



# TEST REPORT: IRM-02-9

## 2W Single Output Encapsulated Type

### ■ DESIGN VERIFY TEST

Output Function Test

Input Function Test

Protection Function Test

Component Stress Test

### ■ SAFETY & E.M.C. TEST

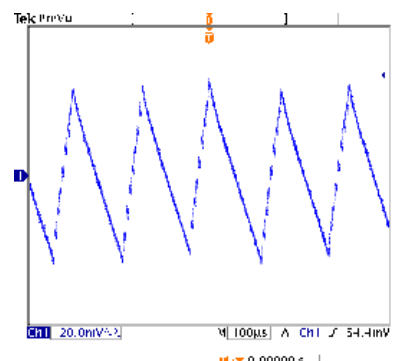
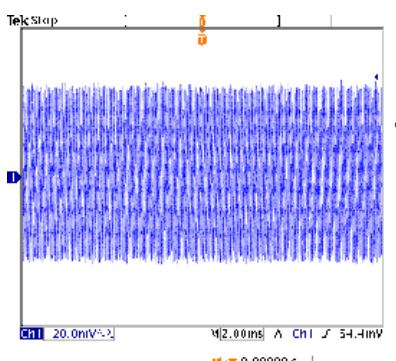
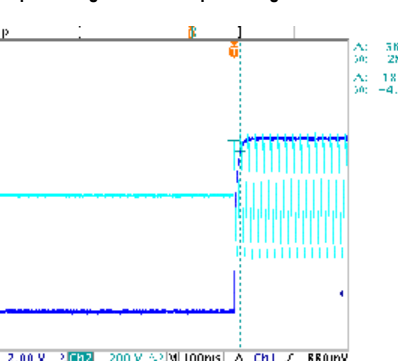
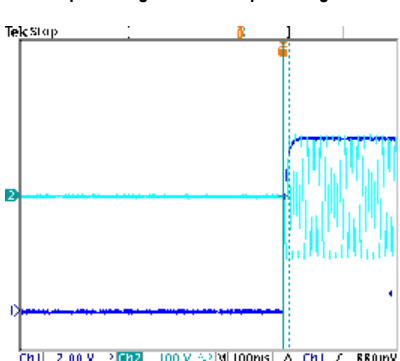
Safety Test

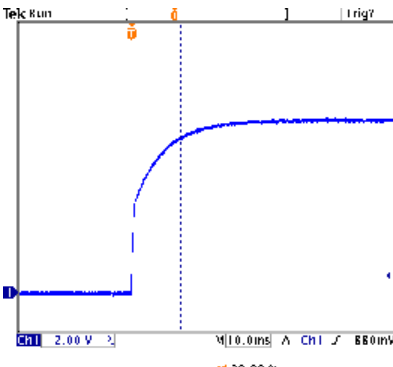
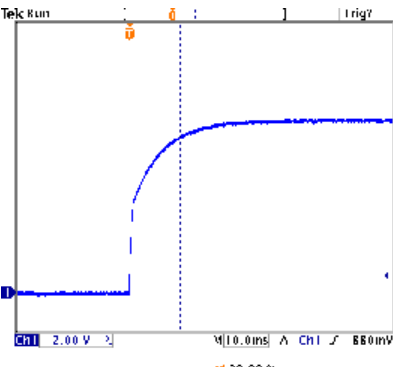
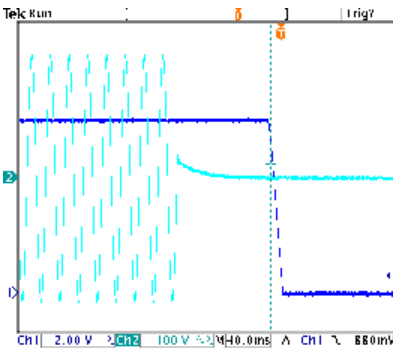
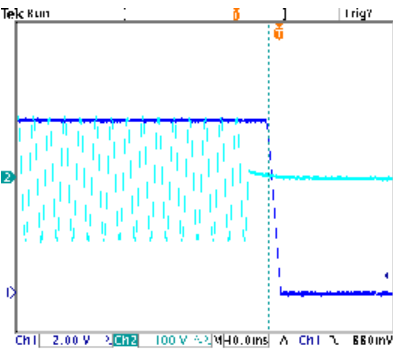
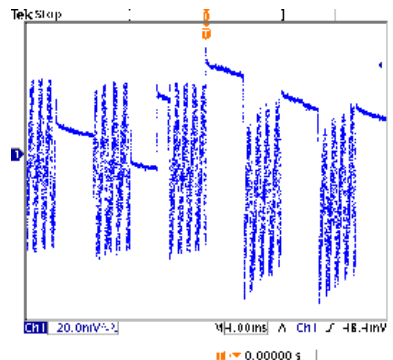
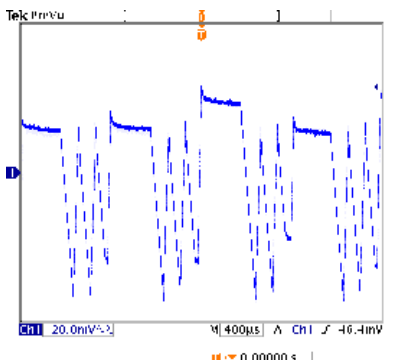
E.M.C. Test

