



Test Report: RID-85B

85W Dual Output Switching Power Supply

■ 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

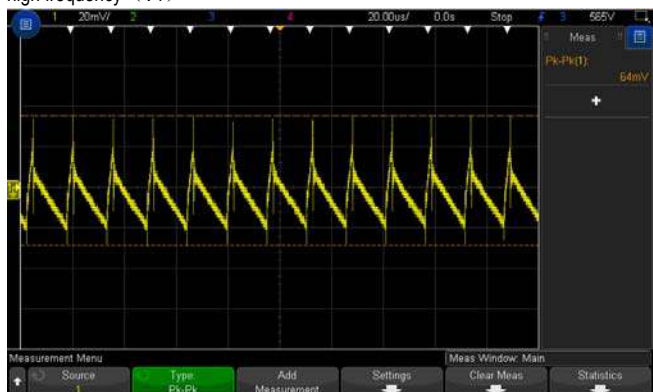
ENVIRONMENT TEST

DESIGN VERIFY TEST

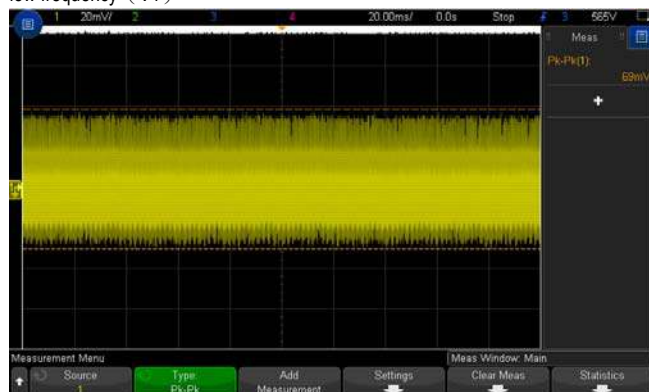
OUTPUT FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	OUTPUT VOLTAGE ADJUST RANGE	CH1: 4.75V~ 5.5 V	I/P : 230 VAC I/P : 115 VAC O/P : MIN LOAD Ta : 25℃	4.67V~5.67V/230VAC 4.67V~5.67V /115VAC
2	OUTPUT VOLTAGE(Max) TOLERANCE	V1: -2%~2 % V2: -5%~5%	I/P: 88VAC /264VAC O/P:FULL/ MIN. LOAD Ta:25℃	V1: -0.07%~0.14% V2: -3.45%~2.70 %
3	LINE REGULATION (Max)	V1: -0.5%~0.5% V2: -1%~ 1%	I/P: 88VAC~ 264VAC O/P:FULL LOAD Ta:25℃	V1: -0.02%~0.04% V2: -0.09%~0.06%
4	LOAD REGULATION(Max)	V1: -1%~1% V2: -5%~5%	I/P: 230VAC O/P:FULL ~MIN LOAD Ta:25℃	V1: -0.07%~0.14% V2: -3.45%~2.70 %
5	OVER/UNDERSHOOT TEST	< ±10%	I/P: 230VAC O/P:FULL LOAD Ta:25℃	2.0%
6	RIPPLE & NOISE(Max)	V1: 80mVp-p V2: 120mVp-p	I/P:230VAC O/P:FULL LOAD Ta:25℃	V1: 69mVp-p V2: 90mVp-p

high frequency (V1) :



low frequency (V1) :



high frequency (V2) :

