S6SAL211A94SA1001

4ch 10W LED Driver Board Operation Guide

Preface

This manual explains how to use the evaluation board. Be sure to read this manual before using the product. For this product, please consult with sales representatives or support representatives.

Handling and Use

Handling and use of this product and notes regarding its safe use are described in the manuals.

Follow the instructions in the manuals to use this product.

Keep this manual at hand so that you can refer to it anytime during use of this product.

Notice on this Document

All information included in this document is current as of the date it is issued. Such information is subject to change without any prior notice.

Please confirm the latest relevant information with the sales representatives.

Cautions

Caution of the Products Described in this Document

The following precautions apply to the product described in this manual.

⚠ WARNING	Indicates a potentially hazardous situation which could result in death or serious injury and/or a fault in the user's system if the product is not used correctly.
⚠ WARNING	Do not look directly at LED. There is a possibility that your eye is hurt.

Electric shock, Damage	Before performing any operation described in this manual, turn off all the power supplies to the system. Performing such an operation with the power on may cause an electric shock or device fault.
Electric shock, Damage	Once the product has been turned on, do not touch any metal part of it. Doing so may cause an electric shock or device fault.

⚠ CAUTION	Indicates the presence of a hazard that may cause a minor or moderate injury, damages to this product or devices connected to it, or may cause to loose software resources and other properties such as data, if the device is not used appropriately.

Cuts, Damage	Before moving the product, be sure to turn off all the power supplies and unplug the cables. Watch your step when carrying the product. Do not use the product in an unstable location such as a place exposed to strong vibration or a sloping surface. Doing so may cause the product to fall, resulting in an injury or fault.
Cuts	The product contains sharp edges that are left unavoidably exposed, such as jumper plugs. Handle the product with due care not to get injured with such pointed parts.
Damage	Do not place anything on the product or expose the product to physical shocks. Do not carry the product after the power has been turned on. Doing so may cause a malfunction due to overloading or shock.
Damage	Since the product contains many electronic components, keep it away from direct sunlight, high temperature, and high humidity to prevent condensation. Do not use or store the product where it is exposed to much dust or a strong magnetic or electric field for an extended period of time. Inappropriate operating or storage environments may cause a fault.
Damage	Use the product within the ranges given in the specifications. Operation over the specified ranges may cause a fault.
Damage	To prevent electrostatic breakdown, do not let your finger or other object come into contact with the metal parts of any of the connectors. Before handling the product, touch a metal object (such as a door knob) to discharge any static electricity from your body.
Damage	When turning the power on or off, follow the relevant procedure as described in this document. Before turning the power on, in particular, be sure to finish making all the required connections. Furthermore, be sure to configure and use the product by following the instructions given in this document. Using the product incorrectly or inappropriately may cause a fault.
Damage	Because the product has no casing, it is recommended that it be stored in the original packaging. Transporting the product may cause a damage or fault. Therefore, keep the packaging materials and use them when re-shipping the product.

Contents

1. Description

S6SAL211A94SA1001 is the starter kit tool for BLE (*1) communication.

The tool has one evaluation board, this board implements S6AL211A94, and LED driver controlled by BLE communication.

It is necessary to prepare AC power cable, Android terminal (*2), Application software, LED module and connection cable.

*1: BLE: Bluetooth® Low Energy

*2: Prepare an Android terminal with Android OS 4.4.2 or 4.4.4.

Figure 1-1 Board Outline
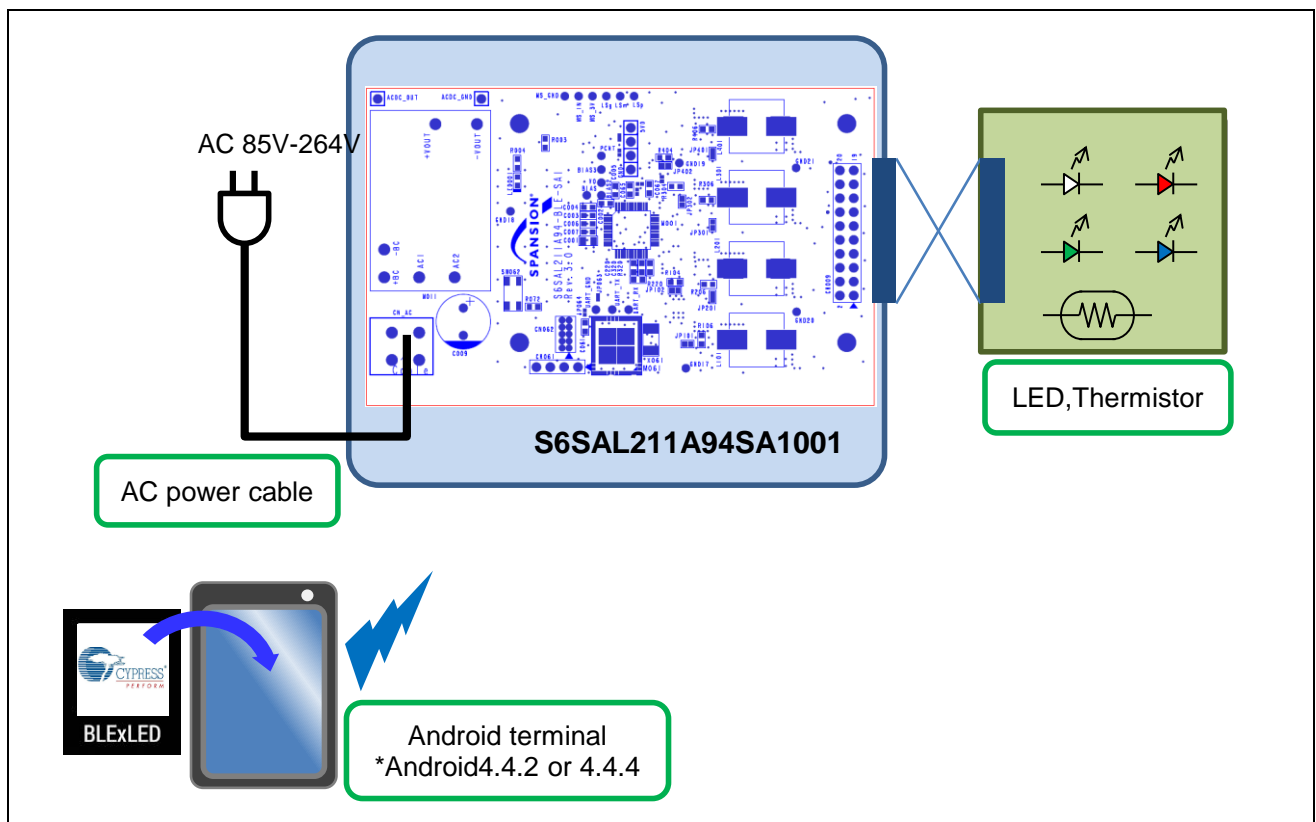
2. Evaluation Board Specification

Figure 2-1 Evaluation Board Specification

Item	Symbol	Min.	Typ.	Max.	Unit
Input voltage (with TUHS10F24)	VINAC	85		264	VRMS
Output LED voltage	VLEDout	0	18	24	V
Output LED current	ILEDout(W) ILEDout(R) ILEDout(G) ILEDout(B)	-	-	290 140 180 90	mA
Board size	-	58 × 93			mm

.

3. Pin Descriptions

3.1 Input/Output Connecter Descriptions

Table 3-1 Input/Output Pin Descriptions

Connecter Symbol	I/O	Function Description
CN_AC	I	AC power supply terminal
ACDC_OUT	O	24V AC/DC module output
ACDC_GND	-	GND
CN009	I/O	CH1 - CH4 LED , thermistor terminal
MS_3V	O	3V power supply terminal for motion sensor
MS_IN	I	Input terminal for motion sensor
MS_GND	-	GND terminal for motion sensor
LSp	O	3V power supply terminal for Illumination sensor
LSm	I	Input terminal for Illumination sensor
LSg	-	GND terminal for Illumination sensor
CN061	I/O	JTAG terminal for BLE module

3.2 Switch Descriptions

Table 3-2 Switch Descriptions

Switch	Description
SW062	Reset push switch for BLE module

4. Setup and Verification

4.1 Contents in a Package

Table 4-1 S6SAL211A94SA1001 Contents List

No.	Contents	Description	Quantity	Notes
1	S6SAL211A94-BLE-SA1	Evaluation board of 4CH 10W with S6AL211A94	1	-
2	Leaflet	Described startup information	2	English, Japanese

Figure 4-1 Contents Picture

4.2 Evaluation with BLE Communication

Using Items for Evaluation with I^{2}C Control

- Evaluation board   1pic (*1)
- AC power cable   1pic (*2)
- Android terminal with Android OS 4.4.2 or 4.4.4.   1pic (*2)
- Application software   1pic (*3)
- LED module(5 series × 4ch)   1set (*2)
- Connection cable   1set (*2)

*1: Included in a package.

