

<b>Specification</b>	
Part Number:	MCOB22005AX-EBP
Version:	10/08/2015
Date:	1
<b>Revision</b>	



design • manufacture • supply



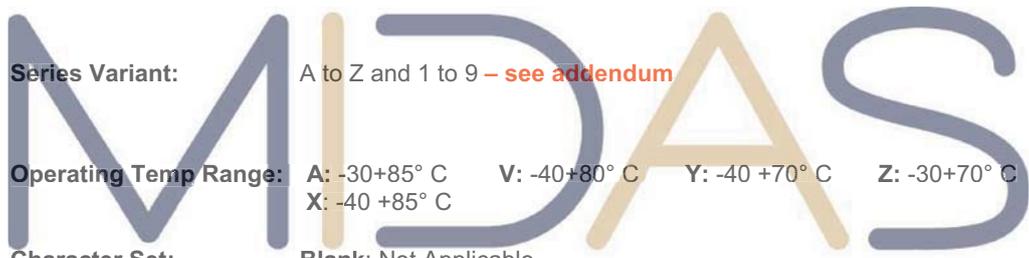
# Content

- History of versions and modifications .....3
- Coding system .....3
- Mechanical Specification .....4
- Mechanical Drawing.....5
- Pin Description.....6
- DC Characteristics .....7
- Optical Characteristics .....7
- Electrical Absolute Ratings .....8
- POWER SUPPLY .....8
- Application .....9
- SSD1311 CGROM CHARACTER CODE.....11



# Midas Displays OLED Part Number System

MCO	B	21605	A	*	V	-	E	W	I	*		
1	2	3	4	5	6		7	8	9	10		
1	=	<b>MCO:</b>	Midas Displays OLED									
2	=	<b>Blank:</b>	<b>B:</b> COB (Chip on Board) <b>T:</b> TAB (Taped Automated Bonding)									
3	=	<b>No of dots:</b>	(e.g. 240064 = 240 x 64 dots)				(e.g. 21605 = 2 x 16 5mm C.H.)					
4	=	<b>Series</b>	A to Z									
5	=	<b>Series Variant:</b>	A to Z and 1 to 9 – see addendum									
6	=	<b>Operating Temp Range:</b>	A: -30+85° C		V: -40+80° C		Y: -40 +70° C		Z: -30+70° C			
			X: -40 +85° C									
7	=	<b>Character Set:</b>	<b>Blank:</b> Not Applicable <b>E:</b> Multi European Font Set (English/Japanese – Western European (K) – Cyrillic (R))									
8	=	<b>Colour:</b>	Y: Yellow		W: White		B: Blue		R: Red		G: Green	RGB: Full Colour
9	=	<b>Interface:</b>	<b>P:</b> Parallel		<b>I:</b> I <sup>2</sup> C		<b>S:</b> SPI		<b>M:</b> Multi			
10	=	<b>Voltage Variant:</b>	e.g. <b>3</b> = 3v									



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## Functions and Features

- 2 lines x 20 characters
- Built-in controller
- Parallel or serial MPU interface (Default 6800 MPU parallel)
- +2.8V ~ +5.3V Power Supply
- viewing angle "Free"
- Wide Temperature -40°C ~ +80°C (Operating)
- Sunlight Readable Technology
- RoHS compliant

## Mechanical Specification

Item	Description	
Product No.	MCOB22005AX-EBP	
Viewing Area	75.52(W)×13.52(H)	mm
Module Size	116.0(W)×37.0(H)×9.0 (D)	mm
Dot Size	0.62(W)×0.67(H)	mm
Dot Pitch	0.65(W)×0.70(H)	mm
Display Format	20 characters (W)×2 lines (H)	
Duty Ratio	1/16	Duty
Controller	SSD1311 or Equivalent	
Interface	6800 (Default) 8Bit 8080 (Option) SPI (Option) I2C (Option)	





# Pin Description

Parallel Interface (default):

Pin No.	Symbol	External Connection	Description
1	VSS	Power Supply	Ground
2	VDD	Power Supply	Supply Voltage for OLED and logic
3	Vo	-	Contrast Adjustment
4	RS(D/C#)	MPU	Register select signal. H: DATA, L: Command
5	RW# (WR#)	MPU	6800-interface:  Read/Write select signal, RW=1: Read RW: =0: Write  8080-interface:  Active LOW Write signal.
6	E <sub>or</sub> /RD	MPU	6800-interface:  Operation enable signal. Falling edge triggered.  8080-interface:  Active LOW Read signal.
7-14	DB0~DB7	MPU	8-bit Bi-directional data bus lines
15-16	NC	-	No Connect



