十速科技股份有限公司
tenx technology inc.

Advance Information

4-Bit Micro-Controller

TM8530 Demo Board Introduction

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

Instruction for using TM8530 Demo Board

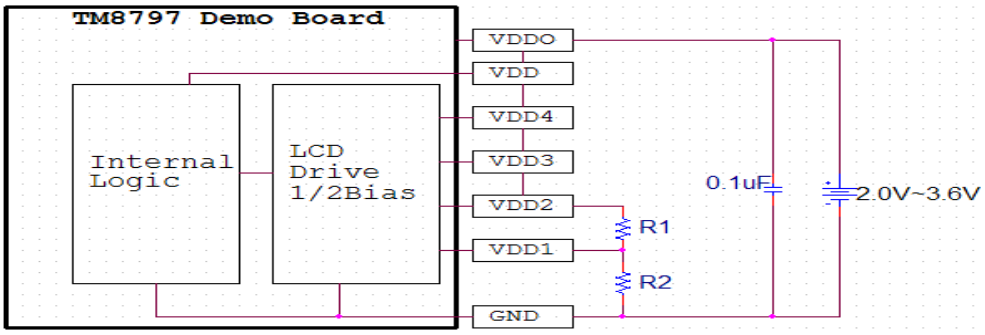
APPLICATION NOTE

Introduction

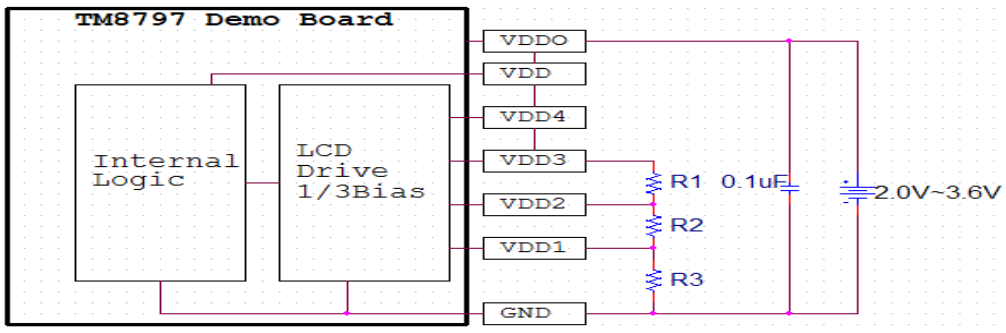
It will be demonstrated here on how to simulate a LCD driving mode of a resistive voltage divider in TM8530 using a LCD driving mode of a capacitive voltage booster on TM8797 Demo Board . The instruction and introduction of TM8797 Demo Board is provided at the end of this document to facilitate the reference and comparison of the user.

The operating range for the LCD driving mode of a resistive voltage divider in TM8530 is 2.0V~3.6V. It can be executed directly on the TM8797 Demo Board.

TM8530 provides two resistive voltage divider modes: 1/2Bias and 1/3Bias（as shown in Figure 1, Figure 2） Different voltage divider resistance values are recommended for different modes. The smaller the resistance the stronger the LCD driving power due to the characteristic of resistive voltage divider and the current consumption will be larger relatively. Therefore, an appropriate voltage divider resistance value must be selected to match the LCD characteristic. The recommended resistance value is an absolute value; it will be fine in actual applications as long as it comes close to the value. (The recommended resistance values are shown in Table 1, Table 2.)



(Figure 1)



(Figure 2)

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

(Table 1)

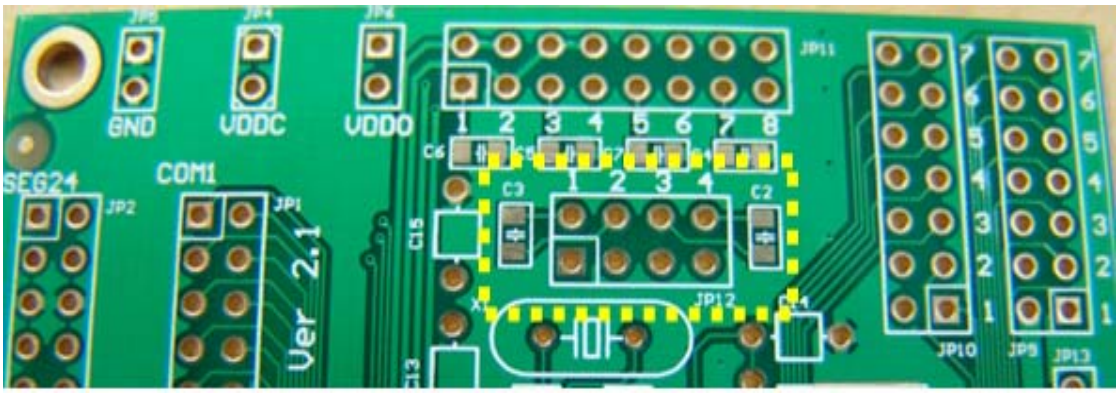
1/3Bias LCD Drive of Resistance Choose				
	Low_(500KΩ)	Normal_(250KΩ)	High_(125KΩ)	Higher_(50KΩ)
R1	166.6K	83.3K	41.6K	16.6K
R2	166.6K	83.3K	41.6K	16.6K
R3	166.6K	83.3K	41.6K	16.6K

