	Basic criteria	Refer to A.1.12.3, Spark Assessment performed and observed with compliant results.	Pass

IEC 60079-11			
Clause	Requirement – Test	Result – Remark	Verdict
A.2	Assessment using reference curves and tables	Refer to A.1.12.3	Pass
A.3	Examples of simple circuits	Not a simple circuit	NA
A.4	Permitted reduction of effective capacitance when protected by a series resistance	Not used.	NA

Annex B (Normative)	Spark test apparatus for intrinsically safe circuits		
B.1	Test methods for spark ignition		
B.1.1	Principle	Spark test was not required as assessment was performed, and compliance granted through the comparison method.	Pass
B.1.2	Apparatus	Refer to B.1.1.	Pass
B.1.3	Calibration of spark test apparatus	Refer to B.1.1.	Pass
B.1.4	Preparation and cleaning of tungsten wires	Refer to B.1.1.	Pass
B.1.5	Conditioning a new cadmium disc	Refer to B.1.1.	Pass
B.1.6	Limitations of the apparatus	Refer to B.1.1.	Pass
B.1.7	Modifications of test apparatus for use at higher currents	Refer to B.1.1.	Pass

Annex C (Informative)	Measurement of creepage distances, clearances and separation distances through casting compound and through solid insulation

Annex D (Normative)	Encapsulation		
D.1	Adherence	Refer to IEC 60079-0, section for encapsulation and enclosure.	Pass
D.2	Temperature	Small component testing under encapsulation performed under report SUW-5135299-TDS-001a and SUW-4939411-TDS-008.	Pass

Annex E (Informative)	Transient energy test

Annex F (Normative)	Alternative separation distances for assembled printed circuit boards and separation of components	NA

IEC 60079-11			
Clause	Requirement – Test	Result – Remark	Verdict
Annex G (Normative)	Fieldbus intrinsically safe concept (FISCO) – Apparatus requirements		NA
Annex H (Informative)	Ignition testing of semiconductor limiting power supply circuits		

A.1 Ratings of Safety Components

Designation [function]	Description	Max. in use (W2)	Nominal rating (W1)	Safety factor (W1/W2) >1.5	Comment / Calculation
Q1, Q2, Q3	PowerPAK SO8 SMD N-ch MOSFET Transistor 60V 117A 69.4W Vishay - SIR182DP-T1-RE3	6.8A	25.1A	3.69	The maximum current = 4A fuse x 1.7 = 6.8A Imax = 25.1A mounted to 1" x1" pad

Calculations for IIC assessment

All circuit assessment per SGS report US/SNA/ExTR 24.004/00 other than below were assessed for Group IIC. The following were recalculated for IIC

The Aegex100M Tablet **Data pins of X2** has the following output entity parameters:

- • **Uo = 10.0 V**
- • **Io = 3.002 A**
- • **Po = 2.304 W**
- • **Co = 20.0 µF**
- • **Lo = 3.95 µH**

Inductance calculation:
E = ½ * L * I_2 (where E = 40µJ maximum for IIC)
Lmax = 2 * E / I2
Lmax = 2 * 40µJ / (3.322A * 1.5)2
Lo = 3.22 µH

Inductance calculation:
E = ½ * L * I_2 (where E = 40µJ maximum for IIC)
Lmax = 2 * E / I2
Lmax = 2 * 40µJ / (3.002A * 1.5)2
Lo = 3.95 µH

HDMI ENTITY PARAMETERS

- • **Uo = 10.0 V**
- • **Io = 3.329 A**
- • **Po = 3.831 W**
- • **Co = 20.0 µF**
- • **Lo = 3.21 µH**

Inductance calculation:
E = ½ * L * I_2 (where E = 40µJ maximum for IIC)
Lmax = 2 * E / I2
Lmax = 2 * 40µJ / (3.329A * 1.5)2
Lo = 3.21 µH

Designation	Value	Tolerance	Quantity	Sub Total
C1072 (C1084)	1 µF	10 %	1	1.1 µF
C1083 (C1085)	2.2 µF	10 %	1	2.42 µF
C1000 (C1010)	4.7 µF	10 %	1	5.17 µF
C1003 (C1023)	0.1 µF	10 %	1	0.11 µF
Total		**8.8 µF**		

Since the grand totals are less than the permitted value (10.4 µF) for IIC for 7.6V, the circuits are capacitively non-incendive for group IIC including a safety factor of 1.5.**A.1.2.13.1.5.3 Inductive Circuit Assessment**

Measured Values of speaker Part# ABY 2-14072-12WP Serial Number	Inductance (µH)	Resistance (Ohm)
1	61.0	7.56
2	112.20	7.79
3	157.80	**5.99**
4	131.60	7.72
5	143.20	6.13
6	148.50	7.81
7	153.00	7.76
8	**161.00**	6.10
9	118.00	7.70
10	150.60	7.80

