Test Report: BIC-2200-12

AC<->DC Bidirectional Power Supply with Energy Recycle Function

■ DESIGN VERIFY TEST

Output Function Test (AC to DC Direction)
Input Function Test(AC to DC Direction)
Output Function Test (DC to AC Direction)
Input Function Test(DC to AC Direction)
Protection Function Test
Control Function Test
Component Stress Test

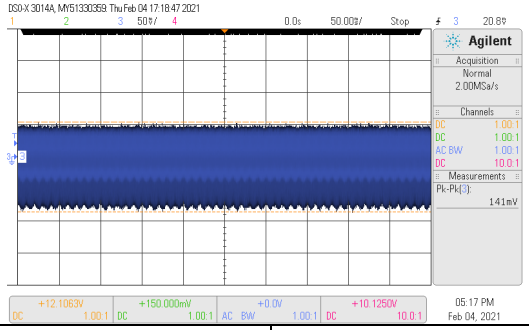
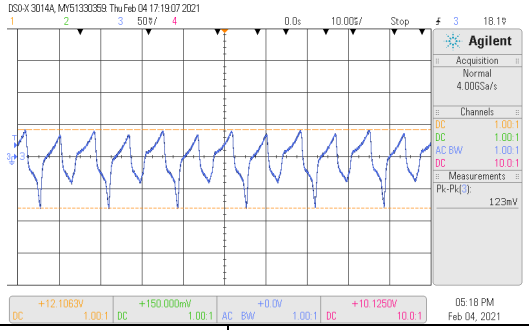
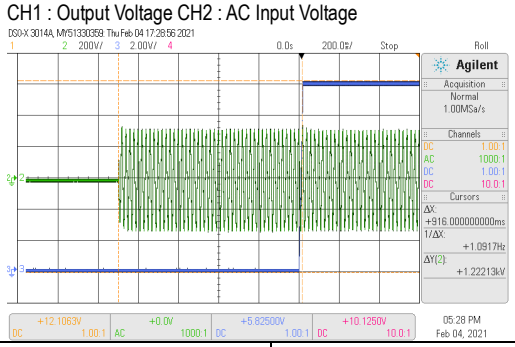
■ SAFETY & E.M.C. TEST

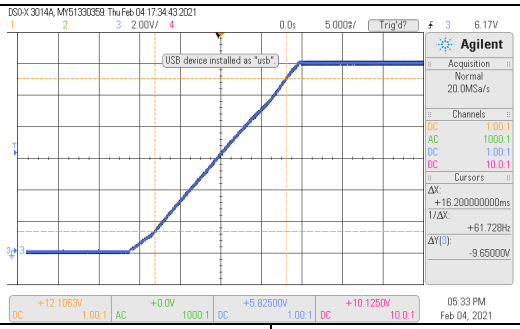
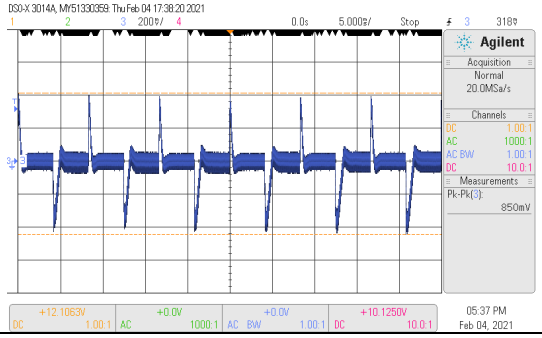
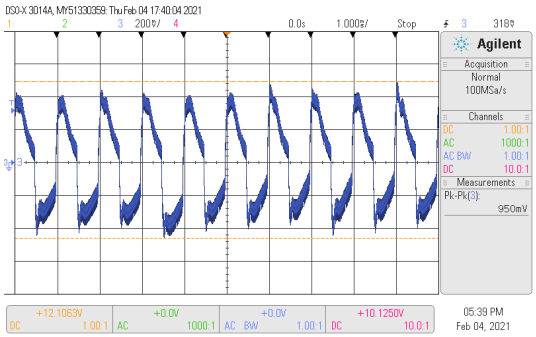
Safety Test
E.M.C. Test