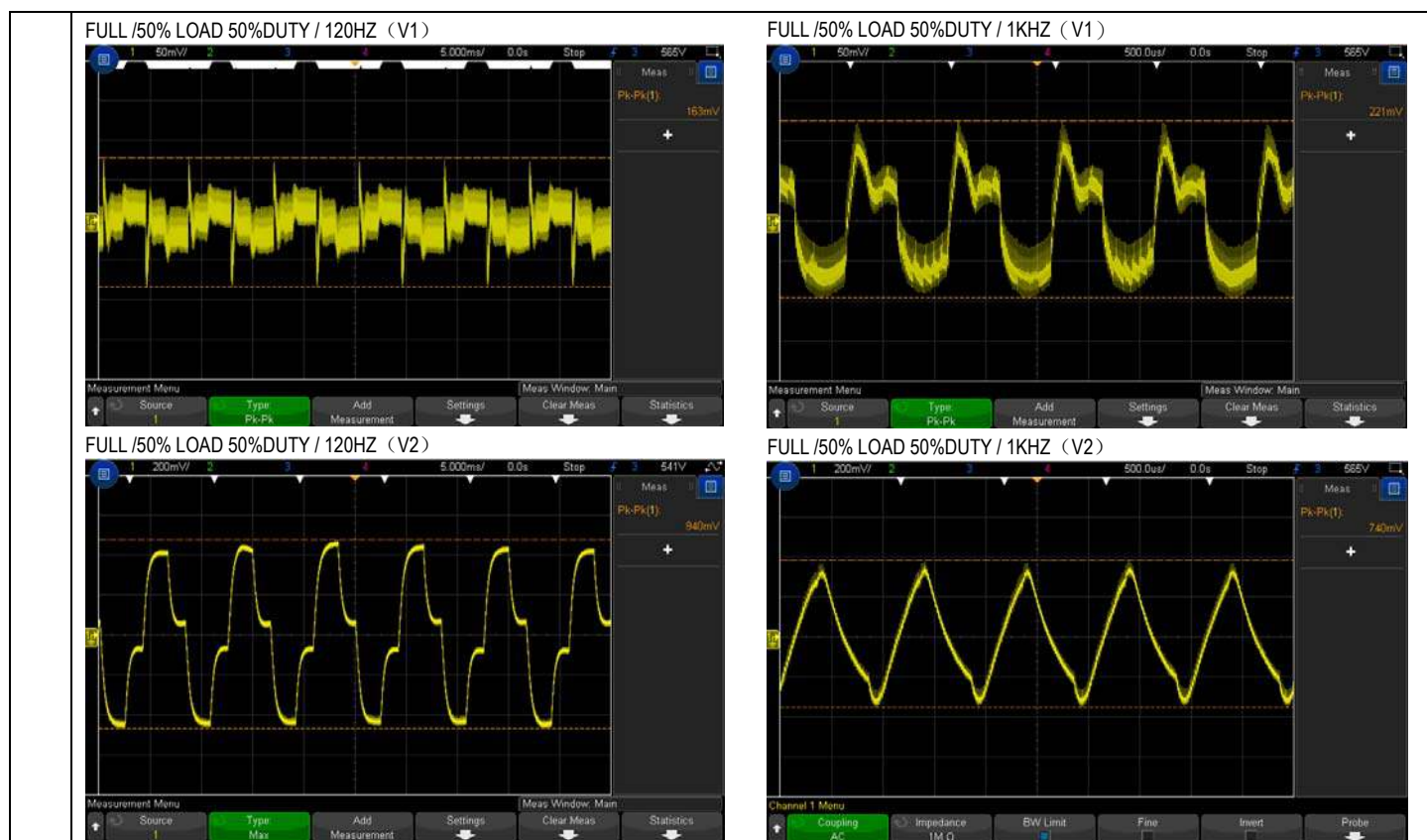


low frequency (V2) :



7	SET UP TIME(Max)	230VAC/500ms 115VAC/1200ms	I/P : 230 VAC I/P : 115 VAC O/P : FULL LOAD Ta : 25℃	230VAC/ 192ms 115VAC/ 198ms
---	------------------	-------------------------------	---	--------------------------------

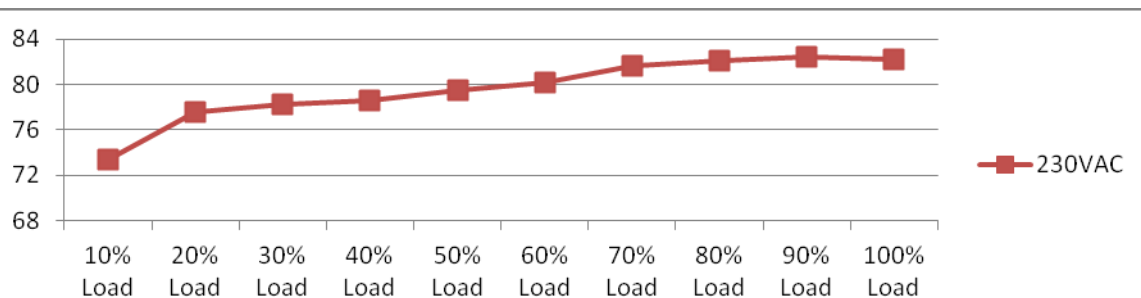
		INPUT=230VAC/50HZ @ FULL LOAD CH1 : Output Voltage CH2 : AC Input Voltage		INPUT=115VAC/60HZ @ FULL LOAD CH1 : Output Voltage CH2 : AC Input Voltage	
8	RISE TIME (Max)	230VAC/20ms 115VAC/30ms	I/P : 230 VAC I/P : 115 VAC O/P : FULL LOAD Ta : 25°C		230VAC/ 11.31ms 115VAC/ 8.23 ms
		INPUT=230VAC/50HZ @ FULL LOAD CH1 : Output Voltage		INPUT=115VAC/60HZ @ FULL LOAD CH1 : Output Voltage	
9	HOLD UP TIME (Typ.)	230VAC/100ms 115VAC/18ms	I/P : 230 VAC I/P : 115 VAC O/P : FULL LOAD Ta : 25°C		230VAC/ 120ms 115VAC/19.8ms
		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: 1000 mVp-p V2: 2400 mVp-p	I/P: 230VAC O/P: (1)FULL /50% LOAD 50%DUTY / 120HZ (2)FULL /50% LOAD 50%DUTY / 1KHZ Ta:25°C		(1) V1: 163mVp-p V2: 1320mVp-p (2) V1: 221mVp-p V2: 740mVp-p



