



Test Report: NPP-450-12

450W High Reliable Ultra Wide Output Range Battery
Charger & Power Supply 2-in-1

■ 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

Battery Charger mode

■ DESIGN VERIFY TEST

OUTPUT FUNCTION TEST

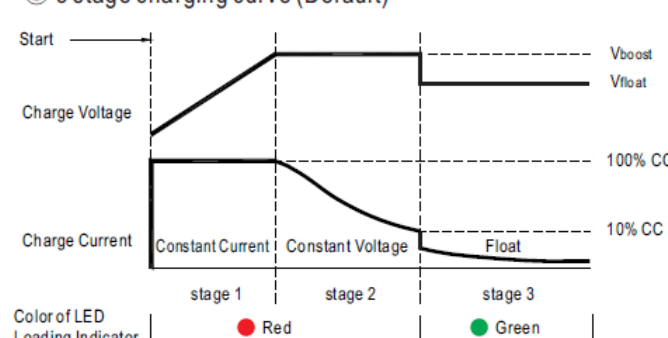
NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	BOOST CHARGE VOLTAGE (default)	14.4V± 0.24 V	I/P: 230 VAC O/P: CC=90% LOAD Ta:25°C	14.446 V
2	FLOAT CHARGE VOLTAGE (default)	13.8V± 0.12 V	I/P: 230 VAC O/P:NO LOAD Ta:25°C	13.847 V
3	MAX. OUTPUT CURRENT	25A± 0.25 A	I/P: 230 VAC O/P:C.V MODE-1V Ta:25°C	25.055 A
4	MAX. POWER	420W	I/P: 230 VAC O/P:C.V =16.8V Ta:25°C	420.6W
5	OUTPUT VOLTAGE ADJUST RANGE	10.5 V~ 21 V	I/P : 230 VAC O/P : CC=90% LOAD Ta : 25°C	9.846~21.979V
6	CURRENT ADJUSTABLE RANGE	12.5~25A	I/P : 230 VAC O/P : C.V MODE-1V Ta : 25°C	11.988A~26.049A

PROTECTION FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	SHORT PROTECTION	SHORT EVERY OUTPUT 1 HOUR NO DAMAGE Constant current Range: 22.5 ~30A PROTECTION TYPE : Constant current limiting, charger will shutdown after 5 sec, re-power on to recover	I/P: 264 VAC O/P: BAT. LOAD Ta:25°C	NO DAMAGE Constant current Range: 25.08 A PROTECTION TYPE : Constant current limiting, charger will shut down after 5 sec, re-power on to recover
2	OVER VOLTAGE PROTECTION	21.5V~26V PROTECTION TYPE : Shut down and latch off o/p voltage, re-power on to recover	I/P: 264VAC I/P: 230VAC I/P: 90VAC O/P:MIN LOAD Ta:25°C	25.1V/ 264VAC 24.9V/ 230VAC 25.1V/ 90VAC PROTECTION TYPE : Shut down and latch off o/p voltage, re-power on to recover
3	OVER TEMPERATURE PROTECTION	Protection type : Shut down O/P voltage, recovers automatically after	I/P: 264VAC I/P: 90VAC O/P:FULL LOAD	O.T.P. Active PROTECTION TYPE : Shut down O/P voltage,

