



# Test Report: CXLDA480F-48

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480W AC-DC DIN Rail (1  $\Phi$ )

## ■ DESIGN VERIFY TEST

Output Function Test

Input Function Test

Protection Function Test

Component Stress Test

## ■ SAFETY & E.M.C. TEST

Safety Test

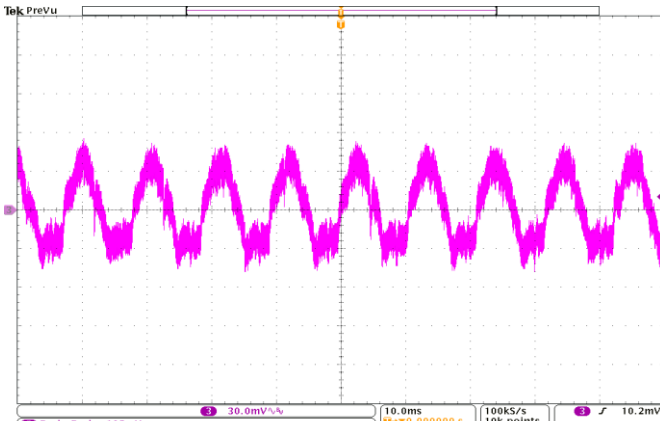
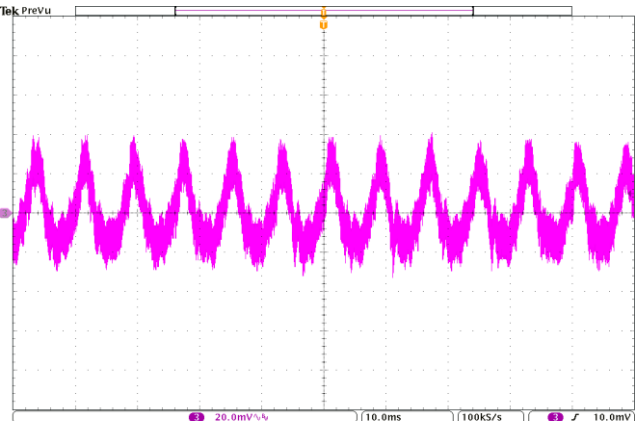
E.M.C. Test

## ■ RELIABILITY TEST

Environment Test

DESIGN VERIFY TEST

OUTPUT FUNCTION TEST

| NO | TEST ITEM                                                                                                                       | SPECIFICATION    | TEST CONDITION                                                                                                                    | RESULT          |                 |
|----|---------------------------------------------------------------------------------------------------------------------------------|------------------|-----------------------------------------------------------------------------------------------------------------------------------|-----------------|-----------------|
| 1  | OUTPUT VOLTAGE TOLERANCE.                                                                                                       | No specification | I/P: 85VAC ~ 264VAC<br>O/P: NO ~ FULL LOAD<br>Ta: -25°C, 25°C, 55°C                                                               | 47.97 ~ 48.04V  |                 |
| 2  | LINE REGULATION                                                                                                                 | -0.5%~+0.5%      | I/P: 85VAC ~ 264VAC<br>O/P: NO ~ FULL LOAD<br>Ta: -25°C, 25°C, 55°C                                                               | 85 to 115VAC    | -0.03% ~ +0.03% |
|    |                                                                                                                                 |                  |                                                                                                                                   | 230 to 264VAC   | -0.01% ~ +0.01% |
| 3  | LOAD REGULATION                                                                                                                 | -1%~+1%          | I/P: 85VAC<br>I/P: 264VAC<br>O/P: NO ~ FULL LOAD<br>Ta: 25°C                                                                      | -0.05% ~ +0.05% |                 |
| 4  | RIPPLE & NOISE                                                                                                                  | 120mVp-p         | I/P: 85VAC<br>I/P: 264VAC<br>O/P: FULL LOAD<br>Ta: 25°C                                                                           | 85VAC           | 103mVp-p        |
|    |                                                                                                                                 |                  |                                                                                                                                   | 264VAC          | 73.6mVp-p       |
|    | 85VAC/ FULL LOAD                                                                                                                |                  | 264VAC/ FULL LOAD                                                                                                                 |                 |                 |
|    | <div>25°C</div> <div>103mV</div> <div></div> |                  | <div>25°C</div> <div>73.6mV</div> <div></div> |                 |                 |

