



Test Report: NCP-3200-24

3200W 2-in-1 Rack-mounted Switching Power Supply & Battery Charger

■ DESIGN VERIFY TEST

- Output Function Test
- Input Function Test
- Protection Function Test
- Control Function Test
- Charger mode
- Component Stress Test

■ SAFETY & E.M.C. TEST

- Safety Test
- E.M.C. Test

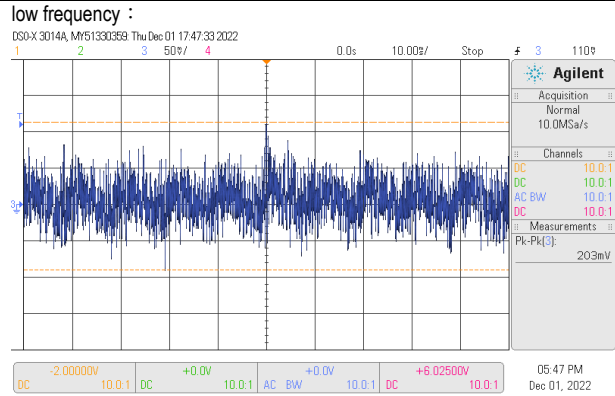
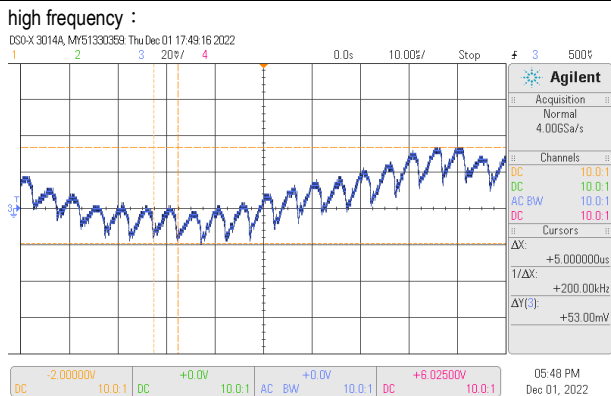
■ RELIABILITY TEST

- ENVIRONMENT TEST

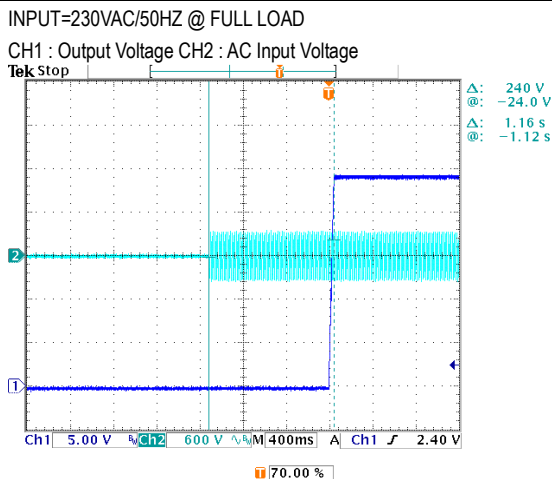
■ DESIGN VERIFY TEST

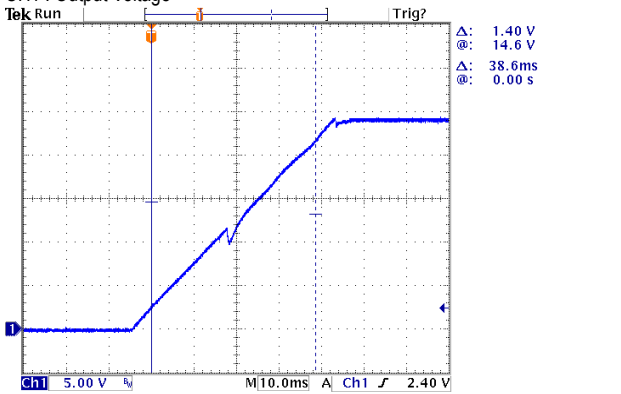
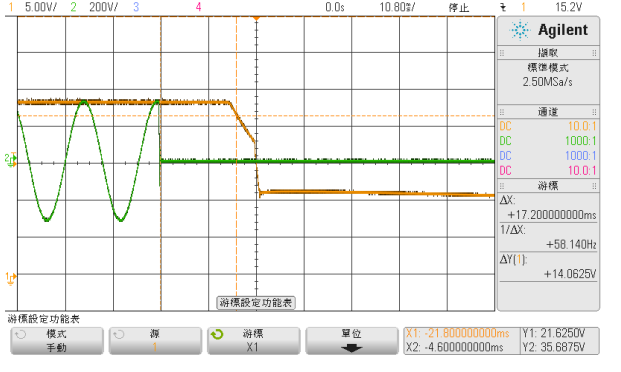
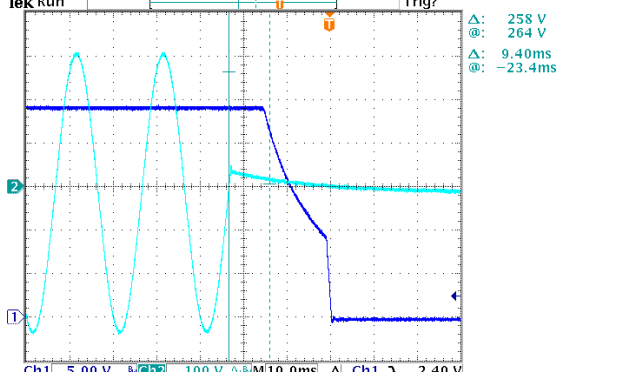

