

MCOT22005A1V-EBM		2 x 20	Euro/Jap/Cyrillic	OLED Module		
			Specification			
Versio	n: 1		Date: 23/10/2017			
			Revision			
1 20/10/2017			First Issue.			

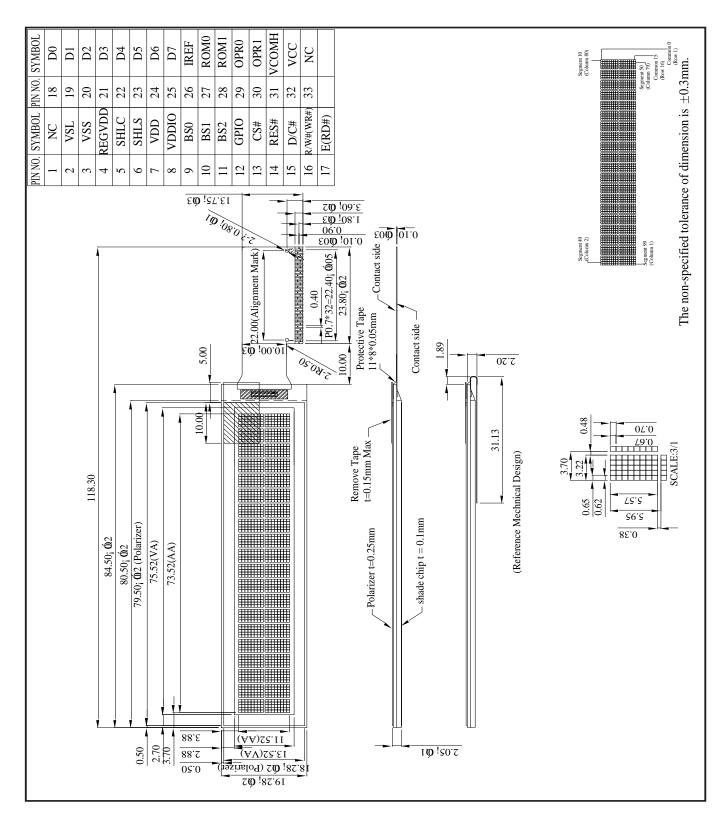
Disp	Display Features				
Character Count	2 x 20				
Appearance	Blue on Black				
Logic Voltage	5V				
Interface	Parallel / SPI / I2C		COHS ompliant		
Font Set	English / Japanese / Cyrillic		ompliant		
Character Height	5.57		omphant		
Module Size	84.50 x 19.28 x 2.05 mm				
Operating Temperature	-40°C ~ +80°C	Box Quantity	Weight / Display		
Construction	ТАВ				

* - For full design functionality, please use this specification in conjunction with the SSD1311 specification.(Provided Separately)

Display Accessories							
Part Number	Description						
MPBV4-Iss2	Direct solder-to-2mm pitch DIL pinout interface board. Compatible with: 0.7, 0.8, 0.845 and 1mm pitch pads.						
MCIB-13 V2	Direct solder OLED character interface board. Used in conjunction with MCIB-12 and UC32.						

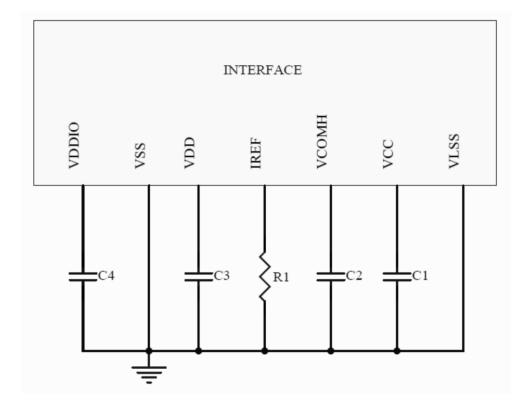
Optional Variants						
Appearance	Voltage					
White on Black						
Green on Black						
Yellow on Black						
Interface						

Mechanical Specifications										
Module Size84.50 x 19.28 x 2.05 (Without Backlight)W x H x D mm										
Active Area	73.52 x 11.52	W x H mm	Hole-to-Hole		W x H mm					
Character Size	3.22 x 5.57	W x H mm	Character Pitch	3.70 x 5.95	W x H mm					
Dot Size	0.62 x 0.67	W x H mm	Dot Pitch	0.65 x 0.70	W x H mm					



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Block Diagram and Application Recommendation



C1, C2: 4.7uF (1)

C3, C4: 1.0uF (1) place close to IC VDDIO / VDD and VSS pins on PCB

Voltage at IREF = VCC - 4.5V. For VCC = 10V, IREF = 15uA: R1 = (Voltage at IREF - VSS) / IREF (10-4.5)V / 15uA = $366K\Omega$

Note

(1) The capacitor value is recommended value. Select appropriate value against module application.