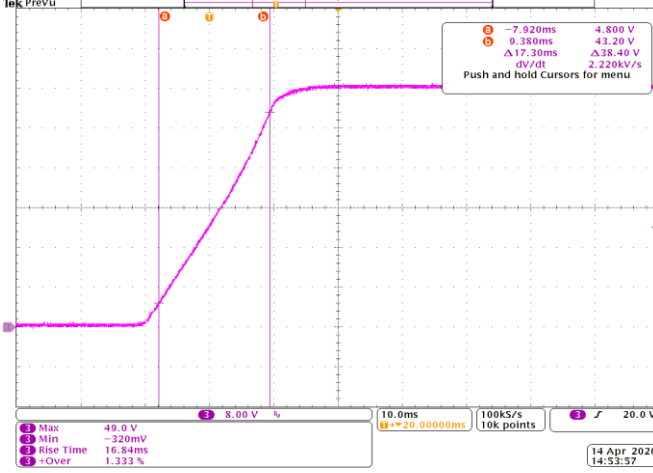
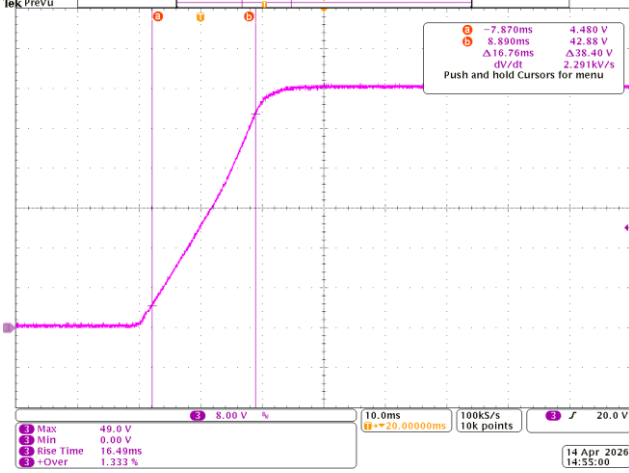
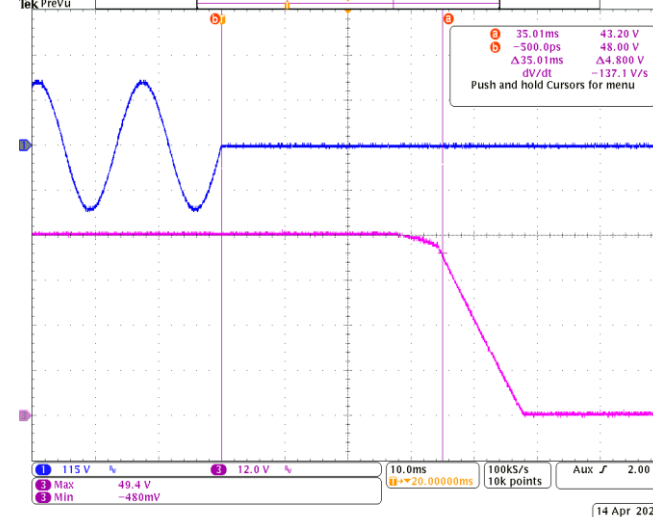
480W AC-DC DIN Rail (1 Φ)

CXLDA480F-48

|   |                                                             |  |                                                              |                                                                       |        |        |
|---|-------------------------------------------------------------|--|--------------------------------------------------------------|-----------------------------------------------------------------------|--------|--------|
| 5 | START UP TIME                                               |  | 2000ms                                                       | I/P: 100VAC<br>I/P: 264VAC<br>O/P: FULL LOAD<br>Ta: -25°C, 25°C, 55°C | 100VAC | 1432ms |
|   | INPUT=100VAC/60HZ @ FULL LOAD                               |  | INPUT=264V/50HZ @ FULL LOAD                                  |                                                                       |        |        |
|   | -25°C: 1432ms<br>CH1: AC Input Voltage, CH3: Output Voltage |  | -25°C: 553.2ms<br>CH1: AC Input Voltage, CH3: Output Voltage |                                                                       |        |        |
|   |                                                             |  |                                                              |                                                                       |        |        |
|   | 25°C: 707.6ms<br>CH1: AC Input Voltage, CH3: Output Voltage |  | 25°C: 737.6ms<br>CH1: AC Input Voltage, CH3: Output Voltage  |                                                                       |        |        |
|   |                                                             |  |                                                              |                                                                       |        |        |
|   | 55°C: 915.6ms<br>CH1: AC Input Voltage, CH3: Output Voltage |  | 55°C: 1078ms<br>CH1: AC Input Voltage, CH3: Output Voltage   |                                                                       |        |        |
|   |                                                             |  |                                                              |                                                                       |        |        |