*2: Please prepare. Refer to 4.2.1 Operation

*3: Please download it from our device home page.

URL: http://www.cypress.com/S6AL211A

S6AL211A94:   BLE Application software file   BLExLED.apk in S6AL211_BLExLED.cab

4.2.1 Operation

⚠	WARNING	Do not look directly at LED. There is a possibility that your eye is hurt.

1. Connect CN009 of the evaluation board and LED by connection cable. (*1)

2. Set some attributes in the application of Android terminal. (*2)

3. Connect AC plug of the evaluation board to AC power supply.

4. Connect Android terminal to BLE module by BLE communication. (*2)

5. When connection succeeds, it is possible to make them do various movement by application. (*3)

6. When ending operation, make the brightness level of the LED "0" and tap "Disconnect" button of "HOME" tab and cut power supply.

Figure 4-2 Board Connection
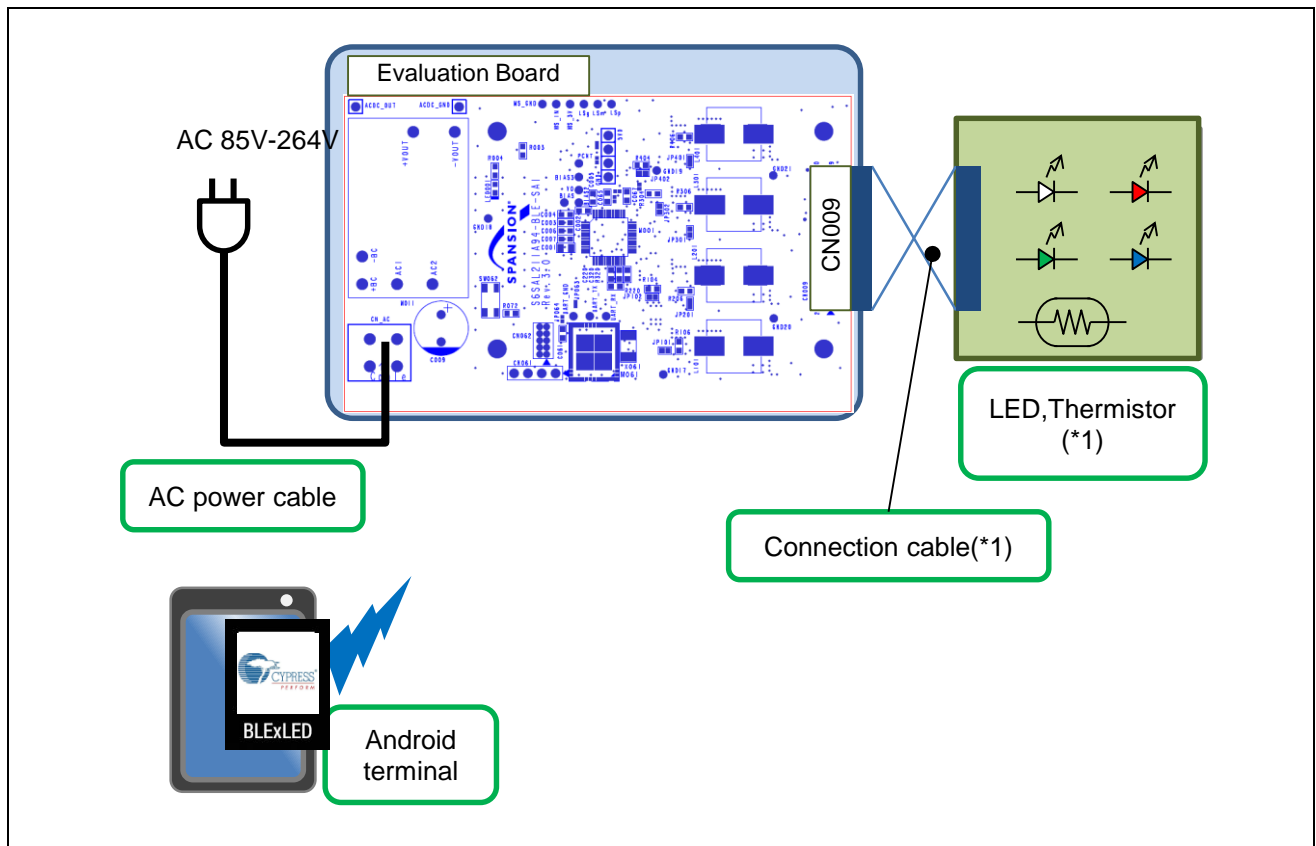
*1: Connect LED to all CH from CN009. Refer to 4.2.1.1 Connection of the Evaluation Board and LED.

*2: Refer to 4.2.1.2 Setup with BLE Communication.

*3: Refer to 4.3 Function of Application.

4.2.1.1 Connection of the Evaluation Board and LED

Figure 4-3 Connection of the Evaluation Board and LED
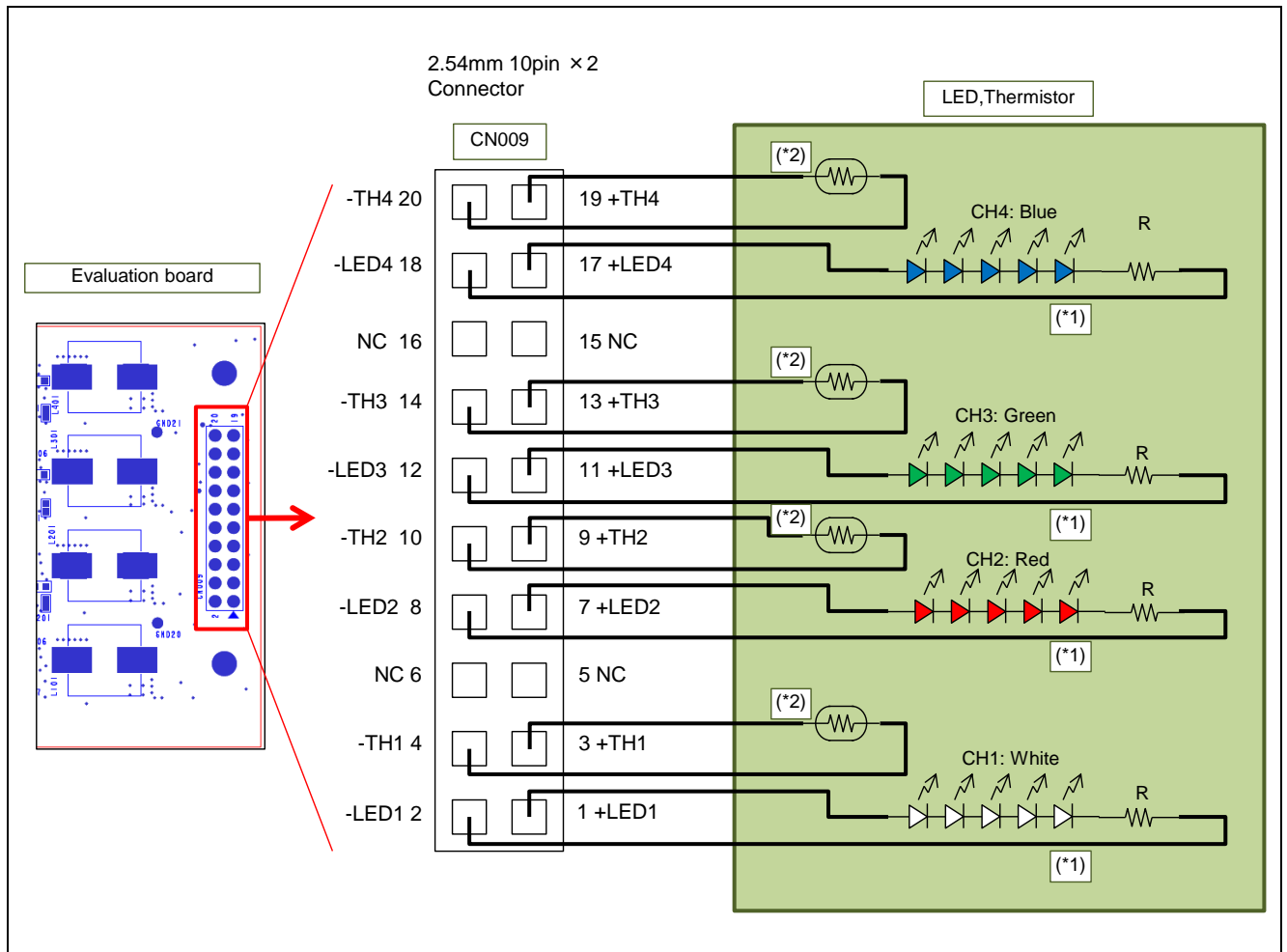
*1: Connect LED to CN009.