### ■ RELIABILITY TEST

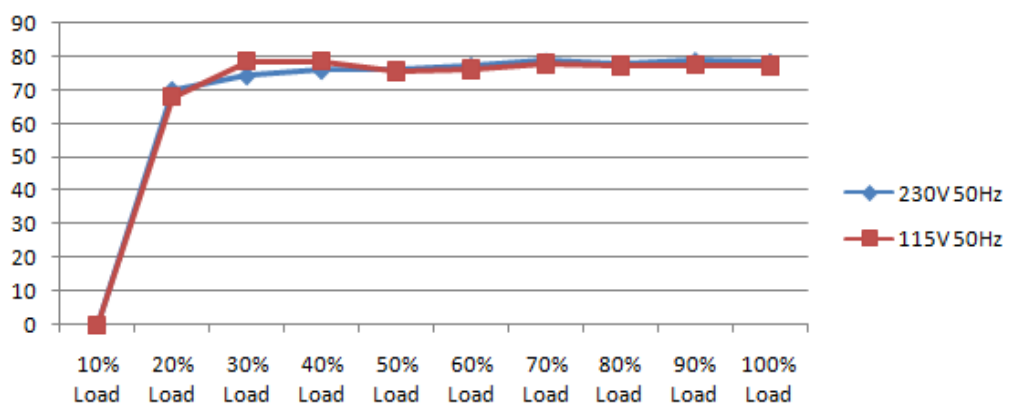
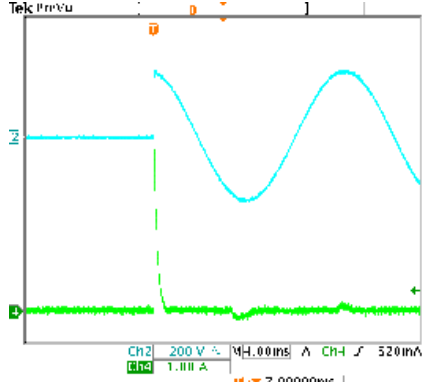
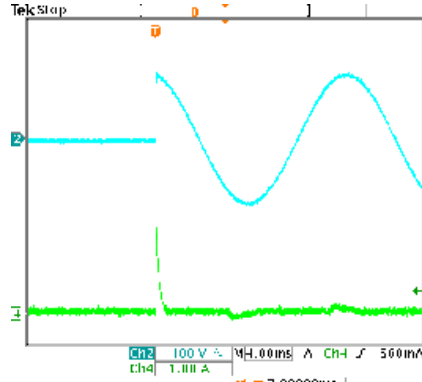
ENVIRONMENT TEST

DESIGN VERIFY TEST  
OUTPUT FUNCTION

| NO | TEST ITEM                      | SPECIFICATION                                                                       | TEST CONDITION                                                                       | RESULT                                                                       |
|----|--------------------------------|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|------------------------------------------------------------------------------|
| 1  | OUTPUT VOLTAGE RANGE           | CH1: 8.910V ~ 9.090V                                                                | I/P : 230VAC<br>O/P: MIN LOAD<br>TA : 25°C                                           | CH1: 9.05V                                                                   |
| 2  | OUTPUT VOLTAGE TOLERANCE (Max) | V1 : 2.5% ~ -2.5%                                                                   | I/P : 100VAC / 305VAC<br>O/P: FULL / MINLOAD<br>TA= 25°C                             | V1: 0.56% ~ 0.44%                                                            |
| 3  | LINE REGULATION (MAX.)         | V1 : 0.5% ~ -0.5%                                                                   | I/P : 100VAC / 305VAC<br>O/P: FULL LOAD<br>TA : 25°C                                 | V1: 0.00% ~ 0.00%                                                            |
| 4  | LOAD REGULATION (MAX.)         | V1 : 0.5% ~ -0.5%                                                                   | I/P : 230VAC<br>O/P: MIN LOAD ~ FULL LOAD<br>TA : 25°C                               | V1: 0.11% ~ 0.00%                                                            |
| 5  | OVER/UNDERSHOOT TEST           | < ±10%                                                                              | I/P : 230VAC<br>O/P: FULL LOAD<br>TA : 25°C                                          | TEST< 2.22 %                                                                 |
| 6  | RIPPLE & NOISE(Max)            | V1 : 150 mVp-p                                                                      | I/P : 230VAC<br>O/P: FULL LOAD<br>TA : 25°C                                          | V1 : 100.00 mVp-p                                                            |
|    |                                | high frequency :                                                                    |                                                                                      | low frequency :                                                              |
|    |                                |   |   |                                                                              |
| 7  | SET UP TIME (MAX.)             | 230VAC : 600ms<br>115VAC : 600ms                                                    | I/P : 230VAC<br>I/P : 115VAC                                                         | 230VAC : 18ms<br>115VAC : 16ms                                               |
|    |                                | 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 |
|    |                                |  |  |                                                                              |
|    | RISE TIME (MAX.)               | 230VAC : 30ms<br>115VAC : 30ms                                                      | I/P : 230VAC<br>I/P : 115VAC<br>O/P: FULL LOAD<br>TA : 25°C                          | 230VAC : 13.0ms<br>115VAC : 13.4ms                                           |

