十速科技股份有限公司
tenx technology inc.

Advance Information

4-Bit Micro-Controller

TM8530 Demo Board 使用說明

Application Note

Tenx reserves the right to change or discontinue this product without notice.

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PRODUCT NAME

4 Bit Micro-controller

TITLE

TM8530 Demo Board 使用說明

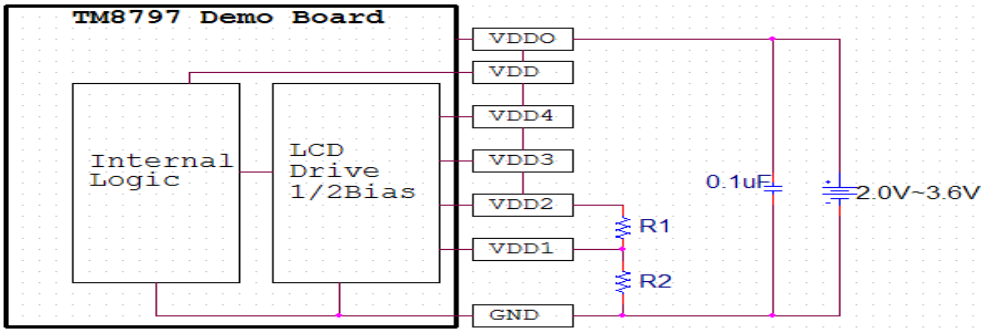
APPLICATION NOTE

簡介

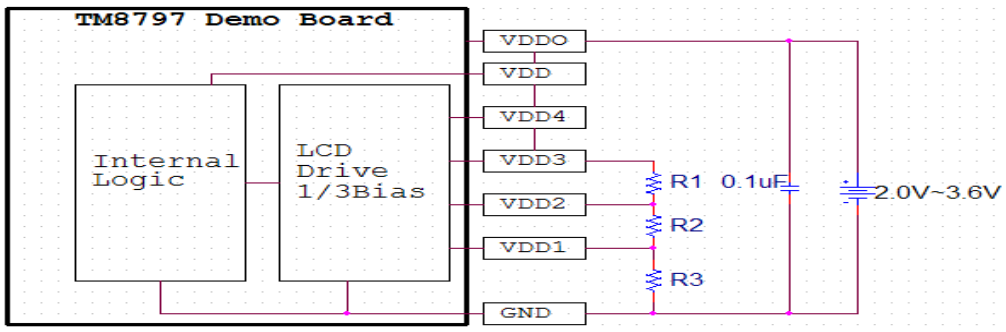
說明如何在 LCD 驅動方式爲電容式升壓的 TM8797 Demo Board 下模擬 LCD 驅動方式爲電阻式分壓的 TM8530，在文件後端有提供 TM8797 Demo Board 的說明與介紹，以方便使用者參照比對。

TM8530 電阻分壓的 LCD 驅動模式電壓操作範圍爲 2.0V~3.6V，可以直接在 TM8797 Demo Board 上執行。

TM8530 提供 1/2Bias 和 1/3Bias 等二種的電阻分壓模式(如圖一，圖二)，在不同的模式我們建議不同的分壓電阻值，因電組分壓的特性在電阻值越小代表 LCD 驅動能力越強，相對的耗電流也較大，所以必須搭配 LCD 的特性選擇適合的分壓電阻值，該電阻值的建議並非絕對值，實際的應用只要接近就可以了。(電阻值建議如表一，表二)



(圖一)



(圖二)

1/2Bias LCD Drive of Resistance Choose				
	Low_(500KΩ)	Normal_(250KΩ)	High_(125KΩ)	Higher_(50KΩ)
R1	250K	125K	62.5K	25K
R2	250K	125K	62.5K	25K

(表一)

