



VK2C21B

LCD

Rev.1.3

“ ”

%

VK2C21B	LCD
64 16SEG x 4COM	96 12SEGx8COM
LCD	I2C

ž

&

- 2.4-5.5V
- 32 kHz RC
- BIAS 1/3 1/4
- COM DUTY 1/4 1/8
- RAM 20x4 16x8
- 80Hz 160Hz
-
- I2C
- 16x4 12x8
- 3
- LCD
- 1
- VLCD LCD ≤ VDD
- 16 LCD
- (POR)
-
-

SOP24 (300mil) (15.4mm × 7.5mm PP=1.27mm)

1 .

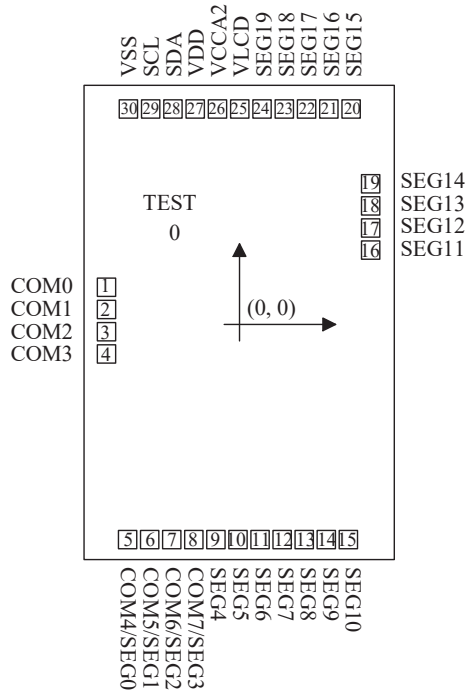
	SEG×COM			
VK2C21A	20×4,16×8	1/3,1/4	1/4,1/8	SOP28
VK2C21AA	20×4,16×8	1/3,1/4	1/4,1/8	SSOP28
VK2C21AQ	20×4,16×8	1/3,1/4	1/4,1/8	QFN28L
VK2C21B	16×4,12×8	1/3,1/4	1/4,1/8	SOP24
VK2C21BA	16×4,12×8	1/3,1/4	1/4,1/8	SSOP24
VK2C21BQ	16×4,12×8	1/3,1/4	1/4,1/8	QFN24L
VK2C21C	12×4,8×8	1/3,1/4	1/4,1/8	SOP20
VK2C21CQ	12×4,8×8	1/3,1/4	1/4,1/8	QFN20L
VK2C21D	8×4,4×8	1/3,1/4	1/4,1/8	SOP16
VK2C21DQ	8×4,4×8	1/3,1/4	1/4,1/8	QFN16L

(.

			fl L			
VK2C21A	SOP28	1 /26		1 /2080	1 /20800	
VK2C21AA	SSOP28	1 /50		1 /5000	1 /50000	
VK2C21AQ	QFN28L		1 /490	1 /4900	1 /29400	
VK2C21B	SOP24	1 /30		1 /2400	1 /24000	
VK2C21BA	SSOP24	1 /50		1 /10000	1 /100000	
VK2C21BQ	QFN24L		1 /490	1 /4900	1 /29400	
VK2C21C	SOP20	1 /36		1 /2880	1 /28800	
VK2C21CQ	QFN20L		1 /490	1 /4900	1 /29400	
VK2C21D	SOP16	1 /50		1 /10000	1 /100000	
VK2C21DQ	QFN16L		1 /3000	1 /3000	1 /120000	

5 COB

5.1 COB /PAD



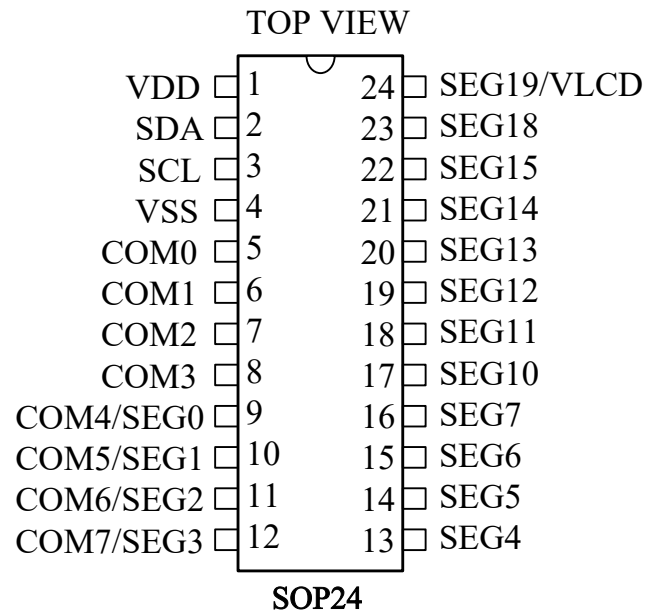
	1150×1715 μm^2	VSS	
PAD	70×70 μm		
VDD (Pad27)	VCCA2 (Pad26)		
VLCD (Pad25)	SEG19 (Pad24)		
VLCD	LCD	VLCD	