The maximum available voltage of the J1000 pins is 7.54V. The worst-case series/parallel combination that gives the highest short-circuit current on one pin is shown below (only the LEFT channel has been calculated, the RIGHT channel has exactly same components and the results as well):

3.692Ω + (1.3Ω * 0.99) = **4.979Ω**

Hence the maximum short circuit current before the power supplies is: (7.54V / 4.979Ω) = **1515mA** (rounded up).
The maximum available voltage at these lines is **4.90V** (we do not calculate the 3.8V on lines EXT_AMP_PD_N_L_PROT or EXT_AMP_PD_N_R_PROT because of the simpler calculation). The worst-case series/parallel combination that gives the highest short-circuit current is shown below (calculation is explained through LEFT audio channel, the RIGHT audio channel has the same components and calculation results):
(R1090 // R1096) * 0.99 = (68kΩ // 2kΩ) * 0.99 = **1.9234kΩ**
Hence the maximum short circuit current from this line is: (4.90V / 1.9234kΩ) = **2.6mA** (rounded up).

Therefore, one speaker channel's maximum total short circuit current from J1000 is:
$Itotal_{maxLEFT} = Itotal_{maxRIGHT} = I_{max\_POWER} + I_{max\_SIGNALS}$ = 1515mA + 2.6mA = **1517.6mA**

Most Onerous Value for Speaker: 161.00 µH, 5.99 ohms

Therefore, due to resistive value of the speaker, current calculation will be as below.

Based on current calculated above, the effective resistance in the circuit is;

(7.54V / 1517.6mA) = **4.968** Ω

In Addition to this, speaker resistance will be added, resulting to 5.99+4.968 = **10.958 Ω**.

Conclusively, current value for inductive energy is => 7.54V / 10.958 Ω = **0.6881A**.

Thus, ½ LI^2 = 0.5 * 161.00 * 0.6881 * 0.6881 => **38.12 µJ<40uJ**

.

Designation	Value	Tolerance	Quantity	Sub Total
C1, C2, C58, C59, C72, C79	1 µF	10 %	6	6.6 µF
C5, C6, C7	0.1 µF	10 %	3	0.33 µF
Camera internal capacitance	1 µF	10 %	6	6.6 µF
Camera internal capacitance	2.2 µF	10 %	1	2.42 µF
			Total	**15.95 µF**

Since the grand totals are less than the permitted value (40 µF) for 6V for IIC, the circuits are capacitively non-incendive for group IIC including a safety factor of 1.5.

Most Onerous Value for Main Camera: 91.90 µH**,** 18.73 ohms
Therefore, due to resistive value of the speaker, current calculation will be as below.
Based on current calculated above, the effective resistance in the circuit is;
(5.79V / 2570mA) = **2.25 Ω**
In Addition to this, speaker resistance will be added, resulting to 20.98 ohms.
Conclusively, current value for inductive energy is => 5.79V / 20.98 ohms = 0.276A.
Thus, ½ LI_2 = 0.5*91.90*0.276*0.276 => 3.5 µJ.
Since this is less than, 40 µJ, by a factor of safety 11, this can be deemed compliant.

A.1.2.13.1.6.4 Combination Circuit Assessment
Since the values of Factor of Safety for Capacitive and Inductive parameters are significantly higher, with Capacitive Factor of Safety 62.70 and Inductive Factor of Safety 11, the combination circuit can be deemed compliant via calculation.

Designation	Value	Tolerance	Quantity	Sub Total
C3, C4, C70, C71, C80, C81	1 µF	10 %	6	6.6 µF
C8, C9, C10	0.1 µF	10 %	3	0.33 µF
Camera internal capacitance	1 µF	10 %	5	5.5 µF
			Total	**12.43 µF**

Since the grand totals are less than the permitted value (40 µF) for up to 6V, for IIC, the circuits are capacitively non-incendive for group IIC including a safety factor of 1.5.

Designation	Value	Tolerance	Quantity	Sub Total
C2, C3	1 µF	10 %	2	2.2 µF
C5	680 nF	10 %	1	748 nF
C8, C9, C10	33 pF	5 %	3	0.104 nF
			Total	**2.9482 µF**

Since the grand totals are less than the permitted value (3.0 µF) for 10V, for Group IIC, the circuits are capacitively non-incendive for group IIC including a safety factor of 1.5.

Designation	Value	Tolerance	Quantity	Sub Total
C4, C11	1 µF	10 %	2	2.2 µF
C5	680 nF	10 %	1	748 nF
			Total	**2.948 µF**

Since the grand totals are less than the permitted value (3.0 µF) for 10V, for Group IIC, the circuits are capacitively non-incendive for group IIC including a safety factor of 1.5.