|                                                                                                                           |                                                                                                                                                                         |                                                                                                                           |                                                                                                                                                                          |        |                                                                                                                                                                                                                                                                   |                                                                                                                                                                        |       |        |        |                           |        |                                |           |                               |      |                                                                                                                    |                   |        |   |         |        |   |        |
|---------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|--------|--------|---------------------------|--------|--------------------------------|-----------|-------------------------------|------|--------------------------------------------------------------------------------------------------------------------|-------------------|--------|---|---------|--------|---|--------|
| 8                                                                                                                         | <p>INPUT=230VAC/50HZ @ FULL LOAD<br/>CH1 : Output Voltage</p>                          |                                                                                                                           | <p>INPUT=115VAC/60HZ @ FULL LOAD<br/>CH1 : Output Voltage</p>                          |        |                                                                                                                                                                                                                                                                   |                                                                                                                                                                        |       |        |        |                           |        |                                |           |                               |      |                                                                                                                    |                   |        |   |         |        |   |        |
| <p>HOLD UP TIME (TYP.)</p> <table><tr><td>230VAC</td><td>: 40ms</td></tr><tr><td>115VAC</td><td>: 12ms</td></tr></table>  |                                                                                                                                                                         | 230VAC                                                                                                                    | : 40ms                                                                                                                                                                   | 115VAC | : 12ms                                                                                                                                                                                                                                                            | <table><tr><td>I/P :</td><td>230VAC</td></tr><tr><td>I/P :</td><td>115VAC</td></tr><tr><td>O/P:</td><td>FULL LOAD</td></tr><tr><td>TA :</td><td>25°C</td></tr></table> |       | I/P :  | 230VAC | I/P :                     | 115VAC | O/P:                           | FULL LOAD | TA :                          | 25°C | <table><tr><td>230VAC</td><td>:</td><td>100.0ms</td></tr><tr><td>115VAC</td><td>:</td><td>21.6ms</td></tr></table> |                   | 230VAC | : | 100.0ms | 115VAC | : | 21.6ms |
| 230VAC                                                                                                                    | : 40ms                                                                                                                                                                  |                                                                                                                           |                                                                                                                                                                          |        |                                                                                                                                                                                                                                                                   |                                                                                                                                                                        |       |        |        |                           |        |                                |           |                               |      |                                                                                                                    |                   |        |   |         |        |   |        |
| 115VAC                                                                                                                    | : 12ms                                                                                                                                                                  |                                                                                                                           |                                                                                                                                                                          |        |                                                                                                                                                                                                                                                                   |                                                                                                                                                                        |       |        |        |                           |        |                                |           |                               |      |                                                                                                                    |                   |        |   |         |        |   |        |
| I/P :                                                                                                                     | 230VAC                                                                                                                                                                  |                                                                                                                           |                                                                                                                                                                          |        |                                                                                                                                                                                                                                                                   |                                                                                                                                                                        |       |        |        |                           |        |                                |           |                               |      |                                                                                                                    |                   |        |   |         |        |   |        |
| I/P :                                                                                                                     | 115VAC                                                                                                                                                                  |                                                                                                                           |                                                                                                                                                                          |        |                                                                                                                                                                                                                                                                   |                                                                                                                                                                        |       |        |        |                           |        |                                |           |                               |      |                                                                                                                    |                   |        |   |         |        |   |        |
| O/P:                                                                                                                      | FULL LOAD                                                                                                                                                               |                                                                                                                           |                                                                                                                                                                          |        |                                                                                                                                                                                                                                                                   |                                                                                                                                                                        |       |        |        |                           |        |                                |           |                               |      |                                                                                                                    |                   |        |   |         |        |   |        |
| TA :                                                                                                                      | 25°C                                                                                                                                                                    |                                                                                                                           |                                                                                                                                                                          |        |                                                                                                                                                                                                                                                                   |                                                                                                                                                                        |       |        |        |                           |        |                                |           |                               |      |                                                                                                                    |                   |        |   |         |        |   |        |
| 230VAC                                                                                                                    | :                                                                                                                                                                       | 100.0ms                                                                                                                   |                                                                                                                                                                          |        |                                                                                                                                                                                                                                                                   |                                                                                                                                                                        |       |        |        |                           |        |                                |           |                               |      |                                                                                                                    |                   |        |   |         |        |   |        |
| 115VAC                                                                                                                    | :                                                                                                                                                                       | 21.6ms                                                                                                                    |                                                                                                                                                                          |        |                                                                                                                                                                                                                                                                   |                                                                                                                                                                        |       |        |        |                           |        |                                |           |                               |      |                                                                                                                    |                   |        |   |         |        |   |        |
| 9                                                                                                                         | <p>INPUT=230VAC/50HZ @ FULL LOAD<br/>CH1 : Output Voltage CH2 : AC Input Voltage</p>  |                                                                                                                           | <p>INPUT=115VAC/60HZ @ FULL LOAD<br/>CH1 : Output Voltage CH2 : AC Input Voltage</p>  |        |                                                                                                                                                                                                                                                                   |                                                                                                                                                                        |       |        |        |                           |        |                                |           |                               |      |                                                                                                                    |                   |        |   |         |        |   |        |
| <p>DYNAMIC LOAD</p> <table><tr><td>V1 :</td><td>1800</td><td>mVp-p</td></tr></table>                                      |                                                                                                                                                                         | V1 :                                                                                                                      | 1800                                                                                                                                                                     | mVp-p  | <table><tr><td>I/P :</td><td>230VAC</td></tr><tr><td>O/P:</td><td>(1). 138.0mv (2). 116.0mv</td></tr><tr><td></td><td>(1)Full/Min load 50%duty/120HZ</td></tr><tr><td></td><td>(2)Full/Min load 50%duty/1KHZ</td></tr><tr><td>TA :</td><td>25°C</td></tr></table> |                                                                                                                                                                        | I/P : | 230VAC | O/P:   | (1). 138.0mv (2). 116.0mv |        | (1)Full/Min load 50%duty/120HZ |           | (2)Full/Min load 50%duty/1KHZ | TA : | 25°C                                                                                                               | <p>unit:mVp-p</p> |        |   |         |        |   |        |
| V1 :                                                                                                                      | 1800                                                                                                                                                                    | mVp-p                                                                                                                     |                                                                                                                                                                          |        |                                                                                                                                                                                                                                                                   |                                                                                                                                                                        |       |        |        |                           |        |                                |           |                               |      |                                                                                                                    |                   |        |   |         |        |   |        |
| I/P :                                                                                                                     | 230VAC                                                                                                                                                                  |                                                                                                                           |                                                                                                                                                                          |        |                                                                                                                                                                                                                                                                   |                                                                                                                                                                        |       |        |        |                           |        |                                |           |                               |      |                                                                                                                    |                   |        |   |         |        |   |        |
| O/P:                                                                                                                      | (1). 138.0mv (2). 116.0mv                                                                                                                                               |                                                                                                                           |                                                                                                                                                                          |        |                                                                                                                                                                                                                                                                   |                                                                                                                                                                        |       |        |        |                           |        |                                |           |                               |      |                                                                                                                    |                   |        |   |         |        |   |        |
|                                                                                                                           | (1)Full/Min load 50%duty/120HZ                                                                                                                                          |                                                                                                                           |                                                                                                                                                                          |        |                                                                                                                                                                                                                                                                   |                                                                                                                                                                        |       |        |        |                           |        |                                |           |                               |      |                                                                                                                    |                   |        |   |         |        |   |        |
|                                                                                                                           | (2)Full/Min load 50%duty/1KHZ                                                                                                                                           |                                                                                                                           |                                                                                                                                                                          |        |                                                                                                                                                                                                                                                                   |                                                                                                                                                                        |       |        |        |                           |        |                                |           |                               |      |                                                                                                                    |                   |        |   |         |        |   |        |
| TA :                                                                                                                      | 25°C                                                                                                                                                                    |                                                                                                                           |                                                                                                                                                                          |        |                                                                                                                                                                                                                                                                   |                                                                                                                                                                        |       |        |        |                           |        |                                |           |                               |      |                                                                                                                    |                   |        |   |         |        |   |        |
| <p>FULL /Min LOAD 50%DUTY / 120HZ</p>  |                                                                                                                                                                         | <p>FULL /Min LOAD 50%DUTY / 1KHZ</p>  |                                                                                                                                                                          |        |                                                                                                                                                                                                                                                                   |                                                                                                                                                                        |       |        |        |                           |        |                                |           |                               |      |                                                                                                                    |                   |        |   |         |        |   |        |
| 10                                                                                                                        |                                                                                                                                                                         |                                                                                                                           |                                                                                                                                                                          |        |                                                                                                                                                                                                                                                                   |                                                                                                                                                                        |       |        |        |                           |        |                                |           |                               |      |                                                                                                                    |                   |        |   |         |        |   |        |

