



# Test Report : IOB-05-09

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5W 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            | 89 mVp-p        | P       |
| 2  | VOLTAGE TOLERANCE | -5% ~ +5%       | I/P:85VAC~305VAC<br>O/P:FULL~MIN. LOAD<br>Ta:25°C | +0.32%          | P       |
| 3  | LINE REGULATION   | -1.5% ~ +1.5%   | I/P:85VAC~305VAC<br>O/P:FULL LOAD<br>Ta:25°C      | -0.31% ~ +0.34% | P       |
| 4  | LOAD REGULATION   | -3% ~ +3%       | I/P:230VAC<br>O/P:FULL ~MIN LOAD<br>Ta:25°C       | +1.30% ~ -0.01% | 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             | 29V ~ 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                | 77%                                | I/P:230VAC<br>O/P:FULL LOAD<br>Ta:25°C              | 80.04 %    | P       |
| 4  | AC CURRENT                | 0.2 A (Typ)                        | I/P: 100VAC<br>O/P:FULL LOAD<br>Ta:25°C             | 0.119 A    | P       |
| 5  | INRUSH CURRENT            | < 40A<br>COLD START                | I/P:230VAC<br>O/P:FULL LOAD<br>Ta:25°C              | 17.5 A     | P       |
| 6  | NO LOAD POWER CONSUMPTION | < 0.15W (Max)                      | I/P:230VAC<br>O/P: NO LOAD<br>Ta:25°C               | 0.0551 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   | 160%<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            | SPECIFICATION        | 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: 1.266mA<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:50% LOAD Ta=85℃</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>49.1℃</td><td>75.8℃</td><td>95.9℃</td></tr><tr><td>2</td><td>U1</td><td>63.9℃</td><td>90.4℃</td><td>105.0℃</td></tr><tr><td>3</td><td>D3</td><td>69.2℃</td><td>92.7℃</td><td>104.3℃</td></tr><tr><td>4</td><td>T1 線圈</td><td>62.2℃</td><td>88.0℃</td><td>102.0℃</td></tr><tr><td>5</td><td>T1 鐵芯</td><td>50.1℃</td><td>76.2℃</td><td>95.9℃</td></tr></table> |                                            |           | NO      | Position | 1 | 2 | 3 | 1 | BD1 | 49.1℃ | 75.8℃ | 95.9℃ | 2 | U1 | 63.9℃ | 90.4℃ | 105.0℃ | 3 | D3 | 69.2℃ | 92.7℃ | 104.3℃ | 4 | T1 線圈 | 62.2℃ | 88.0℃ | 102.0℃ | 5 | T1 鐵芯 | 50.1℃ | 76.2℃ | 95.9℃ |  | P |
| NO | Position                     | 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 2                                          | 3         |         |          |   |   |   |   |     |       |       |       |   |    |       |       |        |   |    |       |       |        |   |       |       |       |        |   |       |       |       |       |  |   |
| 1  | BD1                          | 49.1℃                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 75.8℃                                      | 95.9℃     |         |          |   |   |   |   |     |       |       |       |   |    |       |       |        |   |    |       |       |        |   |       |       |       |        |   |       |       |       |       |  |   |
| 2  | U1                           | 63.9℃                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 90.4℃                                      | 105.0℃    |         |          |   |   |   |   |     |       |       |       |   |    |       |       |        |   |    |       |       |        |   |       |       |       |        |   |       |       |       |       |  |   |
| 3  | D3                           | 69.2℃                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 92.7℃                                      | 104.3℃    |         |          |   |   |   |   |     |       |       |       |   |    |       |       |        |   |    |       |       |        |   |       |       |       |        |   |       |       |       |       |  |   |
| 4  | T1 線圈                        | 62.2℃                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 88.0℃                                      | 102.0℃    |         |          |   |   |   |   |     |       |       |       |   |    |       |       |        |   |    |       |       |        |   |       |       |       |        |   |       |       |       |       |  |   |
| 5  | T1 鐵芯                        | 50.1℃                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 76.2℃                                      | 95.9℃     |         |          |   |   |   |   |     |       |       |       |   |    |       |       |        |   |    |       |       |        |   |       |       |       |        |   |       |       |       |       |  |   |
| 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 | SPECIFICATION                                                                           | 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 |