



WE CATCH THE
BEST TECH. FOREVER

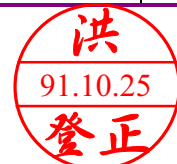
EVERBOUQUET INTERNATIONAL CO., LTD.

PART NO. : MCG1602B-TGRU

FOR MESSRS. : _____

CONTENTS

<i>NO.</i>	<i>ITEM</i>	<i>PAGE</i>
1.	COVER	1
2.	RECORD OF REVISION	2
3.	GENERAL SPECIFICATION	3
4.	MECHANICAL DATA	3
5.	ABSOLUTE MAXIMUM RATINGS	4
6.	ELECTRICAL CHARACTERISTICS	5
7.	OPTICAL CHARACTERISTICS	5
8.	OUTLINE DIMENSION	6-7
9.	BLOCK DIAGRAM	8
10.	POWER SUPPLY FOR LCM	8
11.	LCM PROCESS FLOW AND INSPECTION	9



ACCEPTED BY : _____

PROPOSED BY : _____

RECORD OF REVISION

DATE	PAGE	SUMMARY
2002/10/25	6	8.Modity the dimension : (3.0) → 3.0max , (1.2) → 1.2max

3. General specifications

3.1 General specifications

PLEASE REFER TO:

- a. "CUSTOMER ACCEPTANCE STANDARD SPECIFICATIONS (MS-10-10000)"
- b. "CUSTOMER ACCEPTANCE STANDARD SPECIFICATIONS (IC-NT7603)"

3.2 This individual specification is prior to general specifications

4. Mechanical data

- (1) NUMBER OF CHARACTERS-----16 CH * 2 LINE
- (2) MODULE SIZE -----69.5 W * 77.4 H * 2.7 T (max) mm
- (3) EFFECTIVE AREA -----61.0 W * 15.1 H mm
- (4) CHARACTER PATTERN-----5 * 8 DOTS
- (5) CHARACTER SIZE -----2.95 W * 5.55 H mm
- (6) CHARACTER PITCH -----3.55 W * 5.95H mm
- (7) DOT SIZE-----0.55 W * 0.65 H mm
- (8) DOT PITCH -----0.60 W * 0.70 H mm
- (9) VIEWING DIRECTION-----12 O'CLOCK
- (10) LCD TYPE-----TN. GRAY. REFLECTIVE

5. Absolute maximum ratings

5.1 Electrical absolute maximum ratings

<i>I T E M</i>	<i>SYMBOL</i>	<i>MIN.</i>	<i>MAX.</i>	<i>UNIT</i>	<i>COMMENT</i>
POWER SUPPLY FOR LOGIC	VDD-VSS	-0.3	7.0	V	-----
POWER SUPPLY FOR LCD	VDD-VO	0	VDD+0.3	V	-----
INPUT VOLTAGE	VI	-0.3	VDD+0.3	V	-----
STATIC ELECTRICITY	-----	-----	100	V	NOTE (1)

NOTE (1):ELECTRO-STATIC DISCHARGE RESISTANCE IS TESTED BY CHARGING A 200PF CAPACITOR AND DISCHARGING IT BY CONTACT WITH A INTERFACE CONNECTOR PIN.

5.2 Environmental absolute maximum ratings

<i>I T E M</i>	<i>OPERATING</i>		<i>STORAGE</i>		<i>COMMENT</i>
	<i>MIN.</i>	<i>MAX.</i>	<i>MIN.</i>	<i>MAX.</i>	
AMBIENT TEMPERATURE	0°C	50°C	-20°C	70°C	-----
HUMIDITY	NOTE (2)		NOTE (2)		NO CONDENSATION
CORROSIVE GAS	NOT ACCEPTABLE		NOT ACCEPTABLE		-----

NOTE (2) : Ta ≤ 50°C: 85%RH MAX.