## INPUT FUNCTION TEST

| NO                                                                                                                                                                                                                                                                                                                                                                                        | TEST ITEM                 | SPECIFICATION                                                                    | TEST CONDITION                                                                                                                                                                            | RESULT                                                               |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------|
| 1                                                                                                                                                                                                                                                                                                                                                                                         | INPUT VOLTAGE RANGE       | 85VAC ~ 305VAC<br>120VDC ~ 430VDC                                                | I/P : TESTING<br>O/P : FULL LOAD<br>Ta : 25°C<br><br>I/P :<br>LOW-LINE = 97VAC<br>HIGH-LINE = 315VAC<br>O/P : FULL/MIN LOAD<br>ON:30 Sec ; OFF:30 Sec 10MIN<br>( POWER ON/OFF NO DAMAGE ) | 48.0VAC ~ 305VAC<br>71VDC ~ 430VDC<br><br>TEST : OK                  |
| 2                                                                                                                                                                                                                                                                                                                                                                                         | INPUT FREQUENCY RANGE     | 47HZ ~ 63HZ<br>NO DAMAGE                                                         | I/P : 100VAC ~ 305VAC<br>O/P : FULL~MIN LOAD<br>Ta : 25°C                                                                                                                                 | TEST : OK                                                            |
| 3                                                                                                                                                                                                                                                                                                                                                                                         | INPUT CURRENT (TYP.)      | 0.030A / 230VAC<br>0.045A / 115VAC<br>0.025A / 277VAC                            | I/P : 230VAC<br>I/P : 115VAC<br>O/P: FULL LOAD<br>TA : 25°C                                                                                                                               | I= 0.01812A / 230VAC<br>I= 0.03255A / 115VAC<br>I= 0.01720A / 277VAC |
| 4                                                                                                                                                                                                                                                                                                                                                                                         | LEAKAGE CURRENT           | < 0.25mA                                                                         | I/P : 277VAC<br>O/P: MIN LOAD<br>TA : 25°C                                                                                                                                                | L-O/P: 0.0112 mA<br>N-O/P: 0.011 mA                                  |
| 5                                                                                                                                                                                                                                                                                                                                                                                         | NO LOAD POWER CONSUMPTION | < 0.075W                                                                         | I/P : 230VAC<br>O/P: MIN LOAD<br>TA : 25°C                                                                                                                                                | < 0.0332 W                                                           |
| 6                                                                                                                                                                                                                                                                                                                                                                                         | EFFICIENCY (TYP.)         | 72.0%                                                                            | I/P : 230VAC<br>O/P: FULL LOAD<br>TA : 25°C                                                                                                                                               | 79.3 %                                                               |
|                                                                                                                                                                                                                                                                                                       |                           |                                                                                  |                                                                                                                                                                                           |                                                                      |
| 7                                                                                                                                                                                                                                                                                                                                                                                         | INRUSH CURRENT (TYP.)     | 20A / 230VAC<br>10A / 115VAC<br>twidth= 0 us measured at 50% Ipeak<br>COLD START | I/P : 230VAC<br>I/P : 115VAC<br>O/P: FULL LOAD<br>TA : 25°C                                                                                                                               | I= 4.02A / 230VAC<br>I= 2.14A / 115VAC                               |
| <div> <div> INPUT=230VAC/50HZ @ FULL LOAD<br/>CH2 : Input current (1V=1A) CH4 : AC Input Voltage  </div> <div> INPUT=115VAC/50HZ @ FULL LOAD<br/>CH2 : Input current (1V=1A) CH4 : AC Input Voltage  </div> </div> |                           |                                                                                  |                                                                                                                                                                                           |                                                                      |

## PROTECTION FUNCTION TEST

| NO | TEST ITEM               | SPECIFICATION                          | TEST CONDITION                                                        | RESULT                                                                                          |
|----|-------------------------|----------------------------------------|-----------------------------------------------------------------------|-------------------------------------------------------------------------------------------------|
| 1  | OVER LOAD PROTECTION    | > 110%                                 | I/P: 305VAC<br>I/P: 230VAC<br>I/P: 100VAC<br>O/P: TESTING<br>Ta: 25°C | 375% 305VAC<br>316% 230VAC<br>237% 100VAC<br>Hiccup Mode                                        |
| 2  | OVER VOLTAGE PROTECTION | 10.30V ~ 12.20V                        | I/P: 305VAC<br>I/P: 230VAC<br>I/P: 85VAC<br>O/P: MIN LOAD<br>Ta: 25°C | 10.90V 305VAC<br>10.90V 230VAC<br>10.90V 85VAC<br>Shut off o/p voltage, clamping by zener diode |
| 3  | SHORT PROTECTION        | SHORT EVERY OUTPUT<br>1 HOUR NO DAMAGE | I/P: 305VAC<br>I/P: 85VAC<br>O/P: FULL LOAD<br>Ta: 25°C               | NO DAMAGE<br>Hiccup Mode                                                                        |

