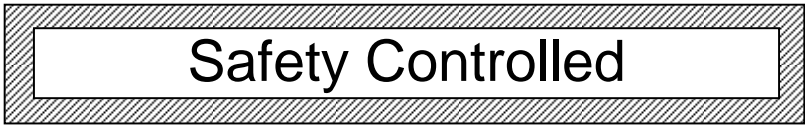


CLASS TS	DWG NO. 638300
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REVISIONS				
REV	DESCRIPTION	CHECK	ENG	DATE
00	INITIAL BOSE VERSION		NM	28/5/14
02	UPDATE ATS2 AND EXCLE MACRO TO REV21B		NM	02/11/14

BOSE APPLICABLE DOCUMENTS:




DOC LVL	DRAFTER NOTIO MAEDA @ AUBIT	DATE 28/05/14	 FRAMINGHAM, MA 01701-9168				
3	CHECKER		DESCRIPTION TEST SPEC,CONTROLSpace GPIO-II (Zamboni project)				
2	ENGINEER						
	SAFETY ENGINEER						
1	RLS TO PROD		SIZE A	FSCM 32108	CLASS TS	DWG NO. TS 638300	REV. 02
						SHT 1 OF 23	

Table of Contents

1. Overview.....	3
1.1. Purpose.....	3
1.2. Scope.....	3
1.2.1. Identification.....	3
1.2.2. System Overview.....	3
1.3. Definitions and Abbreviations.....	3
1.3.1. Definitions.....	3
1.3.2. Acronyms.....	4
1.4. Change History.....	4
2. References.....	4
2.1. Industry Standards.....	4
2.2. Bose Corporation Documents.....	4
2.3. Project Documents.....	4
3. Introduction.....	5
3.1. Pre-test Programming.....	5
3.1.1. GPIO-II.....	5
3.1.2. Other reference cards.....	5
3.2. Restrictions.....	5
4. The files for this test.....	5
4.1. Connection of GPIO-II test.....	6
4.2. Procedure of GPIO-II test.....	7
4.3. GPIO-II test.....	8
5. Pass/Fail Evaluation and Test Report.....	9
6. Testing method and criteria.....	11
6.1. Full value test.....	11
6.2. Half value test.....	11
6.3. Single Channel Test.....	12
6.4. Overall rating.....	12
6.5. Card configuration.....	12

1. Overview

1.1. Purpose

This document describes the manufacturing test procedure for the GPIO-II (Zamboni project).
This document can be applied to the GPIO-II that already programmed the firmware by IOpgm.exe.

1.2. Scope

1.2.1. Identification

This release is identified by the following configuration items:

- ESP Firmware espII_v4.130.frm
- ATS-2 Test Macro Rev21b
- (720110-001S)(BSE99A1)Motherboard
- (720112-001S)(BSE98A1)DSP-HIGH-PERFORMANCE
- (720111-001S)(BSE97A1)DSP-STANDARD
- (638300-0010)(BSE52A1)GPIO II

1.2.2. System Overview

This test procedure is used for production testing of GPIO-II (Zamboni project). This test should be performed on all GPIO-II and each GPIO-II shall "PASS" prior to shipping.

This test utilizes ATS2 macro and ATS software, but ATS2 hardware is not needed.

The ATS software can be used under its demo mode.

The switcher system is not needed for this test.

1.3. Definitions and Abbreviations

1.3.1. Definitions

Term	Definition
ESP-00 II	ESP-00II frame with : (720110-001S)(BSE99A1)Motherboard (720111-001S)(BSE97A1)DSP-STANDARD (720112-001S)(BSE98A1)DSP-HIGH-PERFORMANCE ASTEC Power supply These cards is for the reference. They shall not shipped.
Switcher	Not needed
ESP for fixture	Not needed

1.3.2. Acronyms

Term	Definition
ESP	ControlSpace Engineered Sound Processor
CSD	ControlSpace Designer software
MB	ESP Motherboard
DSP-STD card	Main card with digital processing
DSP-HP card	DSP processing card with 3 DSP device
GPIO	8 control inputs and 8 control outputs.
CC-16	Zone Controller with RS485 interface
DUT	Device Under Test

1.4. Change History

Revision	Date	Section	Description	Changed By
A	2014/05/21	All	Initial Bose version following Pilot	Notio Maeda @ AuBit

2. References

2.1. Industry Standards

Ref #	Title	By	Rev	URL

2.2. Bose Corporation Documents

Ref	Title	By	Rev	URL

2.3. Project Documents

Ref	Title	By	Rev	URL
	Product specification			

3. Introduction

This GPIO-II is the functional module that accept analog/digital control input signals and output the digital control signals.

