

## LCD MONITOR CONTROL BOARD SPECIFICATION

*With VGA analogic RVB input*

*With HDMI input*

*With Video input*

*With 12V power supply input*

*With Audio input*



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### 1) Revision history

Revision NO.	Date	Page	Revision Description
2.0	April 28th,2013	ALL	FIRST PUBLISH



## 2) General description

The driving board compatible for SAMSUNG, CMO, AUO, LGP, SHARP, BOE etc. Market main manufacturer LCD board. It can reappear image color and sound of the real world. Main IC adopts case of MSTAR single chip TSUM39LU

- Max. supports TFT-LCD screen with full HD 1920X1200 resolution
- All ports are accessible of plug-in sockets.
- One HDMI 1.4、HDCP1.2 or DVI 1.0
- One VGA input
- One video input, possible for plugging in RCA socket or BNC iron socket.
- One audio input, using ø3.5 universal earphone socket.
- 3D video decode (PAL/NTSC). Separated brightness and color, space low noise function.
- Automatically detect video input format.
- Support screen display mode switch between 4:3 and 16:9
- Colorful OSD, humanized operation menu.
- Reliable EMC and antistatic handling measurement.
- 12V direct power supply input.
- Used for vehicle-mounted and monitoring system.
- One extensive USB port, supporting updating online.



### 3) Product feature

chip	TSUM39LU(TSUM29LU for option)			
OSD language , for option	English, French, German, Italian, Spanish, Portuguese and so on.			
screen	resolution	Max.: 1920X1080		
	interface	single/dual LVDS		
	voltage	3.3V, 5V, 12V		
Input signal	HDMI	480i, 480p, 576i, 576p, 720p, 1080i, 1080p		
	computer	Imitating RGB(0.7Vp-p), horizontal and field synchronization separated (TTL)		
	video	Color system	PAL/SECAM/NTSC	
		Video range	1.0 Vp-p ±5%	
	audio	Earphone input	0.2 – 1.5 Vrms	
Output signal	audio	power: 3W * 2 (8ohm) THD+N<10%		
		socket: 4Pin/2.0mm pin		
press key	Standard seven keys: power supply/input selection/menu/CH+/CH-/V+/V- Compatible for five keys.			
OSD menu:	Brightness, contrast ratio, autocorrection, horizontal and field location, function installation, color system, language, background, noise reduction			
Power supply input:	4pin 2.0mm socket or 12V DC socket			
PCB measurement:	108mm(L)×51.3mm(W)×18mm(H)			
Plug and play:	support			

Noted: It doesn't support screen pouring when chip is TSUM29LU.