Designation	Value	Tolerance	Quantity	Sub Total
C1 (Sensor board) {DMIC}	0.1 µF	10 %	1	0.11 µF
C70 {DMIC}	68 pF	10 %	1	74.8 pF
C6, C7 {DMIC}	0.68 µF	10 %	2	1.496 µF
C1 (Button board) {DMIC}	0.1 µF	10 %	1	0.11 µF
C61{ALS}	68 pF	10 %	1	74.8 pF
C64 {ALS}	0.1 µF	10 %	1	0.11 µF
C65 {ALS}	1 µF	10 %	1	1.1 µF
			Total	**2.927µF (rounded up)**

Since the grand totals are less than the permitted value (3.0 µF) for 10V, for Group IIC, the circuits are capacitively non-incendive for group IIC including a safety factor of 1.5.

The docking station is powered by an approved limited power source or PS2 AC/DC power adapter

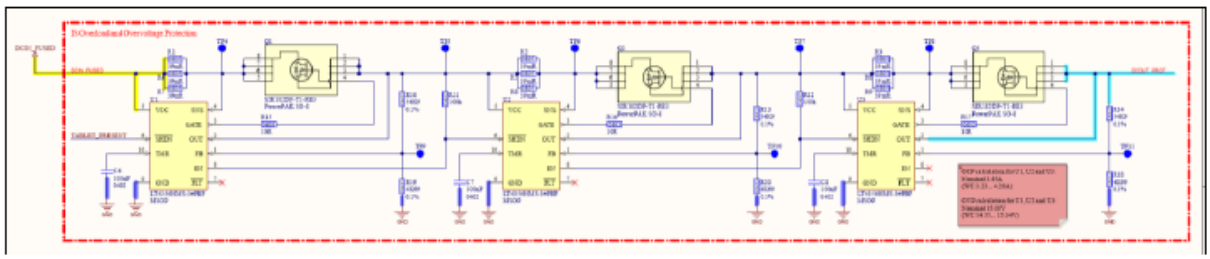
Barrier Protection Adapter

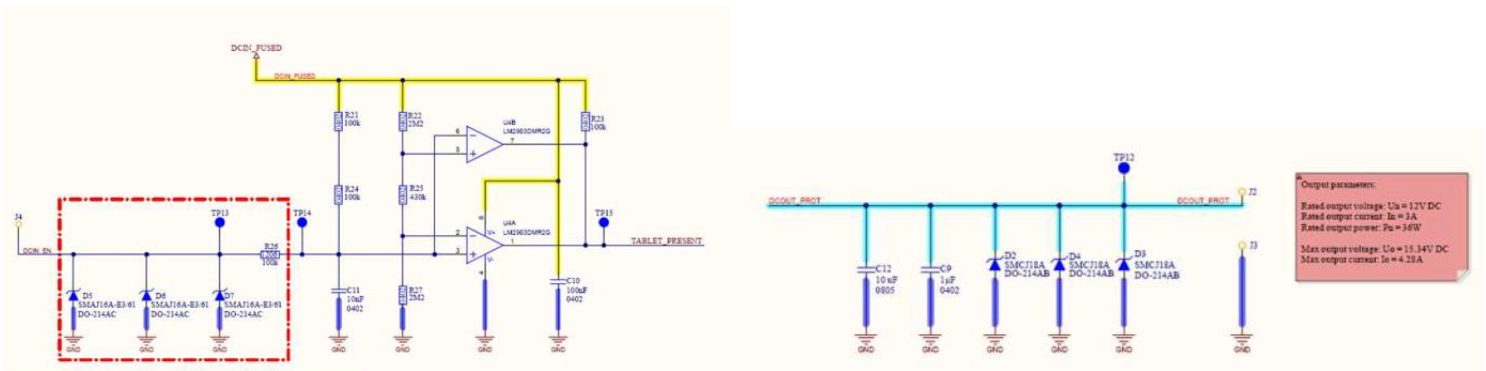
The Protection PCBA schematic is as referenced in the document **AAEP-075-03 (Page 3)** DC IN (**AAEP-056-06** or version **AAEP-056-07**, page 4 Left side) and it is derived from 100_Protection_Box (**AAEP-075-03**), which acts as an assessed circuit in between (wall plug) DC Adapter and the Tablet, to define voltage and current parameters for the charging of the tablet outside of Hazardous Classified Areas.

Thus, DC IN is derived from the output parameters of Protection Box as in snippet below.
DC IN => Um => Uo => **15.34Vdc**
For the Protection Box Circuit **AAEP-075-03**, the input parameters are shown below.
Um: 30Vdc
U_{OUTPUT} => 15.34 Vdc (This acts as the Um for the Charger Circuitry within the Tablet)
I_{OUTPUT} => 4.28 A (This acts as the Ii for the Charger Circuitry within the Tablet)

The Fuse F1, in this section of the circuit F1 (Belfuse C1F, 4A, 63V, 50A interrupt) will act as the primary current limiter. Therefore, current considerations will be as follows,
I_{NOM} => I_{FUSE} * 1.7 => 4A * 1.7 => **6.8A**

Note: The Charger circuitry has been evaluated / tested under this report at higher values (Um: 20Vdc, Ii: 4.33A) to include any future changes applicable. The declaration / entity parameters will thus indicate 20Vdc, 4.33A.





