



# TEST REPORT: RPS-300-24

## 300W Single Output Green 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	VERDICT
1	OUTPUT VOLTAGE ADJUST RANGE	CH1: 22.80V ~ 25.20V	I/P : 230VAC O/P: MIN LOAD TA : 25°C	CH1: 22.05V ~ 26.05V	PASS
2	OUTPUT VOLTAGE TOLERANCE (Max)	V1 : 2.0% ~ -2.0%	I/P : 115VAC / 264VAC O/P: FULL / MINLOAD TA= 25°C	V1: 0.76% ~ -0.56%	PASS
3	LINE REGULATION (MAX.)	V1 : 0.5% ~ -0.5%	I/P : 115VAC / 264VAC O/P: FULL LOAD TA : 25°C	V1: 0.00% ~ 0.00%	PASS
4	LOAD REGULATION(MAX.)	V1 : 1.0% ~ -1.0%	I/P : 230VAC O/P: MIN LOAD ~ FULL LOAD TA : 25°C	V1: 0.76% ~ -0.56%	PASS
5	OVER/UNDERSHOOT TEST	< ±5%	I/P : 230VAC O/P: FULL LOAD TA : 25°C	TEST< 1.3 %	PASS
6	RIPPLE & NOISE(Max)	V1 : 150 mVp-p	I/P : 230VAC O/P: FULL LOAD TA : 25°C	V1 : 91.2 mVp-p	PASS
7	SET UP TIME (MAX.)	230VAC : 2500ms 115VAC : 3000ms	I/P : 230VAC I/P : 115VAC O/P: FULL LOAD TA : 25°C	230VAC : 856ms 115VAC : 840ms	PASS
		<p>INPUT=230VAC/50HZ @ FULL LOAD CH1 : Output Voltage CH2 : AC Input Voltage</p>	<p>INPUT=115VAC/60HZ @ FULL LOAD CH1 : Output Voltage CH2 : AC Input Voltage</p>		

8	RISE TIME (MAX.)	230VAC : 30ms 115VAC : 30ms	I/P : 230VAC I/P : 115VAC O/P: FULL LOAD TA: 25°C	230VAC : 9.4ms 115VAC : 9.2ms	PASS
	INPUT=230VAC/50HZ @ FULL LOAD CH1 : Output Voltage		INPUT=115VAC/60HZ @ FULL LOAD CH1 : Output Voltage		
9	HOLD UP TIME (TYP.)	230VAC : 13ms 115VAC : 13ms	I/P : 230VAC I/P : 115VAC O/P: FULL LOAD TA: 25°C	230VAC : 17.6ms 115VAC : 17.2ms	PASS
	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 : 2400 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). 542mv (2). 590mv unit:mVp-p	PASS
	FULL /MIN LOAD 50%DUTY / 120HZ		FULL /MIN% LOAD 50%DUTY / 1KHZ		

INPUT FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	INPUT VOLTAGE RANGE	90VAC ~ 264VAC	I/P : TESTING O/P : FULL LOAD Ta : 25°C	73.1VAC ~ 264VAC	PASS
			I/P : LOW-LINE = 112VAC 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	PASS
3	INPUT CURRENT (TYP.)	1.80A / 230VAC 3.50A / 115VAC	I/P : 230VAC I/P : 115VAC O/P : FULL LOAD TA : 25°C	I= 1.32A / 230VAC I= 2.74A / 115VAC	PASS
4	LEAKAGE CURRENT	< 150uA Earth leakage current	I/P : 264VAC O/P : MIN LOAD	80 uA	PASS
		< 70uA Touch leakage current	TA : 25°C	35 uA	
5	NO LOAD POWER CONSUMPTION	< 0.50W	I/P : 230VAC O/P : MIN LOAD TA : 25°C	< 0.392 W	PASS
6	POWER FACTOR (TYP.)	0.93 / 230VAC 0.98 / 115VAC	I/P : 230VAC I/P : 115VAC O/P : FULL LOAD TA : 25°C	PF= 0.9896 / 230VAC PF= 0.9972 / 115VAC	PASS
7	EFFICIENCY (TYP.)	92.5%	I/P : 230VAC O/P : FULL LOAD TA : 25°C	93.01 %	PASS

