



# Test Report: RQ-125C

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125W Quad Output Switching Power Supply

## ■ DESIGN VERIFY TEST

Output Function Test

Input Function Test

Protection Function Test

Control Function Test

Component Stress Test

## ■ SAFETY & E.M.C. TEST

Safety Test

E.M.C. Test

## ■ RELIABILITY TEST

ENVIRONMENT TEST

## DESIGN VERIFY TEST

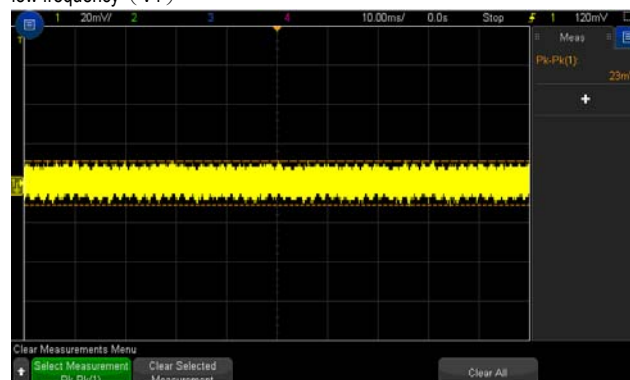
### OUTPUT FUNCTION TEST

| NO | TEST ITEM                        | SPECIFICATION                                                  | TEST CONDITION                                               | RESULT                                                                           |
|----|----------------------------------|----------------------------------------------------------------|--------------------------------------------------------------|----------------------------------------------------------------------------------|
| 1  | OUTPUT VOLTAGE<br>ADJUST RANGE   | CH1: 4.75V~ 5.5 V                                              | I/P : 230 VAC<br>I/P : 115 VAC<br>O/P : MIN LOAD<br>Ta : 25℃ | 4.59V~5.71V/230VAC<br>4.59V~5.71V/115VAC                                         |
| 2  | OUTPUT VOLTAGE(Max)<br>TOLERANCE | V1 : -2%~2 %<br>V2 : -1%~10 %<br>V3 : -10%~6 %<br>V4 : -5%~5 % | I/P: 88VAC /264VAC<br>O/P:FULL/ MIN. LOAD<br>Ta:25℃          | V1 : -0%~0%<br>V2 : -7%~7 %<br>V3 : -7%~7 %<br>V4 : -7%~7 %                      |
| 3  | LINE REGULATION (Max)            | V1: -0.5%~0.5%<br>V2: -1%~ 1%<br>V3: -1%~ 1%<br>V4: -1%~ 1%    | I/P: 88VAC~ 264VAC<br>O/P:FULL LOAD<br>Ta:25℃                | V1 : -0.00%~0.00%<br>V2 : -0.02%~0.01%<br>V3 : -0.06%~0.10%<br>V4 : -0.00%~0.00% |
| 4  | LOAD REGULATION(Max)             | V1: -1%~1%<br>V2: -3%~3%<br>V3: -6%~6%<br>V4: -2%~2%           | I/P: 230VAC<br>O/P:FULL ~MIN LOAD<br>Ta:25℃                  | V1 : -0.12%~0.12%<br>V2 : -1.17%~0.5%<br>V3 : -0.55%~1.2%<br>V4 : -0.02%~0.01%   |
| 5  | OVER/UNDERSHOOT TEST             | < ±10%                                                         | I/P: 230VAC<br>O/P:FULL LOAD<br>Ta:25℃                       | 4.0%                                                                             |
| 6  | RIPPLE & NOISE(Max )             | V1: 80mVp-p<br>V2: 120mVp-p<br>V3: 80mVp-p<br>V4: 80mVp-p      | I/P:230VAC<br>O/P:FULL LOAD<br>Ta:25℃                        | V1: 23mVp-p<br>V2: 80mVp-p<br>V3: 48mVp-p<br>V4: 11mVp-p                         |

high frequency (V1) :



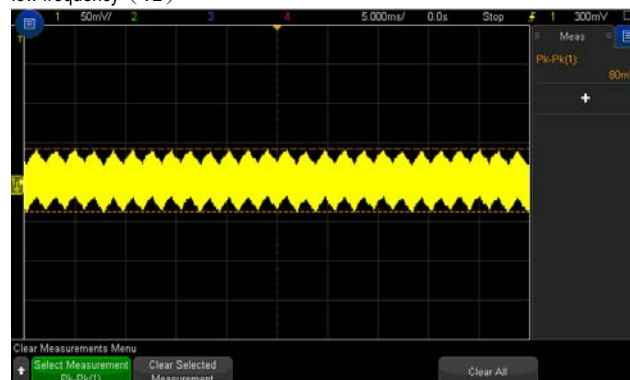
low frequency (V1) :



