



TEST REPORT: RPS-30-12

30W Single Output Medical Type

■ DESIGN VERIFY TEST

Output Function Test

Input Function Test

Protection Function Test

Component Stress Test

■ SAFETY & E.M.C. TEST

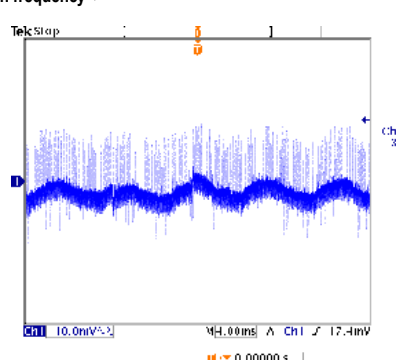
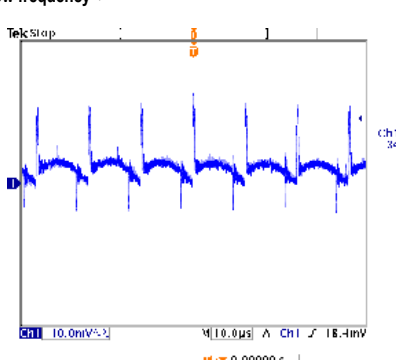
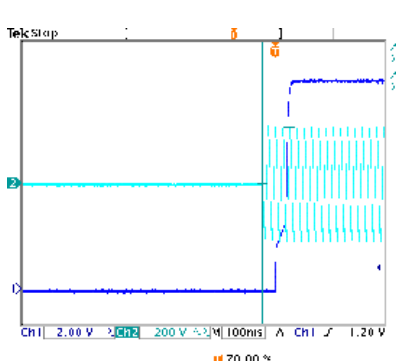
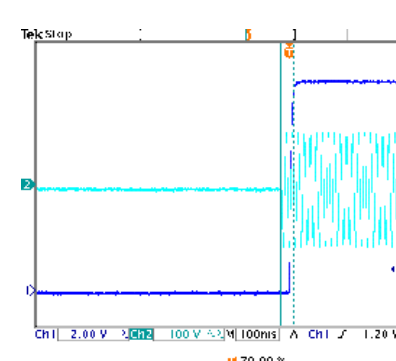
Safety Test

E.M.C. Test

■ RELIABILITY TEST

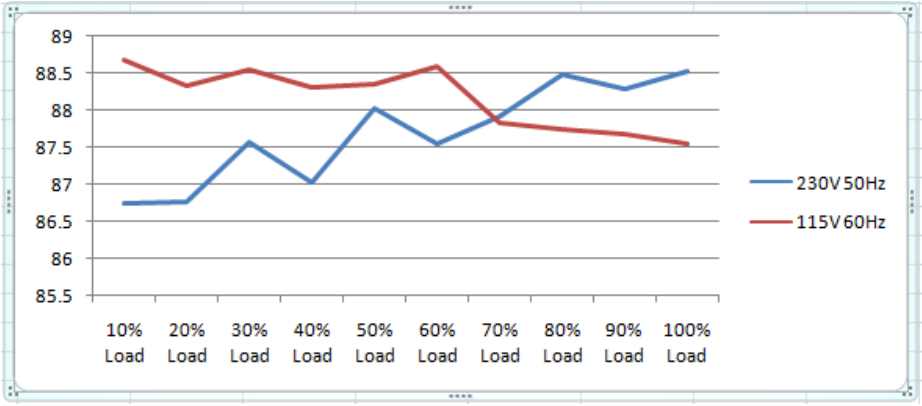
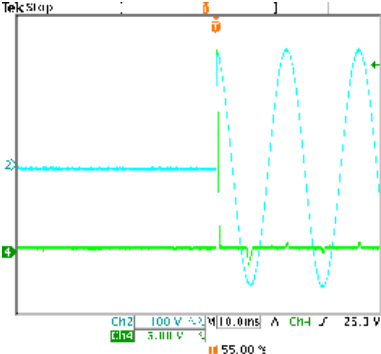
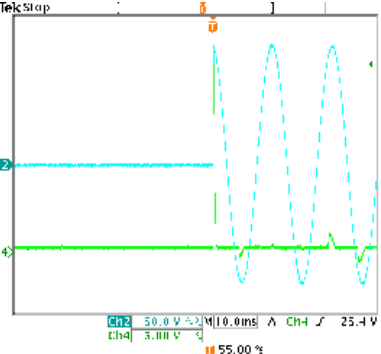
ENVIRONMENT TEST