		temperature goes down		recovers automatically after temperature goes down
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CONTROL FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT				
1	FAN SPEED CONTROL	Depends on internal temperature	I/P: 230 VAC O/P:BAT. LOAD Ta:25°C	TEST: <u>OK</u>				
2	REMOTE CONTROL	Rc+ / Rc- OPEN(-0.5V~0.5V) : Charger OFF ; SHORT(10.8V~13.2V):Charger ON	I/P: 230 VAC O/P:BAT. LOAD Ta:25°C	OPEN/SHORT TEST: <u>OK</u> Charger OFF: <u>-0.5V~1.7V</u> Charger ON: <u>1.8~13.2V</u> (1) Remote off Pin= <u>2.95W</u> (2) Remote off Vo= <u>0.09V</u>				
3	CHARGE OK SIGNAL	The TTL signal out, Charger OK = 4.5 ~ 5.5V; Charger failure or protection = -0.5 ~ 0.5V	I/P: 230 VAC O/P:BAT. LOAD Ta:25°C	TEST: Charger OK = <u>5.199</u> V; Charger failure or protection = <u>0.038</u> V				
4	BATTERY FULL SIGNAL	The TTL signal out, Battery full = 4.5 ~ 5.5V . Charging = -0.5 ~ 0.5V	I/P: 230 VAC O/P:BAT. LOAD Ta:25°C	TEST: Battery full = <u>5.189</u> V Charging = <u>0.034</u> V				
5	AUX POWER	OUTPUT VOLTAGE RANGE : 10.8~13.2V OUTPUT RIPPLE&NOISE: 240mVp-p	I/P: 230 VAC O/P:BAT. LOAD Ta:25°C	TEST: <u>11.988</u> V <u>27</u> mVp-p				
6	CHARGING CURVE	I/P:230Vac O/P:TESTING Ta:25°C ◎ 3 stage charging curve (Default)  <table><tr><td>Taper Current</td><td>2.5A±0.25A</td></tr><tr><td>Io</td><td>2.306A</td></tr></table>			Taper Current	2.5A±0.25A	Io	2.306A
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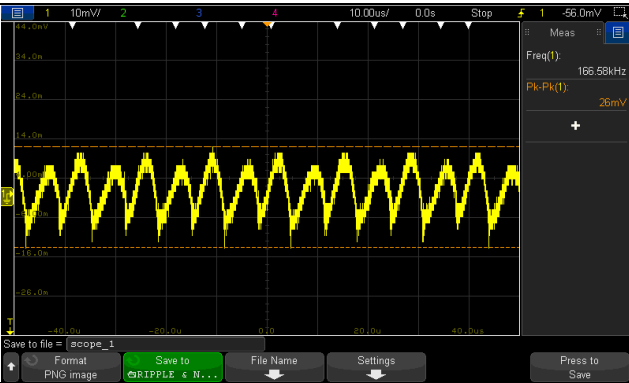
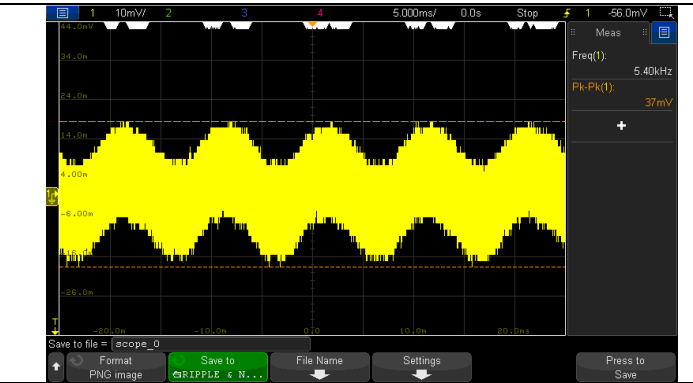
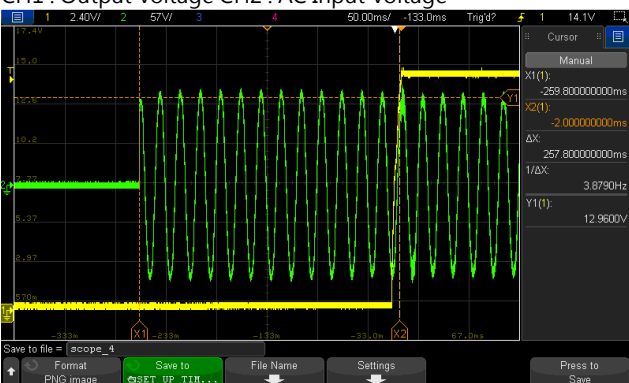
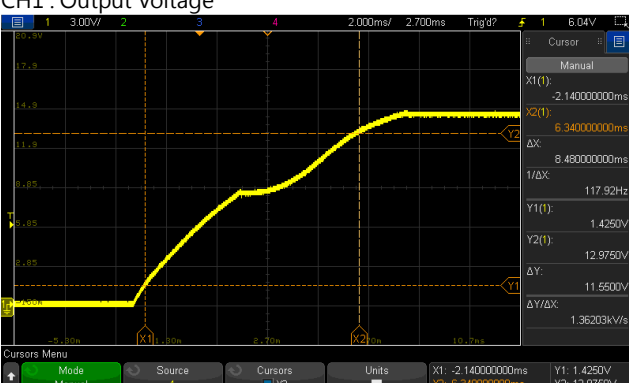
7	LED INDICATOR	LED Indicator	Charger(Default)	Power Supply	TEST : <u>OK</u>
		Green	Float stage(stage 3) or full charged	Normal working	
		Red	Charging(stage 1 or 2)	——	
		NO Light	Abnormal	Abnormal	
		I/P: 230V O/P:TESTING LOAD Ta:25°C			