5.2 COB/PAD

μm

		X	Y			X	Y
1	COM0	93.11	1016.655	17	SEG12	1056.89	1621.89
2	COM1	93.11	932.155	18	SEG13	1056.89	1265.89
3	COM2	93.11	847.655	19	SEG14	1056.89	1350.39
4	COM3	93.11	763.155	20	SEG15	1040.39	1621.89
5	COM4/SEG0	130.97	93.11	21	SEG16	950.39	1621.89
6	COM5/SEG1	220.97	93.11	22	SEG17	860.39	1621.89
7	COM6/SEG2	310.9	93.11	23	SEG18	756.75	1621.89
8	COM7/SEG3	400.97	93.11	24	SEG19	666.75	1621.89
9	SEG4	490.97	93.11	25	VLCD	576.75	1621.89
10	SEG5	580.97	93.11	26	VCCA2	486.75	1621.89
11	SEG6	670.97	93.11	27	VDD	396.75	1621.89
12	SEG7	760.97	93.11	28	SDA	306.75	1621.89
13	SEG8	850.97	93.11	29	SCL	199.61	1621.89
14	SEG9	940.97	93.11	30	VSS	109.61	1621.89
15	SEG10	1030.97	93.11				
16	SEG11	1056.89	1096.89	0	TEST	295.57	1211.795

6



8 I2C

VK2C21 2

I2C

SCL

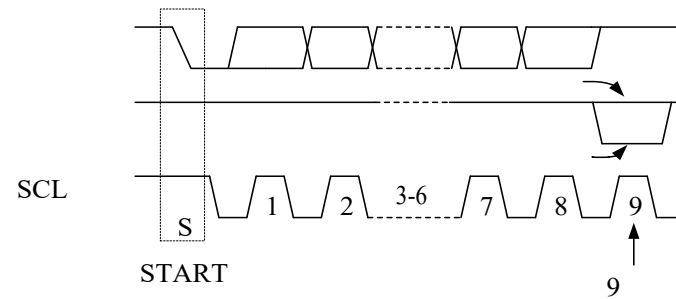
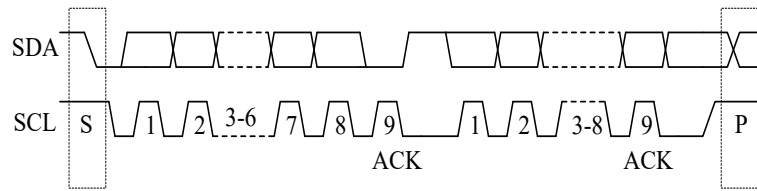
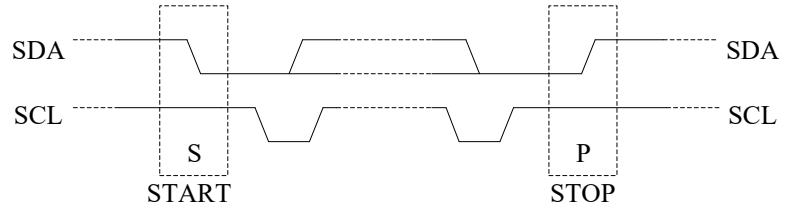
SDA

