



# Test Report: DBU-3200-48

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3200W Intelligent Single Output Battery Charger

## ■ DESIGN VERIFY TEST

Output Function Test

Input Function Test

Protection Function Test

Control Function Test

Component Stress Test

## ■ SAFETY & E.M.C. TEST

Safety Test

E.M.C. Test

## ■ RELIABILITY TEST

ENVIRONMENT TEST

■ DESIGN VERIFY TEST

**OUTPUT FUNCTION TEST**

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	BOOST CHARGE VOLTAGE	Default, programmable 57.6V±0.48V	I/P: 230 VAC O/P: CV MODE Ta:25°C	57.56V
2	FLOAT CHARGE VOLTAGE	Default, programmable 55.2V±0.48V	I/P: 230 VAC O/P: CV MODE Ta:25°C	55.16V
3	OUTPUT CURRENT	55A±3%	I/P: 230 VAC O/P:CV MODE-2V Ta:25°C	55.6 A
4	VOLTAGE ADJ. RANGE	47.5V~58.8V	I/P: 230 VAC O/P:NO LOAD Ta:25°C	46.18V~ 62.59V/230VAC 46.18V~62.59V/115VAC
5	LEAKAGE CURRENT FROM BATTERY (Typ.)	<1.5mA	I/P: AC OFF O/P:BATTERY(48V) Ta:25°C	1.09mA

**INPUT FUNCTION TEST**

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	INPUT VOLTAGE RANGE	90VAC~264VAC	I/P:TESTING O/P:FULL LOAD Ta:25°C	180V~264V/ FULL LOAD 76V~264V/HALF LOAD
			I/P: (1)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 (2)230Vac ON: 0.5 Sec OFF: 0.5 Sec 20MIN (3)230Vac ON:3Sec OFF:3Sec 12HOURS (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/ 17A	I/P : 230 VAC  O/P : FULL LOAD Ta : 25°C	I = 14.96A/ 230VAC
4	LEAKAGE CURRENT	<2 mA / 230 VAC	I/P : 230 VAC O/P : Min LOAD Ta : 25°C	L-FG : 0.7 mA N-FG : 0.7 mA
5	POWER FACTOR (Typ.)	0.97 / 230VAC	I/P : 230 VAC O/P : FULL LOAD Ta : 25°C	PF=0.993/230VAC
6	EFFICIENCY(Typ.)	94.5%	I/P:230 VAC O/P:FULL LOAD	94.7%

			Ta:25°C	
7	INRUSH CURRENT(Typ.)	230V/55 A COLD START	I/P : 230 VAC O/P : FULL LOAD Ta : 25°C	I =49.2A/ 230VAC T50= 2230us/230V
<p>INPUT=230VAC/50HZ @ FULL LOAD CH4 : Input current CH2: input voltage</p>				

**PROTECTION FUNCTION TEST**

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	OVER VOLTAGE PROTECTION	63 V~ 75 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	68.12V/ 264VAC 68.2V/ 230VAC 68.25V/ 90VAC PROTECTION TYPE :
2	OVER TEMPERATURE PROTECTION	NO DAMAGE  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  PROTECTION TYPE : Shut down o/p voltage, recovers automatically after temperature goes down

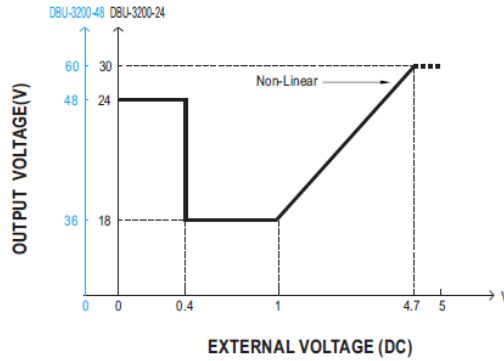
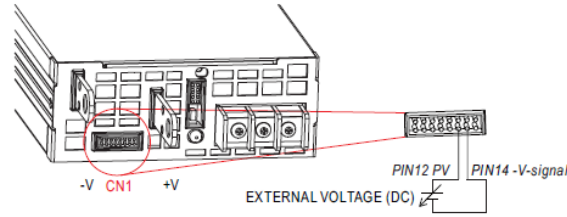
**CONTROL FUNCTION TEST**