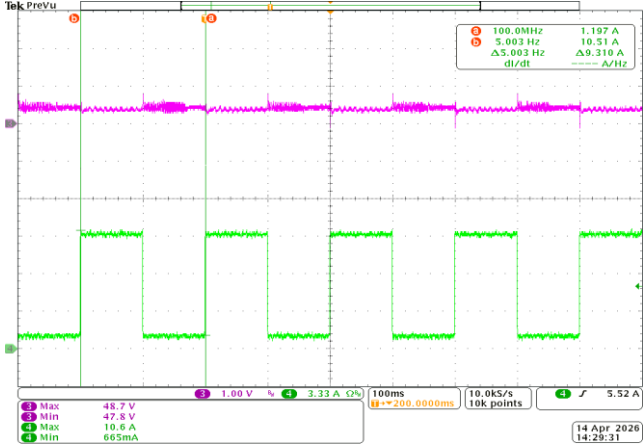
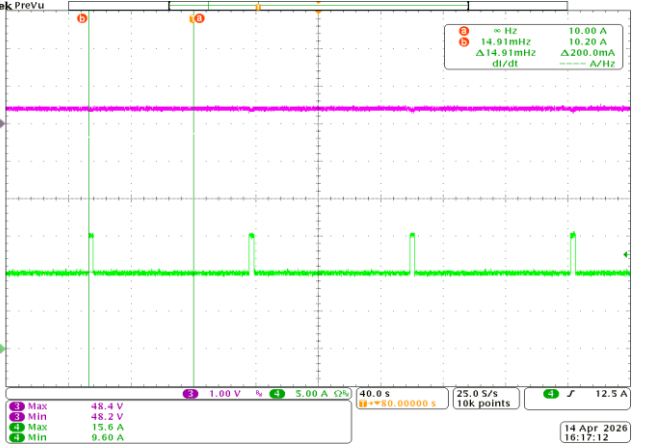
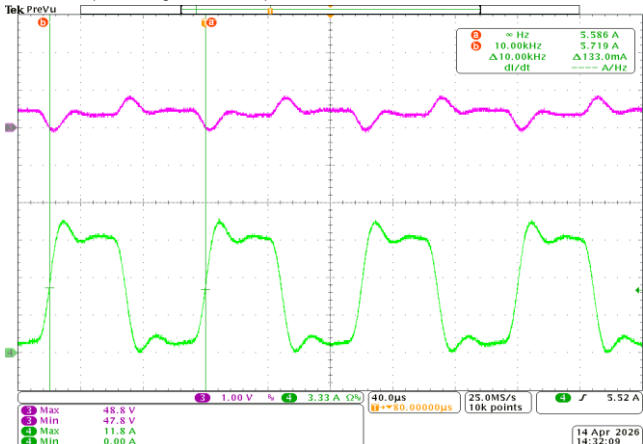
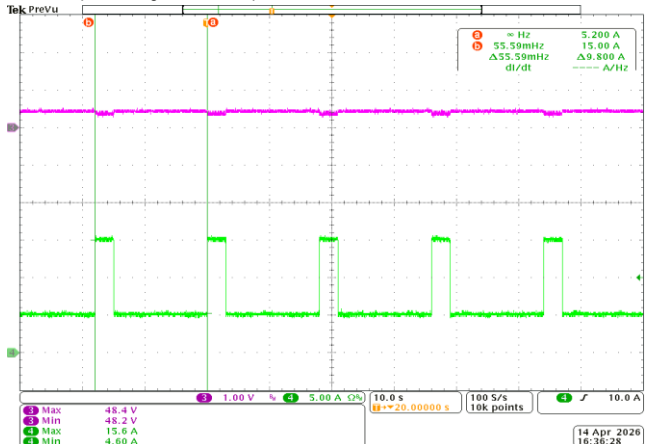
480W AC-DC DIN Rail (1  $\Phi$ )