8	INRUSH CURRENT (TYP.)	80A / 230VAC 40A / 115VAC	I/P : 230VAC I/P : 115VAC O/P : FULL LOAD TA : 25°C	I= 69.6A / 230VAC I= 28.8A / 115VAC	PASS
	COLD START				
INPUT=230VAC/50HZ @ FULL LOAD		INPUT=115VAC/50HZ @ FULL LOAD			
CH2 : AC Input Voltage CH4 : Input current (1V=1A)		CH2 : AC Input Voltage CH4 : Input current (1V=1A)			

PROTECTION FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	OVER LOAD PROTECTION	105% ~ 135%	I/P: 264VAC I/P: 230VAC I/P: 115VAC O/P: TESTING TA : 25°C	115.44% 264VAC 115.76% 230VAC 115.76% 115VAC Hiccup Mode	PASS
2	OVER VOLTAGE PROTECTION	26.00V ~ 30.00V	I/P: 264VAC I/P: 230VAC I/P: 90VAC O/P: MIN LOAD TA : 25°C	28.20V 264VAC 28.20V 230VAC 28.20V 90VAC Shut down Re- power ON	PASS
3	OVER TEMPERATURE PROTECTION	Shut down Re- power ON	I/P: 264VAC I/P: 90VAC O/P: FULL LOAD	O.T.P. Active Shut down Re- power ON	PASS
4	SHORT PROTECTION	SHORT EVERY OUTPUT 1 HOUR NO DAMAGE	I/P: 264VAC I/P: 90VAC O/P: FULL LOAD Ta: 25°C	NO DAMAGE Hiccup Mode	PASS

COMPONENT STRESS TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	PWM Power Transistor	Q5 Rated : 600V 19.0A	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). 444.00V (2). 472.00V (3). 440.00V	PASS
2	PWM Power Transistor	Q5 Rated : 600V 19.0A	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). 452.00V (2). 446.00V (3). 440.00V	PASS
3	O/P MOSFET	Q101 Rated : 75V 80.0A Q102 Rated : 75V 80.0A	I/P : 267VAC VDS : O/P : (1)Full Load Turn on (2) Output Short (3)Full load continue Ta : 25°C	Q101 Q102 VDS : VDS : (1). 59.20V 59.20V (2). 12.00V 12.00V (3). 59.20V 59.20V	PASS
4	Input Capacitor	C5 Rated : 150uf 400V	I/P : 267VAC O/P : (1)Full Load Turn on /Off (2)Min load Turn on /Off (3)Full Load /Min load Change (4)Full Load Continue Ta : 25°C	(1). 398.00V (2). 399.00V (3). 399.00V (4). 398.00V	PASS

5	Control IC	U1 Rated : 16V (max) 8.85V (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). 14.40V (2). 14.10V (3). 14.00V (4). 14.10V (5). 14.00V	PASS
6	PFC Power Transistor	Q1 Rated : 600V 17.9A	I/P : 267VAC VDS : O/P : (1)Full Load Turn on (2) Output Short (3)Full load continu #REF! Ta : 25°C	VIN: 267VAC VDS: (1). 496.00V (2). 516.00V (3). 472.00V	PASS
7	PFC Diode	D10 Rated : 600V 8.0A	I/P : 267VAC O/P : (1)Full Load Turn on (2) Output Short (3)Dynamic Load Full/Min Load 90%Duty/5KHz (4)Dynamic Load Full/Min Load 50%Duty/120Hz Ta : 25°C	267VAC (1). 418.00V (2). 418.00V (3). 418.00V (4). 418.00V	PASS
8	Clamp Diode	D33 Rated : 1000V 1.0A	I/P : 267VAC O/P : (1)Dynamic Load Full/Min Load 90%Duty/1KHz (2)Full load continue Ta : 25°C	(1). 326.00V (2). 268.00V	PASS