INPUT FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	INPUT VOLTAGE RANGE	88VAC~264VAC	I/P:TESTING O/P:FULL LOAD Ta:25°C	71V~264V
			I/P: LOW-LINE-3V=85 V HIGH-LINE+15%=300 V O/P:FULL/MIN LOAD (PLEASE CHECK DERATING CURVE) ON: 30 Sec OFF: 30 Sec 10MIN (POWER ON/OFF NO DAMAGE)	TEST: OK
2	INPUT FREQUENCY RANGE	47HZ ~63 HZ NO DAMAGE	I/P:88 VAC ~264 VAC O/P:FULL~MIN LOAD Ta:25°C	TEST: OK
3	INPUT CURRENT (Typ.)	230V/1.5A 115V/ 2.5A	I/P : 230 VAC I/P : 115 VAC O/P : FULL LOAD Ta : 25°C	I =0.80A/ 230VAC I =1.34A/ 115VAC
4	LEAKAGE CURRENT	<2 mA / 240 VAC	I/P : 240 VAC O/P : Min LOAD Ta : 25°C	0.8mA
5	EFFICIENCY(Typ.)	81%	I/P:230 VAC O/P:FULL LOAD Ta:25°C	82.2%

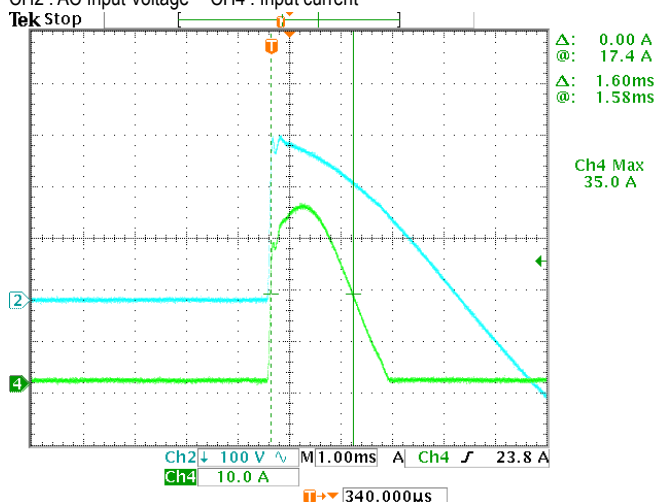
EFFICIENCY vs LOAD



6	INRUSH CURRENT(Typ.)	230V / 50A COLD START	I/P : 230 VAC O/P : FULL LOAD Ta : 25℃	35.0A
---	----------------------	--------------------------	--	-------

INPUT=230VAC/50HZ @ FULL LOAD

CH2 : AC Input Voltage CH4 : Input current



PROTECTION FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	OVER LOAD PROTECTION	110%~150%	I/P: 264VAC I/P: 230VAC I/P: 115VAC O/P: TESTING Ta: 25℃	118.2%/ 264VAC 121.4%/ 230VAC 125.9%/115VAC PROTECTION TYPE : Hiccup mode, recovers automatically after fault condition is removed
2	OVER VOLTAGE PROTECTION	5.75V~6.75V	I/P: 264VAC I/P: 230VAC I/P: 88VAC O/P: MIN LOAD Ta: 25℃	6.30V/ 264VAC 6.30V/ 230VAC 6.30V/ 88VAC PROTECTION TYPE : Hiccup mode, recovers automatically after fault condition is removed
3	SHORT PROTECTION	SHORT EVERY OUTPUT 1 HOUR NO DAMAGE	I/P: 264VAC I/P: 88VAC O/P: FULL LOAD Ta: 25℃	NO DAMAGE PROTECTION TYPE : Hiccup mode, recovers automatically after fault condition is removed

