



# Test Report : IOB-15-24

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15W AC-DC Industrial On Board Type Power Module

## ■ DESIGN VERIFY TEST

Output Function Test

Input Function Test

Protection Function Test

## ■ SAFETY TEST

Safety Test

## ■ RELIABILITY TEST

Environment Test

Other test

## DESIGN VERIFY TEST

### OUTPUT FUNCTION TEST

| NO | TEST ITEM         | SPECIFICATION   | TEST CONDITION                                    | RESULT          | VERDICT |
|----|-------------------|-----------------|---------------------------------------------------|-----------------|---------|
| 1  | RIPPLE & NOISE    | 150 mVp-p (Max) | I/P:230VAC<br>O/P:FULL LOAD<br>Ta:25°C            | 48 mVp-p        | P       |
| 2  | VOLTAGE TOLERANCE | -2% ~ +2%       | I/P:85VAC~305VAC<br>O/P:FULL~MIN. LOAD<br>Ta:25°C | +0.79%          | P       |
| 3  | LINE REGULATION   | -0.5% ~ +0.5%   | I/P:85VAC~305VAC<br>O/P:FULL LOAD<br>Ta:25°C      | -0.02% ~ -0.02% | P       |
| 4  | LOAD REGULATION   | -1.5% ~ +1.5%   | I/P:230VAC<br>O/P:FULL ~MIN LOAD<br>Ta:25°C       | +0.07% ~ -0.04% | P       |

### INPUT FUNCTION TEST

| NO | TEST ITEM                 | SPECIFICATION                      | TEST CONDITION                                      | RESULT     | VERDICT |
|----|---------------------------|------------------------------------|-----------------------------------------------------|------------|---------|
| 1  | VOLTAGE RANGE             | 85VAC ~ 350VAC                     | I/P:TESTING<br>O/P:FULL LOAD<br>Ta:25°C             | 40V ~ 305V | P       |
| 2  | FREQUENCY RANGE           | 47HZ - 60HZ (Typ)<br>NO DAMAGE OSC | I/P: 85VAC ~ 305VAC<br>O/P:FULL~MIN LOAD<br>Ta:25°C | TEST: OK   | P       |
| 3  | EFFICIENCY                | 85%                                | I/P:230VAC<br>O/P:FULL LOAD<br>Ta:25°C              | 85.60 %    | P       |
| 4  | AC CURRENT                | 0.4 A (Typ)                        | I/P: 100VAC<br>O/P:FULL LOAD<br>Ta:25°C             | 0.368 A    | P       |
| 5  | INRUSH CURRENT            | < 35A<br>COLD START                | I/P:230VAC<br>O/P:FULL LOAD<br>Ta:25°C              | 17.0A      | P       |
| 6  | NO LOAD POWER CONSUMPTION | < 0.25W (Max)                      | I/P:230VAC<br>O/P: NO LOAD<br>Ta:25°C               | 0.0743 W   | P       |

### PROTECTION FUNCTION TEST

| NO | TEST ITEM            | SPECIFICATION                    | TEST CONDITION                         | RESULT                                         | VERDICT |
|----|----------------------|----------------------------------|----------------------------------------|------------------------------------------------|---------|
| 1  | SHORT PROTECTION     | SHORT OUTPUT<br>1 HOUR NO DAMAGE | I/P:305VAC<br>O/P:FULL LOAD<br>Ta:25°C | NO DAMAGE<br>HICCUP MODE<br>RESET AUTO RECOVER | P       |
| 2  | OVER LOAD PROTECTION | >110%                            | I/P:230VAC<br>O/P:TESTING<br>Ta:25°C   | 135.4%<br>HICCUP MODE<br>RESET : AUTO RECOVER  | P       |

|   |                         |     |                                       |                                             |   |
|---|-------------------------|-----|---------------------------------------|---------------------------------------------|---|
| 3 | OVER VOLTAGE PROTECTION | YES | I/P:230VAC<br>O/P:MIN LOAD<br>Ta:25°C | PROTECTION TYPE:<br>OUTPUT VOLTAGE<br>CLAMP | P |
|---|-------------------------|-----|---------------------------------------|---------------------------------------------|---|