Driver's output channel and color of LED are fixing by application software.
To indicate correct color, connect each channel exactly.
Specification of LED module and resistor: LED (5-series) + resistor
  White: IF ≥ 1A, VF ≈ 3 V   Ex: LUW CR7P(OSRAM)
  Red: IF ≥ 1A, VF ≈ 2.2 V   Ex: LR CP7P(OSRAM)
  Green: IF ≥ 1A, VF ≈ 3.2 V   Ex: LT CP7P(OSRAM)
  Blue: IF ≥ 1A, VF ≈ 3.2V   Ex: LB CP7P(OSRAM)
  R: 10Ω 2W
  Be careful about polarity.

*2: Thermistor (+TH,-TH) is an option. Even if that isn't connected, a board operates.

Ex: NTCG104EF104FT1 (TDK)

4.2.1.2 Setup with BLE Communication

1. Start "BLExLED" by tapping icon in android tablet. (In advance, set on Bluetooth in Android OS)

   Set some attributes in the application. (Device Name #0)

2. Connect AC plug to AC power supply.

3. Tap "Connect" button in "HOME" tab. If connection succeeds, "BLE Connection SUCCESS!" is indicated in the display.

4. Refer to 4.3 Function of Application and operate.

Starting App   **Setting of the Attribute (In Setting Page)**

"Cypress Demo"← Check

Return to "HOME" tab
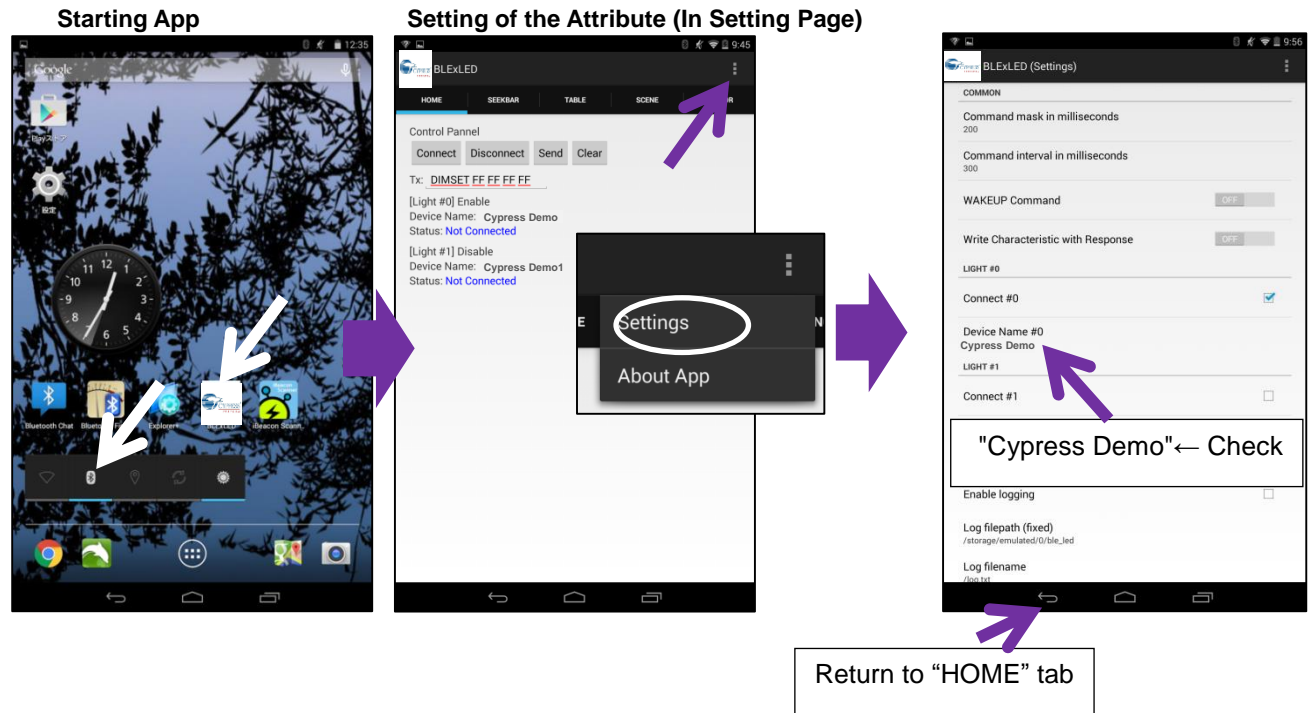
Connecting to BLE Module with BLE Communication
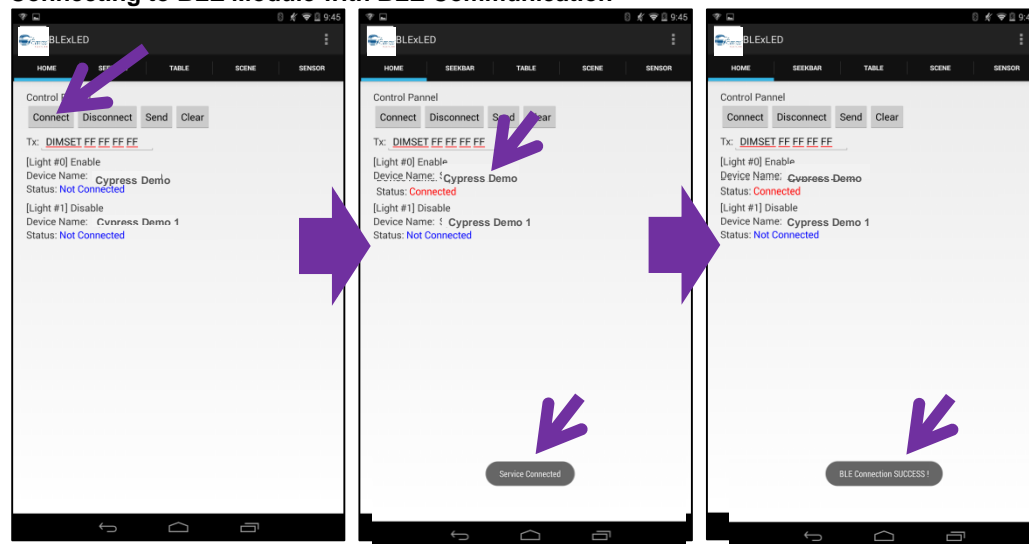
4.3   Function of Application

4.3.1   "SEEKBER" Tab
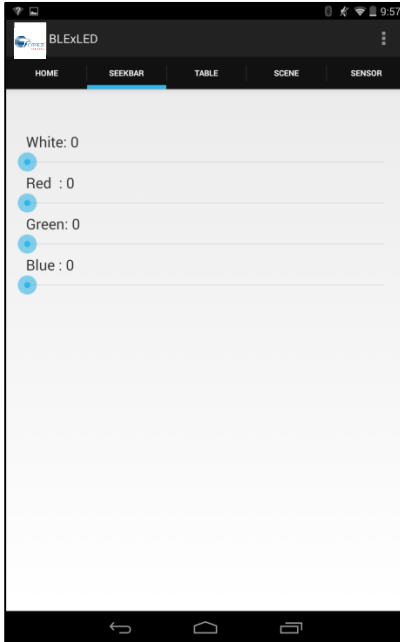
It is possible to change the brightness of each LED by swiping level of seek bar.

When releasing a finger, brightness of LED changes.

Maximum supply power of AC/DC module is 10.8W.Total maximum Output power is over 10W.

When lighting White LED, make the lighting level of RGB LED "0".
When lighting RGB LED, make the lighting level of White LED "0".

4.3.2   "TABLE" Tab
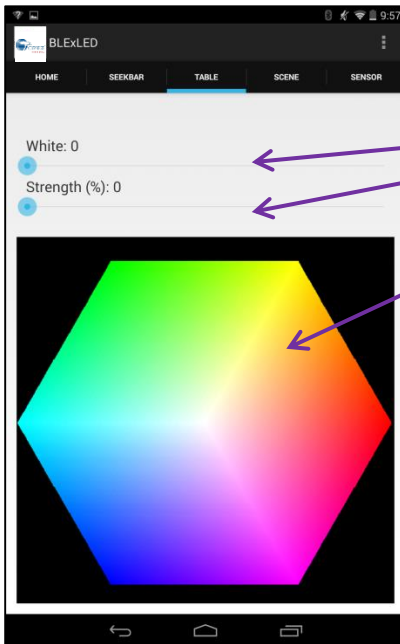
It's possible to change the brightness of the White LED by swiping level of White Seek bar.

