

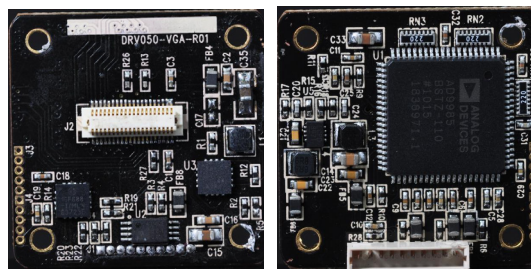
DRV050-VGA-R01

SVGA050 VGA Drive Board

User manual

Features

- RGB graphics signals input
- Low power consumption
- Industrial temperature grade
- Wide power supply (5.5V~17V)
- Custom Re-configurable



General description

DRV050-VGA-R01 is an RGB graphics signals input driver board for SVGA050 Micro-OLED Display. The low power consumption Decoder can automatically detects and converts RGB graphics signals into digital RGB 4:4:4 component video data compatible with the 8-bit ITU-R BT.656 interface standard. Default display setting is RGB graphics signals input, and the resolution is 800x600, support EDID identification, support mono or color signal.

Display center is accord to driver PCB center, convenient for design and set up optical system.

Two digital input interface are reserved to allow user to adjust the brightness, contrast of video signal and the brightness of display. One CMOS standard serial communication interface allow user to configure all register of the Decoder and Display. So user can re-configure the driver board flexible.

Low-noise, low-dropout DC/DC convertor can support 5.5V-17V wide input voltage

Power and consumption

Input voltage	DC 5.5~17V (typical is 6V)
Typical power consumption	700mW ((Include display)

Input video signal

Video signal	RGB graphics signals
Voltage level	0~1.0 Vpp
Input resistor	75Ω
Output	800×600

Interface (3.3V CMOS standard)

I/O definition (active low)	Function
KEY1	Increase Brightness(++)
KEY2	Reduce Brightness(--)
KEY1+KEY2	Brightness & Contrast Reset
PGCLK/KEY_F	Increase Signal Contrast(++)
PGDATA/KEY_M	Reduce Signal Contrast (--)
KEY_F+ KEY_M	On /Off Temp. Compensation
VPP	Hardware Reset
TxD/RxD	CMOS 3.3V RS232 interface
COM Setting	9600/N/8/1

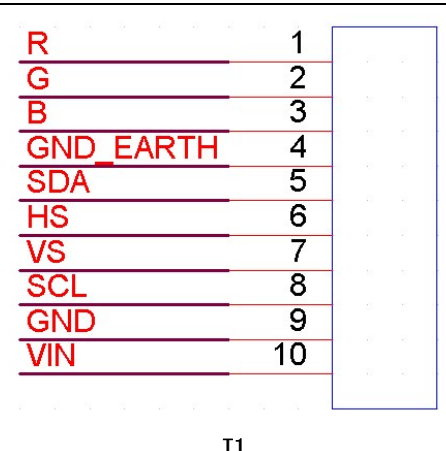
Mechanic dimension

Dimension (L×W)	31mm×31mm
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Display center is accord to drive PCB center
 (SVGA060 display is not accord to the center)

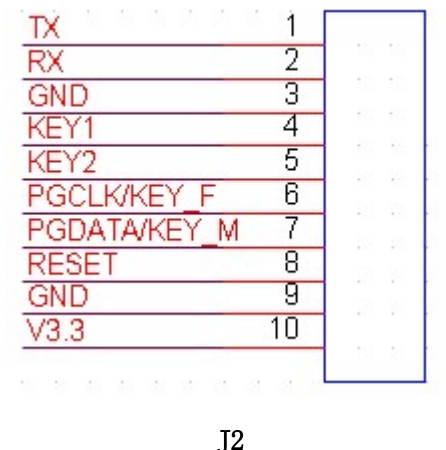
Interface and pin definition

No.	Name	Function	Voltage level
1	R	Red Input	0~1V
2	G	Green Input	0~1V
3	B	Blue Input	0~1V
4	Earth Gnd	Input Signal Gnd	0V
5	SDA	EEPROM I2C DATA (EDID)	0/3.3V
6	HS	Horizontal SYNC Input	0/3.3V
7	VS	Vertical SYNC Input	0/3.3V
8	SCL	EEPROM I2C CLK (EDID)	0/3.3V
9	GND	Power GND	0V
10	VIN	Power Input	5.5~17V