The GPIO-II is compatible to the Redline GPIO characteristics.

This card have 2 of 9 pin connector for 8 channels input and 8 channels output.

3.1. Pre-test Programming

The following devices must be programmed prior to testing:

3.1.1. GPIO-II

This should be programmed with the latest GPIO-II firmware.

GPIO-II can be wrote the firmware by using IOpgm.exe through Ethernet.

3.1.2. Other reference cards.

The other cards for reference shall be preprogrammed.

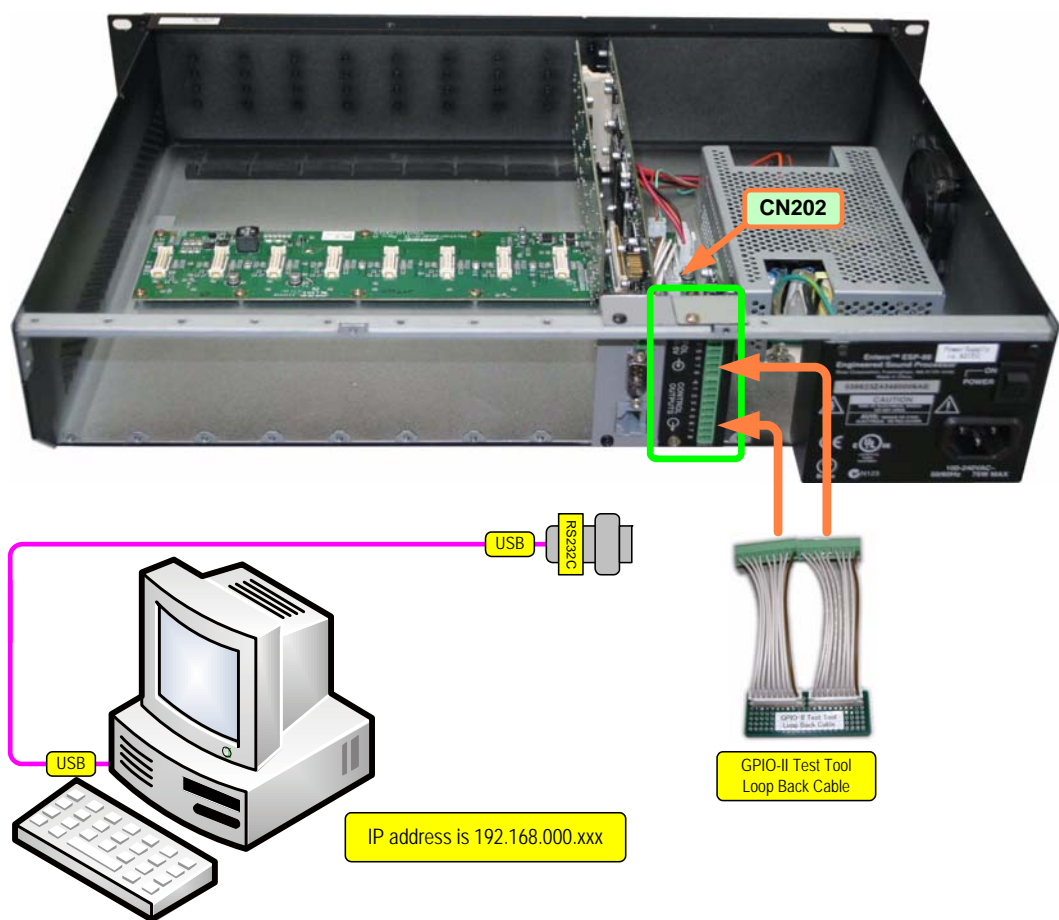
3.2. Restrictions

4. The files for this test.

File name	Software	Notes
ESP88C_Test_Macro_Rev_21b.atsb	ATS 1.60	These files are the modules for these test.
ESP_ESP-00II_AcommandII.atsb	ATS 1.60	
ESP_GPIO-II.atsb	ATS 1.60	
ESP_INPUT-II+OUTPUT-II.atsb	ATS 1.60	
RedlineAudioPerformanceTestingModule.atsb	ATS 1.60	
RedlineMacAddressWritingModule.atsb	ATS 1.60	
RedlinePhantomTestingModule.atsb	ATS 1.60	
ControlSpace_Test_Report_form_Rev_21b.xls	Excel	

Note : This test does not need the CSP file. CSD software also not needed.