■ RELIABILITY TEST

ENVIRONMENT TEST

■ DESIGN VERIFY TEST

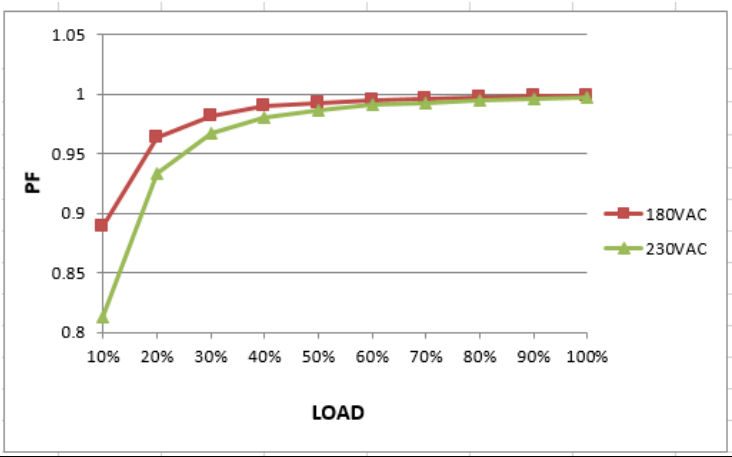
NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	OUTPUT VOLTAGE ADJUST RANGE	CH1: 10 V~ 15 V	I/P ： 230 VAC O/P ：MIN LOAD Ta ：25℃	9.735V~15.583V/230VAC
2	VOLTAGE TOLERANCE (Max)	1%~ -1 %	I/P: 180VAC /264VAC O/P:FULL/ MIN. LOAD Ta:25℃	0.58%~ -0.43 %
3	LINE REGULATION (Max)	0.5 %~ -0.5 %	I/P: 180VAC~ 264VAC O/P:FULL LOAD Ta:25℃	0.33%~ - 0.33%
4	LOAD REGULATION(Max)	0.5%~ -0.5%	I/P: 230VAC O/P:FULL ~MIN LOAD Ta:25℃	0.06%~- 0.066%
5	OVER/UNDERSHOOT TEST	< ±10%	I/P: 230VAC O/P:FULL LOAD Ta:25℃	<10%
6	RIPPLE & NOISE(Max)	160mVp-p	I/P:230VAC O/P:FULL LOAD Ta:25℃	141mVp-p
	high frequency ：  		low frequency ：  	
7	SET UP TIME(Max)	230VAC/1800ms	I/P ： 230 VAC O/P ：FULL LOAD Ta ：25℃	230VAC/ 916ms
	INPUT=230VAC/50HZ @ FULL LOAD CH1 : Output Voltage CH2 : AC Input Voltage  			
8	RISE TIME (Max)	230VAC/60ms	I/P ： 230 VAC O/P ：FULL LOAD Ta ：25℃	230VAC/ 16.2ms
	INPUT=230VAC/50HZ @ FULL LOAD CH1 : Output Voltage			

				
9	DYNAMIC LOAD	V1: 2400mVp-p	I/P: 230VAC O/P: (1)FULL /50% LOAD 50%DUTY / 120HZ (2)FULL /50% LOAD 50%DUTY / 1KHZ Ta:25℃	850mVp-p 950mVp-p
	FULL /50% LOAD 50%DUTY / 120HZ 		FULL /50% LOAD 50%DUTY / 1KHZ 	

INPUT FUNCTION TEST(AC to DC Direction)

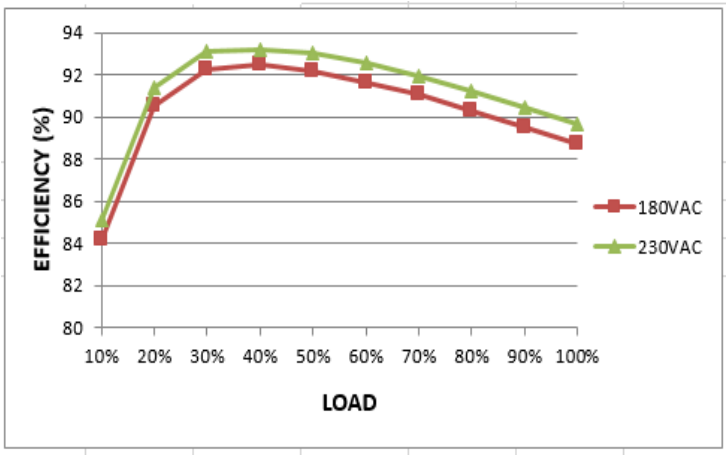
NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	INPUT VOLTAGE RANGE	180VAC~264VAC	(1) I/P:TESTING O/P:FULL LOAD Ta:25℃	(1) 162V~272V
			I/P: LOW-LINE-3V=177 V HIGH-LINE+15%=300 V O/P:FULL/MIN LOAD (PLEASE CHECK DERATING CURVE) ON: 30 Sec OFF: 30 Sec 10MIN (POWER ON/OFF NO DAMAGE)	TEST: OK
2	INPUT FREQUENCY RANGE	47HZ ~63 HZ NO DAMAGE	I/P:180VAC ~264 VAC O/P:FULL~MIN LOAD Ta:25℃	TEST: OK
3	INPUT CURRENT (Typ.)	230V/ 11A	I/P ： 230 VAC O/P ：FULL LOAD Ta ：25℃	I =10.9A/ 230VAC
4	LEAKAGE CURRENT	< 2mA / 230 VAC	I/P ： 230 VAC O/P ：Min LOAD Ta ：25℃	L-FG ： 1.2 mA N-FG ： 1.2 mA
5	POWER FACTOR (Typ.)	0.98/ 230VAC	I/P ： 230 VAC O/P ：FULL LOAD Ta ：25℃	PF=0.9938/230VAC