(Table 2)

TM8797 Demo Board operating instructions

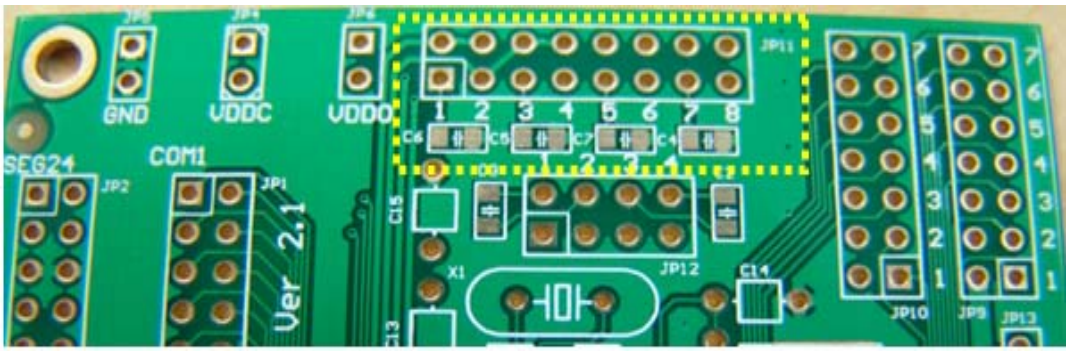
A. Please set the voltage mode to EXT-V(2.0V~3.6V).

B. There is no need to add any capacitance between any pair of CUP0, CUP1, CUP2. Therefore, there is no need to set up and use JP12, C2, C3 etc. on TM8797 Demo Board. (Figure 3)

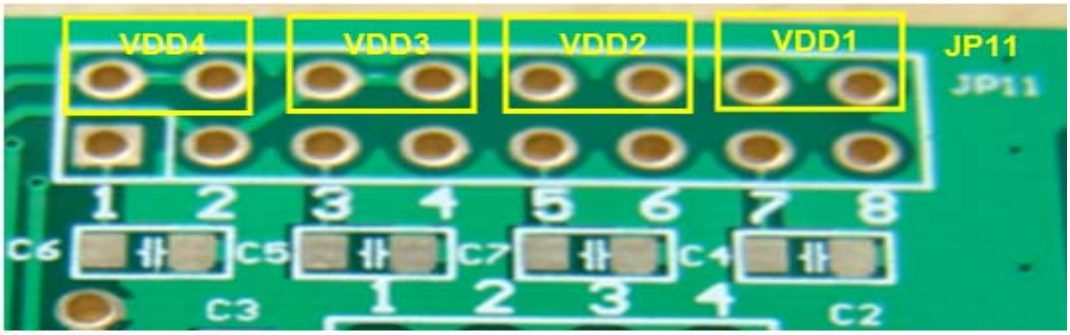


(Figure 3)

C. Whether it is the operation for 1/2Bias or 1/3Bias, there is no need to add any capacitance to any pair of VDD1~3. However, resistances are needed. Therefore, there is no need to set up and use JP11, C4, C5, C6, C7 etc. on TM8797 Demo Board. (as shown in Figure 4); while the divider resistance can be connected to VDD1~4 places marked as JP11 (as shown in Figure 5).

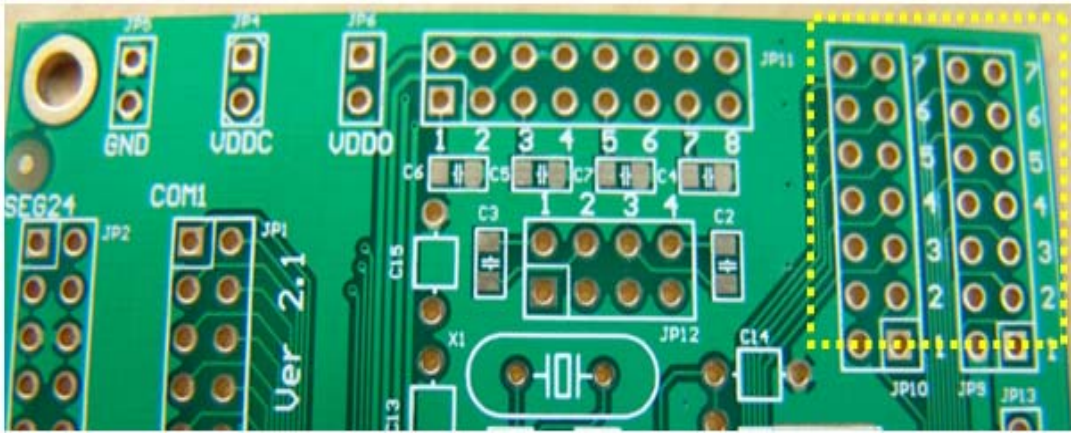


(Figure 4)



(Figure 5)

D. There are no changes in the settings and usage methods related to JP10 and JP9. They are still set up using the OPT file in the program developed by the user. Please refer to P4 of TM8797 Demo Board User's Manual for the related usage settings.