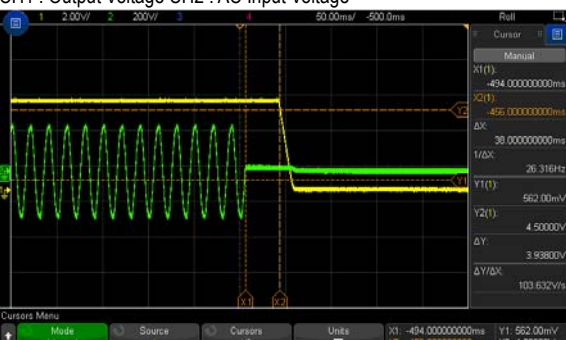
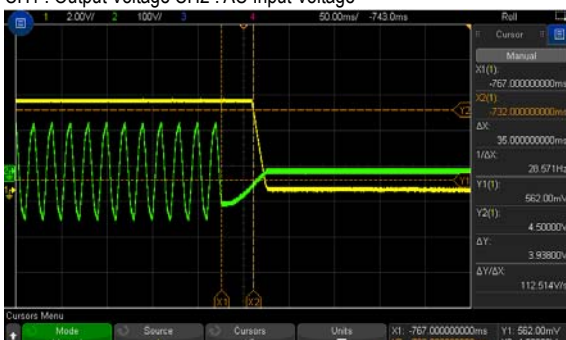
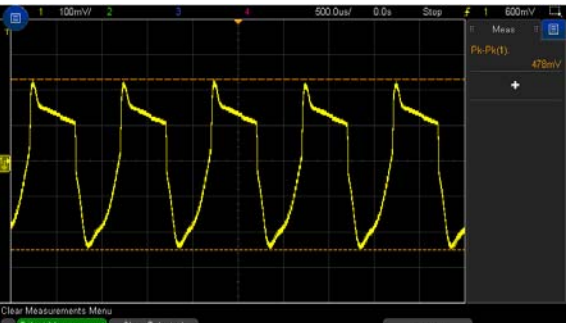
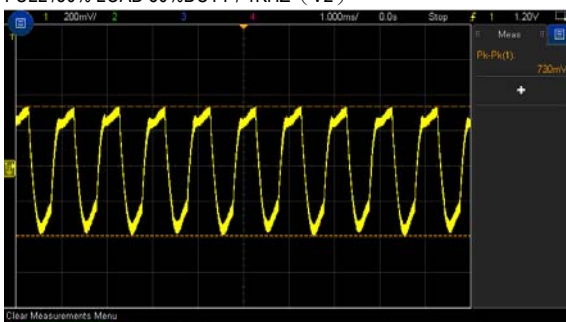
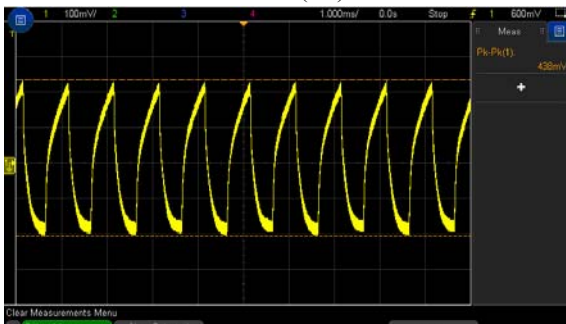
high frequency (V2) :



low frequency (V2) :

