



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

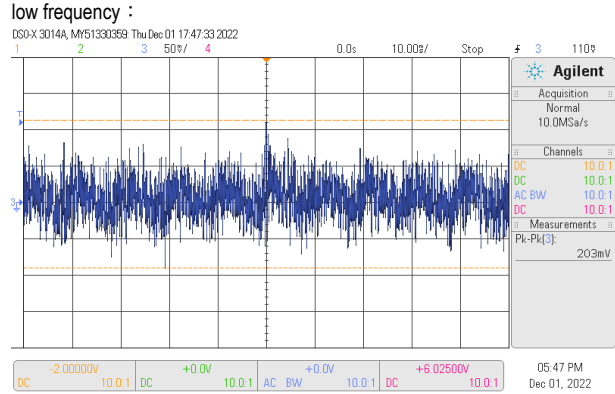
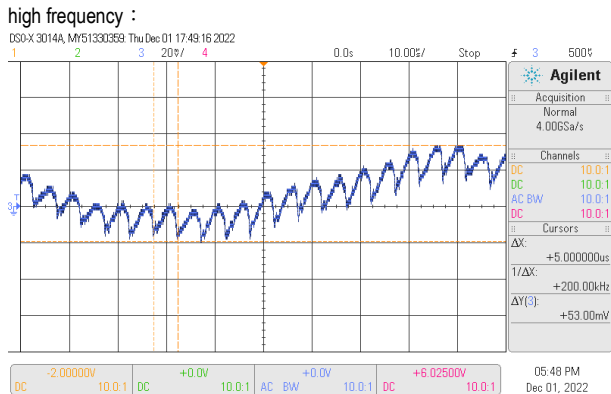
■ RELIABILITY TEST

