

# FSP060-DIBAN2

## with

# BOXER-6404

## Power Electronics Test Report

|                            |   |       |       |             |
|----------------------------|---|-------|-------|-------------|
| Summary                    | <input checked="" type="checkbox"/> <b>Pass</b><br><input type="checkbox"/> <b>Fail</b><br><input type="checkbox"/> <b>Pass with Deviation</b><br><b>Comment:</b> |       |       |             |
| <b>Test Result Summary</b> |   |       |       |             |
|                            | Critical  | Major | Minor | Enhancement |
| Defect Found               | 0   | 0     | 0     | 0           |
| Defect Unsolved            | 0   | 0     | 0     | 0           |

|                   |                |                 |
|-------------------|----------------|-----------------|
| Issue date        | Approval       | Test Engineer   |
| <b>08/14/2015</b> | <b>KJ Wang</b> | <b>Mike Lee</b> |

## Table of Contents

|  |   |
|--|---|
| 1. Project.....                                    | 3 |
| 2. Power Manufacturer .....                        | 3 |
| 3. Team Member .....                               | 3 |
| 4. Test Equipment.....                             | 3 |
| 5. AC Adapter Spec.....                            | 3 |
| 6. Test Item.....                                  | 4 |
| 6.1. AC Input Current.....                         | 4 |
| 6.2. MAX Inrush Current .....                      | 4 |
| 6.3. Input Frequency & Voltage .....               | 4 |
| 6.4. Switching Test.....                           | 4 |
| 6.5. Efficiency .....                              | 4 |
| 6.6. Line Regulation.....                          | 4 |
| 6.7. Load Regulation .....                         | 4 |
| 6.8. Over-Voltage Protection .....                 | 4 |
| 6.9. Over-Current Protection .....                 | 4 |
| 6.10. Over-Load Protection .....                   | 4 |
| 6.11. Short Circuit Protect.....                   | 4 |
| 6.12. Line Voltage Surge.....                      | 5 |
| 6.13. Line Voltage Sag .....                       | 5 |
| 6.14. Ripple & Noise.....                          | 5 |
| 6.15. Setup Time .....                             | 5 |
| 6.16. Hold up Time.....                            | 5 |
| 6.17. Rise Time.....                               | 5 |
| 6.18. Turn on Overshoot .....                      | 5 |
| 6.19. Turn off Undershoot.....                     | 5 |
| 6.20. Remote ON/OFF .....                          | 5 |
| 6.21. Power Good Signal.....                       | 5 |
| 6.22. Power Consumption Test with AC Adapter ..... | 5 |

