

Microtech Technology Co. Ltd.

PRODUCT SPECIFICATIONS

MODULE NO. : MTF0240CMIL-06

REVISION : V3.0

DRAWING BY : QSC

DATE : 2012-09-18

APPROVED BY : _____

DATE : _____

FOR CUSTOMER'S APPROVAL

CHECK BY: _____

DATE : _____

APPROVED BY: _____

DATE : _____

OK

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COMMENT:

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History of Versions and Modifications

Version	Modifications	Date
V1.0	Generation first version	Jan 20,2010
V2.0	The exterior structure change.FPC	May 15,2010
V3.0	Modify driver IC from OTM3225A to OTM3225C	Nov 26,2010
V4.0	Modify driver IC from OTM3225A to ILI9341	Sep 18,2012

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1.General Specifications

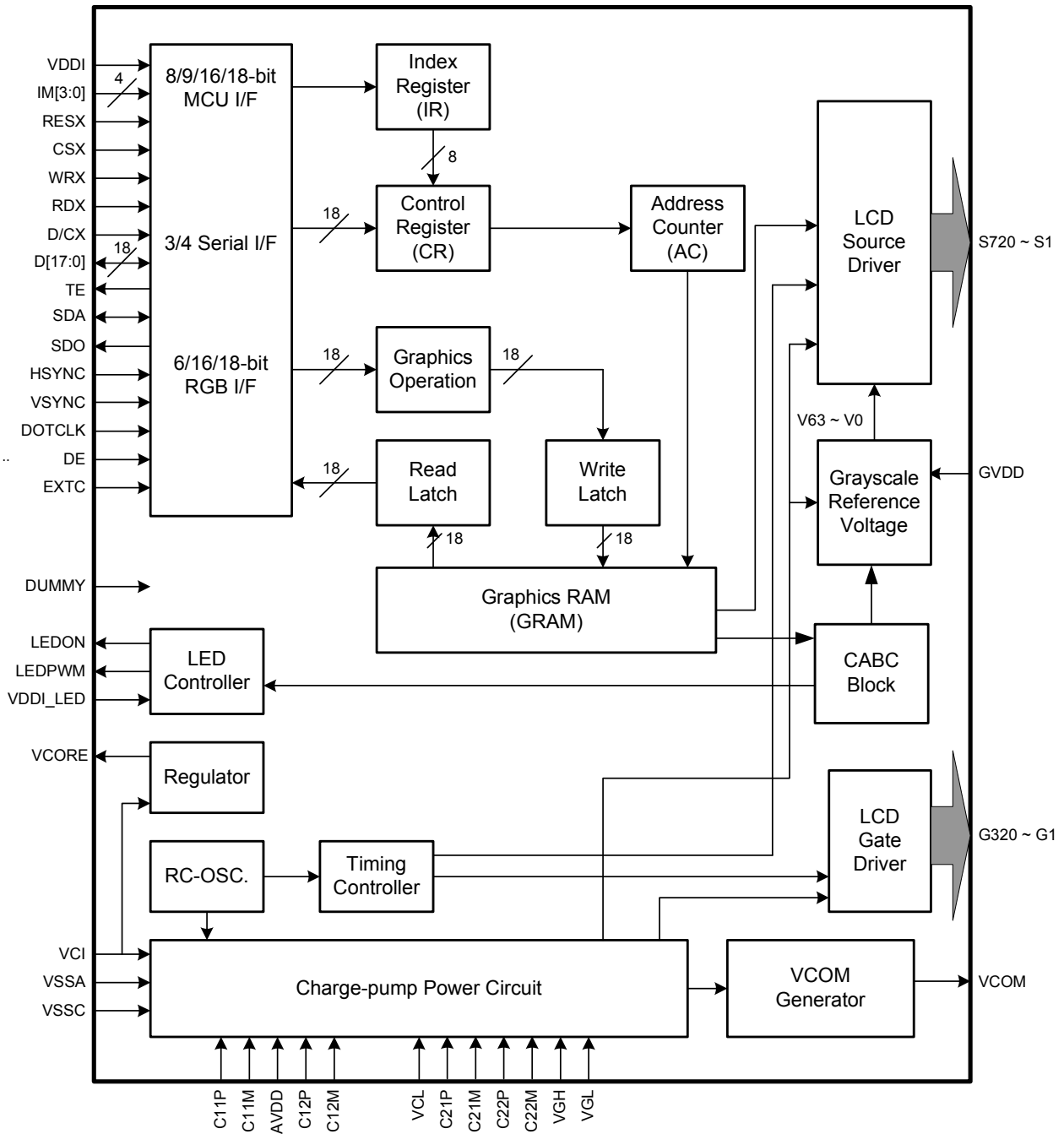
Item	Main LCD	Unit	Note
LCD Type	2.4' TFT LCD	-	
Display color	262K	-	
LCD Duty	1/320	-	
LCD Bias	-	-	
Viewing Direction	12:00	0°Clock	
Viewing Area(W×H)	-	mm	
Active Area(W×H)	36.72X48.96	mm	
Number of Dots		-	
Dot Size(W×H)	-	mm	
Dot Pitch(W×H)		-	
Controller	ILI9341	-	
V _{DD}	2.7~3.3V	V	
Outline Dimensions	Refer to outline drawing on next page		
Backlight	LED(white)	-	
Operating Temperature	-20~+70°C	-	
Storage Temperature	-30~+80°C	-	
Weight	TBD	g	
Data Transfer	8 Bits paralle	-	
Display Type	Transmissive type	-	