Overload Protection

Overcurrent Protection – Figure 17

An active current limiting circuit consisting of 3 pcs serial connected regulators **U1, U2** and **U3** (Analog Devices - LT4356HMS-3, 10-Pin MSOP, -40°C to 125°C, Vmax: 80V) and 3 pcs serial connected MOSFETs **Q1, Q2** and **Q3** (Vishay - SIR12BDP-T1-GE3) limit the current and power, which can draw from the power supply to the output.

The LT4356HMS-3 features an adjustable current limit that protects against short circuits or excessive load current. During an overcurrent event, the GATE pin is regulated to limit the current sense voltage across the VCC and SNS pins to 50mV. An overcurrent or overload fault occurs when the current limit circuitry has been engaged for longer than the time-out delay set by the timer capacitor (C6 and C7). The GATE pin is then immediately pulled low to GND turning off the MOSFET. The

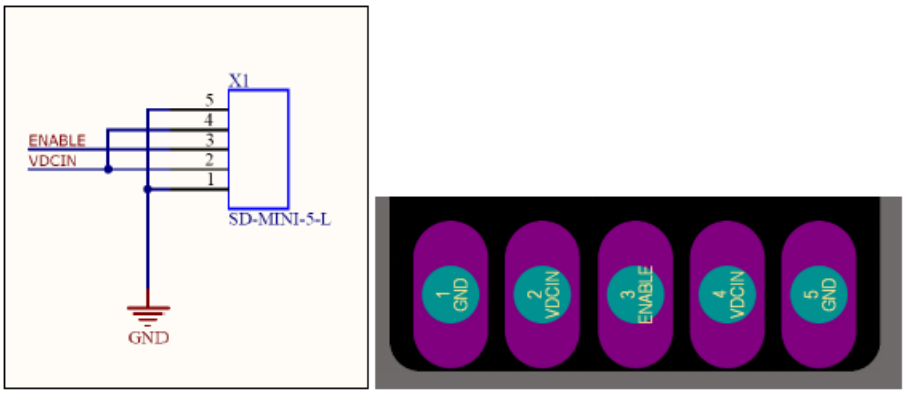
GATE pin stays low until the SHDN pin is pulled low for at least 100µs and pulled high again. This means when an overcurrent fault occurs the user would be required to disconnect the charger and re-connect it to reset the current limiter circuit.
The worst-case sense voltage/sense resistance combination that gives the highest short-circuit current is shown below:
$I_{lim\_max} = \Delta V_{SNS\_max} / R_{SNS\_min}$ = 55mV / ((39mΩ/3) * 0.99) = **4.28A**

Overvoltage Protection

The **U1, U2** and **U3** (Analog Devices - LT4356HMS-3, 10-Pin MSOP, -40°C to 125°C, Vmax: 80V) limits the voltage at the OUT pin during an overvoltage situation as well. An internal voltage amplifier regulates the GATE pin voltage to maintain a 1.25V threshold at the FB pin connected to a voltage divider providing the measured voltage. During this, the power MOSFET is still on and continues to supply current to the load. The voltage divider upper (54.9kΩ, 0.1%) and lower (4.99kΩ, 0.1%) divider components are high precision resistances.
When the voltage regulation loop is engaged an overvoltage fault is detected. The GATE pin is pulled down to the OUT pin by a 150mA current. This prevents the power MOSFET from being damaged during a long period of overvoltage. Pulling the SHDN pin low for at least 100µs and pulled high with a slew rate faster than 10V/ms will allow the GATE pin to pull back up. This means when an overcurrent fault occurs the user would be required to disconnect the charger and re-connect it to reset the current limiter circuit.
The worst-case sense voltage/sense resistance combination that gives the highest voltage at the output is shown below:
$U_{lim\_max} = (V_{FB\_max} * (R_{divider\_upper\_max} + R_{divider\_lower\_min})) / R_{divider\_lower\_min}$
= 1.275V * ((54.9kΩ*1,001) + (4.99kΩ*0.999)) / (4.99kΩ*0.999) = **15.34V**
Therefore, the Aegex Protection Adapter has the following parameters:

- • Um = 30.0 V (Supply from Power Supply or Wall Adapter)
- • U_{OUTPUT} = 15.34 V (Output Voltage of Protection Circuit per assessment above)
- • I_{OUTPUT} = 4.28 A (Output Current of Protection Circuit per assessment above)

Pinout configuration of X1:

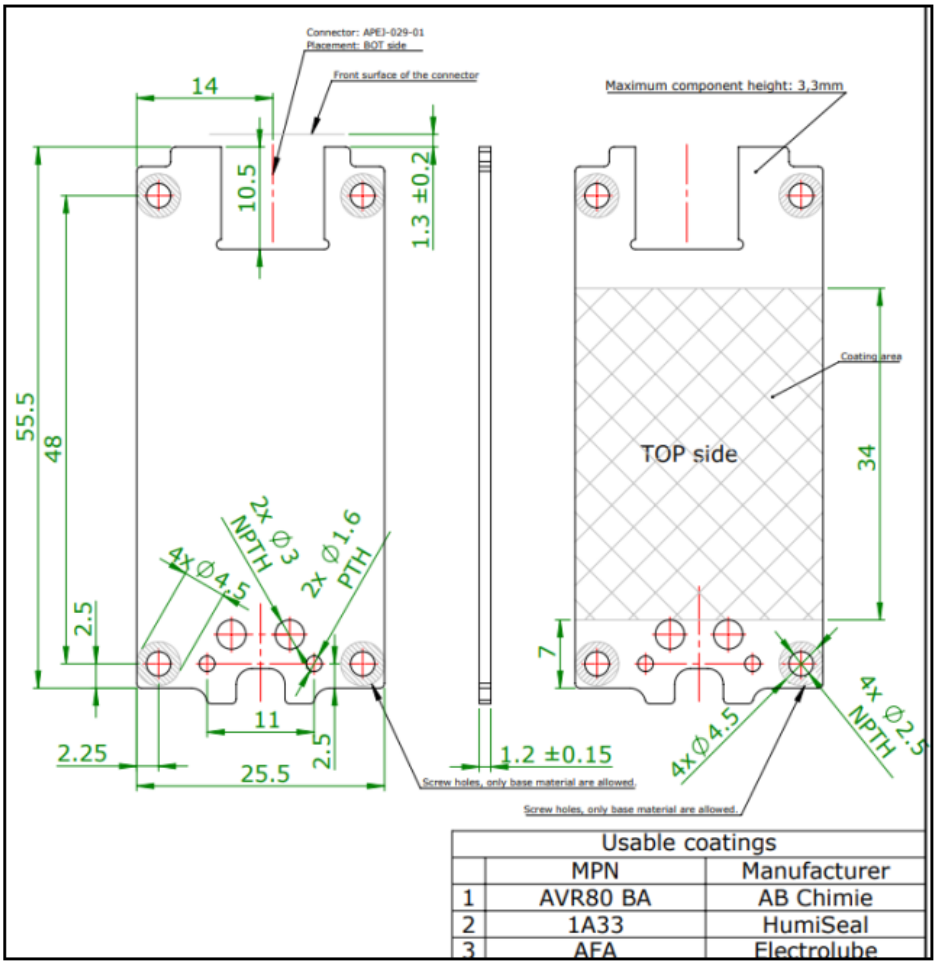


The Aegex100M Tablet charging port has the following entity parameters:

- • **Ui = 20.0 V**
- • **Ii = 4.33 A**
- • **Pi = 66.0 W**
- • **Co = 0 µF**
- • **Lo = 0 µH**

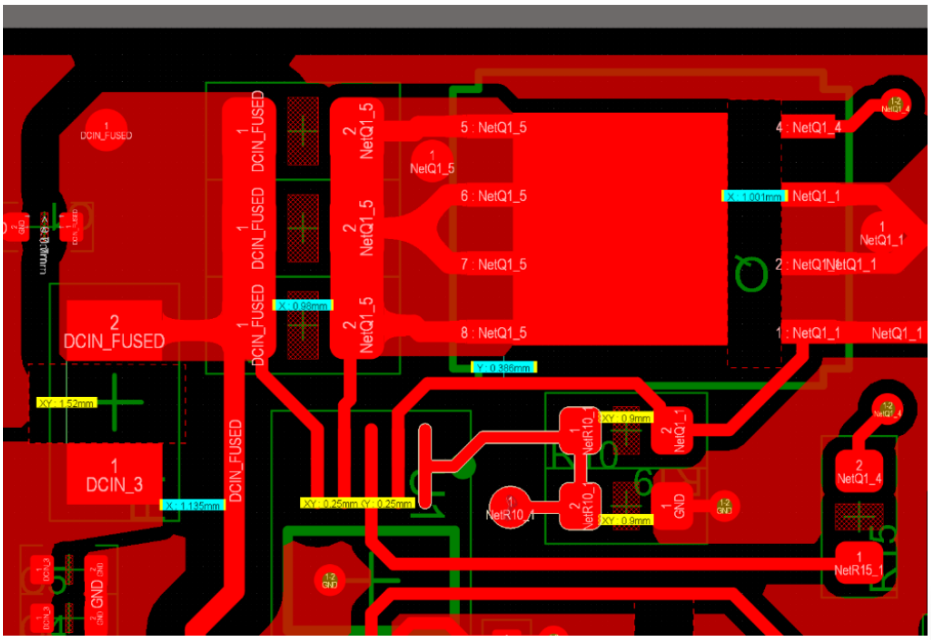
Note: Charging is only allowed in Unclassified Areas with the protection adapter connected to the wall plug.