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	PMBus Communication Interface	DBU-3200 supports PMBus Rev. 1.1 with maximum 100KHz bus speed, allowing information reading, status monitoring, output trimming, etc. For details, please refer to the Installation Manual. TEST RESULT : OK		

<p>2</p>	<p>Charging Curve</p>	<p>※ By factory default, this charger performs the default curve which can be programmed via PMBus.          ※ To disable / enable the charging curve, change to a 2 stage curve, a different curve frequently used for certain types of batteries in the industry, and so on, please refer to the Installation Manual.</p> <p>⊙ Default 3 stage charging curve</p> <p>⊙ Embedded 3 stage charging curve</p> <table border="1"> <thead> <tr> <th>MODEL</th> <th>Description</th> <th>Vboost</th> <th>Vfloat</th> <th>CC(default)</th> </tr> </thead> <tbody> <tr> <td rowspan="4">24V</td> <td>Default, programmable</td> <td>28.8</td> <td>27.6</td> <td rowspan="4">110A</td> </tr> <tr> <td>Pre-defined, gel batter</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>57.6</td> <td>55.2</td> <td rowspan="4">55A</td> </tr> <tr> <td>Pre-defined, gel batter</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>Note:          When using this charger unit, please configured the system with recommended battery capacity by specification defined. Should battery capacity in use be much smaller so that user needs to set a low current for charging, under such condition it might cause higher current ripple.</p> <p>⊙ Suitable for lead-acid batteries (flooded, Gel and AGM) and Li-ion batteries (lithium iron and lithium manganese).</p> <p>I/P: 230 VAC          O/P: TESTING          Ta: 25°C          TEST RESULT : OK</p>	MODEL	Description	Vboost	Vfloat	CC(default)	24V	Default, programmable	28.8	27.6	110A	Pre-defined, gel batter	28	27.2	Pre-defined, flooded battery	28.4	26.8	Pre-defined, AGM battery	29	27	48V	Default, programmable	57.6	55.2	55A	Pre-defined, gel batter	56	54.4	Pre-defined, flooded battery	56.8	53.6	Pre-defined, AGM battery	58	54
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<p>3</p>	<p>Front Panel LED Indicators &amp; Corresponding Signal at Function Pins</p>	<table border="1"> <thead> <tr> <th>LED</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>● Green</td> <td>Float (stage 3)</td> </tr> <tr> <td>● Orange</td> <td>Charging (stage 1 or stage 2)</td> </tr> <tr> <td>● Red</td> <td>Abnormal status (OTP, OLP, Fan Fail, Charging timeout.)</td> </tr> </tbody> </table> <p>I/P: 230 VAC          O/P: TESTING          Ta: 25°C          TEST RESULT : OK</p>	LED	Description	● Green	Float (stage 3)	● Orange	Charging (stage 1 or stage 2)	● Red	Abnormal status (OTP, OLP, Fan Fail, Charging timeout.)																									
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4 OUTPUT VOLTAGE PROGRAMMABLE(PV)

※ In addition to the adjustment via the built-in potentiometer, the output voltage can be trimmed by applying EXTERNAL VOLTAGE.



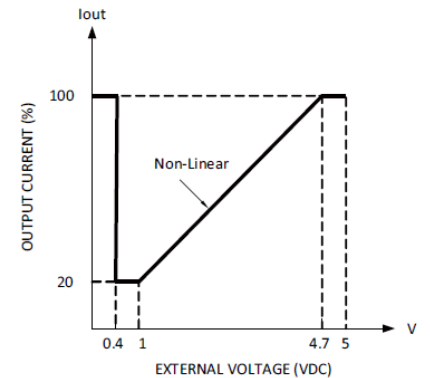
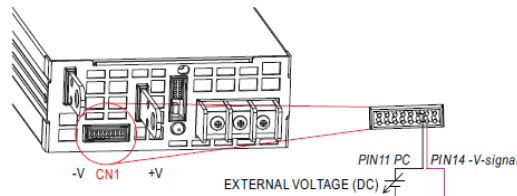
I/P: 230 VAC  
 O/P: FULL LOAD  
 Ta: 25°C  
 TEST RESULT :