P.F vs LOAD



6	EFFICIENCY(Typ.)	90%	I/P:230 VAC O/P:75% LOAD Ta:25℃	90.95%

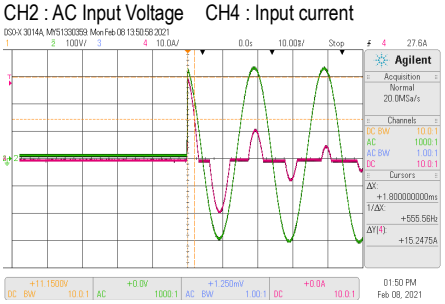
EFFICIENCY vs LOAD

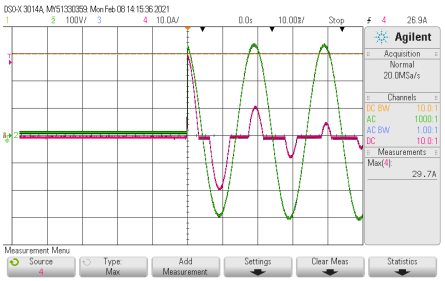


7	INRUSH CURRENT(Typ.)	230V/35A COLD START	I/P ： 230 VAC O/P ：FULL LOAD Ta ：25℃	I =29.7A/ 230VAC T50= 1800us/230V

INPUT=230VAC/50HZ @ FULL LOAD

CH2 : AC Input Voltage CH4 : Input current





8	TOTAL HARMONIC DISTORTION	<3%	I/P ： 230 VAC O/P ：FULL LOAD Ta ：25℃	THD = 1.8%

OUTPUT FUNCTION TEST(DC to AC Direction)

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	RATED OUTPUT POWER (Typ.) (@230V, 50Hz)	1725VA	I/P:12VDC O/P: FULL LOAD Ta:25℃	1670.5VA
2	VOLTAGE RANGE	180VAC~264VAC	I/P:12VDC O/P: TESTING Ta:25℃	158VAC~270VAC
3	FREQUENCY RANGE	47HZ ~63 HZ NO DAMAGE	I/P:12VDC O/P:FULL~MIN LOAD Ta:25℃	TEST: OK
4	AC CURRENT (Typ.)	230VAC/ 7.5A	I/P ： 12VDC O/P ：FULL LOAD Ta ：25℃	I =6.67A/ 230VAC
5	POWER FACTOR (Typ.)	0.99/ 230VAC	I/P ： 12VDC O/P ：FULL LOAD Ta ：25℃	PF=0.9949/230VAC
6	EFFICIENCY(Typ.)	90.5%	I/P: 12VDC O/P:75%LOAD Ta:25℃	91.83%
7	TOTAL HARMONIC DISTORTION	<3%	I/P ： 12VDC O/P ：FULL LOAD Ta ：25℃	THD = 2.7%/

INPUT FUNCTION TEST(DC to AC Direction)

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	RATED INPUT POWER	1800W	I/P ： 12VDC O/P ：FULL LOAD Ta ：25℃	1833W
2	DC VOLTAGE RANGE	10VDC ~15VDC	I/P ： TESTING VDC O/P ：FULL LOAD AUTO DERATING Ta ：25℃	10VDC/151.8A 12VDC/151.8A 15VDC/121.56A/ AUTO DERATING
3	MAX INPUT CURRENT	150A	I/P ： 12VDC O/P ：FULL LOAD Ta ：25℃	V1: 151.8A

PROTECTION FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	OVER LOAD PROTECTION	105%~ 115 % **AC to DC Direction:** Constant current limiting, shut down DC O/P voltage 5 sec. after DC O/P voltage is down low, re-power on to recover **DC to AC Direction:** Not accurable with constant power design	**AC to DC Direction** I/P: 264VAC I/P: 230VAC I/P: 180VAC **DC to AC Direction** I/P: 10VDC I/P: 12VDC I/P: 15VDC O/P:FULL LOAD Ta:25℃	**AC to DC Direction** 110.9%/ 264VAC 110.9%/ 230VAC 110.9%/180VAC PROTECTION TYPE ： Constant current limiting, shut down DC O/P voltage 5 sec. after DC O/P voltage is down low, re-power on to recover

