



TEST REPORT: IRM-03-5

3W 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

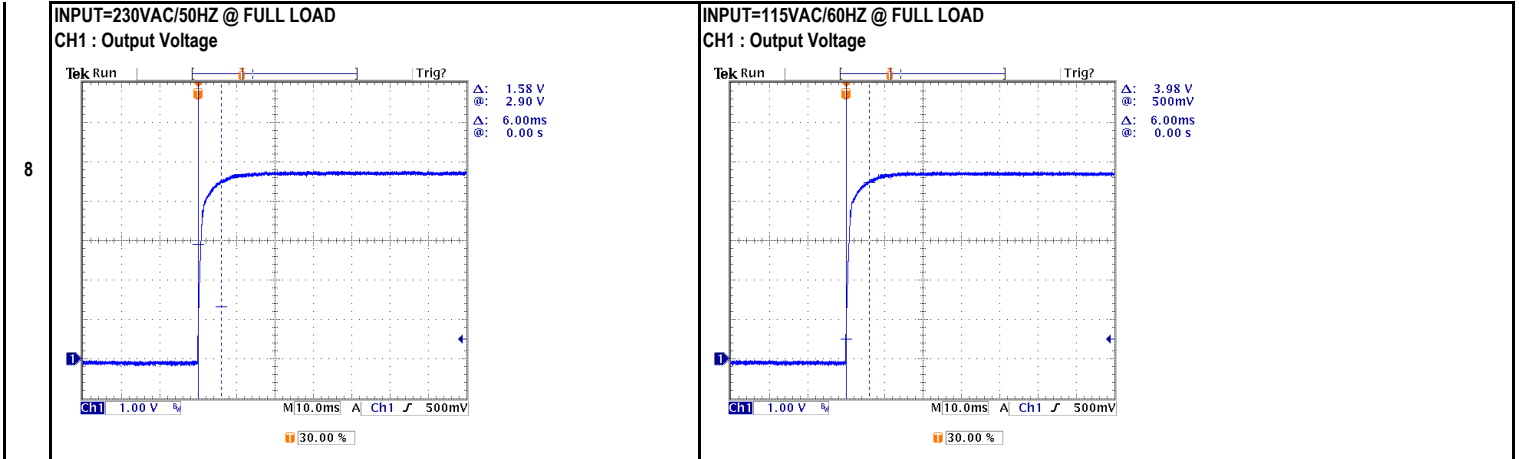
