



Test Report: IRM-30-12

30W Single Output Encapsulated Type

■ 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	VERDICT
1	RIPPLE & NOISE	V1: 150 mVp-p (Max)	I/P: 230VAC O/P: FULL LOAD Ta: 25°C	V1: 36 mVp-p (Max)	P
2	OUTPUT VOLTAGE TOLERANCE	V1: 2.5 % ~ -2.5 % (Max)	I/P: 100VAC / 264VAC O/P: FULL / MIN. LOAD Ta: 25°C	V1: 0 % ~ -0.11 %	P
3	LINE REGULATION	V1: 0.5 % ~ -0.5 % (Max)	I/P: 100VAC ~ 264VAC O/P: FULL LOAD Ta: 25°C	V1: 0 % ~ 0 %	P
4	LOAD REGULATION	V1: 0.5 % ~ -0.5 % (Max)	I/P: 230VAC O/P: FULL ~ MIN LOAD Ta: 25°C	V1: 0 % ~ -0.05 %	P
5	SET UP TIME	230VAC/1000ms (Max) 115VAC/1500ms (Max)	I/P: 230VAC/115VAC O/P: FULL LOAD Ta: 25°C	230VAC/95.381 ms 115VAC/244ms	P
6	RISE TIME	230VAC/30ms (Max) 115VAC/30ms (Max)	I/P: 230VAC/115VAC O/P: FULL LOAD Ta: 25°C	230VAC/13.181ms 115VAC/ 12.956ms	P
7	HOLD UP TIME	230VAC/40ms (Typ) 115VAC/12ms (Typ)	I/P: 230VAC/115VAC O/P: FULL LOAD Ta: 25°C	230VAC/77.62ms 115VAC/16.579ms	P
8	OVER/UNDERSHOOT TEST	< ±5%	I/P: 230VAC O/P: FULL LOAD Ta: 25°C	< 5 %	P
9	DYNAMIC LOAD	V1: 1200 mVp-p	I/P: 230VAC O/P(1) FULL / Min LOAD 90% DUTY/1KHZ (2) (1) FULL / Min LOAD 90% DUTY/3KHZ (3) FULL / Min LOAD 90% DUTY/5KHZ (4) FULL / Min LOAD 50% DUTY/120HZ Ta: 25°C	303mVp-p 224mVp-p 124mVp-p 378mVp-p	P

INPUT FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	INPUT VOLTAGE RANGE	85VAC~264VAC	I/P:TESTING O/P:FULL LOAD Ta:25°C	64.043V~264V	P
			I/P: (1)LOW-LINE-3V=82 V HIGH-LINE+15%=300 V O/P:FULL/MIN LOAD ON: 30 Sec OFF: 30 Sec 10MIN (2)230Vac ON: 0.5 Sec OFF: 0.5 Sec 20MIN (3)230Vac ON:3Sec OFF:3Sec 12HOURS (POWER ON/OFF NO DAMAGE)	TEST:OK	
2	INPUT FREQUENCY RANGE	47HZ ~440 HZ NO DAMAGE OSC	I/P:100 VAC ~264 VAC O/P:FULL~MIN LOAD Ta:25°C	TEST:OK	P
3	EFFICIENCY	88 % (TYP)	I/P:230 VAC O/P:FULL LOAD Ta:25°C	89.74 %	P
4	INPUT CURRENT	230V/ 0.5 A (Typ) 115V/ 0.75A (Typ)	I/P: 230 VAC/115VAC O/P:FULL LOAD Ta:25°C	I =0.260A/ 230VAC I = 0.505A/ 115VAC	P
5	INRUSH CURRENT	230V/ 45 (Typ) 115V/ 25A (Typ) COLD START	I/P:230VAC/115VAC O/P:FULL LOAD Ta:25°C	I =29.789A/ 230VAC I =12.5A/ 115VAC	P
6	NO LOAD CONSUMPTION	<0.1W	I/P: 240 VAC/115VAC O/P:NO LOAD Ta:25°C	0.03W /240V 0.03W /115V	P
7	LEAKAGE CURRENT	<0.25 mA/ 240VAC	I/P : 240 VAC O/P : Min LOAD Ta : 25°C	L-FG:0.011mA N-FG:0.011mA	P

PROTECTION FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	OVER LOAD PROTECTION	105%~160% RATED OUTPUT POWER	I/P: 230VAC I/P: 115VAC O/P: TESTING Ta: 25°C	130.00%/ 230VAC 136.4%/115VAC Hiccup Mode, recovers automatically after fault condition is removed.	P
2	OVER VOLTAGE PROTECTION	CH: 12.6V~16.2V(Typ)	I/P: 230VAC O/P: MIN LOAD Ta: 25°C	15.5V Shut off o/p voltage, clamping by zener diode	P
3	SHORT PROTECTION	SHORT EVERY OUTPUT 1 HOUR NO DAMAGE	I/P: 264VAC O/P: FULL LOAD Ta: 25°C	NO DAMAGE Hiccup Mode	P

