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Specification

BTHQ 42003 AV-STF-06-LED01YG-CON-IC-RW1067

Doc. No.VL-FS-BTHQ 42003AV-111 REV. B

Version September 2008

DOCUMENT REVISION HISTORY

DOCUMENT REVISION FROM TO	DATE	DESCRIPTION	CHANGED BY	CHECKED BY
A	2008.08.13	First Release. a.) VL-QUA-012A REV. S, 2008.02.18. According to VL-QUA-012A, LCD size is small because Unit Per Laminate=36 which is greater than 6pcs/Laminate.	CHEN HUI JUAN	HELEN HE
B	2008.09.11	Items 1 to 3 were updated: 1.) (Whole document) Preliminary Specification were updated to Full Specification. 2.) (Page 4, Table 1) Weight was added. 3.) (Page 8, Table 5) The Values of VLCD & IDD were updated.	CHEN HUI JUAN	FENG NAN

CONTENTS

Specification
of
LCD Module Type
Item No.: BTHQ 42003AV-111

1. General Description

- 20 characters(5x8 dots) x 4 lines STN Positive Transflective Yellow Dot Matrix LCD module.
- Viewing Angle: 6 O'clock direction.
- Driving scheme: 1/33 Duty, 1/6.7 bias.
- 'RockWorks' RW1067C-0B-002 (COB) 34COM/80SEG Controller & Driver.
- 'RockWorks' RW1060 (COB) 40CH Segment/Common Driver or equivalent.
- Temperature compensation.
- Yellow-green LED01 backlight.
- Connector
- "RoHS" compliance.

2. Mechanical Specifications

The mechanical detail is shown in Fig. 1 and summarized in Table 1 below.

Table 1

Parameter	Specifications	Unit
Outline dimensions	65.0(W) x 28.4(H) x 8.0 MAX.(D) (Exclude Conn.)	mm
Viewing area	46.0(W) x 18.4(H)	mm
Display format	20 characters x 4 lines	-
Character size	1.85(W) x 3.153(H) (5 x 8 dots)	mm
Character spacing	0.30(W) x 1.097(H)	mm
Character pitch	2.15(W) x 4.250(H)	mm
Dot size	0.358(W) x 0.381(H)	mm
Dot spacing	0.015(W) x 0.015(H)	mm
Dot pitch	0.373(W) x 0.396(H)	mm
Weight	Approx. 18.0	grams