J1

No.	Name	Function	Voltage level
1	TX	RS232 Send Pin	0/3.3V
2	RX	RS232 Received Pin	0/3.3V
3	GND	Power GND	0V
4	KEY1	Increase Brightness(++)	0/3.3V
5	KEY2	Reduce Brightness(--)	0/3.3V
6	PGCLK/KEY_F	Increase Signal Contrast(++)	0/3.3V
7	PGDATA/KEY_M	Reduce Signal Contrast(--)	0/3.3V
8	RESET	Hardware Reset	0/3.3V
9	GND	Power GND	0V
10	V3.3	V3.3 Output	3.3V



J2

Function key description

All of the Keys are active low pulse, and must be not less than 20ms. If the low pulse is more than 20ms, MCU will do the same operate continually by every 20ms.

KEY1: Only when temperature compensation disabled, Increase Display 19H register value: (19H)++, adjust range is 20H~ FFH. If (19H) less than 20H, then recover to FFH. It's effect to adjust Display common cathode voltage, and make the Display brightness change from darkest (FFH) to brightest (20H).

KEY2: Only when temperature compensation disabled, Decrease Display 19H register value: (19H)--, adjust range is 20H~ FFH. If (19H) less than 20H, then recover to FFH. It's effect to adjust Display common cathode voltage, and make the Display brightness change from darkest (FFH) to brightest (20H).

KEY_F: Increase Display 09H register: (09H) ++, adjust range is 00H~ FFH. It's effect to adjust the contrast of input video signal., from all dark to double-brightness.

$$\text{Output} = \text{Input} + (\text{Reg}(09\text{H}) - 80\text{H})$$

Reg(09H)	Result
00H	All dark
80H	Signal no change
FFH	Double brightness

KEY_M: Decrease Display 09H register: (09H) --, adjust range is 00H~ FFH. It's effect to adjust the contrast of input video signal, from double-brightness to all dark.

$$\text{Output} = \text{Input} + (\text{Reg}(09\text{H}) - 80\text{H})$$

Reg(09H)	Result
00H	All dark
80H	Signal no change
FFH	Double brightness

KEY_F+ KEY_M: Turn On/Off temperature compensation function. When temperature compensation turn on, every 10s will check the value of Display temperature sensor, and automatic correct the value of Display 19H register, and all the other operate of 19H register will be disabled.

KEY1+KEY2: Brightness and contrast return to the initial state (The state before you change the register value).

Reset: Hardware reset, all setting will come back to default.

Communication description

RxD and TxD pin are work in COMS 3.3V standard, it cannot connect to PC RS232 port directly. In order to ensure the MCU to work normally, when the driver board is powered up, the PC port must send a reset command at the same time (02 55 03 00 00 03).

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

Communication interface support master controller to read/write the register value of 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.

Display, Decoder and EEPROM register address range are both 00H~FFH. Driver board's MCU will not validate the address and values in received command, so please use it be carefully and make reference of the related spec or contact our technical supports.

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_DateLen	F3h	Data Length error
CMD	00h	Read soft version			

	11h	Read Display	Err_Frame	F4h	Frame error
	12h	Read Decoder	Err_FIFO	F5h	FIFO overflow
	13h	Read EEPROM	Err_RxProc	F6h	CMD process error
	21h	Write Display	Err_TimeOut	F7h	CMD timeout
	22h	Write Decoder	Err_Waiting	F8h	CMD not finished
	23h	Write EEPROM	Err_Unknow	FFh	Unknown CMD

Communication command formatting

Send: STX + CMD + DataLen + Data + ETX
 (Diagram: A dashed arrow points from the 'DataLen' field to the start of the 'Data' field.)

Response: STX + CMD + DataLen + ACK/NAK + Data + ETX
 (Diagram: A dashed arrow points from the 'DataLen' field to the start of the 'Data' field.)