4.1. Connection of GPIO-II test



(DUT view point) The connectors shall connect to this device.

Slot Number	Item	Device	Note
GPIO2	No need		This is for test.
GPIO1	GIO-II for ship	GPIO-II loop back cable	Connect to CN202 on MB-II
DSP	DSP-STD+DSP-HP For reference	RS232C	
SLOT 1	No need		
SLOT 2	No need		
SLOT 3	No need		
SLOT 4	No need		
SLOT 5	No need		
SLOT 6	No need		
SLOT 7	No need		
SLOT 8	No need		

4.2. Procedure of GPIO-II test

This GPIO-II test is performed by ATS-2 macro. ATS hardware is not needed.
ATS software can run under Demo mode.
The filename of the macro is **ESP88C_Test_Macro_Rev_21b.atsb** .
Related files also needed.

This is the dialog of this test.

Before running this test , all equipments of the fixture power shall be turned on.

Orange marked part is the function for this test.

To start this test, choose [Zamboni GPIO-II]
And fill the [Serial number] and other fields.

The [DUT Comm Port] field is for the COM port number to communicate to the ESP-00II for reference.
The [Fixture Comm Port] is not used in this test.

After filling the fields and check the DUT, push the [Start Test] Button.

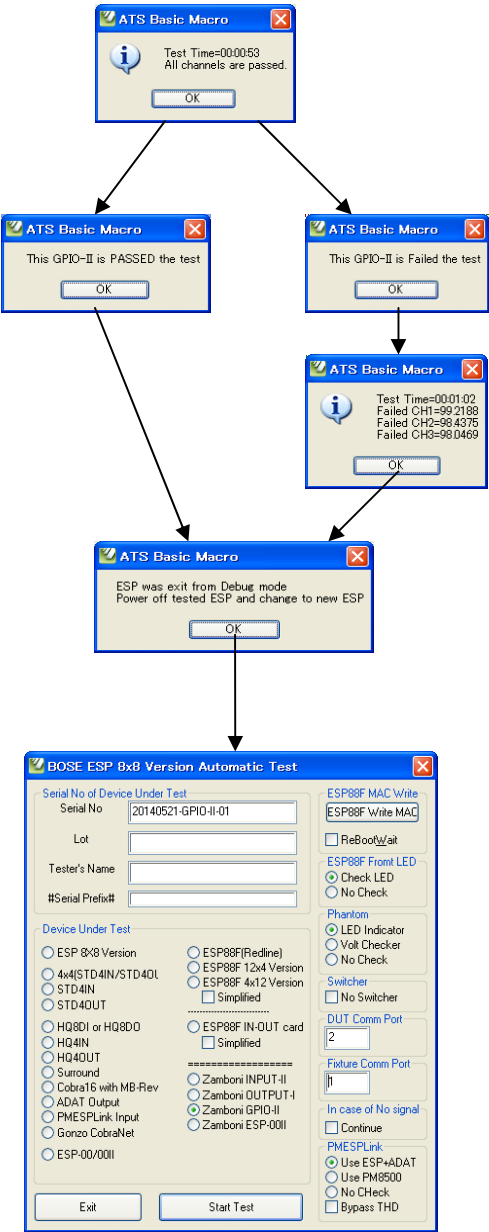
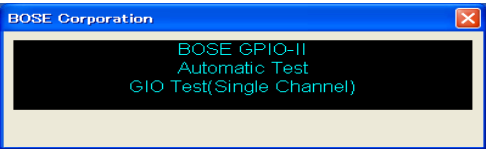
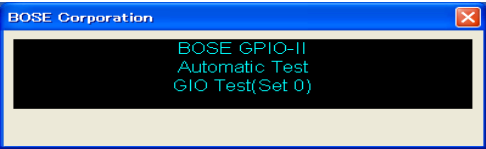
The file name dialog will come up.

The serial number is utilized for the file name.
This file name will be used for the Excel macro.

Note : The [#Serial Prefix#] field will utilize for the beginning of the serial number for following test.
For example the serial number for test is
060849Z31400001AE to 060849Z31400099AE
Please input [060849Z314000] .

