Test Report: ES-S2200

2400W Portable power supply

■ DESIGN VERIFY TEST

Output Function Test
Input Function Test
Protection Function Test
Control Function 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 for AC	230V@50HZ for CN 230V@50HZ for EU 120V@60HZ for US	I/P： NONE O/P：FULL LOAD Ta：25℃	227.8V for CN 230.2V for EU 121.7V for US
2	FREQUENCE	230V@50HZ for CN 230V@50HZ for EU 120V@60HZ for US	I/P： NONE O/P：FULL LOAD Ta：25℃	49.91 for CN 49.92 for EU 59.81 for US
2	AC OUTPUT REGULATION	-10% ~ +10%	I/P: BAT O/P:MIN~FULL LOAD Ta:25℃	-0.46%~+0.45% for CN -0.52%~+0.56% for EU -0.54%~+0.96%for US
3	TRANSFER TIME（UPS）	20ms	I/P: AC IN→BAT O/P:ND LOAD/FULL LOAD Ta:25℃	17.1ms for CN 17.7ms for EU 18.5ms for US
4	THD	≤3%	I/P: NONE O/P: FULL LOAD Ta:25℃	1.73%@50HZ for CN 1.72%@50HZ for EU 1.81%@60HZ for US
5	OUTPUT VOLTAGE for USB-C1	5V/3A 9V/3A 12V/3A 15V/3A 20V/5A	I/P: NONE O/P: FULL LOAD Ta:25℃	5.112V/3A 9.040V/3A 12.045V/3A 14.881V/3A 19.705V/5A
	OUTPUT VOLTAGE for USB-C2	5V/3A 9V/3A 12V/3A 15V/3A 20V/2.25A	I/P: NONE O/P: FULL LOAD Ta:25℃	5.021V/3A 9.023V/3A 12.036V/3A 15.037V/3A 20.052V/2.25A
6	RIPPLE & NOISE for USB-C1	200mVp-p	I/P: NONE O/P: FULL LOAD Ta:25℃	24 mVp-p /5V 29 mVp-p /9V 34 mVp-p /12V 37 mVp-p /15V 42 mVp-p /20V
	RIPPLE & NOISE for USB-C2	200mVp-p	I/P: NONE O/P: FULL LOAD Ta:25℃	29 mVp-p /5V 37 mVp-p /9V 42 mVp-p /12V 42 mVp-p /15V 39 mVp-p /20V
7	LOAD REGULATION for USB-C1	-5% ~ +5%	I/P: NONE O/P: MIN~FULL LOAD Ta:25℃	-0.83%~ +0.76%/5V -0.48%~ +0.36%/9V -0.37%~ +0.25%/12V -0.92%~ +0.88%/15V -1.19%~ +1.19%/20V

	LOAD REGULATION for USB-C2	-5% ~ +5%	I/P: NONE O/P: MIN~FULL LOAD Ta:25℃	-0.71%~ +1.42%/5V -0.38%~ +0.86%/9V -0.29%~ +0.63%/12V -0.24%~ +0.51%/15V -0.13%~ +0.15%/20V
8	OUTPUT VOLTAGE for USB-A	5V/3A 9V/2A 12V/1.5A	I/P: NONE O/P: FULL LOAD Ta:25℃	4.991/5V 8.996/9V 11.969/12V
9	RIPPLE & NOISE for USB-A	200mVp-p	I/P: NONE O/P: FULL LOAD Ta:25℃	48 mVp-p /5V 45 mVp-p /9V 50 mVp-p /12V
10	LOAD REGULATION for USB-A	-5% ~ +5%	I/P: NONE O/P: FULL LOAD / NO LOAD Ta:25℃	0.48%~ +3.6%/5V 0.17%~ +2.8%/9V 0.1%~ +0.42%/12V
11	OUTPUT VOLTAGE for DC5525	12V/10A	I/P: NONE O/P: Ta:25℃	12.819V
12	RIPPLE & NOISE for DC5525	300mVp-p	I/P: NONE O/P: Ta:25℃	43 mVp-p
13	LOAD REGULATION for DC5525	-20% ~ +20%	I/P: NONE O/P: FULL LOAD / NO LOAD Ta:25℃	-2.83%~ +2.52%
14	TOTLE POWER	2400W for CN&EU 2000W for US	I/P: NONE O/P:2400W for CN&EU O/P:2000W for US Ta:25℃	Test: OK
15	PEAK POWER	4800W/300ms for CN&EU 4000W/300 ms for US	I/P: NONE O/P: 3600W for CN&EU O/P: 2400W for CUS Ta:25℃	432ms for CN 460ms for EU 380ms for US

INPUT FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	INPUT VOLTAGE RANGE For AC	200~240VAC for CN&EU 100~120VAC for US	I/P: Testing O/P: :NO LOAD Ta:25℃	181V~240VAC for CN 185V~250VAC for EU 92V~143VAC for US
2	INPUT VOLTAGE RANGE For DC	12~59V	I/P: Testing O/P:NO LOAD Ta:25℃	10.3~59VDC
3	INPUT CURRENT AC（2000W max for CN&EU	10A Max for 200AC 15A Max for 100AC 15A Max for DC	I/P：200VAC/100VAC12VDC O/P：AC（2000W ） DC（500W ）	I =8.7A/200VAC for CN I=8.6A/200VAC for EU I =13.9 A/100VAC for US