Note 1: Select by software, and color tune is slightly changed by temperature and driving voltage.

Note 2: TBD- To Be Determined.

Note 3: Requirements on Environmental Protection:RoHS

2. Functional block diagram



MODEL NO:MTF0240CMIL-06

3.Outline Drawing

NOTES:

- 1.DISPLAY TYPE: 2.4" TFT LCD TRANSMISSIVE
- 2.VIEWING DIRECTION: 12:00
- 3.LCD DRIVER IC: IL19341
- 4.OPERATING TEMP: -20°C~70°C
- 5.STORAGE TEMP: -30°C~80°C
- 6.BACKLIGHT: 4CHIP-LED PARALLEL

NO.	SYMBOL
1	GND
2	/RESET
3	DB17
4	DB16
5	DB15
6	DB14
7	DB13
8	DB12
9	DB11
10	DB10
11	/RD
12	/WR
13	RS
14	/CS
15	GND
16	IOVCC
17	VCI
18	VCI
19	LED-4
20	LED-3
21	LED-2
22	LED-1
23	LED-A
24	GND

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LCM NO.: MTF0240CMIL-06	PFC NO. A:
	PFC NO. B:
	PFC NO. C:
DESIGNED BY: QSG	VERSION: 4.0
APPROVED BY:	NO.: 1 OF 1
	UNIT: MM
	DATE: 2012-09-12

MODEL NO:MTF0240CMIL-06

4. Absolute Maximum Ratings(Ta=25 °C)

Item	Symbol	Min.	Max.	Unit	Note
Power Supply Voltage(1)	V _{BAT}	-	-	V	1,2
Power Supply Voltage(2)	V _{DD}	2.4	3.3	V	
Power Supply Voltage for Mail LCD	V _{op}	-	-	V	
Logic Signal Input Voltage	V _I	-0.3	V _{DD} +0.3	V	
Operating Temperature	T _{op}	-20	+70	°C	
S torage Temperature	T _{st}	-30	+80	°C	

Notes:

1. If the module is above these absolute maximum ratings. It may become permanently damaged. Using the module within the following electrical characteristic conditions are also exceeded, the module will malfunction and cause poor reliability.
2. V_{DD} > V_{SS} must be maintained.

5. LED Backlight Specification and Instruction Code

5.1 ABSOLUTE MAXIMUM RATINGS

(Ta=25°C.Unless specified,The Ambient temperature Ta=25°C)

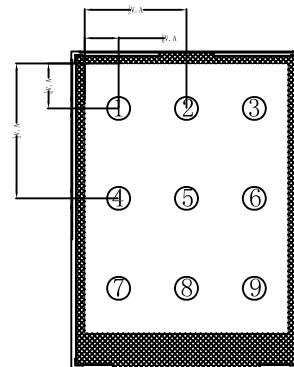
Item	Symbol	Conditions	Rating	Unit
* Absolute maximum forward current	Ifm		150	mA
* Peak forward current	Ifp	1 msec Plus 10% Duty Cycle	100	mA
Reverse Voltage	Vr		5	V
* Power dissipation	Pd		510	mW
Operating Temperature Range	Topr		-30~+70	°C
Storage Temperature Range	Tstg		-40~+80	°C

5.2 ELECTRICAL–OPTICAL CHARACTERISTICS

(Ta=25°C.Unless specified,The Ambient temperature Ta=25°C)