When this dialog will come up, the ATS macro is opening the ESP for debug mode and getting configuration.

4.3. GPIO-II test.



The testing will proceed automatically.

These results will be recorded to the file automatically.

After testing, this macro reports the result of test.

When failed, failed channels will be reported.

5. Pass/Fail Evaluation and Test Report

After retrieving the log file for the test (using the TestLogOpen macro in the ControlSpace_Test_Report_form_Rev_21b49.xls file) the, pass/fail evaluation is done automatically. Gray colored cells are not used for pass/fail detection. If the result cell indicates "FAIL", this DUT cannot be shipped.

Microsoft Excel - 20140521-GPIO-II-03(FAIL).xls

ファイル(F) 編集(E) 表示(V) 挿入(I) 書式(O) ツール(T) データ(D) ウィンドウ(W) ヘルプ(H) 質問を入力してください

Arial 11 B I U

K1

1	BOSE										Date: 12-May-14
3	Device under test					ControlSpace_Test_Report_form_Rev_19					
4	Serial Number	20140521-GPIO-II-03									
5	Lot										
6	Date of test	2014,05,21									
7	Tester's Name										
8	This report sheet = ControlSpace_Test_Report_form_Rev_19a.xls										
9	Zamboni GPIO-II Card TEST	This ATS Macro ID = ESP88C_Test_Macro_Rev_19d									
10		CH1	CH2	CH3	CH4	CH5	CH6	CH7	CH8		
11	GIO full Value Set0	99.22	98.44	98.05	98.44	98.44	99.22	98.44	99.22		
12	GIO Harf Value Set1	99.22	98.44	98.05	98.44	98.44	99.22	98.44	99.22		
13	GIO Single Channel CH1	99.22	98.44	98.05	98.44	98.44	99.22	98.44	99.22		
14	GIO Single Channel CH2	99.22	98.44	98.05	98.44	98.44	99.22	98.44	99.22		
15	GIO Single Channel CH3	99.22	98.44	98.05	98.44	98.44	99.22	98.44	99.22		
16	GIO Single Channel CH4	99.22	98.44	98.05	98.44	98.44	99.22	98.44	99.22		
17	GIO Single Channel CH5	99.22	98.44	98.05	98.44	98.44	99.22	98.44	99.22		
18	GIO Single Channel CH6	99.22	98.44	98.05	98.44	98.44	99.22	98.44	99.22		
19	GIO Single Channel CH7	99.22	98.44	98.05	98.44	98.44	99.22	98.44	99.22		
20	GIO Single Channel CH8	99.22	98.44	98.05	98.44	98.44	99.22	98.44	99.22		
21											
22	10.11 Audio test card configuration										
23	Slot1 =										
24	Slot2 =										
25	Slot3 =										
26	Slot4 =										
27	Slot5 =										
28	Slot6 =										
29	Slot7 =										
30	Slot8 =										
31	Slot9 = Q12V0001										
32	Slot10 =										
33											
34											

20140521-GPIO-II-03/

図形の調整(R) オートシェイプ(U)

コマンド NUM

BOSE Framingham, MA 01701-9168	SIZE A	FSCM 32108	CLASS TS	DWG NO. TS 638300	SHEET 9 of 12	REV. 00
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Passed Test report