## SAFETY TEST

### SAFETY TEST

| NO | TEST ITEM            | SPECICATION          | TEST CONDITION                  | RESULT                     | VERDICT |
|----|----------------------|----------------------|---------------------------------|----------------------------|---------|
| 1  | WITHSTAND VOLTAGE    | I/P-O/P:3000 VAC/min | I/P-O/P:3000 VAC/min<br>Ta:25°C | I/P-O/P: <5mA<br>NO DAMAGE | P       |
| 2  | ISOLATION RESISTANCE | I/P-O/P:500VDC>100MΩ | I/P-O/P:500 VDC<br>Ta:25°C      | I/P-O/P>100MΩ<br>NO DAMAGE | P       |

## RELIABILITY TEST

### ENVIRONMENT TEST

| NO | TEST ITEM                    | SPECICATION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | TEST CONDITION                             | RESULT    | VERDICT |          |   |   |   |   |     |       |       |       |   |    |       |       |       |   |    |       |        |       |   |    |       |       |       |   |    |       |       |       |   |    |       |       |       |   |       |       |        |       |   |       |       |       |       |  |   |
|----|------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------|-----------|---------|----------|---|---|---|---|-----|-------|-------|-------|---|----|-------|-------|-------|---|----|-------|--------|-------|---|----|-------|-------|-------|---|----|-------|-------|-------|---|----|-------|-------|-------|---|-------|-------|--------|-------|---|-------|-------|-------|-------|--|---|
| 1  | TEMPERATURE RISE TEST        | <div>1. ROOM AMBIENT BURN-IN : 4HRS<br/>I/P:230VAC O/P:100% LOAD Ta=25℃</div> <div>2. HI AMBIENT BURN-IN : 4HRS<br/>I/P:230VAC O/P:100% LOAD Ta=50℃</div> <div>3. HI AMBIENT BURN-IN : 4HRS<br/>I/P:230VAC O/P:10% LOAD Ta=80℃</div> <table><tr><th>NO</th><th>Position</th><th>1</th><th>2</th><th>3</th></tr><tr><td>1</td><td>BD1</td><td>47.4℃</td><td>77.4℃</td><td>85.5℃</td></tr><tr><td>2</td><td>D3</td><td>45.2℃</td><td>75.2℃</td><td>87.7℃</td></tr><tr><td>3</td><td>D4</td><td>72.6℃</td><td>102.6℃</td><td>87.4℃</td></tr><tr><td>4</td><td>D5</td><td>67.7℃</td><td>97.7℃</td><td>86.7℃</td></tr><tr><td>5</td><td>Q1</td><td>59.0℃</td><td>89.0℃</td><td>86.7℃</td></tr><tr><td>6</td><td>U1</td><td>50.9℃</td><td>80.9℃</td><td>87.7℃</td></tr><tr><td>7</td><td>T1 線圈</td><td>70.9℃</td><td>100.9℃</td><td>87.0℃</td></tr><tr><td>8</td><td>T1 鐵芯</td><td>63.6℃</td><td>93.6℃</td><td>85.9℃</td></tr></table> |                                            |           | NO      | Position | 1 | 2 | 3 | 1 | BD1 | 47.4℃ | 77.4℃ | 85.5℃ | 2 | D3 | 45.2℃ | 75.2℃ | 87.7℃ | 3 | D4 | 72.6℃ | 102.6℃ | 87.4℃ | 4 | D5 | 67.7℃ | 97.7℃ | 86.7℃ | 5 | Q1 | 59.0℃ | 89.0℃ | 86.7℃ | 6 | U1 | 50.9℃ | 80.9℃ | 87.7℃ | 7 | T1 線圈 | 70.9℃ | 100.9℃ | 87.0℃ | 8 | T1 鐵芯 | 63.6℃ | 93.6℃ | 85.9℃ |  | P |
| NO | Position                     | 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 2                                          | 3         |         |          |   |   |   |   |     |       |       |       |   |    |       |       |       |   |    |       |        |       |   |    |       |       |       |   |    |       |       |       |   |    |       |       |       |   |       |       |        |       |   |       |       |       |       |  |   |
| 1  | BD1                          | 47.4℃                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 77.4℃                                      | 85.5℃     |         |          |   |   |   |   |     |       |       |       |   |    |       |       |       |   |    |       |        |       |   |    |       |       |       |   |    |       |       |       |   |    |       |       |       |   |       |       |        |       |   |       |       |       |       |  |   |
| 2  | D3                           | 45.2℃                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 75.2℃                                      | 87.7℃     |         |          |   |   |   |   |     |       |       |       |   |    |       |       |       |   |    |       |        |       |   |    |       |       |       |   |    |       |       |       |   |    |       |       |       |   |       |       |        |       |   |       |       |       |       |  |   |