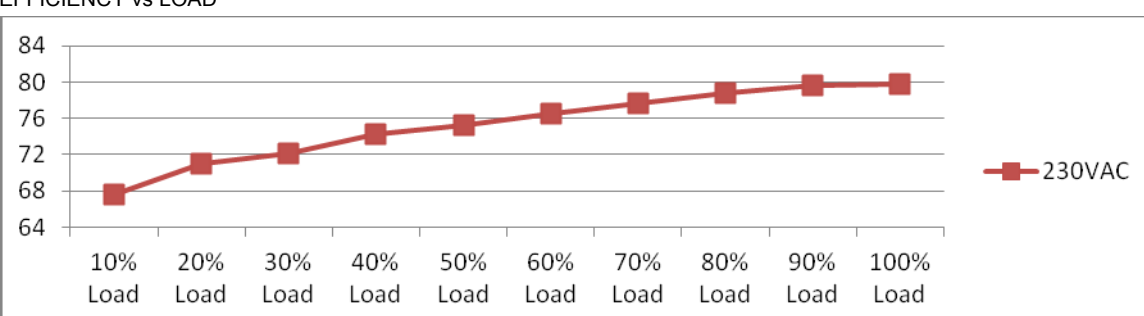


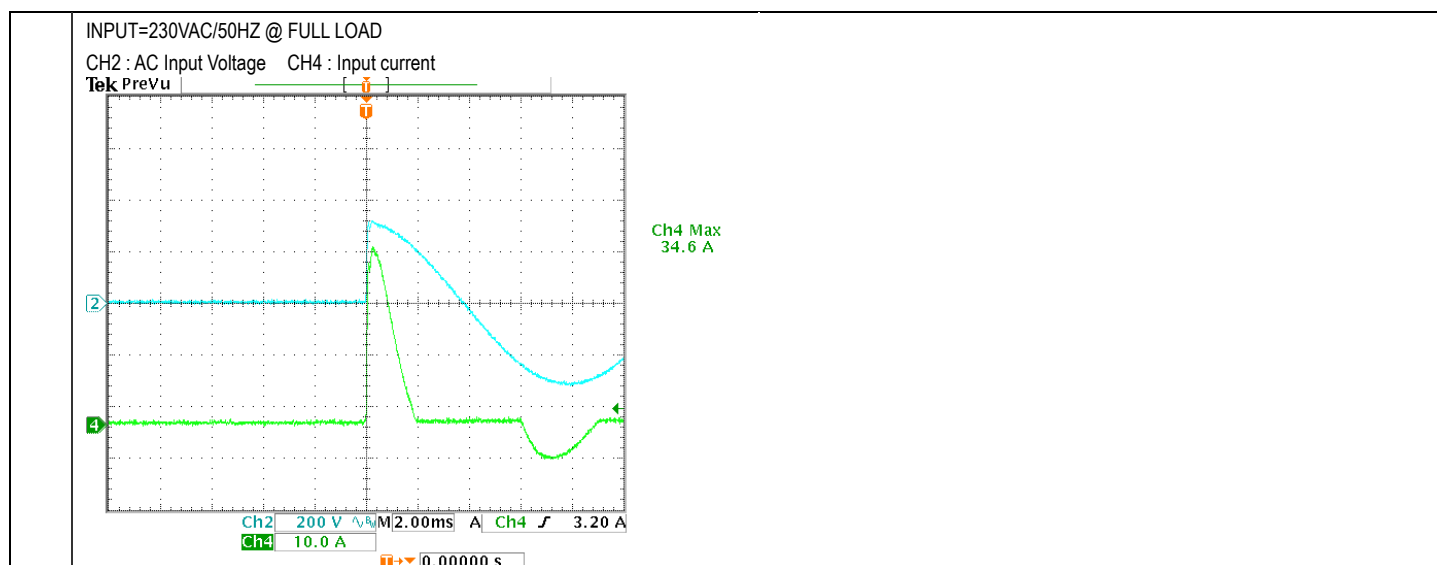
|                                                                                                                                                                                                                           |                  |                               |                                                                |                                 |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|-------------------------------|----------------------------------------------------------------|---------------------------------|
| <div> <div>high frequency (V3) :</div> </div> <div> <div>low frequency (V3) :</div> </div> <div> <div>high frequency (V4) :</div> </div> <div> <div>low frequency (V4) :</div> </div>                                     |                  |                               |                                                                |                                 |
| 7                                                                                                                                                                                                                         | SET UP TIME(Max) | 230VAC/500ms<br>115VAC/1200ms | I/P : 230 VAC<br>I/P : 115 VAC<br>O/P : FULL LOAD<br>Ta : 25°C | 230VAC/ 454 ms<br>115VAC/ 460ms |
| <div> <div>INPUT=230VAC/50HZ @ FULL LOAD</div> <div>CH1 : Output Voltage CH2 : AC Input Voltage</div> </div> <div> <div>INPUT=115VAC/60HZ @ FULL LOAD</div> <div>CH1 : Output Voltage CH2 : AC Input Voltage</div> </div> |                  |                               |                                                                |                                 |
| 8                                                                                                                                                                                                                         | RISE TIME (Max)  | 230VAC/20ms<br>115VAC/30ms    | I/P : 230 VAC<br>I/P : 115 VAC<br>O/P : FULL LOAD<br>Ta : 25°C | 230VAC/5.9 ms<br>115VAC/4.5 ms  |
| <div> <div>INPUT=230VAC/50HZ @ FULL LOAD</div> <div>CH1 : Output Voltage</div> </div> <div> <div>INPUT=115VAC/60HZ @ FULL LOAD</div> <div>CH1 : Output Voltage</div> </div>                                               |                  |                               |                                                                |                                 |