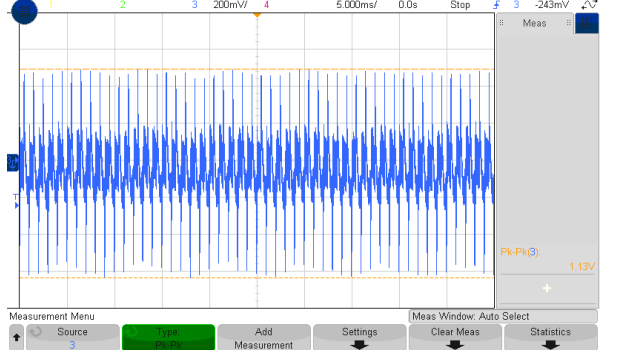
OUTPUT FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	OUTPUT VOLTAGE ADJUST RANGE	CH1: 23.5 V~ 30V	I/P : 230 VAC I/P : 115 VAC O/P : MIN LOAD Ta : 25°C	22.86V~30.99V/230VAC 22.86V~30.99V/115VAC
2	OUTPUT VOLTAGE(Max) TOLERANCE	V1: 1%~-1%	I/P: 180VAC /264VAC O/P:FULL/ MIN. LOAD Ta:25°C	V1: 0.33%~0.33%
3	LINE REGULATION (Max)	V1: 0.5%~-0.5%	I/P: 180VAC~ 264VAC O/P:FULL LOAD Ta:25°C	V1:0.13%~-0.13%
4	LOAD REGULATION(Max)	V1: 0.5%~-0.5%	I/P: 230VAC O/P:FULL ~MIN LOAD Ta:25°C	V1: 0.33%~0.33%
5	OVER/UNDERSHOOT TEST	<±10%	I/P: 230VAC O/P:FULL LOAD Ta:25°C	<10%
6	RIPPLE & NOISE(Max)	V1: 300mVp-p	I/P:230VAC O/P:FULL LOAD Ta:25°C	V1 203 mVp-p

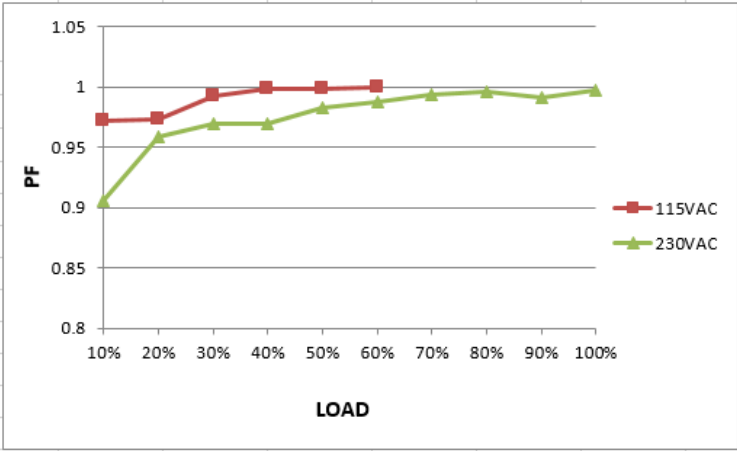


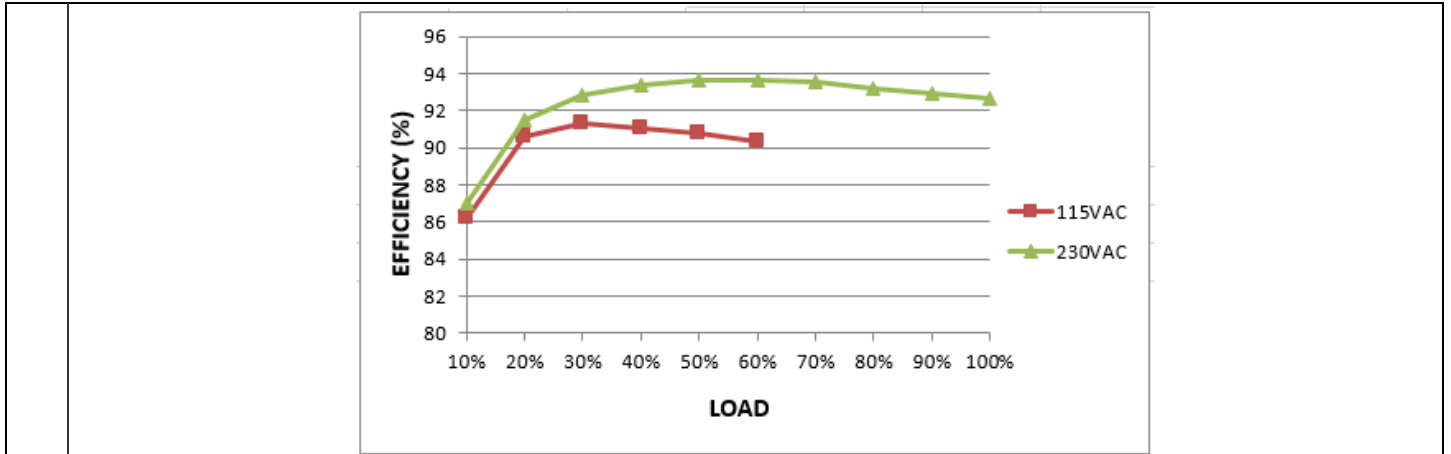
7	SET UP TIME(Max)	230VAC/1500ms	I/P : 230 VAC O/P : FULL LOAD Ta : 25°C	230VAC/ 1160 ms
---	------------------	---------------	---	-----------------