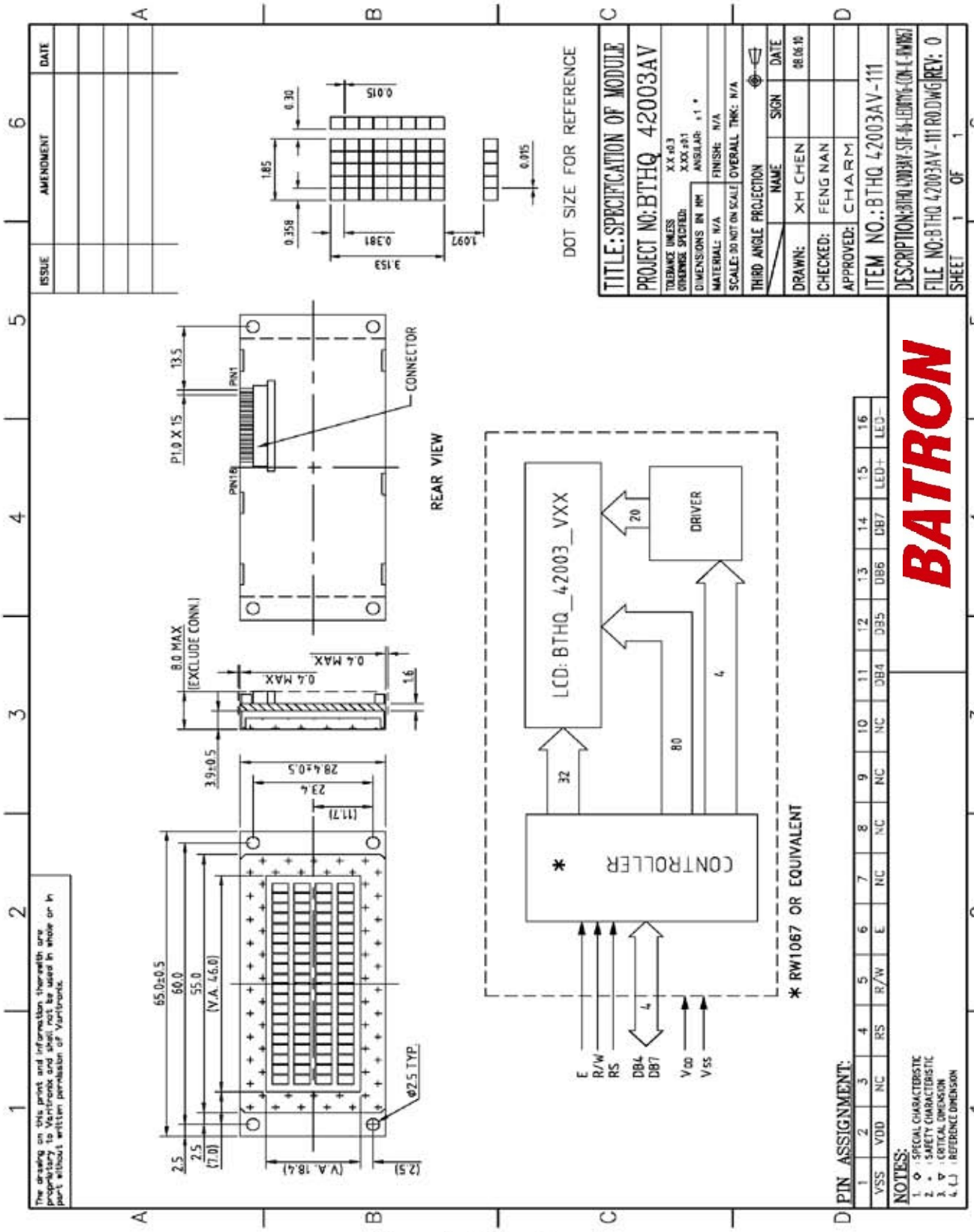


Figure 1: Outline Drawing

3. Interface signals

Table 2

Pin No.	Symbol	Description
1	VSS	Ground (0V).
2	VDD	Power supply for logic (+5.0V)
3	NC	No connection.
4	RS	Register Select Input: 'High' for Data register (for read and write) 'Low" for Instruction register (for write), Busy flag, address counter (for read)
5	R/W	Read/Write signal: 'High' for Read mode. 'Low' for Write mode.
6	E	Enable. Start signal for data read /write.
7	NC	No connection.
8	NC	No connection.
9	NC	No connection.
10	NC	No connection.
11	DB4	Data input/output
12	DB5	Data input/output
13	DB6	Data input/output
14	DB7	Data input/output (MSB)
15	LED+	Anode of LED Backlight.
16	LED-	Cathode of LED Backlight.

4. Absolute Maximum Ratings

4.1 Electrical Maximum Ratings – for IC Only

Table 3

Parameter	Symbol	Min.	Max.	Unit
Power Supply voltage (Logic)	VDD - VSS	-0.3	+5.5	V
Power Supply voltage (LCD drive)	VLCD	-0.3	+7.0	V
Input voltage	Vin	-0.3	VDD+0.3	V

Note:

The modules may be destroyed if they are used beyond the absolute maximum ratings.

All voltage values are referenced to VSS = 0V.

4.2 Environmental Condition

Table 4

Item	Operating Temperature (Topr)		Storage Temperature (Tstg) (Note 1)		Remark
	Min.	Max.	Min.	Max.	
Ambient Temperature	0°C	+50°C	-10°C	+60°C	Dry
Humidity (Note 1)	90% max. RH for Ta ≤ 40°C <50%RH for 40°C <Ta≤ Maximum operating temperature				No condensation
Vibration (IEC 68-2-6) cells must be mounted on a suitable connector	Frequency: 10 ~ 55 Hz Amplitude: 0.75 mm Duration: 20 cycles in each direction.				3 directions
Shock (IEC 68-2-27) Half-sine pulse shape	Pulse duration: 11 ms Peak acceleration: 981 m/s^2 = 100g Number of shocks: 3 shocks in 3 mutually perpendicular axes.				3 directions

Note 1: Product cannot sustain at extreme storage conditions for long time.

5. Electrical Specifications

5.1 Typical Electrical Characteristics

At Ta = 25 °C, VDD = +5V±5%, VSS=0V.

Table 5

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Supply voltage (Logic)	VDD -VSS		4.75	5.0	5.25	V
Supply voltage (LCD)	VLCD	VDD=+5V, Note1, Ta =0 °C	-	6.0	-	V
		VDD=+5V, Note1, Ta = +25 °C	5.4	5.7	6.0	V
		VDD=+5V, Note1, Ta = +50 °C	-	5.4	-	V
Input signal voltage for E,DB0-DB7,R/W,RS	V_{IH}	"High" level	2.5	-	VDD	V
	V_{IL}	"Low" level	-0.3	-	0.6	V
Supply Current (Logic & LCD)	IDD	Character mode, VDD = +5V	-	0.8	1.2	mA
		Checker board mode, VDD = +5V	-	1.2	1.8	mA
Supply voltage of Yellow-green LED01 backlight	VLED	Forward current =40mA	4.0	4.1	4.2	V
Wavelength of Yellow-green LED01 backlight	λ	Number of LED chips =2x4 =8.	569	572	575	nm

Note 1: There is tolerance in optimum LCD driving voltage during production and it will be within the specified range.