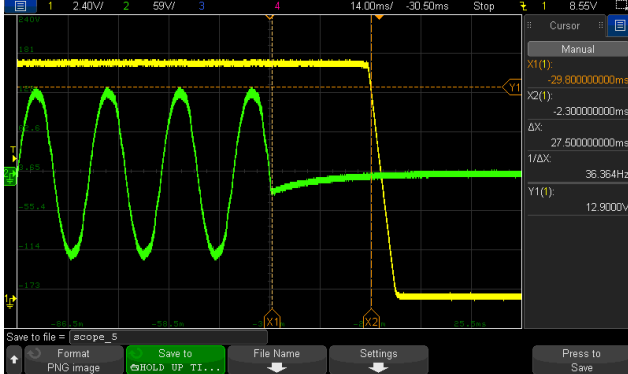
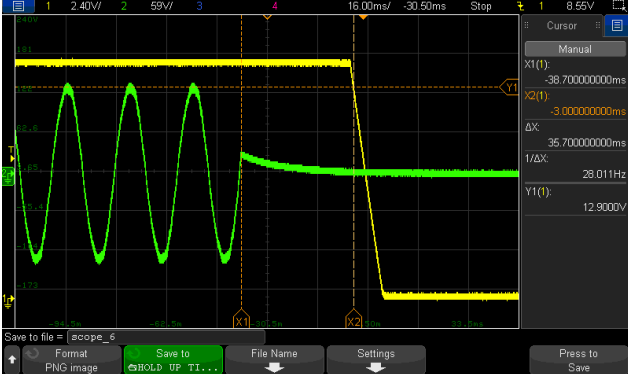
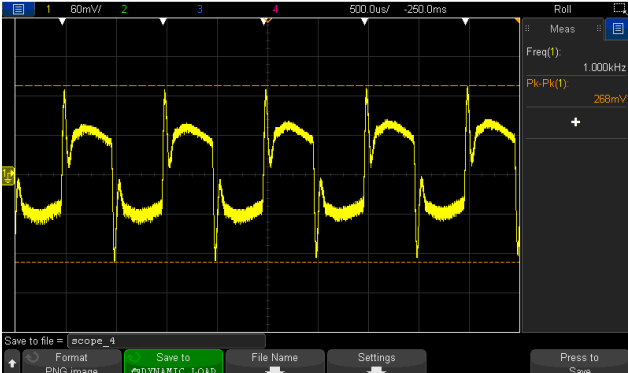
Power Supply mode

