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|--|---|--|----------------------------------|---------------------------------------|
| Prüfbericht-Nr.: <i>Test report no.:</i> | KR22QYF3 001 | Auftrags-Nr.: <i>Order no.:</i> | 156145056 30 | Seite 1 von 14 <i>Page 1 of 14</i> |
| Kunden-Referenz-Nr.: <i>Client reference no.:</i> | 620573 | Auftragsdatum: <i>Order date:</i> | 2022.01.26 | |
| Auftraggeber: <i>Client:</i> | Autonics Corporation 18, Bansong-ro 513beon-gil, Haeundae-gu, Busan, 48002 Rep. of Korea | | | |
| Prüfgegenstand: <i>Test item:</i> | POWER SUPPLY | | | |
| Bezeichnung / Typ-Nr.: <i>Identification / Type no.:</i> | SPB-030-24 | | | |
| Auftrags-Inhalt: <i>Order content:</i> | SEMI F47-0706; 2006 (Voltage Sag Test) | | | |
| Prüfgrundlage: <i>Test specification:</i> | SEMI F47-0706; 2006 (Voltage Sag Test) | | | |
| Wareneingangsdatum: <i>Date of sample receipt:</i> | 2022.01.27 |  | | |
| Prüfmuster-Nr.: <i>Test sample no.:</i> | VL15R | | | |
| Prüfzeitraum: <i>Testing period:</i> | 2022.01.27 | | | |
| Ort der Prüfung: <i>Place of testing:</i> | Autonics Corporation | | | |
| Prüflaboratorium: <i>Testing laboratory:</i> | TÜV Rheinland Korea Ltd. | | | |
| Prüfergebnis*: <i>Test result*:</i> | Pass | | | |
| geprüft von: <i>compiled by:</i> | | genehmigt von: <i>authorized by:</i> | | |
| Datum: <i>Date:</i> | 2022.02.10 | Ausstellungsdatum: <i>Issue date:</i> | 2022.02.10 | |
| | Sang-Kyu Jung | | Sang-Hyeup Lee | |
| Stellung / Position: | Sachverständige(r)/Expert | Stellung / Position: | Sachverständige(r)/Expert | |
| Sonstiges: <i>Other:</i> | | | | |
| Zustand des Prüfgegenstandes bei Anlieferung: <i>Condition of the test item at delivery:</i> | Prüfmuster vollständig und unbeschädigt <i>Test item complete and undamaged</i> | | | |
| * Legende: | P(ass) = entspricht o.g. Prüfgrundlage(n) | F(ail) = entspricht nicht o.g. Prüfgrundlage(n) | N/A = nicht anwendbar | N/T = nicht getestet |
| * Legend: | P(ass) = passed a.m. test specification(s) | F(ail) = failed a.m. test specification(s) | N/A = not applicable | N/T = not tested |
| Dieser Prüfbericht bezieht sich nur auf das o.g. Prüfmuster und darf ohne Genehmigung der Prüfstelle nicht auszugsweise vervielfältigt werden. Dieser Bericht berechtigt nicht zur Verwendung eines Prüfzeichens. <i>This test report only relates to the a. m. test sample. Without permission of the test center this test report is not permitted to be duplicated in extracts. This test report does not entitle to carry any test mark.</i> | | | | |

Verwendete Meßgeräte/ Prüfmittel/ Equipment list

| Prüfmittel/ Equipment | Gerätenummer/ Ident.-Nummer Barcode-Nummer Equipment number | Nächste Kalibrierung/ Überwachung next calibration/ surveillance |
|----------------------------------|--|---|
| Industrial Power Corruptor | IPC-480V-200A / IPC14094 | 2022.08.25 |
| - | - | - |

Description of the machine

System consists of: refer to the manual.

Intended use: refer to the manual.

Facility connections:

INPUT: 100-240VAC, 50/60HZ, 0.8A

OUTPUT: 24VDC, 1.3A

Test Voltage :

INPUT: 140-240VAC, 50/60HZ, 0.8A

OUTPUT: 24VDC, 1.3A

Abbreviations in this report: NA

Notes: NA



*Photo 1: Equipment under test
POWER SUPPLY / SPB-030-24*

Client personnel

The following client personnel participated in the test. It is acceptable for one person to perform more than one role. Note that TUV Rheinland Korea provides engineering advice only, and accepts responsibility for damage only to equipment provided by TUV Rheinland Korea. Client is responsible for safety during testing and is responsible for any damage to Client equipment and/or facilities.