|                                                                                     |                     |                                                                                      |                                                                                                         |                                                                                                                                                                                                                                             |     |     |              |          |               |          |              |          |             |         |
|-------------------------------------------------------------------------------------|---------------------|--------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|-----|--------------|----------|---------------|----------|--------------|----------|-------------|---------|
| 9                                                                                   | HOLD UP TIME (Typ.) | 230VAC/25ms<br>115VAC/30ms                                                           | I/P : 230 VAC<br>I/P : 115 VAC<br>O/P : FULL LOAD<br>Ta : 25°C                                          | 230VAC/ 38ms<br>115VAC/ 35ms                                                                                                                                                                                                                |     |     |              |          |               |          |              |          |             |         |
| INPUT=230VAC/50HZ @ FULL LOAD<br>CH1 : Output Voltage CH2 : AC Input Voltage        |                     | INPUT=115VAC/60HZ @ FULL LOAD<br>CH1 : Output Voltage CH2 : AC Input Voltage         |                                                                                                         |                                                                                                                                                                                                                                             |     |     |              |          |               |          |              |          |             |         |
|    |                     |    |                                                                                                         |                                                                                                                                                                                                                                             |     |     |              |          |               |          |              |          |             |         |
| 10                                                                                  | DYNAMIC LOAD        | V1: 1000 mVp-p<br>V2: 1500 mVp-p<br>V3: 1000 mVp-p<br>V4: 1500 mVp-p                 | I/P: 230VAC<br>O/P:<br>(1)FULL /50% LOAD 50%DUTY / 120HZ<br>(2)FULL /50% LOAD 50%DUTY / 1KHZ<br>Ta:25°C | <table><tr><td>(1)</td><td>(2)</td></tr><tr><td>V1: 478mVp-p</td><td>326mVp-p</td></tr><tr><td>V2: 1190mVp-p</td><td>730mVp-p</td></tr><tr><td>V3: 830mVp-p</td><td>438mVp-p</td></tr><tr><td>V4: 96mVp-p</td><td>90mVp-p</td></tr></table> | (1) | (2) | V1: 478mVp-p | 326mVp-p | V2: 1190mVp-p | 730mVp-p | V3: 830mVp-p | 438mVp-p | V4: 96mVp-p | 90mVp-p |
| (1)                                                                                 | (2)                 |                                                                                      |                                                                                                         |                                                                                                                                                                                                                                             |     |     |              |          |               |          |              |          |             |         |
| V1: 478mVp-p                                                                        | 326mVp-p            |                                                                                      |                                                                                                         |                                                                                                                                                                                                                                             |     |     |              |          |               |          |              |          |             |         |
| V2: 1190mVp-p                                                                       | 730mVp-p            |                                                                                      |                                                                                                         |                                                                                                                                                                                                                                             |     |     |              |          |               |          |              |          |             |         |
| V3: 830mVp-p                                                                        | 438mVp-p            |                                                                                      |                                                                                                         |                                                                                                                                                                                                                                             |     |     |              |          |               |          |              |          |             |         |
| V4: 96mVp-p                                                                         | 90mVp-p             |                                                                                      |                                                                                                         |                                                                                                                                                                                                                                             |     |     |              |          |               |          |              |          |             |         |
| FULL /50% LOAD 50%DUTY / 120HZ ( V1 )                                               |                     | FULL /50% LOAD 50%DUTY / 1KHZ ( V1 )                                                 |                                                                                                         |                                                                                                                                                                                                                                             |     |     |              |          |               |          |              |          |             |         |
|   |                     |   |                                                                                                         |                                                                                                                                                                                                                                             |     |     |              |          |               |          |              |          |             |         |
| FULL /50% LOAD 50%DUTY / 120HZ ( V2 )                                               |                     | FULL /50% LOAD 50%DUTY / 1KHZ ( V2 )                                                 |                                                                                                         |                                                                                                                                                                                                                                             |     |     |              |          |               |          |              |          |             |         |
|  |                     |  |                                                                                                         |                                                                                                                                                                                                                                             |     |     |              |          |               |          |              |          |             |         |
| FULL /50% LOAD 50%DUTY / 120HZ ( V3 )                                               |                     | FULL /50% LOAD 50%DUTY / 1KHZ ( V3 )                                                 |                                                                                                         |                                                                                                                                                                                                                                             |     |     |              |          |               |          |              |          |             |         |
|  |                     |  |                                                                                                         |                                                                                                                                                                                                                                             |     |     |              |          |               |          |              |          |             |         |