(Figure 6)

E. TM8797 Demo Board is provided to the user for easy verification of functions only. The details of the electric characteristics must still use the actual TM8530 testing results as the official standard.

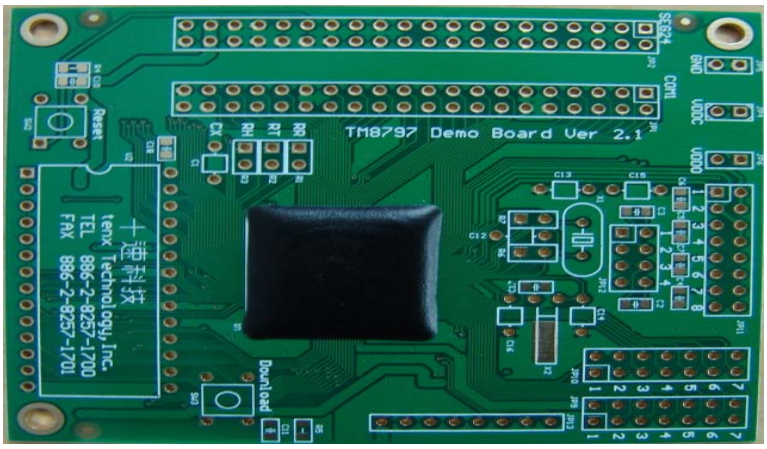
TM8797 Demo Board Ver2.1 User Manual

1. Supported IC series

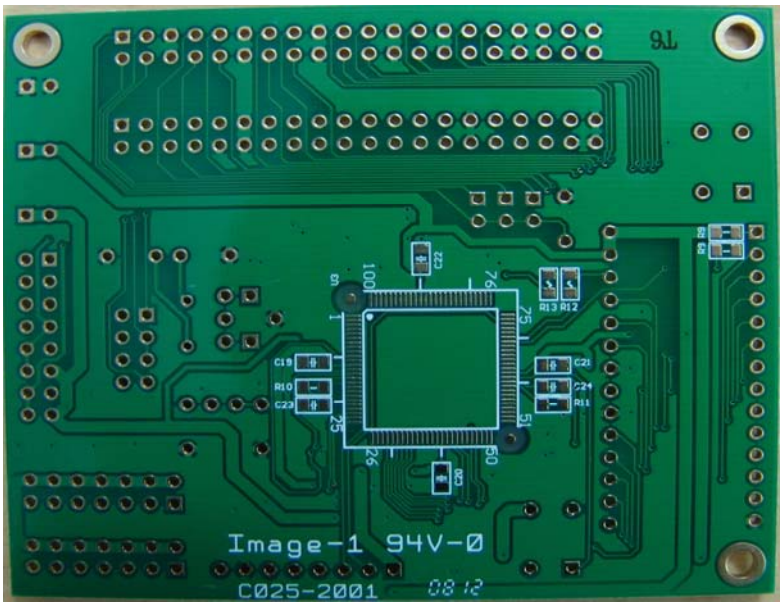
TM8797 DEMO board Ver 2.1 can support following chips: TM8720, TM8721, TM8722, TM8723, TM8724, TM8725, TM8726, TM87P04, TM87P08, TN87R04, TM87R08，TM8530.

2. TM8797 Demo Board Ver 2.1 Figure

2-1.TOP View



2-2. Bottom View



3. Parts Location & Description

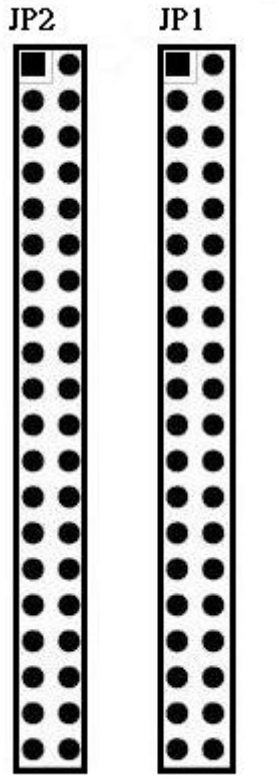
tem	Parts ref.	Description	Parts type
1	U1	TM8797 EV chip	COB
2	U2	Program ROM: For 27C256/28C256, starting address is 4000H For 27C512/28C512, starting address is C000H	28pin DIP
3	SW2	Reset key	Push button
4	R4	RC for Reset key	0805
5	C10	RC for Reset key	0805
6	SW3	Download key	Push button
7	R5	RC 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

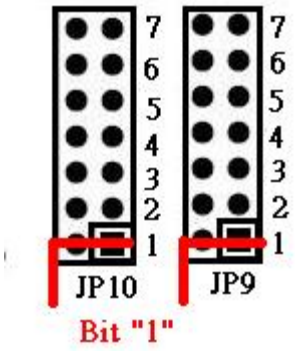


5. The Selection Bits of Mask Option

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