



# Test Report: RD-125-1248

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125W 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

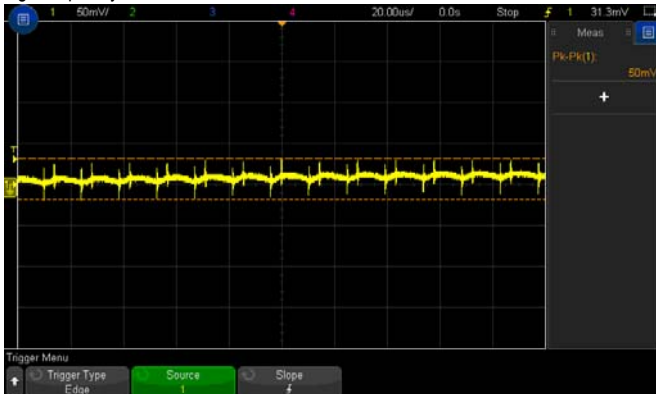
ENVIRONMENT TEST

DESIGN VERIFY TEST

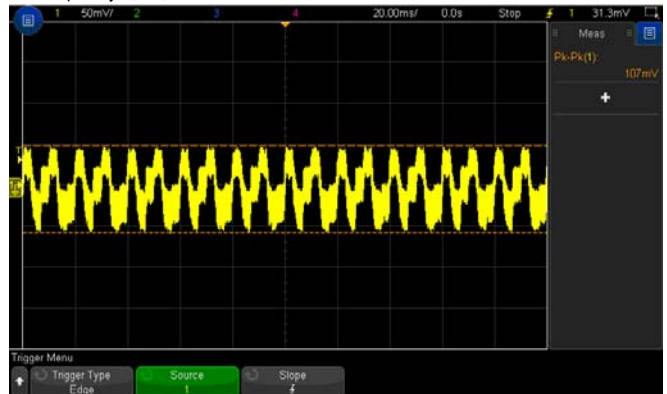
OUTPUT FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	OUTPUT VOLTAGE ADJUST RANGE	CH1: 11.4V~ 13.2 V	I/P : 230 VAC I/P : 115 VAC O/P : MIN LOAD Ta : 25°C	11.09V~13.80V/230VAC 11.09V~13.80V/115VAC
2	OUTPUT VOLTAGE(Max) TOLERANCE	V1: -2%~2 % V2: -8%~8 %	I/P: 88VAC /264VAC O/P:FULL/ MIN. LOAD Ta:25°C	V1 : -0.05%~0.07% V2 : -0.12%~0.27%
3	LINE REGULATION (Max)	V1: -0.5%~ 0.5% V2: -1%~ 1%	I/P: 88VAC~ 264VAC O/P:FULL LOAD Ta:25°C	V1 : -0.02%~0.02% V2 : -0.01%~0.01%
4	LOAD REGULATION(Max)	V1: -1%~1% V2: -5%~5%	I/P: 230VAC O/P:FULL ~MIN LOAD Ta:25°C	V1 : -0.05%~0.07% V2 : -0.12%~0.27%
5	OVER/UNDERSHOOT TEST	< ±5%	I/P: 230VAC O/P:FULL LOAD Ta:25°C	2.5%
6	RIPPLE & NOISE(Max)	V1: 120mVp-p V2: 240mVp-p	I/P:230VAC O/P:FULL LOAD Ta:25°C	V1: 107 mVp-p V2: 141 mVp-p

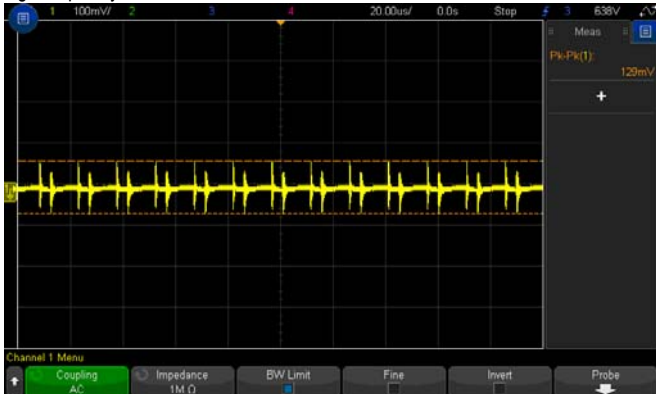
high frequency (V1) :