Supervising engineers: S.H Lee, TUV Rheinland Korea Ltd.

(This person is responsible for the overall testing procedure and environment.)

Equipment engineer: S.W. Ahn, Assistant Manager, Autonics Corporation

(This person is primarily responsible for operating the Equipment Under Test, and determining if it has experienced a failure of operation.)

Electrician: S.K Jung, TUV Rheinland Korea Ltd.

(This person is primarily responsible for making and adjusting the electric power connections, and is responsible for safety during the tests.)

Testing Engineer: S.K Jung, TUV Rheinland Korea Ltd.

(This person is primary responsible for real testing with operating the sag generator.)

Documents, Test Environment, Tools and Supplies

Client provided the following documents, test environment, tools and supplies.

Documents provided by Client:

- √ Schematics of the power-related segments of Equipment Under Test

Test environment provided by Client:

- √ A test space that provides convenient, safe, comfortable access to the Equipment Under Test
- √ Readily-disconnected electric power for Equipment Under Test, with current limiting devices rated no more than twice the nameplate rating of the Equipment Under Test. Each electric power connection must be clearly labeled with phase identification and voltage.
- √ Instrument power (100-240VAC, 50/60 Hz, 5 amps) for sag generator and data acquisition system, located no more than three feet from power connection for Equipment Under Test. Extension cords are acceptable.
- √ Work-table for sag generator, capable of supporting 176 lbs (approx. 80kg).

Tools and supplies provided by Client

- √ One or more spools of stranded 10AWG-8AWG conductors for miscellaneous wiring, plus spare fuses (if used) for Equipment Under Test and electric power source.
- √ Standard safety equipment for all participants (gloves, glasses, etc.), and standard hand tools and supplies for electric power work (screwdrivers, cutters, tape, etc.)
- √ Hand-held DVM for checking connections, fuses, voltages, etc.
- √ Clamp-on AC current meter for miscellaneous checks



Photo 2: IPC Voltage Sag Generator



Photo 3: IPC Voltage Sag Generator rear panel



Photo 4: SEMI F47 Configuration

Safety review

- √ Prior to test commencement, all participants review the exit locations, the location of fire extinguishers, the emergency telephone number.
- √ Protective eyewear was required.
- √ The participants had current CPR certification.

Electric power connections

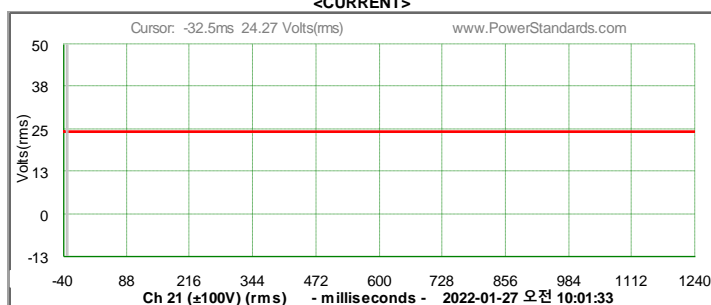
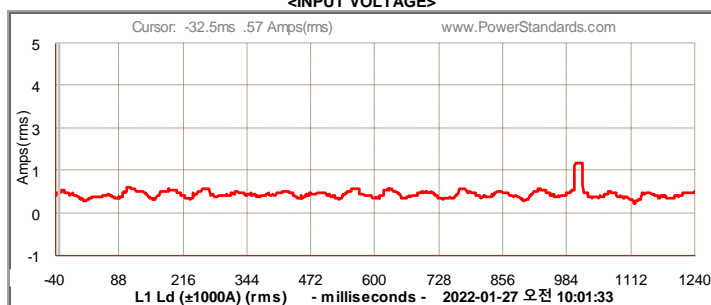
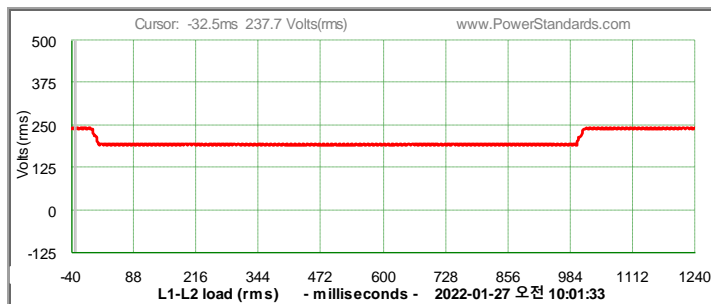
- √ Powers were 1-phase 208V nominal phase-to-phase

