
Documnt Number:

DRV060-HDMI-R01 Drive Board
User manual
Pre_Spec V0.2

For Products:

SXGA060 SC — Full Color

SXGA060 SW — Monochrome White

Compatible with SVGA060 series

Record of Revision

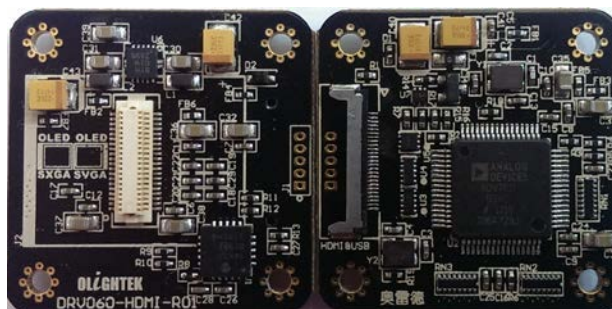
Revision	Revise Date	Page	Content
Pre_Spec V0.1	Oct 14,2013		Initial release .
Pre_Spec V0.2	Oct 25,2013	2	1. Update general description
		4	2. Add USB(Virtual COM) Communication protocol
		8	3. Add Installation diagram with SVGA060 OLED

DRV060-HDMI-R01 Drive Board

User manual

Features

- **High-Definition Multimedia Interface(HDMI) 1.4a features supported**
- **USB2.0 interface supported**
- **Hot Plug supported**
- **Low power consumption**
- **Industrial temperature grade(-40°C~+65°C)**
- **Automatic Gamma and temperature compensation**
- **Custom Re-configurable**



General description

DRV060-HDMI-R01 is an HDMI input driver board mainly for SXGA060 Micro-OLED Display. Low power consumption Decoder can automatically detects and converts TMDS signals into digital RGB 4:4:4 video data compatible with the 24-bit ITU-R BT.601 interface standard. It is also compatible with SVGA060 series. Automatic identification of display supported and the default resolution is 1280×1024 for SXGA,800×600 for SVGA.EDID identification supported.

The SXGA060 Micro-OLED Display center is according to the drive board center , convenient for design and optical system.

One USB communication interface allow user to configure all register of the Decoder and Display. User can re-configure the drive board flexible.

Low-noise, low-dropout DC/DC convertor can support 5V input voltage.

Power and consumption

Input voltage	DC 5V
Typical power consumption	800mW (Include display)

Input video signal

Video signal	TMDS
Input resistor	50Ω
Output	1280×1024@60Hz

Communication Interface

USB2.0 supported. It works as a virtual COM based on CDC class.

Interface	USB (Virtual COM)
COM Setting	9600bps/N/8/1

Mechanic dimension

Dimension (L×W)	31mm×31mm
Refer to diagram of mechanism	

Interface and pin definition

No.	Name	Function	Voltage level
1,2	GND	Power Ground	0V
3	USB_P	USB Data+	0~3.3V
4	USB_N	USB Data-	0~3.3V
5, 6	Vin	Power Input	5V
7	HPD	Hot Plug Detect	0/5V
8	HDMI_5V	HDMI 5V Power	5V
9	GND	Signal Ground	0V
10	HDMI_SDA	DDC Data	0/5V
11	HDMI_SCL	DDC Clock	0/5V
12	Reserve(N.C.)		
13	HDMI_CEC	Consumer Electronics Control	0/5V
14	TMDS Clock-	Clock- Input	0~3.3V
15	TMDS Clock Shield	Shield	0V
16	TMDS Clock+	Clock+ Input	0~3.3V
17	TMDS Data0-	Data0 Input	0~3.3V
18	TMDS Data0 Shield	Shield	0V
19	TMDS Data0+	Data0 Input	0~3.3V
20	TMDS Data1-	Data1 Input	0~3.3V
21	TMDS Data1 Shield	Shield	0V
22	TMDS Data1+	Data1 Input	0~3.3V
23	TMDS Data2-	Data2 Input	0~3.3V
24	TMDS Data2 Shield	Shield	0V
25	TMDS Data2+	Data2 Input	0~3.3V

HDMI&USB

No.	Name	Function	Voltage level
1	PGC	Programming Clock	0/3.3V
2	PGD	Programming Data	0/3.3V
3	VPP	Programming Power	0/3.3V
4	GND	Power Ground	0V
5	V3.3	3.3V Power Output	3.3V

J1

Note: 1. It remarks the first pin as circle in the Connector.

