十速科技股份有限公司
tenx technology inc.

Advance Information

TM8999

Demo Board Specification User's Manual

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

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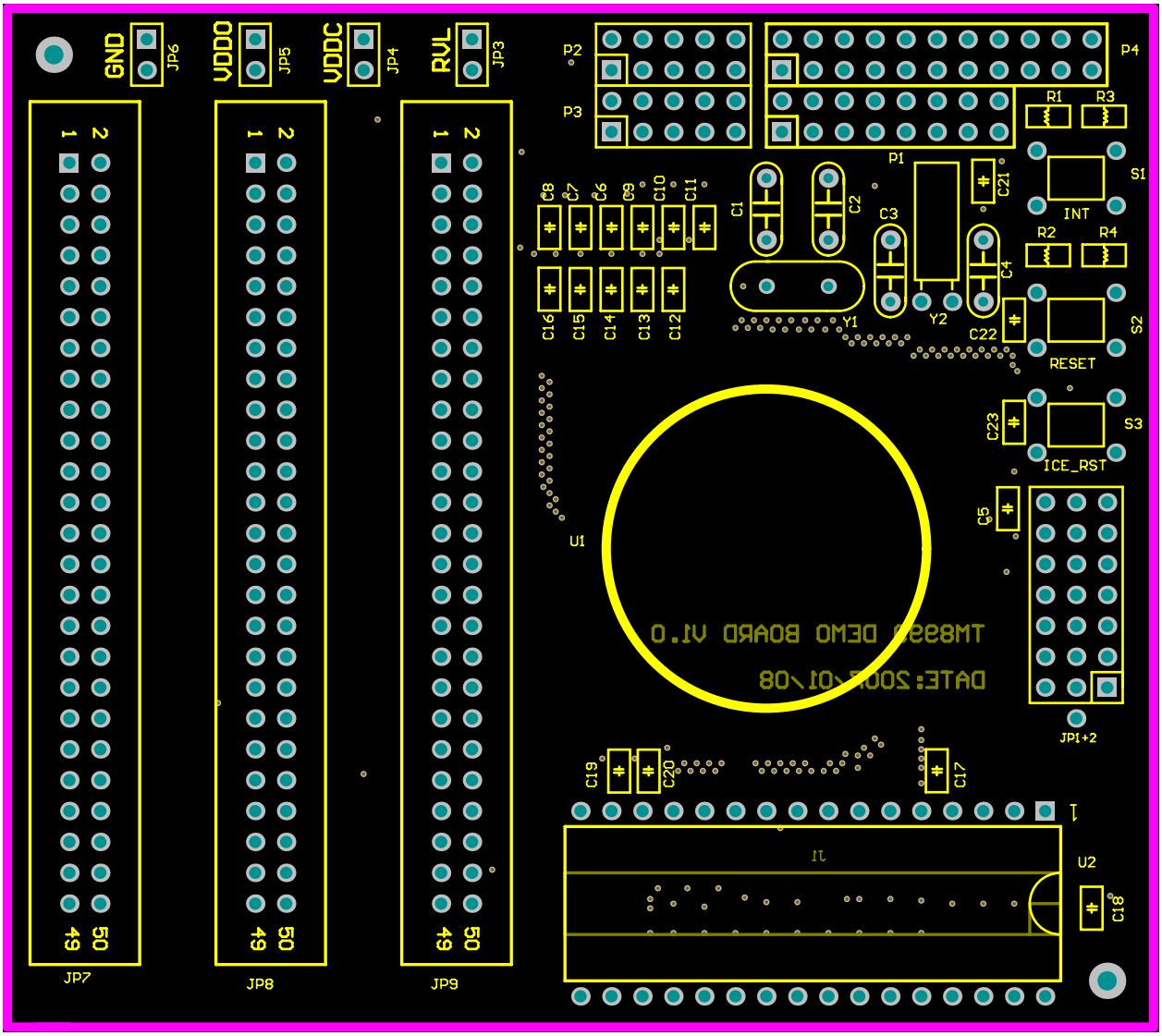
Content

1. **TM8999 Demo Board could support following chips directly: TM89 series, TM8727**