Item	Symbol	min.	typ.	max.	Unit	Condition
Forward Voltage	Vf	3.0	3.2	3.4	V	If= 75 mA
Reverse Current	Ir			-	μA	Vr= 5 V
Dominant wave length	λ_D	X 0.26 Y 0.26		X 0.30 Y 0.30	nm	If= 75 mA
Spectral Line Half width	$\Delta\lambda$				nm	If= 75 mA
* Luminance	Lv	3000	-		cd/m ²	If= 75 mA

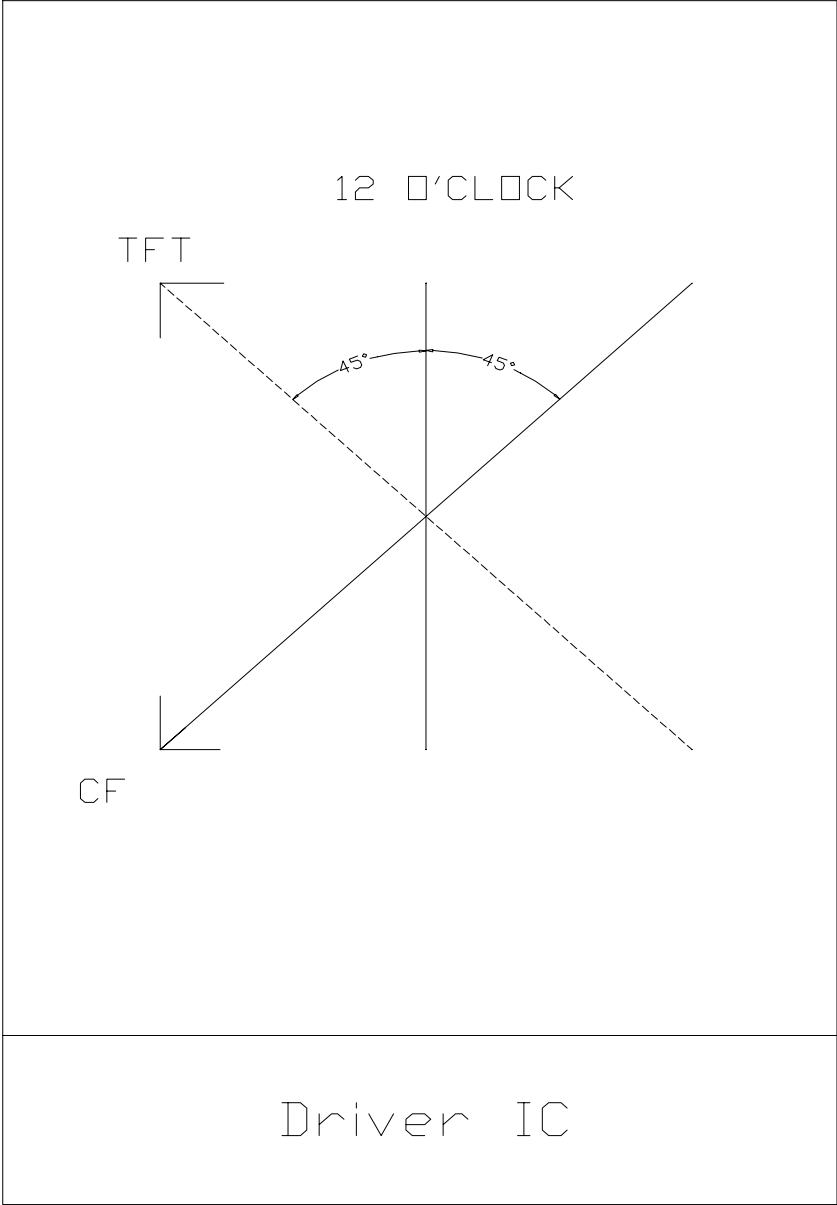
The luminance is the average value of 9 points, and
 The Lvmin./Lvmax. is more than 80% Typical
 The measurement instrument is BM-7 luminance
 Colorimeter.The aperture is ϕ 5 mm. lifetime=50000h