SAFETY & E.M.C. TEST

SAFETY TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	WITHSTAND VOLTAGE	I/P-O/P : 4.000KVAC /min I/P-FG : 2.000KVAC /min O/P-FG : 1.500KVAC /min	I/P-O/P: 4.400KVAC /min I/P-FG: 2.400KVAC /min O/P-FG: 1.800KVAC /min Ta : 25°C	I/P-O/P: 1.17mA I/P-FG: 1.16mA O/P-FG: 1.22mA NO DAMAGE	PASS
2	ISOLATION RESISTANCE	I/P-O/P : 500VDC>100MΩ I/P-FG : 500VDC>100MΩ O/P-FG : 500VDC>100MΩ	I/P-O/P: 500VDC I/P-FG: 500VDC O/P-FG: 500VDC Ta : 25°C/70%RH	I/P-O/P: 9999MΩ I/P-FG: 9999MΩ O/P-FG: 9999MΩ NO DAMAGE	PASS

E.M.C. TEST

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



RELIABILITY TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	TEMPERATURE RISE TEST	MODEL : RPS-300-24-C			PASS
		1. ROOM AMBIENT BURN-IN : 1.0hrs IP: 230VAC O/P: 100% LOAD TA= 32.5°C			
		2. HIGH AMBIENT BURN-IN : 1.0hrs IP: 230VAC O/P: 100% LOAD TA= 51.9°C			
			NO. Position ROOM AMBIENT 32.5°C HIGH AMBIENT Ta: 51.9°C		
			1 BD1 66.2°C 89.4°C		
			2 ZNR1 47.0°C 68.4°C		
			3 C1 40.2°C 61.3°C		
			4 LF2 37.3°C 58.3°C		
			5 C5 63.6°C 85.2°C		
			6 Q1 58.8°C 80.7°C		
			7 L2 69.6°C 89.8°C		
			8 ZNR2 38.4°C 58.8°C		
			9 T1 56.6°C 77.0°C		
			10 C200 52.8°C 73.4°C		
			11 C105 44.2°C 64.7°C		
			12 Q101 42.6°C 63.6°C		
			13 Q5 77.2°C 99.1°C		
			14 TSW1 46.6°C 68.7°C		
			15 TSW2 42.3°C 63.1°C		
			16 U1 58.0°C 80.3°C		
			17 U103 58.0°C 78.8°C		
			18 C911 64.1°C 84.1°C		
			19 T900 68.4°C 88.5°C		
			20 U903 76.4°C 97.4°C		
	21 C950 62.0°C 82.1°C				
	22 C955 57.2°C 77.6°C				
	23 L1 58.6°C 84.7°C				
2	OVER LOAD BURN-IN TEST	NO DAMAGE 1 HOUR ( MIN )	I/P : 230VAC O/P : 112.00% LOAD Ta : 25°C	TEST : OK	PASS
3	LOW TEMPERATURE TURN ON TEST	NO DAMAGE 1 HOUR ( MIN )	I/P : 264VAC / 115VAC O/P : FULL LOAD Ta : -30.0°C	TEST : OK	PASS
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	PASS
5	TEMPERATURE COEFFICIENT	±0.03% /(0°C~50°C)	I/P : 230VAC O/P : FULL LOAD	±0.0022% /(0°C~50°C)	PASS
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	PASS
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	PASS
8	VIBRATION TEST	1 Carton & 1 Set (1) Waveform : Sine Wave (2) Frequency : 10~500Hz (4) Acceleration : 2G (5) Test Time : 60 min in each axis (X.Y.Z) (6) Ta : 25°C		TEST : OK	PASS
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 (2) I/P : 230VAC O/P : FULL LOAD Ta= 50.0°C LIFE TIME (3) I/P : 230VAC O/P : 75% LOAD Ta= 50.0°C LIFE TIME (4) I/P : 230VAC O/P : 50% LOAD Ta= 50.0°C LIFE TIME		(1). 686033.1 HRS (2). 112399.2 HRS (3). 183833.7 HRS (4). 304670.1 HRS	PASS
10	MTBF	Conducted by Parts Stress Analysis Prediction 160K hrs min. MIL-HDBK-217F (25°C)			PASS
11	DMTBF /Accelerated Life test	Demonstration Mean Time Between Failure (Expected Life): Above 30000HRS @ TA 50°C			PASS

TEST RESULT	TESTER	REVIEW	APPROVAL
PASS	FRANK	GESG	WANGDZ

2007/3/20 A50-S014