**1. Project**

FSP060-DIBAN2 AC-DC Adapter for BOXER-6404

**2. Power Manufacturer**

FSP

**3. Team Member**

PM : Tim Lin ; H/W : Ying Chiang

**4. Test Equipment**

4.1. LCD Monitor : ASUS , Model : PA238

4.2. PCB Board : AAEON , GENE-BT04 Rev A1.0

4.3. CPU : Intel ® Celeron ® Processor J1900 @ 1.99GHz (2M Cache, up to 2.42 GHz)

4.4. CFast : innodisk CFast 3ME 32GB

4.5. Memory : innodisk DDR3L 1600 SODIMM 8GB (SEC 501 BYK0 K4B4G0846D)

**5. AC Adapter Spec**

AC Input : 90VAC~264VAC / 47Hz~63Hz

DC Output : 12VDC Min Load : 0A Full Load : 5A / 60W

## 6. Test Item

| Test Item                      | Test Condition / Specification                  |  | Sanction |        |
|--------------------------------|---|--|----------|--------|
|                                |   |  | Measured | Result |
| 6.1. AC Input Current          | I/P:90VAC                                       | 1.5A   | 1.31A    | PASS   |
| 6.2. MAX Inrush Current        | I/P:115VAC                                      | A  | A        | -      |
|                                | I/P:230VAC                                      | A  | A        | -      |
| 6.3. Input Frequency & Voltage | I/P:90VAC/47HZ                                  | ■ON □ OFF                                    | -        | PASS   |
|                                | I/P:90VAC/63HZ                                  | ■ON □ OFF                                    | -        | PASS   |
|                                | I/P:264VAC/47HZ                                 | ■ON □ OFF                                    | -        | PASS   |
|                                | I/P:264VAC/63HZ                                 | ■ON □ OFF                                    | -        | PASS   |
| 6.4. Switching Test            | Switching Time: 0.5 Sec<br>MIN Load / Full Load | @90VAC ■ON □ OFF                             | -        | PASS   |
|                                | Switching Time: 0.5 Sec<br>MIN Load / Full Load | @115VAC ■ON □ OFF                            | -        | PASS   |
|                                | Switching Time: 0.5 Sec<br>MIN Load / Full Load | @230VAC ■ON □ OFF                            | -        | PASS   |
|                                | Switching Time: 0.5 Sec<br>MIN Load / Full Load | @264VAC ■ON □ OFF                            | -        | PASS   |
| 6.5. Efficiency                | I/P:115VAC O/P:5A                               | @88%Min Average<br>Efficiency(for four Load) | 88.231%  | PASS   |
|                                | I/P:230VAC O/P:5A                               | @88%MinAverage<br>Efficiency(for four Load)  | 88.237%  | PASS   |
| 6.6. Line Regulation           | I/P:90VAC~264VAC                                | <±1%   | 0.083%   | PASS   |
| 6.7. Load Regulation           | I/P:115VAC<br>O/P:MIN~FULL LOAD                 | <±5%   | 3.23%    | PASS   |
|                                | I/P:230VAC<br>O/P:MIN~FULL LOAD                 | <±5%   | 2.525%   | PASS   |
| 6.8. Over-Voltage Protection   | I/P:230VAC O/P:MIN<br>LOAD                      | V1 : 13~18 (MAX)                             | -        | -      |
| 6.9. Over-Current Protection   | O/P: 12V  | 10A(MAX)                                     | 6.5A     | PASS   |
| 6.10. Over-Load Protection     | I/P:90VAC O/P:MIN<br>LOAD                       | 200%   | 121.8%   | PASS   |
|                                | I/P:115VAC O/P:MIN<br>LOAD                      | 200%   | 130%     | PASS   |
|                                | I/P:230VAC O/P:MIN<br>LOAD                      | 200%   | 134%     | PASS   |
|                                | I/P:264VAC O/P:MIN<br>LOAD                      | 200%   | 128%     | PASS   |
| 6.11. Short Circuit Protect    | I/P:115VAC O/P:MIN<br>LOAD                      | 12V&GND Short                                | -        | PASS   |
|                                | I/P:230VAC O/P:MIN<br>LOAD                      | 12V&GND Short                                | -        | PASS   |

|   |   |  |                          |      |
|---|---|--|--------------------------|------|
| <b>6.12. Line Voltage Surge</b>                     | O/P: FULL LOAD  | Surge voltage from 132VAC to 147VAC (0.5sec), back to 132VAC | -                        | PASS |
|   | O/P: FULL LOAD  | Surge voltage from 264VAC to 293VAC (0.5sec), back to 264VAC | -                        | PASS |
| <b>6.13. Line Voltage Sag</b>                       | O/P: FULL LOAD  | Sag voltage from 108VAC to 80VAC (0.5sec), back to 108VAC    | -                        | PASS |
|   | O/P: FULL LOAD  | Sag voltage from 198VAC to 161VAC (0.5sec), back to 198VAC   | -                        | PASS |
| <b>6.14. Ripple &amp; Noise</b>                     | I/P:115VAC O/P:FULL LOAD  | $\leq 150\text{mv}$  | 48.4mv                   | PASS |
|   | I/P:230VAC O/P:FULL LOAD  | $\leq 150\text{mv}$  | 48.4mv                   | PASS |
| <b>6.15. Setup Time</b>                             | I/P:90VAC O/P:FULL LOAD   | 3S(MAX)  | 1.2ms                    | PASS |
|   | I/P:230VAC O/P:FULL LOAD  | mS(MAX)  | 748ms                    | -    |
| <b>6.16. Hold up Time</b>                           | I/P:115VAC O/P:FULL LOAD  | 8mS(MIN)   | 19.2ms                   | PASS |
|   | I/P:230VAC O/P:FULL LOAD  | 20mS(MIN)  | 55ms                     | PASS |
| <b>6.17. Rise Time</b>                              | I/P:115VAC O/P:FULL LOAD  | 40mS(MAX)  | 10.132ms                 | PASS |
|   | I/P:230VAC O/P:FULL LOAD  | mS(MAX)  | 9.207ms                  | -    |
| <b>6.18. Turn on Overshoot</b>                      | Turn on overshoot shall not exceed 10% over nominal voltages@ 20 % LOAD |  | -                        | PASS |
|   | Turn on overshoot shall not exceed 10% over nominal voltages@ 20 % LOAD |  | -                        | PASS |
| <b>6.19. Turn off Undershoot</b>                    | Turn off undershoot shall not exceed 10% over nominal voltages          |  | -                        | PASS |
|   | Turn off undershoot shall not exceed 10% over nominal voltages          |  | -                        | PASS |
| <b>6.20. Remote ON/OFF</b>                          | Simulate TTL signal to test this function                               |  | -                        | -    |
| <b>6.21. Power Good Signal</b>                      | Shall go high level with a delay of 100~500ms                           |  | -                        | -    |
| <b>6.22. Power Consumption Test with AC Adapter</b> | No Run Prime95  | I/P:100VAC 0.15A<br>6.1W                                     | O/P : 12V/0.37A<br>4.44W | PASS |
|   | Run Prime 95  | I/P:100VAC 0.29A<br>12.6W                                    | O/P : 12V/0.70A<br>8.4W  | PASS |
|   | Sleep mode(S3)  | I/P:100VAC 0.05A<br>1.8W                                     | O/P : 12V/0.06A<br>0.72W | PASS |
|   | Off mode  | I/P:100VAC 0.03A<br>1.0W                                     | O/P : 12V/0.05A<br>0.6W  | PASS |