	1500W for US） DC（2*500W max）		Ta：25℃	I =9.91A/12VDC

PROTECTION FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	Input over voltage protection	＞240VAC for CN&EU ＞120VAC for US ＞59VDC	I/P: Testing O/P: Battery Ta:25℃	263VAC for CN 256VAC for EU 143VAC for US 70.5VDC
2	Input under voltage protection	＜200VAC for CN&EU ＜100VAC for US ＜12VDC	I/P: Testing O/P: Battery Ta:25℃	181VAC for CN 176VAC for EU 92VAC for US 10.3VDC
3	OVER LOAD PROTECTION FOR DC OUTPUT	PROTECTION TYPE： Hiccup mode, recovers automatically after fault condition is removed	I/P: Normal O/P: Testing Ta:25℃	Test：OK
	OVER LOAD PROTECTION FOR AC OUTPUT	PROTECTION TYPE： Shut down o/p voltage, re-power on to recover	I/P: Normal O/P: Testing Ta:25℃	Test：OK
4	SHORT PROTECTION FOR DC OUTPUT	PROTECTION TYPE： Hiccup mode, recovers automatically after fault condition is removed	I/P: Normal O/P: Full Load Ta:25℃	Test：OK
	SHORT PROTECTION FOR AC OUTPUT	PROTECTION TYPE： Shut down o/p voltage, re-power on to recover	I/P: Normal O/P: Full Load Ta:25℃	Test：OK
5	OVER/UNDER TEMPERATURE PROTECTION FOR DC OUTPUT	PROTECTION TYPE： Hiccup mode, recovers automatically after fault condition is removed	I/P: Normal O/P: Full Load Ta:25℃	Test：OK
	OVER/UNDER TEMPERATURE PROTECTION FOR AC OUTPUT	PROTECTION TYPE： Shut down o/p voltage, re-power on to recover	I/P: Normal O/P: Full Load Ta:25℃	Test：OK

CONTROL FUNCTION TEST

NO	TEST ITEM		SPECIFICATION	RESULT
1	Button Function	On-screen button	Tap on/Off to turn on/off the screen	Test：OK
		AC output button	Tap on/Off to turn on/off the AC output	Test：OK
		DC output button	Tap on/Off to turn on/off the DC output	Test：OK
2	Bluetooth Function	Mobile APP Control	Open the DC car port with the mobile APP	Test：OK
			Close the DC car port with the mobile APP	Test：OK

			Open the AC output with the mobile APP	Test: OK
			Close the AC output with the mobile APP	Test: OK
		Button action, corresponding action of mobile app	Press the button to open the DC car port, and the DC car port on the mobile APP will open accordingly	Test: OK
			Press the button to close the DC car port, and the DC car port on the mobile APP will close accordingly	Test: OK
			Press the button to open the AC port, and the AC port on the mobile APP will open accordingly	Test: OK
			Press the button to close the AC port, and the AC port on the mobile APP will close accordingly	Test: OK

■ SAFETY& E.M.C. TEST

SAFETY TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	WITHSTAND VOLTAGE	Primary circuit to Enclosure：4KVDC Primary circuit to secondary circuit：4KVDC	Primary circuit to Enclosure：4KVDC Primary circuit to secondary circuit：4KVDC Ta:25℃	Primary circuit to Enclosure：OK Primary circuit tosecondary circuit：OK NO DAMAGE
2	Test by certified Lab & Test Report Prepare Any contradictions of the test results, please refer to the latest SAFETY test report			

E.M.C TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	HARMONIC	EN301 489-1 V2.2.3:2019, IEC61000-3-2:2014 CLASS A	I/P:230VAC/50HZ I/P:110VAC/60HZ（for US） I/P:59VDC O/P:FULL LOAD Ta:25℃	PASS
2	CONDUCTION	EN55032:2015+A11+A1, EN301 489-1 V2.2.3:2019 CLASS A	I/P： 230 VAC (50HZ) I/P:110VAC/60HZ（for US） I/P:59VDC	PASS Test by certified Lab

			O/P：FULL LOAD Ta：25℃	
3	RADIATION	N55032:2015+A11+A1, EN301 489-1 V2.2.3:2019 CLASS A	I/P： 230 VAC (50HZ) I/P:110VAC/60HZ（for US） I/P:59VDC O/P：FULL LOAD Ta：25℃	PASS Test by certified Lab
4	E.S.D	EN 301 489-1 V2.2.3:2019 ,EN 61000-4-2:2009 AIR：8KV / Contact：4KV	I/P： 230 VAC/50HZ I/P:110VAC/60HZ（for US） I/P:59VDC O/P：FULL LOAD Ta：25℃	■CRITERIA B
5	E.F.T	EN 301 489-1 V2.2.3:2019, EN 61000-4-4: 2012 INPUT： 1KV	I/P： 230 VAC/50HZ I/P:110VAC/60HZ（for US） I/P:59VDC O/P：FULL LOAD Ta：25℃	■CRITERIA B
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：ES-S2200EU HIGH AMBIENT BURN-IN：2 HRS I/P： 230VAC O/P： FULL LOAD Ta=45℃		

NO	Position	HIGH AMBIENT Ta=50℃
1	T1coil	105.7℃
2	T1core	98.5℃
3	L7	99.9℃
4	L5	75.9℃
5	U17	82.8℃
6	Q5	102.5℃
7	Q18	109℃
8	C164	63.9℃
9	C176	75.3℃
10	C72	81.7℃
11	S6	96.7℃

2	LOW TEMPERATURE TURN ON TEST	TURN ON AFTER 2 HOUR	I/P： 230 VAC (50HZ) I/P:110VAC/60HZ（for US） I/P:59VDC O/P： 100%LOAD Ta= -10℃	TEST：OK
3	STORAGE TEMPERATURE TEST	-10~45℃	1. Thermal shock Temperature： -15℃~ +50℃ 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 RESULT	TESTER	REVIEW	APPROVAL
PASS	Jinkj		Chenhm

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