2. The type of HDMI&USB connector is **CABLIN-E-V (20347-025E-**) made by I-PEX.**

3. J1 is no soldering.

Communication description


USB Communication interface support master controller to read/write the register value of the display, decoder and EEPROM. The change of the Decoder and Display will effect immediately, but when power down or reset, it will lost. The change of the EEPROM is equal to modify the default setting, will effect after power up in next time or reset.

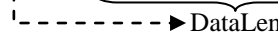
Every command must be sending in 600ms and total bytes must be less than 64 bytes, otherwise, will receive the error code.

Communication mnemonic symbol

Mnemonic	Code(Hex)	Signification	Error Code		Signification
			Mnemonic	Code(Hex)	
STX	02h	Start symbol	Err_Head	F0h	Start symbol error
ETX	03h	End symbol	Err_End	F1h	End symbol error
ACK	06h	ACK symbol	Err_CMD	F2h	CMD symbol error
NAK	07h	NAK symbol	Err_DataLen	F3h	Data Length error
CMD	00h	Read soft version	Err_Frame	F4h	Frame error
	11h	Read Display	Err_FIFO	F5h	FIFO overflow
	12h	Read Decoder	Err_RxProc	F6h	CMD process error
	13h	Read EEPROM	Err_TimeOut	F7h	CMD timeout
	21h	Write Display	Err_Waiting	F8h	CMD not finished
	22h	Write Decoder	Err_Unknow	FFh	Unknown CMD
	23h	Write EEPROM			
	41h	Reset display			
	42h	Reset decoder			
	43h	Open/Close temperature compensation			
	55h	Reset			
	80h	Resume factory setting			

Communication command formatting

Send: STX + CMD + DataLen + Data + ETX


Response: STX + CMD + DataLen + ACK/NAK + Data + ETX


Command usage

1. Read command (All command are fixed in 6 bytes except read decoder)

Send:	STX	CMD	Length	Add0	ReadLen	ETX
	02	00/11/13	03	00~FF	01~FF	03

Succeed Response:	STX	CMD	Length	ACK	Data0	.....	Datan	ETX
	02	00/11/13	03~FF	06	00~FF	.....	00~FF	03

Error Response:	STX	ErrCode	Length	NAK	ETX
	02	F0~FF	02	07	03

Read command examples:

Read Display register from 00H to 0FH: 02 11 03 00 10 03

Since the decoder has eight independent data space which mapping in eight I2C slave addressee, it needs a different reading command as below:

Read Decoder:

Send:	STX	CMD	Length	SlaveAddr	Add0	ReadLen	ETX
	02	12	04	XX	00~FF	01~FF	03

Succeed Response:	STX	CMD	Length	SlaveAddr	ACK	Data0	.....	Datan
	02	12	04~FF	XX	06	00~FF	.....	00~FF

Error Response:	STX	ErrCode	Length	NAK	ETX
	02	F0~FF	02	07	03

Examples:

Read decoder IOMAP (0x98) from 00H to 0FH: 02 12 04 98 00 10 03

2. Write Command ($6 \leq \text{Total Bytes} \leq 64$ except write decoder)

Send:	STX	CMD	Length	Add0	Data0	.....	Addn	Datan	ETX
	02	21/23	03~3C	00~FF	00~FF	.....	00~FF	00~FF	03

Succeed Response:	STX	CMD	Length	ACK	ETX
	02	21/23	02	06	03

Error Response:	STX	ErrCode	Length	NAK	ETX
	02	F0~FF	02	07	03

Write command example:

Write Display register (01H) = 41H, (19H) = A0H: 02 21 05 01 41 19 A0 03

To read decoder, a different writing command is needed:

Write Decoder:

Send:

STX	CMD	Length	SlaveAddr	Add0	Data0	.....	Addn	Datan	ETX
02	22	04~3C	XX	00~FF	00~FF	.....	00~FF	00~FF	03

Succeed Response:

STX	CMD	Length	SlaveAddr	ACK	ETX
02	22	03	XX	06	03

Error Response:

STX	ErrCode	Length	NAK	ETX
02	F0~FF	02	07	03

Example:

Write decoder IOMAP(0x98) (01H) = 41H, (19H) = A0H: 02 22 06 98 01 41 19 A0 03

MECHANICAL CHARACTERISTICS

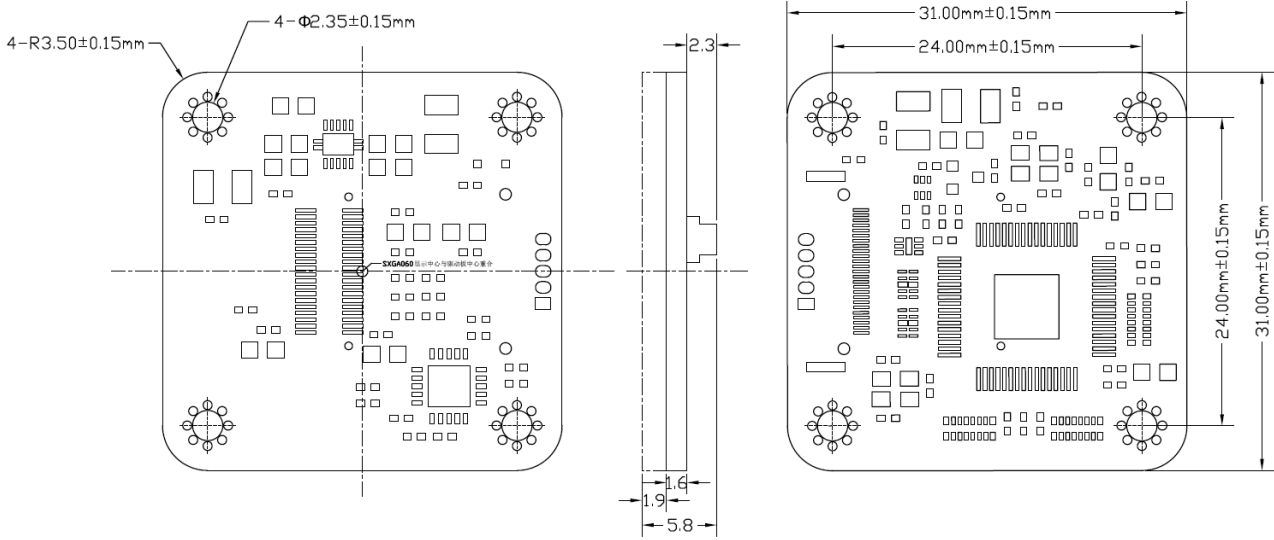
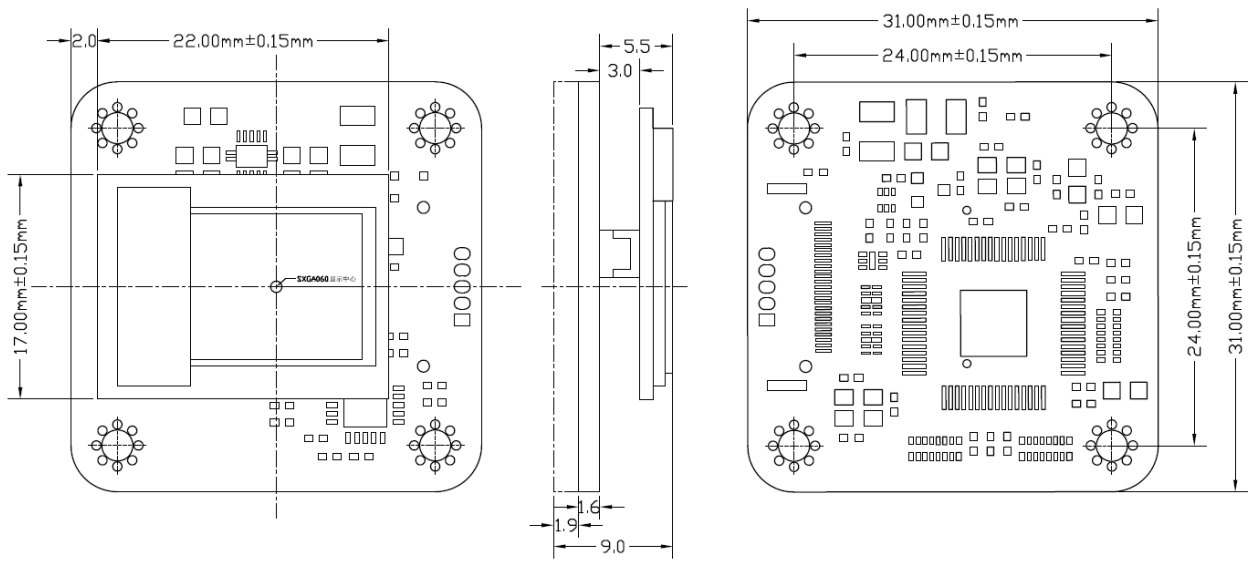
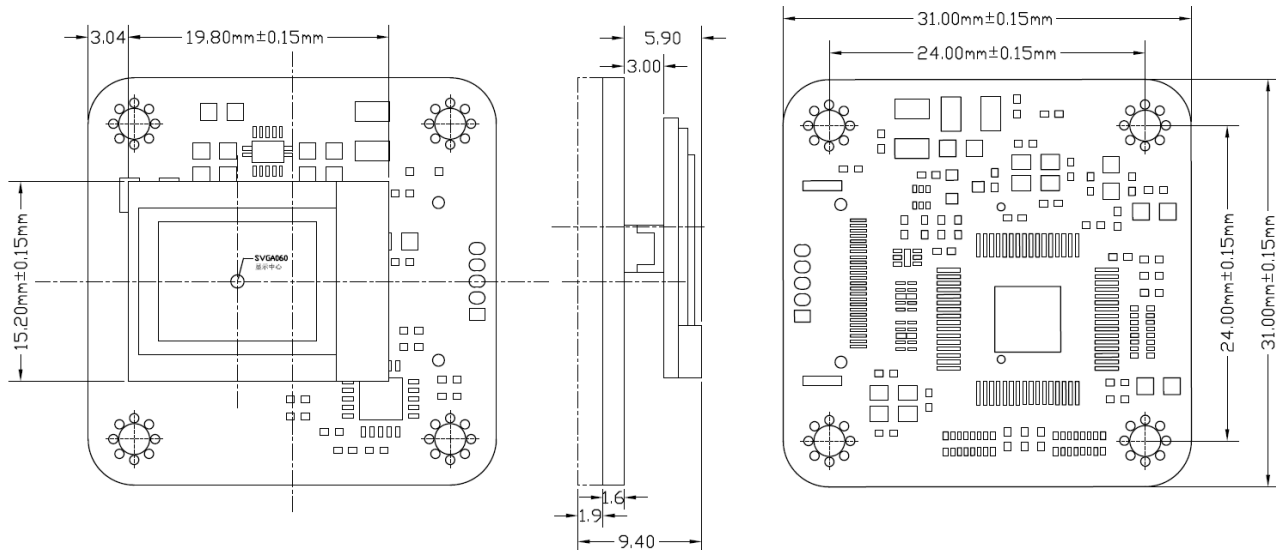


Diagram of mechanism



Installation diagram with SXGA060 OLED
(Display center is according to the drive board center)



Installation diagram with SVGA060 OLED
(Display center is not according to the drive board center)

Accessories

HDMI&USB Transfer Board

A transfer board may be needed in order to facilitate the use of different users. This transfer board incorporates HDMI, USB signal and the 5V power into a CABLINE-V connector. It also support user to choose the power supply between USB and 5V-DC.



HDMI&USB Transfer Board

Note: User can purchase according to their actual use.

CABLINE-V 25ways

The type of the cable is CABLINE-V (20345-025T-02) made by I-PEX. It is necessary for all users.



CABLINE-V 25Ways

Accessories USE

The cable itself can prevent reverse insertion.



Physical Connection



No Power Supply Input



Choose USB Power Supply Choose 5V-DC Power Supply

Choose Power Supply



Switch Off



USB Power Supply Input



5V-DC Power Supply Input

Practical application