COMPONENT STRESS TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	PWM Transistor (D to S) or (C to E) Peak Voltage	Q1 Rated : 900 V	AC ON/OFF I/P: High-Line +3V = 267V VDS: O/P: (1) Full Load (2) Output Short (3) Full Load Continue Ta: 25°C	VDS: (1) 538V (2) 763V (3) 514V
2	O/P Diode	D55 Rated : 200 V D60 Rated : 60 V	AC ON/OFF I/P: High-Line +3V = 267 V O/P: (1) Full Load (2) Output Short (3) Full Load Continue Ta: 25°C	D55 (1) 139V (2) 161V (3) 69.8V D60 (1) 29.7V (2) 36.1V (3) 14.2V
3	Input Capacitor Voltage	C5 Rated : 150 μ / 400 V	I/P: High-Line +3V = 267V O/P: (1) Full Load input on/off (2) Min load input on /Off (3) Full Load /Min load Change (4) Full load continue Ta: 25°C	(1) 373V (2) 373V (3) 369V (4) 365 V
4	Control IC Voltage Test	U1 Rated : 8.4V ~ 21 V	AC ON/OFF I/P: High-Line +3V = 267 V O/P: (1) FULL LOAD (2) Output Short (3) O.L.P (4) O.V.P. (5) NO LOAD VRmin (LOW LINE) Ta: 25°C	(1) 15.0V (2) 12.8V (3) 14.0V (4) 12.8V (5) 12.8V
5	Clamp Diode Peak Voltage	D1 Rated : 1000 V	AC ON/OFF I/P : High-Line +3V = 267 V O/P : (1) Dynamic Load 90%Duty/1KHz (2) Full load continue Ta : 25°C	(1) 518V (2) 470V

SAFETY TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	WITHSTAND VOLTAGE	I/P-O/P: 3KVAC/min I/P-FG: 2 KVAC/min O/P-FG: 0.5KVAC/min	I/P-O/P: 3.6 KVAC/min I/P- FG: 2.4 KVAC/min O/P - FG: 0.6 KVAC/min Ta: 25°C	I/P-O/P: 3.77mA I/P-FG: 2.34mA O/P-FG: 1.31mA NO DAMAGE
2	ISOLATION RESISTANCE	I/P-O/P: 500VDC > 100M Ω I/P- FG: 500VDC > 100M Ω O/P- FG: 500VDC > 100M Ω	I/P-O/P: 600 VDC I/P- FG: 600 VDC Ta: 25°C	I/P-O/P: 9999M Ω I/P-FG: 9999M Ω O/P-FG: 9999M Ω NO DAMAGE
3	GROUNDING CONTINUITY	FG(PE) TO CHASSIS OR TRACE < 100 m Ω	40 A / 2min Ta: 25°C / 70%RH	12m Ω

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 ☐ FAIL
2	CONDUCTION	EN55032 CLASS B	I/P : 230 VAC (50HZ) O/P : FULL/50% LOAD Ta : 25°C	PASS Test by certified Lab
3	RADIATION	EN55032 CLASS B	I/P : 230 VAC (50HZ) O/P : FULL LOAD Ta : 25°C	PASS Test by certified Lab
4	E.S.D	EN61000-4-2 ☐ LIGHT INDUSTRY AIR: 8KV / Contact: 4KV ☒ INDUSTRY AIR: 8KV / Contact: 4KV ☐ Din rail Model : AIR: 15KV / Contact: 8KV	I/P : 230 VAC/50HZ O/P : FULL LOAD Ta : 25°C	CRITERIA A
5	E.F.T	EN61000-4-4 ☐ LIGHT INDUSTRY INPUT : 1KV ☐ MEDICAL ☒ INDUSTRY INPUT : 2KV	I/P : 230 VAC/50HZ O/P : FULL LOAD Ta : 25°C	CRITERIA A
6	SURGE	IEC61000-4-5 INDUSTRY L-N : 2KV L/N-PE : 4KV	I/P : 230 VAC/50HZ O/P : FULL LOAD Ta : 25°C	CRITERIA A
7	Test by certified Lab & Test Report Prepare Any contradictions of the test results, please refer to the latest EMC test report.			

