



# Test Report: IRM-30-24

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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: 240 mVp-p (Max)	I/P: 230VAC O/P: FULL LOAD Ta: 25°C	V1: 40.3 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 %~0.02 %	P
3	LINE REGULATION	V1: 0.5 %~ -0.5 % (Max)	I/P: 100VAC ~ 264VAC O/P: FULL LOAD Ta: 25°C	V1: 0.02 %~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%	P
5	SET UP TIME	230VAC/1000ms (Max) 115VAC/1500ms (Max)	I/P: 230VAC/115VAC O/P: FULL LOAD Ta: 25°C	230VAC/94.345ms 115VAC/ 270 ms	P
6	RISE TIME	230VAC/30ms (Max) 115VAC/30ms (Max)	I/P: 230VAC/115VAC O/P: FULL LOAD Ta: 25°C	230VAC/11.767ms 115VAC/ 13.99ms	P
7	HOLD UP TIME	230VAC/40ms (Typ) 115VAC/12ms( Typ)	I/P: 230VAC/115VAC O/P: FULL LOAD Ta: 25°C	230VAC/77.803ms 115VAC/16.972ms	P
8	OVER/UNDERSHOOT TEST	< ±5%	I/P: 230VAC O/P: FULL LOAD Ta: 25°C	< 5%	P
9	DYNAMIC LOAD	V1: 2400 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	296mVp-p 115mVp-p 84mVp-p 852mVp-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	64.168V~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	90.91%	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 = 0.28A/ 230VAC I = 0.480A/ 115VAC	P
5	INRUSH CURRENT	230V/ 40A (Typ) 115V/ 20A (Typ) COLD START	I/P:230VAC/115VAC O/P:FULL LOAD Ta:25°C	I =29.664A/ 230VAC I =12.7A/ 115VAC	P
6	NO LOAD CONSUMPTION	<0.1W	I/P: 240 VAC/115VAC O/P:NO LOAD Ta:25°C	0.033W /240V 0.027W /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	126.46%/ 230VAC 126.15%/115VAC Hiccup Mode	<b>NOTE1</b> <b>P</b>
2	OVER VOLTAGE PROTECTION	CH:25.2V~32.4V(Typ)	I/P:230VAC O/P:MIN LOAD Ta:25°C	28.2V Shut off o/p voltage, clamping by zener diode	<b>P</b>
3	SHORT PROTECTION	SHORT EVERY OUTPUT 1 HOUR NO DAMAGE	I/P: 264VAC O/P: FULL LOAD Ta:25°C	NO DAMAGE Hiccup Mode	<b>P</b>

## COMPONENT STRESS TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	Power Transistor (D to S) or (C to E) <b>Peak Voltage</b>	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) 588V (3) 500V	<b>P</b>
2	Diode <b>Peak Voltage</b>	D100 Rated 20A/200V	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)153V (2)129V (3)138V	<b>P</b>
3	<b>Input Capacitor Voltage</b>	C5 Rated: : 56 $\mu$ /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)360V (2)360V (3)360V	<b>P</b>
4	<b>Control IC Voltage Test</b>	PWM IC U1 Rated FA8A70N: 24V 7V(MIN.)	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)16.9V (2) 16.2V (3) 16.8V	<b>P</b>

## ■ 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 : 2.048 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 Ω 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-30-24 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			P

			NO	Position	ROOM AMBIENT Ta= 29.2°C	HIGH AMBIENT Ta= 51.5°C																																																													
			1	D100	67.3°C	85.2°C			2	T1	66.1°C	83.8°C	3	C106	53.7°C	72.0°C	4	C105	61.8°C	79.7°C	5	C40	60.0°C	77.8°C	6	Q1	63.9°C	82.0°C	7	D5	62.3°C	80.3°C	8	D40	58.4°C	76.3°C	9	C5	59.8°C	77.5°C	10	BD1	58.6°C	76.6°C	11	LF2	53.9°C	72.0°C	12	LF1	52.7°C	69.9°C	13	L100	54.8°C	73.2°C	14	D6	61.4°C	79.4°C	15	D42	54.6°C	72.8°C	16	D43	54.8°C
2	OVER LOAD BURN-IN TEST	NO DAMAGE 1 HOUR ( MIN )			I/P : 230 VAC O/P : 114% LOAD Ta : 25°C	TEST : OK		P																																																											
3	LOW TEMPERATURE TURN ON TEST	TURN ON AFTER 2 HOUR			I/P : 264VAC/100VAC O/P : 100 % LOAD Ta= -30°C	TEST : OK		P																																																											
4	HIGH HUMIDITY HIGH TEMPERATURE HIGH VOLTAGE TURN ON TEST	AFTER 12 HOURS IN CHAMBER ON CONTROL50°C NO DAMAGE			I/P : 272 VAC O/P : FULL LOAD Ta=50°C HUMIDITY= 95 %R.H	TEST : OK		P																																																											
5	TEMPERATURE COEFFICIENT	±0.03%/°C (0-50°C)			I/P : 230 VAC O/P : FULL LOAD	0%/°C (0-50°C)		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 : 5G (5) Test Time : 60min in each axis (X.Y.Z) (6) Ta : 25°C				TEST : OK		P																																																											



# 30W Single Output Encapsulated Type

## IRM-30 series

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

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SAMPLE	TEST RESULT	TESTER	APPROVAL
PRODUCT SAMPLE	PASS	FRANK	WANGDZ