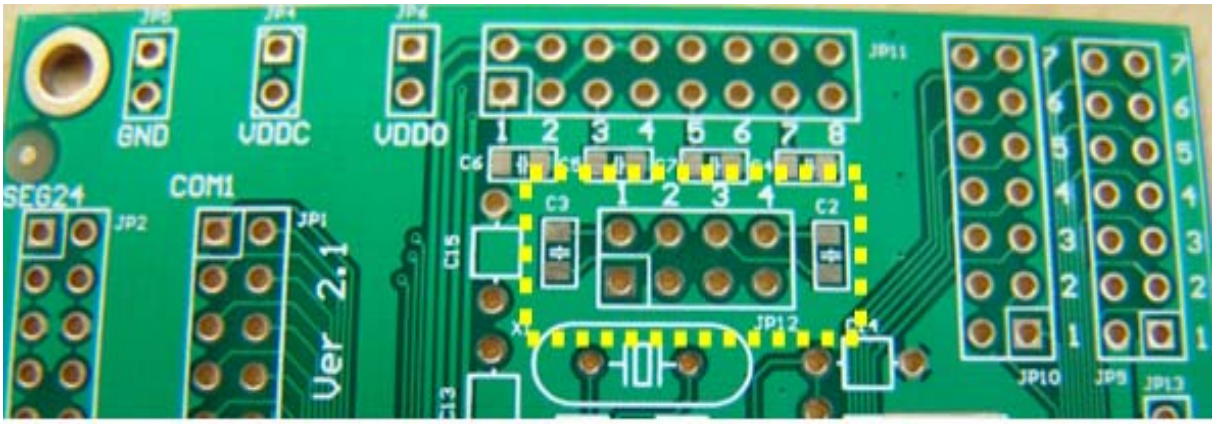
1/3Bias LCD Drive of Resistance Choose				
	Low_(500KΩ)	Normal_(250KΩ)	High_(125KΩ)	Higher_(50KΩ)
R1	166.6K	83.3K	41.6K	16.6K
R2	166.6K	83.3K	41.6K	16.6K
R3	166.6K	83.3K	41.6K	16.6K

(表二)

TM8797 Demo Board 操作說明

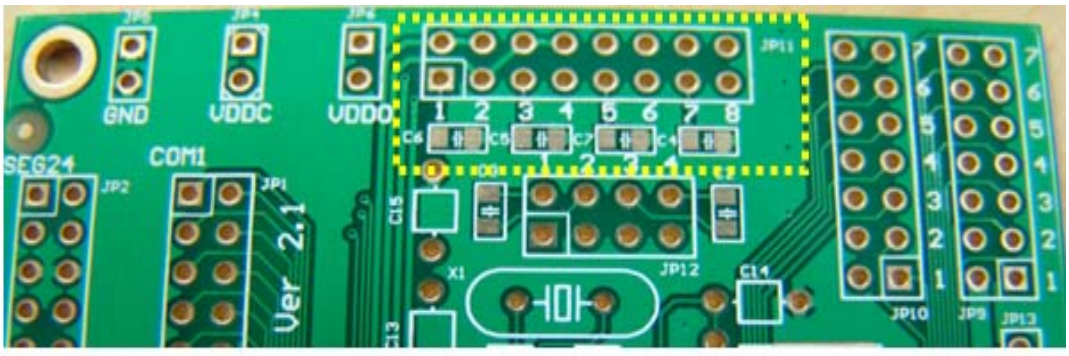
A. 電壓模式的選擇請設定在 EXT-V(2.0V~3.6V)。

B. CUP0，CUP1，CUP2 彼此之間不需加任何電容，因此 TM8797 Demo Board 上的 JP12，C2，C3 等，都不需設定與使用。(圖三)

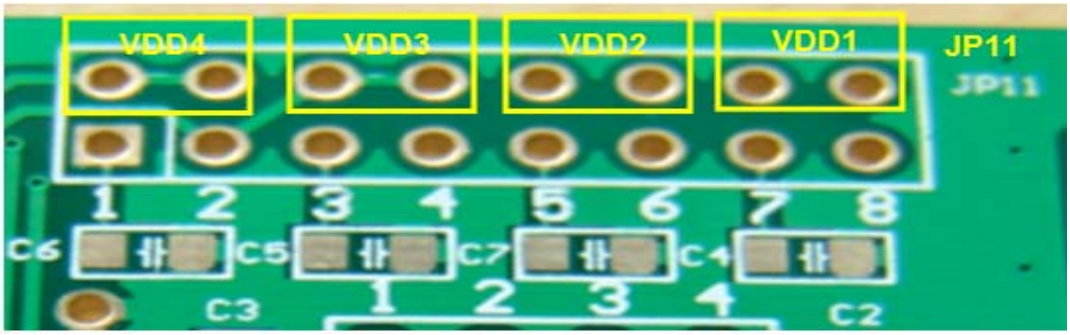


(圖三)