It's possible to change color brightness of the RGB LED by swiping level of Strength Seek bar.

It's possible to change the color of LED by tapping color table.

When Strength Seek bar level is "0", RGB LED goes out.

Maximum supply power of AC/DC module is 10.8W.Total maximum Output power is over 10W.

When lighting White LED, make the lighting level of RGB LED "0".
When lighting RGB LED, make the lighting level of White LED "0".

4.3.3 "SCENE" Tab

"Preset Lighting" is operated by this table.

Reading: Bright white lighting

Dinner: Warm white lighting

CYPRESS: Cypress blue color

ALERT: Switching white and red (Sequence per second)

Wakeup: gradually brighter (5 seconds sequence)

Rainbow: Automatic color control

Stop: Stop sequence of "ALERT", "Wake up" and "Rainbow".

4.3.4 "SENSOR" Tab
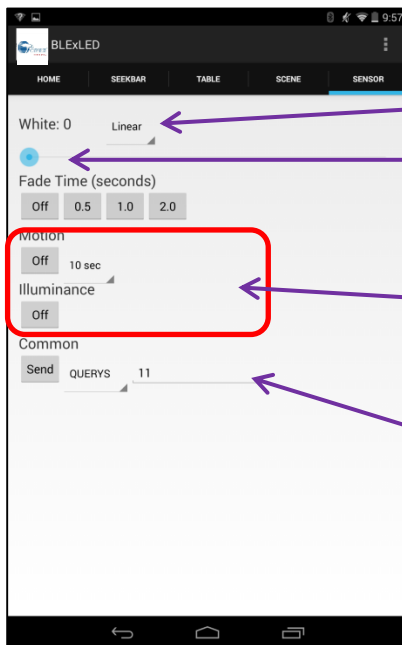
It's possible to set a sensor setting and dimming curve at this table.
Dimming curve type select "Linear" or "Log"
It's possible to change the brightness of the white LED by swiping level of white seek bar.
Fade Time: Setting of fade time

When installing a sensor, below is used. (*1)
Motion: Motion sensor on/off, stand-by detection time select "10sec" or "5min"
Illuminance: Illuminance sensor on/off (*2)

Common: It's used for setting change. The following item can be chosen by a pulldown.
 QUERYS: S6Al211A94 memory reading command (*3)
 MEMSET: S6Al211A94 memory writing in command (*3)
 BLEGET: BLE module memory reading command (*4)
 BLESET: BLE module memory writing in command (*4)

*1: Refer to 4.3.4.1. Example of Sensor Use
*2: When using a motion sensor, illumination sensor can not be used.
*3: Refer to 4.3.4.2 S6Al211A94 Control Command
*4: Refer to 4.3.4.3. BLE Module Control Command

4.3.4.1 Example of Sensor Use

When using the sensor function of the application, prepare the outside sensor parts.

The recommended parts are as follows.

Figure 4-4 Example of Sensor Use
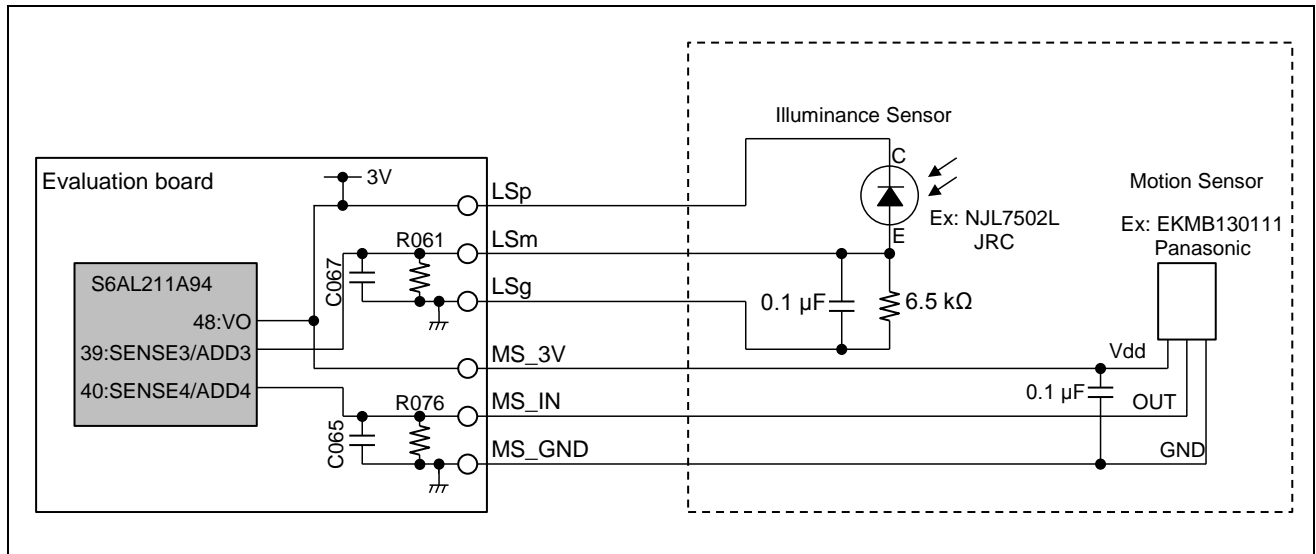
4.3.4.2 S6Al211A94 Control Command

QUERYS: "1st argument: read address" is input, and "Send" button is pushed.
Data or "TRUE" or "FALSE" of memory is indicated.

MEMSET: "1st argument: write address" and "2nd argument: write data" is input, and "Send" button is pushed.
"OK" is indicated.

Note: Refer to hardware manual of S6AL211A94 for details of the address and write data.
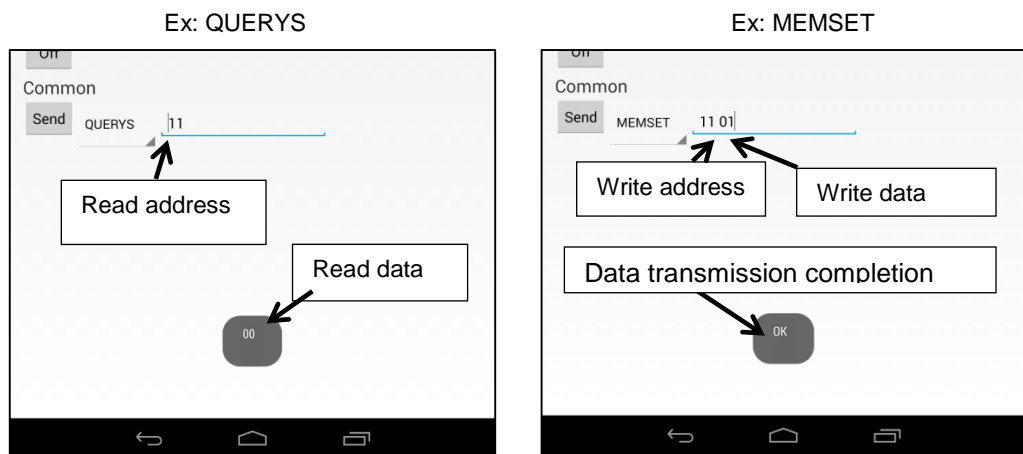
4.3.4.3 BLE Module Control Command

Table 4-2 BLEGET Command

Command	1st Argument Address	2nd Argument Data	Function	Response	Initial Value
BLEGET	00	00	Turning on the lights threshold reading of illumination sensor	HH LL<CR><LF> (*1)	00 02
		01	Turning off the lights threshold reading of illumination sensor		00 08
	01	-	Reply interval time reading of illumination sensor	HH LL<CR><LF> (*2)	00 05

Table 4-3 BLESET Command

Command	1st Argument Address	2nd Argument Address/Data	3rd Argument Data	4th Argument Data	Function	Response
BLESET	00	00	HH (*1)	LL (*1)	Turning on the lights threshold writing of illumination sensor	OK<CR><LF>
		01			Turning off the lights threshold writing of illumination sensor	OK<CR><LF>
	01	HH (*2)	LL (*2)	-	Reply interval time writing of illumination sensor	OK<CR><LF>

*1: Threshold (hexadecimal number). HH: Upper 2bit data, LL: Lower 8bit data
Only lower rank 2bit is effective for HH data.
Set Turning on the lights threshold smaller than Turning off the lights threshold.