### INPUT FUNCTION TEST

| NO                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | TEST ITEM             | SPECIFICATION            | TEST CONDITION                                                                                                                                                      | RESULT                               |          |                |     |    |     |    |     |    |     |    |     |    |     |    |     |    |     |    |     |    |      |      |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|--------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|----------|----------------|-----|----|-----|----|-----|----|-----|----|-----|----|-----|----|-----|----|-----|----|-----|----|------|------|
| 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | INPUT VOLTAGE RANGE   | 88VAC~264VAC             | I/P:TESTING<br>O/P:FULL LOAD<br>Ta:25℃                                                                                                                              | 80V~264V                             |          |                |     |    |     |    |     |    |     |    |     |    |     |    |     |    |     |    |     |    |      |      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                       |                          | I/P:<br>LOW-LINE-3V=85 V<br>HIGH-LINE+15%=300 V<br>O/P:FULL/MIN LOAD<br>(PLEASE CHECK DERATING CURVE)<br>ON: 30 Sec OFF: 30 Sec 10MIN<br>( POWER ON/OFF NO DAMAGE ) | TEST:OK                              |          |                |     |    |     |    |     |    |     |    |     |    |     |    |     |    |     |    |     |    |      |      |
| 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | INPUT FREQUENCY RANGE | 47HZ ~63 HZ<br>NO DAMAGE | I/P:88 VAC ~264 VAC<br>O/P:FULL~MIN LOAD<br>Ta:25℃                                                                                                                  | TEST: OK                             |          |                |     |    |     |    |     |    |     |    |     |    |     |    |     |    |     |    |     |    |      |      |
| 3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | INPUT CURRENT (Typ.)  | 230V/ 2A<br>115V/ 3A     | I/P : 230 VAC<br>I/P : 115 VAC<br>O/P : FULL LOAD<br>Ta : 25℃                                                                                                       | I =1.06A/ 230VAC<br>I =1.93A/ 115VAC |          |                |     |    |     |    |     |    |     |    |     |    |     |    |     |    |     |    |     |    |      |      |
| 4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | LEAKAGE CURRENT       | <2 mA / 240 VAC          | I/P : 240 VAC<br>O/P : Min LOAD<br>Ta : 25℃                                                                                                                         | 0.6mA                                |          |                |     |    |     |    |     |    |     |    |     |    |     |    |     |    |     |    |     |    |      |      |
| 5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | EFFICIENCY(Typ.)      | 78%                      | I/P:230 VAC<br>O/P:FULL LOAD<br>Ta:25℃                                                                                                                              | 79.8%                                |          |                |     |    |     |    |     |    |     |    |     |    |     |    |     |    |     |    |     |    |      |      |
| EFFICIENCY vs LOAD                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                       |                          |                                                                                                                                                                     |                                      |          |                |     |    |     |    |     |    |     |    |     |    |     |    |     |    |     |    |     |    |      |      |
| <div><table><caption>Efficiency vs Load Data (230VAC)</caption><thead><tr><th>Load (%)</th><th>Efficiency (%)</th></tr></thead><tbody><tr><td>10%</td><td>68</td></tr><tr><td>20%</td><td>70</td></tr><tr><td>30%</td><td>71</td></tr><tr><td>40%</td><td>73</td></tr><tr><td>50%</td><td>74</td></tr><tr><td>60%</td><td>75</td></tr><tr><td>70%</td><td>76</td></tr><tr><td>80%</td><td>77</td></tr><tr><td>90%</td><td>78</td></tr><tr><td>100%</td><td>79.8</td></tr></tbody></table></div> |                       |                          |                                                                                                                                                                     |                                      | Load (%) | Efficiency (%) | 10% | 68 | 20% | 70 | 30% | 71 | 40% | 73 | 50% | 74 | 60% | 75 | 70% | 76 | 80% | 77 | 90% | 78 | 100% | 79.8 |
| Load (%)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Efficiency (%)        |                          |                                                                                                                                                                     |                                      |          |                |     |    |     |    |     |    |     |    |     |    |     |    |     |    |     |    |     |    |      |      |
| 10%                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 68                    |                          |                                                                                                                                                                     |                                      |          |                |     |    |     |    |     |    |     |    |     |    |     |    |     |    |     |    |     |    |      |      |
| 20%                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 70                    |                          |                                                                                                                                                                     |                                      |          |                |     |    |     |    |     |    |     |    |     |    |     |    |     |    |     |    |     |    |      |      |
| 30%                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 71                    |                          |                                                                                                                                                                     |                                      |          |                |     |    |     |    |     |    |     |    |     |    |     |    |     |    |     |    |     |    |      |      |
| 40%                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 73                    |                          |                                                                                                                                                                     |                                      |          |                |     |    |     |    |     |    |     |    |     |    |     |    |     |    |     |    |     |    |      |      |
| 50%                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 74                    |                          |                                                                                                                                                                     |                                      |          |                |     |    |     |    |     |    |     |    |     |    |     |    |     |    |     |    |     |    |      |      |
| 60%                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 75                    |                          |                                                                                                                                                                     |                                      |          |                |     |    |     |    |     |    |     |    |     |    |     |    |     |    |     |    |     |    |      |      |
| 70%                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 76                    |                          |                                                                                                                                                                     |                                      |          |                |     |    |     |    |     |    |     |    |     |    |     |    |     |    |     |    |     |    |      |      |
| 80%                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 77                    |                          |                                                                                                                                                                     |                                      |          |                |     |    |     |    |     |    |     |    |     |    |     |    |     |    |     |    |     |    |      |      |
| 90%                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 78                    |                          |                                                                                                                                                                     |                                      |          |                |     |    |     |    |     |    |     |    |     |    |     |    |     |    |     |    |     |    |      |      |
| 100%                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 79.8                  |                          |                                                                                                                                                                     |                                      |          |                |     |    |     |    |     |    |     |    |     |    |     |    |     |    |     |    |     |    |      |      |
| 6                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | INRUSH CURRENT(Typ.)  | 230V / 50A<br>COLD START | I/P : 230 VAC<br>O/P : FULL LOAD<br>Ta : 25℃                                                                                                                        | 34.6A                                |          |                |     |    |     |    |     |    |     |    |     |    |     |    |     |    |     |    |     |    |      |      |



