



Test Report: IRM-30-12

30W AC-DC PCB-Mount Green Power Module

■ 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: 85VAC / 305VAC 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 ~ 305VAC 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/95.381ms 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~305VAC	I/P:TESTING O/P:FULL LOAD Ta:25 ~	64.05VAC~305VAC	P
			I/P: (1)LOW-LINE=3V=82 V HIGH-LINE=305 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:85 VAC ~305 VAC O/P:FULL~MIN LOAD Ta:25 ~	TEST:OK	P
3	EFFICIENCY	88 % (TYP)	I/P:230 VAC O/P:FULL LOAD Ta:25 ~	89.74 %	P
4	INPUT CURRENT	230V/ 0.5 A (Typ) 115V/ 0.75A (Typ) 277V/ 0.375A (Typ)	I/P: 230 VAC/115VAC /277VAC O/P:FULL LOAD Ta:25 ~	I =0.260A/ 230VAC I = 0.505A/ 115VAC I = 0.211A/ 277VAC	P
5	INRUSH CURRENT	230V/ 45 (Typ) 115V/ 25A (Typ) COLD START	I/P:230VAC/115VAC O/P:FULL LOAD Ta:25 ~	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 ~	0.03W /240V 0.03W /115V	P
7	LEAKAGE CURRENT	<0.25 mA/ 277VAC	I/P 277 VAC O/P Min LOAD Ta 25 ~	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 ~	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 ~	15.5V Shut off o/p voltage, clamping by zener diode	P
3	SHORT PROTECTION	SHORT EVERY OUTPUT 1 HOUR NO DAMAGE	I/P: 305VAC O/P: FULL LOAD Ta:25 ~	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 = 305 V O/P (1)Full Load Turn on (2)Output Short (3)Full load continue Ta 25 ~	(1) 500V (2) 576V (3) 492V	P
2	Diode Peak Voltage	D100 Rated 30A/100V	I/P High-Line = 305 V O/P (1)Full Load Turn on (2)Output Short (3)Full load continue Ta 25 ~	(1)79.2V (2)60.4V (3)72.4V	P
3	Input Capacitor Voltage	C5 Rated: : 56 /400 V	I/P High-Line = 305 V O/P (1)Full Load Turn on /Off (2) Min load Turn on /Off (3)Full Load /Min load Change Ta 25 ~	(1)362V (2)362V (3)360V	P
4	Control IC Voltage Test	PWM IC U1 Rated 24V	I/P High-Line = 305 V O/P (1)Full Load Turn on /Off (2) Min load Turn on /Off (3)Full Load /Min load Change Ta 25 ~	(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 ~	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 ~/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	BS EN/EN61000-3-2 CLASS A	I/P 230 VAC/50HZ O/P FULL LOAD Ta 25 ~	PASS	P
2	CONDUCTION	BS EN/EN55032(CISPR32) CNS13438 CLASS B	I/P 230 VAC (50HZ) O/P FULL/50% LOAD Ta 25 ~	PASS Test by certified Lab	P
3	RADIATION	BS EN/EN55032(CISPR32) CNS13438 CLASS B	I/P 230 VAC (50HZ) O/P FULL LOAD Ta 25 ~	PASS Test by certified Lab	P
4	E.S.D	BS EN/EN61000-4-2 AIR 8KV / Contact 4KV	I/P 230 VAC/50HZ O/P FULL LOAD Ta 25 ~	CRITERIA A	P
5	E.F.T	BS EN/EN61000-4-4 INPUT 2KV	I/P 230 VAC/50HZ O/P FULL LOAD Ta 25 ~	CRITERIA A	P
6	SURGE	BS EN/EN61000-4-5 L-N 2KV	I/P 230 VAC/50HZ O/P FULL LOAD Ta 25 ~	CRITERIA A	P
7	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			P			
		1. ROOM AMBIENT BURN-IN 1 HRS						
		I/P 230VAC O/P FULL LOAD Ta= 29.2°C						
		2. HIGH AMBIENT BURN-IN 1 HRS						
		I/P 230VAC O/P FULL LOAD Ta=51.5°C						
		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 305VAC/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 305 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°C~ +90°C 2. Temperature change rate : 25°C / 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 2G (Blank) /5G (ST) (5) Test Time 60min in each axis (X.Y.Z) (6) Ta 25 ~	TEST OK	P
9	CAPACITOR LIFE CYCLE	SUPPOSE C105 IS THE MOST CRITICAL COMPONENT (1) I/P 230VAC O/P FULL LOAD Ta=25 ~ LIFE TIME (2) I/P 230VAC O/P FULL LOAD Ta=50 ~ LIFE TIME (3) I/P 230VAC O/P 75% LOAD Ta=50 ~ LIFE TIME (4) I/P 230VAC O/P 50% LOAD Ta=50 ~ 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 ~		P

2007/3/20 A50-S014

SAMPLE	TEST RESULT	TESTER	APPROVAL
PRODUCT SAMPLE	PASS	FRANK	WANGDZ