C. 不論是 1/2Bias，1/3Bias 的操作，VDD1~3 之間都不需接任何的電容，但要改接電阻，因此 TM8797 Demo Board 上的 JP11，C4，C5，C6，C7 等，都不需設定與使用(如圖四)，而分壓電阻可以接在 JP11(如圖五)所標示 VDD1~4 的地方，

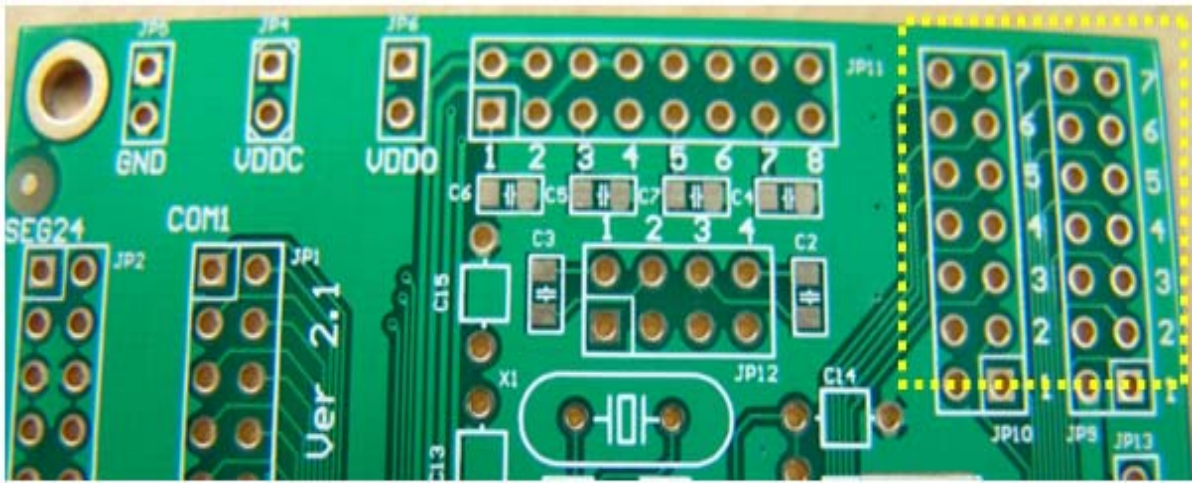


(圖四)



(圖五)

D. JP10，JP9 的相關設定與使用方式並沒有變動，還是依照使用者開發程式中的.OPT 檔來做相同的設定，相關使用設定請參考 P4 的 TM8797 Demo Board User's Manual。



(圖六)