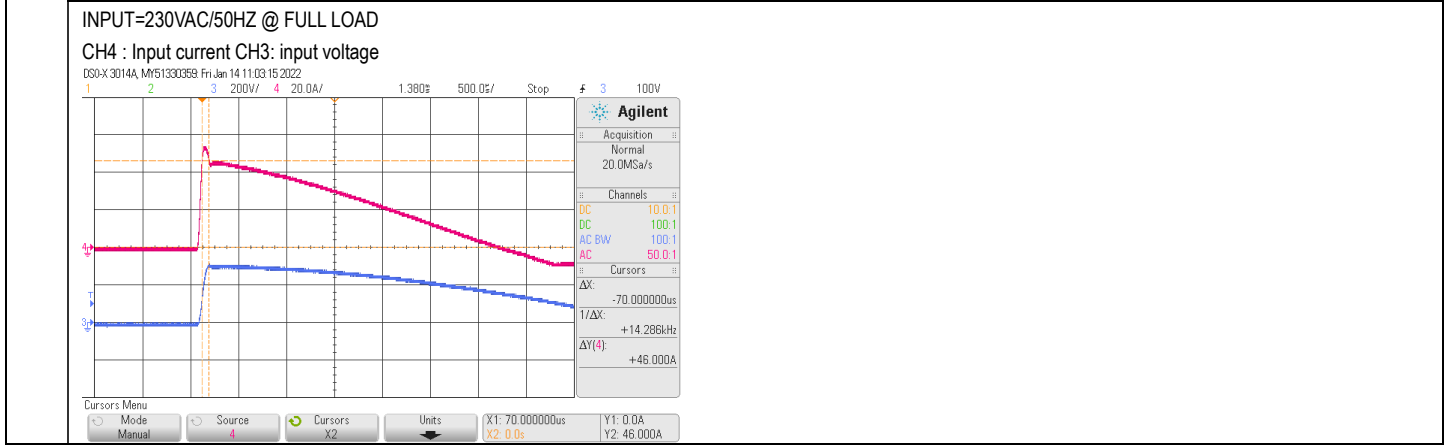
8	RISE TIME (Max)	230VAC/60ms	I/P : 230 VAC O/P : FULL LOAD Ta : 25°C	230VAC/ 38.6ms
<p>INPUT=230VAC/50HZ @ FULL LOAD</p> <p>CH1 : Output Voltage</p>  <p>Δ: 1.40 V @: 14.6 V Δ: 38.6ms @: 0.00 s</p>				
9	HOLD UP TIME (Typ.)	230VAC 70%/ 16ms 230VAC 100%/8ms	I/P : 230 VAC O/P : 70% LOAD O/P : 100% LOAD Ta : 25°C	17.2ms (70% load) 9.4ms (100% load)
<p>INPUT=230VAC/50HZ @70% LOAD</p> <p>CH1 : Output Voltage CH2 : AC Input Voltage</p>  <p>Agilent</p> <p>ΔX: +17.200000000ms 1/ΔX: +58.140Hz ΔY(1): +14.0625V</p> <p>INPUT=230VAC/50HZ @100% LOAD</p> <p>CH2 : Output Voltage CH1 : AC Input Voltage</p>  <p>Δ: 258 V @: 26.4 V Δ: 9.40ms @: -23.4ms</p>				
10	DYNAMIC LOAD	V1: 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	1010mVp-p(120HZ) 1130mVp-p(1KHZ)
<p>FULL /50% LOAD 50%DUTY / 120HZ</p>  <p>KEYSIGHT TECHNOLOGIES</p> <p>PK-Pk(3): 1.01V</p> <p>FULL /50% LOAD 50%DUTY / 1KHZ</p>  <p>KEYSIGHT TECHNOLOGIES</p> <p>PK-Pk(3): 1.13V</p>				

INPUT FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT																																	
1	INPUT VOLTAGE RANGE	90VAC~264VAC 127VDC~400VDC	(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 (PLEASE CHECK DERATING CURVE) Ta:25°C	(1)168Vac~264Vac/FULL LOAD 85Vac~264Vac/50%LOAD (2)242Vdc~400Vdc/FULL LOAD 108Vdc~400Vdc/50% LOAD (3) 242Vdc~400Vdc/FULL LOAD 107Vdc~400Vdc/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:180 VAC ~264 VAC O/P:FULL~MIN LOAD Ta:25°C	TEST: OK																																	
3	INPUT CURRENT (Typ.)	230V/ 17 A	I/P : 230 VAC O/P : FULL LOAD Ta : 25°C	I =15.32 A/ 230VAC																																	
4	LEAKAGE CURRENT	<2 mA / 230 VAC	I/P : 240 VAC O/P : Min LOAD Ta : 25°C	L-FG : 0.96 mA N-FG : 0.96 mA																																	
5	POWER FACTOR (Typ.)	0.97 / 230VAC	I/P : 230 VAC O/P : FULL LOAD Ta : 25°C	PF= 0.996/230VAC																																	
<p>P.F vs LOAD</p>  <table border="1"> <caption>Approximate data from P.F vs LOAD graph</caption> <thead> <tr> <th>LOAD (%)</th> <th>115VAC PF</th> <th>230VAC PF</th> </tr> </thead> <tbody> <tr><td>10%</td><td>0.97</td><td>0.90</td></tr> <tr><td>20%</td><td>0.97</td><td>0.96</td></tr> <tr><td>30%</td><td>0.99</td><td>0.97</td></tr> <tr><td>40%</td><td>1.00</td><td>0.97</td></tr> <tr><td>50%</td><td>1.00</td><td>0.98</td></tr> <tr><td>60%</td><td>1.00</td><td>0.99</td></tr> <tr><td>70%</td><td>1.00</td><td>0.99</td></tr> <tr><td>80%</td><td>1.00</td><td>0.99</td></tr> <tr><td>90%</td><td>1.00</td><td>0.99</td></tr> <tr><td>100%</td><td>1.00</td><td>1.00</td></tr> </tbody> </table>					LOAD (%)	115VAC PF	230VAC PF	10%	0.97	0.90	20%	0.97	0.96	30%	0.99	0.97	40%	1.00	0.97	50%	1.00	0.98	60%	1.00	0.99	70%	1.00	0.99	80%	1.00	0.99	90%	1.00	0.99	100%	1.00	1.00
LOAD (%)	115VAC PF	230VAC PF																																			
10%	0.97	0.90																																			
20%	0.97	0.96																																			
30%	0.99	0.97																																			
40%	1.00	0.97																																			
50%	1.00	0.98																																			
60%	1.00	0.99																																			
70%	1.00	0.99																																			
80%	1.00	0.99																																			
90%	1.00	0.99																																			
100%	1.00	1.00																																			
6	EFFICIENCY(Typ.)	93.5% / (75%LOAD)	I/P:230 VAC O/P:75%LOAD Ta:25°C	93.6%																																	
EFFICIENCY vs LOAD																																					



7	INRUSH CURRENT(Typ.) COLD START	230V/55 A	I/P : 230 VAC O/P : FULL LOAD Ta : 25°C	I=46A/ 230VAC T50=1562 us/230V
---	------------------------------------	-----------	---	-----------------------------------