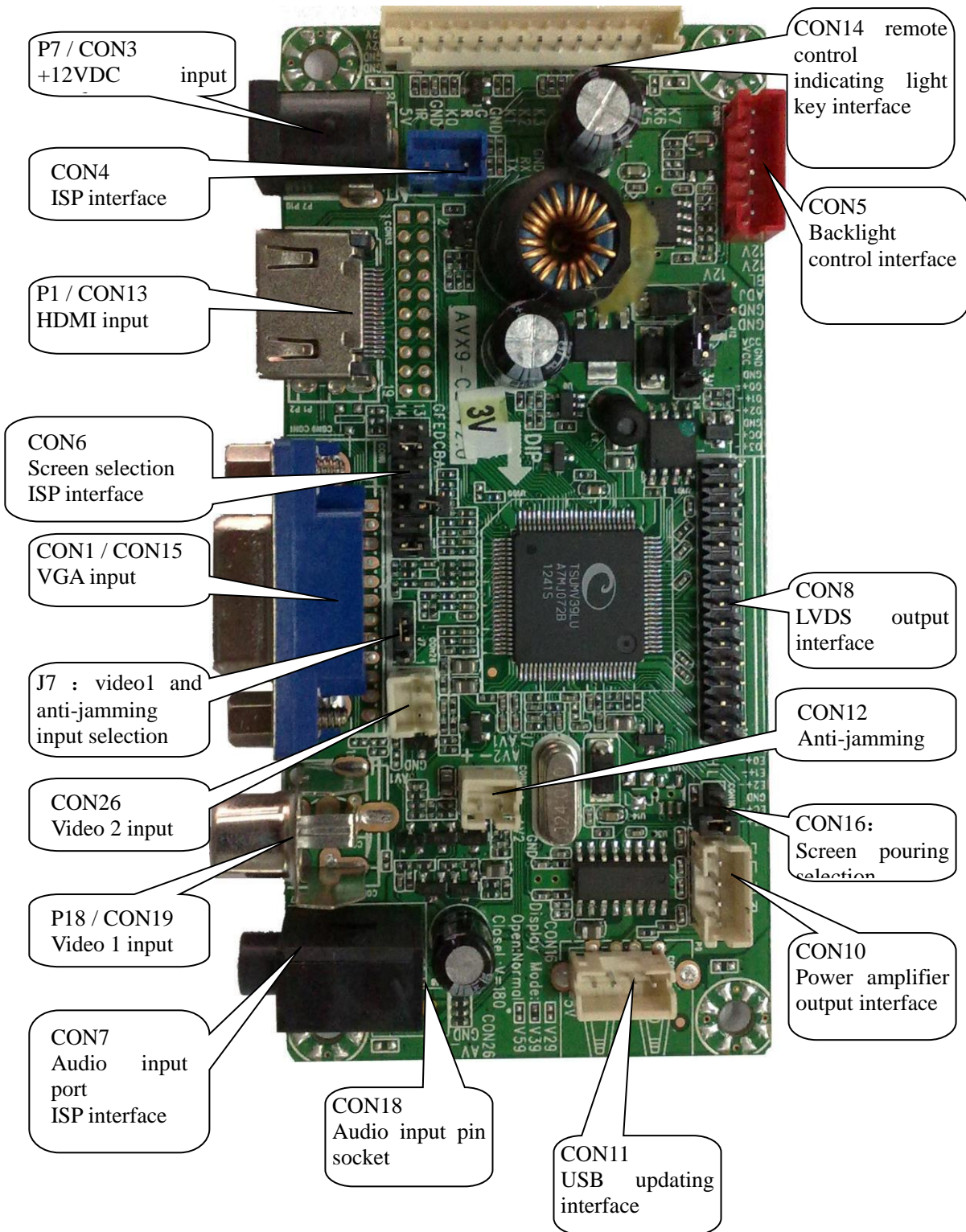
#### 4) PC-RGB supporting mode table

Supporting PC-RGB mode of part of the products listed in this part, including field frequency, horizontal frequency and resolution, is just for reference. It will be different from data in the table as signal output difference.

Mode	Resolution	Horizontal Frequency(KHz)	Field Frequency(Hz)	Standard
WUXGA	1920X1200	74.5	60	
		94.0	75	
UXGA	1600X1200	74.5	60	VESA
		94.0	75	
WSXGA+	1680X1050	65.2	60	
		82.2	75	
WXGA+	1440X900	55.9	60	--
		70.5	75	
WXGA	1280X800	49.7	60	--
		62.6	75	
SXGA+	1400X1050	65.2	60	--
		82.2	75	
SXGA	1280X1024	63.6	60	VESA
		80.2	75	
XGA	1024X768	47.7	60	VESA
		56.0	70	
		60.1	75	
SVGA	800X600	37.3	60	VESA
		43.8	70	
		47.3	75	
VGA	640X480	29.8	60	VESA
		35.0	70	
		37.7	75	
DOS	640X480	29.8	60	VESA
	720X400	29.2	70	



**5) Production appearance figure**





## 6) Product main interface definition

All connector default pin pad stack is one-foot (the first foot is start from the right facing the direction of socket gap) Definition of the pin is seen in the silkscreen on the surface of PCB.

