



# Test Report: DBR-3200-48

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3200W Rack Mountable Front End 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	57.56 V
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	55.9A
4	VOLTAGE ADJ. RANGE	47.5V~58.8V	I/P: 230 VAC O/P:NO LOAD Ta:25°C	46.14V~62.48V/230VAC 46.14V~62.48V/115VAC
5	LEAKAGE CURRENT FROM BATTERY (Typ.)	<1.5mA	I/P: AC OFF O/P:BATTERY(48V) Ta:25°C	1.084mA

**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  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)	180V~264V/ FULL LOAD 76V~264V/HALF LOAD  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 = 14.9A/ 230VAC
4	LEAKAGE CURRENT	<1.5 mA / 230 VAC	I/P : 230 VAC O/P : Min LOAD Ta : 25°C	L-FG : 0.63 mA N-FG : 0.63 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 Ta:25°C	94.62%

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=2230 us/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	63V~ 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	68.2V/ 264VAC 68.2V/ 230VAC 68.11V/ 90VAC PROTECTION TYPE : Shut down o/p voltage, re-power on to recover
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

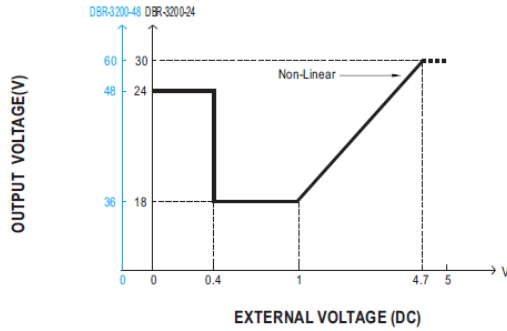
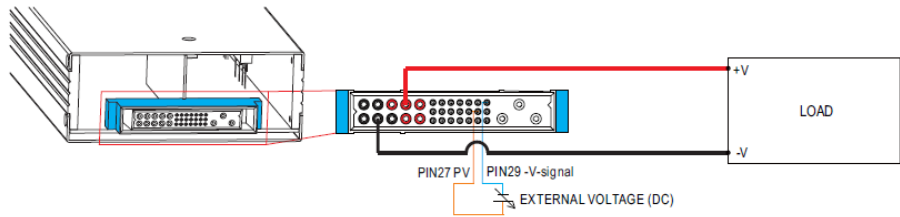
## CONTROL FUNCTION TEST

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1	PMBus Communication Interface	※DBR-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																																			
2	Charging Curve	<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 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>57.6</td> <td>55.2</td> <td rowspan="4">55A</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>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). I/P: 230 VAC</p>	MODEL	Description	Vboost	Vfloat	CC(default)	24V	Default, programmable	28.8	27.6	110A	Pre-defined, gel battery	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 battery	56	54.4	Pre-defined, flooded battery	56.8	53.6	Pre-defined, AGM battery	58	54		
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		<p>O/P: TESTING  Ta: 25°C  TEST RESULT : OK</p>																																							
3	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" style="margin-left: auto; margin-right: auto;"> <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" style="margin-left: auto; margin-right: auto;"> <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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4	ALARM SIGNAL	<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  Ta: 25°C  Test Result :</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Vout</th> <th>DC OK SIGNAL</th> </tr> </thead> <tbody> <tr> <td><math>V_{out} \leq 31V</math></td> <td>5.031v</td> </tr> <tr> <td><math>V_{out} \geq 33V</math></td> <td>-0.044</td> </tr> </tbody> </table> <p>2. T-ALARM</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <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" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>P.SU STATUS</th> <th>T-ALARM</th> </tr> </thead> <tbody> <tr> <td>NORMAL</td> <td>-0.046</td> </tr> <tr> <td>OTP OR FAN LOCK</td> <td>5.031v</td> </tr> </tbody> </table> <p>3. AC-OK</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>AC IN</th> <th>Vo</th> <th>AC OK</th> </tr> </thead> <tbody> <tr> <td><math>AC I/P \geq 87V_{rms}</math></td> <td>100%±2%</td> <td>4.5~5.5V</td> </tr> <tr> <td><math>AC I/P \leq 75V_{rms}</math></td> <td>0V</td> <td>-0.1~0.5V</td> </tr> </tbody> </table> <p>I/P: TEST  O/P: 50% LOAD  Test Result :</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>AC IN</th> <th>Vo</th> <th>AC OK</th> </tr> </thead> <tbody> <tr> <td><math>AC I/P \geq 87V</math></td> <td>57.57V</td> <td>5.031v</td> </tr> <tr> <td><math>AC I/P \leq 75V</math></td> <td>0V</td> <td>-0.045V</td> </tr> </tbody> </table>	Vout	DC OK SIGNAL	$V_{out} \leq 31V$	5.031v	$V_{out} \geq 33V$	-0.044	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	-0.046	OTP OR FAN LOCK	5.031v	AC IN	Vo	AC OK	$AC I/P \geq 87V_{rms}$	100%±2%	4.5~5.5V	$AC I/P \leq 75V_{rms}$	0V	-0.1~0.5V	AC IN	Vo	AC OK	$AC I/P \geq 87V$	57.57V	5.031v	$AC I/P \leq 75V$	0V	-0.045V
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5 OUTPUT VOLTAGE PROGRAMMABLE(PV)