■ DESIGN VERIFY TEST

OUTPUT FUNCTION TEST

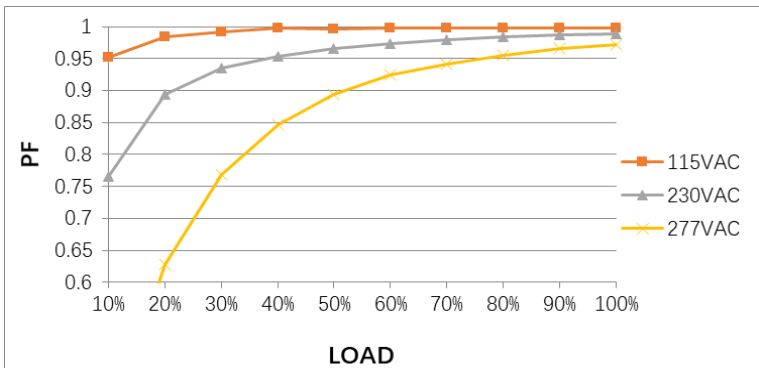
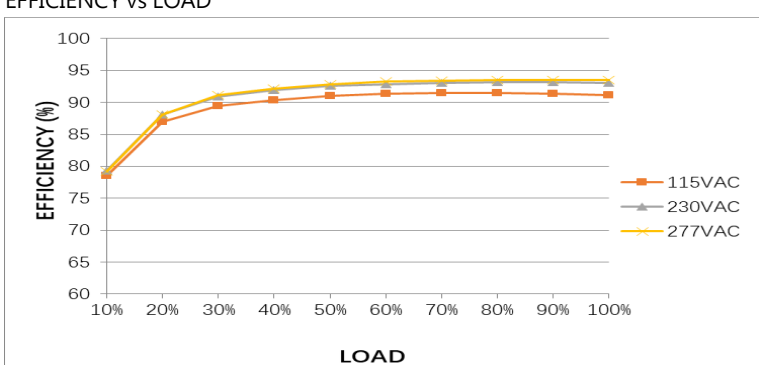
NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	OUTPUT VOLTAGE ADJUST RANGE	CH1: 10.5 V~ 21 V	I/P : 230 VAC I/P : 115 VAC O/P : MIN LOAD Ta : 25°C	9.975V~22.035V/230VAC 9.980V~22.035V/115VAC
2	CURRENT ADJUSTABLE RANGE	12.5~25A	I/P : 230 VAC O/P : TEST LOAD Ta : 25°C	12.325A~25.71A
3	OUTPUT VOLTAGE(Max) TOLERANCE	V1: -1.0 %~ +1.0 %	I/P: 90VAC / 264VAC O/P: FULL / MIN. LOAD Ta: 25°C	V1: -0.191 %~ +0.215 %
4	LINE REGULATION (Max)	V1: -0.5 %~ +0.5 %	I/P: 90VAC~ 264VAC O/P: FULL LOAD Ta: 25°C	V1: -0.042 %~ +0.006 %
5	LOAD REGULATION(Max)	V1: -1.0 %~ +1.0 %	I/P: 230VAC O/P: FULL ~ MIN LOAD Ta: 25°C	V1: -0.191 %~ +0.215 %
6	OVER/UNDERSHOOT TEST	< $\pm 5\%$	I/P: 230VAC O/P: FULL LOAD Ta: 25°C	3.0%
7	RIPPLE & NOISE(Max)	V1: 180 mVp-p	I/P: 230VAC O/P: FULL LOAD Ta: 25°C	V1: 37 mVp-p
	high frequency : low frequency :			

				
8	SET UP TIME(Max)	230VAC/1800ms	I/P : 230 VAC O/P : FULL LOAD Ta : 25°C	257.8 ms
INPUT=230VAC/50HZ @ FULL LOAD CH1 : Output Voltage CH2 : AC Input Voltage 				
9	RISE TIME (Max)	230VAC/60ms	I/P : 230 VAC O/P : FULL LOAD Ta : 25°C	8.48 ms
INPUT=230VAC/50HZ @ FULL LOAD CH1 : Output Voltage 				
10	HOLD UP TIME (Typ.)	230VAC/FULL LOAD /10ms 230VAC/75% LOAD /16ms	I/P : 230 VAC O/P : FULL LOAD Ta : 25°C	230VAC/FULL LOAD /27.5 ms 230VAC/75% LOAD /35.7 ms
INPUT=230VAC/50HZ @ FULL LOAD CH1 : Output Voltage CH2 : AC Input Voltage			INPUT=230VAC/50HZ @ 75% LOAD CH1 : Output Voltage CH2 : AC Input Voltage	

				
11	DYNAMIC LOAD	V1: 1440 mVp-p	I/P: 230VAC O/P: (1)FULL /50% LOAD 50%DUTY / 120HZ (2)FULL /50% LOAD 50%DUTY / 1KHZ Ta:25°C	321mVp-p/ 120HZ 268 mVp-p / 1KHZ
	FULL /50% LOAD 50%DUTY / 120HZ 		FULL /50% LOAD 50%DUTY / 1KHZ 	
12	TRANSIENT RECOVERY TIME	V1: 1440 mVp-p	I/P: 230VAC O/P:40% LOAD CHANGE 50%DUTY/120HZ 1.25A/us	503 mVp-p

INPUT FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	INPUT VOLTAGE RANGE	90VAC~264VAC 127VDC~ 370VDC	(1) I/P:TESTING O/P:FULL LOAD (2) I/P:DC TESTING(L:+ N:-) O/P: FULL / 50% LOAD (3) I/P:DC TESTING(L:- N:+) O/P: FULL / 50% LOAD Ta:25°C	(1) 86.65 V~264V (2) 115Vdc~370Vdc/FULL LOAD 115Vdc~370Vdc/50% LOAD (3) 115 Vdc~370Vdc/FULL LOAD 115Vdc~370Vdc/50% LOAD