DESIGN VERIFY TEST
OUTPUT FUNCTION

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	OUTPUT VOLTAGE ADJUST RANGE	CH1: 11.40V ~ 13.20V	I/P : 230VAC O/P: MIN LOAD TA: 25°C	CH1: 11.09V ~ 13.54V
2	OUTPUT VOLTAGE TOLERANCE (Max)	V1 : 2.0% ~ -2.0%	I/P : 115VAC / 264VAC O/P: FULL / MINLOAD TA= 25°C	V1: 0.26% ~ -0.36%
3	LINE REGULATION (MAX.)	V1 : 0.5% ~ -0.5%	I/P : 115VAC / 264VAC O/P: FULL LOAD TA: 25°C	V1: 0.00% ~ -0.10%
4	LOAD REGULATION (MAX.)	V1 : 1.0% ~ -1.0%	I/P : 230VAC O/P: MIN LOAD ~ FULL LOAD TA: 25°C	V1: 0.26% ~ -0.36%
5	OVER/UNDERSHOOT TEST	< ±5%	I/P : 230VAC O/P: FULL LOAD TA: 25°C	TEST< 4.167 %
6	RIPPLE & NOISE(Max)	V1 : 100 mVp-p	I/P : 230VAC O/P: FULL LOAD TA: 25°C	V1 : 36 mVp-p
		high frequency :		low frequency :
				
7	SET UP TIME (MAX.)	230VAC : 200ms 115VAC : 200ms	I/P : 230VAC I/P : 115VAC	230VAC 74ms 115VAC 36ms
	INPUT=230VAC/50HZ @ FULL LOAD CH1 : Output Voltage CH2 : AC Input Voltage	INPUT=115VAC/60HZ @ FULL LOAD CH1 : Output Voltage CH2 : AC Input Voltage		
				

8	RISE TIME (MAX.)	230VAC : 30ms 115VAC : 30ms	I/P : 230VAC I/P : 115VAC O/P: FULL LOAD TA: 25°C	230VAC : 9.2ms 115VAC : 9.0ms
	INPUT=230VAC/50HZ @ FULL LOAD CH1 : Output Voltage	INPUT=115VAC/60HZ @ FULL LOAD CH1 : Output Voltage		
9	HOLD UP TIME (TYP.)	230VAC : 30ms 115VAC : 12ms	I/P : 230VAC I/P : 115VAC O/P: FULL LOAD TA: 25°C	230VAC : 64.0ms 115VAC : 22.4ms
	INPUT=230VAC/50HZ @ FULL LOAD CH1 : Output Voltage CH2 : AC Input Voltage	INPUT=115VAC/60HZ @ FULL LOAD CH1 : Output Voltage CH2 : AC Input Voltage		
10	DYNAMIC LOAD	V1 : 1200 mVp-p	I/P : 230VAC O/P: (1) Full/Min load 50% duty/120HZ (2) Full/Min load 50% duty/1KHZ TA: 25°C	V1: (1). 84.4mv (2). 60.4mv unit:mVp-p
	FULL /50% LOAD 50%DUTY / 120HZ	FULL /50% LOAD 50%DUTY / 1KHZ		