- ENVIRONMENT TEST

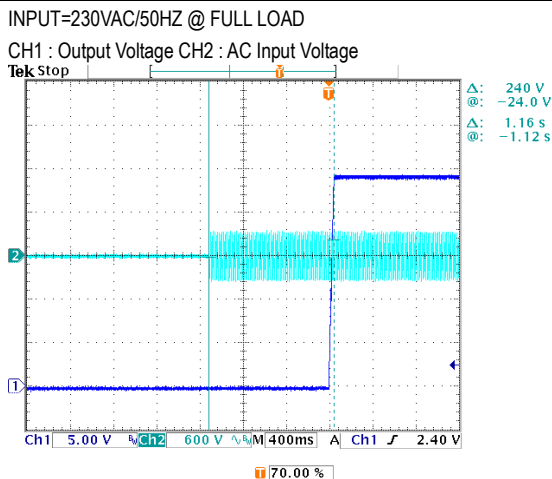
■ DESIGN VERIFY TEST

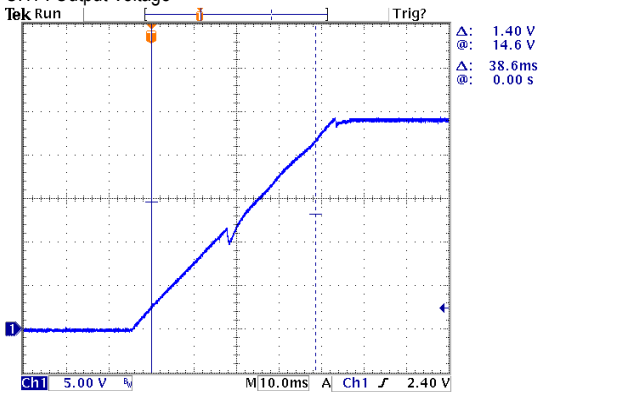
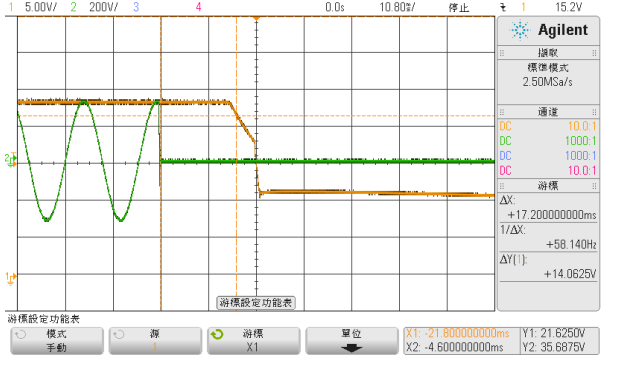
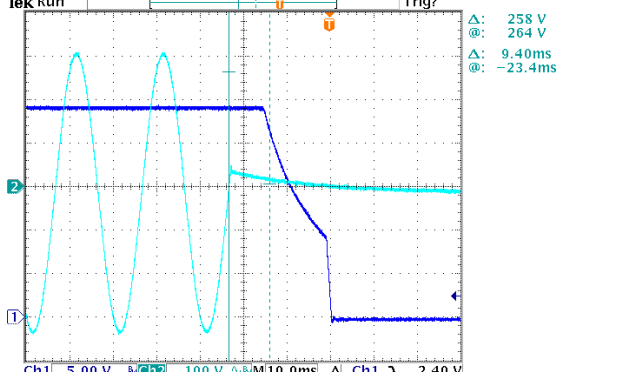

