



Test Report: IRM-30-5

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: 120 mVp-p (Max)	I/P: 230VAC O/P: FULL LOAD Ta: 25°C	V1: 46.8 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: 0.119% ~ 0.119%	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: 1% ~ -1 % (Max)	I/P: 230VAC O/P: FULL ~ MIN LOAD Ta: 25°C	V1: 0.119% ~ 0.119%	P
5	SET UP TIME	230VAC/1000ms (Max) 115VAC/1500ms (Max)	I/P: 230VAC/115VAC O/P: FULL LOAD Ta: 25°C	230VAC/ 247.556 ms 115VAC/ 273.894 ms	P
6	RISE TIME	230VAC/30ms (Max) 115VAC/30ms (Max)	I/P: 230VAC/115VAC O/P: FULL LOAD Ta: 25°C	230VAC/12.003ms 115VAC/12.410ms	P
7	HOLD UP TIME	230VAC/40ms (Typ) 115VAC/12ms (Typ)	I/P: 230VAC/115VAC O/P: FULL LOAD Ta: 25°C	230VAC/71.763ms 115VAC/14.195ms	P
8	OVER/UNDERSHOOT TEST	< ±5%	I/P: 230VAC O/P: FULL LOAD Ta: 25°C	< 5%	P
9	DYNAMIC LOAD	V1: 1000 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	462mVp-p 280mVp-p 182mVp-p 440mVp-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	63.912V~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	83% (TYP)	I/P:230 VAC O/P:FULL LOAD Ta:25°C	85.20%	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 = 0.282A/ 230VAC I = 0.519A/ 115VAC	P
5	INRUSH CURRENT	230V/ 45A (Typ) 115V/ 25A (Typ) COLD START	I/P:230VAC/115VAC O/P:FULL LOAD Ta:25°C	I =39.007A/ 230VAC I =16.429A/ 115VAC	P
6	NO LOAD CONSUMPTION	<0.1W	I/P: 240 VAC/115VAC O/P:NO LOAD Ta:25°C	0.038W /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	126.83/ 230VAC 129.67%/115VAC Hiccup Mode, recovers automatically after fault condition is removed.	P
2	OVER VOLTAGE PROTECTION	CH: 5.25V~6.75V(Typ)	I/P: 230VAC O/P: MIN LOAD Ta: 25°C	6.33V 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) 564V (2) 544V (3) 562 V	P
2	Diode Peak Voltage	D100 Rated 30A/45V	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) 37.6V (2) 34.6V (3) 33.2V	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) 358V (2) 358V (3) 358V	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) 17.3V (2) 14.5V (3) 17.3V	P

■ SAFETY & E.M.C. TEST

SAFETY TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	WITHSTAND VOLTAGE	I/P-O/P : 3 KVAC/min	I/P-O/P : 3.6 KVAC/min Ta : 25°C	I/P-O/P : 1.738 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 : 1KV	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-30-5 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><tr><th>NO</th><th>Position</th><th>ROOM AMBIENT Ta= 29.2℃</th><th>HIGH AMBIENT Ta= 51.5℃</th></tr><tr><td>1</td><td>C5</td><td>74.2℃</td><td>92.2℃</td></tr><tr><td>2</td><td>D40</td><td>73.9℃</td><td>92.2℃</td></tr><tr><td>3</td><td>D100</td><td>82.8℃</td><td>101.5℃</td></tr><tr><td>4</td><td>T1</td><td>82.4℃</td><td>100.9℃</td></tr><tr><td>5</td><td>C106</td><td>68.7℃</td><td>87.4℃</td></tr><tr><td>6</td><td>D5</td><td>79.0℃</td><td>97.5℃</td></tr><tr><td>7</td><td>Q1</td><td>80.1℃</td><td>98.4℃</td></tr><tr><td>8</td><td>C105</td><td>78.6℃</td><td>97.5℃</td></tr><tr><td>9</td><td>C40</td><td>74.1℃</td><td>92.2℃</td></tr><tr><td>10</td><td>BD1</td><td>75.1℃</td><td>93.0℃</td></tr><tr><td>11</td><td>L100</td><td>71.3℃</td><td>90.1℃</td></tr><tr><td>12</td><td>U1</td><td>72.0℃</td><td>90.5℃</td></tr><tr><td>13</td><td>LF2</td><td>68.7℃</td><td>86.8℃</td></tr><tr><td>14</td><td>LF1</td><td>67.0℃</td><td>84.5℃</td></tr><tr><td>15</td><td>CASE</td><td>68.8℃</td><td>87.0℃</td></tr></table>			NO	Position	ROOM AMBIENT Ta= 29.2℃	HIGH AMBIENT Ta= 51.5℃	1	C5	74.2℃	92.2℃	2	D40	73.9℃	92.2℃	3	D100	82.8℃	101.5℃	4	T1	82.4℃	100.9℃	5	C106	68.7℃	87.4℃	6	D5	79.0℃	97.5℃	7	Q1	80.1℃	98.4℃	8	C105	78.6℃	97.5℃	9	C40	74.1℃	92.2℃	10	BD1	75.1℃	93.0℃	11	L100	71.3℃	90.1℃	12	U1	72.0℃	90.5℃	13	LF2	68.7℃	86.8℃	14	LF1	67.0℃	84.5℃	15	CASE	68.8℃	87.0℃	P
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2	OVER LOAD BURN-IN TEST	NO DAMAGE 1 HOUR (MIN)	I/P : 230 VAC O/P : 127% 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℃~ +70℃ 2. Temperature change rate : 25℃ / 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=45°C LIFE TIME (3) I/P : 230VAC O/P : 75% LOAD Ta=45°C LIFE TIME (4) I/P : 230VAC O/P : 50% LOAD Ta=45°C LIFE TIME	(1) 157680HRS (2) 71653HRS (3) 78840HRS (4) 175200HRS	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 50,000 hours @ TA 50°C		P

2007/3/20 A50-S014

SAMPLE	TEST RESULT	TESTER	APPROVAL
PRODUCT SAMPLE	PASS	FRANK	WANGDEZHAO