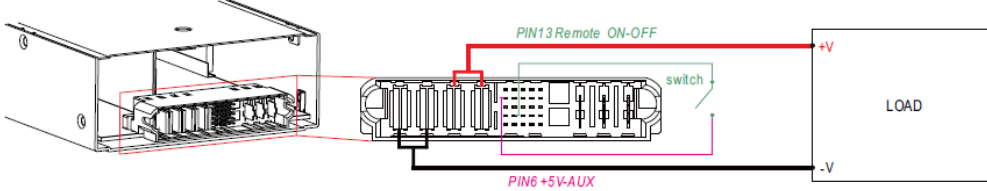


PROTECTION FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	OVER LOAD PROTECTION	105 %~ 115 % PROTECTION TYPE : Constant current limiting, shut down O/P voltage after 5 sec. After O/P voltage falls, re-power on to recover	I/P: 264VAC I/P: 230VAC I/P: 180VAC O/P: TESTING Ta:25°C	110.45%/ 264VAC 110.45%/ 230VAC 110.22%/180VAC PROTECTION TYPE : Constant current limiting, shut down O/P voltage after 5 sec. After O/P voltage falls, re-power on to recover
2	OVER VOLTAGE PROTECTION	31.5 V~ 37.5 V PROTECTION TYPE : Shut down o/p voltage, re-power on to recover	I/P: 264VAC I/P: 230VAC I/P: 90VAC O/P: MIN LOAD Ta:25°C	33.35V/ 264VAC 33.33V/ 230VAC 33.35V/ 90VAC PROTECTION TYPE : Shut down o/p voltage, re-power on to recover
3	OVER TEMPERATURE PROTECTION	NO DAMAGE PROTECTION TYPE : Shut down o/p voltage, recovers automatically after temperature goes down	I/P: 264VAC I/P: 180VAC O/P: FULL LOAD	O.T.P. Active PROTECTION TYPE : Shut down o/p voltage, recovers automatically after temperature goes down
4	SHORT PROTECTION	SHORT EVERY OUTPUT 1 HOUR NO DAMAGE	I/P: 264VAC I/P: 90VAC O/P: FULL LOAD	NO DAMAGE PROTECTION TYPE :

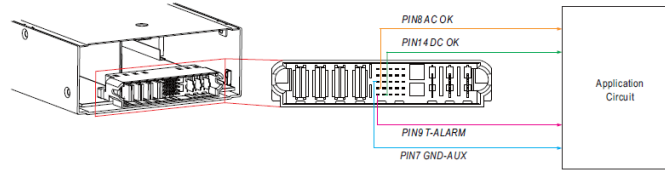
	PROTECTION TYPE :	Ta:25°C	Constant current limiting, shut down O/P voltage after 5 sec. After O/P voltage falls, re-power on to recover
	Constant current limiting, shut down O/P voltage after 5 sec. After O/P voltage falls, re-power on to recover		

CONTROL FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT												
1	AUXILIARY POWER (AUX)	<p>Auxiliary voltage output, 10.8~13.2V, referenced to GND-AUX (pin7). The maximum load current is 0.8A. This output has the built-in "Oring diodes" and is not controlled by "Remote ON-OFF".</p> <p>Auxiliary voltage output, 4.5~5.5V, reference to GND_AUX(pin7).The maximum load current is 0.3A. The output has the built-in "Oring diodes" and is not controlled by the Remote ON/OFF control.</p> <p>I/P: 230 VAC O/P:FULL LOAD Ta:25°C</p> <p>Test Result :</p> <table border="1"> <thead> <tr> <th>AUX</th> <th>TOLERANCE</th> <th>RIPPLE</th> <th>TEST RESULT</th> </tr> </thead> <tbody> <tr> <td>12V / 0.8A</td> <td>10.8~13.2 V</td> <td>450mVp-p</td> <td>11.73V /0.8A 226 mVp-p</td> </tr> <tr> <td>5V/0.3A</td> <td>4.5~5.5V</td> <td>150 mVp-p</td> <td>4.71V/0.3A 117 mVp-p</td> </tr> </tbody> </table>	AUX	TOLERANCE	RIPPLE	TEST RESULT	12V / 0.8A	10.8~13.2 V	450mVp-p	11.73V /0.8A 226 mVp-p	5V/0.3A	4.5~5.5V	150 mVp-p	4.71V/0.3A 117 mVp-p		
AUX	TOLERANCE	RIPPLE	TEST RESULT													
12V / 0.8A	10.8~13.2 V	450mVp-p	11.73V /0.8A 226 mVp-p													
5V/0.3A	4.5~5.5V	150 mVp-p	4.71V/0.3A 117 mVp-p													
2	REMOTE ON/OFF CONTROL	<p>The power supply can be turned ON/OFF individually or along with other units by using the "Remote ON-OFF" function.</p>  <table border="1"> <thead> <tr> <th>Between Remote ON-OFF and +5V-AUX</th> <th>Power Supply Status</th> </tr> </thead> <tbody> <tr> <td>Switch Short</td> <td>ON</td> </tr> <tr> <td>Switch Open</td> <td>OFF</td> </tr> </tbody> </table> <p>I/P: 230 VAC O/P:FULL LOAD Ta:25°C</p> <p>Test Result :</p> <table border="1"> <thead> <tr> <th>Between ON/OFF and +5V-AUX</th> <th>Power Supply Status</th> </tr> </thead> <tbody> <tr> <td>SW SHORT</td> <td>ON</td> </tr> <tr> <td>SW OPEN</td> <td>OFF</td> </tr> </tbody> </table>	Between Remote ON-OFF and +5V-AUX	Power Supply Status	Switch Short	ON	Switch Open	OFF	Between ON/OFF and +5V-AUX	Power Supply Status	SW SHORT	ON	SW OPEN	OFF		
Between Remote ON-OFF and +5V-AUX	Power Supply Status															
Switch Short	ON															
Switch Open	OFF															
Between ON/OFF and +5V-AUX	Power Supply Status															
SW SHORT	ON															
SW OPEN	OFF															
3	REMOTE SENSE	<p>S+ / S- 0.3V~0.5V Compensate voltage drop on the load wiring up to 0.5V.</p>	<p>I/P: 230 VAC O/P:FULL LOAD Ta:25°C</p>	0.3V~0.5V												

4 ALARM SIGNAL output

※ There are 3 alarm signals, DC-OK, AC-OK and T-ALARM, in TTL signal form, on CN1. These signals are isolated from output. The maximum sink current is 10mA.