※ In addition to the adjustment via the built-in potentiometer, the output voltage can be trimmed to 75~125% of the nominal voltage by applying EXTERNAL VOLTAGE.



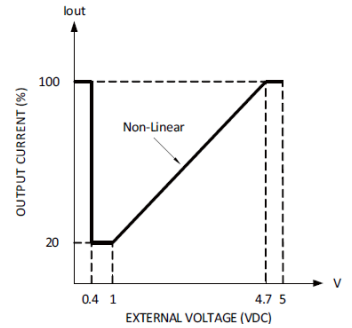
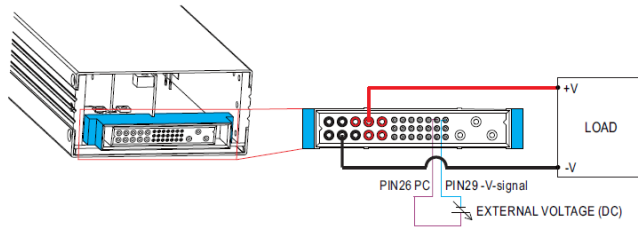
I/P: 230 VAC  
 O/P: FULL LOAD  
 Ta: 25°C  
 TEST RESULT :

PV	<0.3V	1V	4.7V	5V
MODEL				
SPEC	48V±5%	36V±5%	60V±5%	60V±5%
Vout	48.1V	35.59V	61.46V	62.5V

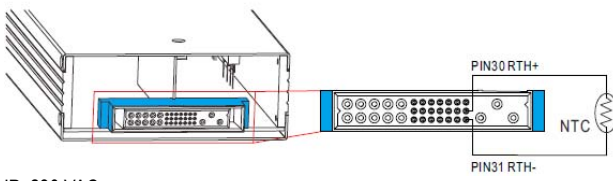
6 OUTPUT CURRENT PROGRAMMABLE (PC)

ADJ V	<0.4V	1V	4.7V	5V
SPEC	100%±10%	20%±10%	100%±10%	100%±10%
Iout	56.3A	10.4A	56.3A	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

7	Temperature Compensation	 <p>IP: 230 VAC O/P: FULL LOAD Ta: 25°C Test Result :</p> <table border="1" data-bbox="470 560 1500 891"> <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> <p>⊙ To exploit the temperature compensation function, please attach the temperature sensor, NTC, to the battery or the battery's vicinity. ⊙ The charger is able to work normally without the NTC.</p>	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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8	AUXILIARY POWER	<p>a. 12V : Auxiliary voltage output, 10.8~13.2V, referenced to GND-AUX (pin 12). 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 12). 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" data-bbox="550 1153 1388 1384"> <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>12.29V /52mv</td> </tr> <tr> <td>5V / 0.3A</td> <td>4.5 ~ 5.5V</td> <td>150mVp-p</td> <td>4.806V/52mv</td> </tr> </tbody> </table>	AUX	TOLERANCE	RIPPLE	TEST RESULT	12V / 0.8A	10.8~13.2 V	450mVp-p	12.29V /52mv	5V / 0.3A	4.5 ~ 5.5V	150mVp-p	4.806V/52mv						
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9	LED Status Indicators	<p>※ LED Status Indicators</p> <table border="1" data-bbox="478 1411 1492 1556"> <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>The LED will present a constant red light when the abnormal status (OTP, OLP, fan fail and charging timeout) arises.</td> </tr> <tr> <td>● 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 interface.)</td> </tr> </tbody> </table> <p>Test Result : OK</p>	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 interface.)								
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10	CURRENT SHARING	<p>&lt; ±5%</p> <table border="1" data-bbox="829 1601 1508 1960"> <tr> <td>I/P : 230 VAC O/P : 198A/80A Ta : 25°C</td> <td>O/P : 198A PSU1 : 48.9A PSU2 : 49 A PSU3 : 49.1 A PSU4 : 49 A</td> </tr> <tr> <td></td> <td>O/P : 80A PSU1 : 18.9 A PSU2 : 20 A PSU3 : 19.9 A PSU4 : 19.5 A</td> </tr> </table>	I/P : 230 VAC O/P : 198A/80A Ta : 25°C	O/P : 198A PSU1 : 48.9A PSU2 : 49 A PSU3 : 49.1 A PSU4 : 49 A		O/P : 80A PSU1 : 18.9 A PSU2 : 20 A PSU3 : 19.9 A PSU4 : 19.5 A														
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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  Q107: VDS: (1)119.4V	Q104: VDS: (1)114.6V  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: 12.17 mA I/P-FG: 13.99 mA O/P-FG: 18.51 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: 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