| 3  | D4                           | 72.6℃                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 102.6℃                                     | 87.4℃     |         |          |   |   |   |   |     |       |       |       |   |    |       |       |       |   |    |       |        |       |   |    |       |       |       |   |    |       |       |       |   |    |       |       |       |   |       |       |        |       |   |       |       |       |       |  |   |
| 4  | D5                           | 67.7℃                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 97.7℃                                      | 86.7℃     |         |          |   |   |   |   |     |       |       |       |   |    |       |       |       |   |    |       |        |       |   |    |       |       |       |   |    |       |       |       |   |    |       |       |       |   |       |       |        |       |   |       |       |       |       |  |   |
| 5  | Q1                           | 59.0℃                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 89.0℃                                      | 86.7℃     |         |          |   |   |   |   |     |       |       |       |   |    |       |       |       |   |    |       |        |       |   |    |       |       |       |   |    |       |       |       |   |    |       |       |       |   |       |       |        |       |   |       |       |       |       |  |   |
| 6  | U1                           | 50.9℃                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 80.9℃                                      | 87.7℃     |         |          |   |   |   |   |     |       |       |       |   |    |       |       |       |   |    |       |        |       |   |    |       |       |       |   |    |       |       |       |   |    |       |       |       |   |       |       |        |       |   |       |       |       |       |  |   |
| 7  | T1 線圈                        | 70.9℃                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 100.9℃                                     | 87.0℃     |         |          |   |   |   |   |     |       |       |       |   |    |       |       |       |   |    |       |        |       |   |    |       |       |       |   |    |       |       |       |   |    |       |       |       |   |       |       |        |       |   |       |       |       |       |  |   |
| 8  | T1 鐵芯                        | 63.6℃                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 93.6℃                                      | 85.9℃     |         |          |   |   |   |   |     |       |       |       |   |    |       |       |       |   |    |       |        |       |   |    |       |       |       |   |    |       |       |       |   |    |       |       |       |   |       |       |        |       |   |       |       |       |       |  |   |
| 2  | LOW TEMPERATURE TURN ON TEST | TURN ON AFTER 2 HOURS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | I/P : 230VAC<br>O/P : 100%LOAD<br>Ta= -20℃ | TEST : OK | P       |          |   |   |   |   |     |       |       |       |   |    |       |       |       |   |    |       |        |       |   |    |       |       |       |   |    |       |       |       |   |    |       |       |       |   |       |       |        |       |   |       |       |       |       |  |   |

## OTHER

| NO | TEST ITEM | SPECICATION                                                                             | TEST CONDITION | RESULT | VERDICT |
|----|-----------|-----------------------------------------------------------------------------------------|----------------|--------|---------|
| 1  | MTBF      | MIL-KDBK-217F NOTICES 2 PARTS COUNT<br>TOTAL FAILURE RATE : 0.1<br>M.T.B.F : >10000KHRS |                |        | P       |

| TEST RESULT | TESTER | APPROVAL |
|-------------|--------|----------|
|-------------|--------|----------|



|      |              |             |
|------|--------------|-------------|
| PASS | ARCHEN HSIAO | PETER CHENG |
|------|--------------|-------------|