Equipment under test

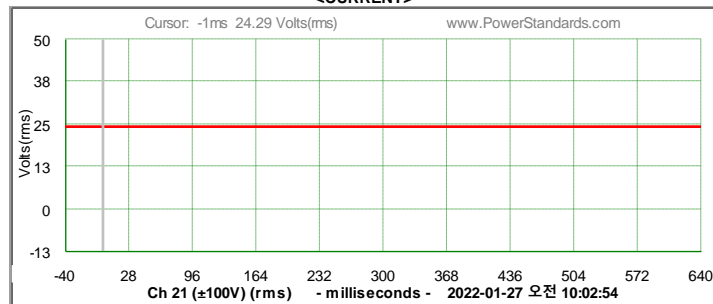
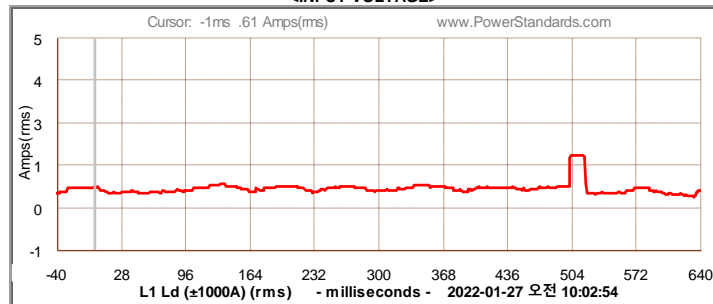
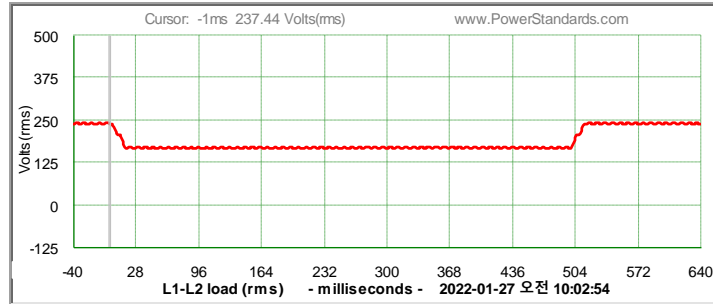
- √ POWER SUPPLY / SPB-030-24, S/N: VL15R
- √ TUV Rheinland Korea personnel performed the sag testing in the manufacturer's premise.

Equipment operating condition:

