



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

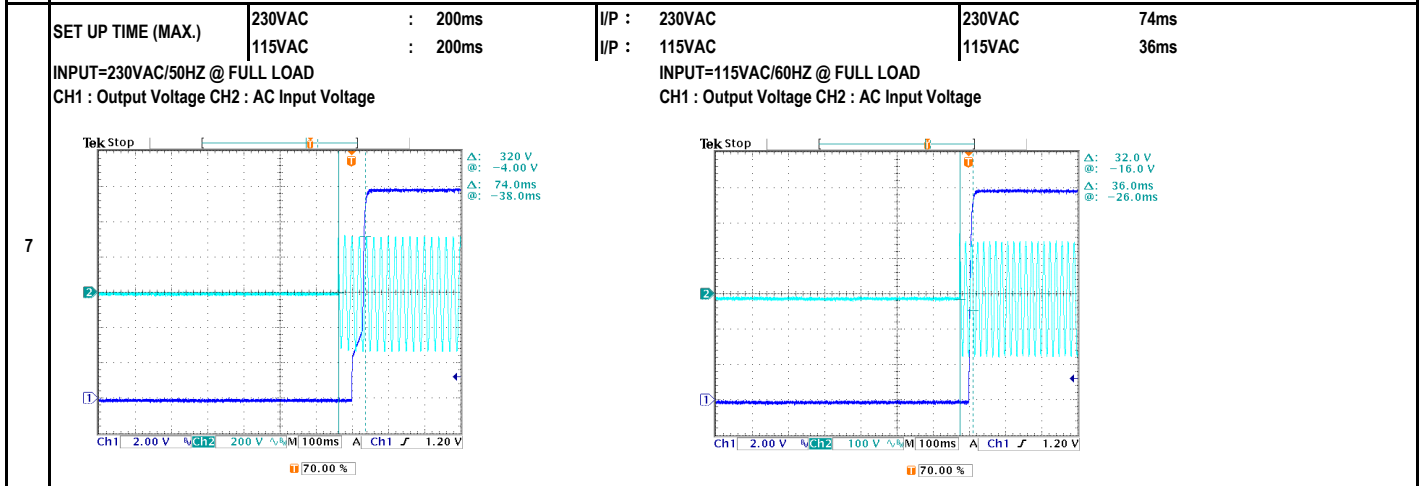
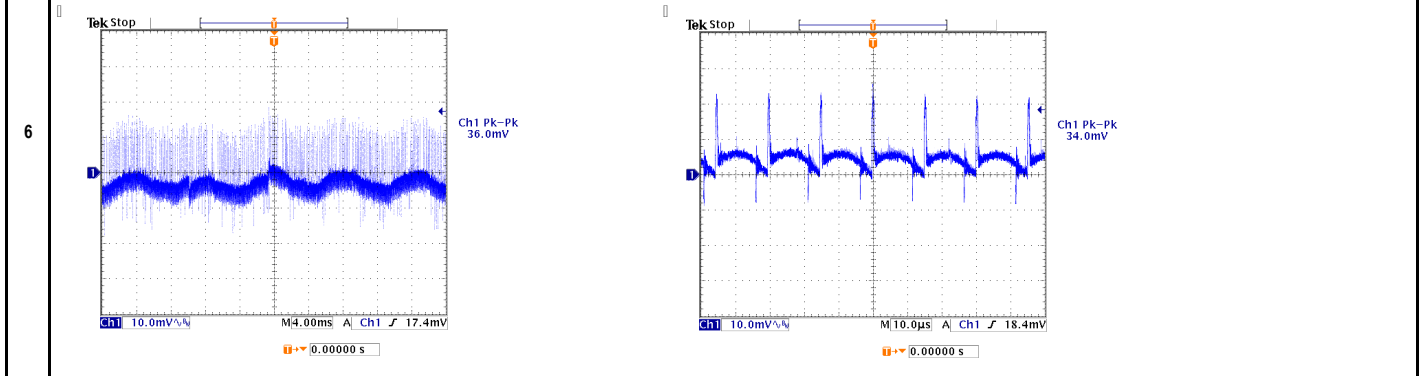
ENVIRONMENT TEST

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 %
	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 :





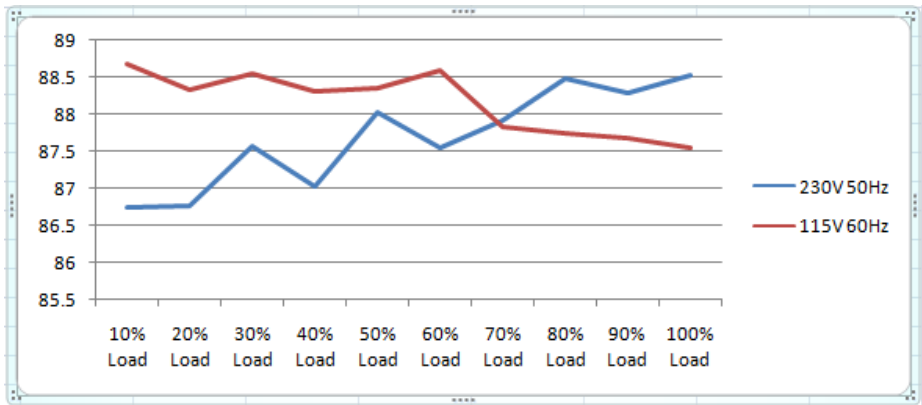
8	RISE TIME (MAX.)	230VAC : 30ms 115VAC : 30ms	I/P : 230VAC I/P : 115VAC O/P: FULL LOAD TA : 25°C	230VAC : 9.2ms 115VAC : 9.0ms
	INPUT=230VAC/50HZ @ FULL LOAD CH1 : Output Voltage	INPUT=115VAC/60HZ @ FULL LOAD CH1 : Output Voltage		
9	HOLD UP TIME (TYP.)	230VAC : 30ms 115VAC : 12ms	I/P : 230VAC I/P : 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		