DC-OK signal	Power Supply Mode Status	Charger Mode Status
High > 3.5~5.5V	Vout ≒ 77%±5%	Vout ≒ 66%±5%
Low < -0.5~0.5V	Vout ≒ 80%±5%	Vout ≒ 67%±5%

AC-OK signal	Power Supply and Charger Mode Status
High > 3.5~5.5V	Input voltage ≒ 87Vrms
Low < -0.5~0.5V	Input voltage ≒ 75Vrms

T-ALARM signal	Power Supply and Charger Mode Status
High > 3.5~5.5V	OFF(OTP or Fan Fail)
Low < -0.5~0.5V	ON(Normal Work)

1. DC OK SIGNAL

For power supply mode

High (3.5 ~ 5.5V) : When the $V_{out} \leq 77\% \pm 5\%$.

Low (-0.5 ~ 0.5V) : When the $V_{out} \geq 80\% \pm 5\%$.

The maximum sourcing current is 10mA and only for output.

For charger mode

High (3.5 ~ 5.5V) : When the $V_{out} \leq 66\% \pm 5\%$.

Low (-0.5 ~ 0.5V) : When the $V_{out} \geq 67\% \pm 5\%$. The maximum sourcing current is 10mA and only for output.

DC OK is associated with battery low protection.

I/P: 230 VAC

O/P: FULL LOAD

Ta: 25°C

Test Result :

Vout	DC OK SIGNAL
$V_{out} \leq 72\%$	4.9612V
$V_{out} \geq 85\%$	0.0081V

2. T-ALARM

High (3.5 ~ 5.5V) : When the internal temperature exceeds the limit of temperature alarm, or when Fan fails.

Low (-0.5 ~ 0.5V) : When the internal temperature is normal, and when Fan works normally.

The maximum sourcing current is 10mA and only for output

I/P: 230 VAC

O/P: FULL LOAD

Ta: 25°C

Test Result :

P.SU STATUS	Vo	T-ALARM SPEC	T-ALARM TEST
NORMAL	100%±2%	-0.5 ~ 0.5V	0.0081v
OTP	0V	3.5~5.5V	4.961V
FAN LOCK	0V	3.5~5.5V	4.961V

3. AC OK

The maximum sourcing current is 10mA and only for output.

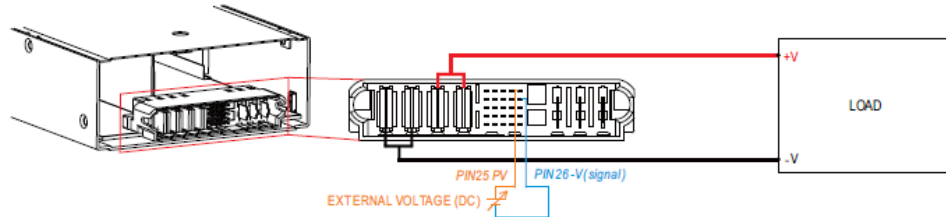
Low (-0.5 ~ 0.5V) : When the input voltage is $\leq 75V_{rms}$.

High (3.5 ~ 5.5V) : When the input voltage is $\geq 87V_{rms}$.

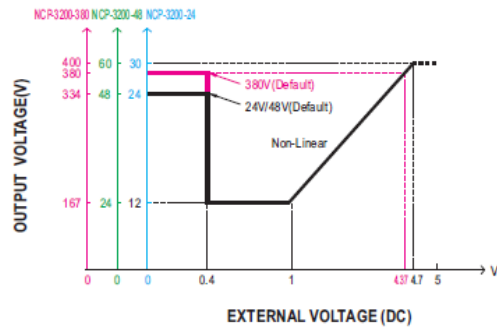
Vout	AC OK SIGNAL
AC $\geq 87V_{rms}$	4.9612V
AC $\leq 75V_{rms}$	0.0081v

5 OUTPUT VOLTAGE PROGRAMMABLE (PV)

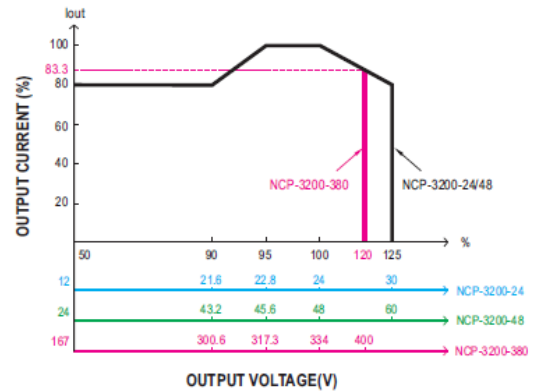
※ In addition to the adjustment via the built-in potentiometer, the output voltage can be trimmed to 50~125%(24/48V models) or 50~120%(380V model) of the nominal voltage by applying EXTERNAL VOLTAGE.



◎ For Remote Sense / Local Sense, please refer to "Voltage Drop Compensation" section.



◎ For power supply mode
 ◎ The 100% output voltage is 24/48/334V.



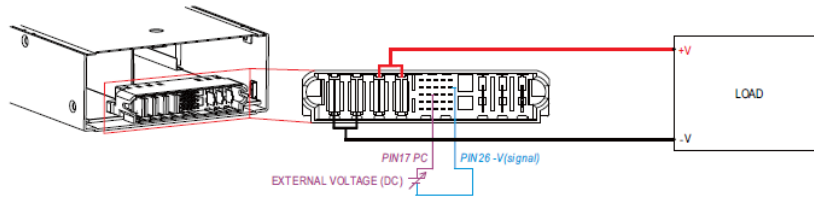
◎ The rated current should change with the Output Voltage Programming accordingly.
 ◎ The 100% output current is 133/67/9.6A.
 ◎ For Remote Sense / Local Sense, please refer to "Voltage Drop Compensation" section.