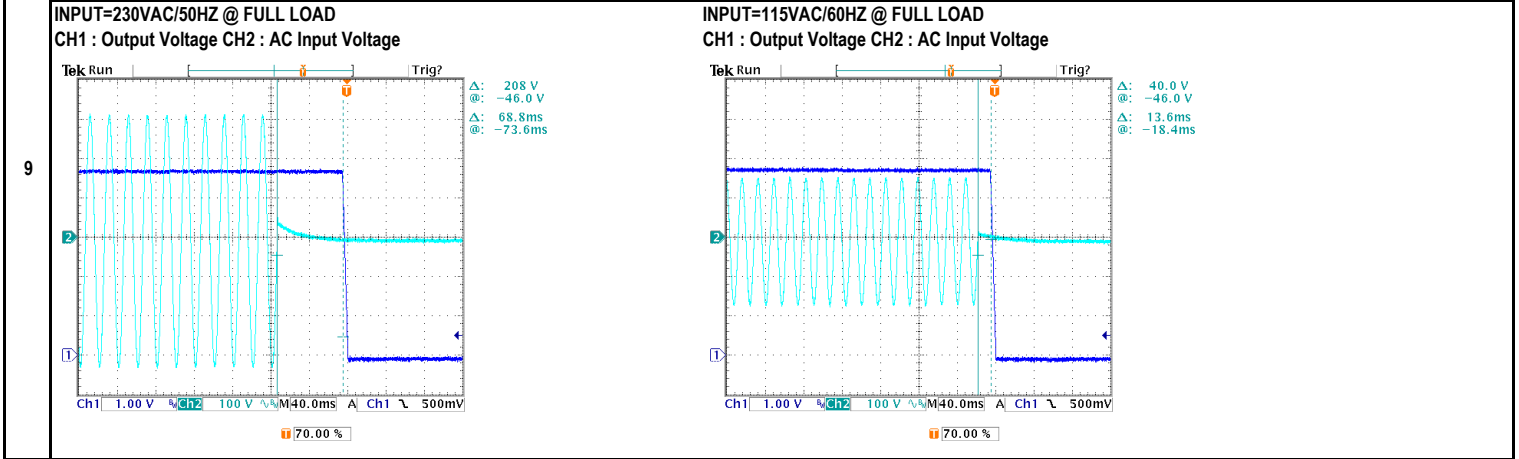
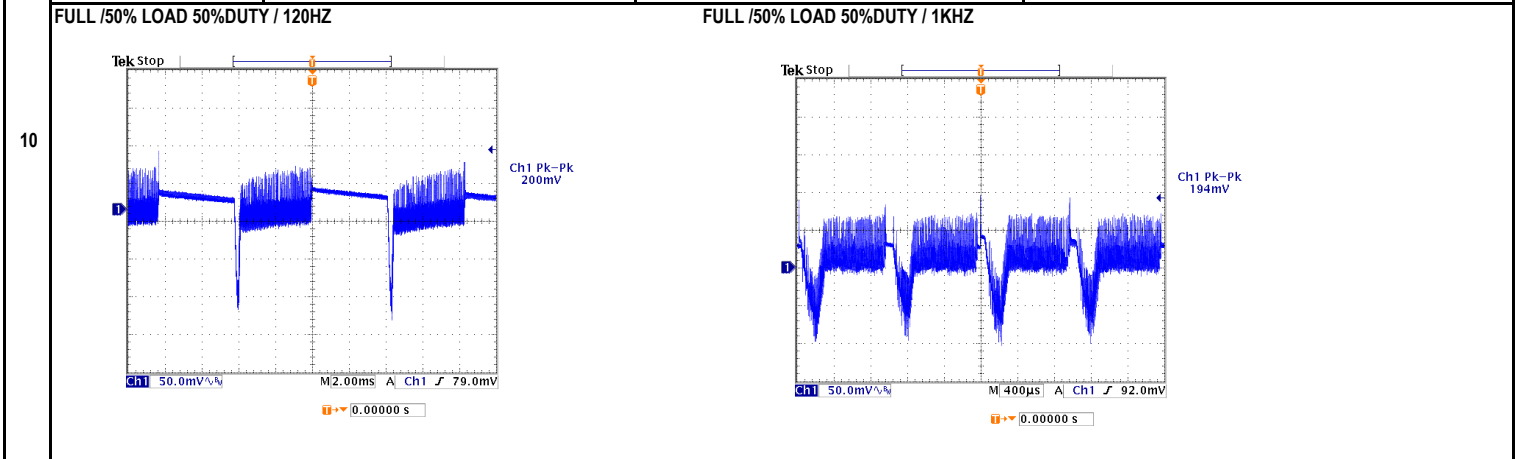
E.M.C. Test