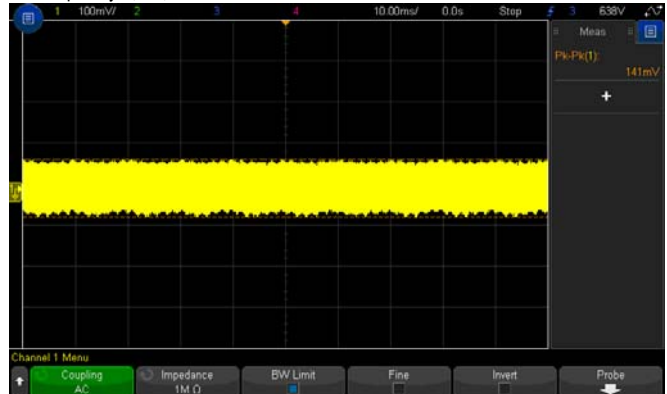
low frequency (V1) :



high frequency (V2) :

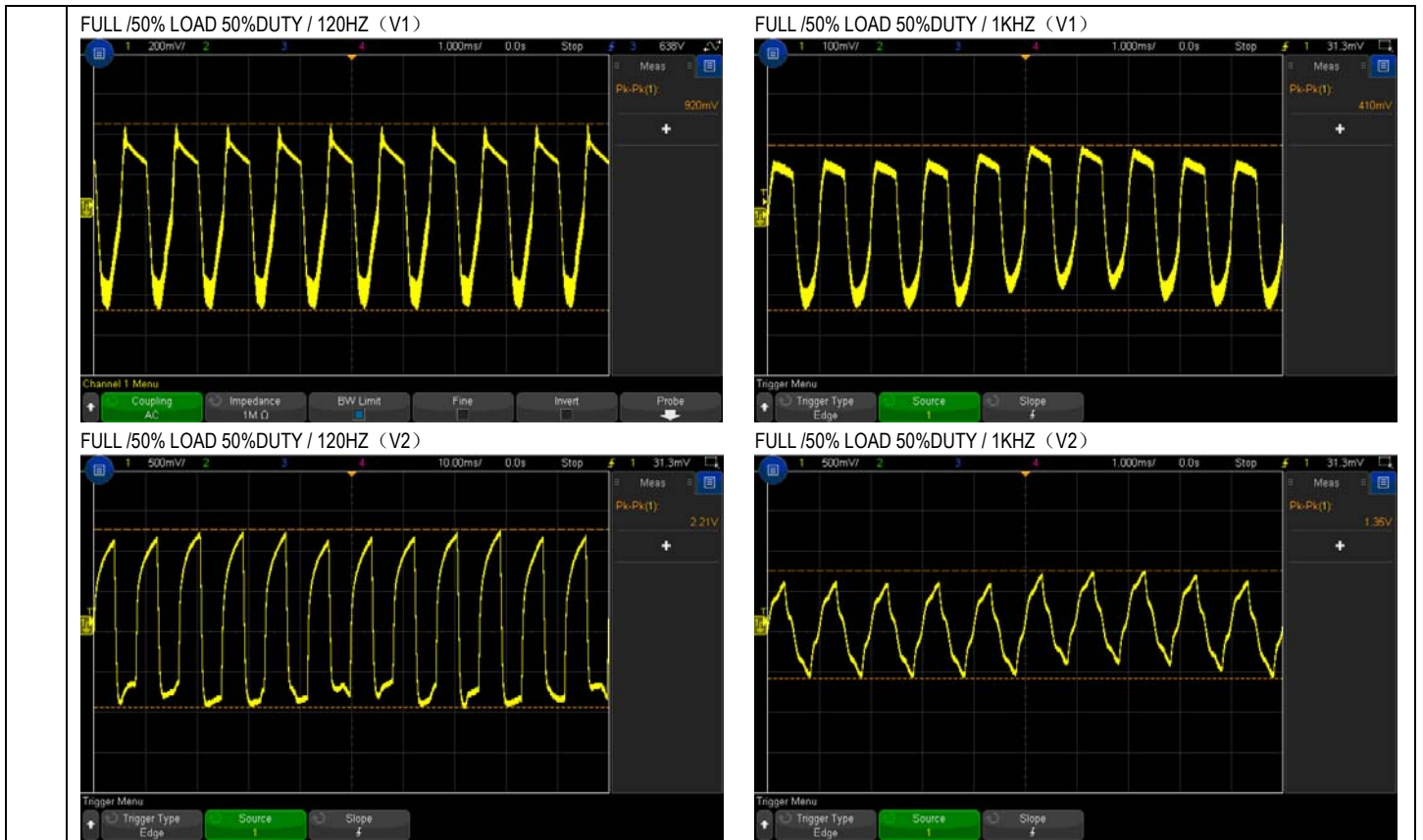


low frequency (V2) :