PV	<0.3V	1V	4.7V	5V
MODEL				
SPEC	48V±5%	36V±5%	60V±5%	60V±5%
Vout	48.06V	35.7V	61.68V	62.58V

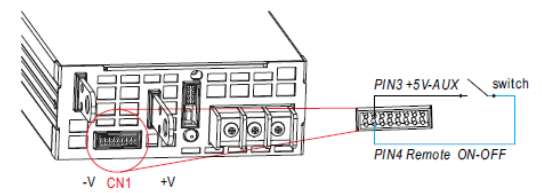
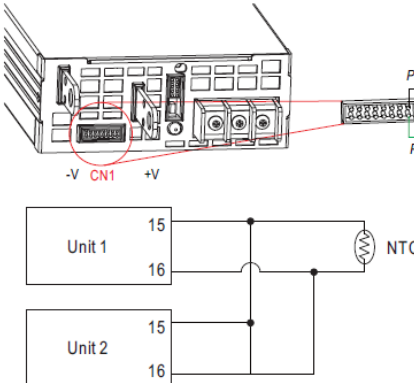
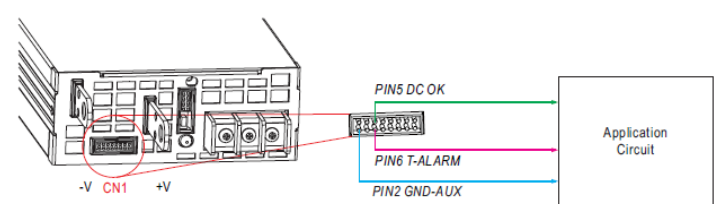
5 OUTPUT CURRENT PROGRAMMABLE (PC)

ADJ V	<0.4V	1V	4.7V	5V
SPEC	100%±10%	20%±10%	100%±10%	100%±10%
Iout	56.3A	10.7A	55.3A	56.3A

※ The output current can be trimmed to 20~100% of the rated current by applying EXTERNAL VOLTAGE.



I/P: 230 VAC  
 O/P: TESTING  
 Ta: 25°C

<p>6</p>	<p>REMOTE ON/OFF CONTROL</p>	<p>The power supply can be turned ON/OFF individually or along with other units in parallel by using the "Remote ON-OFF" function.</p>  <table border="1" data-bbox="1037 369 1492 470"> <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 Test Result :</p> <table border="1" data-bbox="470 616 1021 750"> <thead> <tr> <th>Between ON/OFF and +5V-AUX</th> <th>OUTPUT</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	OUTPUT	SW SHORT	ON	SW OPEN	OFF						
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<p>7</p>	<p>Temperature Compensation</p>	 <p>         ◎ To exploit the temperature compensation function, please attach the temperature sensor, NTC, which is enclosed with the charger, to the battery or the battery's vicinity.          ◎ The charger is able to work normally without the NTC.     </p> <p>When multiple chargers are connected in parallel, please configure with the NTC as exhibited in the diagram. If the temperature compensation is not required, RTH+ (PIN15) and RTH- (PIN16) from each unit still need to be connected.</p> <p>I/P: 230 VAC O/P: FULL LOAD Ta: 25°C Test Result :</p> <table border="1" data-bbox="470 1288 1500 1624"> <thead> <tr> <th rowspan="2">TEMP</th> <th rowspan="2">Voltage compensation</th> <th colspan="2">Temperature compensation</th> </tr> <tr> <th>BEFORE</th> <th>AFTER</th> </tr> </thead> <tbody> <tr> <td>( Ta=0°C )</td> <td>57.6V=+1.80V ±0.48V</td> <td>57.6</td> <td>59.4</td> </tr> <tr> <td>( Ta=25°C )</td> <td>57.6V=0V ±0.48V</td> <td>57.6</td> <td>57.6</td> </tr> <tr> <td>( Ta=50°C )</td> <td>57.6V=-1.80V ±0.48V</td> <td>57.6</td> <td>55.82</td> </tr> </tbody> </table>	TEMP	Voltage compensation	Temperature compensation		BEFORE	AFTER	( Ta=0°C )	57.6V=+1.80V ±0.48V	57.6	59.4	( Ta=25°C )	57.6V=0V ±0.48V	57.6	57.6	( Ta=50°C )	57.6V=-1.80V ±0.48V	57.6	55.82
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<p>8</p>	<p>ALARM SIGNAL</p>	<p>※ There are 2 alarm signals, DC OK and T-ALARM, in TTL signal form, on CN1. These signals are isolated from output. The maximum sink current is 10mA.</p>  <p>1. DC OK SIGNAL High (4.5 ~ 5.5V) : When the <math>V_{out} \leq 32V \pm 1V</math>. Low (-0.1 ~ 0.5V) : When <math>V_{out} \geq 32V \pm 1V</math>. The maximum sourcing current is 10mA and only for output. I/P: 230 VAC O/P: FULL LOAD</p>																		