## COMPONENT STRESS TEST

| NO | TEST ITEM            | SPECIFICATION                         | TEST CONDITION                                                                                                            | RESULT                                                              |
|----|----------------------|---------------------------------------|---------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------|
| 1  | PWM Power Transistor | Q1 Rated : 700V 0.4A                  | I/P : 315VAC<br><br>VDS :<br>O/P : (1)Full Load Turn on<br>(2) Output Short<br>(3)Full load continue<br>Ta : 25°C         | VIN: 315VAC<br>VDS:<br>(1). 628.00V<br>(2). 668.00V<br>(3). 628.00V |
| 2  | Input Capacitor      | C6 Rated : 5uf 450V                   | I/P : 315VAC<br>O/P : (1)Full Load Turn on /Off<br>(2)Min load Turn on /Off<br>(3)Full Load /Min load Change<br>Ta : 25°C | (1). 448.00V<br>(2). 448.00V<br>(3). 448.00V                        |
| 3  | Control IC           | U1 Rated : 9.00V (max)<br>-0.3V (min) | I/P : 315VAC<br>O/P : (1)Full Load<br>(2)Output Short<br>(3)O.L.P<br>(4)Low Line No Load Vo(min)<br>Ta : 25°C             | U1<br>(1). 6.60V<br>(2). 6.36V<br>(3). 6.36V<br>(4). 6.60V          |
| 5  | O/P Diode            | D100 Rated : 60V 3.0A                 | I/P : 315VAC<br>O/P : (1)Full Load Turn on<br>(2) Output Short<br>(3)Full load continue<br>Ta : 25°C                      | (1). 56.40V<br>(2). 47.20V<br>(3). 56.40V                           |
| 6  | Clamp Diode          | D1 Rated : 1000V 1.0A                 | I/P : 315VAC<br>O/P : (1)Full load continue<br>Ta : 25°C                                                                  | (1). 596.00V                                                        |

## SAFETY &amp; E.M.C. TEST

## SAFETY TEST

| NO | TEST ITEM            | SPECIFICATION            | TEST CONDITION                       | RESULT                       |
|----|----------------------|--------------------------|--------------------------------------|------------------------------|
| 1  | WITHSTAND VOLTAGE    | I/P-O/P : 3.000KVAC /min | I/P-O/P: 3.300KVAC /min<br>Ta : 25°C | I/P-O/P: 0.05mA<br>NO DAMAGE |
| 2  | ISOLATION RESISTANCE | I/P-O/P : 500VDC>100MΩ   | I/P-O/P: 500VDC<br>Ta : 25°C/70%RH   | I/P-O/P: 9999MΩ<br>NO DAMAGE |

## 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            | PASS                          |
| 2  | CONDUCTION | EN55022<br>CLASS B                              | I/P : 230VAC /50HZ<br>O/P : FULL LOAD / 50% LOAD<br>Ta : 25°C | PASS<br>Test by certified Lab |
| 3  | RADIATION  | EN55022<br>CLASS B                              | I/P : 230VAC /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 AIR: 8KV / Contact: 4KV | I/P : 230VAC /50HZ<br>O/P : FULL LOAD<br>Ta : 25°C            | CRITERIA A                    |
| 5  | E.F.T      | EN61000-4-4<br>INDUSTRY INPUT: 2KV              | I/P : 230VAC /50HZ<br>O/P : FULL LOAD<br>Ta : 25°C            | CRITERIA A                    |
| 6  | SURGE      | IEC61000-4-5<br>INDUSTRY L-N: 1KV               | I/P : 230VAC /50HZ<br>O/P : FULL LOAD<br>Ta : 25°C            | CRITERIA A                    |