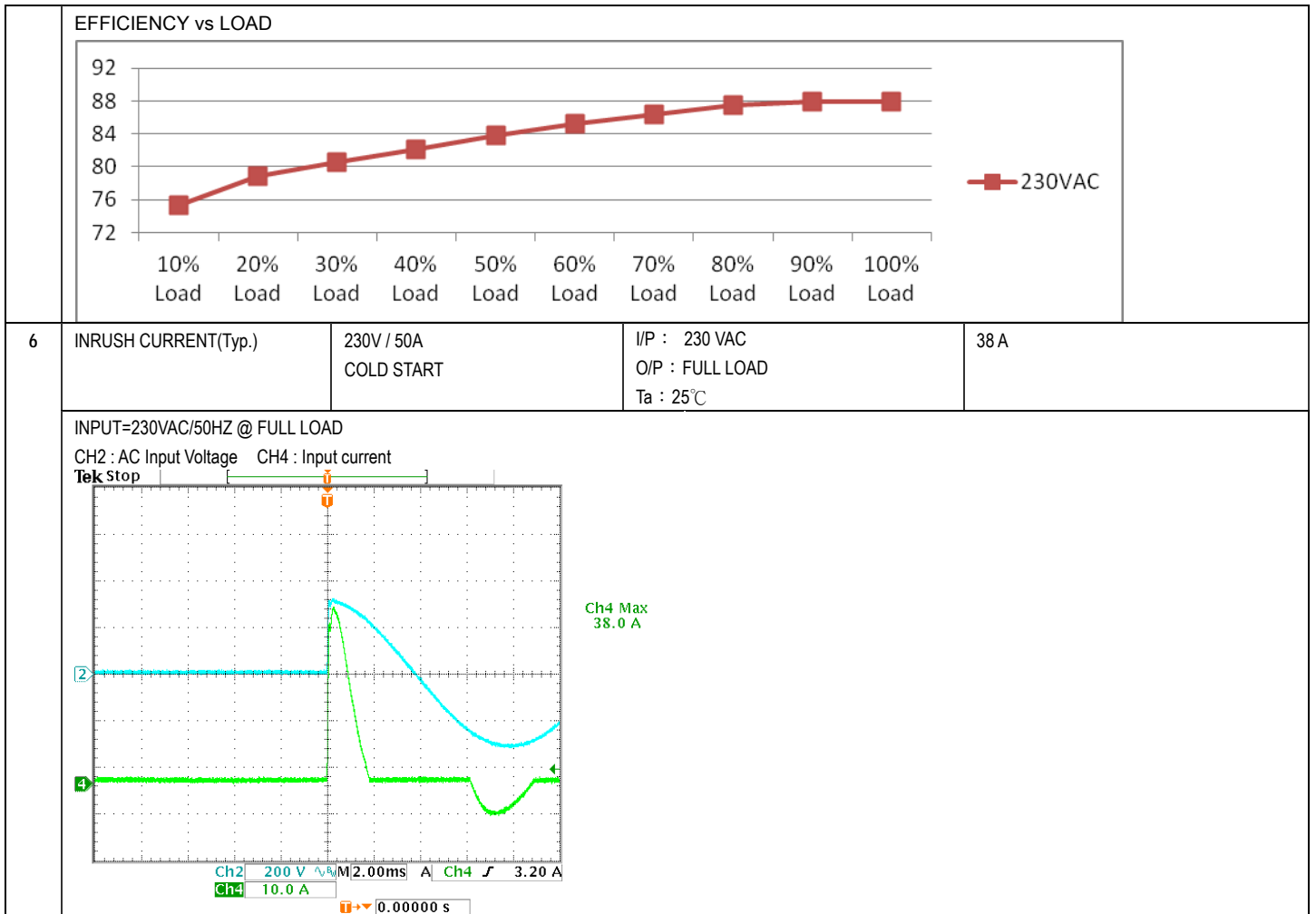
7	SET UP TIME(Max)	230VAC/500ms 115VAC/1200ms	I/P : 230 VAC I/P : 115 VAC O/P : FULL LOAD Ta : 25°C	230VAC/ 400 ms 115VAC/346 ms
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	<p>INPUT=230VAC/50HZ @ FULL LOAD CH1 : Output Voltage CH2 : AC Input Voltage</p>	<p>INPUT=115VAC/60HZ @ FULL LOAD CH1 : Output Voltage CH2 : AC Input Voltage</p>	
<p>8 RISE TIME (Max)</p>	<p>230VAC/20ms 115VAC/30ms</p>	<p>I/P : 230 VAC I/P : 115 VAC O/P : FULL LOAD Ta : 25°C</p>	<p>230VAC/ 14.1 ms 115VAC/ 13.5 ms</p>
	<p>INPUT=230VAC/50HZ @ FULL LOAD CH1 : Output Voltage</p>		<p>INPUT=115VAC/60HZ @ FULL LOAD CH1 : Output Voltage</p>
<p>9 HOLD UP TIME (Typ.)</p>	<p>230VAC/25ms 115VAC/30ms</p>	<p>I/P : 230 VAC I/P : 115 VAC O/P : FULL LOAD Ta : 25°C</p>	<p>230VAC/ 44 ms 115VAC/ 38 ms</p>
	<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>
<p>10 DYNAMIC LOAD</p>	<p>V1: 1200 mVp-p V2: 4800 mVp-p</p>	<p>I/P: 230VAC O/P: (1)FULL /50% LOAD 50%DUTY / 120HZ (2)FULL /50% LOAD 50%DUTY / 1KHZ Ta:25°C</p>	<p>(1) (2) V1: 920 mVp-p 410 mVp-p V2: 2210 mVp-p 1350 mVp-p</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	80V~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/ 2A 115V/ 3A	I/P : 230 VAC I/P : 115 VAC O/P : FULL LOAD Ta : 25°C	I =1.08A/ 230VAC I =1.96A/ 115VAC
4	LEAKAGE CURRENT	<2 mA / 240 VAC	I/P : 240 VAC O/P : Min LOAD Ta : 25°C	0.58 mA
5	EFFICIENCY(Typ.)	86%	I/P:230 VAC O/P:FULL LOAD Ta:25°C	87.87%