### PROTECTION FUNCTION TEST

| NO | TEST ITEM               | SPECIFICATION                          | TEST CONDITION                                                       | RESULT                                                                                                                                        |
|----|-------------------------|----------------------------------------|----------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|
| 1  | OVER LOAD PROTECTION    | 110%~150%                              | I/P: 264VAC<br>I/P: 230VAC<br>I/P: 88VAC<br>O/P: TESTING<br>Ta:25°C  | 125.9%/ 264VAC<br>137.6%/ 230VAC<br>137.0%/88VAC<br>PROTECTION TYPE :<br>Hiccup mode, recovers automatically after fault condition is removed |
| 2  | OVER VOLTAGE PROTECTION | 5.75V~6.75V                            | I/P: 264VAC<br>I/P: 230VAC<br>I/P: 88VAC<br>O/P: MIN LOAD<br>Ta:25°C | 6.33V/ 264VAC<br>6.33V/ 230VAC<br>6.33V/ 88VAC<br>PROTECTION TYPE :<br>Hiccup mode, recovers automatically after fault condition is removed   |
| 3  | SHORT PROTECTION        | SHORT EVERY OUTPUT<br>1 HOUR NO DAMAGE | I/P: 264VAC<br>I/P: 88VAC<br>O/P: FULL LOAD<br>Ta:25°C               | NO DAMAGE<br>PROTECTION TYPE :<br>Hiccup mode, recovers automatically after fault condition is removed                                        |

### COMPONENT STRESS TEST

| NO | TEST ITEM                                            | SPECIFICATION                         | TEST CONDITION                                                                                                               | RESULT                                                                       |
|----|------------------------------------------------------|---------------------------------------|------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------|
| 1  | PWM Transistor<br>( D to S) or (C to E) Peak Voltage | Q1 Rated : 900 V                      | AC ON/OFF<br>I/P: High-Line +3V =267V<br>VDS:<br>O/P: (1) Full Load<br>(2) Output Short<br>(3) Full Load Continue<br>Ta:25°C | VDS:<br>(1) 758V<br>(2) 823V<br>(3) 694V                                     |
| 2  | O/P Diode                                            | D55 Rated : 200 V<br>D60 Rated : 40 V | AC ON/OFF<br>I/P: High-Line +3V =267 V<br>O/P: (1) Full Load<br>(2) Output Short<br>(3) Full Load Continue<br>Ta:25°C        | D55 D60<br>(1) 73.9V (1) 36.9V<br>(2) 79.5V (2) 35.3V<br>(3) 64.2V (3) 30.5V |

|   |                          |                                                 |                                                                                                                                                              |                                                                                           |
|---|--------------------------|-------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------|
|   |                          | D50 Rated<br>:200 V<br><br>D52 Rated<br>: 200 V |                                                                                                                                                              | D50<br>(1) 35.3V<br>(2) 38.5V<br>(3) 30.5V<br><br>D52<br>(1) 161V<br>(2) 115V<br>(3) 117V |
| 3 | Input Capacitor Voltage  | C5 Rated<br>:330 $\mu$ / 200 V                  | I/P:High-Line +3V =267V<br>O/P: (1)Full Load input on/off<br>(2) Min load input on /Off<br>(3)Full Load /Min load Change<br>(4)Full load continue<br>Ta:25°C | (1) 187V<br>(2) 187V<br>(3) 185V<br>(4) 183V                                              |
| 4 | Control IC Voltage Test  | U1 Rated<br>: 8.4V~ 21 V                        | AC ON/OFF<br>I/P:High-Line +3V =267 V<br>O/P(1)FULL LOAD<br>(2) Output Short<br>(3)O.L.P<br>(4)O.V.P.<br>(5)NO LOAD VRmin(LOW LINE)<br>Ta:25°C               | (1) 18.1V<br>(2) 15.3V<br>(3) 18.1V<br>(4) 12.3V<br>(5) 13.5V                             |
| 5 | Clamp Diode Peak Voltage | D1 Rated<br>: 1000 V                            | AC ON/OFF<br>I/P : High-Line +3V = 267 V<br>O/P : (1) Dynamic Load<br>90%Duty/1KHz<br>(2)Full load continue<br>Ta : 25°C                                     | (1) 694V<br>(2) 598V                                                                      |

### SAFETY TEST

| NO | TEST ITEM            | SPECIFICATION                                                                                | TEST CONDITION                                                                      | RESULT                                                                                   |
|----|----------------------|----------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------|
| 1  | WITHSTAND VOLTAGE    | I/P-O/P: 3KVAC/min<br>I/P-FG:2 KVAC/min<br>O/P-FG: 0.5KVAC/min                               | I/P-O/P: 3.6 KVAC/min<br>I/P- FG: 2.4 KVAC/min<br>O/P - FG: 0.6 KVAC/min<br>Ta:25°C | I/P-O/P:3.82mA<br>I/P-FG:1.62mA<br>O/P-FG:1.33mA<br>NO DAMAGE                            |
| 2  | ISOLATION RESISTANCE | I/P-O/P:500VDC>100M $\Omega$<br>I/P- FG:500VDC>100M $\Omega$<br>O/P- FG:500VDC>100M $\Omega$ | I/P-O/P: 600 VDC<br>I/P- FG: 600 VDC<br>Ta:25°C                                     | I/P-O/P: 9999M $\Omega$<br>I/P-FG: 9999M $\Omega$<br>O/P-FG: 9999M $\Omega$<br>NO DAMAGE |
| 3  | GROUNDING CONTINUITY | FG(PE) TO CHASSIS<br>OR TRACE < 100 m $\Omega$                                               | 40 A / 2min<br>Ta: 25°C/70%RH                                                       | 7m $\Omega$                                                                              |