Ta > 50°C: ABSOLUTE HUMIDITY MUST BE LOWER THAN THE HUMIDITY OF 85% RH AT 50°C. (80% RH AT 60°C)

6. Electrical characteristics

$$T_a = 25^\circ\text{C} \quad V_{DD} = 5.0 \pm 0.25 \text{ V}$$

<i>I T E M</i>	<i>SYMBOL</i>	<i>CONDITION</i>	<i>MIN.</i>	<i>TYP.</i>	<i>MAX.</i>	<i>UNIT</i>	
INPUT VOLTAGE	V _{IH}	T _a = 25°C	0.8 V _{DD}	-----	V _{DD}	V	
	V _{IL}	T _a = 25°C	-0.3	-----	0.2 V _{DD}	V	
OUTPUT VOLTAGE	V _{OH}	-I _{OH} = 0.2 mA	V _{DD} -0.6	-----	-----	V	
	V _{OL}	I _{OL} = 1.2 mA	-----	-----	GND+0.6	V	
POWER SUPPLY CURRENT	I _{DD}	V _{DD} = 5.0V	-----	1.5	2.5	mA	
RECOMMENDED LCD DRIVING VOLTAGE,NOTE(1)	V _{DD} -V _O	DUTY = 1/16 Φ = 25° θ = 0°	T _a = 0°C	-----	4.7	-----	V
		T _a = 25°C	-----	4.5	-----	V	
		T _a = 50°C	-----	4.3	-----	V	

NOTE (1): RECOMMENDED LCD DRIVING VOLTAGE MAY FLUCTUATE ABOUT ±0.5V BY EACH MODULE.