2. **The top view of TM8999 Demo Board:**



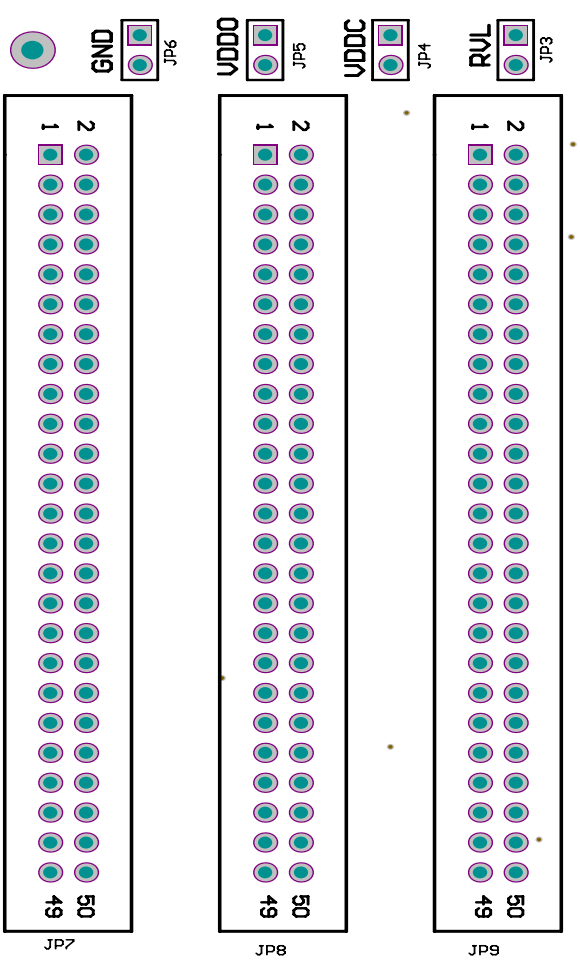
3. Parts Location & Description:

Item	Parts ref.	Description	Parts type
1	U1	TM8999 EV chip	COB
2	U2	Program Rom: 1M bits EPROM, EEPROM or Flash Example: ICE28LF010, 27C010, 28C010, starting address is 0000H	32 pin DIP
3	C1	EV chip CFOUT CAP	
4	C2	EV chip CFIN CAP	
5	C3	EV chip XOUT CAP	
6	C4	EV chip Xin CAP	
7	C5	VDDR CAP 0.1uF	104/0805
8	C6	For CUPN with CUP0 or CUP1	104/0805
9	C7	For CUP0 with CUP1 or CUP2	104/0805
10	C8	For CUP1, CUP2	104/0805
11	C9~C16	For BAK, VDD1, VDDO, VDD2, VDD3, VDD4, VDD5, VDDT	104/0805
12	C17	For VDDC	104/0805
13	C18	For U2 VCC	104/0805
14	C19	For VDDO	104/0805
15	C20	For BAK	104/0805
16	C21	INT CAP connect to GND or VDDO	104/0805
17	C22	RESET CAP connect to GND or VDDO	104/0805
18	C23	ICE_RST CAP connect to GND	104/0805
19	J1	For EV test	
20	JP1+2	For RFC use	
21	JP3	External regulator input for LCD	
22	JP4	*External Voltage input for EV chip & program rom interface	
23	JP5	Working voltage input for EV chip	
24	JP6	Power Ground	
25	JP7	SEG25 ~ SEG64 connector	50 pin IDC
26	JP8	COM1 ~ COM16 and SEG1 ~ SEG24 connector	50 pin IDC
27	JP9	ELC & ELP & BZB & BZ & IOA1 ~ IOE4 & RESET & INT & KI1 ~ KI4 connector	50 pin IDC
28	P1	VDD1 ~ VDD5 & VDDO & RVL for LCD power setting	16 pin Jumper
29	P2	CUP CAP selection	10 pin Jumper
30	P3	VDD5 & VDDO & VDDT & VDDR & BAK for IO PAD power setting	10 pin Jumper
31	P4	Mask Option	22 pin Jumper
32	R1	Selection C21 connect to VDDO	0/0805
33	R2	Selection C22 connect to VDDO	0/0805
34	R3	Selection C21 connect to GND	0/0805
35	R4	Selection C22 connect to GND	0/0805
36	S1	INT key	Push button
37	S2	RESET key	Push button
38	S3	Download key	Push button
39	Y1	Fast clock used crystal or resonator or R	
40	Y2	Slow clock used crystal or R	

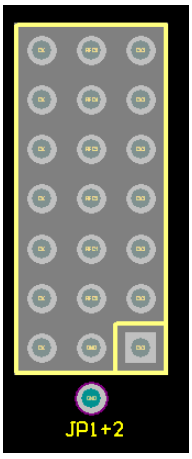
“ * ” : The Voltage is used for external ROM (U2).