			I/P: LOW-LINE-3V=87 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:90 VAC ~264 VAC O/P:FULL~MIN LOAD Ta:25°C	TEST: OK																																												
3	INPUT CURRENT (Typ.)	230V/ 2.2 A 115V/ 4.5 A	I/P : 230 VAC I/P : 115 VAC O/P : FULL LOAD Ta : 25°C	I =1.9836A/ 230VAC I =4.101A/ 115VAC																																												
6	POWER FACTOR (Typ.)	0.95/ 230VAC 0.98/115VAC	I/P : 230 VAC I/P : 115 VAC O/P : FULL LOAD Ta : 25°C	PF=0.988/230VAC PF=0.997/115VAC																																												
P.F vs LOAD  <table border="1"><caption>P.F vs LOAD Data (Approximate)</caption><thead><tr><th>LOAD (%)</th><th>115VAC PF</th><th>230VAC PF</th><th>277VAC PF</th></tr></thead><tbody><tr><td>10</td><td>0.95</td><td>0.75</td><td>-</td></tr><tr><td>20</td><td>0.98</td><td>0.88</td><td>0.62</td></tr><tr><td>30</td><td>0.99</td><td>0.95</td><td>0.78</td></tr><tr><td>40</td><td>0.99</td><td>0.97</td><td>0.85</td></tr><tr><td>50</td><td>0.99</td><td>0.98</td><td>0.90</td></tr><tr><td>60</td><td>0.99</td><td>0.98</td><td>0.93</td></tr><tr><td>70</td><td>0.99</td><td>0.98</td><td>0.95</td></tr><tr><td>80</td><td>0.99</td><td>0.98</td><td>0.96</td></tr><tr><td>90</td><td>0.99</td><td>0.98</td><td>0.97</td></tr><tr><td>100</td><td>0.99</td><td>0.98</td><td>0.98</td></tr></tbody></table>					LOAD (%)	115VAC PF	230VAC PF	277VAC PF	10	0.95	0.75	-	20	0.98	0.88	0.62	30	0.99	0.95	0.78	40	0.99	0.97	0.85	50	0.99	0.98	0.90	60	0.99	0.98	0.93	70	0.99	0.98	0.95	80	0.99	0.98	0.96	90	0.99	0.98	0.97	100	0.99	0.98	0.98
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7	EFFICIENCY(Typ.)	92%	I/P:230 VAC O/P:FULL LOAD Ta:25°C	92.535 %																																												
EFFICIENCY vs LOAD  <table border="1"><caption>EFFICIENCY vs LOAD Data (Approximate)</caption><thead><tr><th>LOAD (%)</th><th>115VAC Efficiency (%)</th><th>230VAC Efficiency (%)</th><th>277VAC Efficiency (%)</th></tr></thead><tbody><tr><td>10</td><td>78</td><td>78</td><td>78</td></tr><tr><td>20</td><td>88</td><td>88</td><td>88</td></tr><tr><td>30</td><td>90</td><td>91</td><td>91</td></tr><tr><td>40</td><td>91</td><td>92</td><td>92</td></tr><tr><td>50</td><td>91</td><td>92</td><td>93</td></tr><tr><td>60</td><td>91</td><td>92</td><td>93</td></tr><tr><td>70</td><td>91</td><td>92</td><td>93</td></tr><tr><td>80</td><td>91</td><td>92</td><td>93</td></tr><tr><td>90</td><td>91</td><td>92</td><td>93</td></tr><tr><td>100</td><td>91</td><td>92</td><td>93</td></tr></tbody></table>					LOAD (%)	115VAC Efficiency (%)	230VAC Efficiency (%)	277VAC Efficiency (%)	10	78	78	78	20	88	88	88	30	90	91	91	40	91	92	92	50	91	92	93	60	91	92	93	70	91	92	93	80	91	92	93	90	91	92	93	100	91	92	93
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70	91	92	93																																													
80	91	92	93																																													
90	91	92	93																																													
100	91	92	93																																													
8	INRUSH CURRENT(Typ.)	230V/50A COLD START	I/P : 230 VAC O/P : FULL LOAD Ta : 25°C	I = 44.7 A/ 230VAC T50= 1.122ms/230V																																												
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	105 %~ 115 % PROTECTION TYPE : Constant current limiting, unit will shut down after 5 sec, re-power on to recover	I/P: 264VAC I/P: 230VAC I/P: 100VAC O/P: TESTING Ta:25°C	110.78%/ 264VAC 110.70%/ 230VAC 110.70%/100VAC PROTECTION TYPE : Constant current limiting, unit will shut down after 5 sec, re-power on to recover
2	OVERVOLTAGE PROTECTION	21.5V~26V PROTECTION TYPE : Shut down and latch off o/p voltage, re-power on to recover	I/P: 264VAC I/P: 230VAC I/P: 90VAC O/P: MIN LOAD Ta:25°C	25.1V/ 264VAC 24.9V/ 230VAC 25.1V/ 90VAC PROTECTION TYPE : Shut down and latch off o/p voltage, re-power on to recover
3	OVER TEMPERATURE PROTECTION	Protection type : Shut down O/P voltage, recovers automatically after temperature goes down	I/P: 264VAC I/P: 90VAC O/P: FULL LOAD	O.T.P. Active OK PROTECTION TYPE : Shut down O/P voltage, recovers automatically after temperature goes down
4	SHORT PROTECTION	SHORT EVERY OUTPUT 1 HOUR NO DAMAGE Constant current Range: 22.5 ~30A PROTECTION TYPE : Constant current limiting, charger will shut down after 5 sec, re-power on to recover	I/P: 264 VAC O/P: BAT. LOAD Ta:25°C	NO DAMAGE Constant current Range: 25.077 A PROTECTION TYPE : Constant current limiting, charger will shut down after 5 sec, re-power on to recover