*2: Reply interval time (hexadecimal number). HH: Upper 2bit data, LL: Lower 8bit data
Unit: 0.1 ms, Setting area: 0.1 ms to 6553.5 ms

Ex: BLEGET
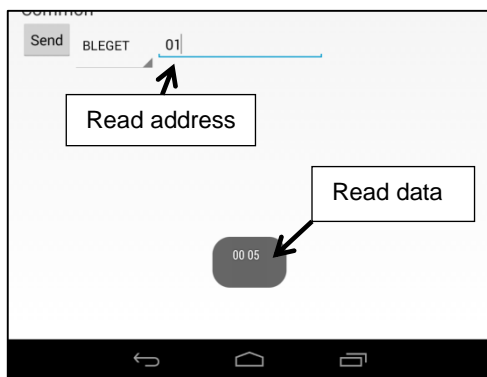
Ex: BLESET

4.4   How to Do When LED Lighting can not be Controlled.

1.   Pull out AC plug

2.   Exit "BLExLED" application

3.   Turn off Bluetooth indicator in Android OS.

4.   Turn on Bluetooth indicator in Android OS.

5.   Connect AC plug to electrical outlet.

6.   Start "BLExLED". (Continue as above-mentioned)

5. Layout

5.1 Component Layout

Figure 5-1 Evaluation Board Component Layout

Board size of 10W LED driver: 58mm x 93mm

Layer1 (Top View)

Layer4 (Top View)
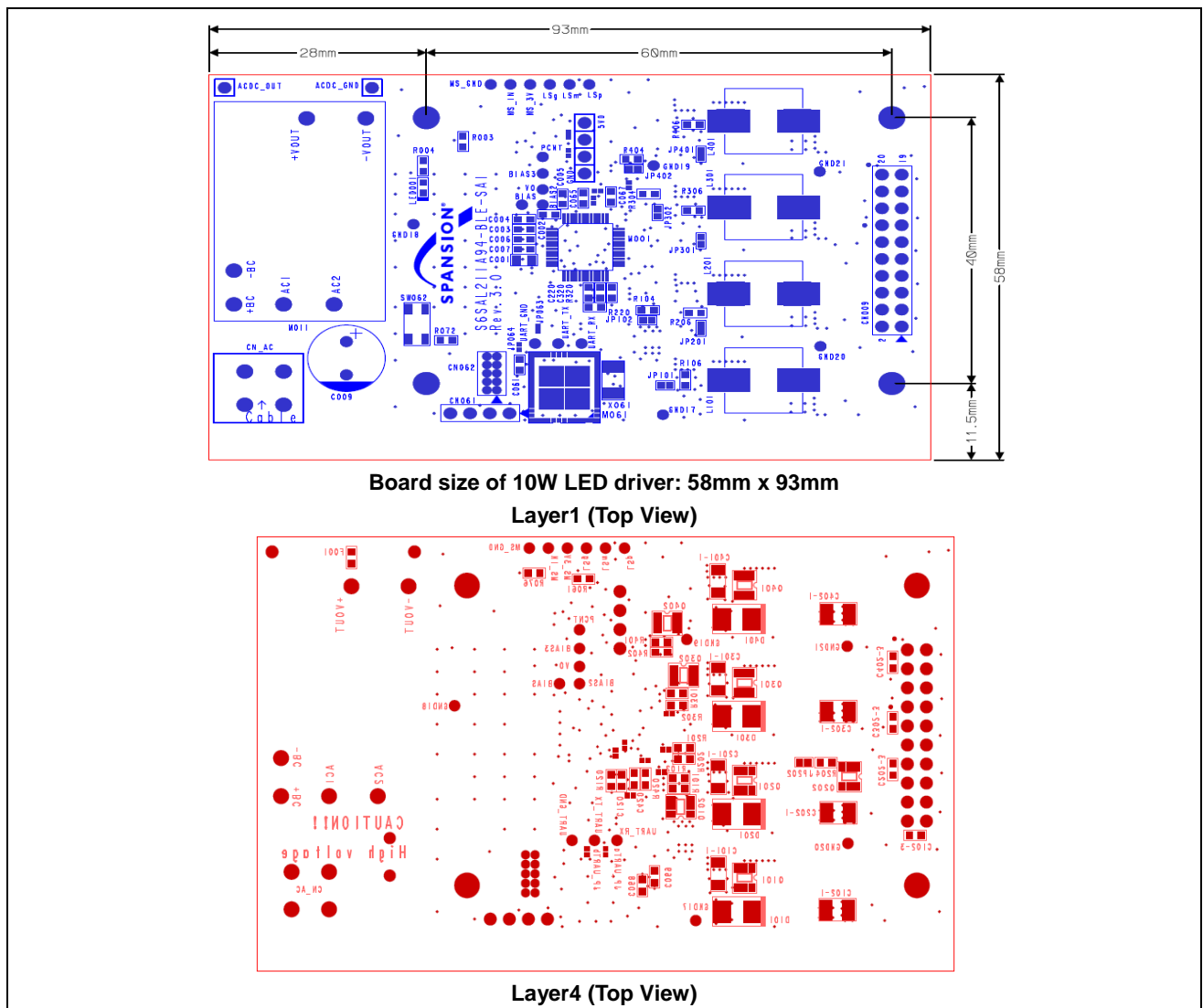
5.2 Wiring Layout

Figure 5-2 Evaluation Board Wiring Layout

Layer 1 (Top View)   **Layer 2 (Top View)**

Layer 3 (Top View)   **Layer 4 (Top View)**
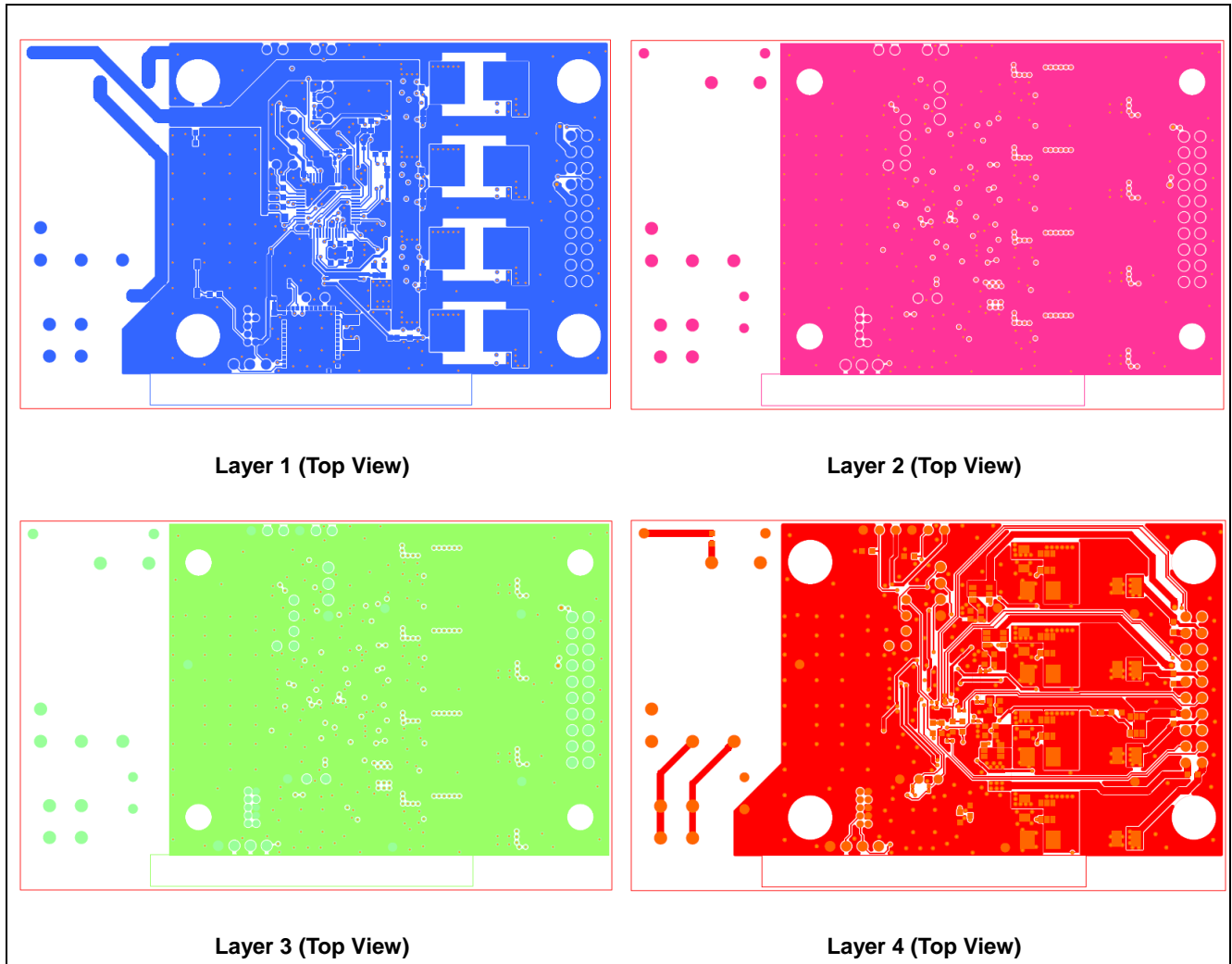
6. Circuit Schematic