■ RELIABILITY TEST

ENVIRONMENT TEST

■ DESIGN VERIFY TEST
OUTPUT FUNCTION TEST

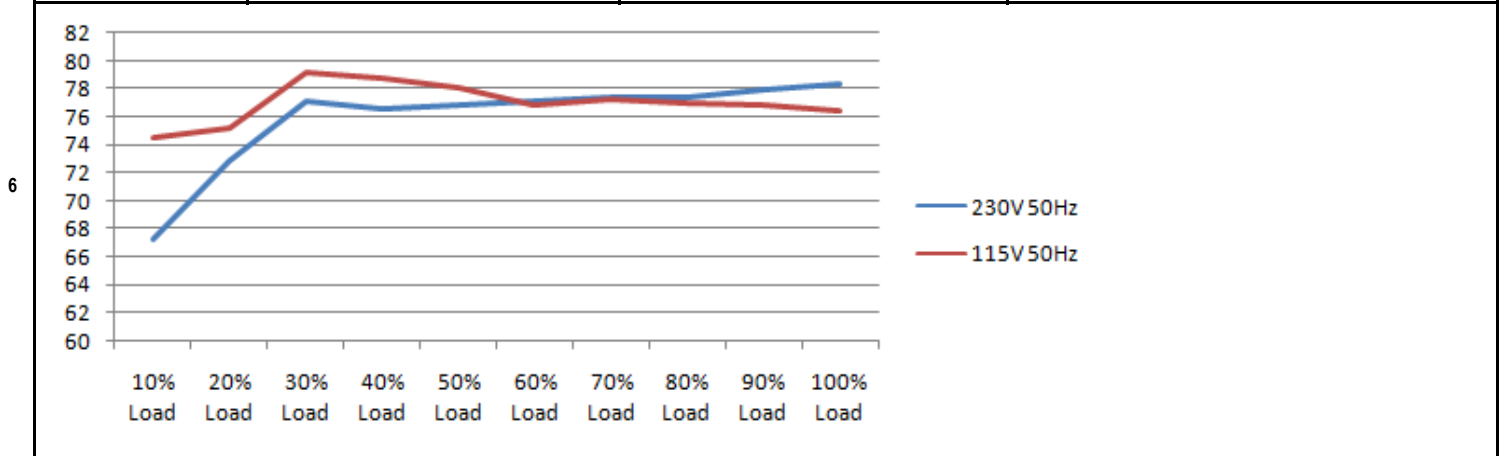
NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	OUTPUT VOLTAGE RANGE	CH1: 4.900V ~ 5.100V	I/P: 230VAC O/P: MIN LOAD TA: 25°C	CH1: 5.01V ~ 5.01V
2	OUTPUT VOLTAGE TOLERANCE (Max)	V1: 2.5% ~ -2.5%	I/P: 100VAC / 305VAC O/P: FULL / MINLOAD TA: 25°C	V1: 0.20% ~ 0.00%
3	LINE REGULATION (MAX.)	V1: 0.5% ~ -0.5%	I/P: 100VAC / 305VAC O/P: FULL LOAD TA: 25°C	V1: 0.20% ~ 0.00%
4	LOAD REGULATION (MAX.)	V1: 0.5% ~ -0.5%	I/P: 230VAC O/P: MIN LOAD ~ FULL LOAD TA: 25°C	V1: 0.00% ~ -0.20%
5	OVER/UNDERSHOOT TEST	< ±10%	I/P: 230VAC O/P: FULL LOAD TA: 25°C	TEST< 2.49 %
	RIPPLE & NOISE(Max)	V1: 100 mVp-p	I/P: 230VAC O/P: FULL LOAD TA: 25°C	V1: 70.4 mVp-p
6	<div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> <p>high frequency :</p> </div> <div style="text-align: center;"> <p>low frequency :</p> </div> </div>			
	SET UP TIME (MAX.)	230VAC : 600ms 115VAC : 600ms	I/P: 230VAC I/P: 115VAC	230VAC : 12ms 115VAC : 10ms
7	<div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> <p>INPUT=230VAC/50HZ @ FULL LOAD CH1 : Output Voltage CH2 : AC Input Voltage</p> </div> <div style="text-align: center;"> <p>INPUT=115VAC/60HZ @ FULL LOAD CH1 : Output Voltage CH2 : AC Input Voltage</p> </div> </div>			
	RISE TIME (MAX.)	230VAC : 30ms 115VAC : 30ms	I/P: 230VAC I/P: 115VAC O/P: FULL LOAD TA: 25°C	230VAC : 6.0ms 115VAC : 6.0ms



INPUT FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	INPUT VOLTAGE RANGE	85VAC ~ 305VAC 120VDC ~ 430VDC	I/P: TESTING O/P: FULL LOAD Ta: 25°C	56.0VAC ~ 305VAC 78.2VDC ~ 430VDC
			I/P: LOW-LINE = 97VAC HIGH-LINE = 315VAC O/P: FULL/MIN LOAD ON:30 Sec ; OFF:30 Sec 10MIN (POWER ON/OFF NO DAMAGE)	TEST: OK
2	INPUT FREQUENCY RANGE	47HZ ~ 63HZ NO DAMAGE	I/P: 100VAC ~ 305VAC O/P: FULL-MIN LOAD Ta: 25°C	TEST: OK
3	INPUT CURRENT (TYP.)	0.04A / 230VAC 0.07A / 115VAC 0.035A / 277VAC	I/P: 230VAC I/P: 115VAC I/P: 277VAC O/P: FULL LOAD TA : 25°C	I= 0.03092A / 230VAC I= 0.04967A / 115VAC I= 0.02062A / 277VAC
4	LEAKAGE CURRENT	< 0.25mA	I/P: 277VAC O/P: MIN LOAD TA : 25°C	L-FG: 0.0694 mA N-FG: 0.0691 mA
5	NO LOAD POWER CONSUMPTION	< 0.075W	I/P: 230VAC O/P: MIN LOAD TA : 25°C	< 0.039 W
	EFFICIENCY (TYP.)	72.0%	I/P: 230VAC O/P: FULL LOAD TA : 25°C	78.2 %