CONTROL FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	FAN SPEED CONTROL	Depends on internal temperature	I/P: 230 VAC O/P: testing Ta:25°C	TEST: <u>OK</u>
2	REMOTE CONTROL	OPEN : POWER OFF ; SHORT : POWER ON	I/P: 230 VAC O/P: FULL. LOAD Ta:25°C	OPEN/SHORT TEST: <u>OK</u>
3	DC OK	The TTL signal out, DC OK = 4.5 ~ 5.5V; Power supply failure or protection = -0.5 ~ 0.5V	I/P: 230 VAC O/P: BAT. LOAD Ta:25°C	TEST: Charger OK = <u>5.196</u> V; Charger failure or protection = <u>0.038</u> V

COMPONENT STRESS TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	PWM Transistor (D to S) or (C to E) Peak Voltage	Q 5/Q6 Rated : 25A/ 600 V	AC ON/OFF I/P: High-Line +3V =267V VDS: O/P: (1) Full Load (2) Output Short (3) Dynamic Load Full Load/ Min. Load 90%Duty/1KHz (4) Dynamic Load Full Load/ Min. Load 90%Duty/3KHz (5) Dynamic Load Full Load/ Min. Load 90%Duty/5KHz (6) Dynamic Load 100% Load/ Min. Load 50%Duty/120Hz (7)0%→400% Load. Ta:25°C	Q5 VDS: (1) 490 V (2) 498 V (3) 486V (4) 486V (5) 486V (6) 490V (7) 478V Q6 VDS: (1) 482V (2) 498V (3) 482V (4) 482V (5) 486V (6) 478V (7) 466V
2	P.F.C Transistor (D to S) or (C to E) Peak Voltage	Q1 Rated : 18A/ 600 V	I/P: High-Line +3V =267 V AC ON/OFF O/P: (1)Full Load (2)Output Short (3) Dynamic Load Full Load/ Min. Load 90%Duty/1KHz (4) Dynamic Load Full Load/ Min. Load 90%Duty/3KHz (5) Dynamic Load Full Load/ Min. Load 90%Duty/5KHz (6) Dynamic Load 100% Load/ Min. Load 50%Duty/120Hz (7)0%→400% Load. Ta:25°C	VDS: (1) 514V (2) 479V (3) 514V (4) 514V (5) 514V (6) 510V (7) 462V