				DC to AC Direction: 10VDC/151.8A 12VDC/151.8A 15VDC/121.56A/ AUTO DERATING PROTECTION TYPE： Not accurable with constant power design
2	OVER VOLTAGE PROTECTION	17.6V~20.8V Protection type : Shut down o/p voltage, re-power on to recover	I/P: 264VAC I/P: 230VAC I/P: 180VAC O/P:MIN LOAD Ta:25℃	18.1V/ 264VAC 18.1V/ 230VAC 18.1V/ 180VAC PROTECTION TYPE： Shut down o/p voltage, re-power on to recover
3	OVER TEMPERATURE PROTECTION	Protection type : Shut down o/p voltage, recovers automatically after temperature goes down	**AC to DC Direction** I/P: 264VAC I/P: 180VAC **DC to AC Direction** I/P: 10VDC I/P: 15VDC O/P:FULL LOAD Ta:25℃	**AC to DC Direction** O.T.P. Active Protection type : Shut down o/p voltage, recovers automatically after temperature goes down **DC to AC Direction** 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	**AC to DC Direction** I/P: 264VAC I/P: 180VAC **DC to AC Direction** I/P: 10VDC I/P: 15VDC O/P:FULL LOAD Ta:25℃	**AC to DC Direction** NO DAMAGE PROTECTION TYPE： Shut down o/p voltage, re-power on to recover **DC to AC Direction** NO DAMAGE PROTECTION TYPE： Shut down o/p voltage, re-power on to recover
5	ISLANDING PROTECTION	NO DAMAGE PROTECTION TYPE： Shut down o/p voltage, re-power on to recover	IEC62116 I/P: 14.5VDC O/P: FULL LOAD I/P: 12.5VDC O/P: 50% LOAD I/P: 10.5VDC O/P: 10% LOAD Ta:25℃	**DC to AC Direction** NO DAMAGE PROTECTION TYPE： Shut down o/p voltage, re-power on to recover

CONTROL FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT

<table>
<tr><td>1</td><td>AUXILIARY POWER (AUX)</td><td>
Auxiliary voltage output, 11.4~12.6V, referenced to GND-AUX (pin 2,4). The maximum output current is 0.5A. This output is not controlled by the Remote ON/OFF control.
I/P: 230 VAC /12VDC
O/P:FULL LOAD
Ta:25℃

Test Result：
<table>
<tr><td></td><td>TOLERANCE</td><td>RIPPLE</td></tr>
<tr><td>SPEC</td><td>11.4~12.6 V</td><td>150mVp-p</td></tr>
<tr><td>TEST RESULT</td><td>11.7V</td><td>35mV</td></tr>
</table>
</td></tr>
<tr><td>2</td><td>REMOTE ON/OFF CONTROL</td><td>
I/P: 230 VAC /12VDC
O/P:FULL LOAD
Ta:25℃
Test Result：
<table>
<tr><td>MODE</td><td>electrical signal or dry contact between Remote ON/OFF and +12V-AUX</td><td>Power Supply Status</td></tr>
<tr><td rowspan="2">AC to DC Direction</td><td>SW SHORT</td><td>ON</td></tr>
<tr><td>SW OPEN</td><td>OFF</td></tr>
<tr><td rowspan="2">DC to AC Direction</td><td>SW SHORT</td><td>ON</td></tr>
<tr><td>SW OPEN</td><td>OFF</td></tr>
</table>
</td></tr>
<tr><td>3</td><td>BIDIRECTION SWITCH TIME(DEFAULT)</td><td>
I/P: 230 VAC /12VDC
O/P:FULL LOAD
Ta:25℃
Test Result：
<table>
<tr><td>MODE</td><td>BIDIRECTION SWITCH TIME</td><td>Result</td></tr>
<tr><td>AC to DC Direction</td><td>1ms</td><td>888 us</td></tr>
<tr><td>DC to AC Direction</td><td>1ms</td><td>681 us</td></tr>
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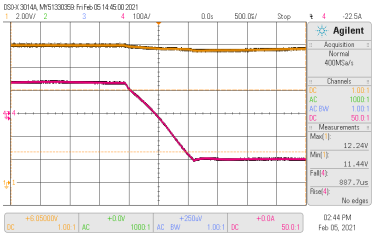
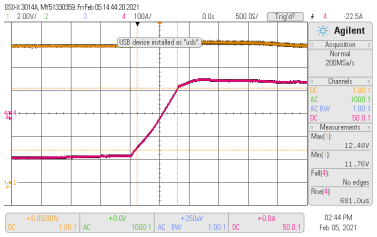
</td></tr>
<tr><td>4</td><td>ALARM SIGNAL</td><td>
1. DC OK SIGNAL
High (4.5 ~ 5.5V) : When the Vout ≦ 80%±5%.
Low (-0.5 ~ 0.5V) : When the Vout ≧ 80%±5%.
The maximum sourcing current is 4mA and only for output.
I/P: 230 VAC/12VDC
O/P:FULL LOAD
Ta:25℃
Test Result：
<table>
<tr><td>MODE</td><td>Vout</td><td>DC OK SIGNAL</td></tr>
<tr><td rowspan="2">AC to DC Direction</td><td>Vout≦75%</td><td>5.006V</td></tr>
<tr><td>Vout≧85%</td><td>-0.004V</td></tr>
</table>
</td></tr>
</table>