### ➤ CON5 (6PIN/2.0MM red socket) : INVERTER

Pin Number	definition	description
one	GND	grounded
two	GND	grounded
three	ADJ	Backlight brightness adjustment
four	BL_ON	INVERTER switch control
five	12V	Power supply
six	12V	Power supply

### ➤ CON14 (14PIN/2.0MM beige socket) : press key remote control interface socket

Pin Number	definition	description
one	K7	Not connected
two	K6	Default voice-
three	K5	Default voice+
four	K4	Default menu
five	K3	Default information source
six	K2	Default CH-
seven	K1	Default CH+
eight	GND	grounded
nine	G	Indicating light-green
ten	R	Indicating light-red
eleven	K0	Default power supply starting up
twelve	GND	grounded
thirteen	IR	Remote control receiving
fourteen	+5V	Receiving power supply

### ➤ CON3 (4PIN/2.0MM red socket) : 12V power supply socket

Pin Number	definition	description
one	GND	grounded
two	GND	grounded
three	+12V	+12V power supply
four	+12V	+12V power supply



➤ **CON4 (3PIN/2.0MM blue socket) : ISP interface socket**

Pin Number	definition	description
one	GND	grounded
two	RXD	Burn RXD
three	TXD	Burn TXD

➤ **CON13 (2 X 10PIN/2.0mm two row pins) : HDMI plug-in pin socket**

Pin Number	definition	description
one	GND	grounded
two	HPD	HPD detecting foot
three	5V	HDMI 5V output
four	GND	grounded
five	SDA	SDA bus
six	SCL	SCL bus
seven	CEC	CEC signal
eight	RXC-	HDMI RXC- signal
nine	RXC+	HDMI RXC+ signal
ten	GND	HDMI GND
eleven	RX0-	HDMI RX0- signal
twelve	RX0+	HDMI RX0+ signal
thirteen	GND	HDMI GND
fourteen	RX1-	HDMI RX1-signal
fifteen	RX1+	HDMI RX1+signal
sixteen	GND	HDMI GND
seventeen	RX2-	HDMI RX2-signal
eighteen	RX2+	HDMI RX2+signal
nineteen	GND	GND
twenty	GND	GND





➤ **CN15 (12PIN/2.0) : VGA signal input socket**

Pin Number	definition	description
one	GND	grounded
two	VS	Field synchronize
three	HS	Horizontal synchronize
four	GND	grounded
five	RIN	Red primary input
six	GND	grounded
seven	GIN	Green primary input
eight	GND	grounded
nine	BIN	Blue primary input
ten	GND	grounded
eleven	SDA	Data bus
twelve	SCL	Clock bus

➤ **CON18 (3PIN/2.0MM beige socket) : audio input interface**

Pin Number	definition	description
one	PC_L	Computer left channel input
two	GND	grounded
three	PC_R	Computer right channel input

➤ **CON11 (4PIN/2.0MM beige socket) : USB updating interface**

Pin Number	definition	description
one	5V	+5V power supply
two	USB2_D-	USB data-
three	USB2_D+	USB data+
four	GND	grounded