Figure 6-1 Evaluation Board Circuit Schematic
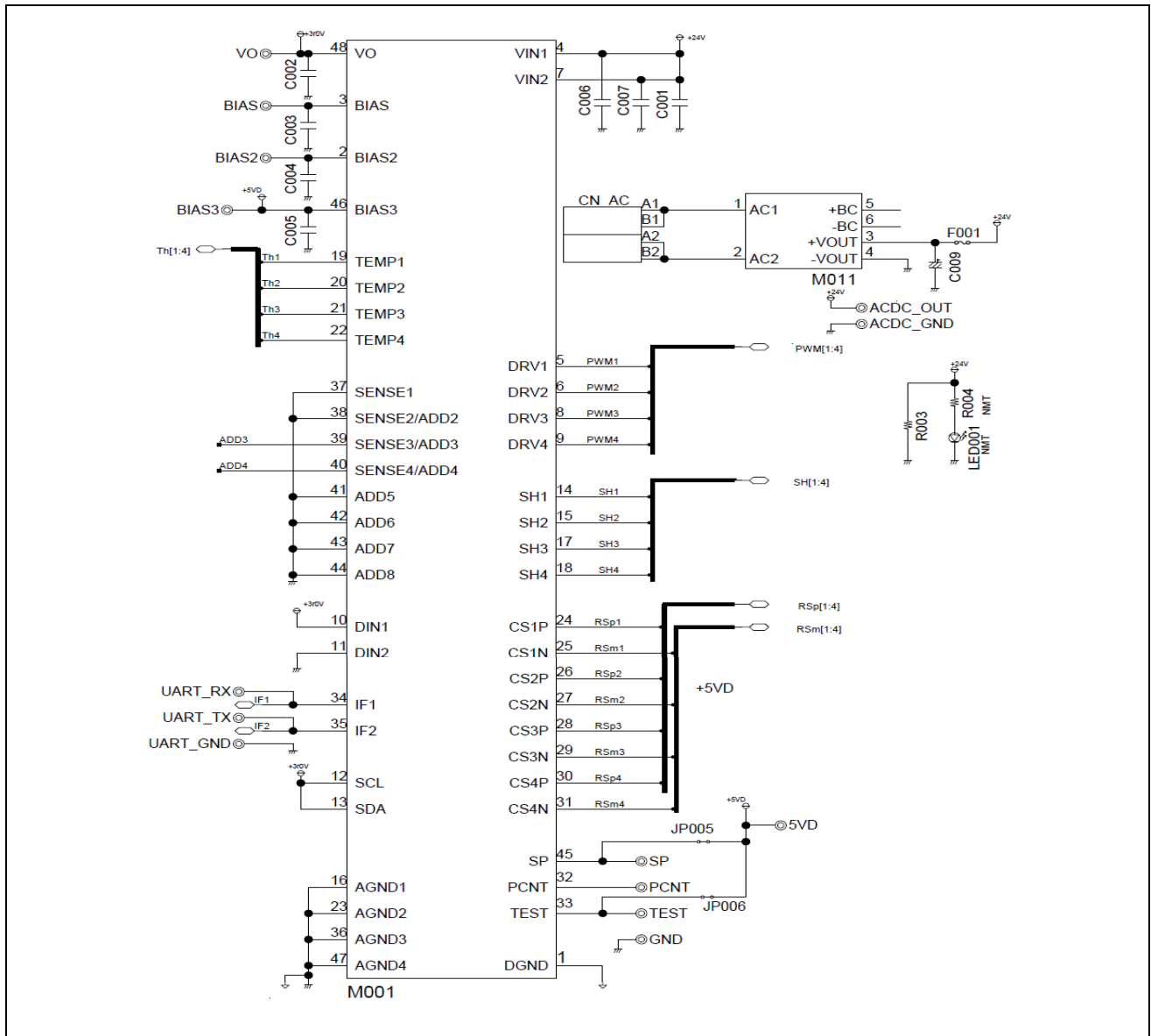
Figure 6-2 Evaluation Board Circuit Schematic
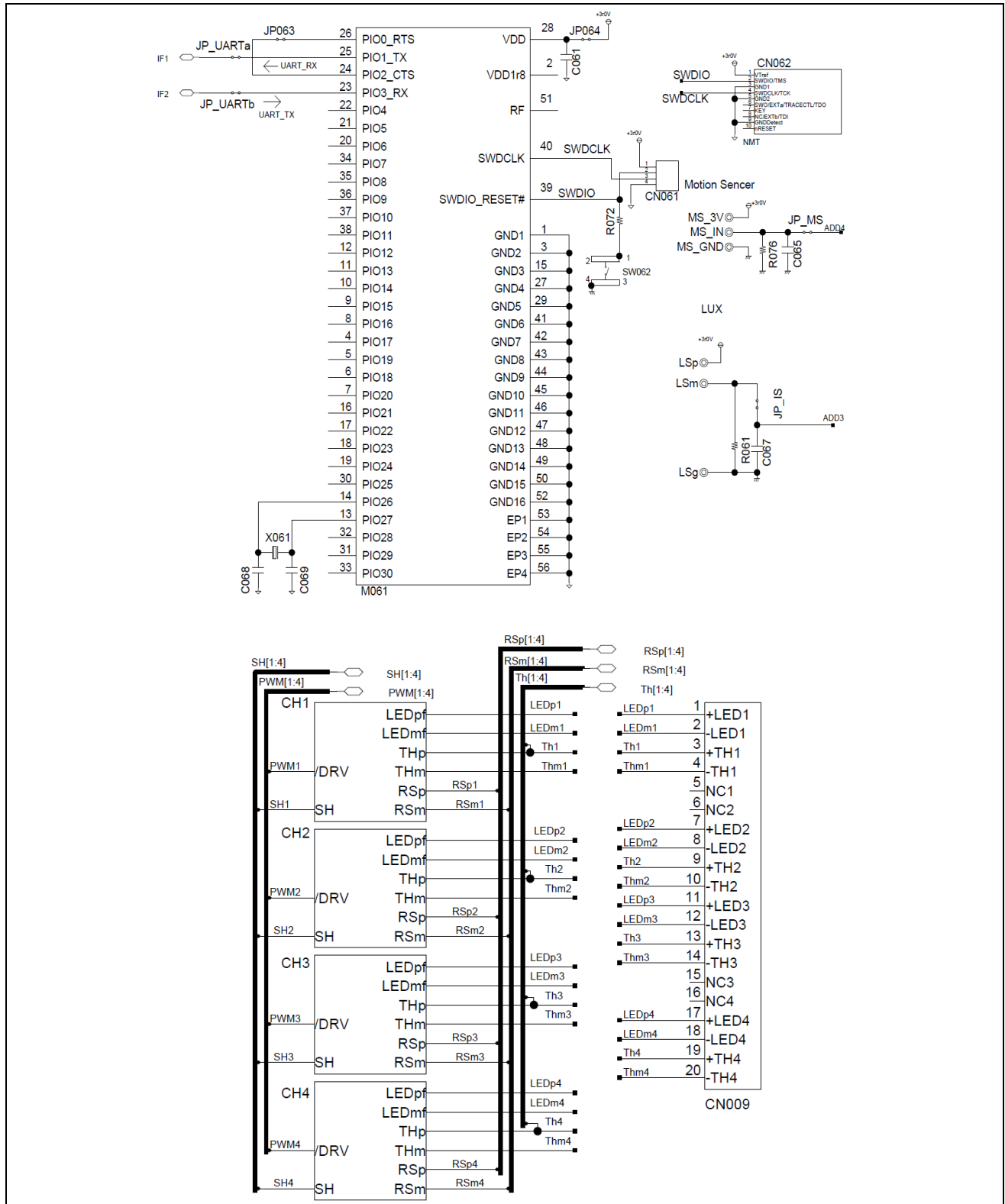
Figure 6-3 Evaluation Board Circuit Schematic
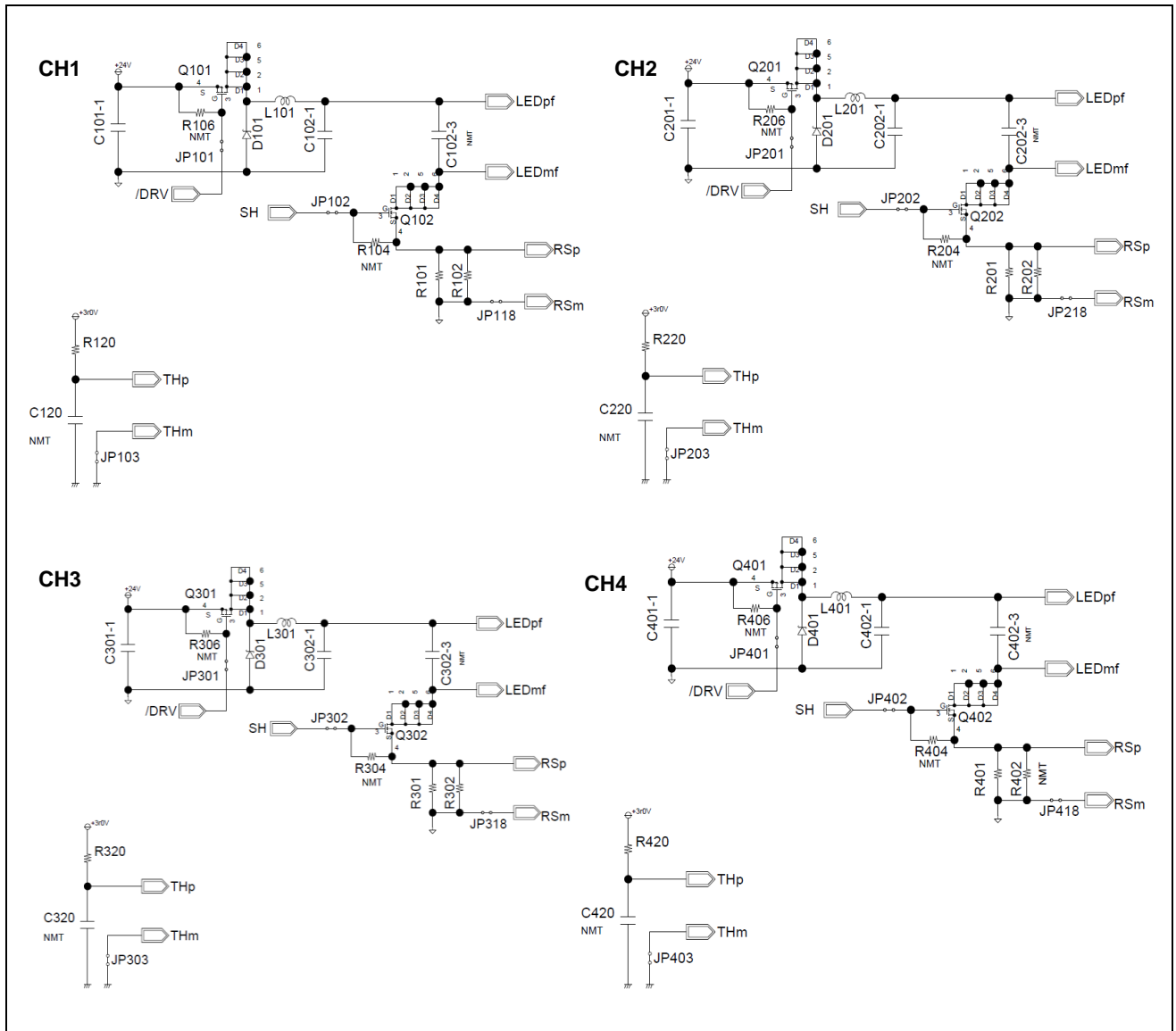
7. Component List