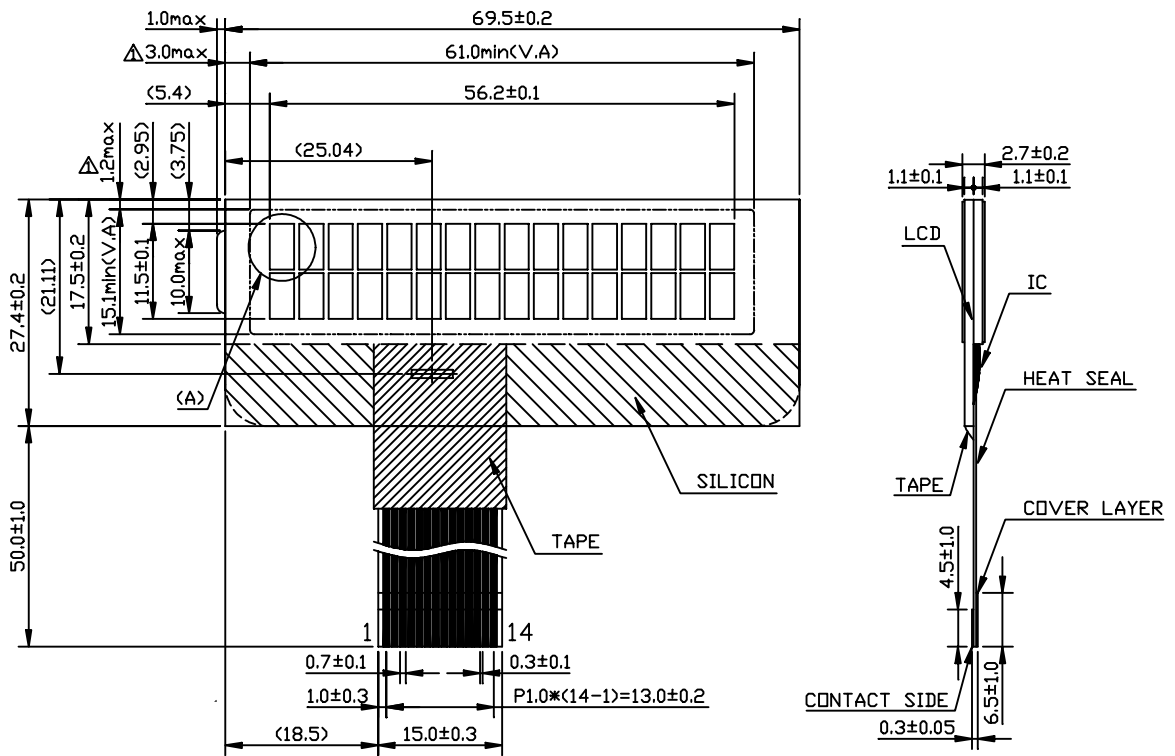
7. Optical characteristics

$$T_a = 25^\circ\text{C} \quad V_{DD} - V_O = 4.5\text{V}$$

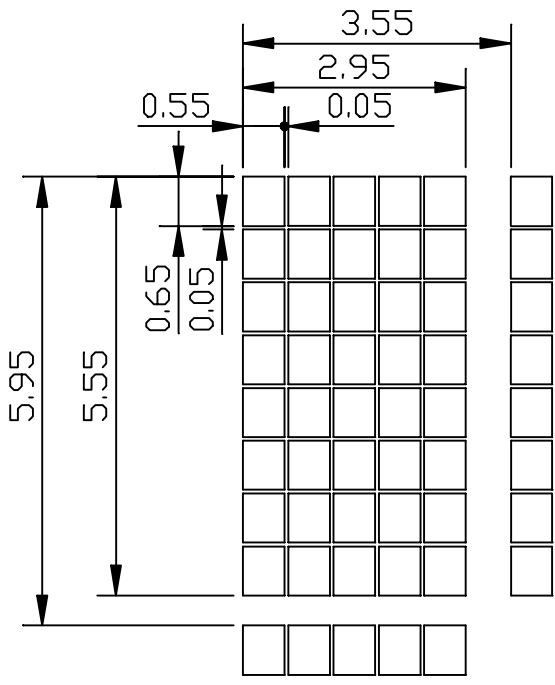
<i>I T E M</i>	<i>SYMBOL</i>	<i>CONDITION</i>	<i>MIN.</i>	<i>TYP.</i>	<i>MAX.</i>	<i>UNIT.</i>	<i>NOTE</i>
VIEWING ANGLE(V)	Φ	K ≥ 2.0 θ = -30° ~ 30°	0	-----	30	deg.	1
VIEWING ANGLE(H)	θ	K ≥ 2.0 Φ = 0° ~ 30°	-30	-----	30	deg	1
CONTRAST RATIO	K	Φ = 25° θ = 0°	-----	3.0	-----	-----	1
RESPONSE TIME	tr (rise)	Φ = 25° θ = 0°	-----	100	150	ms	1
	tf (fall)	Φ = 25° θ = 0°	-----	100	150	ms	1

NOTE (1): SEE CUSTOMER ACCEPTANCE STANDARD SPECIFICATION FOR DEFINITION OF OPTICAL CHARACTERISTICS.

8. Outline dimension



(Silicon coating area must be cover ITD lines)



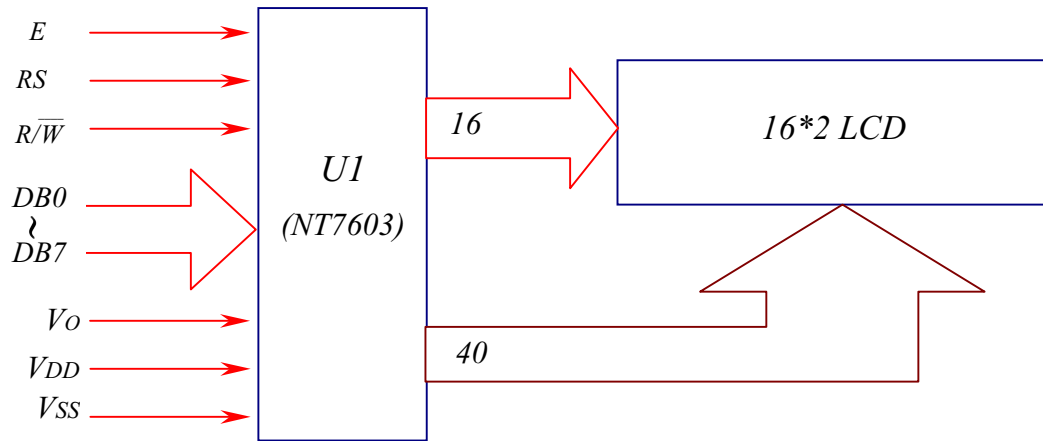
DETAIL (A)