		<p>Ta:25°C Test Result :</p> <table border="1"> <thead> <tr> <th>Vout</th> <th>DC OK SIGNAL</th> </tr> </thead> <tbody> <tr> <td>Vout ≤ 31V</td> <td>4.82V</td> </tr> <tr> <td>Vout ≥ 33V</td> <td>-0.065V</td> </tr> </tbody> </table> <p>2. T-ALARM</p> <table border="1"> <thead> <tr> <th>P.SU STATUS</th> <th>Vo</th> <th>T-ALARM</th> </tr> </thead> <tbody> <tr> <td>NORMAL</td> <td>100%±2%</td> <td>-0.1 ~-0.5V</td> </tr> <tr> <td>OTP OR FAN LOCK</td> <td>0V</td> <td>4.5~5.5V</td> </tr> </tbody> </table> <p>I/P: 230 VAC O/P:FULL LOAD Ta:25°C Test Result :</p> <table border="1"> <thead> <tr> <th>P.SU STATUS</th> <th>T-ALARM</th> </tr> </thead> <tbody> <tr> <td>NORMAL</td> <td>-0.065V</td> </tr> <tr> <td>OTP OR FAN LOCK</td> <td>4.826V</td> </tr> </tbody> </table>	Vout	DC OK SIGNAL	Vout ≤ 31V	4.82V	Vout ≥ 33V	-0.065V	P.SU STATUS	Vo	T-ALARM	NORMAL	100%±2%	-0.1 ~-0.5V	OTP OR FAN LOCK	0V	4.5~5.5V	P.SU STATUS	T-ALARM	NORMAL	-0.065V	OTP OR FAN LOCK	4.826V	
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9	<p><b>Current Sharing with Remote Sensing</b></p>	<p>DBU-3200 has the built-in active current sharing function and can be connected in parallel, up to 2 units, to provide higher output power as exhibited below :</p> <ul style="list-style-type: none"> <li>※ The power supplies should be paralleled using short and large diameter wiring and then connected to the load.</li> <li>※ Difference of output voltages among parallel units should be less than 0.2V.</li> <li>※ The total output current must not exceed the value determined by the following equation: Maximum output current at parallel operation=(Rated current per unit)×(Number of unit)×0.9</li> <li>※ When the total output current is less than 5% of the total rated current, or say (5% of Rated current per unit)×(Number of unit) the current shared among units may not be balanced.</li> <li>※ CN500/SW1 Function pin connection</li> </ul> <table border="1"> <thead> <tr> <th rowspan="2">Parallel</th> <th colspan="2">PSU1</th> <th colspan="2">PSU2</th> </tr> <tr> <th>CN500</th> <th>SW1</th> <th>CN500</th> <th>SW1</th> </tr> </thead> <tbody> <tr> <td>1 unit</td> <td>X</td> <td>ON</td> <td>—</td> <td>—</td> </tr> <tr> <td>2 unit</td> <td>V</td> <td>ON</td> <td>V</td> <td>ON</td> </tr> </tbody> </table> <p>(V : CN500 connected ; X : CN500 not connected.)</p> <p>Fig 5.1</p> <p>PSU1 CN500      PSU2 CN500</p> <p>If the lines of CN500 are too long, they should be twisted in pairs to avoid the noise.</p>	Parallel	PSU1		PSU2		CN500	SW1	CN500	SW1	1 unit	X	ON	—	—	2 unit	V	ON	V	ON	<p>I/P : 230 VAC O/P : 198A/80A Ta : 25°C</p> <p>O/P : 198A PSU1 : 48.9A PSU2 : 49 A PSU3 : 49.1 A PSU4 : 49 A</p> <p>O/P : 80A PSU1 : 18.9 A PSU2 : 20 A PSU3 : 19.9 A PSU4 : 19.5 A</p>		
Parallel	PSU1			PSU2																				
	CN500	SW1	CN500	SW1																				
1 unit	X	ON	—	—																				
2 unit	V	ON	V	ON																				
10	<p><b>AUXILIARY POWER (AUX)</b></p>	<p>a.+12V Auxiliary voltage output, 10.8~13.2V, referenced to GND-AUX (pin 2). The maximum load current is 0.8A. This output has the built-in "Oring diodes" and is not controlled by the Remote ON/OFF control</p> <p>b.+5V Auxiliary voltage output, 4.5~5.5V, referenced to GND-AUX (pin 2). The maximum load current is 0.3A. This 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 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>11.54V/210m</td> </tr> </tbody> </table>	AUX	TOLERANCE	RIPPLE	TEST RESULT	12V / 0.8A	10.8~13.2 V	450mVp-p	11.54V/210m														
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12V / 0.8A	10.8~13.2 V	450mVp-p	11.54V/210m																					