5.2 Timing Specifications

At Ta = 0°C To +50°C, VDD = +5V±5%, VSS = 0V.

Refer to Fig. 3, Writing data from MPU to RW1067.

Table 6

Symbol	Characteristics	Test Condition	Min.	Typ.	Max.	Unit
T_C	Enable Cycle Time	Pin E (except clear display)	40	-	-	us
T_{PW}	Enable Pulse Width	Pin E	40	-	-	ns
T_R,T_F	Enable Rise/Fall Time	Pin E	-	-	25	ns
T_{AS}	Address Setup Time	Pins: RS,RW,E	0	-	-	ns
T_{AH}	Address Hold Time	Pins: RS,RW,E	10	-	-	ns
T_{DSW}	Data Setup Time	Pins: DB4 - DB7	20	-	-	ns
T_H	Data Hold Time	Pins: DB4 - DB7	10	-	-	ns

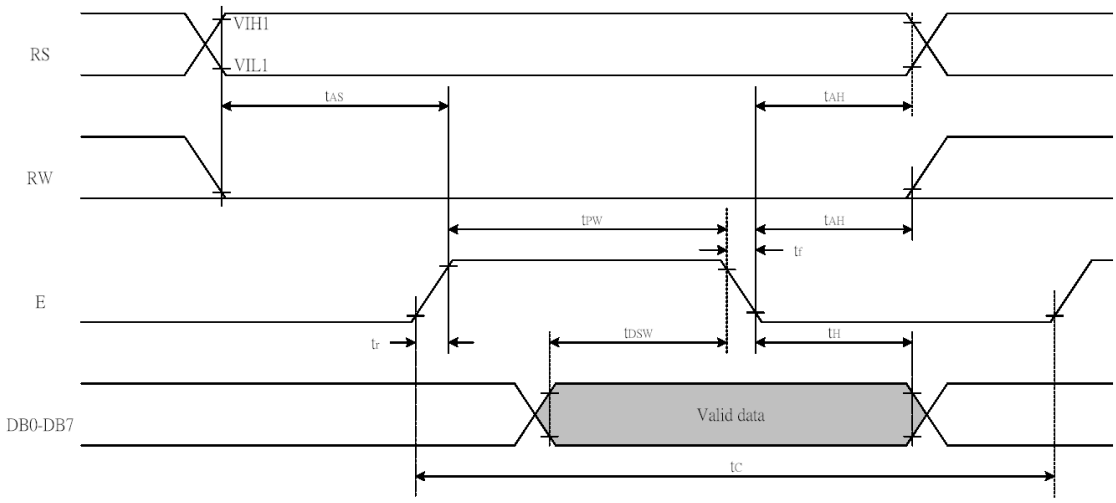


Figure 3: Writing data from MPU to RW1067

Refer to Fig. 4, Reading data from RW067 to MPU.

Table 7

Symbol	Characteristics	Test Condition	Min.	Typ.	Max.	Unit
T_C	Enable Cycle Time	Pin E	1200	-	-	ns
T_{PW}	Enable Pulse Width	Pin E	480	-	-	ns
T_R,T_F	Enable Rise/Fall Time	Pin E	-	-	25	ns
T_{AS}	Address Setup Time	Pins: RS,RW,E	0	-	-	ns
T_{AH}	Address Hold Time	Pins: RS,RW,E	10	-	-	ns
T_{DDR}	Data Setup Time	Pins: DB4 - DB7	-	-	320	ns
T_H	Data Hold Time	Pins: DB4 - DB7	10	-	-	ns