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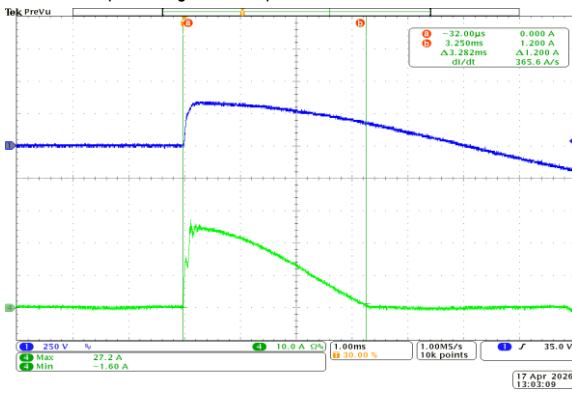
|   |                                                                                                                                                           |                 |                                                                                                             |                   |                   |
|---|-----------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|-------------------------------------------------------------------------------------------------------------|-------------------|-------------------|
| 6 | RISE TIME                                                                                                                                                 | 50ms            | I/P: 100VAC<br>I/P: 264VAC<br>O/P: FULL LOAD<br>Ta: 25°C                                                    | 100VAC<br>16.84ms | 264VAC<br>16.49ms |
|   | INPUT=100VAC/47HZ @ FULL LOAD                                                                                                                             |                 | INPUT=264V/63HZ @ FULL LOAD                                                                                 |                   |                   |
|   | <div>25°C: 16.84ms</div>                                                 |                 | <div>25°C: 16.49ms</div>  |                   |                   |
| 7 | HOLD UP TIME                                                                                                                                              | > 16ms / 115VAC | I/P: 115VAC<br>O/P: FULL LOAD<br>Ta: 25°C                                                                   | 35.01ms           |                   |
|   | INPUT=115VAC/60HZ @ FULL LOAD                                                                                                                             |                 |                                                                                                             |                   |                   |
|   | <div>25°C</div> <div>CH1: AC Input Voltage, CH3: Output Voltage</div>  |                 |                                                                                                             |                   |                   |

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|                                                                                     |  |                                                                                      |                                                                                                                                                                                         |   |
|-------------------------------------------------------------------------------------|--|--------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|
| DYNAMIC LOAD                                                                        |  | No specification                                                                     | I/P: 115VAC<br>O/P: (1) LOAD 10%~100% 50%DUTY / 5HZ<br>(2) LOAD 10%~100% 50%DUTY / 10KHZ<br>(3) LOAD 100%~150% 100%: 100s, 150%: 3s<br>(4) LOAD 50%~150% 50%: 15s, 150%: 3s<br>Ta: 25°C | - |
| (1) INPUT=115VAC/60HZ @ LOAD 10%~100% 50%DUTY / 5HZ                                 |  | (3) INPUT=115VAC/60HZ @ LOAD 100%~150% 100%: 100s, 150%: 3s                          |                                                                                                                                                                                         |   |
| 25°C<br>CH3: Output Voltage, CH4: Output Current                                    |  | 25°C<br>CH3: Output Voltage, CH4: Output Current                                     |                                                                                                                                                                                         |   |
|    |  |    |                                                                                                                                                                                         |   |
| (2) INPUT=115VAC/60HZ @ LOAD 10%~100% 50%DUTY / 10KHZ                               |  | (4) INPUT=115VAC/60HZ @ LOAD 50%~150% 50%: 15s, 150%: 3s                             |                                                                                                                                                                                         |   |
| 25°C<br>CH3: Output Voltage, CH4: Output Current                                    |  | 25°C<br>CH3: Output Voltage, CH4: Output Current                                     |                                                                                                                                                                                         |   |
|  |  |  |                                                                                                                                                                                         |   |