7	INRUSH CURRENT (TYP.)	20A / 230VAC 10A / 115VAC twidth= 0 us measured at 50% Ipeak COLD START	I/P: 230VAC I/P: 115VAC O/P: FULL LOAD TA : 25°C	I= 5.06A / 230VAC I= 2.50A / 115VAC
	INPUT=230VAC/50HZ @ FULL LOAD CH2 : Input current (1V=1A) CH4 : AC Input Voltage	INPUT=115VAC/50HZ @ FULL LOAD CH2 : Input current (1V=1A) CH4 : AC Input Voltage		

PROTECTION FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	OVER LOAD PROTECTION	105% ~ 260%	I/P: 305VAC I/P: 230VAC I/P: 100VAC O/P: TESTING TA: 25°C	221% 305VAC 210% 230VAC 200% 100VAC Hiccup mode, recovers automatically after fault condition is removed
2	OVER VOLTAGE PROTECTION	5.20V ~ 6.80V	I/P: 305VAC I/P: 230VAC I/P: 85VAC O/P: MIN LOAD TA: 25°C	6.40V 305VAC 6.40V 230VAC 6.40V 85VAC Shut off o/p voltage, clamping by zener diode
3	SHORT PROTECTION	SHORT EVERY OUTPUT 1 HOUR NO DAMAGE	I/P: 305VAC I/P: 85VAC O/P: FULL LOAD Ta: 25°C	NO DAMAGE Hiccup Mode

COMPONENT STRESS TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	PWM Power Transistor	Q1 Rated: 725V 0.4A	I/P: 315VAC VDS : O/P: (1)Full Load Turn on (2) Output Short (3)Full load continue Ta: 25°C	VIN: 315VAC VDS: (1). 654.00V (2). 578.00V (3). 648.00V
2	Input Capacitor	C5 Rated: 2uf 450V	I/P: 315VAC O/P: (1)Full Load Turn on /Off (2)Min load Turn on /Off (3)Full Load /Min load Change Ta: 25°C	(1). 434.00V (2). 438.00V (3). 436.00V
3	Control IC	U1 Rated: 6.85V (max) 6.0V (min)	I/P: 315VAC O/P: (1)Full Load (2)Output Short Change (4)Low Line No Load Vo(min) Ta: 25°C	(1). 6.60V (2). 6.12V (3). 6.12V (4). 6.60V
4	O/P Diode	D100 Rated: 45V 5.0A	I/P: 315VAC O/P: (1)Full Load Turn on (2) Output Short (3)Full load continue Ta: 25°C	(1). 26.90V (2). 27.10V (3). 26.90V
5	Clamp Diode	D1 Rated: 1000V 1.0A	I/P: 315VAC O/P: (1)Full load continue Ta: 25°C	(1). 624.00V



■ SAFETY & 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 Ta: 25°C	I/P-O/P: 0.48mA NO DAMAGE
2	ISOLATION RESISTANCE	I/P-O/P: 500VDC>100MΩ	I/P-O/P: 500VDC Ta: 25°C/70%RH	I/P-O/P: 9999MΩ NO DAMAGE