3	AUX MOS	U600 Rated : 0.88A / 725V	I/P: High-Line +3V =267 V AC ON/OFF O/P: (1)Full Load (2)Output Short (3) Dynamic Load Full Load/ Min. Load 90%Duty/1KHz (4) Dynamic Load Full Load/ Min. Load 90%Duty/3KHz (5) Dynamic Load Full Load/ Min. Load 90%Duty/5KHz (6) Dynamic Load 100% Load/ Min. Load 50%Duty/120Hz (7)0%→400% Load. Ta:25°C	VDS: (1) 640V (2) 618V (3) 640V (4) 632V (5) 640V (6) 640V (7) 612V
4	P.F.C DIODE	D 19 Rated : 6 A /650 V	I/P:High-Line +3V =267 V AC ON/OFF O/P: (1)Full Load (2)Output Short (3)Dynamic Load Full Load/ Min. Load 90%Duty/5KHz (4)Dynamic Load 100% Load/ Min. Load 50%Duty/120Hz Ta:25°C	(1) 466V (2) 450 V (3) 466 V (4) 466 V
5	Diode Peak Voltage	Q211 / Q213Rated : 120 A/ 60 V	AC ON/OFF I/P:High-Line +3V =267 V Vo=Vmax O/P: (1)Full Load (2)Output Short (3)Dynamic Load Full Load/ Min. Load 90%Duty/1KHz (4)Dynamic Load Full Load/ Min. Load 90%Duty/3KHz (5)Dynamic Load Full Load/ Min. Load 90%Duty/5KHz (6)Dynamic Load 100% Load/ Min. Load 50%Duty/120Hz (7)0%→400% Load. (8)NO LOAD Vo=Normal O/P: (1)Full Load (2) Before Burst Mode Ta:25°C	Q211 VDS: Vo=Vmax (1) 51.9V (2) 51.1V (3) 51.8V (4) 51.4V (5) 51.4V (6) 52.2V (7) 51.4V (8) 47.0V Vo=Normal (1) 44.2V (2) 36.7V Q213 VDS: Vo=Vmax (1) 51.2V (2) 57.0V (3) 51.2V (4) 51.2V (5) 51.2V (6) 51.6V (7) 50.4V (8) 48.8V Vo=Normal (1) 46.8V (2) 40.4V
6	Input Capacitor Voltage	C5 Rated: 220u / 450 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)444V (2)440V (3)444V (4)438V



450W High Reliable Ultra Wide Output Range Battery Charger & Power Supply 2-in-1

NPP-450 series

7	Control IC Voltage Test	PWM IC U3Rated 8.9V~15.5V	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	U3 (1) 13.7V (2) 13.7V (3) 13.7V (4) 13.9V (5) 13.7V	U801 (1) 10.30V (2) 10.50V (3) 10.30V (4) 10.10V (5) 10.30V
		PFC IC U2Rated 11V~26V O/P IC U801 Rated 4.5V~36V U100 Rated 6.5V~35V		U2 (1) 14.3V (2) 14.3V (3) 14.3V (4) 14.6V (5) 14.6V	U100 (1) 12.5V (2) 13.7V (3) 12.5V (4) 12.7V (5) 12.5V

■ SAFETY& E.M.C. TEST

SAFETY TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	WITHSTAND VOLTAGE	I/P-O/P: 3KVAC/min I/P-FG :2KVAC/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:3.66mA I/P-FG:3.58mA O/P-FG:1.28mA NO DAMAGE
2	ISOLATION RESISTANCE	I/P-O/P:500VDC>100MΩ I/P-FG: 500VDC>100MΩ O/P-FG:500VDC>100MΩ	I/P-O/P: 500 VDC I/P-FG: 500 VDC O/P-FG: 500 VDC Ta:25°C	I/P-O/P: 9999MΩ I/P-FG: 9999MΩ O/P-FG: 9999MΩ NO DAMAGE
3	GROUNDING CONTINUITY	FG(PE) TO CHASSIS OR TRACE < 100 mΩ	40A / 2min Ta:25°C	18mΩ

E.M.C TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	HARMONIC	BS EN/EN61000-3-2 CLASS A	I/P:230VAC/50HZ O/P:FULL LOAD Ta:25°C	PASS
2	CONDUCTION	BS EN/EN 55032 (CISPR32), BS EN / EN55014-1 CLASS B	I/P: 230 VAC (50HZ) O/P:FULL/50% LOAD Ta:25°C	PASS Test by certified Lab
3	RADIATION	BS EN/EN 55032 (CISPR32), BS EN / EN55014-1 CLASS B	I/P:230VAC/50HZ O/P:FULL/50% LOAD Ta:25°C	PASS Test by certified Lab
4	E.S.D	BS EN/EN61000-4-2 AIR : 8KV / Contact : 4KV	I/P:230VAC/50HZ O/P:FULL LOAD Ta:25°C	CRITERIA A