I/P: 230 VAC
 O/P: FULL LOAD
 Ta: 25°C
 TEST RESULT :

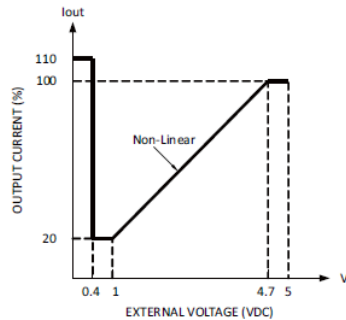
PV	<0.3V	1V	3.435V	4.7V	5V
MODEL					
SPEC	24V±5%	12V±5%	24V±5%	30V±5%	30V±5%
Vout	24.03V	12.063V	24.068V	30.47V	30.99V

6 Constant Current Level Programming

※ The constant current level can be trimmed to 20~100% of the rated current by applying EXTERNAL VOLTAGE.
 ※ If setting output current to a much lower level, as output status turns to constant current mode, it might cause higher current ripple under such condition.



- ◎ For Remote Sense / Local Sense, please refer to "Voltage Drop Compensation" section.
- ◎ Output will shut down after O/P voltage is below < 80% of Vset for 5 sec, re-power on to recover.



- ◎ The 100% output current is 133/67/9.6A.
- ◎ Notice the output power do not over rated power (max.)

I/P: 230 VAC
 O/P: FULL LOAD
 Ta: 25°C
 TEST RESULT :

	PC	<0.3V	1V	2.388V	4.7V	5V
MODEL						
SPEC		110%±10%	20%±10%	50%±10%	100%±10%	100%±10%
Iout		107.52%	18.95%	49.25%	99.25%	101.5%

7 CURRENT SHARING

Power supply that can be connected in parallel is 40 units
 CURRENT SHARING TOLERANCE <±10%
 I/P : 230 VAC
 O/P : 90%/50% LOAD
 Ta : 25°C
 TEST RESULT :

NO	50% LOAD	90% LOAD	NO	50% LOAD	90% LOAD	NO	50% LOAD	90% LOAD	NO	50% LOAD	90% LOAD
0	66.40	120.30	10	66.50	120.20	20	66.30	120.10	30	66.40	120.00
1	66.40	120.30	11	66.30	120.30	21	66.50	119.90	31	66.40	120.10
2	66.60	120.10	12	66.50	120.00	22	66.40	120.10	32	66.60	120.30
3	66.30	119.90	13	66.40	120.10	23	66.50	120.20	33	66.30	120.10
4	66.50	120.00	14	66.50	120.10	24	66.60	120.20	34	66.50	120.20
5	66.50	120.10	15	66.60	120.10	25	66.60	120.00	35	66.50	120.30
6	66.60	120.00	16	66.50	120.20	26	66.50	120.30	36	66.60	120.30
7	66.50	120.20	17	66.50	120.20	27	66.60	120.20	37	66.50	120.00
8	66.40	120.10	18	66.50	120.10	28	66.30	120.20	38	66.40	120.30
9	66.40	119.90	19	66.40	119.90	29	66.50	120.00	39	66.40	120.10