E.M.C. TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	HARMONIC	EN61000-3-2 CLASS A	I/P: 230VAC /50HZ O/P: FULL LOAD Ta: 25°C	PASS
2	CONDUCTION	EN55022 CLASS B	I/P: 230VAC /50HZ O/P: FULL LOAD / 50% LOAD Ta: 25°C	PASS Test by certified Lab
3	RADIATION	EN55022 CLASS B	I/P: 230VAC /50HZ O/P: FULL LOAD Ta: 25°C	PASS Test by certified Lab
4	E.S.D	EN61000-4-2 INDUSTRY AIR: 8KV / Contact: 4KV	I/P: 230VAC /50HZ O/P: FULL LOAD Ta: 25°C	CRITERIA A
5	E.F.T	EN61000-4-4 INDUSTRY INPUT: 2KV	I/P: 230VAC /50HZ O/P: FULL LOAD Ta: 25°C	CRITERIA A
6	SURGE	IEC61000-4-5 INDUSTRY L-N: 1KV	I/P: 230VAC /50HZ O/P: FULL LOAD Ta: 25°C	CRITERIA A

■ RELIABILITY TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	
1	TEMPERATURE RISE TEST	MODEL: IRM-03-3.3			
		1. ROOM AMBIENT BURN-IN: 1.0hrs			
		IP: 230VAC O/P: 100% LOAD TA= 21.9°C			
		2. HIGH AMBIENT BURN-IN: 1.0hrs			
		IP: 230VAC O/P: 100% LOAD TA= 68.2°C			
			NO. Position Ta ROOM AMBIENT 21.9°C HIGH AMBIENT Ta: 68.2°C		
			1 C6 43.6°C 89.3°C		
			2 R5 41.7°C 87.6°C		
			3 R2 41.5°C 87.4°C		
			4 T1 48.7°C 94.4°C		
			5 C101 47.5°C 92.4°C		
	6 D100 52.8°C 97.1°C				
	7 U1 46.7°C 93.1°C				
	8 D1 45.7°C 91.5°C				
	9 BD1 43.4°C 89.1°C				
	10 CASE 43.4°C 88.4°C				
2	OVER LOAD BURN-IN TEST	NO DAMAGE 1 HOUR (MIN)	I/P: 230VAC O/P: 134% LOAD Ta: 25°C	TEST: OK	
3	LOW TEMPERATURE TURN ON TEST	NO DAMAGE 1 HOUR (MIN)	I/P: 305VAC / 100VAC O/P: FULL LOAD Ta: -30.0°C	TEST: OK	
4	HIGH HUMIDITY HIGH TEMPERATURE HIGH VOLTAGE TEST	AFTER 12 HOURS IN CHAMBER ON CONTROL 70°C NO DAMAGE	I/P: 315VAC O/P: FULL LOAD Ta: 70°C HUMIDITY= 95.0% RH	TEST: OK	
5	TEMPERATURE COEFFICIENT	±0.03% /(0°C-50°C)	I/P: 230VAC O/P: FULL LOAD	±0.0000% /(0°C-50°C)	



6	STORAGE TEMPERATURE TEST	1. Thermal shock Temperature: -40°C ~ +100°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	TEST: OK
7	THERMAL SHOCK TEST	1. Thermal shock Temperature: -35°C ~ +75°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	TEST: OK
8	VIBRATION TEST	1 Carton & 1 Set (1) Waveform: Sine Wave (2) Frequency: 10~500Hz (4) Acceleration: 5G (5) Test Time: 60 min in each axis (X.Y.Z) (6) Ta: 25°C	TEST: OK
9	CAPACITOR LIFE CYCLE	:SUPPOSE C101 IS THE MOST CRITICAL COMPONENT (1) I/P: 230VAC O/P : FULL LOAD Ta= 25.0°C LIFE TIME (2) I/P: 230VAC O/P : FULL LOAD Ta= 70.0°C LIFE TIME (3) I/P: 230VAC O/P : 75% LOAD Ta= 70.0°C LIFE TIME (4) I/P: 230VAC O/P : 50% LOAD Ta= 70.0°C LIFE TIME	(1). 158118 HRS (2). 17782.8 HRS (3). 35390.4 HRS (4). 62984.4 HRS
10	MTBF	10762.8K hrs min. Telcordia SR-332 (Bellcore) ; 2137.6K hrs min. MIL-HDBK-217F (25°C)	
11	DMTBF /Accelerated Life test	Demonstration Mean Time Between Failure (Expected Life): Above 30000HRS @ TA 70°C O/P: FULL LOAD	

TEST RESULT	TESTER	REVIEW	APPROVAL
PASS	FRANK	GESG	WANGDZ