5	E.F.T	BS EN/EN61000-4-4 INPUT: 1KV	I/P:230VAC/50HZ O/P:FULL LOAD Ta:25°C	CRITERIA A
6	SURGE	BS EN/EN 61000-4-5 L-N :1KV L,N-PE:2KV	I/P:230VAC/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 : NPP-450-12 1. ROOM AMBIENT BURN-IN : 2 HRS I/P : 230VAC O/P : FULL LOAD Ta= 26.2 °C 2. HIGH AMBIENT BURN-IN : 2 HRS I/P : 230VAC O/P : FULL LOAD Ta= 50.8 °C		

			NO	Position	ROOM AMBIENT Ta= 26.2 °C	HIGH AMBIENT Ta=50.8°C
			1	ZNR1	31.9°C	59.2°C
			2	LF1	34.0°C	60.8°C
			3	RY1	37.8°C	63.8°C
			4	U3	38.4°C	64.9°C
			5	RTH2	35.1°C	61.1°C
			6	LF2	38.3°C	65.0°C
			7	C2	35.8°C	62.2°C
			8	C8	41.9°C	68.8°C
			9	BD1	42.1°C	68.8°C
			10	R18	45.8°C	73.3°C
			11	C24	39.6°C	66.1°C
			12	C5	42.8°C	67.7°C
			13	L1	51.0°C	79.3°C
			14	C60	48.6°C	75.1°C
			15	Q2	44.6°C	71.1°C
			16	TSW1	35.6°C	61.1°C
			17	Q5	39.4°C	65.4°C
			18	T1	63.8°C	90.1°C
			19	T600	43.7°C	69.3°C
			20	U600	50.9°C	76.6°C
			21	RTH5	42.8°C	68.7°C
			22	Q211	50.0°C	77.7°C
			23	Q213	45.1°C	71.6°C
			24	C111	38.8°C	64.4°C
			25	C113	38.4°C	63.9°C
			26	LF100	38.8°C	65.2°C
			27	U150	37.0°C	62.4°C
			28	U801	29.8°C	55.0°C
			29	C830	28.1°C	53.0°C
			30	J102	51.2°C	77.2°C
			31	U100	60.0°C	87.6°C
			32	R210	54.7°C	82.8°C
			33	D651	45.9°C	70.7°C
			34	D19	47.0°C	73.8°C
			35	U2	43.4°C	70.0°C
			36	Q632	43.1°C	69.3°C
2	LOW TEMPERATURE TURN ON TEST	TURN ON AFTER 2 HOUR	I/P : 230VAC/100VAC O/P : 100 %LOAD Ta= -35°C		TEST : OK	
3	HIGH HUMIDITY HIGH TEMPERATURE HIGH VOLTAGE TURN ON TEST	AFTER 12 HOURS IN CHAMBER ON CONTROL 50 °C NO DAMAGE	I/P : 272 VAC O/P : FULL LOAD Ta= 50.1 °C HUMIDITY= 95 %R.H		TEST : OK	
4	TEMPERATURE COEFFICIENT	± 0.05%/ (0°C~50°C)	I/P : 230 VAC O/P : FULL LOAD		0.0061 %/°C(0~50°C)	

5	STORAGE TEMPERATURE TEST	-40~85°C	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 : 10CYCLE 5. Input/Output condition : STATIC
6	THERMAL SHOCK TEST	-30~50°C	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 : 16 CYCLE 5. Input/Output condition : 15cycle:230V/ FULL LOAD AC ON 3sec/AC OFF 1sec TEST 1cycle:230V/ FULL LOAD Burn In Test
7	VIBRATION TEST	10 ~ 500Hz, 2G 10min./1cycle, 60min. each along X, Y, Z axes	1 Carton & 1 Set (1) Waveform : Sine Wave (2) Frequency : 10~500Hz (3) Sweep Time : 10min/sweep cycle (4) Acceleration : 3G (5) Test Time : 180min in each axis (X.Y.Z) (6) Ta : 25°C
8	CAPACITOR LIFE CYCLE	SUPPOSE C111 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= 50 °C LIFE TIME (3) I/P : 230VAC O/P : 75% LOAD Ta= 50 °C LIFE TIME (4) I/P : 230VAC O/P : 50% LOAD Ta= 50 °C LIFE TIME	(1) 1666932.8HRS (2) 274941.4HRS (3) 421577.4HRS (4) 571813.7HRS
9	MTBF	Conducted by Parts Stress Analysis Prediction 352.3K hrs min. Telcordia SR-332 (Bellcore) ; 118.5K hrs min. MIL-HDBK-217F (25°C)	
10	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

2020.10.1 TAG-QA-009