5.3 Interface Signal

PinNo	Symbol	Description
1	GND	System Ground
2	RESET	Reset Signal pin (“Low” is enable)
3	DB17	Data bus
4	DB16	
5	DB15	
6	DB14	
7	DB13	
8	DB12	
9	DB11	
10	DB10	
11	RD	Read signal pin
12	WR	Write signal pin
13	RS	Command/display data select pin
14	CS	Chip enable,active low
15	GND	System Ground
16	IOVCC	I/O interface supply voltage.(1.8-3.3V)
17	VCI	Power supply for logic operation
18	VCI	Power supply for logic operation
19	LED-K4	Backlight LED Cathode.
20	LED-K3	Backlight LED Cathode.
21	LED-K2	Backlight LED Cathode.
22	LED-K1	Backlight LED Cathode.
23	LED-A	Backlight LED Anode.
24	GND	System Ground

6.Viewing Direction



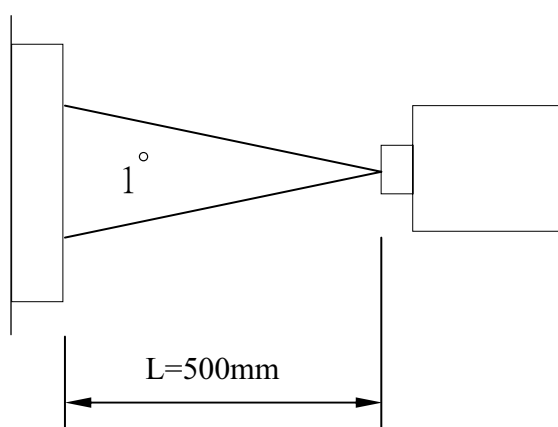
Viewing angle 12o'clock

7. Electro-optical Units

ITEM	SYMBOL	CONDITION	MIN.	TYP.	MAX.	UNIT	REMARK
Transmittance	T			4.7		%	
Contrast Ratio	CR	*1)		250	-		Note 3
Response Time	Tr+ Tf	*3)	-	25		ms	Note 4
Viewing Angle	Vertical	θ *2)	$CR \geq 10$	105	115	-	Note 5
	Horizontal	ϕ *2)		110	120	-	
Color Filter Chromacicity	White	x	$\theta = \phi = 0^\circ$	(0.288)	(0.308)	(0.328)	Note 6
		y		(0.322)	(0.342)	(0.362)	
		Y		(27.488)	(30.488)	(33.488)	
	Red	x	$\theta = \phi = 0^\circ$	(0.632)	(0.652)	(0.672)	
		y		(0.310)	(0.330)	(0.350)	
		Y		(15.153)	(18.153)	(21.153)	
	Green	x	$\theta = \phi = 0^\circ$	(0.297)	(0.317)	(0.337)	
		y		(0.555)	(0.575)	(0.595)	
		Y		(54.617)	(58.617)	(62.617)	
	Blue	x	$\theta = \phi = 0^\circ$	(0.117)	(0.137)	(0.157)	
y		(0.112)		(0.132)	(0.152)		
Y		(11.694)		(14.694)	(17.694)		
NTSC			-	(61%)	-		

Note 1. Ambient condition : $25^\circ\text{C} \pm 2^\circ\text{C}$, $60 \pm 10\% \text{RH}$, under 10 Lux in the darkroom .

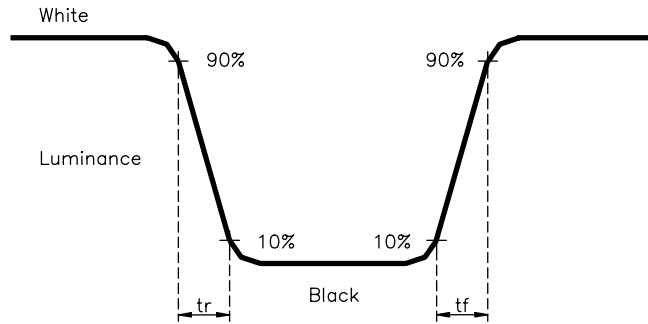
Note 2. Measure device : BM-5A (TOPCON) , viewing cone= 1° , $I_L=20\text{mA}$.