/

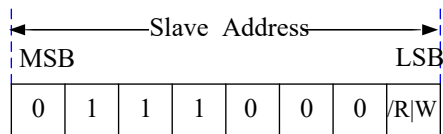
I2C

2

START STOP

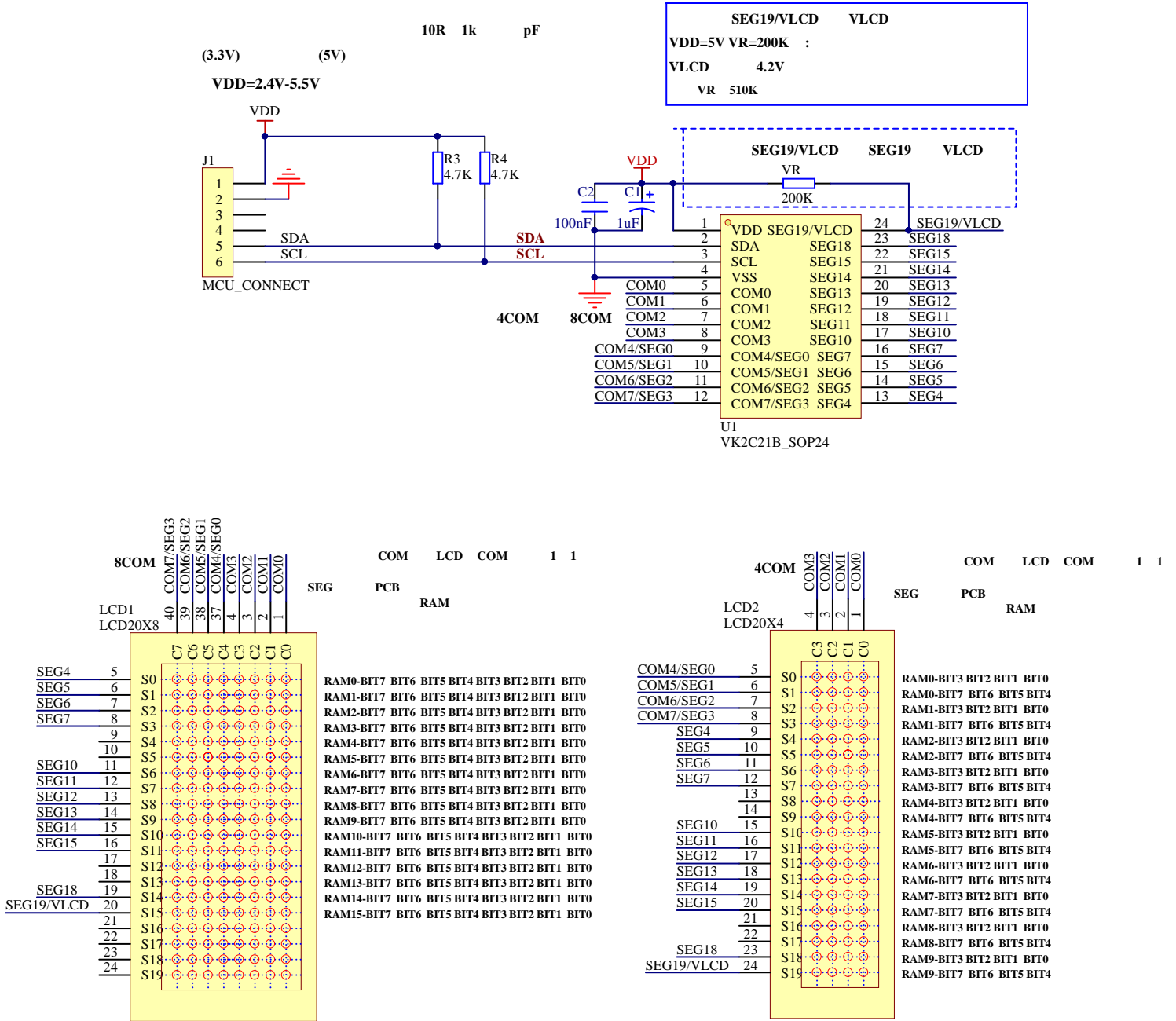


0x70 Bit0-



10.6

IVA				16				LCD				R/W	Def
	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0					
IVA	1 st	1	0	0	0	1	0	1	0			W	
IVA	2 nd	X	X	DE	VE	DA3	DA2	DA1	DA0	SEG/VLCD DE VE DA3~DA0	VLCD	W	30H
Bit 5	Bit 4	SEG19/VLCD											
DE	VE												
0	0	VLCD		off		<ul style="list-style-type: none"> • SEG/VLCD VLCD • VLCD VDD DA3-DA0 "0000" • VLCD VDD DA3-DA0 "0000" 							
0	1	VLCD		on		<ul style="list-style-type: none"> • SEG/VLCD VLCD • VLCD MCU VLCD 							
1	0	SEG19		off		<ul style="list-style-type: none"> • SEG/VLCD SEG • VDD DA3-DA0 							
1	1	SEG19		on		<ul style="list-style-type: none"> • SEG/VLCD SEG 							
						<ul style="list-style-type: none"> • SEG/VLCD SEG • DA0~DA3 "0000" • DA0~DA3 "0000" 							