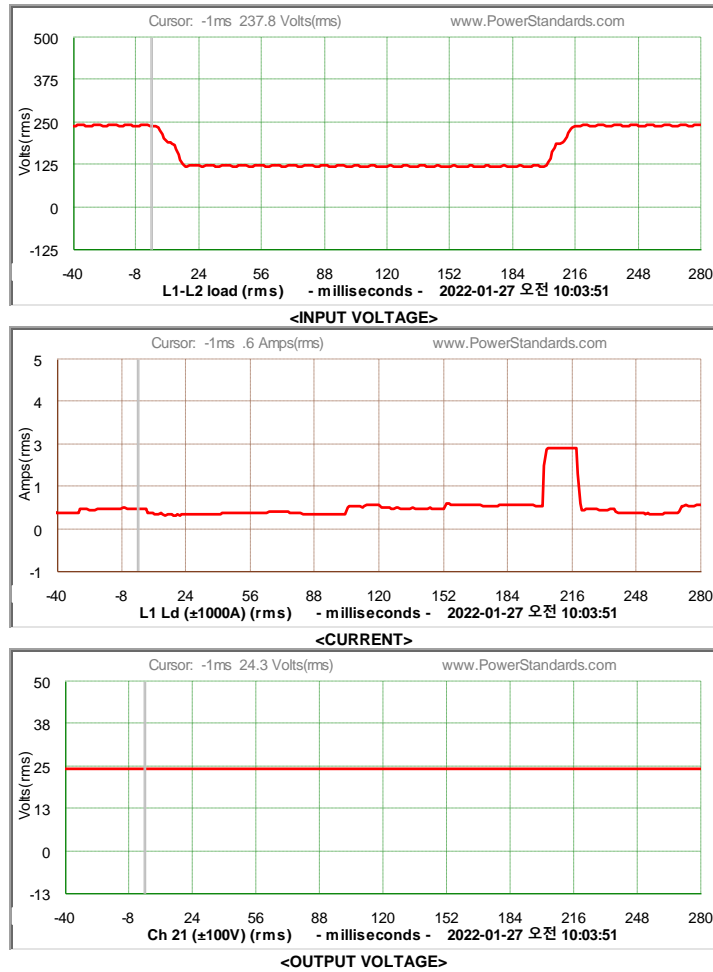
- √ Equipment Auto Running Status.



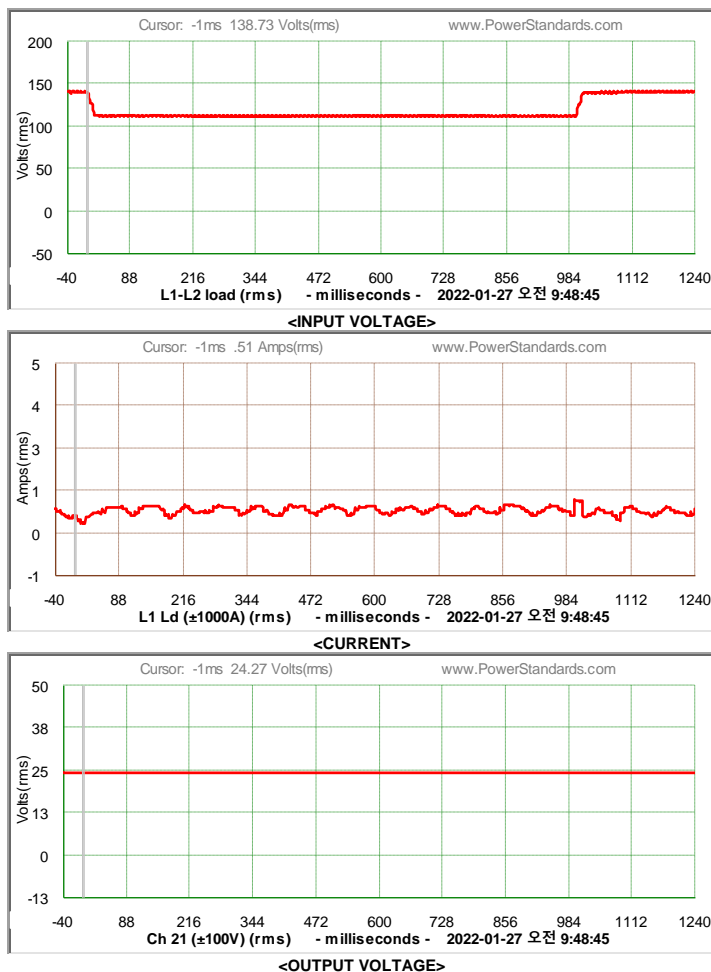
| | |
|--------------------------|---|
| Recorded at: | 2022-01-27 am10:01:33 |
| Test equipment: | Industrial Power Corruptor, IPC-480V-200A |
| Test equipment S/N: | IPC14094 |
| Last service date: | 2021/08/25 |
| Rev levels: | Firmware: Rev 4.0.0 Software: Rev 4.0.1 Hardware: Rev |
| Test engineer: | S.K. Jung |
| Test company: | TUV RHEINLAND KOREA |
| Equipment Under Test: | POWER SUPPLY |
| EUT manufacturer: | Autonics Corporation |
| Manufacturer location: | 18, Bansong-ro 513beon-gil, Haeundae-gu, Busan, 48002 Rep. of Korea |
| EUT Model Number: | SPB-030-24 |
| EUT Serial Number: | VL15R |
| Comments: | |
| INPUT power: | 240Va.c / 60Hz / 1Phase / 2W+1PE |
| Event retained voltages: | 80% |
| Event duration: | 60 cycles |
| Event phase angle | 0 deg |
| Applied to: | MAIN POWER |
| Result | PASS |