E. TM8797 Demo Board 只是提供使用者方便做功能的驗證，詳細的電氣特性還是必須以實際的 TM8530 所測試的結果爲標準。

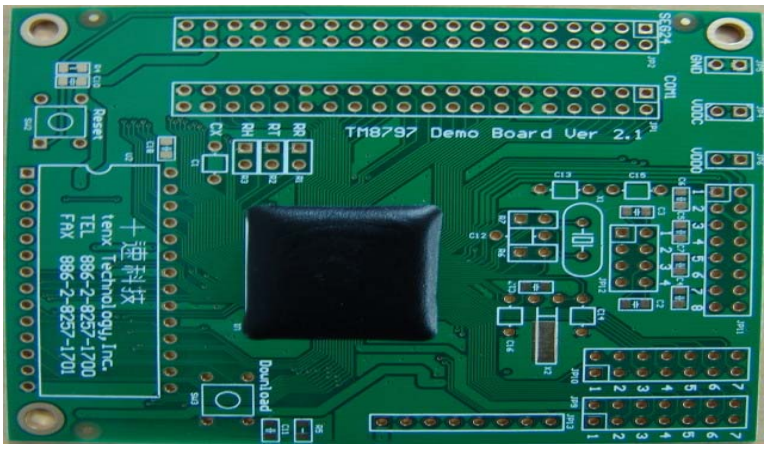
TM8797 Demo Board Ver2.1 User Manual

1. Supported IC series

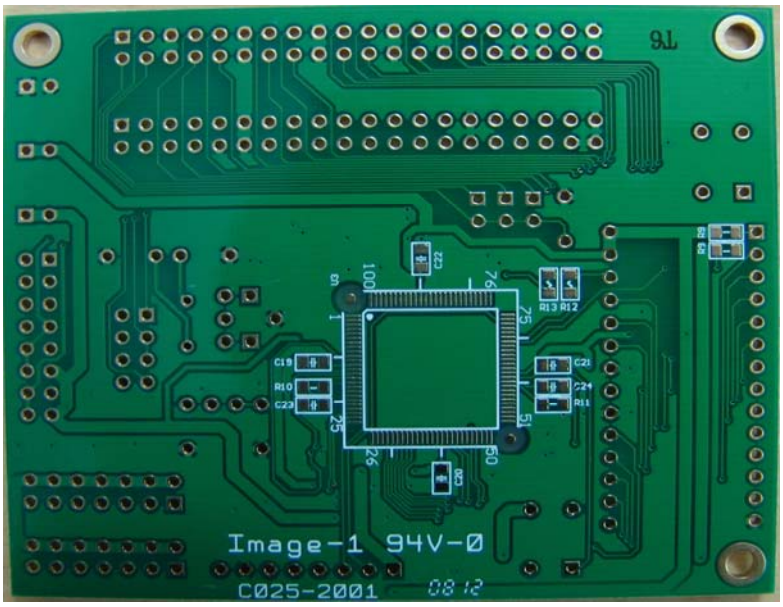
TM8797 DEMO board Ver 2.1 can support following chips: TM8720, TM8721, TM8722, TM8723, TM8724, TM8725, TM8726, TM87P04, TM87P08, TN87R04, TM87R08，TM8530.

2. TM8797 Demo Board Ver 2.1 Figure

2-1.TOP View



2-2. Bottom View



3. Parts Location & Description

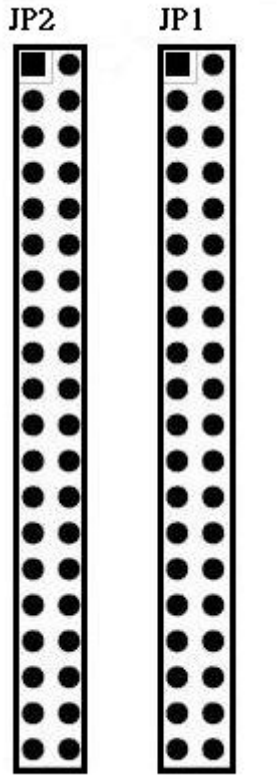
tem	Parts ref.	Description	Parts type
1	U1	TM8797 EV chip	COB
2	U2	Program ROM: For 27C256/28C256, starting address is 4000H For 27C512/28C512, starting address is C000H	28pin DIP
3	SW2	Reset key	Push button
4	R4	RC for Reset key	0805
5	C10	RC for Reset key	0805
6	SW3	Download key	Push button
7	R5	RC for Download key	0805
8	C11	RC for Download key	0805
9	JP1	COM1~9 & SEG1~23 I/O connector	40pin IDC
10	JP2	SEG24~41 & Reset & INT & VDDO connector	40pin IDC
11	JP4	External 5V input for EV chip & ROM interface	2pin Jumper
12	JP5	Power ground	2pin Jumper
13	JP6	Working voltage input for EV chip	2pin Jumper
14	JP9	Mask option sw1~sw7	14pin Jumper
15	JP10	Mask option sw8~sw14	14pin Jumper
16	JP11	Vdd1~3	16pin Jumper
17	X2	Slow clock used crystal (32.768kHz)	Crystal
18	C14	EV chip XOUT CAP	
19	C16	EV chip XIN CAP	
20	R6	Slow clock used external RC	
21	C12	Slow clock used external RC	
22	X1	Fast clock used crystal or resonator (3.58MHz)	Resonator
23	C13	EV chip CFOUT CAP	
24	C15	EV chip CFIN CAP	
25	R7	Fast clock used external RC	
26	C17	BAK CAP connect to GND	104 / 0805
27	R1	RR connect to RFC circuit	
28	R2	RT connect to RFC circuit	
29	R3	RH connect to RFC circuit	
30	C1	CX connect to RFC circuit	