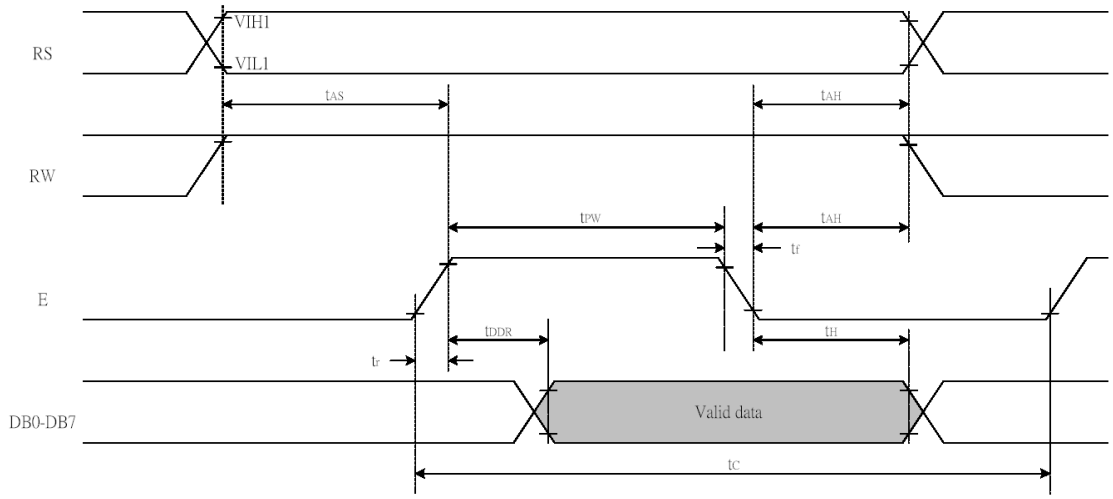
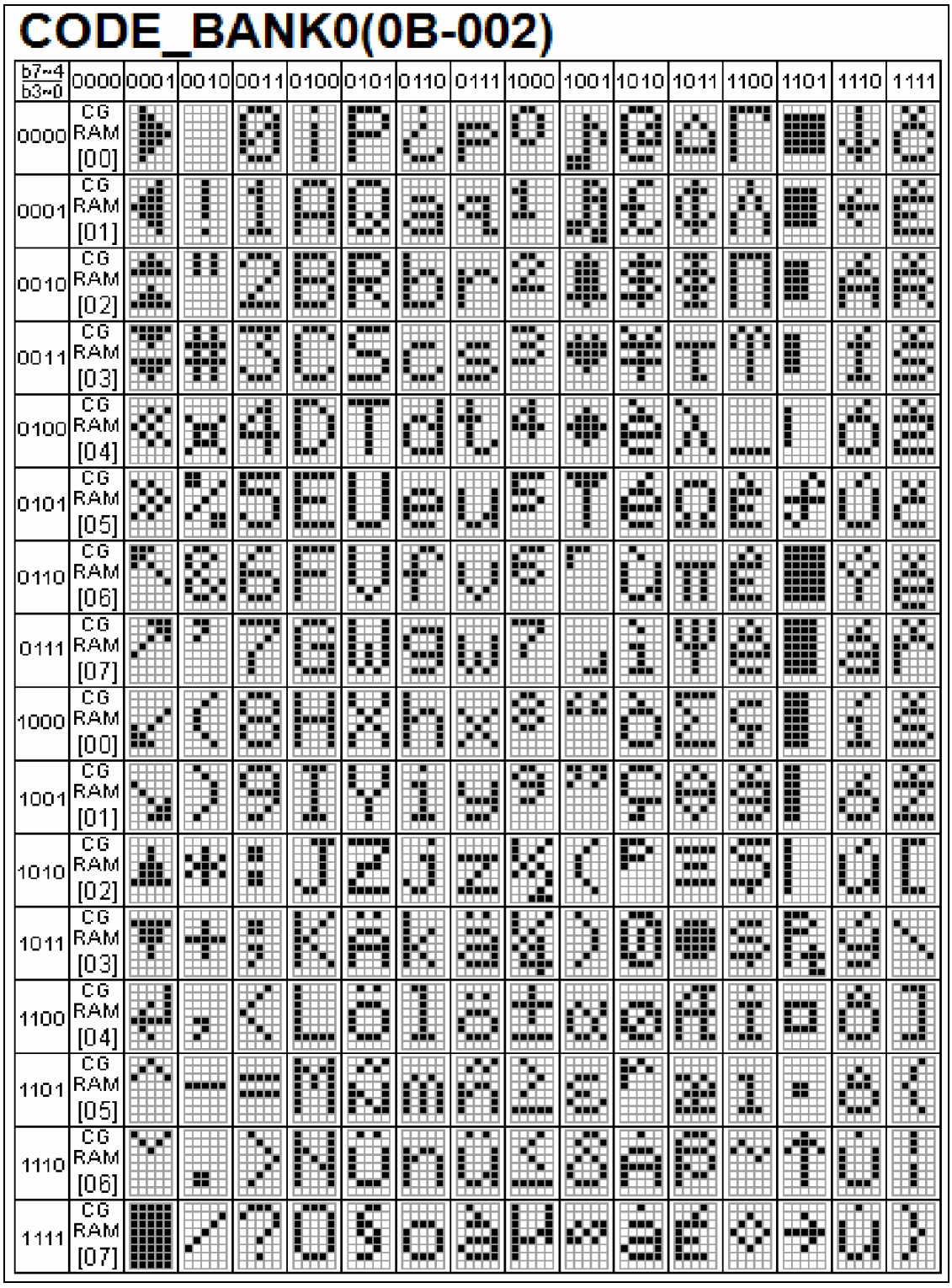


Figure 4: Reading data from RW1067 to MPU.

6. Character Generator ROM



8. LCD Cosmetic Conditions

a.) Reference document follow VL-QUA-012A.

b.) LCD size of the product is small.

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