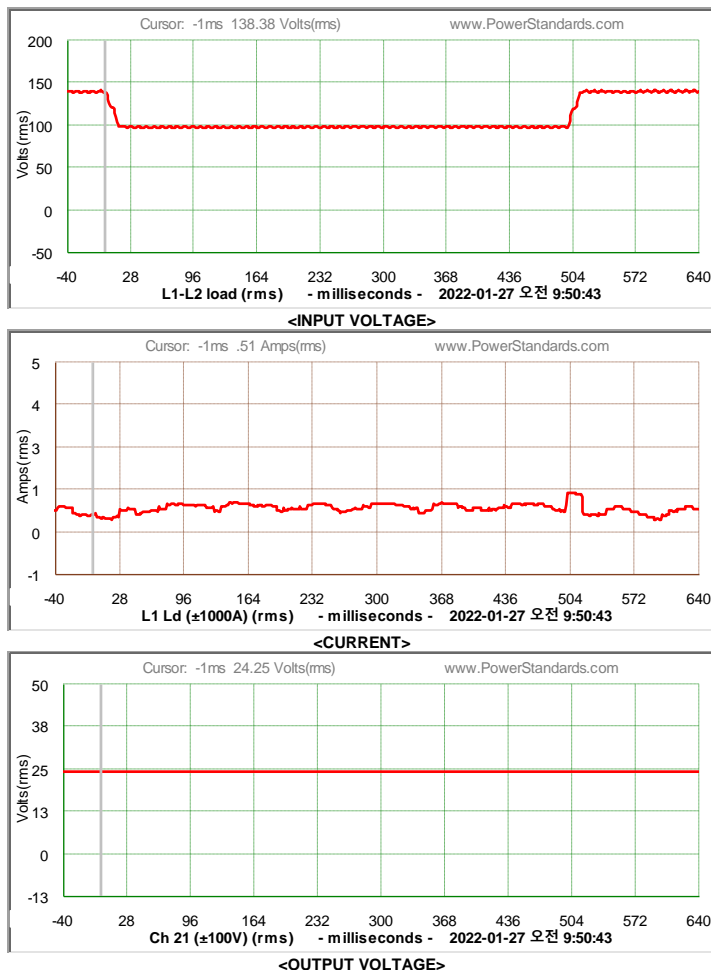
| | |
|--------------------------|---|
| Recorded at: | 2022-01-27 am10:02:54 |
| Test equipment: | Industrial Power Corruptor, IPC-480V-200A |
| Test equipment S/N: | IPC14094 |
| Last service date: | 2021/08/25 |
| Rev levels: | Firmware: Rev 4.0.0 Software: Rev 4.0.1 Hardware: Rev |
| Test engineer: | S.K. Jung |
| Test company: | TUV RHEINLAND KOREA |
| Equipment Under Test: | POWER SUPPLY |
| EUT manufacturer: | Autonics Corporation |
| Manufacturer location: | 18, Bansong-ro 513beon-gil, Haeundae-gu, Busan, 48002 Rep. of Korea |
| EUT Model Number: | SPB-030-24 |
| EUT Serial Number: | VL15R |
| Comments: | |
| INPUT power: | 240Va.c / 60Hz / 1Phase / 2W+1PE |
| Event retained voltages: | 70% |
| Event duration: | 30 cycles |
| Event phase angle | 0 deg |
| Applied to: | MAIN POWER |
| Result | PASS |