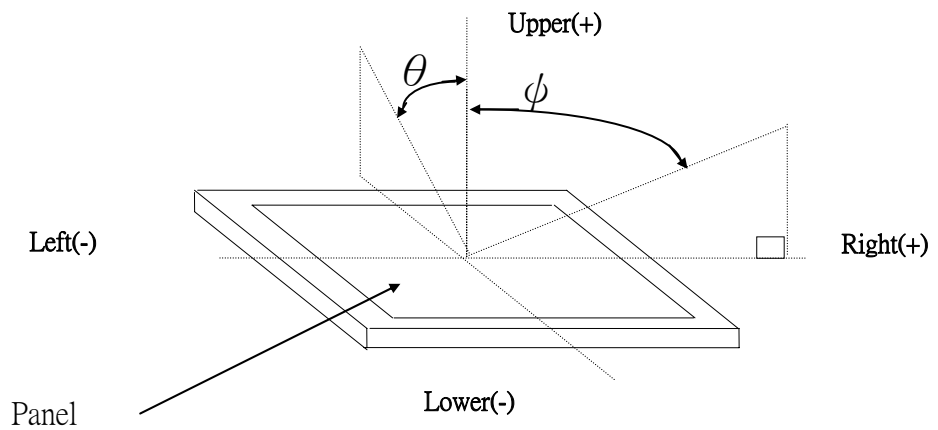
Note 3. Definition of Contrast Ratio :

$$CR = \text{White Luminance (ON)} / \text{Black Luminance (OFF)}$$

Note 4. Definition of response time : The response time is defined as the time interval between the 10% and 90% amplitudes.



Note 5. Definition of view angle(θ , ψ) :



Note 6. Light source: C light.

8. Standard Specification for Reliability

No.	Test Item	Test condition	Criterion
1	High Temperature Storage	80°C±2°C 96H Restore 4H at 25°C	1. After testing, cosmetic defects should not happen. 2. Total current consumption should not be over 10% of initial value.
2	Low Temperature Storage	-30°C±2°C 96H Restore 4H at 25°C	
3	High Temperature Operation	70°C±2°C 48H Restore 4H at 25°C	
4	Low Temperature Operation	-20°C±2°C 48H Restore 4H at 25°C	
5	High Temperature /Humidity Storage	40°C±2°C 90%RH 48H	
6	Temperature Cycle	-30°C — 25°C — 80°C 5min 30min — 25°C , 5min after 10cycle, Restore 4H at 25°C	
7	Vibration Test (package state)	10Hz~150Hz, 100m/s ² , 120min	Not allowed cosmetic and electrical defects.
8	Shock Test (package state)	Half- sine wave, 300m/s ² , 18ms	
9	Atmospheric Pressure Test	25kPa 16H Restore 2H	
10	Cable Bending Test	Bending area and angle follow design document requirement	More than 50000 times

9. Precautions for Use of LCD Modules

9.1 Handling Precautions

- 9.1.1 The display panel is made of glass. Do not subject it to a mechanical shock by dropping it from a high place, etc.
- 9.1.2 If the display panel is damaged and the liquid crystal substance inside it leaks out, be sure not to get any in your mouth, if the substance comes into contact with your skin or clothes, promptly wash it off using soap and water.
- 9.1.3 Do not apply excessive force to the display surface or the adjoining areas since this may cause the color tone to vary.
- 9.1.4 The polarizer covering the display surface of the LCD module is easily scratched. Handle this polarizer carefully.
- 9.1.5 If the display surface is contaminated, breathe on the surface and gently wipe it with a soft dry cloth. If still not completely clear, moisten cloth with one of the following solvents:
- Isopropyl alcohol
 - Ethyl alcohol
- Solvents other than those mentioned above may damage the polarizer. Especially, do not use the following:
- Water
 - Ketone
 - Aromatic solvents
- 9.1.6 Do not attempt to disassemble the LCD Module.
- 9.1.7 If the logic circuit power is off, do not apply the input signals.
- 9.1.8 To prevent destruction of the elements by static electricity, be careful to maintain an optimum work environment.
- a. Be sure to ground the body when handling the LCD Modules.
 - b. Tools required for assembly, such as soldering irons, must be properly ground.
 - c. To reduce the amount of static electricity generated, do not conduct assembly and other work under dry conditions.

- d. The LCD Module is coated with a film to protect the display surface. Be care when peeling off this protective film since static electricity may be generated.

9.2 Storage precautions

9.2.1 When storing the LCD modules, avoid exposure to direct sunlight or to the light of fluorescent lamps.

9.2.2 The LCD modules should be stored under the storage temperature range. If the LCD modules will be stored for a long time, the recommend condition is:

Temperature : 0℃ ~ 40℃

Relatively humidity: ≤80%

9.2.3 The LCD modules should be stored in the room without acid, alkali and harmful gas.

9.3 The LCD modules should be no falling and violent shocking during transportation, and also should avoid excessive press, water, damp and sunshine.