2. T-ALARM
High (4.5 ~ 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 4mA and only for output.

I/P: 230 VAC/12VDC
O/P:FULL LOAD
Ta:25℃

Test Result：

MODE	P.SU STATUS	Vo	T-ALARM SPEC	T-ALARM TEST
AC to DC Direction	NORMAL	100%±2%	-0.5~0.5V	-0.004V
	OTP	0V	4.5~5.5V	4.95V
	FAN LOCK	0V	4.5~5.5V	4.95V

3. FAULT
High (4.5 ~ 5.5V) : When the input voltage is≧175Vrms，OLP, SCP,OTP,OVP,AC Fail,fan lock,islanding protection
Low (-0.5 ~ 0.5V) : When the input voltage is≦165Vrms.
The maximum sourcing current is 4mA and only for output.

MODE	Vout	FAULT SIGNAL
AC to DC Direction	VAC≧175Vrms	5.027v
	VAC≦165Vrms.	-0.004V

5	CURRENT SHARING	CURRENT SHARING TOLERANCE <±10%	I/P： 230 VAC O/P：90/50% LOAD Ta：25℃	**AC to DC Direction** O/P：90% PSU1：163.78A PSU2：163.51A PSU3：160 A PSU4：163.69A PSU5：160.88A O/P：50% PSU1：90.81 A PSU2：90.96A PSU3：88.45A PSU4：91.14 A PSU5：89.78 A	**DC to AC Direction** O/P：100% PSU1：151.6A PSU2：148.4A PSU3：149.8A PSU4：148.4A PSU5：147.6A O/P：50% PSU1：76.6 A PSU2：75A PSU3：74.2A PSU4：76.8 A PSU5：74 A
6	BATTERY MODE RATED CURRENT(CAN BUS model only)	AC to DC Direction:160A DC to AC Direction:120A Can be adjusted by communication	**AC to DC Direction** I/P: 230VAC **DC to AC Direction** I/P: 12VDC O/P:FULL LOAD Ta:25℃	**AC to DC Direction:** 160.72A/230VAC **DC to AC Direction** 119.25A/12VDC	

COMPONENT STRESS TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	PWM Transistor (D to S) or (C to E) Peak Voltage	**AC to DC Direction &** **DC to AC Direction** Q903 Rated: 36A/ 600V VGS :± 20V	AC ON/OFF **AC to DC Direction** I/P:High-Line +3V =267V VDS: O/P: (1)Full Load (2)Output Short (3)0%→400% Load. I/P:Low-Line -3V = 177V O/P: (1)Full Load (2)Output Short (3)0%→400% Load.	**AC to DC Direction** I/P:High-Line +3V =267V Q903 VDS: (1) 419V/20.38A (2) 408V/ 15.21A (3) 403V/16.05 A I/P:Low-Line -3V = 177V Q903 VDS: (1) 406V/ 19.98A (2) 398V/ 14.85A (3) 402V/ 16.03A