INPUT FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	INPUT VOLTAGE RANGE	80VAC ~ 264VAC	I/P : TESTING O/P : FULL LOAD Ta : 25°C	68.1VAC ~ 264VAC
			I/P : LOW-LINE = 77VAC HIGH-LINE = 300VAC 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 : 115VAC ~ 264VAC O/P : FULL~MIN LOAD Ta : 25°C	TEST : OK
3	INPUT CURRENT (TYP.)	0.5 / 230VAC 1 / 115VAC	I/P : 230VAC I/P : 115VAC O/P : FULL LOAD TA : 25°C	I= 0.281 / 230VAC I= 0.4793 / 115VAC
4	LEAKAGE CURRENT	< 80uA Touch current	I/P : 264VAC O/P : MIN LOAD TA : 25°C	L-FG: 53 uA N-FG: 53 uA
5	NO LOAD POWER CONSUMPTION	< 0.10W	I/P : 230VAC O/P : MIN LOAD TA : 25°C	< 0.0521 W
6	EFFICIENCY (TYP.)	88.0%	I/P : 230VAC O/P : FULL LOAD TA : 25°C	88.57 %
				
7	INRUSH CURRENT (TYP.)	60A / 230VAC 30A / 115VAC twitd= 0 us measured at 50% Ipeak COLD START	I/P : 230VAC I/P : 115VAC O/P : FULL LOAD TA : 25°C	I= 27.30A / 230VAC I= 27.10A / 115VAC
		INPUT=230VAC/50HZ @ FULL LOAD CH2 : Input current (1V=1A) CH4 : AC Input Voltage		
7				
		INPUT=115VAC/50HZ @ FULL LOAD CH2 : Input current (1V=1A) CH4 : AC Input Voltage		
7				

PROTECTION FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	OVER LOAD PROTECTION	115% ~ 150%	I/P: 264VAC I/P: 230VAC I/P: 115VAC O/P: TESTING Ta: 25°C	128.4% 264VAC 133.2% 230VAC 128.8% 115VAC Hiccup Mode
2	OVER VOLTAGE PROTECTION	13.80V ~ 16.20V	I/P: 264VAC I/P: 230VAC I/P: 80VAC O/P: MIN LOAD Ta: 25°C	14.55V 264VAC 14.51V 230VAC 14.70V 80VAC Shut down Re- power ON
3	SHORT PROTECTION	SHORT EVERY OUTPUT 1 HOUR NO DAMAGE	I/P: 264VAC I/P: 80VAC 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 : 600V 7.0A	I/P : 267VAC VDS : O/P : (1)Full Load Turn on (2) Output Short (3)Full load continue Ta : 25°C	VIN: 267VAC VDS: (1). 494.00V (2). 474.00V (3). 492.00V
2	Input Capacitor	C5 Rated : 68uf 400V	I/P : 267VAC O/P : (1)Full Load Turn on /Off (2)Min load Turn on /Off (3)Full Load /Min load Change Ta : 25°C	(1). 348.00V (2). 352.00V (3). 352.00V
3	Control IC	U1 Rated : 28.0V (max) -0.3V (min)	I/P : 267VAC O/P : (1)Full Load (2)Output Short (3)O.L.P (4)O.V.P (5)Low Line No Load Vo(min) Ta : 25°C	U1 (1). 19.60V (2). 11.80V (3). 18.30V (4). 22.60V (5). 18.80V
4	O/P Diode	D101 Rated : 100V 30.0A	I/P : 267VAC O/P : (1)Full Load Turn on (2) Output Short (3)Full load continue Ta : 25°C	(1). 82.80V (2). 70.40V (3). 80.20V
5	Clamp Diode	D5 Rated : 800V 2.0A	I/P : 267VAC O/P : (1)Full load continue Ta : 25°C	(1). 462.00V

SAFETY & E.M.C. TEST
SAFETY TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	WITHSTAND VOLTAGE	I/P-O/P : 4.000KVAC /min	I/P-O/P: 4.400KVAC /min Ta : 25°C	I/P-O/P: 1.20mA 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	EN55011 CLASS B	I/P : 230VAC /50HZ O/P : FULL LOAD / 50% LOAD Ta : 25°C	PASS Test by certified Lab