RELIABILITY TEST

ENVIRONMENT TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	TEMPERATURE RISE TEST	MODEL : RD-85A 1. ROOM AMBIENT BURN-IN : 1.5 HRS I/P : 230VAC O/P : FULL LOAD Ta= 27.7°C 2. HIGH AMBIENT BURN-IN : 1.5 HRS I/P : 230VAC O/P : FULL LOAD Ta= 41.0°C		

			NO	Position	ROOM AMBIENT Ta= 27.7 °C	HIGH AMBIENT Ta=41.0 °C
			1	LF1	68.2℃	83.5℃
			2	BD1	64.6℃	79.9℃
			3	C5	51.5℃	67.3℃
			4	C6	53.4℃	68.7℃
			5	D1	82.3℃	96.3℃
			6	D2	89.3℃	101.7℃
			7	D4	97.0℃	109.6℃
			8	R55	95.6℃	109.1℃
			9	U1	91.6℃	99.6℃
			10	Q1	85.1℃	99.9℃
			11	C10	85.7℃	98.1℃
			12	T1	96.9℃	110.4℃
			13	D55	102.1℃	114.8℃
			14	D60	101.2℃	114.9℃
			15	C56	76.4℃	91.2℃
			16	C62	74.1℃	90.0℃
			17	L60	99.9℃	101.5℃
			18	R2	88.1℃	101.2℃
			19	R8	74.4℃	88.3℃
			20	R72	89.5℃	104.7℃
2	OVER LOAD BURN-IN TEST	NO DAMAGE 1 HOUR (MIN)	I/P : 230 VAC O/P : 113% LOAD Ta : 25℃		TEST : OK	
3	LOW TEMPERATURE TURN ON TEST	TURN ON AFTER 2 HOUR	I/P : 264VAC/115VAC O/P : 100 % LOAD Ta= -25℃		TEST : OK	
4	HIGH HUMIDITY HIGH TEMPERATURE HIGH VOLTAGE TURN ON TEST	AFTER 12 HOURS IN CHAMBER ON CONTROL40℃ / 95 %R.H NO DAMAGE	I/P : 272 VAC O/P : FULL LOAD Ta=40 °C HUMIDITY= 95 %R.H		TEST : OK	
5	TEMPERATURE COEFFICIENT	± 0.03%/℃ (0~50℃)	I/P : 230 VAC O/P : FULL LOAD		± 0.0046%/℃ (0~50℃)	
6	STORAGE TEMPERATURE TEST	1. Thermal shock Temperature : -45℃~ +90℃ 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 : STATIC			TEST : OK	
7	THERMAL SHOCK TEST	1. Thermal shock Temperature : -30℃~ +45℃ 2. Temperature change rate : 25℃ / MIN 3. Dwell time low and high temperature : 30 MIN/EACH 4. Total test cycle : 16 CYCLE 5. Input/Output condition : 15cycle:230V/ FULL LOAD AC ON 3sec/AC OFF 1sec TEST 1cycle:230V/ FULL LOAD Burn In Test			TEST : OK	
8	VIBRATION TEST	1 Carton & 1 Set (1) Waveform : Sine Wave (2) Frequency : 10~500Hz (3) Sweep Time : 10min/sweep cycle (4) Acceleration : 5G (5) Test Time : 180min in each axis (X.Y.Z) (6) Ta : 25℃			TEST : OK	



9	CAPACITOR LIFE CYCLE	SUPPOSE C56 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=40 °C LIFE TIME (3) I/P : 230VAC O/P : 75% LOAD Ta=40 °C LIFE TIME (4) I/P : 230VAC O/P : 50% LOAD Ta= 40 °C LIFE TIME	(1) 150859.6HRS (2) 44541HRS (3) 68309.8 HRS (4) 124411.2HRS
10	MTBF	Conducted by Parts Stress Analysis Prediction 239.4K hrs min. MIL-HDBK-217F (25°C)	
11	Ongoing Reliability Test	I/P : 230VAC O/P : FULL LOAD TA=50°C Demonstration Mean Time Between Failure : 30,000 hours	

TEST RESULT	TESTER	REVIEW	APPROVAL
PASS	LIUTT		Wangdz

2018.4.30 GP-A50-F010