Table 7-1 Evaluation Board Component List

No.	Component	Parts Number	Vendor	Value	Rated Voltage(V)	Rated Current(A)	Remarks
1	C001	C2012X5R1V106K125AC	TDK	10 µF	35	-	-
2	C002	C1608X5R1V475K	TDK	4.7 µF	35	-	-
3	C003	C1608X5R1H104K080AA	TDK	0.1 µF	50	-	-
4	C004	C1608X5R1V475K	TDK	4.7 µF	35	-	-
5	C005	C1608X5R1V475K	TDK	4.7 µF	35	-	-
6	C006	C1608CH1H101J	TDK	100 pF	50	-	-
7	C007	C1608CH1H101J	TDK	100 pF	50	-	-
8	C009	EKMG350ELL471MJ16S	NIPPON-CHEMI-CON	470 µF	35	-	-
9	C061	C1608X5R1H104K080AA	TDK	0.1 µF	50	-	-
10	C065	C1608X5R1H104K080AA	TDK	0.1 µF	50	-	NMT
11	C067	C1608X5R1H104K080AA	TDK	0.1 µF	50	-	-
12	C068	C1608CH1H010C	TDK	1 pF	50	-	-
13	C069	C1608CH1H010C	TDK	1 pF	50	-	-
14	C101-1	C3216X5R1V475K160AB	TDK	4.7 µF	35	-	-
15	C102-1	C3225X5R1H106K	TDK	10 µF	50	-	-
16	C102-3	C1608CH1H102J	TDK	0.001 µF	50	-	NMT
17	C120	C1608X5R1H104K080AA	TDK	0.1 µF	50	-	NMT
18	C201-1	C3216X5R1V475K160AB	TDK	4.7 µF	35	-	-
19	C202-1	C3225X5R1H106K	TDK	10 µF	50	-	-
20	C202-3	C1608CH1H102J	TDK	0.001 µF	50	-	NMT
21	C220	C1608X5R1H104K080AA	TDK	0.1 µF	50	-	NMT
22	C301-1	C3216X5R1V475K160AB	TDK	4.7 µF	35	-	-
23	C302-1	C3225X5R1H106K	TDK	10 µF	50	-	-
24	C302-3	C1608CH1H102J	TDK	0.001 µF	50	-	NMT
25	C320	C1608X5R1H104K080AA	TDK	0.1 µF	50	-	NMT
26	C401-1	C3216X5R1V475K160AB	TDK	4.7 µF	35	-	-
27	C402-1	C3225X5R1H106K	TDK	10 µF	50	-	-
28	C402-3	C1608CH1H102J	TDK	0.001 µF	50	-	NMT
29	C420	C1608X5R1H104K080AA	TDK	0.1 µF	50	-	NMT
30	CN009	M20-9981045	Harwin Inc	2×10 pin	-	3	-

No.	Component	Parts Number	Vendor	Value	Rated Voltage(V)	Rated Current(A)	Remarks
31	CN061	TSW-104-14-L-S	Samtec	-	550	7.6	-
32	CN062	FTSH-105-01-F-D-K-ND	Samtec	-	-	-	NMT
33	CN_AC	ML-2100-2P	SATOPARTS	-	300	7	-
34	D101	SS23	FAIRCHILD	-	30	2	-
35	D201	SS23	FAIRCHILD	-	30	2	-
36	D301	SS23	FAIRCHILD	-	30	2	-
37	D401	SS23	FAIRCHILD	-	30	2	-
38	F001	RK73Z1J	KOA	0Ω	-	1	-
39	L101	CLF10040T-221M	TDK	220 µH	-	700 m	-
40	L201	CLF10040T-221M	TDK	220 µH	-	700 m	-
41	L301	CLF10040T-221M	TDK	220 µH	-	700 m	-
42	L401	CLF10040T-221M	TDK	220 µH	-	700 m	-
43	LED001	OSHR1608C1A	OptoSupply	-	-	30 m	NMT
44	M001	S6AL211A94	Cypress	-	-	-	-
45	M011	TUHS10F24	COSEL	24 V	-	-	-
46	M061	MBH7BTZ02	FUJITSU	-	-	-	-
47	Q101	FDC658AP	FAIRCHILD	-	30	4	-
48	Q102	FDC8886	FAIRCHILD	-	30	6.5	-
49	Q201	FDC658AP	FAIRCHILD	-	30	4	-
50	Q202	FDC8886	FAIRCHILD	-	30	6.5	-
51	Q301	FDC658AP	FAIRCHILD	-	30	4	-
52	Q302	FDC8886	FAIRCHILD	-	30	6.5	-
53	Q401	FDC658AP	FAIRCHILD	-	30	4	-
54	Q402	FDC8886	FAIRCHILD	-	30	6.5	-
55	R003	RR0816P-104-D	SSM	100 kΩ	-	-	-
56	R004	RR0816P-123-D	SSM	12 kΩ	-	-	NMT
57	R072	RR0816P-101-D	SSM	100Ω	-	-	-
58	R076	RR0816P-274-D	SSM	270 kΩ	-	-	-
59	R101	RK73H1JTTD2R20F	KOA	2.2Ω	-	-	-
60	R102	RK73H1JTTD1R00F	KOA	1Ω	-	-	-
61	R103	RK73Z1J	KOA	0Ω	-	1	-
62	R104	RK73H1JTTD1004F	KOA	1 MΩ	-	-	NMT
63	R106	RK73H1JTTD1004F	KOA	1 MΩ	-	-	NMT
64	R107	RK73Z1J	KOA	0Ω	-	1	-
65	R120	RR0816P-752-D	SSM	7.5 kΩ	-	-	-
66	R201	RK73H1JTTD2R20F	KOA	2.2Ω	-	-	-
67	R202	RK73H1JTTD3R90F	KOA	3.9Ω	-	-	-
68	R203	RK73Z1J	KOA	0Ω	-	1	-
69	R204	RK73H1JTTD1004F	KOA	1 MΩ	-	-	NMT
70	R206	RK73H1JTTD1004F	KOA	1 MΩ	-	-	NMT
71	R207	RK73Z1J	KOA	0Ω	-	1	-
72	R220	RR0816P-752-D	SSM	7.5 kΩ	-	-	-