Spacings Assessment for Barrier Protection Adapter
Conformal coating is used on the Aegex100M Protection box PCBA, where the Coating material Comparative Track Index is > 275V based on Table 5 of IEC 60079-11, and dielectric strength > 2kV/mm according to Clause 6.3.13 of IEC 60079-11. Conformal coating is applied to the protection components of the TOP side of the Aegex100M Protection PCBA as shown in Figure 11 below as is referenced in the document AAEP-075-03-W01.01

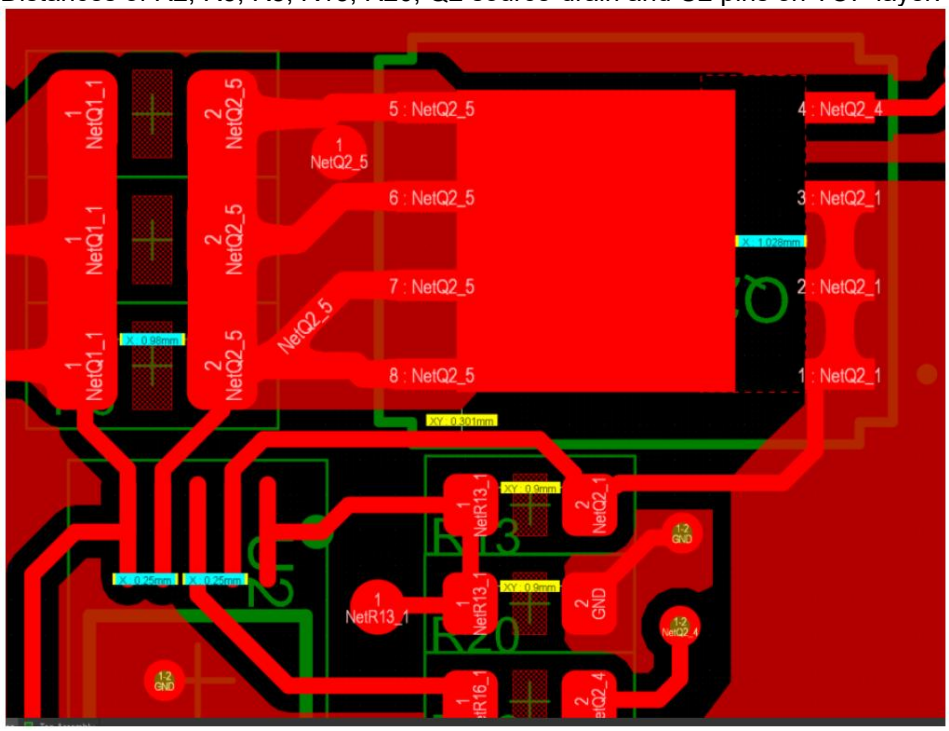


Usable coatings		
	MPN	Manufacturer
1	AVR80 BA	AB Chimie
2	1A33	HumiSeal
3	AFA	Electrolube

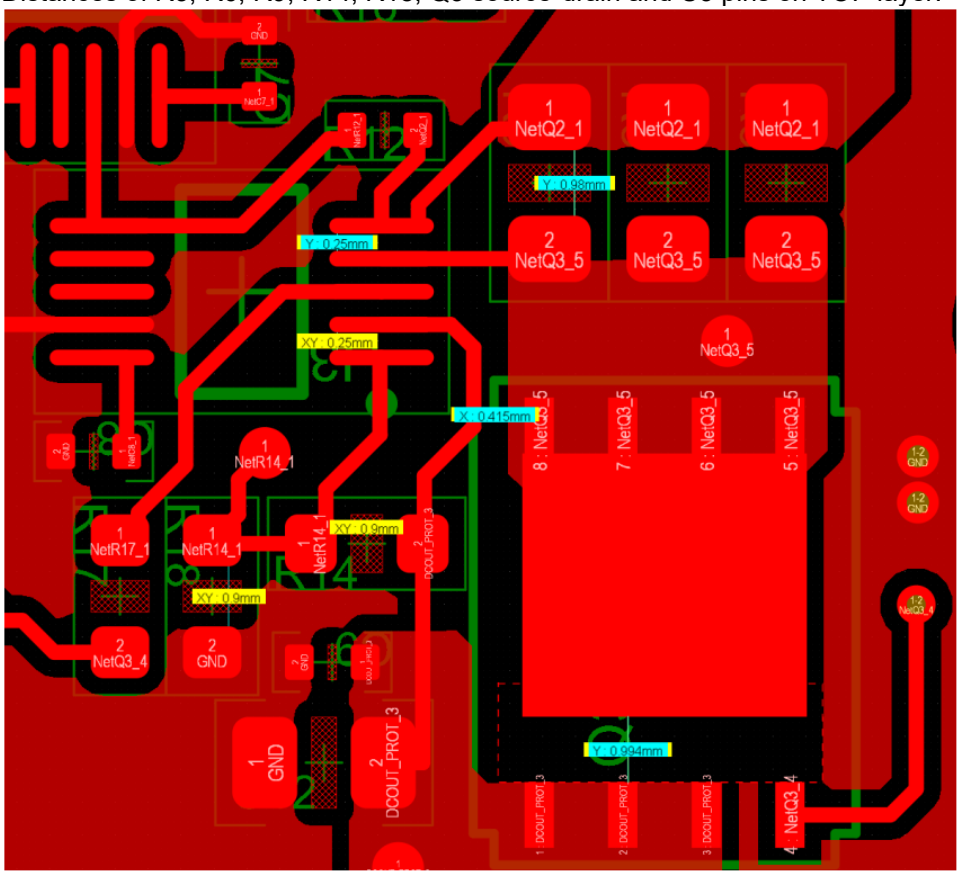
Distances of R1, R4, R7, R10, R19, Q1 source-drain U1 pins and F1 on TOP layer:



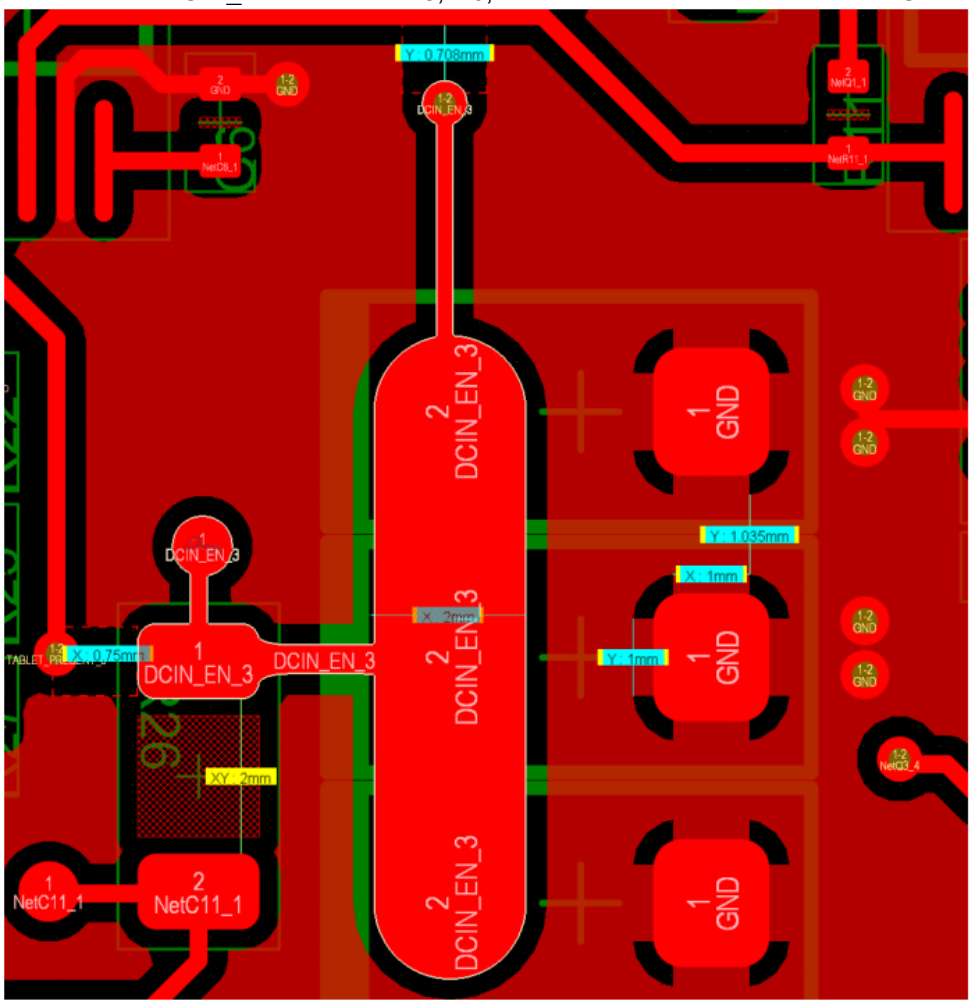
Distances of R2, R5, R8, R13, R20, Q2 source-drain and U2 pins on TOP layer:



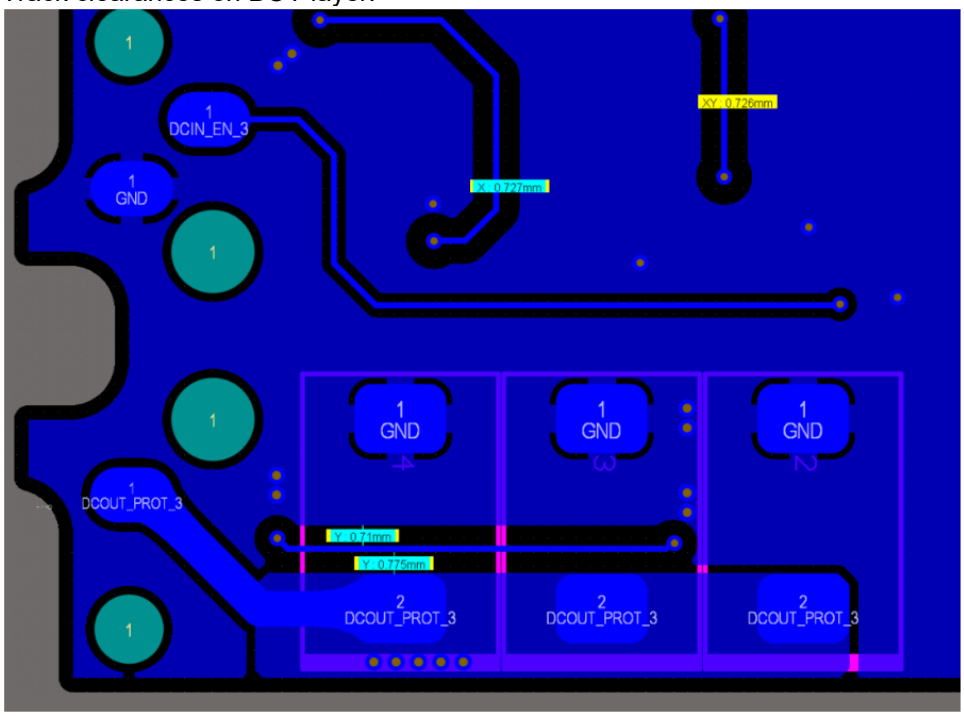
Distances of R3, R6, R9, R14, R18, Q3 source-drain and U3 pins on TOP layer:



Distances on DCIN_EN track and D5, D6, D7 diodes infallible connection to GND on TOP layer:



Track clearances on BOT layer:



Ratings of Safety Components

Designation [function]	Description	Max. in use (W2)	Nominal rating (W1)	Safety factor (W1/W2) >1.5	Comment / Calculation
R1, R2, R3, R4, R5, R6, R7, R8, R9	0805 SMD Resistor 39mΩ 1% 500mW Susumu - KRL1220E-M-R039-F-T5	202.38 mW	500 mW	2.47	The maximum power dissipation = $(I/3)^2$*R, where I is 6.8A (based on I_{NOM} due to F1) Pmax = $(I/3)^2$*R = $(4.28A/3)_2$ * (39mΩ * 1.01) = 202.47mW
R10, R13, R14	0603 SMD Resistor 54.9kΩ 0.1% 100mW Yageo - RT0603BRD0754K9L	17 mW	100 mW	5.88	The maximum power dissipation = V2/R = 30V/54.9k-1%) = 17mW
R18, R19, R20	0603 SMD Resistor 4.99kΩ 0.1% 100mW Yageo - RT0603BRD074K99L	0.22 mW	100 mW	454.55	The maximum power dissipation = I^2*R, where I is (U_{max}/R_{sum} = 30V / ((54.9k||4.99k)*0.999) = 6.6mA) Pmax = I^2*R = $(6.6\ mA)^2$ * (4.99kΩ * 1.001) = 0.22mW
R27	1206 SMD Resistor 100kΩ 1% 250mW Yageo - RC1206FR-07100KL	9 mW	250 mW	28	The maximum power dissipation = V^2/R = 30V/100k-1%) = 9mW
U1, U2, U3	Surge Stopper, 80V	30V	80V	2.67	Based on Um = 30V
Q1, Q2, Q3	PowerPAK SO8 SMD N-ch MOSFET Transistor 60V 117A 69.4W Vishay - SIR182DP-T1-RE3	6.8A	25.1A	3.69	The maximum current = 4A fuse x 1.7 = 6.8A Imax = 25.1A mounted to 1" x1" pad
D5, D6, D7	SMA SMD TVS Diode 16V 60A 3.3W Vishay - SMAJ16A	2.43 mW	792 mW	325	The maximum power dissipation = U*I = UTVS_max * ((Umax-UTVS_min) / (100kΩ*0.99)) Pmax = 19.7V * ((30V-17.8V) / 99kΩ) = 2.43mW PW1 = (TJ_max-Tamb_max) / RθJA_typ = (150°C-55°C) / 120K/W = 792mW
F1	1206 SMD Fuse Fast acting 63V 4A Bel Fuse Inc. - 0685F4000-01	30V	63V, 50A	2.1	Based on Um of 30V and clause 7.3 of IEC 60079-11.