4. IO connector JP7, JP8, JP9 and JP1+2 Pin Description:

JP7		JP8		JP9	
SEG25	SEG26	COM1	COM2	ELC	ELP
SEG27	SEG28	COM3	COM4	BZB	BZ
SEG29	SEG30	COM5	COM6	GND	GND
SEG31	SEG32	COM7	COM8	IOA1	IOA2
GND	GND	GND	GND	IOA3	IOA4
SEG33	SEG34	COM9	COM10	GND	GND
SEG35	SEG36	COM11	COM12	IOB1	IOB2
SEG37	SEG38	COM13	COM14	IOB3	IOB4
SEG39	SEG40	COM15	COM16	GND	GND
GND	GND	GND	GND	IOC1	IOC2
SEG41	SEG42	SEG1	SEG2	IOC3	IOC4
SEG43	SEG44	SEG3	SEG4	GND	GND
SEG45	SEG46	SEG5	SEG6	IOD1	IOD2
SEG47	SEG48	SEG7	SEG8	IOD3	IOD4
GND	GND	GND	GND	GND	GND
SEG49	SEG50	SEG9	SEG10	IOE1	IOE2
SEG51	SEG52	SEG11	SEG12	IOE3	IOE4
SEG53	SEG54	SEG13	SEG14	GND	VDDO
SEG55	SEG56	SEG15	SEG16	RESET	GND
GND	GND	GND	GND	GND	RVL
SEG57	SEG58	SEG17	SEG18	INT	GND
SEG59	SEG60	SEG19	SEG20	GND	GND
SEG61	SEG62	SEG21	SEG22	KI1	KI2
SEG63	SEG64	SEG23	SEG24	KI3	KI4
GND	GND	GND	GND	GND	GND

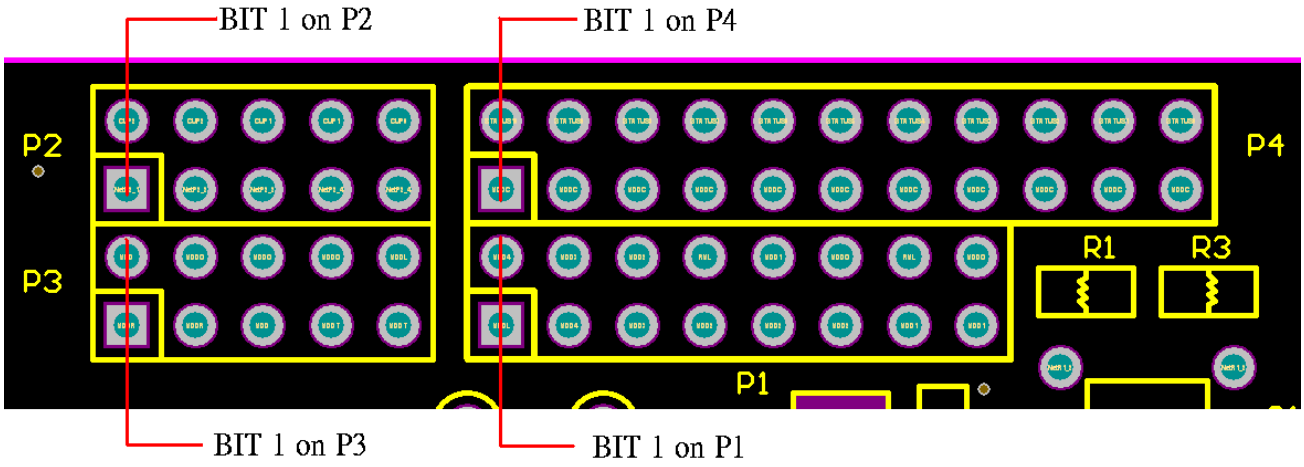


JP1+2		
CX	RFC5	CX2
CX	RFC4	CX2
CX	RFC3	CX2
CX	RFC2	CX2
CX	RFC1	CX2
CX	RFC0	CX2
CX	GND	CX2
	GND	



5. P1 ~ P4 Description:

When the upper side hole and lower side hole are shorted in each bit on P1, P2, P3 or P4, the bit will be set to 1. If the holes are opened in each bit on P1, P2, P3 or P4, the bit will be set to 0.