### E.M.C TEST

| NO | TEST ITEM  | SPECIFICATION          | TEST CONDITION                                           | RESULT                                                                    |
|----|------------|------------------------|----------------------------------------------------------|---------------------------------------------------------------------------|
| 1  | HARMONIC   | EN61000-3-2<br>CLASS A | I/P:230VAC/50HZ<br>O/P:FULL LOAD<br>Ta:25°C              | <input checked="" type="checkbox"/> PASS<br><input type="checkbox"/> FAIL |
| 2  | CONDUCTION | EN55032<br>CLASS B     | I/P : 230 VAC (50HZ)<br>O/P : FULL/50% LOAD<br>Ta : 25°C | PASS<br>Test by certified Lab                                             |
| 3  | RADIATION  | EN55032<br>CLASS B     | I/P : 230 VAC (50HZ)<br>O/P : FULL LOAD<br>Ta : 25°C     | PASS<br>Test by certified Lab                                             |

|   |                                                                                                                                    |                                                       |                                                    |            |
|---|------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------|----------------------------------------------------|------------|
| 4 | E.S.D                                                                                                                              | EN61000-4-2<br>INDUSTRY<br>AIR: 8KV / Contact: 4KV    | I/P : 230 VAC/50HZ<br>O/P : FULL LOAD<br>Ta : 25°C | CRITERIA A |
| 5 | E.F.T                                                                                                                              | EN61000-4-4<br>INDUSTRY<br>INPUT : 2KV                | I/P : 230 VAC/50HZ<br>O/P : FULL LOAD<br>Ta : 25°C | CRITERIA A |
| 6 | SURGE                                                                                                                              | IEC61000-4-5<br>INDUSTRY<br>L-N : 2KV<br>L/N-PE : 4KV | I/P : 230 VAC/50HZ<br>O/P : FULL LOAD<br>Ta : 25°C | CRITERIA A |
| 7 | Test by certified Lab & Test Report Prepare<br>Any contradictions of the test results, please refer to the latest EMC test report. |                                                       |                                                    |            |

## RELIABILITY TEST

### ENVIRONMENT TEST

| NO | TEST ITEM              | SPECIFICATION                                                                 | TEST CONDITION                                | RESULT                   |                         |
|----|------------------------|-------------------------------------------------------------------------------|-----------------------------------------------|--------------------------|-------------------------|
| 1  | TEMPERATURE RISE TEST  | MODEL : RQ-125D                                                               |                                               |                          |                         |
|    |                        | 1. ROOM AMBIENT BURN-IN : 1.5 HRS<br>I/P : 230VAC O/P : FULL LOAD Ta= 30.1 °C |                                               |                          |                         |
|    |                        | 2. HIGH AMBIENT BURN-IN : 1.5 HRS<br>I/P : 230VAC O/P : FULL LOAD Ta=40.9°C   |                                               |                          |                         |
|    |                        | NO                                                                            | Position                                      | ROOM AMBIENT Ta= 30.1 °C | HIGH AMBIENT Ta=40.9 °C |
|    |                        | 1                                                                             | LF1                                           | 57.6°C                   | 70.9°C                  |
|    |                        | 2                                                                             | BD1                                           | 80.0°C                   | 91.3°C                  |
|    |                        | 3                                                                             | C5                                            | 71.3°C                   | 81.0°C                  |
|    |                        | 4                                                                             | D1                                            | 86.8°C                   | 96.4°C                  |
|    |                        | 5                                                                             | D55                                           | 95.7°C                   | 106.2°C                 |
|    |                        | 6                                                                             | Q1                                            | 88.7°C                   | 101.5°C                 |
|    |                        | 7                                                                             | ZD1                                           | 79.0°C                   | 89.5°C                  |
|    |                        | 8                                                                             | U1                                            | 78.6°C                   | 88.7°C                  |
|    |                        | 9                                                                             | D60                                           | 100.3°C                  | 110.7°C                 |
|    |                        | 10                                                                            | T1 core                                       | 82.2°C                   | 91.8°C                  |
|    |                        | 11                                                                            | T1 coil                                       | 87.9°C                   | 97.6°C                  |
|    |                        | 12                                                                            | C10                                           | 70.7°C                   | 81.4°C                  |
|    |                        | 13                                                                            | D52                                           | 97.4°C                   | 106.7°C                 |
|    |                        | 14                                                                            | L60                                           | 88.8°C                   | 100.9°C                 |
|    |                        | 15                                                                            | C62                                           | 80.0°C                   | 91.3°C                  |
|    |                        | 16                                                                            | RTH1                                          | 91.4°C                   | 97.8°C                  |
|    |                        | 17                                                                            | RG1                                           | 91.7°C                   | 101.9°C                 |
|    |                        | 18                                                                            | D50                                           | 91.4°C                   | 101.2°C                 |
|    |                        | 19                                                                            | C51                                           | 77.7°C                   | 88.6°C                  |
|    |                        | 20                                                                            | C54                                           | 61.1°C                   | 72.7°C                  |
|    |                        | 21                                                                            | C56                                           | 79.2°C                   | 90.0°C                  |
|    |                        | 22                                                                            | C53                                           | 85.7°C                   | 96.5°C                  |
|    |                        | 23                                                                            | C63                                           | 70.5°C                   | 82.6°C                  |
| 24 | C7                     | 86.3°C                                                                        | 95.6°C                                        |                          |                         |
| 25 | R3                     | 99.1°C                                                                        | 105.7°C                                       |                          |                         |
| 2  | OVER LOAD BURN-IN TEST | NO DAMAGE<br>1 HOUR ( MIN )                                                   | I/P : 230 VAC<br>O/P : 122% LOAD<br>Ta : 25°C | TEST : OK                |                         |