## INPUT FUNCTION TEST

| NO | TEST ITEM                                                                                                                                                        | SPECIFICATION                  | TEST CONDITION                                           | RESULT                         |
|----|------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------|----------------------------------------------------------|--------------------------------|
| 1  | INPUT CURRENT                                                                                                                                                    | 5.0A/115VAC<br>2.5A/230VAC     | I/P: 115VAC<br>I/P: 230VAC<br>O/P: FULL LOAD<br>Ta: 25°C | 4.48A @115VAC<br>2.19A @230VAC |
| 2  | LEAKAGE CURRENT                                                                                                                                                  | < 0.75mA / 240VAC              | I/P: 240VAC<br>O/P: FULL LOAD<br>Ta: 25°C                | L-PE: 0.538mA<br>N-PE: 0.538mA |
| 3  | STANDBY POWER                                                                                                                                                    | <1.5W                          | I/P: 115VAC<br>I/P: 230VAC<br>O/P: NO LOAD<br>Ta: 25°C   | 115VAC/0.79W<br>230VAC/0.91W   |
| 4  | INRUSH CURRENT                                                                                                                                                   | 40A at 230Vac (cold start)     | I/P: 230VAC<br>O/P: FULL LOAD<br>Ta: 25°C                | 27.2A                          |
|    | INPUT=230VAC/50HZ @ FULL LOAD<br>CH1: AC Input Voltage, CH4: Input Current<br> |                                |                                                          |                                |
| 5  | EFFICIENCY                                                                                                                                                       | 94.0% / FULL LOAD<br>at 230VAC | I/P: 115VAC<br>I/P: 230VAC<br>O/P: FULL LOAD<br>Ta: 25°C | 115VAC/93.5%<br>230VAC/95.5%   |
| 6  | POWER FACTOR                                                                                                                                                     | > 0.9                          | I/P: 115VAC<br>I/P: 230VAC<br>O/P: FULL LOAD<br>Ta: 25°C | 115VAC/0.992<br>230VAC/0.999   |

**PROTECTION FUNCTION TEST**

| NO | TEST ITEM                   | SPECIFICATION                            | TEST CONDITION                                                       | RESULT                                                                                                 |
|----|-----------------------------|------------------------------------------|----------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------|
| 1  | OVER CURRENT PROTECTION     | 150%~185% rated current<br>10A<OCP<18.5A | I/P: 85VAC<br>I/P: 100VAC<br>I/P: 264VAC<br>O/P: TESTING<br>Ta: 25°C | 85VAC/18.4A<br>100VAC/18.4A<br>264VAC/18.4A                                                            |
| 2  | OVER VOLTAGE PROTECTION     | <63V<br>Auto-recovery                    | I/P: 85VAC<br>I/P: 264VAC<br>O/P: NO LOAD<br>Ta: 25°C                | 85VAC/60.4V<br>264VAC/60.0V                                                                            |
| 3  | SHORT CIRCUIT PROTECTION    | NO DAMAGE<br>(auto-recovery)             | I/P: 85VAC<br>I/P: 264VAC<br>O/P: NO LOAD, FULL LOAD<br>Ta: 25°C     | PASS                                                                                                   |
| 4  | OVER TEMPERATURE PROTECTION | NO DAMAGE<br>(auto-recovery)             | I/P: 100VAC<br>O/P: FULL LOAD                                        | O.T.P. Active at 75.8°C<br>Shut down o/p voltage recovers automatically<br>after temperature goes down |

**COMPONENT STRESS TEST**

| NO | TEST ITEM            | SPECIFICATION         | TEST CONDITION                                                            | RESULT                   |
|----|----------------------|-----------------------|---------------------------------------------------------------------------|--------------------------|
| 1  | PWM Power Transistor | Q050 Rated 30.8A/600V | O/P:<br>(1) Peak voltage at I/P: 264VAC<br>(2) Peak current at I/P: 90VAC | (1) 411.5V<br>(2) 2.437A |
| 2  | PWM Power Transistor | Q051 Rated 30.8A/600V | O/P:<br>(1) Peak voltage at I/P: 264VAC<br>(2) Peak current at I/P: 90VAC | (1) 411.4V<br>(2) 2.442A |
| 3  | PFC Power Transistor | Q010 Rated 31A/600V   | O/P:<br>(1) Peak voltage at I/P: 264VAC<br>(2) Peak current at I/P: 90VAC | (1) 430.4V<br>(2) 2.771A |
| 4  | PFC Power Transistor | Q011 Rated 31A/600V   | O/P:<br>(1) Peak voltage at I/P: 264VAC<br>(2) Peak current at I/P: 90VAC | (1) 432.5V<br>(2) 2.745A |
| 5  | Input Capacitor      | C050 Rated 330uF/450V | O/P:<br>(1) Peak voltage at I/P: 264VAC<br>(2) Peak current at I/P: 90VAC | (1) 411V<br>(2) 3.433A   |