(1). P1 Description:

	Bit1	Bit2	Bit3	Bit4	Bit5	Bit6	Bit7	Bit8
Ext/Li 1/2	1	1	1	VL2	0	VDDO	VL1	0
Ext/Li 1/3	1	1	0	VL2	0	VDDO	VL1	0
Ext/Li 1/4	1	0	0	VL2	0	VDDO	VL1	0
Ext/Li 1/5	0	0	0	VL2	0	VDDO	VL1	0
Ext/Li_DC	1	1	1	0	1	1	0	0
Ag 1/2	1	1	1	0	0	0	VL1	VDDO
Ag 1/3	1	1	0	0	0	0	VL1	VDDO
Ag 1/4	1	0	0	0	0	0	VL1	VDDO
Ag 1/5	0	0	0	0	0	0	VL1	VDDO
Ag DC	1	1	1	0	1	0	0	1

Mask Option file --> Power --> EXTERNAL REGULATOR for LCD:

VL1 => 0: REGULATOR for LCD: NO USE
1: REGULATOR for LCD: VL1

VL2 => 0: REGULATOR for LCD: NO USE
1: REGULATOR for LCD: VL2

VDDO => 0: REGULATOR for LCD: VL1 or VL2
1: REGULATOR for LCD: NO USE

RVL is an exteranl regulated power source for LCD driver.

(2). P2 Description:

Mask Option file --> LCD --> Bias

	Bit1	Bit2	Bit3	Bit4	Bit5
CUP1-2	1	*	0	0	*
CUP0-2	*	1	0	0	*
CUP0-1	*	*	0	0	*
CUP1-N	*	*	0	0	*
CUP0-N	*	*	0	0	1

(3). P3 Description:

	Bit1	Bit2	Bit3	Bit4	Bit5
VDDR = VDDO	1	0	*	*	*
VDDR = BAK	0	1	*	*	*
BAK = VDDO	*	*	1	*	*
BAK = 0.1 uF	*	*	0	*	*
VDDT = VDDO	*	*	*	1	0
VDDT = VDD5	*	*	*	0	1

VDDR: Positive Voltage for RFC
Normal: "VDDR = VDDO"

BAK: Positive Back-up Voltage
Mask Option file --> Power --> Power Source:
BAK = VBAT for BCF = 0 => "BAK = VDDO"
BAK = VL1 for BCF = 0 => "BAK = 0.1 uF" (**For TM8727 Use**)

VDDT: "COM, SEG, IO, RFC, EL, Alarm" Pad most hight voltage for pads short to select
When VDDO > VDD5 is "VDDT = VDDO"
When VDDO < VDD5 is "VDDT = VDD5"

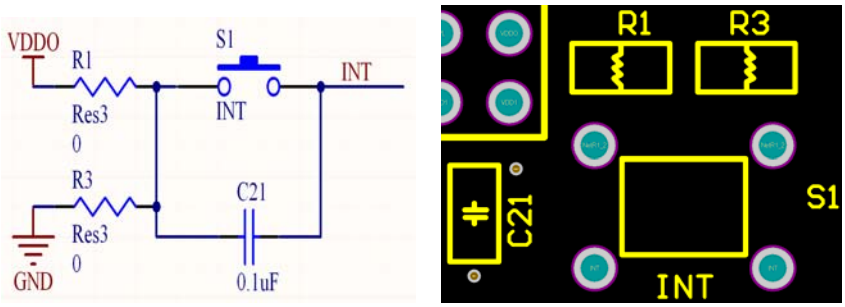
VDD5: LCD most hight voltage
Example: LCD 1/4 Bias, VL1 = 1.5V
VDD5 = VL1 * 4
= 1.5 * 4 = 6 V

(4). P4 Description:

Bit				P4 Bit definition
1				Reset P-L or P-H is defined by Mask Option:
0				Reset P-L (**TM8727 use**)
1				Reset P-H (**TM89 serials normal use**)
2	**3**			Option for Fast Clock source:
0	0			INTR-250KHz
0	1			INTR-500KHz
1	0			EXT-R
1	1			Resonator
4				Option for Slow Clock source:
0				XT
1				RC
5				Option for Fast/Slow:
0				Fast-only
1				Slow-only/Dual
6				Option for LCD Charge pump source: Mask Option File --> Power --> EXTERNAL REGULATOR for LCD: VL1 : 1 VL2 : 0 (**TM8727 use**) NO USE => Ag model : 1 Ext/Li model: 0
7				Option for POWER source:
0				EXTV/Li-B
1				Ag-B
8	**9**	**10**	**11**	Option for Bias:
0	0	0	0	No Bias (**TM8727 can be choice item.**)
0	0	0	1	1/3 Bias (ONE CAPACTOR FOR CUP 1-2) (**TM8727 can be choice item.**)
0	0	1	0	1/2 Bias (ONE CAPACTOR FOR CUP 1-2) (**TM8727 can be choice item.**)
0	1	1	0	1/3 Bias (TWO CAPACTOR FOR CUP 1-2, CUP N-0)
1	0	0	1	1/4 Bias (TWO CAPACTOR FOR CUP 1-2, CUP 2-0) (**TM8727 can be choice item.**)
1	0	1	0	1/4 Bias (TWO CAPACTOR FOR CUP 1-2, CUP N-0)
1	1	1	0	1/5 Bias (TWO CAPACTOR FOR CUP 1-2, CUP N-0)

6. INT key Description:

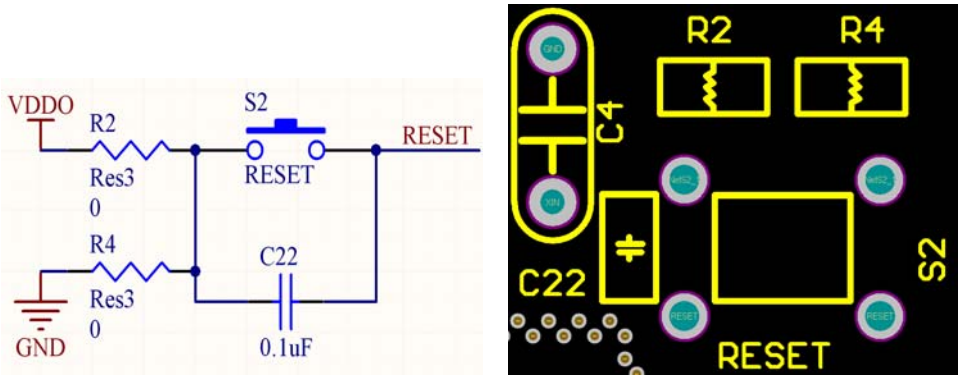
This key function can be ues or not use.



INT pin internal Pull_High: R1 open, R3 short
INT pin internal Pull_low : R1 short, R3 open

7. RESET key Description:

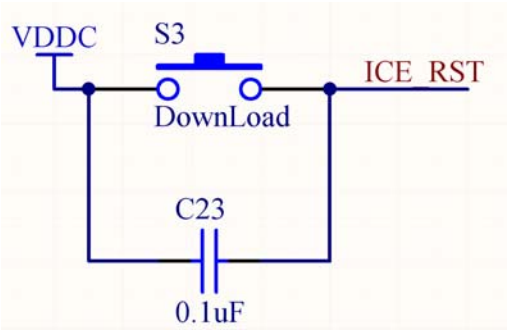
This key function can be ues or not use.

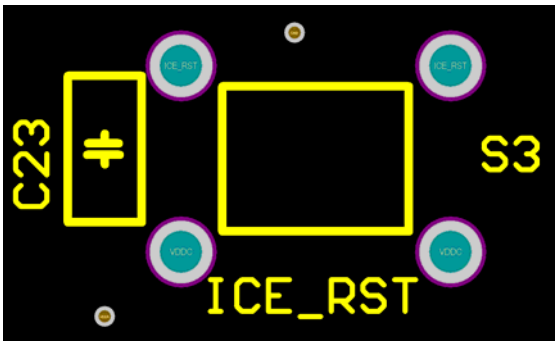


RESET pin internal Pull_High: R2 open, R4 short **(TM89 serials normal use)**
RESET pin internal Pull_low : R2 short, R4 open **(TM8727 use)**

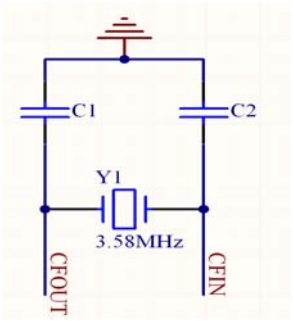
8. ICE_RST Description:

Push this key at first time power on.