Unit: A

CHARGER MODE

OUTPUT FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT																																																																												
1	BOOST CHARGE VOLTAGE	28.8V±0.24V	I/P : 230 VAC O/P : CV MODE Ta : 25°C	28.788 V																																																																												
2	FLOAT CHARGE VOLTAGE	27.6V±0.24V	I/P : 230 VAC O/P : CV MODE Ta : 25°C	27.58V																																																																												
3	OUTPUT CURRENT	110A±3%	I/P : 230 VAC O/P : CV MODE Ta : 25°C	109A																																																																												
4	<p>Charging Curve (Charger mode only available for 24V/48V models)</p> <p>※ By default, the unit operates in power supply mode, and it can be configured to charger mode by PMBus, CANBus or SBP-001.</p> <p>※ By factory default, this charger performs the default curve which can be programmed via PMBus and CANBus.</p> <p>※ To accommodate the parameters of the charging curve, SBP-001, the smart battery charging programmer designed by MEAN WELL, and a personal computer are needed. Please contact MEAN WELL for details.</p> <p>※ 2 stage charging curve</p> <p>※ 3 stage charging curve (default)</p> <div style="display: flex; justify-content: space-around;"> <table border="1" style="font-size: small;"> <thead> <tr><th>State</th><th>NCP-3200-24</th><th>NCP-3200-48</th></tr> </thead> <tbody> <tr><td>Constant Current</td><td>110A</td><td>55A</td></tr> <tr><td>Vboost</td><td>28.8V</td><td>57.6V</td></tr> </tbody> </table> <table border="1" style="font-size: small;"> <thead> <tr><th>State</th><th>NCP-3200-24</th><th>NCP-3200-48</th></tr> </thead> <tbody> <tr><td>Constant Current</td><td>110A</td><td>55A</td></tr> <tr><td>Vboost</td><td>28.8V</td><td>57.6V</td></tr> <tr><td>Vfloat</td><td>27.6V</td><td>55.2V</td></tr> </tbody> </table> </div> <p>Ⓢ Suitable for lead-acid batteries (flooded, Gel and AGM) and Li-ion batteries (lithium iron and lithium manganese).</p> <p>Ⓢ Embedded 2 stage charging curves</p> <table border="1" style="font-size: x-small; width: 100%;"> <thead> <tr><th>MODEL</th><th>Description</th><th>CC(default)</th><th>Vboost</th></tr> </thead> <tbody> <tr><td rowspan="4">24V</td><td>Default, programmable</td><td rowspan="4">110A</td><td>28.8</td></tr> <tr><td>Pre-defined, gel battery</td><td>28</td></tr> <tr><td>Pre-defined, flooded battery</td><td>28.4</td></tr> <tr><td>Pre-defined, AGM battery</td><td>29</td></tr> <tr><td rowspan="4">48V</td><td>Default, programmable</td><td rowspan="4">55A</td><td>57.6</td></tr> <tr><td>Pre-defined, gel battery</td><td>56</td></tr> <tr><td>Pre-defined, flooded battery</td><td>56.8</td></tr> <tr><td>Pre-defined, AGM battery</td><td>58</td></tr> </tbody> </table> <p>Ⓢ Embedded 3 stage charging curves</p> <table border="1" style="font-size: x-small; width: 100%;"> <thead> <tr><th>MODEL</th><th>Description</th><th>CC(default)</th><th>Vboost</th><th>Vfloat</th></tr> </thead> <tbody> <tr><td rowspan="5">24V</td><td>Default, programmable</td><td rowspan="5">110A</td><td>28.8</td><td>27.6</td></tr> <tr><td>Pre-defined, gel battery</td><td>28</td><td>27.2</td></tr> <tr><td>Pre-defined, flooded battery</td><td>28.4</td><td>26.8</td></tr> <tr><td>Pre-defined, AGM battery</td><td>29</td><td>27</td></tr> <tr><td>Default, programmable</td><td rowspan="4">55A</td><td>57.6</td><td>55.2</td></tr> <tr><td rowspan="4">48V</td><td>Pre-defined, gel battery</td><td>56</td><td>54.4</td></tr> <tr><td>Pre-defined, flooded battery</td><td>56.8</td><td>53.6</td></tr> <tr><td>Pre-defined, AGM battery</td><td>58</td><td>54</td></tr> </tbody> </table>	State	NCP-3200-24	NCP-3200-48	Constant Current	110A	55A	Vboost	28.8V	57.6V	State	NCP-3200-24	NCP-3200-48	Constant Current	110A	55A	Vboost	28.8V	57.6V	Vfloat	27.6V	55.2V	MODEL	Description	CC(default)	Vboost	24V	Default, programmable	110A	28.8	Pre-defined, gel battery	28	Pre-defined, flooded battery	28.4	Pre-defined, AGM battery	29	48V	Default, programmable	55A	57.6	Pre-defined, gel battery	56	Pre-defined, flooded battery	56.8	Pre-defined, AGM battery	58	MODEL	Description	CC(default)	Vboost	Vfloat	24V	Default, programmable	110A	28.8	27.6	Pre-defined, gel battery	28	27.2	Pre-defined, flooded battery	28.4	26.8	Pre-defined, AGM battery	29	27	Default, programmable	55A	57.6	55.2	48V	Pre-defined, gel battery	56	54.4	Pre-defined, flooded battery	56.8	53.6	Pre-defined, AGM battery	58	54	PASS
State	NCP-3200-24	NCP-3200-48																																																																														
Constant Current	110A	55A																																																																														
Vboost	28.8V	57.6V																																																																														
State	NCP-3200-24	NCP-3200-48																																																																														
Constant Current	110A	55A																																																																														
Vboost	28.8V	57.6V																																																																														
Vfloat	27.6V	55.2V																																																																														
MODEL	Description	CC(default)	Vboost																																																																													
24V	Default, programmable	110A	28.8																																																																													
	Pre-defined, gel battery		28																																																																													
	Pre-defined, flooded battery		28.4																																																																													
	Pre-defined, AGM battery		29																																																																													
48V	Default, programmable	55A	57.6																																																																													
	Pre-defined, gel battery		56																																																																													
	Pre-defined, flooded battery		56.8																																																																													
	Pre-defined, AGM battery		58																																																																													
MODEL	Description	CC(default)	Vboost	Vfloat																																																																												
24V	Default, programmable	110A	28.8	27.6																																																																												
	Pre-defined, gel battery		28	27.2																																																																												
	Pre-defined, flooded battery		28.4	26.8																																																																												
	Pre-defined, AGM battery		29	27																																																																												
	Default, programmable		55A	57.6	55.2																																																																											
48V	Pre-defined, gel battery	56		54.4																																																																												
	Pre-defined, flooded battery	56.8		53.6																																																																												
	Pre-defined, AGM battery	58		54																																																																												
	5	LEAKAGE CURRENT FROM BATTERY(Typ.)	<1.5mA	I/P: AC OFF O/P:BATTERY 24V Ta:25°C	1.37mA																																																																											
6	Front Panel LED Indicators	<p>※ LED Status Indicators (for charger mode)</p> <table border="1" style="width: 100%; font-size: small;"> <thead> <tr><th>LED</th><th>Description</th></tr> </thead> <tbody> <tr><td style="text-align: center;">● Green</td><td>Float (stage 3)</td></tr> <tr><td style="text-align: center;">● Orange</td><td>Charging (stage 1 or stage 2)</td></tr> <tr><td style="text-align: center;">● Red</td><td>The LED will present a constant red light when the abnormal status (OTP, OLP, fan fail and charging timeout) arises.</td></tr> <tr><td style="text-align: center;">● Red (Flashing)</td><td>The LED will flash with the red light when the internal temperature reaches 60°C; under this condition, the unit still operates normally without entering OTP. (In the meantime, an alarm signal will be sent out through the PMBus/CANBus interface.)</td></tr> </tbody> </table>			LED	Description	● Green	Float (stage 3)	● Orange	Charging (stage 1 or stage 2)	● Red	The LED will present a constant red light when the abnormal status (OTP, OLP, fan fail and charging timeout) arises.	● Red (Flashing)	The LED will flash with the red light when the internal temperature reaches 60°C; under this condition, the unit still operates normally without entering OTP. (In the meantime, an alarm signal will be sent out through the PMBus/CANBus interface.)																																																																		
LED	Description																																																																															
● Green	Float (stage 3)																																																																															
● Orange	Charging (stage 1 or stage 2)																																																																															
● Red	The LED will present a constant red light when the abnormal status (OTP, OLP, fan fail and charging timeout) arises.																																																																															
● Red (Flashing)	The LED will flash with the red light when the internal temperature reaches 60°C; under this condition, the unit still operates normally without entering OTP. (In the meantime, an alarm signal will be sent out through the PMBus/CANBus interface.)																																																																															