**SAFETY TEST**

| NO | TEST ITEM            | SPECIFICATION                                                                                       | TEST CONDITION                                                                 | RESULT |
|----|----------------------|-----------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------|--------|
| 1  | WITHSTAND VOLTAGE    | I/P-O/P: 3.0KVAC/min<br>I/P-PE: 2.0KVAC/min<br>O/P-PE: 0.5KVAC/min                                  | I/P-O/P: 3.0KVAC/min<br>I/P-PE: 2.0KVAC/min<br>O/P-PE: 0.5KVAC/min<br>Ta: 25°C | PASS   |
| 2  | ISOLATION RESISTANCE | I/P-O/P: 500VDC: >100M $\Omega$<br>I/P-PE: 500VDC: >100M $\Omega$<br>O/P-PE: 500VDC: >100M $\Omega$ | I/P-O/P: 500VDC<br>I/P-PE: 500VDC<br>O/P-PE: 500VDC<br>Ta: 25°C                | PASS   |

**E.M.C TEST**

| NO | TEST ITEM    | SPECIFICATION                                                                                                                                                                                             | TEST CONDITION                                           | RESULT |
|----|--------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------|--------|
| 1  | HARMONIC     | EN61000-3-2<br>CLASS A                                                                                                                                                                                    | I/P: 115VAC<br>I/P: 230VAC<br>O/P: FULL LOAD<br>Ta: 25°C | PASS   |
| 2  | RADIATION    | EN55032<br>CLASS B                                                                                                                                                                                        | I/P: 115VAC<br>I/P: 230VAC<br>O/P: FULL LOAD<br>Ta: 25°C | PASS   |
| 3  | CONDUCTION   | EN55032<br>CLASS B                                                                                                                                                                                        | I/P: 110VAC<br>I/P: 230VAC<br>O/P: FULL LOAD<br>Ta: 25°C | PASS   |
| 4  | E. S. D      | EN61000-4-2<br>Air: $\pm 15$ KV, Contact: $\pm 8$ KV<br>CRITERIA A                                                                                                                                        | I/P: 230VAC<br>O/P: FULL LOAD<br>Ta: 25°C                | PASS   |
| 5  | E. F. T      | EN61000-4-4<br>INPUT: $\pm 2$ KV<br>CRITERIA A                                                                                                                                                            | I/P: 230VAC<br>O/P: FULL LOAD<br>Ta: 25°C                | PASS   |
| 6  | SURGE        | EN61000-4-5<br>L-N: $\pm 2$ KV L, N-PE: $\pm 4$ KV<br>CRITERIA A                                                                                                                                          | I/P: 230VAC<br>O/P: FULL LOAD<br>Ta: 25°C                | PASS   |
| 7  | VOLTAGE DIPS | IEC61000-4-11<br>(1) < 5 % residual voltage, 0.55 cycle<br>CRITERIA A<br>(2) 70% residual voltage, 27.5 cycles (at 50Hz)<br>CRITERIA A<br>(3) < 5 % residual voltage, 275 cycles (at 50 Hz)<br>CRITERIA B | I/P: 230VAC<br>O/P: FULL LOAD<br>Ta: 25°C                | PASS   |

**CXLDA480F-48**480W AC-DC DIN Rail (1  $\Phi$ )

|    |                                |                                                                                                                                                  |                                           |      |
|----|--------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------|------|
| 8  | Conducted Immunity             | IEC61000-4-6<br>0.15-10 MHz, 3V, 80% AM (1kHz),<br>10-30 MHz, 3V-1V, 80% AM (1kHz),<br>30-80 MHz, 1V, 80% AM (1kHz),<br>CRITERIA A               | I/P: 230VAC<br>O/P: FULL LOAD<br>Ta: 25°C | PASS |
| 9  | Radiated Immunity              | IEC61000-4-3<br>(1) 80 to 1000(MHz), 3 V/m, 80 % AM (1 kHz)<br>(2) 1800, 2600, 3500, 5000 MHz ( $\pm 1$ %),<br>3V/m, 80% AM (1kHz)<br>CRITERIA A | I/P: 230VAC<br>O/P: FULL LOAD<br>Ta: 25°C | PASS |
| 10 | Power Frequency Magnetic Field | IEC61000-4-8<br>1A/m, 50Hz<br>CRITERIA A                                                                                                         | I/P: 230VAC<br>O/P: FULL LOAD<br>Ta: 25°C | PASS |