☆☆ **Program ROM:**
For 27C256/28C256, starting address is 4000H
For 27C512/28C512, starting address is C000H

4. I/O Connector JP1 & JP2 Pin Description

JP2	
SEG24	SEG25
SEG26	SEG27
GND	GND
SEG28	SEG29
SEG30	SEG31
GND	GND
SEG32	SEG33
SEG34	SEG35
GND	GND
SEG36	SEG37
SEG38	SEG39
GND	GND
SEG40	SEG41
GND	GND
RESET	GND
INT	GND
GND	GND
GND	GND
VDDO	VDDO
GND	GND

JP1	
COM1	COM2
COM3	COM4
COM5	COM6
COM7	COM8
COM9	GND
GND	GND
SEG1	SEG2
SEG3	SEG4
SEG5	SEG6
SEG7	SEG8
SEG9	SEG10
SEG11	SEG12
SEG13	SEG14
SEG15	SEG16
GND	GND
SEG17	SEG18
SEG19	SEG20
SEG21	SEG22
SEG23	GND
GND	GND

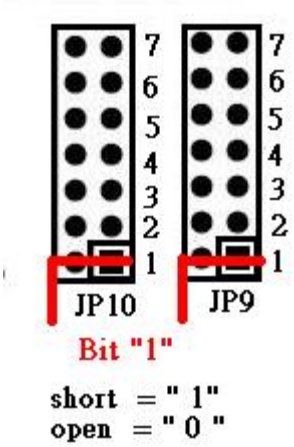


5. The Selection Bits of Mask Option

Some of the mask options are defined on JP10 and JP9. When the hole on the left side and the hole on the right side are short in each bit of JP10 or JP9, the bit will be set to 1.If the holes are open in each bit on JP10 or JP9, the bit will be set to 0.

Bit7
Bit6
Bit5
Bit4
Bit3
Bit2
Bit1
JP10

Bit7
Bit6
Bit5
Bit4
Bit3
Bit2
Bit1
JP9



The following table shows the definition of each bit of JP10 and JP9:

Bit		JP10 bit definition
1	**2**	Option for PH0<->BCLK in FAST ONLY MODE
0	0	PH0=BCLK
0	1	PH0=BCLK/4
1	0	PH0=BCLK/8
1	1	PH0=BCLK/16
3		Option for POWER ON RESET
0		USE
1		NO USE
4	**5**	Option for LCD/LED ACTIVE MODE
0	0	LCD
0	1	LED HIGH ACTIVE
1	0	LED LOW ACTIVE
1	1	O/P
6	**7**	Option for BIAS
0	0	No Bias
0	1	1/2Bias
1	0	1/3Bias
1	1	1/4Bias

Bit		JP9 bit definition
1	**2**	Option for POWER SOURCE
0	0	EXT-V
0	1	3V BATTERY OR HIGNER
1	X	1.5V BATTERY
3	**4**	Option for FAST/SLOW
0	0	FAST ONLY
0	1	SLOW ONLY
1	X	DUAL
5		Option for SLOW Clock Source
0		32.768KHz X'tal
1		RC
6	**7**	Option for Fast Clock Source
0	0	Internal R (250KHz)
0	1	Internal R (500KHz)
1	0	External R
1	1	3.58MHz ceramic resonator