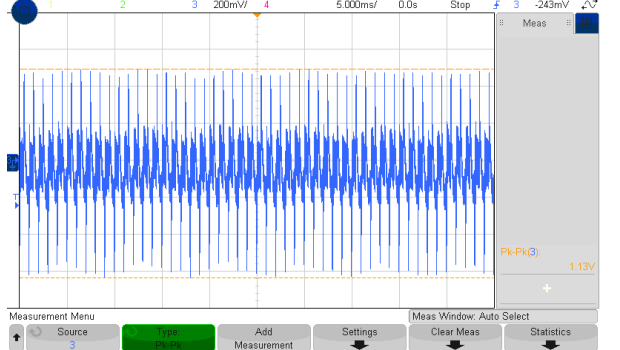
OUTPUT FUNCTION TEST

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

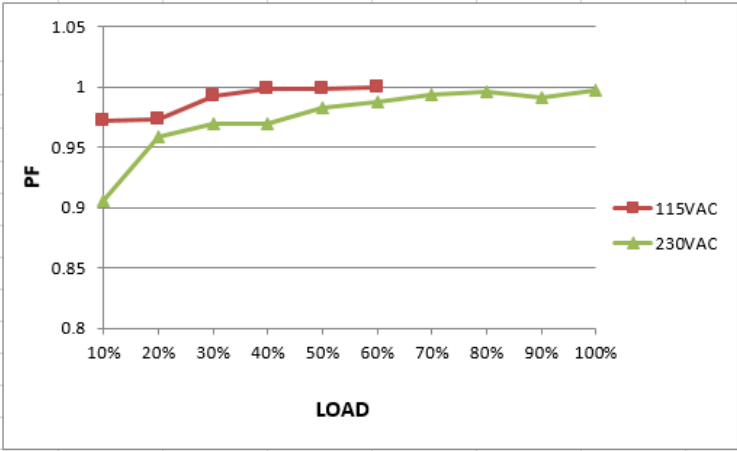


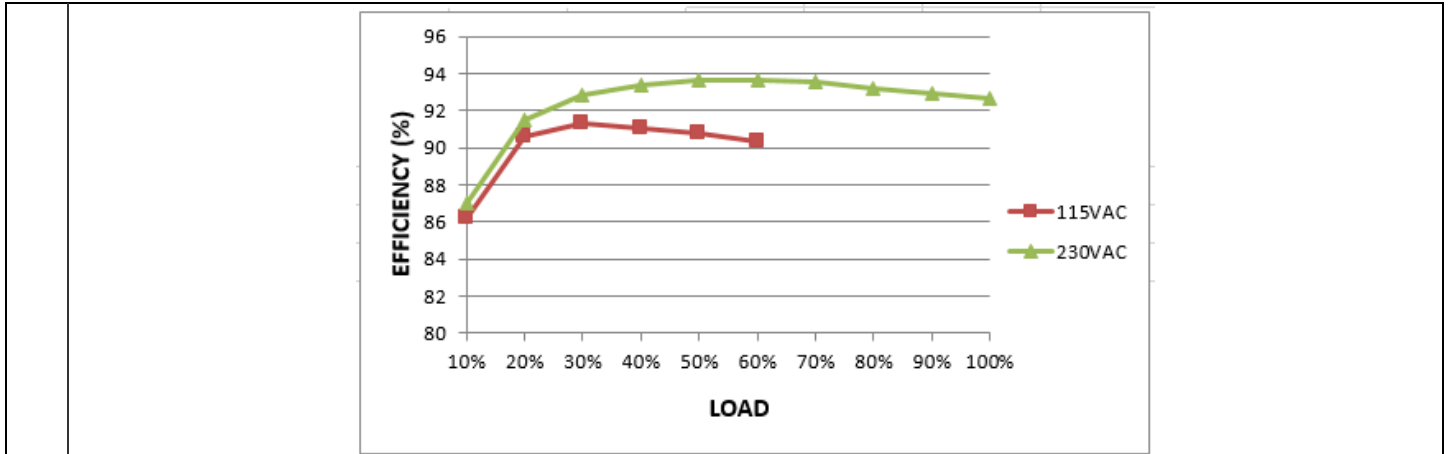
7	SET UP TIME(Max)	230VAC/1500ms	I/P : 230 VAC O/P : FULL LOAD Ta : 25°C	230VAC/ 1160 ms
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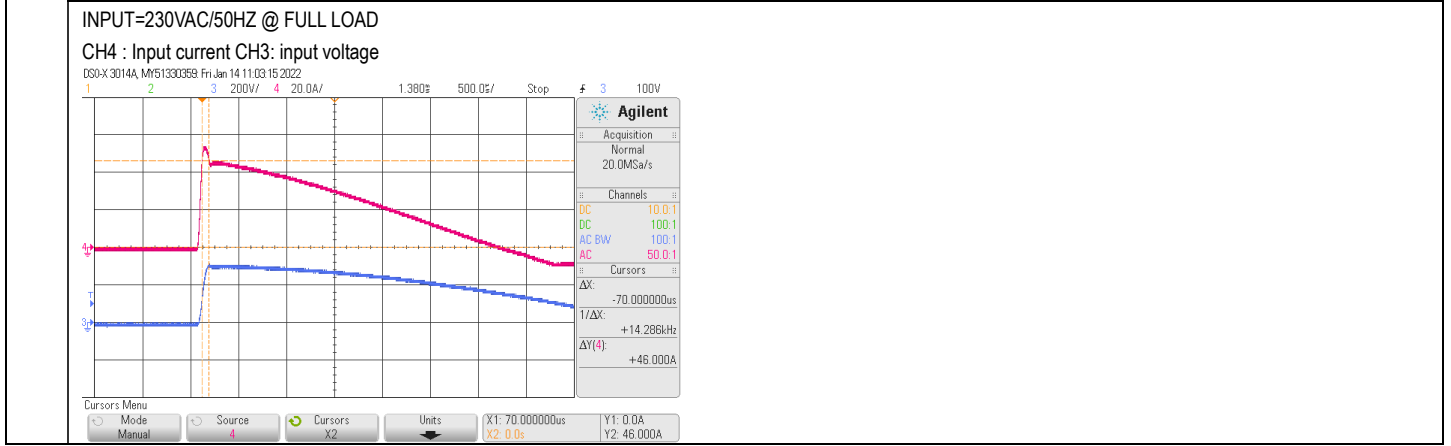
8	RISE TIME (Max)	230VAC/60ms	I/P : 230 VAC O/P : FULL LOAD Ta : 25°C	230VAC/ 38.6ms
<p>INPUT=230VAC/50HZ @ FULL LOAD</p> <p>CH1 : Output Voltage</p>  <p>Δ: 1.40 V @: 14.6 V Δ: 38.6ms @: 0.00 s</p>				
9	HOLD UP TIME (Typ.)	230VAC 70%/ 16ms 230VAC 100%/8ms	I/P : 230 VAC O/P : 70% LOAD O/P : 100% LOAD 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																																			
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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
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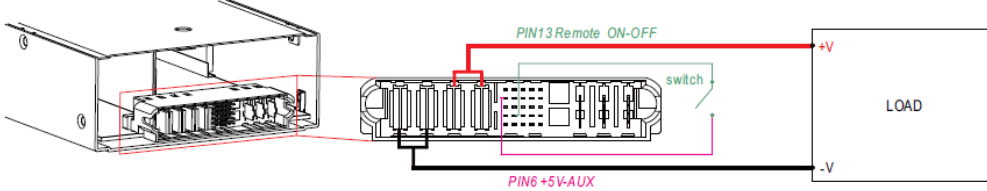