			5V / 0.3A	4.5 ~ 5.5V	150mVp-p	4.599V/80m	
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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 Ta:25°C	Q1: 267VAC: (1)481V  Q3: 267VAC: (1)504V
2	P.F.C Transistor ( D to S) or (C to E) Peak Voltage	Q 900 Rated 52A/600V  Q 902 Rated 52A/600V	I/P:High-Line +3V =267V AC ON/OFF VDS: O/P: (1)Full Load Ta:25°C	Q 900 267VAC:: (1)509V  Q 902 267VAC: (1)439V
3	P.F.C DIODE	D8 Rated : 16A/600V	I/P:High-Line +3V = 267V AC ON/OFF O/P: (1)Full Load Ta:25°C	(1) 452V
4	Diode Peak Voltage	Q101 Rated 87A/150V Q104 Rated 87A/150V Q107 Rated 87A/150V Q110 Rated 87A/150V	I/P:High-Line +3V = 267V AC ON/OFF VDS: O/P: (1)Full Load Ta:25°C	Q101: VDS: (1)116.2V  Q104: VDS: (1)114.6V  Q107: VDS: (1)119.4V  Q110: VDS: (1)117.8V
5	Input Capacitor Voltage	C5 Rated: : 330µ/ 450V 105°C	I/P:High-Line +3V =267V O/P: (1)Full Load input on/off Ta:25°C	(1)436V
6	Control IC Voltage Test	PWM IC U201 Rated 3V~18V  PFC IC U900 Rated 4.5V~20V	I/P:High-Line +3V =267V AC ON/OFF O/P:(1)FULL LOAD Ta:25°C	U201 (1) 13.72V  U900 (1) 11.95V
7	TOP SWITCHING STAND BY POWER	U 71 Rated 20A/800V	I/P:High-Line +3V = 267V AC ON/OFF  O/P: (1)Full Load (2)Remote On/Off Ta:25°C	(1) 589V (2) 585V

### 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: 12.43 mA I/P-FG: 10.66mA O/P-FG: 20.2mA 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: 22.6 GΩ I/P-FG: 20 GΩ O/P-FG: 10GΩ NO DAMAGE



3	GROUNDING CONTINUITY	FG(PE) TO CHASSIS OR TRACE < 100 mΩ	40A / 2min Ta:25°C	25mΩ
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### E.M.C TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	CONDUCTION	EN55032 (CISPR32) / EN55011 (CISPR11) CLASS B	I/P : 230 VAC (50HZ) O/P : FULL/50% LOAD Ta : 25°C	Test by certified Lab
2	RADIATION	EN55032 (CISPR32) / EN55011 (CISPR11) CLASS A	I/P : 230 VAC (50HZ) O/P : FULL LOAD Ta : 25°C	Test by certified Lab
3	HARMONIC	EN61000-3-2 CLASS A	I/P:230VAC/50HZ O/P:100% 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	IEC61000-6-2 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			