## RELIABILITY TEST

| NO                                                                       | TEST ITEM                                                                                                                                                                                                                                                                         | SPECIFICATION                                                      | TEST CONDITION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | RESULT |          |                     |                         |                         |   |      |        |        |   |    |        |        |   |    |        |        |   |     |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |      |        |         |   |    |        |        |    |      |        |        |
|--------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|----------|---------------------|-------------------------|-------------------------|---|------|--------|--------|---|----|--------|--------|---|----|--------|--------|---|-----|--------|--------|---|----|--------|--------|---|----|--------|--------|---|----|--------|--------|---|------|--------|---------|---|----|--------|--------|----|------|--------|--------|
| 1                                                                        | TEMPERATURE RISE TEST                                                                                                                                                                                                                                                             | MODEL : IRM-02-3.3                                                 | <table><tr><td>NO.</td><td>Position</td><td>ROOM AMBIENT 18.9°C</td><td>HIGH AMBIENT Ta: 73.0°C</td></tr><tr><td>1</td><td>C101</td><td>40.1°C</td><td>92.1°C</td></tr><tr><td>2</td><td>T1</td><td>41.7°C</td><td>95.1°C</td></tr><tr><td>3</td><td>C6</td><td>35.3°C</td><td>88.2°C</td></tr><tr><td>4</td><td>BD1</td><td>37.1°C</td><td>90.4°C</td></tr><tr><td>5</td><td>R2</td><td>34.4°C</td><td>87.6°C</td></tr><tr><td>6</td><td>L1</td><td>35.9°C</td><td>88.9°C</td></tr><tr><td>7</td><td>U1</td><td>40.1°C</td><td>94.0°C</td></tr><tr><td>8</td><td>D100</td><td>46.3°C</td><td>100.1°C</td></tr><tr><td>9</td><td>D1</td><td>39.6°C</td><td>93.3°C</td></tr><tr><td>10</td><td>CASE</td><td>36.9°C</td><td>89.7°C</td></tr></table> |        | NO.      | Position            | ROOM AMBIENT 18.9°C     | HIGH AMBIENT Ta: 73.0°C | 1 | C101 | 40.1°C | 92.1°C | 2 | T1 | 41.7°C | 95.1°C | 3 | C6 | 35.3°C | 88.2°C | 4 | BD1 | 37.1°C | 90.4°C | 5 | R2 | 34.4°C | 87.6°C | 6 | L1 | 35.9°C | 88.9°C | 7 | U1 | 40.1°C | 94.0°C | 8 | D100 | 46.3°C | 100.1°C | 9 | D1 | 39.6°C | 93.3°C | 10 | CASE | 36.9°C | 89.7°C |
|                                                                          |                                                                                                                                                                                                                                                                                   | NO.                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |        | Position | ROOM AMBIENT 18.9°C | HIGH AMBIENT Ta: 73.0°C |                         |   |      |        |        |   |    |        |        |   |    |        |        |   |     |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |      |        |         |   |    |        |        |    |      |        |        |
|                                                                          |                                                                                                                                                                                                                                                                                   | 1                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |        | C101     | 40.1°C              | 92.1°C                  |                         |   |      |        |        |   |    |        |        |   |    |        |        |   |     |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |      |        |         |   |    |        |        |    |      |        |        |
|                                                                          |                                                                                                                                                                                                                                                                                   | 2                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |        | T1       | 41.7°C              | 95.1°C                  |                         |   |      |        |        |   |    |        |        |   |    |        |        |   |     |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |      |        |         |   |    |        |        |    |      |        |        |
|                                                                          |                                                                                                                                                                                                                                                                                   | 3                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |        | C6       | 35.3°C              | 88.2°C                  |                         |   |      |        |        |   |    |        |        |   |    |        |        |   |     |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |      |        |         |   |    |        |        |    |      |        |        |
|                                                                          |                                                                                                                                                                                                                                                                                   | 4                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |        | BD1      | 37.1°C              | 90.4°C                  |                         |   |      |        |        |   |    |        |        |   |    |        |        |   |     |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |      |        |         |   |    |        |        |    |      |        |        |
|                                                                          |                                                                                                                                                                                                                                                                                   | 5                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |        | R2       | 34.4°C              | 87.6°C                  |                         |   |      |        |        |   |    |        |        |   |    |        |        |   |     |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |      |        |         |   |    |        |        |    |      |        |        |
|                                                                          |                                                                                                                                                                                                                                                                                   | 6                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |        | L1       | 35.9°C              | 88.9°C                  |                         |   |      |        |        |   |    |        |        |   |    |        |        |   |     |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |      |        |         |   |    |        |        |    |      |        |        |
|                                                                          |                                                                                                                                                                                                                                                                                   | 7                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |        | U1       | 40.1°C              | 94.0°C                  |                         |   |      |        |        |   |    |        |        |   |    |        |        |   |     |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |      |        |         |   |    |        |        |    |      |        |        |