			DC to AC Direction I/P: 15VDC VDS: O/P: (1)Full Load (2)+100%Io/1S~-100%Io/1S (3)-100%Io AC Off I/P: 10VDC O/P: (1)Full Load (2)+100%Io~-100%Io (3)-100%Io AC Off Ta:25℃	**DC to AC Direction** I/P: 15VDC Q903 VDS: (1) 423 V/5.32A (2) 431 V/6.91A (3) 510 V/6.29A I/P: 10VDC Q903 VDS: (1) 424V/ 5.34A (2) 435V/6.57A (3) 510V/6.37A
2	P.F.C Transistor (D to S) or (C to E) Peak Voltage	**AC to DC Direction** Q2 Rated: 53A/ 650V VGS :± 25V Q4 Rated: 52A/ 600V VGS :± 25V	I/P:High-Line +3V =267 V AC ON/OFF (1)Full Load (2)Output Short (3)0%→400% Load. I/P:Low-Line -3V = 177V AC ON/OFF O/P:(1)Full Load (2)Output Short (3)0%→400% Load. Ta:25℃	I/P:High-Line +3V =267V Q2 VDS: (1) 469V/21.8A (2) 423V/10.9A (3) 418V/9.56A Q4 VDS: (1) 411V/18.5A (2) 412V/10.29A (3) 412V/11.28A I/P:Low-Line -3V = 177V Q2 VDS: (1) 429V/13.61A (2) 413V/9.5A (3) 417V/15.58A Q4 VDS: (1) 441V/15.65A (2) 441V/13.98A (3) 417V/13.81A	
3	Diode Peak Voltage	**AC to DC Direction &** **DC to AC Direction** Q950 Rated : 225A/60V VGS :±20V Q951 Rated : 225A/60V VGS :±20V Q958 Rated : 225A/ 60V VGS :±20V Q959 Rated : 225A/60V VGS :±20V **AC to DC Direction only** Q74 Rated :225A/60V VGS :±20V	**AC to DC Direction** AC ON/OFF I/P:High-Line +3V =267 V VO=SPEC VR MAX O/P: (1)Full Load (2)Output Short (3)0%→400% Load. VO=RATED VOLTAGE O/P: (1)Full Load **DC to AC Direction** I/P:15VDC VO=SPEC VR MAX O/P: (1)Full Load (2)+100%Io/1S~-100%Io/1S (3)-100%Io AC Off VO=RATED VOLTAGE O/P: (1)Full Load Ta:25℃	**AC to DC Direction** Q950: VO=SPEC VR MAX VDS: (1) 23.3V (2) 22.67V (3) 22.71V VO=RATED VOLTAGE (1) 22.85V Q951: VO=SPEC VR MAX VDS: (1) 23.86V (2) 23.47V (3) 23.49V VO=RATED VOLTAGE (1) 24.07V Q958: VO=SPEC VR MAX VDS: (1) 22.88V (2) 22.3V	**DC to AC Direction** Q950: VO=SPEC VR MAX VDS: (1) 32.04V (2) 33.42V (3) 36.4V VO=RATED VOLTAGE (1) 33.6V Q951: VO=SPEC VR MAX VDS: (1) 24.52V (2) 28.06V (3) 28.85V VO=RATED VOLTAGE (1) 24.9V Q958: VO=SPEC VR MAX VDS: (1) 32.83V (2) 34.39V

				(3) 22.68V VO=RATED VOLTAGE (1) 22.68V Q959: VO=SPEC VR MAX VDS: (1) 24.1V (2) 23.69V (3) 23.62V VO=RATED VOLTAGE (1) 24.28V Q74 VO=SPEC VR MAX VDS: (1) 32.61V (2) 30.06V (3) 30.45V VO=RATED VOLTAGE (1) 33.43V	(3) 34.4V VO=RATED VOLTAGE (1) 35.59V Q959: VO=SPEC VR MAX VDS: (1) 24.95V (2) 26.28V (3) 25.12V VO=RATED VOLTAGE (1)25.15 V
4	Input Capacitor Voltage	C6 Rated: 470μ/ 450V	I/P:High-Line +3V =267V **AC to DC Direction** O/P: (1)Full Load input on/off (2) Min load input on /Off (3)Full Load /Min load Change (4)Full load continue **DC to AC Direction** (1)+100%Io~-100%Io (2)-100%Io AC Off Ta:25℃	 **AC to DC Direction** (1) 414.3V (2) 410.1V (3) 429.9V (4) 412.1V **DC to AC Direction** (1)429.84V (2)430V	
5	Control IC Voltage Test	PWM IC U57 Rated -0.3V~ 20V PFC IC U551 Rated -0.3V~ 20V O/P IC U308 Rated -0.3V~ 20V MCU IC U201 Rated 1.71V~3.6V AUX IC U701 Rated -0.3V~35V	AC ON/OFF **AC to DC Direction** I/P:High-Line +3V =267 V O/P(1)FULL LOAD (2) Output Short (3)O.L.P (4)O.V.P. (5)NO LOAD VRmin(LOW LINE) Ta:25℃	U57: (1) 11.39V (2) 11.39V (3) 11.39V (4) 11.4V (5) 11.4V U551: (1) 11.95V (2) 11.95V (3) 11.94V (4) 11.95V (5) 11.95V U308: (1) 12.46V (2) 12.45V (3) 12.46V (4) 12.44V (5) 12.43V	U201: (1) 3.304V (2) 3.302V (3) 3.301V (4) 3.302V (5) 3.303V U701: (1) 13.69V (2) 13.76V (3) 13.57V (4) 13.76V (5) 13.96V
6	STAND BY POWER	Q700 Rated : 4.5A/ 800V	AC ON/OFF **AC to DC Direction** I/P:High-Line +3V =267 V O/P: (1)Full Load (2)Remote On/Off	 I/P:High-Line +3V =267 V (1) 557V/1.976 A (2) 561V/ 2.052A	