## DC Characteristics

Item	Symbol	Condition	Min.	Type	Max.	Unit
Power Supply for Logic	VDD	(Wide Voltage I/O Application)	2.8	5.0	5.3	Volt
Input Voltage for I/O Pins	V <sub>i</sub>	(Wide Voltage I/O Application)	2.8	5.0	5.3	Volt
Input Voltage	V <sub>IL</sub>	L level	0	-	0.2 VDD	Volt
Input Voltage	V <sub>IH</sub>	H level	0.8 VDD	-	VDD	Volt
Output Voltage	V <sub>OL</sub>	L level	0	-	0.1 VDD	
Output Voltage	V <sub>OH</sub>	H level	0.9 VDD	-	VDD	
Power Supply Current for OLED	I <sub>DD</sub>	Note	-	30		mA
Sleep Mode Current for VDD	I <sub>DD,SLEEP</sub>			1	10	μA

**Note:**

VDD = 5.0V, 25% Display Area Turn on. 100 cd/m<sup>2</sup>

When random texts pattern is running , averagely , about 1/4 of pixels will be on.

## Optical Characteristics

Item	Symbol	Min.	Typ	Max.	Unit
Viewing angle range			Free		Degree
Dark Room Contrast	Cr		>10,000:1		
Brightness	Lbr		140		cd/m <sup>2</sup>
Peak Emission Wavelength	C.I.E 1931	X=0.12 Y=0.22	X=0.16 Y=0.26	X=0.20 Y=0.30	



# Electrical Absolute Ratings

Item	Symbol	Min.	Typ.	Max.	Unit	Notes
Power Supply for Logic	VDD	-0.3	5.0	5.5	Volt	1,2
Input Voltage for I/O Pins	VI	-0.3	5.0	5.5	Volt	1,2
Life Time (100 cd/m <sup>2</sup> )		---	70,000	---	Hours	3

Note 1: All the above voltages are on the basis of "VSS = 0V".

Note 2: When this module is used beyond the above absolute maximum ratings, permanent breakage of the module may occur.

Note 3: Ta = 25°C, 25% Checkerboard.

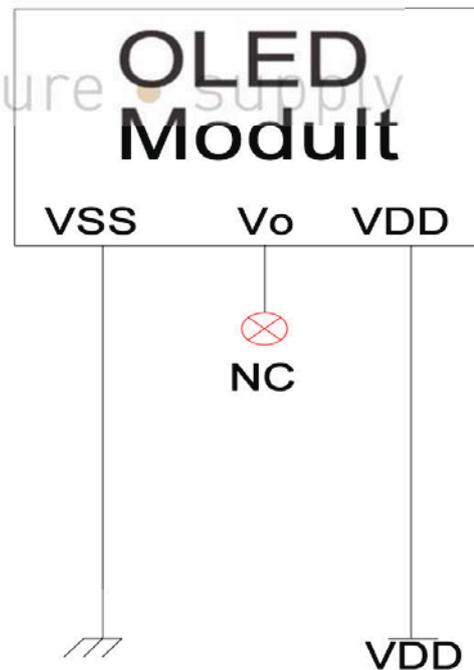
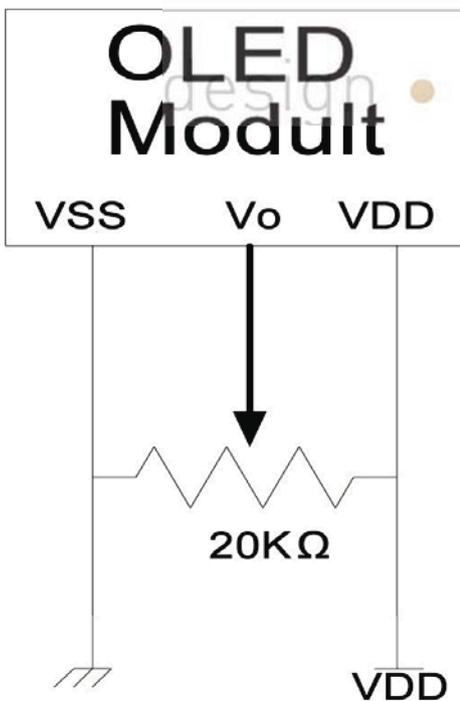
Software configuration follows Section ACTUAL APPLICATION EXAMPLE Initialization.