|    |                                                                   |                                                                                                                                                                                                                                                                                                               |                                                                   |                                                                       |
|----|-------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------|-----------------------------------------------------------------------|
| 3  | LOW TEMPERATURE<br>TURN ON TEST                                   | TURN ON AFTER 2 HOUR                                                                                                                                                                                                                                                                                          | I/P : 264VAC/88VAC<br>O/P : 100 % LOAD<br>Ta= -25°C               | TEST : OK                                                             |
| 4  | HIGH HUMIDITY<br>HIGH TEMPERATURE<br>HIGH VOLTAGE<br>TURN ON TEST | AFTER 12 HOURS<br>IN CHAMBER ON<br>CONTROL40°C /95 %R.H<br>NO DAMAGE                                                                                                                                                                                                                                          | I/P : 272 VAC<br>O/P : FULL LOAD<br>Ta=40 °C<br>HUMIDITY= 95 %R.H | TEST : OK                                                             |
| 5  | TEMPERATURE<br>COEFFICIENT                                        | ± 0.03%/°C (0~50°C)                                                                                                                                                                                                                                                                                           | I/P : 230 VAC<br>O/P : FULL LOAD                                  | ± 0.01%/°C (0~50°C)                                                   |
| 6  | STORAGE TEMPERATURE TEST                                          | 1. Thermal shock Temperature : -45°C~ +90°C<br>2. Temperature change rate : 25°C / MIN<br>3. Dwell time low and high temperature : 30 MIN/EACH<br>4. Total test cycle : 10 CYCLE<br>5. Input/Output condition : STATIC                                                                                        |                                                                   | TEST : OK                                                             |
| 7  | THERMAL SHOCK TEST                                                | 1. Thermal shock Temperature : -30°C~ +45°C<br>2. Temperature change rate : 25°C / MIN<br>3. Dwell time low and high temperature : 30 MIN/EACH<br>4. Total test cycle : 16 CYCLE<br>5. Input/Output condition :<br>15cycle:230V/ FULL LOAD AC ON 3sec/AC OFF 1sec TEST<br>1cycle:230V/ FULL LOAD Burn In Test |                                                                   | TEST : OK                                                             |
| 8  | VIBRATION TEST                                                    | 1 Carton & 1 Set<br>(1) Waveform : Sine Wave<br>(2) Frequency : 10~500Hz<br>(3) Sweep Time : 10min/sweep cycle<br>(4) Acceleration : 5G<br>(5) Test Time : 180min in each axis (X.Y.Z)<br>(6) Ta : 25°C                                                                                                       |                                                                   | TEST : OK                                                             |
| 9  | CAPACITOR<br>LIFE CYCLE                                           | SUPPOSE C62 IS THE MOST CRITICAL COMPONENT<br>(1) I/P : 230VAC O/P : FULL LOAD Ta= 25 °C LIFE TIME<br>(2) I/P : 230VAC O/P : FULL LOAD Ta=40 °C LIFE TIME<br>(3) I/P : 230VAC O/P : 75% LOAD Ta=40 °C LIFE TIME<br>(4) I/P : 230VAC O/P : 50% LOAD Ta= 40 °C LIFE TIME                                        |                                                                   | (1) 118401.4HRS<br>(2) 40397.5HRS<br>(3) 81180 HRS<br>(4) 138029.2HRS |
| 10 | MTBF                                                              | Conducted by Parts Stress Analysis Prediction<br>203.1K hrs min. MIL-HDBK-217F (25°C)                                                                                                                                                                                                                         |                                                                   |                                                                       |
| 11 | Ongoing Reliability Test                                          | I/P : 230VAC O/P : FULL LOAD TA=50°C<br>Demonstration Mean Time Between Failure : 30,000 hours                                                                                                                                                                                                                |                                                                   |                                                                       |

| TEST RESULT | TESTER | REVIEW | APPROVAL |
|-------------|--------|--------|----------|
| PASS        | LIUTT  |        | Wangdz   |

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