Command usage

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

Send:

STX	CMD	Length	Add0	ReadLen	ETX
02	00/11/12/13	03	00~FF	01~FF	03

Succeed Response:

STX	CMD	Length	ACK	Data0	.....	Datan	ETX
02	00/11/12/13	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

Read Decoder register from 00H to 20H: 02 12 03 00 21 03

2. Write Command (6 ≤ Total Bytes ≤ 64)

Send:

STX	CMD	Length	Add0	Data0	.....	Addn	Datan	ETX
02	21/22/23	03~3C	00~FF	00~FF	.....	00~FF	00~FF	03

Succeed Response:

STX	CMD	Length	ACK	ETX
02	21/22/23	02	06	03

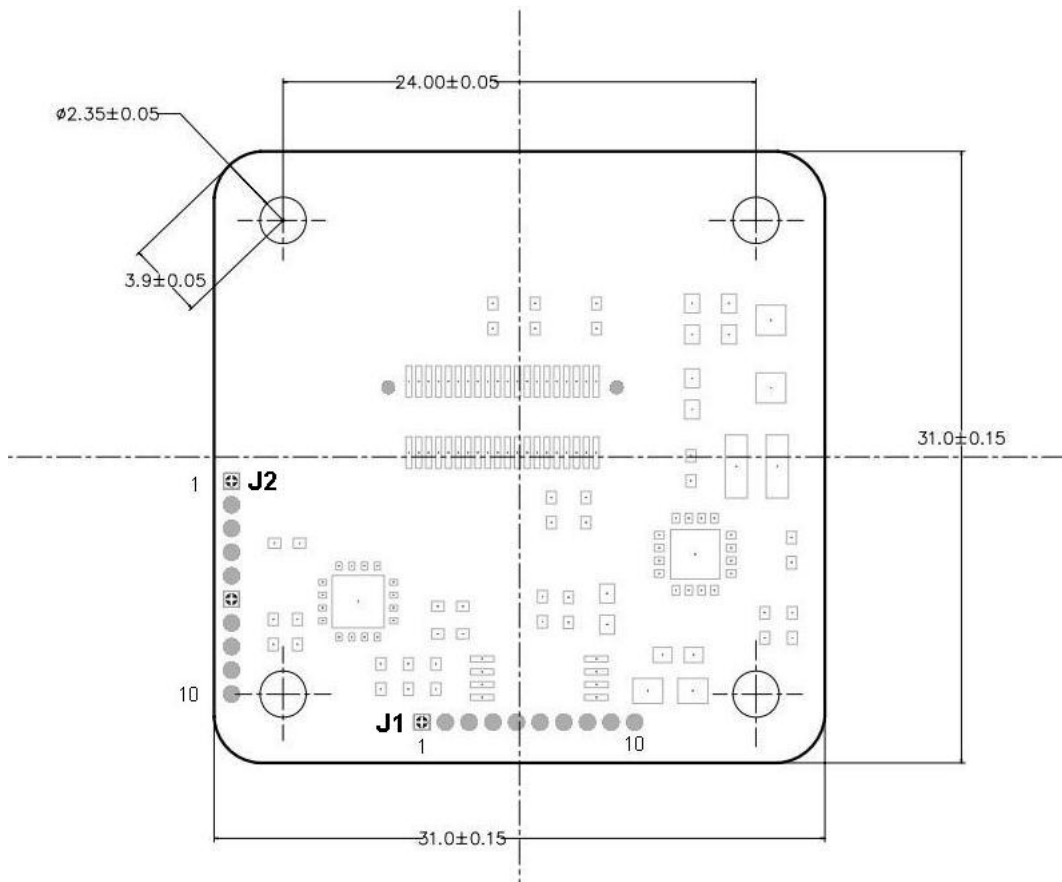
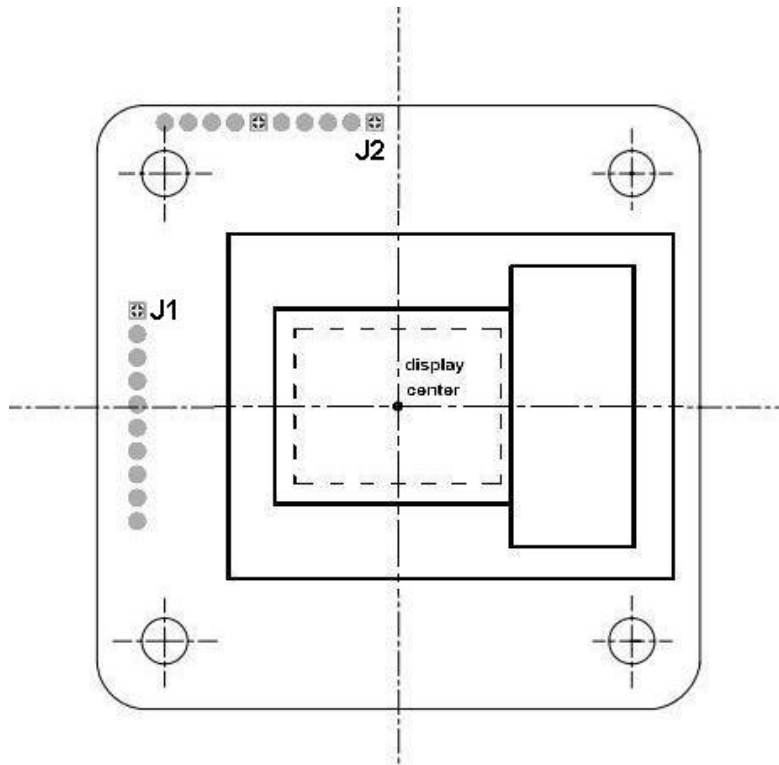
Error Response:

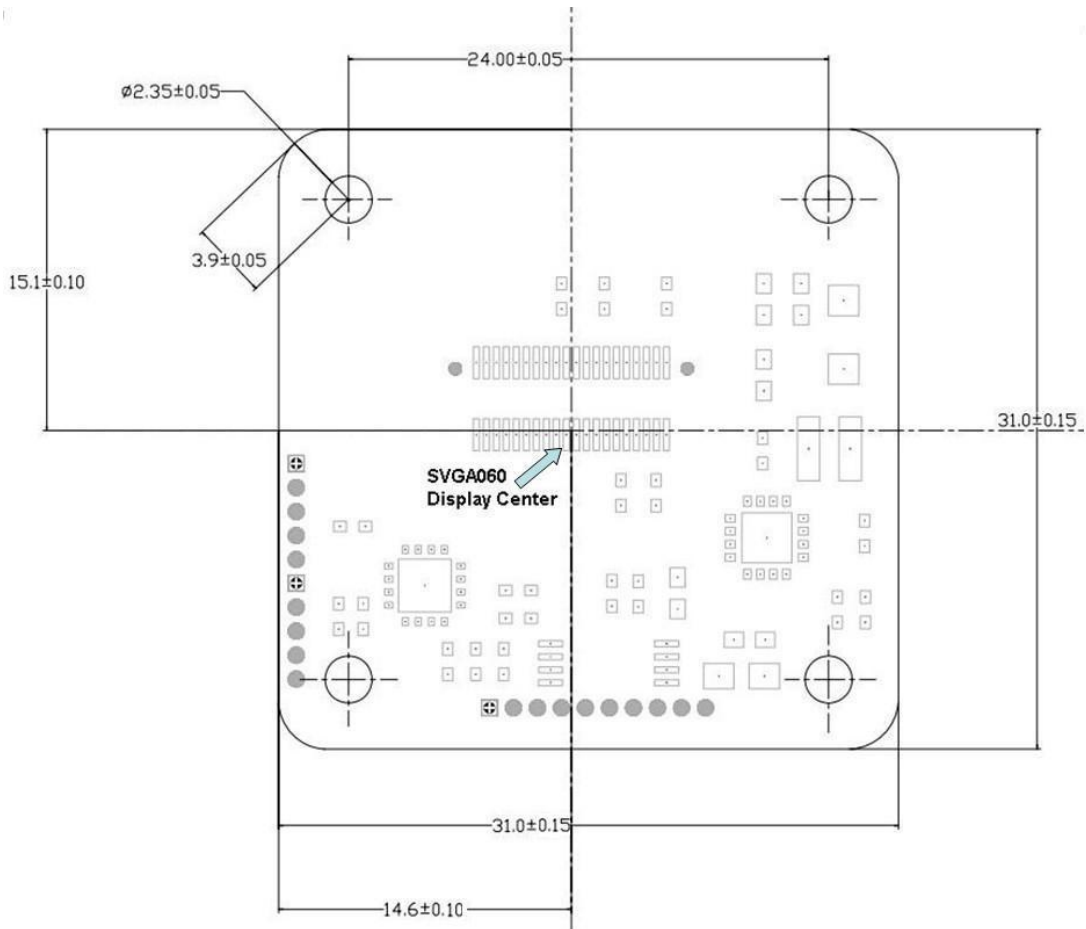
STX	ErrCode	Length	NAK	ETX
02	F0~FF	02	07	03

Write command example:

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

MECHANICAL CHARACTERISTICS





If user uses the SVGA060 microdisplay, remember to adjust the display center to the right position.