### PROTECTION FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	OVER LOAD PROTECTION	110%~150%	I/P: 264VAC I/P: 230VAC I/P: 88VAC O/P: TESTING Ta:25°C	136.7%/ 264VAC 137.9%/ 230VAC 142.6%/88VAC PROTECTION TYPE : Hiccup mode, recovers automatically after fault condition is removed
2	OVER VOLTAGE PROTECTION	13.8V~16.2V	I/P: 264VAC I/P: 230VAC I/P: 88VAC O/P: MIN LOAD Ta:25°C	14.7V/ 264VAC 14.7V/ 230VAC 14.7V/ 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°C	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) 853V (2) 861V (3) 612V
2	O/P Diode	D55 Rated : 400 V  D60 Rated : 200 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 D60 (1) 346V (1) 115V (2) 338V (2) 125V (3) 330V (3) 107V
3	Input Capacitor Voltage	C5 Rated :330 $\mu$ / 200 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) 192V (2) 188V (3) 188V (4) 186 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) 15.7V (2) 16.9V (3) 15.9V (4) 15.1V (5) 13.9V
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) 756V (2) 555V

### 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:4.12mA I/P-FG:2.18mA O/P-FG:1.28mA NO DAMAGE
2	ISOLATION RESISTANCE	I/P-O/P:500VDC>100M $\Omega$ I/P- FG:500VDC>100M $\Omega$ O/P- FG:500VDC>100M $\Omega$	I/P-O/P: 600 VDC I/P- FG: 600 VDC Ta:25°C	I/P-O/P: 9999M $\Omega$ I/P-FG: 9999M $\Omega$ O/P-FG: 9999M $\Omega$ NO DAMAGE
3	GROUNDING CONTINUITY	FG(PE) TO CHASSIS OR TRACE < 100 m $\Omega$	40 A / 2min Ta: 25°C/70%RH	7m $\Omega$







2	OVER LOAD BURN-IN TEST	NO DAMAGE 1 HOUR ( MIN )	I/P : 230 VAC O/P : 115% LOAD Ta : 25°C	TEST : OK
3	LOW TEMPERATURE TURN ON TEST	TURN ON AFTER 2 HOUR	I/P : 264VAC/88VAC O/P : 100 % LOAD Ta= -25°C	TEST : OK
4	HIGH HUMIDITY HIGH TEMPERATURE HIGH VOLTAGE TURN ON TEST	AFTER 12 HOURS IN CHAMBER ON CONTROL45°C /95 %R.H NO DAMAGE	I/P : 272 VAC O/P : FULL LOAD Ta=45 °C HUMIDITY= 95 %R.H	TEST : OK
5	TEMPERATURE COEFFICIENT	± 0.03%/°C (0~50°C)	I/P : 230 VAC O/P : FULL LOAD	± 0.01%/°C (0~50°C)
6	STORAGE TEMPERATURE TEST	1. Thermal shock Temperature : -45°C~ +90°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 : STATIC		TEST : OK
7	THERMAL SHOCK TEST	1. Thermal shock Temperature : -30°C~ +50°C 2. Temperature change rate : 25°C / 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°C		TEST : OK
9	CAPACITOR LIFE CYCLE	SUPPOSE C62 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=45 °C LIFE TIME (3) I/P : 230VAC O/P : 75% LOAD Ta=45 °C LIFE TIME (4) I/P : 230VAC O/P : 50% LOAD Ta= 45 °C LIFE TIME		(1) 71715.8HRS (2) 19783.7HRS (3) 30934.5 HRS (4) 44504.5HRS
10	MTBF	Conducted by Parts Stress Analysis Prediction 218.2K 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