*For more information, please refer to Application Note provided by Midas.

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		Pin Layout
Pin	Symbol	Description
1	NC	No connection
2	VSL	This is segment voltage (output low level) reference pin. When external VSL is not used, this pin should be left open. When external VSL is used, connect with resistor and diode to ground (details depend on application).
3	VSS	Ground pin. It must be connected to external ground.
4	REGVDD	Internal VDD regulator selection pin in 5V I/O application mode. When this pin is pulled HIGH, internal VDD regulator is enabled (5V I/O application). When this pin is pulled LOW, internal VDD regulator is disabled (Low voltage I/O application).
5	SHLC	This pin is used to determine the Common output scanning direction. COM scan direction 1 COM to COM31 (Normal) 0 COM31 to COM0 (Reverse) (1) 0 s connected to VSS (2) 1 s connected to VDDIO
6	SHLS	This pin is used to change the mapping between the display data column address and the Segment driver. SEG scan direction SHLS SEG direction 1 SEG99 (Normal) 0 SEG99 to SEG0 (Reverse) (1) 0 s connected to VSS (2) 1 s connected to VDDIO
7	VDD	Power Supply For Core Logic Operation. VDD can be supplied externally or regulated internally. In LV IO application (internal VDD is disabled), this is a power input pin. In 5V IO application (internal VDD is enabled), VDD is regulated internally from VDDIO. A capacitor should be connected between VDD and VSS under all circumstances.
8	VDDIO	Low voltage power supply and power supply for interface logic level in both Low Voltage I/O and 5V I/O application. It should match with the MCU interface voltage level and must be connected to external source.
9	BS0	MCU bus interface selection pins. Select appropriate logic setting as described in the following table. BS2, BS1 and BS0 are pin select.
10	BS1	Bus Interface selection
11	BS2	BS[2:0] Interface 000 Serial Interface 001 Invalid 010 I ² C 011 Invalid 100 8-bit 6800 parallel 101 4-bit 6800 parallel 110 8-bit 8080 parallel 111 4-bit 8080 parallel
12	GPIO	GPIO pin. Details refer to OLED command DCh.
13	CS#	Chip Select Input Connecting to the MCU. The chip is enabled for MCU communication only when CS# is pulled LOW (active LOW). In I2C mode, this pin must be connected to VSS.
14	RES#	Reset Signal Input. When the pin is pulled LOW, initialization of the chip is executed. Keep this pin pull HIGH during normal operation.

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		Data/Command Control Pin Connecting to the MCU.									
		When the pin is pulled HIGH, the data at D[7:0] will be interpreted as data.									
15	D/C#	When the pin is pulled LOW, the data at D[7:0] will be transferred to a command register.									
		In I2C mode, this pin acts as SA0 for slave address selection.									
		When serial interface is selected, this pin must be connected to VSS.									
		Read / Write Control Input Pin Connecting to the MCU interface.									
		When 6800 interface mode is selected, this pin will be used as Read/Write (R/W#) selection input.									
16		Read mode will be carried out when this pin is pulled HIGH and write mode when LOW.									
10		When 8080 interface mode is selected, this pin will be the Write (WR#) input. Data write operation is									
		iated when this pin is pulled LOW and the chip is selected.									
		When serial or I2C interface is selected, this pin must be connected to VSS.									
		MCU Interface Input. When 6800 interface mode is selected, this pin will be used as the Enable (E) signal.									
		Read/write operation is initiated when this pin is pulled HIGH and the chip is selected.									
17		When 8080 interface mode is selected, this pin receives the Read (RD#) signal. Read operation is									
		initiated when this pin is pulled LOW and the chip is selected.									
		When serial or I2C interface is selected, this pin must be connected to VSS.									
		Bi-directional Data Bus Connecting to the MCU data bus.									
		Unused pins are recommended to tie LOW.									
		When serial interface mode is selected, D0 will be the serial clock input: SCLK; D1 will be the serial									
18-25	D0~D7	data input: SID and D2 will be the serial data output: SOD.									
		When I2C mode is selected, D2, D1 should be tied together and serve as SDAout, SDAin in									
		application and D0 is the serial clock input, SCL.									
		Segment Output Current Reference pin.									
26	IREF	IREF is supplied externally.									
		A resistor should be connected between this pin and VSS to maintain current of around 15uA.									
		These pins are used to select Character ROM; select appropriate logic setting as described in the									
		following table. ROM1 and ROM0 are pin select as shown in below table:									
		Character ROM selection									
27	ROM0	ROM1 ROM0 ROM									
		0 0 A									
		0 1 B									
		1 0 C									
		1 I S/W selectable ⁽³⁾									
28	ROM1	Note									
20		(1) 0 is connected to VSS									
		(2) 1 is connected to VDDIO									
		This pin is used to select the character number of character generator.									
		Character RAM selection									
29	OPR0	OPRI OPR0 CGROM CGRAM									
20		1 1 256 0									
		1 0 250 6									
		0 0 240 8									
	00004	Note									
30	OPR1	(1) 0 is connected to VSS									
		(2) 1 is connected to VDDIO									
	VOON	COM signal deselected voltage level.									
31		A capacitor should be connected between this pin and VSS.									
		No external power supply can connect to this pin. Power Supply for Panel Driving Voltage.									
32	VCC	This is also the most positive power voltage supply pin. It is supplied by external high voltage source.									
22	NO										
33	NC	o connection.									