COMPONENT STRESS TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	Power Transistor (D to S) or (C to E) Peak Voltage	Q1 Rated 8A/600V	I/P : High-Line +3V = 267 V O/P : (1) Full Load Turn on (2) Output Short (3) Full load continue Ta : 25°C	(1) 500V (2) 576V (3) 492V	P
2	Diode Peak Voltage	D100 Rated 30A/100V	I/P : High-Line +3V = 267 V O/P : (1) Full Load Turn on (2) Output Short (3) Full load continue Ta : 25°C	(1) 79.2V (2) 60.4V (3) 72.4V	P
3	Input Capacitor Voltage	C5 Rated: : 56 μ / 400 V	I/P : High-Line +3V = 267 V O/P : (1) Full Load Turn on / Off (2) Min load Turn on / Off (3) Full Load / Min load Change Ta : 25°C	(1) 362V (2) 362V (3) 360V	P
4	Control IC Voltage Test	PWM IC U1 Rated 24V	I/P : High-Line +3V = 267 V O/P : (1) Full Load Turn on / Off (2) Min load Turn on / Off (3) Full Load / Min load Change Ta : 25°C	(1) 16.2V (2) 15.2V (3) 16.2V	P

■ SAFETY & E.M.C. TEST

SAFETY TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	WITHSTAND VOLTAGE	I/P-O/P : 4 KVAC/min	I/P-O/P : 4.4 KVAC/min Ta : 25°C	I/P-O/P : 2.15 mA NO DAMAGE	P
2	ISOLATION RESISTANCE	I/P-O/P : 500VDC>100MΩ	I/P-O/P : 500 VDC Ta : 25°C /70%RH	I/P-O/P : 9999 MΩ NO DAMAGE	P

E.M.C TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	HARMONIC	EN61000-3-2 CLASS A	I/P : 230 VAC/50HZ O/P : FULL LOAD Ta : 25°C	PASS	P
2	E.S.D	EN61000-4-2 INDUSTRY AIR : 8KV / Contact : 4KV	I/P : 230 VAC/50HZ O/P : FULL LOAD Ta : 25°C	CRITERIA A	P
3	E.F.T	EN61000-4-4 LIGHT INDUSTRY INPUT : 1KV	I/P : 230 VAC/50HZ O/P : FULL LOAD Ta : 25°C	CRITERIA A	P
4	SURGE	IEC61000-4-5 LIGHT INDUSTRY L-N : 2KV	I/P : 230 VAC/50HZ O/P : FULL LOAD Ta : 25°C	CRITERIA A	P
5	Test by certified Lab & Test Report Prepare				