UNIT : mm
SCALE : NTS

Interface pin function

<i>PIN NO.</i>	<i>SYMBOL</i>	<i>FUNCTION</i>
1	V _{SS}	POWER SUPPLY (GND)
2	V _O	OPERATING VOLTAGE FOR LCD DRIVING
3	V _{DD}	POWER SUPPLY (+5.0V)
4	RS	REGISTER SELECTION INPUT
5	R/W	READ/WRITE SELECTION INPUT
6	E	ENABLE SIGNAL
7	DB0	DATA INPUT SIGNAL
8	DB1	DATA INPUT SIGNAL
9	DB2	DATA INPUT SIGNAL
10	DB3	DATA INPUT SIGNAL
11	DB4	DATA INPUT SIGNAL
12	DB5	DATA INPUT SIGNAL
13	DB6	DATA INPUT SIGNAL
14	DB7	DATA INPUT SIGNAL

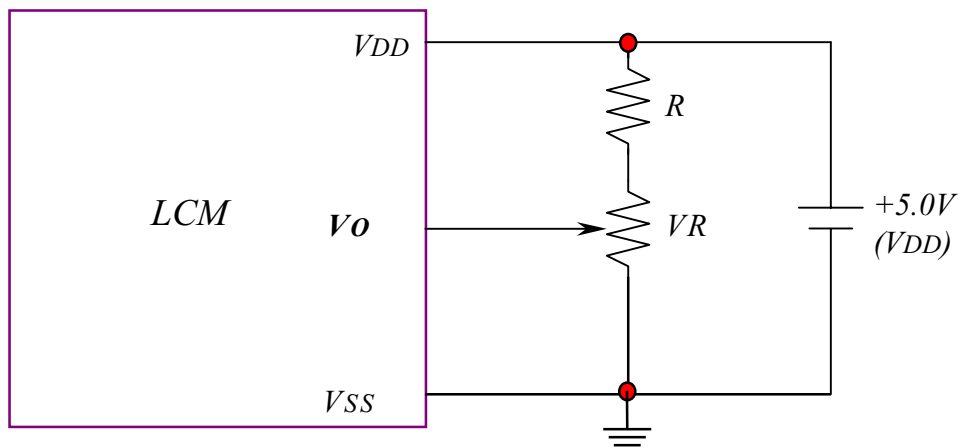
9. Block diagram



Display data address charts

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
LINE 1	00	01	02	03	04	05	06	07	08	09	0A	0B	0C	0D	0E	0F
LINE 2	40	41	42	43	44	45	46	47	48	49	4A	4B	4C	4D	4E	4F

10. Power supply for LCM



RECOMMENDED RESISTOR R: $V_{DD} - V_o \geq 1.5V$

$V_{DD} - V_o$: LCD DRIVING VOLTAGE

VR: $10K\Omega \sim 20K\Omega$

II. LCM PROCESS FLOW AND INSPECTION

flow-chart NO.	Process engineering name	quality managing items			quality managing method				extraordinary handling
		managing items	spec/criteria	confirmation/frequency	measuring method	recording method	responsibility	method	
1	Material I.Q.C	.appearance .outside dimension .basic characteristic	.criteria of material spec	.sampling test by lot MIL-STD-105D	.vision inspection .magnifying glass .calipers .projection machine	.material inspection record	.inspector	.lot rejection advise supplier	
2	COG	.bonding direction position .package temperature .function .appearance	.criteria of COG bonding components	.total Q'TY	.testing equipment	.defective managing form	.operator	.rework process	
3	assembly	.appearance .function	.criteria of assembly	.total Q'TY	.vision inspection .testing equipment	.defective managing form	.operator	.reassemble .adjustment of machine condition	
4	aging experiment	.temperature cycle -10°C ~ 60*3 cycles	.criteria of aging experiment	.total Q'TY	.vision inspection	.temperature record	.operator		
5	final select	.appearance .function	.criteria of material mounting .criteria of LCM	.total Q'TY	.vision inspection .testing equipment .calipers	.defective managing form	.operator	.rework	
6	delivery inspection	.appearance .function	.criteria of material mounting .criteria of LCM	.sampling test by lot .according MIL-STD-105D	.vision inspection .testing equipment .calipers	.inspection record .spec	.inspector	.lot rejection	
7	packing	.quantity .item	.criteria of packaging	.total Q'TY	.vision inspection	.warehouse form	.warehouse worker		