COMPONENT STRESS TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	PWM Transistor (D to S) or (C to E) Peak Voltage	Q1 Rated 52A/600V Q3 Rated 52A/600V	I/P:High-Line +3V =267V AC ON/OFF 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. PV=1V (8)100% LOAD (9)50% LOAD (10)10% LOAD	Q1: VDS: (1)477 V (2)481 V (3)489V (4)493V (5)497V (6)493V (7)501V (8)477 V (9)469V (10)433V Q3 VDS: (1)493 V (2)501 V (3) 493V (4)497V (5)501V (6)493V (7)493V (8)497 V (9) 493V (10)413 V
2	P.F.C Transistor (D to S) or (C to E) Peak Voltage	Q 900 Rated 52 A/600V Q 902 Rated 52 A/600V	I/P:High-Line +3V =267 V AC ON/OFF 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.	Q900: VDS: (1)505V (2)505V (3)505V (4)501V (5)503V (6)473V (7)477V Q902: VDS: (1)493V (2)493V (3)491V (4)493V (5)497V (6)477V (7)457V
3	P.F.C DIODE	D8 Rated 16 A/600V	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) 441V (2) 449V (3) 421V (4) 421V
4	Diode Peak Voltage	Q101 Rated 100 A/100 V Q104 Rated 100 A/100 V Q107 Rated 100 A/100 V	I/P:High-Line +3V =267 V AC ON/OFF 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	Q101: VDS: (1)85.7V (2)95V (3)68.8V (4)68.8V (5)68.8V (6)68V (7)67.2V (8)68V (9)58.3 Q107: VDS: Q104: VDS: (1)72.1V (2)83.4V (3)64.9V (4)64.1V (5)64.9V (6)62.5V (7)64.1V (8)71.3V (9)60.3V Q110: VDS:



		Q110 Rated 100 A/100 V	(7)0%→400% Load. (8).NO LOAD (9) burst mode	(1)77.7V (2)96.2V (3)66.5V (4)68.1V (5)68.6V (6)69.4V (7)68.6V (8)69.4V (9)71V	(1)80.2V (2)93.1V (3)74.6V (4)73.4V (5)68.2V (6)69.8V (7)70.5V (8)61.8V (9)65.8V
5	Input Capacitor Voltage	C5 Rated: 330μ/ 450V 105 °C	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)432V (2)424V (3)448V (4) 432V	
6	Control IC Voltage Test	PWM IC U201 Rated 6.5 V~30V PFC IC U900 Rated 4.5V~20 V	I/P:High-Line +3V =267 V AC ON/OFF 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	U201 (1) 14.9V (2) 15.1V (3) 15.1 (4) 12.7V (5) 13.3V	U900 (1) 13.9V (2)14.5V (3)14.9V (4)13.5V (5)12.7V
7	TOP SWITCHING STAND BY POWER	U71 Rate 20 A/ 800V	I/P:High-Line +3V =267 V AC ON/OFF O/P: (1)Full Load (2)Remote On/Off Ta:25°C	(1) 645V (2) 645V	

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:1.5KVAC/min	I/P-O/P: 3.6 KVAC/min I/P-FG: 2.4 KVAC/min O/P-FG:1.8 KVAC/min Ta:25°C	I/P-O/P: 12.04 mA I/P-FG: 10.73mA O/P-FG: 23 mA 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: 13 GΩ I/P-FG: 2.86GΩ O/P-FG: 5 GΩ NO DAMAGE
3	GROUNDING CONTINUITY	FG(PE) TO CHASSIS OR TRACE < 100 mΩ	40A / 2min Ta:25°C	25mΩ

E.M.C TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	HARMONIC	EN61000-3-2 CLASS A	I/P:230VAC/50HZ O/P:100% LOAD Ta:25°C	Test by certified Lab
2	CONDUCTION	EN55032 CLASS B	I/P : 230 VAC (50HZ) O/P : FULL/50% LOAD Ta : 25°C	Test by certified Lab
3	RADIATION	EN55032 CLASS A	I/P : 230 VAC (50HZ) O/P : FULL LOAD Ta : 25°C	Test by certified Lab
4	E.S.D	EN61000-4-2 INDUSTRY AIR : 8KV / Contact : 4KV	I/P : 230 VAC/50HZ O/P : FULL LOAD Ta : 25°C	CRITERIA A
5	E.F.T	EN61000-4-4 INDUSTRY INPUT : 2KV	I/P : 230 VAC/50HZ O/P : FULL LOAD Ta : 25°C	CRITERIA A
6	SURGE	EN61000-4-5 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			

2	OVER LOAD BURN-IN TEST	NO DAMAGE 1 HOUR (MIN)	I/P : 230 VAC O/P : 110%LOAD Ta : 25°C	TEST : OK
3	LOW TEMPERATURE TURN ON TEST	TURN ON AFTER 2 HOUR	I/P : 264VAC/180VAC O/P : 80 %LOAD Ta= -35 °C	TEST : OK
4	HIGH HUMIDITY HIGH TEMPERATURE HIGH VOLTAGE TURN ON TEST	AFTER 12 HOURS IN CHAMBER ON CONTROL 50 °C/95 %R.H NO DAMAGE	I/P : 272 VAC O/P : FULL LOAD Ta= 50°C HUMIDITY= 95 %R.H	TEST : OK
5	TEMPERATURE COEFFICIENT	± 0.03 %/°C(0~50°C)	I/P : 230 VAC O/P : FULL LOAD	± 0.015 %/°C(0~50°C)
6	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 : 10 CYCLE 5. Input/Output condition : STATIC	
7	THERMAL SHOCK TEST	-20~50°C	1. Thermal shock Temperature : -25°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	
8	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	
9	CAPACITOR LIFE CYCLE	SUPPOSE C121 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) 65469.7HRS (2) 19873.2HRS (3) 64152.9HRS (4) 190032.2HRS
10	MTBF	Conducted by Parts Stress Analysis Prediction 510.5K hrs min. Telcordia SR-332 (Bellcore) ; 45.8K 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 : 50,000 hours		

TEST RESULT	TESTER	REVIEW	APPROVAL
PASS	DANIEL GAO	SANFORD SU	VINCENT TSENG

2020.10.1 TAG-QA-009