No.	Component	Parts Number	Vendor	Value	Rated Voltage(V)	Rated Current(A)	Remarks
73	R301	RK73H1JTTD2R20F	KOA	2.2Ω	-	-	-
74	R302	RK73H1JTTD2R20F	KOA	2.2Ω	-	-	-
75	R303	RK73Z1J	KOA	0Ω	-	1	-
76	R304	RK73H1JTTD1004F	KOA	1 MΩ	-	-	NMT
77	R306	RK73H1JTTD1004F	KOA	1 MΩ	-	-	NMT
78	R307	RK73Z1J	KOA	0Ω	-	1	-
79	R320	RR0816P-752-D	SSM	7.5 kΩ	-	-	-
80	R401	RK73H1JTTD2R20F	KOA	2.2Ω	-	-	-
81	R402	RK73H1JTTD2R20F	KOA	2.2Ω	-	-	NMT
82	R403	RK73Z1J	KOA	0Ω	-	1	-
83	R404	RK73H1JTTD1004F	KOA	1 MΩ	-	-	NMT
84	R406	RK73H1JTTD1004F	KOA	1 MΩ	-	-	NMT
85	R407	RK73Z1J	KOA	0Ω	-	1	-
86	R420	RR0816P-752-D	SSM	7.5 kΩ	-	-	-
87	R421	RK73Z1J	KOA	0Ω	-	1	-
88	SW062	SKRPACE010	ALPS	-	-	50 m	-
89	X061	ABS10-32r768kHz	ABRACON	32.768 kHz	-	-	-

TDK	:	TDK Corporation
NIPPON-CHEMI-CON	:	Nippon Chemi-Con Corporation
Harwin Inc	:	Harwin Inc
Samtec	:	Samtec, Inc.
SATOPARTS	:	SATO PARTS CO.,LTD
FAIRCHILD	:	Fairchild Semiconductor International, Inc.
KOA	:	KOA Corporation
SSM	:	Susumu Co., Ltd
OptoSupply	:	OptoSupply Limited
Cypress	:	Cypress Semiconductor Corp
COSEL	:	COSEL CO., LTD.
FUJITSU	:	FUJITSU COMPONENT LIMITED
ALPS	:	Alps Electric Co., Ltd.
ABRACON	:	Abracon Corporation

NMT: No mount.

These components are compliant with RoHS, and please ask each vendor for details if necessary.

8. Property Data

Figure 8-1 Switching Waveform

CH1 100% Dimming

VINAC =100VRMS, ILEDout(W) = 290 mA
LED: LUW CR7P (5 series + 10Ω)
ACTUAL LEVEL = 255(Line)
CH1: LED current (ILEDout(W)), 100 mA/div
CH2: LEDp voltage (VLEDout(W)), 2V/div
CH3: Switching node voltage(W), 5V/div

CH2 100% Dimming

VINAC =100VRMS, ILEDout(R) = 140 mA
LED: LR CP7P (5 series + 10Ω)
ACTUAL LEVEL = 255(Line)
CH1: LED current (ILEDout(R)), 50 mA/div
CH2: LEDp voltage (VLEDout(R)), 2V/div
CH3: Switching node voltage(R), 5V/div

CH3 100% Dimming

VINAC =100VRMS, ILEDout(G) = 180 mA
LED: LT CP7P (5 series + 10Ω)
ACTUAL LEVEL = 255(Line)
CH1: LED current (ILEDout(G)), 50 mA/div
CH2: LEDp voltage (VLEDout(G)), 2V/div
CH3: Switching node voltage(G), 5V/div

CH4 100% Dimming

VINAC =100VRMS, ILEDout(B) = 90 mA
LED: LB CP7P (5 series + 10Ω)
ACTUAL LEVEL = 255(Line)
CH1: LED current (ILEDout(B)), 20 mA/div
CH2: LEDp voltage (VLEDout(B)), 2V/div
CH3: Switching node voltage(B), 5V/div

Figure 8-2 Switching Waveform

CH1 10% Dimming

VINAC =100VRMS, ILEDout(W) = 29 mA
LED: LUW CR7P (5 series + 10Ω)
ACTUAL LEVEL = 26(Line)
CH1: LED current (ILEDout(W)), 10 mA/div
CH2: LEDp voltage (VLEDout(W)), 2V/div
CH3: Switching node voltage(W), 5V/div

CH2 10% Dimming

VINAC =100VRMS, ILEDout(R) = 14 mA
LED: LR CP7P (5 series + 10Ω)
ACTUAL LEVEL = 26(Line)
CH1: LED current (ILEDout(R)), 5 mA/div
CH2: LEDp voltage (VLEDout(R)), 2V/div
CH3: Switching node voltage(R), 5V/div

CH3 10% Dimming

VINAC =100VRMS, ILEDout(G) = 18 mA
LED: LT CP7P (5 series + 10Ω)
ACTUAL LEVEL = 26(Line)
CH1: LED current (ILEDout(G)), 5 mA/div
CH2: LEDp voltage (VLEDout(G)), 2V/div
CH3: Switching node voltage(G), 5V/div

CH4 10% Dimming

VINAC =100VRMS, ILEDout(B) = 9 mA
LED: LB CP7P (5 series + 10Ω)
ACTUAL LEVEL = 26(Line)
CH1: LED current (ILEDout(B)), 2 mA/div
CH2: LEDp voltage (VLEDout(B)), 2V/div
CH3: Switching node voltage(B), 5V/div

Figure 8-3 Switching Waveform

CH1 1% Dimming

VINAC =100VRMS, ILEDout(W) = 2.9 mA
LED: LUW CR7P (5 series + 10Ω)
ACTUAL LEVEL = 2(Line)
CH1: LED current (ILEDout(W)), 1 mA/div
CH2: LEDp voltage (VLEDout(W)), 2V/div
CH3: Switching node voltage(W), 5V/div

CH2 1% Dimming

VINAC =100VRMS, ILEDout(R) = 1.4 mA
LED: LR CP7P (5 series + 10Ω)
ACTUAL LEVEL = 2(Line)
CH1: LED current (ILEDout(R)), 1 mA/div
CH2: LEDp voltage (VLEDout(R)), 2V/div
CH3: Switching node voltage(R), 5V/div

CH3 1% Dimming

VINAC =100VRMS, ILEDout(G) = 1.8 mA
LED: LT CP7P (5 series + 10Ω)
ACTUAL LEVEL = 2(Line)
CH1: LED current (ILEDout(G)), 1 mA/div
CH2: LEDp voltage (VLEDout(G)), 2V/div
CH3: Switching node voltage(G), 5V/div

CH4 1% Dimming

VINAC =100VRMS, ILEDout(B) = 0.9 mA
LED: LB CP7P (5 series + 10Ω)
ACTUAL LEVEL = 2(Line)
CH1: LED current (ILEDout(B)), 1 mA/div
CH2: LEDp voltage (VLEDout(B)), 2V/div
CH3: Switching node voltage(B), 5V/div

9. Board Picture

Figure 9-1 Evaluation Board Picture

(Top View)

(Bottom View)

10.   Ordering Information

Table 10-1 Ordering Information

Part Number	EVB Revision	Note
S6SAL211A94SA1001	S6SAL211A94-BLE-SA1 Rev3.0	-

Revision History

Document Revision History

Document Title: S6SAL211A94SA1001 4ch 10W LED Driver Board Operation Guide	
Document Number: 002-08727	

Revision	Issue Date	Origin of Change	Description of Change
**	06/12/2015	HSAT	Initial release
*A	04/25/2016	HSAT	Migrated Spansion Guide from S6SAL211A94SA1001_SS901-00039-1v0-E,to Cypress format

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