## ■ RELIABILITY TEST

### ENVIRONMENT TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	TEMPERATURE RISE TEST	MODEL : DBU-3200-48 1. ROOM AMBIENT BURN-IN : 1 HRS I/P : 230VAC O/P : FULL LOAD 2. HIGH AMBIENT BURN-IN : 1 HRS I/P : 230VAC O/P : FULL LOAD		

		NO	Position	ROOM AMBIENT Ta= 25°C	HIGH AMBIENT Ta= 50°C
		1	BD1	69.4°C	94.1°C
		2	RY1	39.2°C	63.7°C
		3	D7	68.2°C	93.1°C
		4	D8	66.8°C	91.7°C
		5	T3	43.1°C	68.0°C
		6	U900	44.6°C	70.8°C
		7	Q900	60.2°C	86.1°C
		8	Q902	64.6°C	91.2°C
		9	C5	42.5°C	67.1°C
		10	U902	38.3°C	63.5°C
		11	Q1	63.0°C	90.2°C
		12	Q3	57.5°C	84.1°C
		13	T1-2	67.3°C	93.9°C
		14	T1-1	70.2°C	96.0°C
		15	T2-2	68.8°C	95.6°C
		16	T2-1	65.0°C	90.3°C
		17	T301	46.5°C	73.2°C
		18	U71	74.6°C	103.0°C
		19	U201	48.9°C	74.5°C
		20	C111	27.0°C	50.0°C
		21	C121	33.4°C	57.9°C
		22	C115	28.8°C	52.8°C
		23	C116	27.7°C	51.7°C
		24	Q401	34.8°C	59.7°C
		25	Q411	33.6°C	58.5°C
		26	Q101	44.5°C	69.1°C
		27	Q108	49.9°C	74.5°C
		28	U110	36.1°C	60.1°C
		29	RT90	60.3°C	86.2°C
		30	U903	46.1°C	73.2°C
		31	U501	33.9°C	58.0°C
		32	RG76	47.4°C	71.4°C
		33	L1	46.3°C	70.4°C
		34	L3	75.3°C	99.5°C
		35	R900	45.6°C	71.2°C
		36	ZR2	32.1°C	56.8°C
		37	LF1	36.2°C	62.2°C
		38	C2	30.7°C	55.3°C
		39	C10	29.4°C	54.1°C
		40	ZR1	26.9°C	51.9°C
		41	RT1	27.8°C	52.0°C
2	LOW TEMPERATURE TURN ON TEST	TURN ON AFTER 2 HOUR		I/P : 230VAC/180VAC O/P : 100 % LOAD Ta= -30°C/-25°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°C HUMIDITY= 95 %R.H	TEST : OK
4	TEMPERATURE COEFFICIENT	± 0.03 %/°C (0-50°C)		I/P : 230 VAC O/P : FULL LOAD	± 0 %/°C (0-50°C)



5	STORAGE TEMPERATURE TEST	1. Thermal shock Temperature : -45°C~ +90°C 2. Temperature change rate : 25°C / MIN 3. Dwell time low and high temperature : 30 MIN/EACH 4. Total test cycle : 10 CYCLE 5. Input/Output condition : STATIC	OK
6	THERMAL SHOCK TEST	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	OK
7	VIBRATION TEST	1 Carton & 1 Set (1) Waveform : Sine Wave (2) Frequency : 10~500Hz (3) Sweep Time : 12min/sweep cycle (4) Acceleration : 2G (5) Test Time : 60min in each axis (X.Y.Z) (6) Ta : 25°C	TEST : OK
8	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) 1291380HRS (2) 205703HRS (3) 346894HRS (4) 479160HRS
9	MTBF	Conducted by Parts Stress Analysis Prediction 494.2K hrs min. Telcordia SR-332 (Bellcore) ; 44.8K hrs min. MIL-HDBK-217F (25°C)	
10	DMTBF/Accelerated Life Test	Demonstration Mean Time Between Failure (Expected Life): Above 50,000 hours @ TA 50°C	

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

2018.4.30 GP-A50-F010