End of lifetime is specified as 50% of initial brightness reached. The average operating lifetime at room temperature is estimated by the accelerated operation at high temperature conditions.

## POWER SUPPLY

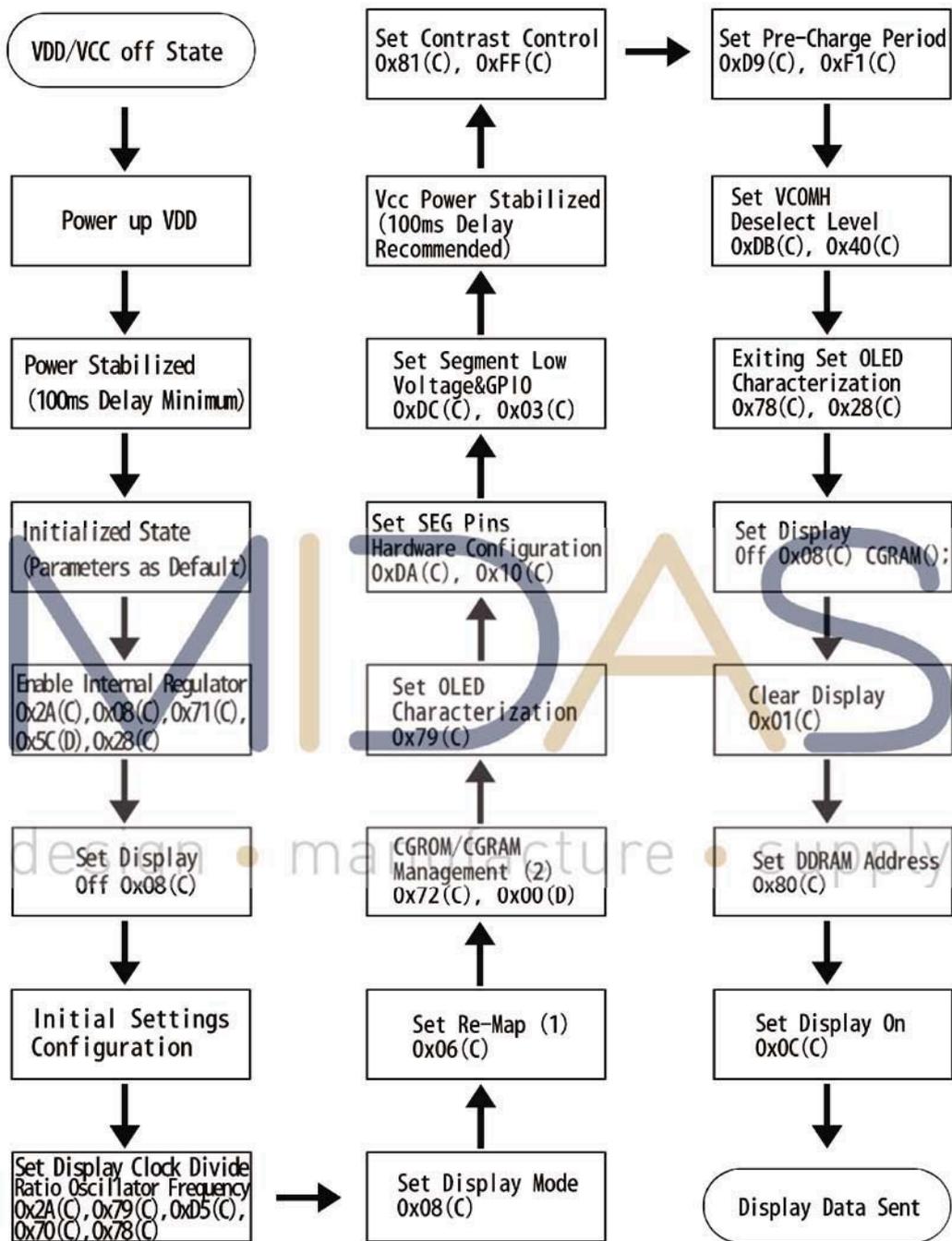
Adjust Brightness by Software & Hardware(VR)

Adjust Brightness by Software(Only)