■ **RELIABILITY TEST**

**ENVIRONMENT TEST**

| NO | TEST ITEM             | SPECIFICATION                                                                                                                                             | TEST CONDITION                                   | RESULT                  |
|----|-----------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------|-------------------------|
| 1  | TEMPERATURE           | No components damaged                                                                                                                                     | I/P: 100VAC @ 47Hz<br>O/P: FULL LOAD<br>Ta: 50°C | PASS*Table 1            |
| 2  | CAPACITOR LIFE CYCLE  | The electrolytical capacitor life is greater than 43,800 hours                                                                                            | I/P: 230 VAC @ 50Hz<br>O/P: 70% Load<br>Ta: 50°C | LIFETIME= 50,941 hours  |
| 3  | MTBF                  | The power supply reliability, when calculated by SR332 exceeds 1,000,000 hours with all output at 100% of maximum load and at ambient temperature of 25°C |                                                  | 1,419,389hours @ 230VAC |
| 4  | HUMIDITY              | Storage: 25°C / 5 ~ 95% RH<br>Working: 25°C/ 20 ~ 95% RH<br>I/P: 100~240VAC (Working)<br>O/P: 100% load (Working)                                         |                                                  | PASS                    |
| 5  | VIBRATION TEST        | Ware form: Random<br>Acceleration: 2Grms<br>Axis/Time: X, Y, Z / 10min per axis<br>Frequency: 10~500Hz<br>No functional, mechanical and safety fail.      |                                                  | PASS                    |
| 6  | ALTITUDE              | Operational and Non-operational<br>Altitude: 5000 meters<br>Temperature: -5°C<br>Dwell time: 24Hrs<br>O/P: 100% load (Operational)                        |                                                  | PASS                    |
| 7  | OVERLOAD BURN-IN TEST | I/P: 100VAC/ 47Hz<br>O/P: Just before OCP kicks in<br>Ta: 50°C                                                                                            |                                                  | PASS                    |

\*1 All component temperatures should not exceed maximum operation temperature.

480W AC-DC DIN Rail (1Φ)

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Table 1. Components temperature @ 50°C 100% Load. (Unit °C)

| No. | Location | 100VAC | Result |
|-----|----------|--------|--------|
| 1   | CN001    | 77.4   | Pass   |
| 2   | F001     | 92.6   | Pass   |
| 3   | L001     | 96.3   | Pass   |
| 4   | C001     | 96.6   | Pass   |
| 5   | L002     | 98.4   | Pass   |
| 6   | BD001    | 126.5  | Pass   |
| 7   | L201     | 100.7  | Pass   |
| 8   | C212     | 91.6   | Pass   |
| 9   | CN202    | 91.8   | Pass   |
| 10  | L004     | 87.0   | Pass   |
| 11  | C004     | 94.1   | Pass   |
| 12  | L010_W   | 93.4   | Pass   |
| 13  | L010_C   | 97.9   | Pass   |
| 14  | Q010     | 103.9  | Pass   |
| 15  | Q011     | 102.6  | Pass   |
| 16  | D003     | 102.3  | Pass   |
| 17  | RT001    | 82.1   | Pass   |
| 18  | C050     | 98.9   | Pass   |
| 19  | C113     | 104.6  | Pass   |
| 20  | C055     | 103.0  | Pass   |
| 21  | T050_W   | 103.5  | Pass   |
| 22  | T050_C   | 101.4  | Pass   |
| 23  | C114     | 101.6  | Pass   |
| 24  | C208     | 89.5   | Pass   |
| 25  | C210     | 93.3   | Pass   |
| 26  | L200     | 94.7   | Pass   |
| 27  | C206     | 85.5   | Pass   |
| 28  | R009     | 109.5  | Pass   |
| 29  | RT101    | 92.0   | Pass   |
| 30  | Q050     | 107.9  | Pass   |
| 31  | Q051     | 113.1  | Pass   |
| 32  | IC201    | 107.2  | Pass   |
| 33  | Q201     | 106.2  | Pass   |
| 34  | Q203     | 107.8  | Pass   |

480W AC-DC DIN Rail (1Φ)

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| TEST RESULT | TESTER    | REVIEW      | APPROVAL     |
|-------------|-----------|-------------|--------------|
| PASS        | Luke Zhou | Jerry Huang | Xiubing Xiag |