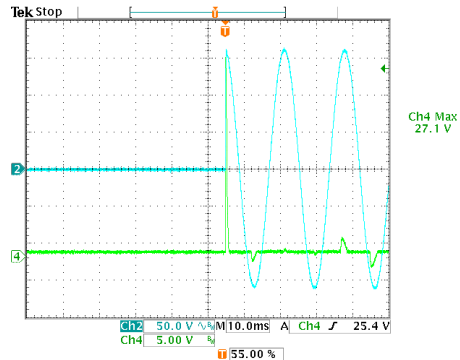
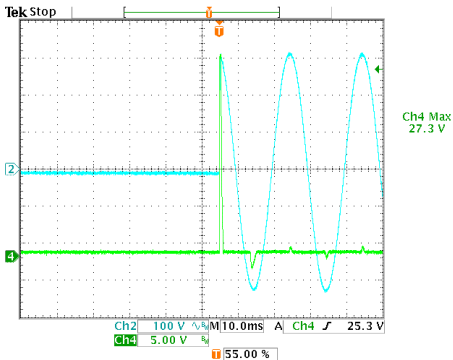
INPUT FUNCTION TEST

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
	EFFICIENCY (TYP.)	88.0%	I/P : 230VAC O/P : FULL LOAD TA : 25°C	88.57 %

6



7	INRUSH CURRENT (TYP.)	60A / 230VAC 30A / 115VAC twidth= 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	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	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°C 2. HIGH AMBIENT BURN-IN : 1.0hrs IP: 230VAC O/P: 100% LOAD TA= 45.8°C	<table border="1"> <thead> <tr> <th>NO.</th> <th>Positio</th> <th>ROOM AMBIENT</th> <th>27.0°C</th> <th>HIGH AMBIENT Ta:</th> <th>45.8°C</th> </tr> </thead> <tbody> <tr><td>1</td><td>LF1</td><td>41.2°C</td><td></td><td>58.3°C</td><td></td></tr> <tr><td>2</td><td>LF2</td><td>38.4°C</td><td></td><td>56.3°C</td><td></td></tr> <tr><td>3</td><td>BD1</td><td>47.8°C</td><td></td><td>65.5°C</td><td></td></tr> <tr><td>4</td><td>Q1</td><td>75.1°C</td><td></td><td>89.8°C</td><td></td></tr> <tr><td>5</td><td>C5</td><td>48.9°C</td><td></td><td>65.7°C</td><td></td></tr> <tr><td>6</td><td>C40</td><td>42.0°C</td><td></td><td>58.6°C</td><td></td></tr> <tr><td>7</td><td>T1 COIL</td><td>60.9°C</td><td></td><td>77.8°C</td><td></td></tr> <tr><td>8</td><td>D101</td><td>78.5°C</td><td></td><td>95.2°C</td><td></td></tr> <tr><td>9</td><td>C105</td><td>58.3°C</td><td></td><td>75.0°C</td><td></td></tr> <tr><td>10</td><td>C106</td><td>54.3°C</td><td></td><td>71.1°C</td><td></td></tr> <tr><td>11</td><td>C107</td><td>43.3°C</td><td></td><td>59.4°C</td><td></td></tr> <tr><td>12</td><td>L100</td><td>42.9°C</td><td></td><td>60.1°C</td><td></td></tr> <tr><td>13</td><td>U1</td><td>48.5°C</td><td></td><td>65.0°C</td><td></td></tr> </tbody> </table>	NO.	Positio	ROOM AMBIENT	27.0°C	HIGH AMBIENT Ta:	45.8°C	1	LF1	41.2°C		58.3°C		2	LF2	38.4°C		56.3°C		3	BD1	47.8°C		65.5°C		4	Q1	75.1°C		89.8°C		5	C5	48.9°C		65.7°C		6	C40	42.0°C		58.6°C		7	T1 COIL	60.9°C		77.8°C		8	D101	78.5°C		95.2°C		9	C105	58.3°C		75.0°C		10	C106	54.3°C		71.1°C		11	C107	43.3°C		59.4°C		12	L100	42.9°C		60.1°C		13	U1	48.5°C		65.0°C		
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2	OVER LOAD BURN-IN TEST	NO DAMAGE 1 HOUR (MIN)	I/P : 230VAC O/P : 116% LOAD Ta : 25°C	TEST : OK																																																																																				
3	LOW TEMPERATURE TURN ON TEST	NO DAMAGE 1 HOUR (MIN)	I/P : 264VAC / 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 50°C NO DAMAGE	I/P : 272VAC O/P : FULL LOAD Ta : 50°C HUMIDITY= 95.0% RH	TEST : OK																																																																																				
5	TEMPERATURE COEFFICIENT	±0.03% /°C(0~50°C)	I/P : 230VAC O/P : FULL LOAD	±0.0480% /°C(0~50°C)																																																																																				
6	STORAGE TEMPERATURE TEST	1. Thermal shock Temperature : -40°C ~ +85°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 ~ +55°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 : 2G (5) Test Time : 60min in each axis (X.Y.Z) (6) Ta : 25°C		TEST : OK																																																																																				



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

TEST RESULT	TESTER	REVIEW	APPROVAL
PASS	FRANK	GESG	WANGDZ

2007/3/20 A50-S014