|                                                                          |                                                                                                                                                                                                                                                                                   | 8                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |        | D100     | 46.3°C              | 100.1°C                 |                         |   |      |        |        |   |    |        |        |   |    |        |        |   |     |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |      |        |         |   |    |        |        |    |      |        |        |
|                                                                          |                                                                                                                                                                                                                                                                                   | 9                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |        | D1       | 39.6°C              | 93.3°C                  |                         |   |      |        |        |   |    |        |        |   |    |        |        |   |     |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |      |        |         |   |    |        |        |    |      |        |        |
|                                                                          |                                                                                                                                                                                                                                                                                   | 10                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |        | CASE     | 36.9°C              | 89.7°C                  |                         |   |      |        |        |   |    |        |        |   |    |        |        |   |     |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |      |        |         |   |    |        |        |    |      |        |        |
| 1. ROOM AMBIENT BURN-IN : 1.0hrs<br>IP: 230VAC O/P: 100% LOAD TA= 18.9°C |                                                                                                                                                                                                                                                                                   |                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |        |          |                     |                         |                         |   |      |        |        |   |    |        |        |   |    |        |        |   |     |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |      |        |         |   |    |        |        |    |      |        |        |
| 2. HIGH AMBIENT BURN-IN : 1.0hrs<br>IP: 230VAC O/P: 100% LOAD TA= 73.0°C |                                                                                                                                                                                                                                                                                   |                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |        |          |                     |                         |                         |   |      |        |        |   |    |        |        |   |    |        |        |   |     |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |      |        |         |   |    |        |        |    |      |        |        |
| OVER LOAD BURN-IN TEST                                                   | NO DAMAGE<br>1 HOUR ( MIN )                                                                                                                                                                                                                                                       | I/P : 230VAC<br>O/P : 275.00% LOAD<br>Ta : 25°C                    | TEST : OK                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |        |          |                     |                         |                         |   |      |        |        |   |    |        |        |   |    |        |        |   |     |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |      |        |         |   |    |        |        |    |      |        |        |
| LOW TEMPERATURE TURN ON TEST                                             | NO DAMAGE<br>1 HOUR ( MIN )                                                                                                                                                                                                                                                       | I/P : 305VAC / 100VAC<br>O/P : FULL LOAD<br>Ta : -30.0°C           | TEST : OK                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |        |          |                     |                         |                         |   |      |        |        |   |    |        |        |   |    |        |        |   |     |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |      |        |         |   |    |        |        |    |      |        |        |
| HIGH HUMIDITY<br>HIGH TEMPERATURE<br>HIGH VOLTAGE TEST                   | AFTER 12 HOURS<br>IN CHAMBER ON<br>CONTROL 75°C<br>NO DAMAGE                                                                                                                                                                                                                      | I/P : 315VAC<br>O/P : FULL LOAD<br>Ta : 75°C<br>HUMIDITY= 95.0% RH | TEST : OK                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |        |          |                     |                         |                         |   |      |        |        |   |    |        |        |   |    |        |        |   |     |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |      |        |         |   |    |        |        |    |      |        |        |
| TEMPERATURE COEFFICIENT                                                  | ±0.03% /(0°C~75°C)                                                                                                                                                                                                                                                                | I/P : 230VAC<br>O/P : FULL LOAD                                    | ±0.0000% /(0°C~75°C)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |        |          |                     |                         |                         |   |      |        |        |   |    |        |        |   |    |        |        |   |     |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |      |        |         |   |    |        |        |    |      |        |        |
| STORAGE TEMPERATURE TEST                                                 | 1. Thermal shock Temperature : -40°C ~ +100°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 : 5 CYCLE<br>5. Input/Output condition : STATIC                                                           | TEST : OK                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |        |          |                     |                         |                         |   |      |        |        |   |    |        |        |   |    |        |        |   |     |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |      |        |         |   |    |        |        |    |      |        |        |
| THERMAL SHOCK TEST                                                       | 1. Thermal shock Temperature : -35°C ~ +80°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 :<br>230VAC Full Load AC ON/OFF test turn on 58sec ; turn off 2sec | TEST : OK                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |        |          |                     |                         |                         |   |      |        |        |   |    |        |        |   |    |        |        |   |     |        |        |   |    |        |        |   |    |        |        |   |    |        |        |   |      |        |         |   |    |        |        |    |      |        |        |