12

12.1

	VDD	-0.3	6.5	V
	VIN	VSS-0.3	VDD+0.3	V
	TSTG	-50	+125	°C
	TOTG	-40	+85	°C

12.2

						VDD	
	VDD	2.4	—	5.5	V	—	—
	I _{DD1}	—	18	27	μA	3V	VLCD=VDD 1/3 bias 80Hz DA0~DA3="0000" LCD RC
		—	25	40		5V	
	I _{DD2}	—	2	5	μA	3V	VLCD=VDD 1/3 bias 80Hz DA0~DA3="0000" LCD RC
		—	4	10		5V	
	I _{STB}	—	0.1	1	μA	3V	VLCD=VDD LCD RC
		—	0.3	2		5V	
	V _{IL}	0	—	0.3	VDD	3V	SCL, SDA
		5V					
	V _{IH}	0.7	—	1.0	VDD	3V	SCL, SDA
		5V					
	I _{OL}	3.0	—	—	mA	3V	V _{OL} =0.4V SDA
		6.0	—	—		5V	
LCD COM	I _{OL1}	250	400	—	μA	3V	V _{OL} =0.3V
		500	800	—		5V	V _{OL} =0.5V
LCD COM	I _{OH1}	-140	-230	—	μA	3V	V _{OH} =2.7V
		-300	-500	—		5V	V _{OH} =4.5V
LCD SEG	I _{OL2}	2500	400	—	μA	3V	V _{OL} =0.3V
		500	800	—		5V	V _{OL} =0.5V
LCD SEG	I _{OH2}	-140	-230	—	μA	3V	V _{OH} =2.7V
		-300	-500	—		5V	V _{OH} =4.5V

13

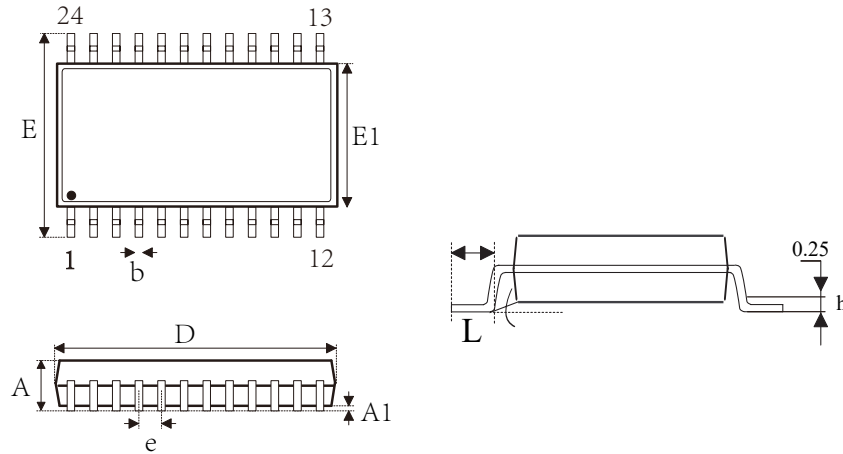
						VDD	
LCD	f_{LCD1}	72	80	88	Hz	4.0V	1/4 duty, 25°C
LCD	f_{LCD2}	144	160	176	Hz	4.0V	1/4 duty, 25°C
LCD	f_{LCD3}	52	80	124	Hz	4.0V	1/4 duty, -40 ~ +85°C
LCD	f_{LCD4}	104	160	248	Hz	4.0V	1/4 duty, -40 ~ +85°C

I2C

						VDD	
	f_{SCL}	—	—	400	kHz	3.0-5.5V	—
	t_{BUF}	1.3	—	—	μ s	3.0-5.5V	
Start	$t_{HD:STA}$	0.6	—	—	μ s	3.0-5.5V	1
SCL	t_{LOW}	1.3	—	—	μ s	3.0-5.5V	—
SCL	t_{HIGH}	0.6	—	—	μ s	3.0-5.5V	—
Start	$t_{SU:STA}$	0.6	—	—	μ s	3.0-5.5V	START
	$t_{HD:DAT}$	0	—	—	ns	3.0-5.5V	—
	$t_{SU:DAT}$	100	—	—	ns	3.0-5.5V	—
SDA SCL	t_R	—	—	0.3	μ s	3.0-5.5V	
SDA SCL	t_F	—	—	0.3	μ s	3.0-5.5V	
Stop	$t_{SU:STO}$	0.6	—		μ s	3.0-5.5V	—
	t_{AA}	—	—	0.9	μ s	3.0-5.5V	—
(SDA SCL)	t_{SP}	—	—	50	ns	3.0-5.5V	

14

14.1 SOP24 (300mil) (15.4mm x 7.5mm PP=1.27mm)



SYMBOL	MILLIMETER		
	MIN	NOM	MAX
A	2.36	2.54	2.64
A1	0.10	0.20	0.30
b	0.39	---	0.47
b1	0.38	0.41	0.44
c	0.25	---	0.29
c1	0.24	0.25	0.26
D	15.30	15.40	15.50
E	10.10	10.30	10.50
E1	7.40	7.50	7.60
e	1.27BSC		
h	0.25	---	0.50
L	0.70	---	1.00
L1	1.40REF		

15

· _____

()

· _____

· _____

<https://www.szvinka.com/>

· _____

· _____

· _____