Microsoft Excel - 20140521-GPIO-II-02(Passed).xls

ファイル(F) 編集(E) 表示(V) 挿入(I) 書式(O) ツール(T) データ(D) ウィンドウ(W) ヘルプ(H) 質問を入力してください

Arial 11 B I U

K1

1	BOSE ®										Date: 12-May-14
3	Device under test					ControlSpace_Test_Report_form_Rev_19					
4	Serial Number	20140521-GPIO-II-02									
5	Lot										
6	Date of test	2014,05,21									
7	Tester's Name										
8	This report sheet = ControlSpace_Test_Report_form_Rev_19a.xls										
9	Zamboni GPIO-II Card TEST	This ATS Macro ID = ESP88C_Test_Macro_Rev_19d									
10		CH1	CH2	CH3	CH4	CH5	CH6	CH7	CH8		
11	GIO full Value Set0	95.31	94.92	94.92	94.92	94.92	95.31	94.92	95.31		
12	GIO Harf Value Set1	49.61	49.61	49.61	49.61	49.61	49.61	49.61	49.61		
13	GIO Single Channel CH1	49.61	94.92	94.92	94.92	95.31	95.31	95.31	95.31		
14	GIO Single Channel CH2	95.31	49.61	94.92	94.92	95.31	95.31	95.31	95.31		
15	GIO Single Channel CH3	95.31	94.92	49.61	94.92	95.31	95.31	95.31	95.31		
16	GIO Single Channel CH4	95.31	94.92	94.92	49.61	95.31	95.31	95.31	95.31		
17	GIO Single Channel CH5	95.31	94.92	94.92	94.92	49.61	95.31	95.31	95.31		
18	GIO Single Channel CH6	95.31	94.92	94.92	94.92	95.31	49.61	95.31	95.31		
19	GIO Single Channel CH7	95.31	94.92	94.92	94.92	95.31	95.31	49.61	95.31		
20	GIO Single Channel CH8	95.31	94.92	94.92	94.92	95.31	95.31	94.92	49.61		
21											
22	10.11 Audio test card configuration										
23	Slot1 =										
24	Slot2 =										
25	Slot3 =										
26	Slot4 =										
27	Slot5 =										
28	Slot6 =										
29	Slot7 =										
30	Slot8 =										
31	Slot9 = Q12V0001										
32	Slot10 =										
33											
34											

20140521-GPIO-II-02/

図形の調整(R) オートシェイプ(U)

コマンド NUM

6. Testing method and criteria

This section describes the criteria of performance test. Determining if the DUT passes on each test is done automatically by the Excel Macro.

These testing use the “GPIO-II loop back cable”. This cable will connect the GPO to GPI with attenuator. The attenuator adjusts the GPO voltage to 95% of GPI input range. (Full value)
When GPO is settled as low, the GPI will pulled down by the loop back resister on the loop back cable. In this case, the GPI voltage will be adjusted to 50% of GPI input range.(Half value)

Note: This GPIO-II loop back cable Is not compatible to the cable for GPIO-RevC.

6.1. Full value test

The measured voltage when the GPO output is settled to high voltage in percent.

Criteria

CH	GPO (Setting)	GPI (Measured)	Tolerance
1	High voltage	95%	2.5%
2	High voltage	95%	2.5%
3	High voltage	95%	2.5%
4	High voltage	95%	2.5%
5	High voltage	95%	2.5%
6	High voltage	95%	2.5%
7	High voltage	95%	2.5%
8	High voltage	95%	2.5%

6.2. Half value test

The measured voltage when the GPO output is settled to low voltage in percent.

Criteria

CH	GPO (Setting)	GPI (Measured)	Tolerance
1	Low voltage	50%	2.5%
2	Low voltage	50%	2.5%
3	Low voltage	50%	2.5%
4	Low voltage	50%	2.5%
5	Low voltage	50%	2.5%
6	Low voltage	50%	2.5%
7	Low voltage	50%	2.5%
8	Low voltage	50%	2.5%

6.3. Single Channel Test

The measured voltage when the GPO output is settled to low voltage in percent.
Set the measured channel to low and the other channels stay high.

Criteria (example of CH1 test)

CH	GPO (Setting)	GPI (Measured)	Tolerance
1	Low voltage	50%	2.5%
2	High voltage	95%	2.5%
3	High voltage	95%	2.5%
4	High voltage	95%	2.5%
5	High voltage	95%	2.5%
6	High voltage	95%	2.5%
7	High voltage	95%	2.5%
8	High voltage	95%	2.5%

Change low channel CH1 to Ch8.

Criteria (example of CH8 test)

CH	GPO (Setting)	GPI (Measured)	Tolerance
1	High voltage	50%	2.5%
2	High voltage	95%	2.5%
3	High voltage	95%	2.5%
4	High voltage	95%	2.5%
5	High voltage	95%	2.5%
6	High voltage	95%	2.5%
7	High voltage	95%	2.5%
8	Low voltage	50%	2.5%

6.4. Overall rating

To detect the failure, this macro (ATS and Excel) calculate recorded value.
Meet with the criteria of each tested item.

GIO full Value Set0
GIO Half Value Set1
GIO Single Channel CH1
GIO Single Channel CH2
GIO Single Channel CH3
GIO Single Channel CH4
GIO Single Channel CH5
GIO Single Channel CH6
GIO Single Channel CH7
GIO Single Channel CH8

6.5. Card configuration

The card configuration records the card firmware version and slots.
It is not used for the pass/fail detection.