PROTECTION FUNCTION TEST

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 :

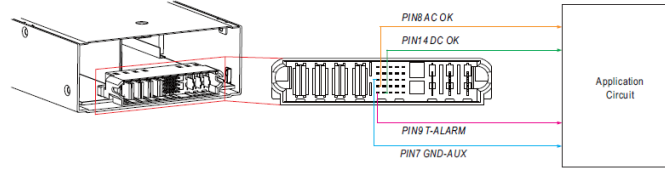
	PROTECTION TYPE :	Ta:25°C	Constant current limiting, shut down O/P voltage after 5 sec. After O/P voltage falls, re-power on to recover
	Constant current limiting, shut down O/P voltage after 5 sec. After O/P voltage falls, re-power on to recover		

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.

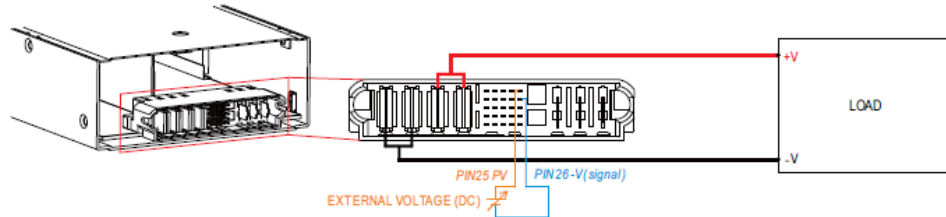
Low (-0.5 ~ 0.5V) : When the input voltage is $\leq 75V_{rms}$.

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

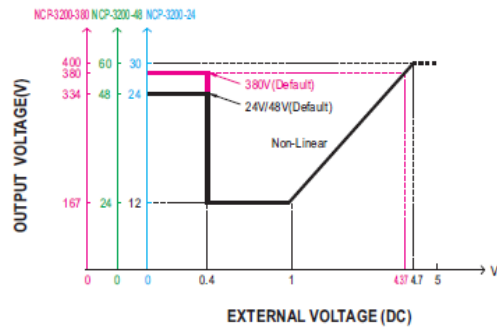
Vout	AC OK SIGNAL
$AC \geq 87V_{rms}$	4.9612V
$AC \leq 75V_{rms}$	0.0081v