3	RADIATION	EN55011 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 MEDICAL AIR: 15KV / Contact: 8KV	I/P : 230VAC /50HZ O/P : FULL LOAD Ta : 25°C	CRITERIA A
5	E.F.T	EN61000-4-4 MEDICAL INPUT: 2KV	I/P : 230VAC /50HZ O/P : FULL LOAD Ta : 25°C	CRITERIA A
6	SURGE	IEC61000-4-5 MEDICAL L-N:2KV;L/N-PE: 4KV	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 : RPS-30-12											
		1. ROOM AMBIENT BURN-IN : 1.0hrs											
		IP: 230VAC O/P: 100% LOAD TA= 27.0℃											
		2. HIGH AMBIENT BURN-IN : 1.0hrs											
		IP: 230VAC O/P: 100% LOAD TA= 45.8℃											
			NO. Position ROOM AMBIENT 27.0℃ HIGH AMBIENT Ta: 45.8℃										
		1 LF1	41.2℃	58.3℃									
		2 LF2	38.4℃	56.3℃									
		3 BD1	47.8℃	65.5℃									
		4 Q1	75.1℃	89.8℃									
		5 C5	48.9℃	65.7℃									
		6 C40	42.0℃	58.6℃									
		7 T1 COIL	60.9℃	77.8℃									
		8 D101	78.5℃	95.2℃									
2	OVER LOAD BURN-IN TEST	NO DAMAGE	I/P : 230VAC	TEST : OK									
		1 HOUR (MIN)	O/P : 116% LOAD										
			Ta : 25℃										
		3	LOW TEMPERATURE TURN ON TEST		NO DAMAGE	I/P : 264VAC / 100VAC	TEST : OK						
					1 HOUR (MIN)	O/P : FULL LOAD							
						Ta : -30.0℃							
					4	HIGH HUMIDITY HIGH TEMPERATURE HIGH VOLTAGE TEST		AFTER 12 HOURS	I/P : 272VAC	TEST : OK			
								IN CHAMBER ON	O/P : FULL LOAD				
								CONTROL 50℃	Ta : 50℃				
								NO DAMAGE	HUMIDITY= 95.0% RH				
								5	TEMPERATURE COEFFICIENT		±0.03% /℃(0~50℃)	I/P : 230VAC	±0.0480% /℃(0~50℃)
												O/P : FULL LOAD	
								6	STORAGE TEMPERATURE TEST		1. Thermal shock Temperature : -40℃ ~ +85℃	TEST : OK	
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													
7	THERMAL SHOCK TEST	1. Thermal shock Temperature : -35℃ ~ +55℃	TEST : OK										
		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											
8	VIBRATION TEST	1 Carton & 1 Set (1) Waveform : Sine Wave (2) Frequency : 10~500Hz (4) Acceleration : 2G (5) Test Time : 60min in each axis (X.Y.Z) (6) Ta : 25℃	TEST : OK										



9	CAPACITOR LIFE CYCLE	:SUPPOSE C105 IS THE MOST CRITICAL COMPONENT					
		(1) I/P : 230VAC	O/P : FULL LOAD	Ta= 25.0℃	LIFE TIME	(1).	307137 HRS
		(2) I/P : 230VAC	O/P : FULL LOAD	Ta= 50.0℃	LIFE TIME	(2).	62813.9 HRS
		(3) I/P : 230VAC	O/P : 75% LOAD	Ta= 50.0℃	LIFE TIME	(3).	107153.6 HRS
		(4) I/P : 230VAC	O/P : 50% LOAD	Ta= 50.0℃	LIFE TIME	(4).	164041.9 HRS
10	MTBF	MIL-HDBK-217F TOTAL FAILURE RATE : 628.7 KHR					
11	DMTBF /Accelerated Life test	Demonstration Mean Time Between Failure (Expected Life): Above 30000HRS @ TA 50℃					

TEST RESULT	TESTER	REVIEW	APPROVAL
PASS	FRANK	GESG	WANGDZ

2007/3/20 A50-S014