			I/P:Low-Line -3V =177V O/P: (1)Full Load (2)Remote On/Off Ta:25℃	I/P:Low-Line -3V =177V (1) 557V/ 1.846A (2) 565V/1.862 A

■ 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:0.5KVAC/min	I/P-O/P: 3.6 KVAC/min I/P-FG: 2.4 KVAC/min O/P-FG:0.6KVAC/min Ta:25℃	I/P-O/P:17.29mA I/P-FG:16.5mA O/P-FG:11.3m A 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℃	II/P-O/P: 12.6GΩ I/P-FG: 13.2GΩ O/P-FG: 7.62GΩ NO DAMAGE
3	GROUNDING CONTINUITY	FG(PE) TO CHASSIS OR TRACE < 100 mΩ	40A / 2min Ta:25℃	13 mΩ

E.M.C TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	HARMONIC	EN61000-3-2 CLASS A	I/P:230VAC/50HZ O/P:FULL LOAD Ta:25℃	PASS
2	CONDUCTION	EN55032 CLASS B	I/P： 230 VAC (50HZ) O/P：FULL/50% LOAD Ta：25℃	PASS Test by certified Lab
3	RADIATION	EN55032 CLASS A	I/P： 230 VAC (50HZ) O/P：FULL LOAD Ta：25℃	PASS Test by certified Lab
4	E.S.D	EN61000-4-2 AIR：8KV / Contact：4KV	I/P： 230 VAC/50HZ O/P：FULL LOAD Ta：25℃	CRITERIA A
5	E.F.T	EN61000-4-4 INPUT： 2KV	I/P： 230 VAC/50HZ O/P：FULL LOAD Ta：25℃	CRITERIA A
6	SURGE	IEC61000-4-5 INDUSTRY L-N ：2KV L,N-PE：4KV	I/P： 230 VAC/50HZ O/P：FULL LOAD Ta：25℃	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 : BIC-2200-12		

AC to DC Direction:

1. ROOM AMBIENT BURN-IN : 1.5 HRS
   I/P : 230VAC O/P : FULL LOAD Ta= 25 ℃
2. HIGH AMBIENT BURN-IN : 1.5 HRS
   I/P : 230VAC O/P : FULL LOAD Ta= 40 ℃

DC to AC Direction:

1. ROOM AMBIENT BURN-IN : 0.5 HRS
   I/P : 12VDC O/P : FULL LOAD Ta= 25 ℃
2. HIGH AMBIENT BURN-IN : 1.5 HRS
   I/P : 12VDC O/P : FULL LOAD Ta= 40 ℃

NO	Position	AC to DC Direction:		DC to AC Direction:	
		ROOM AMBIENT Ta= 25℃	HIGH AMBIENT Ta= 40 ℃	ROOM AMBIENT Ta= 25℃	HIGH AMBIENT Ta= 40 ℃
1	Q1	67.4℃	84.0℃	49.5℃	68.9℃
2	Q4	38.1℃	56.3℃	32.4℃	49.7℃
3	Q906	51.5℃	74.5℃	38.9℃	55.6℃
4	Q907	60.4℃	83.8℃	42.4℃	61.2℃
5	T1 coil	81.9℃	103.9℃	56.6℃	75.5℃
6	Q950	87.9℃	109.0℃	59.6℃	81.0℃
7	Q957	79.3℃	99.6℃	55.7℃	76.8℃
8	Q700	40.4℃	56.8℃	35.4℃	55.2℃
9	T55	45.1℃	60.6℃	43.2℃	60.8℃
10	Q3	37.5℃	57.1℃	32.2℃	49.2℃
11	Q959	80.4℃	104.5℃	58.1℃	75.7℃
12	Q964	97.1℃	110℃	66.0℃	84.4℃
13	D972	99.3℃	111℃	66.9℃	85.7℃
14	T1 core	50.2℃	70.0℃	39.0℃	58.2℃
15	C722	38.1℃	53.3℃	35.8℃	53.7℃
16	L700	35.7℃	48.5℃	33.2℃	52.0℃
17	D707	36.1℃	51.7℃	33.6℃	52.0℃
18	U701	40.5℃	57.8℃	37.3℃	54.5℃
19	C711	39.2℃	57.2℃	36.8℃	53.6℃
20	RG70	48.0℃	66.3℃	46.5℃	64.4℃
21	D706	58.0℃	74.9℃	58.9℃	73.8℃
22	D705	50.1℃	67.5℃	43.1℃	62.8℃
23	U551	48.2℃	64.7℃	38.7℃	59.1℃
24	U201	50.7℃	66.0℃	40.3℃	59.7℃