5 OUTPUT VOLTAGE PROGRAMMABLE (PV)

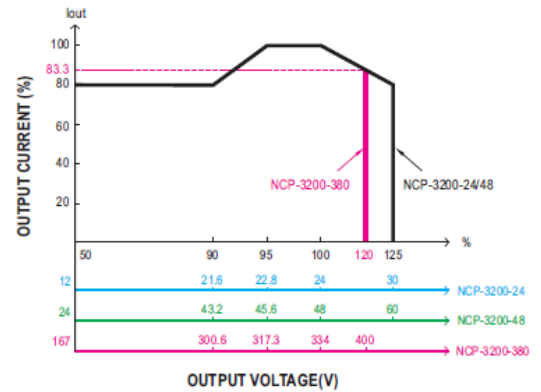
※ In addition to the adjustment via the built-in potentiometer, the output voltage can be trimmed to 50~125%(24/48V models) or 50~120%(380V model) of the nominal voltage by applying EXTERNAL VOLTAGE.



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



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



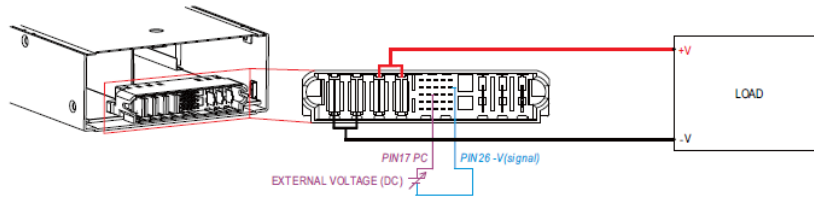
◎ The rated current should change with the Output Voltage Programming accordingly.
 ◎ The 100% output current is 133/67/9.6A.
 ◎ For Remote Sense / Local Sense, please refer to "Voltage Drop Compensation" section.

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

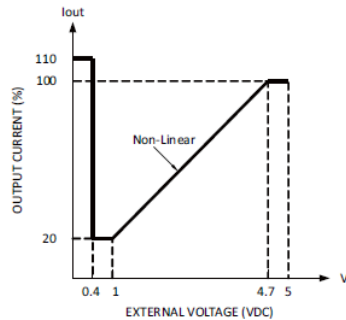
PV	<0.3V	1V	3.435V	4.7V	5V
MODEL					
SPEC	24V±5%	12V±5%	24V±5%	30V±5%	30V±5%
Vout	24.03V	12.063V	24.068V	30.47V	30.99V

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. ※ By factory default, this charger performs the default curve which can be programmed via PMBus and CANBus. ※ 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). Ⓢ 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> <th>Vfloat</th> </tr> </thead> <tbody> <tr> <td rowspan="4">24V</td> <td>Default, programmable</td> <td rowspan="4">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 rowspan="4">48V</td> <td>Default, programmable</td> <td rowspan="4">55A</td> <td>57.6</td> <td>55.2</td> </tr> <tr> <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> <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="4">24V</td> <td>Default, programmable</td> <td rowspan="4">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 rowspan="4">48V</td> <td>Default, programmable</td> <td rowspan="4">55A</td> <td>57.6</td> <td>55.2</td> </tr> <tr> <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	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	48V	Default, programmable	55A	57.6	55.2	Pre-defined, gel battery	56	54.4	Pre-defined, flooded battery	56.8	53.6	Pre-defined, AGM battery	58	54	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	48V	Default, programmable	55A	57.6	55.2	Pre-defined, gel battery	56	54.4	Pre-defined, flooded battery	56.8	53.6	Pre-defined, AGM battery	58	54	PASS
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6	Front Panel LED Indicators	<p>※ LED Status Indicators (for charger mode)</p> <table border="1" style="font-size: x-small; width: 100%;"> <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.)																																																																													
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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			

■ **RELIABILITY TEST**

ENVIRONMENT TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT																																																																																																																												
1	TEMPERATURE RISE TEST	MODEL : NCP-3200-24 1. ROOM AMBIENT BURN-IN : 1 HRS I/P : 230VAC O/P : FULL LOAD Ta= 25 °C 2. HIGH AMBIENT BURN-IN : 1 HRS I/P : 230VAC O/P : FULL LOAD Ta= 50 °C																																																																																																																														
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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