**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	PASS
2	CONDUCTION	EN55032 (CISPR32) / EN55011 (CISPR11) CLASS B	I/P : 230 VAC (50HZ) O/P : FULL/50% LOAD Ta : 25°C	PASS Test by certified Lab
3	RADIATION	EN55032 (CISPR32) / EN55011 (CISPR11) CLASS A	I/P : 230 VAC (50HZ) O/P : FULL LOAD Ta : 25°C	PASS 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 : DBR-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	53.5°C	78.7°C
		2	RY1	44.1°C	70.4°C
		3	D7	63.2°C	88.9°C
		4	D8	76.6°C	102.3°C
		5	T3	40.0°C	65.5°C
		6	U900	42.9°C	68.2°C
		7	Q900	60.0°C	85.8°C
		8	Q902	59.6°C	84.6°C
		9	C5	30.8°C	54.4°C
		10	U902	48.7°C	74.4°C
		11	Q1	53.8°C	80.0°C
		12	Q3	51.2°C	77.0°C
		13	T1-2	64.7°C	91.1°C
		14	T1-1	80.1°C	106.4°C
		15	T2-2	57.7°C	82.7°C
		16	T2-1	70.6°C	96.9°C
		17	T301	34.0°C	57.9°C
		18	U71	39.5°C	63.2°C
		19	U201	40.6°C	65.8°C
		20	C111	50.9°C	76.2°C
		21	C121	45.6°C	70.4°C
		22	C115	46.4°C	71.2°C
		23	C116	45.9°C	70.8°C
		24	Q401	59.8°C	85.5°C
		25	Q411	59.5°C	85.2°C
		26	Q101	54.8°C	80.2°C
		27	Q108	53.8°C	79.3°C
		28	U110	49.4°C	74.5°C
		29	RT90	40.0°C	64.2°C
		30	U903	34.1°C	58.5°C
		31	U501	47.2°C	71.7°C
		32	RG76	85.4°C	110.3°C
		33	L1	43.3°C	68.0°C
		34	L3	62.1°C	87.2°C
		35	R900	47.1°C	71.8°C
		36	ZR2	37.9°C	63.3°C
		37	LF1	51.6°C	78.0°C
		38	C2	43.5°C	69.0°C
		39	C10	50.4°C	76.3°C
		40	ZR1	48.5°C	74.0°C
		41	RT1	37.2°C	62.4°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	± 0.001 %/°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 C111 IS THE MOST CRITICAL COMPONENT (1) I/P : 230VAC O/P : FULL LOAD Ta= 25 °C LIFE TIME (2) I/P : 230VAC O/P : FULL LOAD Ta= 50 °C LIFE TIME (3) I/P : 230VAC O/P : 75% LOAD Ta= 50 °C LIFE TIME (4) I/P : 230VAC O/P : 50% LOAD Ta= 50 °C LIFE TIME	(1) 383955HRS (2) 66460HRS (3) 16891HRS (4) 294949HRS
9	MTBF	Conducted by Parts Stress Analysis Prediction 160.1K hrs min. Telcordia SR-332 (Bellcore) ; 38.9K 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