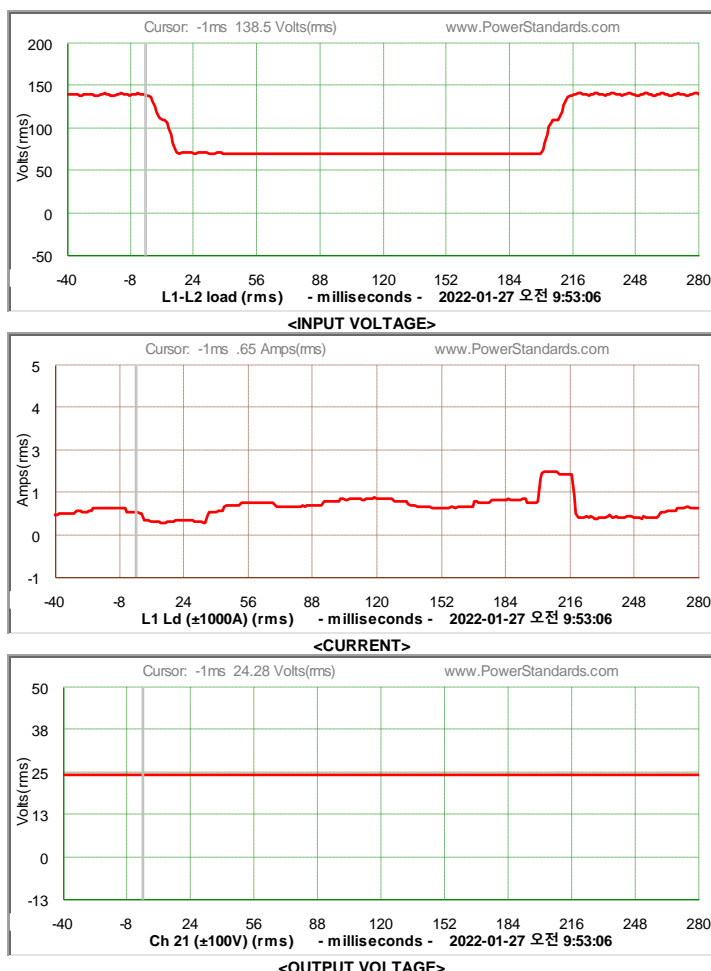
| | |
|--------------------------|---|
| Recorded at: | 2022-01-27 am10:03:51 |
| Test equipment: | Industrial Power Corruptor, IPC-480V-200A |
| Test equipment S/N: | IPC14094 |
| Last service date: | 2021/08/25 |
| Rev levels: | Firmware: Rev 4.0.0 Software: Rev 4.0.1 Hardware: Rev |
| Test engineer: | S.K. Jung |
| Test company: | TUV RHEINLAND KOREA |
| Equipment Under Test: | POWER SUPPLY |
| EUT manufacturer: | Autonics Corporation |
| Manufacturer location: | 18, Bansong-ro 513beon-gil, Haeundae-gu, Busan, 48002 Rep. of Korea |
| EUT Model Number: | SPB-030-24 |
| EUT Serial Number: | VL15R |
| Comments: | |
| INPUT power: | 240Va.c / 60Hz / 1Phase / 2W+1PE |
| Event retained voltages: | 50% |
| Event duration: | 12 cycles |
| Event phase angle: | 0 deg |
| Applied to: | MAIN POWER |
| Result: | PASS |



| | |
|--------------------------|---|
| Recorded at: | 2022-01-27 am09:48:45 |
| Test equipment: | Industrial Power Corruptor, IPC-480V-200A |
| Test equipment S/N: | IPC14094 |
| Last service date: | 2021/08/25 |
| Rev levels: | Firmware: Rev 4.0.0 Software: Rev 4.0.1 Hardware: Rev |
| Test engineer: | S.K. Jung |
| Test company: | TUV RHEINLAND KOREA |
| Equipment Under Test: | POWER SUPPLY |
| EUT manufacturer: | Autonics Corporation |
| Manufacturer location: | 18, Bansong-ro 513beon-gil, Haeundae-gu, Busan, 48002 Rep. of Korea |
| EUT Model Number: | SPB-030-24 |
| EUT Serial Number: | VL15R |
| Comments: | |
| INPUT power: | 140Va.c / 60Hz / 1Phase / 2W+1PE |
| Event retained voltages: | 80% |
| Event duration: | 60 cycles |
| Event phase angle: | 0 deg |
| Applied to: | MAIN POWER |
| Result: | PASS |