# Application

## Power up Sequence



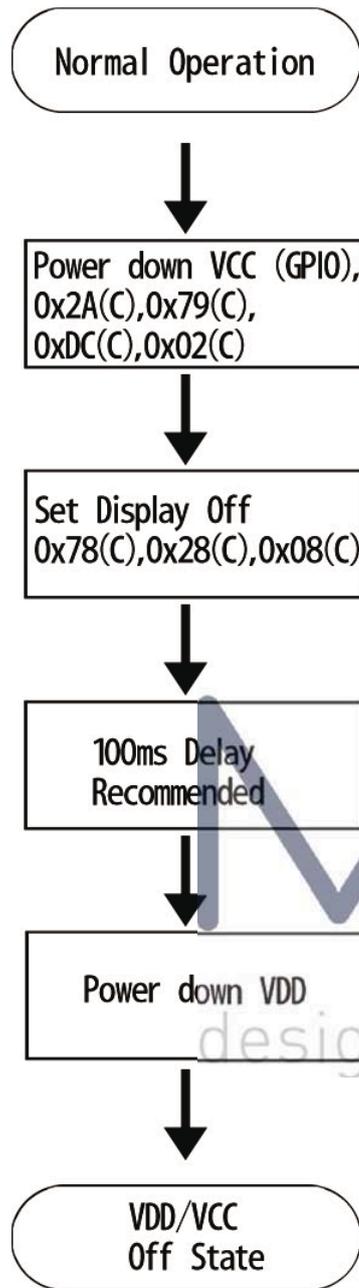
(1) This command could be programmable or defined by pin configuration.

(2) This command could be programmable or defined by pin configuration.

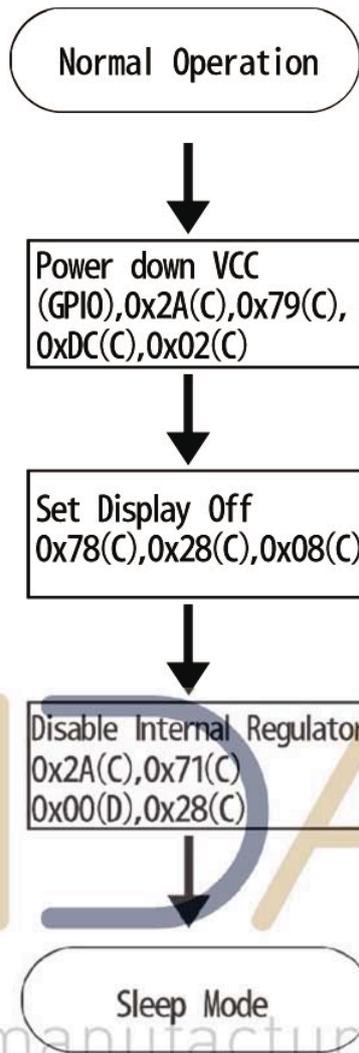
※ ( C ) : Write Command    ※ ( D ) : Write Data

If the noise is accidentally occurred at the displaying window during the operation, please reset the display in order to recover the display function.