			25	Q2	66.8℃	85.1℃	49.5℃	68.0℃
			26	T550	33.9℃	51.4℃	31.2℃	47.5℃
			27	L900	63.0℃	82.7℃	44.9℃	61.0℃
			28	T3	40.4℃	60.4℃	34.7℃	51.1℃
			29	RT51	47.0℃	66.8℃	39.4℃	56.5℃
			30	RT52	35.7℃	55.1℃	29.9℃	50.1℃
			31	L1	40.6℃	56.5℃	31.9℃	51.1℃
			32	BD1	28.3℃	43.0℃	23.0℃	42.8℃
			33	RY1	28.3℃	42.0℃	24.3℃	43.0℃
			34	Q902	57.0℃	77.4℃	38.4℃	55.4℃
			35	LF3	31.6℃	50.6℃	26.9℃	44.8℃
			36	C2	24.2℃	42.4℃	23.0℃	40.9℃
			37	C962	29.4℃	46.0℃	26.8℃	44.3℃
			38	C958	29.9℃	46.7℃	25.5℃	44.7℃
			39	L950	56.7℃	71.2℃	39.9℃	59.2℃
			40	RG61	37.4℃	56.2℃	30.9℃	50.5℃
			41	T92	49.4℃	68.5℃	38.0℃	56.1℃
			42	U405	36.0℃	55.1℃	34.0℃	50.2℃
			43	U51	33.6℃	55.6℃	31.5℃	47.3℃
			44	R143	44.6℃	68.5℃	41.1℃	57.4℃
			45	D906	38.3℃	60.6℃	37.9℃	55.7℃
			46	D905	38.6℃	59.5℃	38.3℃	57.3℃
			47	U120	42.6℃	60.8℃	35.1℃	52.9℃
			48	Q74	50.3℃	68.1℃	39.4℃	58.0℃
			49	RG50	30.9℃	47.2℃	27.9℃	45.7℃
			50	R938	38.2℃	50.4℃	29.8℃	49.4℃
			51	C6	48.2℃	67.1℃	39.3℃	56.1℃
			52	Q903	61.5℃	84.4℃	42.9℃	59.5℃
			53	Q952	80.1℃	101.0℃	58.0℃	77.0℃
			54	D982	72.8℃	92.5℃	53.5℃	74.4℃

2	OVER LOAD BURN-IN TEST	NO DAMAGE 1 HOUR (MIN)	I/P： 230 VAC O/P： 110% LOAD Ta：25℃	TEST：OK
3	LOW TEMPERATURE TURN ON TEST	TURN ON AFTER 2 HOUR	I/P： 264VAC/100VAC O/P： 100 %LOAD Ta= -35 ℃	TEST：OK
4	HIGH HUMIDITY HIGH TEMPERATURE HIGH VOLTAGE TURN ON TEST	AFTER 12 HOURS IN CHAMBER ON CONTROL 40 ℃/95 %R.H NO DAMAGE	I/P： 268 VAC O/P：FULL LOAD Ta= 40 ℃ HUMIDITY= 95 %R.H	TEST：OK
5	TEMPERATURE COEFFICIENT	± 0.03%/℃(0~45℃)	I/P： 230 VAC O/P：FULL LOAD	± 0.01%/℃(0~45℃)
6	STORAGE TEMPERATURE TEST	-40~85℃	1. Thermal shock Temperature： -45℃~ +90℃ 2. Temperature change rate ：25℃ / MIN 3. Dwell time low and high temperature ： 30 MIN/EACH 4. Total test cycle：10 CYCLE 5. Input/Output condition： STATIC	

7	THERMAL SHOCK TEST	-30~45℃	1. Thermal shock Temperature： -35℃~ +50℃ 2. Temperature change rate ：25℃ / 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℃
9	CAPACITOR LIFE CYCLE	SUPPOSE C962 IS THE MOST CRITICAL COMPONENT (1) I/P： 230VAC O/P：FULL LOAD Ta= 25 ℃ LIFE TIME (2) I/P： 230VAC O/P：FULL LOAD Ta= 40 ℃ LIFE TIME (3) I/P： 230VAC O/P：75% LOAD Ta= 40℃ LIFE TIME (4) I/P： 230VAC O/P：50% LOAD Ta= 40 ℃ LIFE TIME	 (1) 519622HRS (2) 164428HRS (3) 481868HRS (4) 784370HRS
10	MTBF	Conducted by Parts Stress Analysis Prediction 462.9K hrs min. Telcordia SR-332 (Bellcore) ; 46K hrs min. MIL-HDBK-217F (25℃)	
11	Ongoing Reliability Test	I/P：230VAC O/P：FULL LOAD TA=40℃ Demonstration Mean Time Between Failure : 50,000 hours	

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

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