RELIABILITY TEST

ENVIRONMENT TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT																																																																								
1	TEMPERATURE RISE TEST	MODEL : IRM-30-24 1. ROOM AMBIENT BURN-IN : 1 HRS I/P : 230VAC O/P : FULL LOAD Ta= 29.2℃ 2. HIGH AMBIENT BURN-IN : 1 HRS I/P : 230VAC O/P : FULL LOAD Ta=51.5℃ <table><thead><tr><th>NO</th><th>Position</th><th>ROOM AMBIENT Ta= 29.2℃</th><th>HIGH AMBIENT Ta= 51.5℃</th></tr></thead><tbody><tr><td>1</td><td>D100</td><td>67.3℃</td><td>85.2℃</td></tr><tr><td>2</td><td>T1</td><td>66.1℃</td><td>83.8℃</td></tr><tr><td>3</td><td>C106</td><td>53.7℃</td><td>72.0℃</td></tr><tr><td>4</td><td>C105</td><td>61.8℃</td><td>79.7℃</td></tr><tr><td>5</td><td>C40</td><td>60.0℃</td><td>77.8℃</td></tr><tr><td>6</td><td>Q1</td><td>63.9℃</td><td>82.0℃</td></tr><tr><td>7</td><td>D5</td><td>62.3℃</td><td>80.3℃</td></tr><tr><td>8</td><td>D40</td><td>58.4℃</td><td>76.3℃</td></tr><tr><td>9</td><td>C5</td><td>59.8℃</td><td>77.5℃</td></tr><tr><td>10</td><td>BD1</td><td>58.6℃</td><td>76.6℃</td></tr><tr><td>11</td><td>LF2</td><td>53.9℃</td><td>72.0℃</td></tr><tr><td>12</td><td>LF1</td><td>52.7℃</td><td>69.9℃</td></tr><tr><td>13</td><td>L100</td><td>54.8℃</td><td>73.2℃</td></tr><tr><td>14</td><td>D6</td><td>61.4℃</td><td>79.4℃</td></tr><tr><td>15</td><td>D42</td><td>54.6℃</td><td>72.8℃</td></tr><tr><td>16</td><td>D43</td><td>54.8℃</td><td>72.9℃</td></tr><tr><td>17</td><td>CASE</td><td>50.6℃</td><td>69.1℃</td></tr></tbody></table>			NO	Position	ROOM AMBIENT Ta= 29.2℃	HIGH AMBIENT Ta= 51.5℃	1	D100	67.3℃	85.2℃	2	T1	66.1℃	83.8℃	3	C106	53.7℃	72.0℃	4	C105	61.8℃	79.7℃	5	C40	60.0℃	77.8℃	6	Q1	63.9℃	82.0℃	7	D5	62.3℃	80.3℃	8	D40	58.4℃	76.3℃	9	C5	59.8℃	77.5℃	10	BD1	58.6℃	76.6℃	11	LF2	53.9℃	72.0℃	12	LF1	52.7℃	69.9℃	13	L100	54.8℃	73.2℃	14	D6	61.4℃	79.4℃	15	D42	54.6℃	72.8℃	16	D43	54.8℃	72.9℃	17	CASE	50.6℃	69.1℃	P
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2	OVER LOAD BURN-IN TEST	NO DAMAGE 1 HOUR (MIN)	I/P : 230 VAC O/P : 114% LOAD Ta : 25℃	TEST : OK	P																																																																								
3	LOW TEMPERATURE TURN ON TEST	TURN ON AFTER 2 HOUR	I/P : 264VAC/100VAC O/P : 100 % LOAD Ta= -30℃	TEST : OK	P																																																																								
4	HIGH HUMIDITY HIGH TEMPERATURE HIGH VOLTAGE TURN ON TEST	AFTER 12 HOURS IN CHAMBER ON CONTROL50℃ NO DAMAGE	I/P : 272 VAC O/P : FULL LOAD Ta=50℃ HUMIDITY= 95 %R.H	TEST : OK	P																																																																								
5	TEMPERATURE COEFFICIENT	±0.03%/℃ (0~50℃)	I/P : 230 VAC O/P : FULL LOAD	0%/℃ (0~50℃)	P																																																																								
6	STORAGE TEMPERATURE TEST	1. Thermal shock Temperature : -45℃~ +90℃ 2. Temperature change rate : 25℃ / MIN 3. Dwell time low and high temperature : 30 MIN/EACH 4. Total test cycle : 5 CYCLE 5. Input/Output condition : STATIC		OK	P																																																																								

7	THERMAL SHOCK TEST	1. Thermal shock Temperature : -30°C ~ +70°C 2. Temperature change rate : 25°C / MIN 3. Dwell time low and high temperature : 30 MIN/EACH 4. Total test cycle : 10 CYCLE 5. Input/Output condition : 230VAC/Full Load AC ON/OFF TEST turn on 58sec ; turn off 2sec	OK	P
8	VIBRATION TEST	1 Carton & 1 Set (1) Waveform : Sine Wave (2) Frequency : 10~500Hz (3) Sweep Time : 12min/sweep cycle (4) Acceleration : 5G (5) Test Time : 60min in each axis (X.Y.Z) (6) Ta : 25°C	TEST : OK	P
9	CAPACITOR LIFE CYCLE	SUPPOSE C105 IS THE MOST CRITICAL COMPONENT (1) I/P : 230VAC O/P : FULL LOAD Ta=25°C LIFE TIME (2) I/P : 230VAC O/P : FULL LOAD Ta=50°C LIFE TIME (3) I/P : 230VAC O/P : 75% LOAD Ta=50°C LIFE TIME (4) I/P : 230VAC O/P : 50% LOAD Ta=50°C LIFE TIME	(1) 152437HRS (2) 36569HRS (3) 54096HRS (4) 91433HRS	P
10	MTBF	MIL-HDBK-217F NOTICE S2 PARTS COUNT TOTAL FAILURE RATE : 593.3K HRS		P
11	DMTBF/Accelerated Life Test	Demonstration Mean Time Between Failure (Expected Life): Above 30,000 hours @ TA 50°C		P

2007/3/20 A50-S014

SAMPLE	TEST RESULT	TESTER	APPROVAL
PRODUCT SAMPLE	PASS	FRANK	WANGDZ