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Font Map

								1		1			1	1	1	
Upper 4bit Lower 4bit	LLLL	LLLH	LLHL	LLHH	LHLL	LHLH	LHHL	LННН	HLLL	HLLH	HLHL	нгнн	HHLL	ннгн		
LLLL	CG RAM (1)															
LLLH	(2)															
LLHL	(3)															
LLHH	(4)															
LHLL	(5)															
LHLH	(6)															
LHHL	(7)															
LHHH	(8)															
HLLL	(1)															
HLLH	(2)															
HLHL	(3)															
HLHH	(4)															
HHLL	(5)															
HHLH	(6)															
HHHL	(7)															
нннн	(8)															

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Upper														
4bit Lower 4bit	LLLL	LLLH	LLHL	LLHH	LHLL	LHLH	LHHL	HLLL	HLLH	HLHL	нгнн	HHLL	ннгн	
LLLL	CG RAM (1)													
LLLH	(2)													
LLHL	(3)													
LLHH	(4)													
LHLL	(5)													
LHLH	(6)													
LHHL	(7)													
LННН	(8)													
HLLL	(1)													
HLLH	(2)													
HLHL	(3)													
нгнн	(4)													
HHLL	(5)													
HHLH	(6)													
HHHL	(7)													
нннн	(8)													

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Upper																
4bit Lower 4bit	LLLL	LLLH	LLHL	LLHH	LHLL	LHLH	LHHL	LHHH	HLLL	HLLH	HLHL	HLHH	HHLL	HHLH	HHHL	
LLLL	CG RAM (1)															
LLLH	(2)															
LLHL	(3)															
LLHH	(4)															
LHLL	(5)															
LHLH	(6)															
LHHL	(7)															
LHHH	(8)															
HLLL	(1)															
HLLH	(2)															
HLHL	(3)															
HLHH	(4)															
HHLL	(5)															
HHLH	(6)															
HHHL	(7)															
нннн	(8)															

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Absolute Maximum Ratings									
ltem	Symbol	Condition	Min	Тур	Max	Unit			
Supply Voltage for Logic	VDDIO		-0.3		6.00	V			
Input Voltage	VDD		-0.3		VDDIO	°C			
Operating Temperature	TOP		-40		80	°C			
Storage Temperature	TST		-40		85	°C			

Electronic Characteristics										
ltem	Item Symbol Condition Minimum Typical Maximum Un									
Input High Voltage	VIH		0.80xVDD			V				
Input Low Voltage	VIL				0.20xVDD	V				
Output High Voltage	VOH	IOH=0.5mA	0.90xVDD			V				
Output Low Voltage	VOL	IOL=0.5mA			0.10xVDD	V				
Supply Voltage for Logic	VDDIO		4.80	5.00	5.30	V				
Supply Voltage for I/O	VDD-VSS		4.80	5.00	5.30	V				
Supply Voltage for Display	VCC		9.50	10.00	10.50	V				
50% Checkboard Operating Current.	ICC	VDD=5V	25	28	30	mA				
CIEx(Blue)		(CIE1931)	0.12	0.16	0.20					
CIEy(Blue)		(CIE1931)	0.22	0.26	0.30					

	OLED Characteristics										
Item Symbol Condition Minimum Typical Maximum Unit											
	θ(V)		160			Deg					
Viewing Angle	(H)φ		160			Deg					
Contrast Ratio	CR	Dark	2000:1								
Deenenee Timee	T Rise			10		μs					
Response Time T Fall				10		μs					
Display with 50% Checkboard Brightness			60	80		cd/m ²					

OLED Life Time									
Item Conditions Typical Remark									
Operating Life Time	Ta=25°C. Initial checkboard brightness. 50%.	50,000 Hours							

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