| | |
|--------------------------|---|
| Recorded at: | 2022-01-27 am09:50:43 |
| Test equipment: | Industrial Power Corruptor, IPC-480V-200A |
| Test equipment S/N: | IPC14094 |
| Last service date: | 2021/08/25 |
| Rev levels: | Firmware: Rev 4.0.0 Software: Rev 4.0.1 Hardware: Rev |
| Test engineer: | S.K. Jung |
| Test company: | TUV RHEINLAND KOREA |
| Equipment Under Test: | POWER SUPPLY |
| EUT manufacturer: | Autonics Corporation |
| Manufacturer location: | 18, Bansong-ro 513beon-gil, Haeundae-gu, Busan, 48002 Rep. of Korea |
| EUT Model Number: | SPB-030-24 |
| EUT Serial Number: | VL15R |
| Comments: | |
| INPUT power: | 140Va.c / 60Hz / 1Phase / 2W+1PE |
| Event retained voltages: | 70% |
| Event duration: | 30 cycles |
| Event phase angle | 0 deg |
| Applied to: | MAIN POWER |
| Result | PASS |



| | |
|--------------------------|---|
| Recorded at: | 2022-01-27 am09:53:06 |
| Test equipment: | Industrial Power Corruptor, IPC-480V-200A |
| Test equipment S/N: | IPC14094 |
| Last service date: | 2021/08/25 |
| Rev levels: | Firmware: Rev 4.0.0 Software: Rev 4.0.1 Hardware: Rev |
| Test engineer: | S.K. Jung |
| Test company: | TUV RHEINLAND KOREA |
| Equipment Under Test: | POWER SUPPLY |
| EUT manufacturer: | Autonics Corporation |
| Manufacturer location: | 18, Bansong-ro 513beon-gil, Haeundae-gu, Busan, 48002 Rep. of Korea |
| EUT Model Number: | SPB-030-24 |
| EUT Serial Number: | VL15R |
| Comments: | |
| INPUT power: | 140Va.c / 60Hz / 1Phase / 2W+1PE |
| Event retained voltages: | 50% |
| Event duration: | 12 cycles |
| Event phase angle: | 0 deg |
| Applied to: | MAIN POWER |
| Result: | PASS |

Table 1: Sag Immunity Test Results (SEMI F47)

| File | Date / Time | Power | Phase | Amplitude | Duration | Angle | Result |
|------------------------|------------------------|------------|-------|-----------|----------|-------|--------|
| 140V_80%60CYC_L1L2.csv | 2022-01-27 am 9:48:45 | MAIN POWER | L1-L2 | 80 % | 60.0 cyc | 0 deg | PASS |
| 140V_70%30CYC_L1L2.csv | 2022-01-27 am 9:50:43 | MAIN POWER | L1-L2 | 70 % | 30.0 cyc | 0 deg | PASS |
| 140V_50%12CYC_L1L2.csv | 2022-01-27 am 9:53:06 | MAIN POWER | L1-L2 | 50 % | 12.0 cyc | 0 deg | PASS |
| 240V_80%60CYC_L1L2.csv | 2022-01-27 am 10:01:33 | MAIN POWER | L1-L2 | 80 % | 60.0 cyc | 0 deg | PASS |
| 240V_70%30CYC_L1L2.csv | 2022-01-27 am 10:02:54 | MAIN POWER | L1-L2 | 70 % | 30.0 cyc | 0 deg | PASS |
| 240V_50%12CYC_L1L2.csv | 2022-01-27 am 10:03:51 | MAIN POWER | L1-L2 | 50 % | 12.0 cyc | 0 deg | PASS |

Comments:

Conclusions

POWER SUPPLY, SPB-030-24, S/N: VL15R complies with all mandatory SEMI F47-0706 voltage sag requirements

Recommendations

POWER SUPPLY, SPB-030-24, S/N: VL15R functions properly during all mandatory voltage sags as described in SEMI F47-0706 requirements.

End of Test Report