|    |                              |                                                                                                                                                                                                                                                                                |                                                                             |
|----|------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------|
| 8  | VIBRATION TEST               | 1 Carton & 1 Set<br>(1) Waveform : Sine Wave<br>(2) Frequency : 10~500Hz<br>(4) Acceleration : 5G<br>(5) Test Time : 60 min in each axis (X.Y.Z)<br>(6) Ta : 25°C                                                                                                              | TEST : OK                                                                   |
| 9  | CAPACITOR LIFE CYCLE         | :SUPPOSE C101 IS THE MOST CRITICAL COMPONENT<br>(1) I/P : 230VAC O/P : FULL LOAD Ta= 25.0°C LIFE TIME<br>(2) I/P : 230VAC O/P : FULL LOAD Ta= 75.0°C LIFE TIME<br>(3) I/P : 230VAC O/P : 75% LOAD Ta= 75.0°C LIFE TIME<br>(4) I/P : 230VAC O/P : 50% LOAD Ta= 75.0°C LIFE TIME | (1). 158118 HRS<br>(2). 17782.8 HRS<br>(3). 28119.6 HRS<br>(4). 70605.6 HRS |
| 10 | MTBF                         | Conducted by Parts Stress Analysis Prediction<br>1960K hrs min. MIL-HDBK-217F (25°C)                                                                                                                                                                                           |                                                                             |
| 11 | DMTBF /Accelerated Life test | Demonstration Mean Time Between Failure (Expected Life): Above 30000HRS @ TA 75°C                                                                                                                                                                                              |                                                                             |

|             |        |        |          |
|-------------|--------|--------|----------|
| TEST RESULT | TESTER | REVIEW | APPROVAL |
| PASS        | FRANK  | GESG   | WANGDZ   |

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