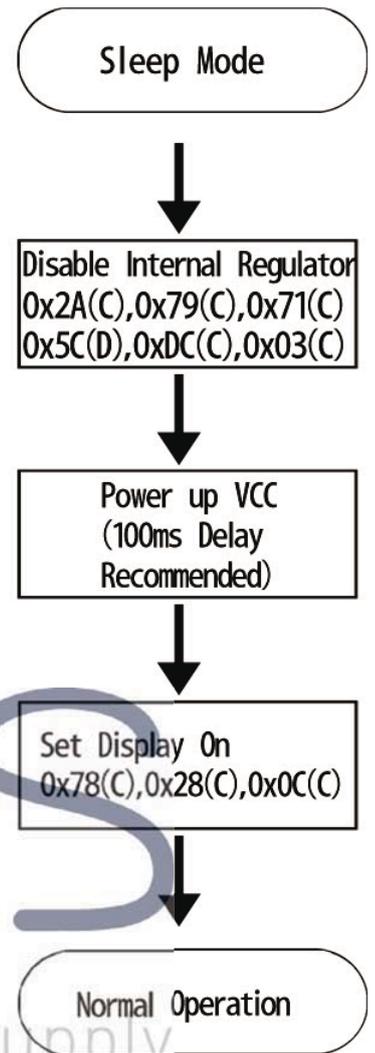
### Power down Sequence



### Entering Sleep Mode



### Exiting Sleep Mode



# SSD1311 CGROM CHARACTER CODE

ROM A

b7-4 \ b3-0	0000	0001	0010	0011	0100	0101	0110	0111	1000	1001	1010	1011	1100	1101	1110	1111
0000																
0001	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒	☒
0010	!	"	#	\$	%	&	'	(	)	*	+	,	-	.	/	
0011	0	1	2	3	4	5	6	7	8	9	*	<	=	>	?	
0100	I	A	B	C	D	E	F	G	H	I	J	K	L	N	O	
0101	P	R	S	T	U	V	W	X	Y	Z	[	]	^	_	~	
0110	̀	á	â	ã	ä	å	æ	ç	è	é	ê	ë	ì	í	î	ï
0111	ƒ	g	h	i	j	k	l	m	n	o	p	q	r	s	t	u
1000	v	w	x	y	z	{	}	~	¸	¸	¸	¸	¸	¸	¸	¸
1001	¸	¸	¸	¸	¸	¸	¸	¸	¸	¸	¸	¸	¸	¸	¸	¸
1010	¸	¸	¸	¸	¸	¸	¸	¸	¸	¸	¸	¸	¸	¸	¸	¸
1011	¸	¸	¸	¸	¸	¸	¸	¸	¸	¸	¸	¸	¸	¸	¸	¸
1100	¸	¸	¸	¸	¸	¸	¸	¸	¸	¸	¸	¸	¸	¸	¸	¸
1101	¸	¸	¸	¸	¸	¸	¸	¸	¸	¸	¸	¸	¸	¸	¸	¸
1110	¸	¸	¸	¸	¸	¸	¸	¸	¸	¸	¸	¸	¸	¸	¸	¸
1111	¸	¸	¸	¸	¸	¸	¸	¸	¸	¸	¸	¸	¸	¸	¸	¸



# ROM B

b7-4	b3-0	0000	0001	0010	0011	0100	0101	0110	0111	1000	1001	1010	1011	1100	1101	1110	1111
0000																	
0001		▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲
0010		!	"	#	\$	%	&	'	(	)	*	+	,	-	.	/	
0011		0	1	2	3	4	5	6	7	8	9	:	;	<	=	>	?
0100		A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	
0101		P	Q	R	S	T	U	V	W	X	Y	Z	[	\	]	^	_
0110		`	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o
0111		p	q	r	s	t	u	v	w	x	y	z	{		}	~	
1000		À	Á	Â	Ã	Ä	Å	Æ	Ç	Ð	Ñ	Ò	Ó	Ô	Õ	Ö	Ø
1001		Ù	Ú	Û	Ü	Ý	Þ	ß	à	á	â	ã	ä	å	æ	ç	ø
1010		À	Á	Â	Ã	Ä	Å	Æ	Ç	Ð	Ñ	Ò	Ó	Ô	Õ	Ö	Ø
1011		À	Á	Â	Ã	Ä	Å	Æ	Ç	Ð	Ñ	Ò	Ó	Ô	Õ	Ö	Ø
1100		À	Á	Â	Ã	Ä	Å	Æ	Ç	Ð	Ñ	Ò	Ó	Ô	Õ	Ö	Ø
1101		À	Á	Â	Ã	Ä	Å	Æ	Ç	Ð	Ñ	Ò	Ó	Ô	Õ	Ö	Ø
1110		À	Á	Â	Ã	Ä	Å	Æ	Ç	Ð	Ñ	Ò	Ó	Ô	Õ	Ö	Ø
1111		À	Á	Â	Ã	Ä	Å	Æ	Ç	Ð	Ñ	Ò	Ó	Ô	Õ	Ö	Ø



# ROM C

b7-4	b3-0															
	0000	0001	0010	0011	0100	0101	0110	0111	1000	1001	1010	1011	1100	1101	1110	1111
0000	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5
0001	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
0010	!	"	#	\$	%	&	'	(	)	*	+	,	-	.	/	:
0011	0	1	2	3	4	5	6	7	8	9	*	+	=	>	?	@
0100	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
0101	P	Q	R	S	T	U	V	W	X	Y	Z	[	\	^	_	~
0110	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o	p
0111	q	r	s	t	u	v	w	x	y	z	{		}	~	*	+
1000	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5
1001	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
1010	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o	p
1011	q	r	s	t	u	v	w	x	y	z	{		}	~	*	+
1100	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5
1101	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
1110	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
1111	Q	R	S	T	U	V	W	X	Y	Z	[	\	^	_	~	+