➤ **CON8 (2 X 15PIN/2.0 two row pins) : LVDS output interface**



Pin Number	definition	description
one	VCC	Screen power supply
two	VCC	Screen power supply
three	VCC	Screen power supply
four	GND	grounded
five	GND	grounded
six	GND	grounded
seven	B0M	LVDS odd line vs 0 cathode
eight	B0P	LVDS odd line vs 0 anode
nine	B1M	LVDS odd line vs 1 cathode
ten	B1P	LVDS odd line vs 1 anode
eleven	B2M	LVDS odd line vs 2 cathode
twelve	B2P	LVDS odd line vs 2 anode
thirteen	GND	grounded
fourteen	GND	grounded
fifteen	BCKM	LVDS odd line clock cathode
sixteen	BCKP	LVDS odd line clock anode
seventeen	B3M	LVDS odd line vs 3 cathode
eighteen	B3P	LVDS odd line vs 3 anode
nineteen	A0M	LVDS even line vs 0 cathode
twenty	A0P	LVDS even line vs 0 anode
Twenty-one	A1M	LVDS even line vs 1 cathode
Twenty-two	A1P	LVDS even line vs 1 anode
Twenty-three	A2M	LVDS even line vs 2 cathode
Twenty-four	A2P	LVDS even line vs 2 anode
Twenty-five	GND	grounded
Twenty-six	GND	grounded
Twenty-seven	ACKM	LVDS even line clock cathode
Twenty-eight	ACKP	LVDS even line clock anode
Twenty-nine	A3M	LVDS even line vs 3 cathode
thirty	A3P	LVDS even line vs 3 anode



➤ **CON10 (4PIN/2.0MM beige socket) : power amplifier loudspeaker output**

Pin Number	definition	description
one	R+	Right loudspeaker positive output+
two	R-	Right loudspeaker negative output-
three	L-	Left loudspeaker negative output-
four	L+	Left loudspeaker positive output+



➤ CON6 (2 X 7PIN/2.0 two row pins) :

number	screen	A	B	C	D	E	F	G	
one	1920X1080-8-1	■	■	□	□	□	□	□	Indicate jumper cat shorten
two	1920X1080-6-2	■	□	■	□	□	□	□	
three	1680X1050-8-1	■	□	□	■	□	□	□	
four	1440X900-8-1	■	□	□	□	■	□	□	
five	1280X1024-8-1	■	□	□	□	□	■	□	
six	1366X768-8-1	□	■	□	□	□	□	□	
seven	1366X768-6-2	□	□	■	□	□	□	□	
eight	1024X768-8-1	□	□	□	■	□	□	□	
nine	1024X768-6-2	□	□	□	□	■	□	□	
ten	800X600-8-1	□	□	□	□	□	■	□	
eleven	1024X600-6-2	■	□	□	□	□	□	□	Indicate jumper cat not needed
twelve	1920X1200-6-2	■	■	□	□	□	□	■	
thirteen	1920X1080-8-2	■	□	■	□	□	□	■	
fourteen	1680X1050-6-2	■	□	□	■	□	□	■	
fifteen	1600X1200-8-1	■	□	□	□	■	□	■	
sixteen	1600X900-8-1	■	□	□	□	□	■	■	
seventeen	1600X900-6-2	□	■	□	□	□	□	■	
eighteen	1440X900-6-2	□	□	■	□	□	□	■	
nineteen	1400X1050-6-2	□	□	□	■	□	□	■	
twenty	1280X1024-8-2	□	□	□	□	■	□	■	
Twenty-one	1280X800-6-2	□	□	□	□	□	■	■	
Twenty-two	1024X768-8-2	■	□	□	□	□	□	■	
Twenty-three	1024X768-6X2-1	□	□	□	□	□	□	■	

Note: the same resolution is separated to -1 and -2, which is MAP changing the screen.



## 7) Requirements of transportation, storage, operating

- Operating temperature: 0~+40°C
- Storage temperature: -20~+60°C
- Relative humidity: ≤80%
- Do not bend, distort or stress on the boards during assembling.
- Keep a safe distance between main board and power source, high-voltage board and screen during assembling.
- For the whole machine a better EMC effect, advice to LVDS a twisted pair tightness connection between main board and screen. Use shield line as much as possible. Conditional to put on magnetic loop for line beside board end.

## 8) Production PCB measurement and structure illustration

- PCB specific measurement is up to structure illustration
- PCB thickness plus height of the highest component is 18.0mm
- Specification of screw hole: diameter of screw hole is 3.5mm, details seen in the structure illustration next page.