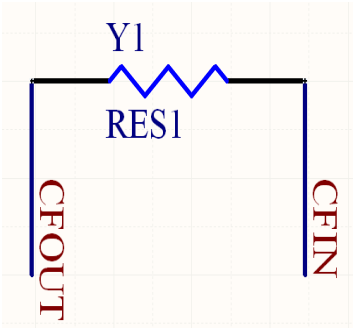




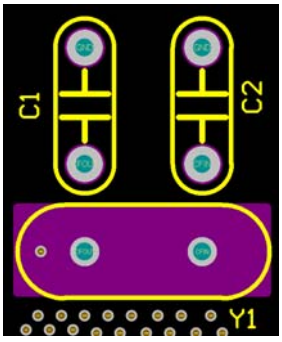
9. FAST CLOCK SOURCE Description:



Fast Resonator Model

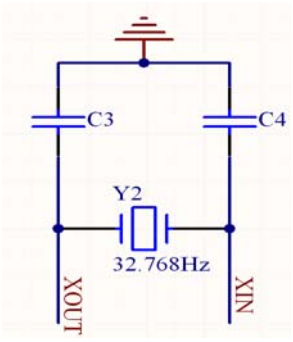


Fast EXT-R Model

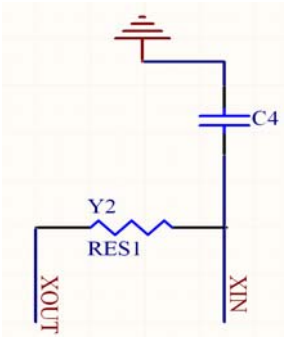


Fast Clock Source on Demo Board

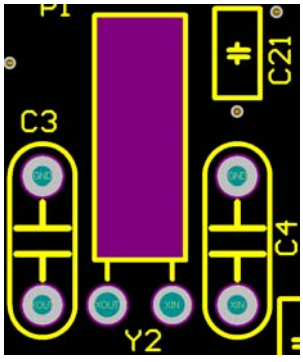
10. SLOW CLOCK SOURCE Description:



Slow XT Model

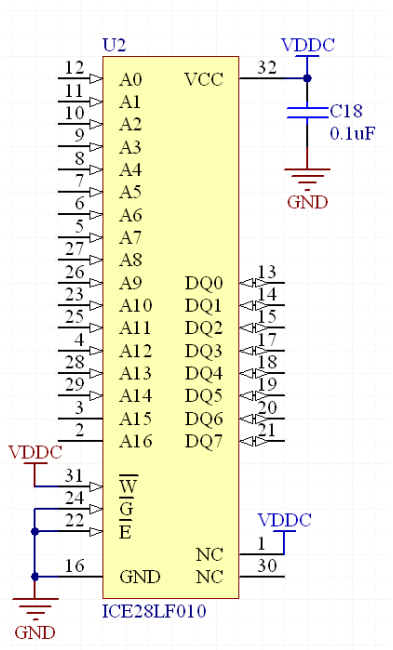


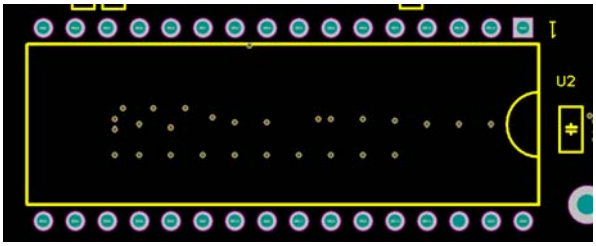
Slow RC Model



Slow Clock Source on Demo Board

11. U2 pin Description:





MEMORY USE: ICE28LF010, AT27C010, AT28C010 ……. 1-Megabit (128K x 8) memory
Programming File: TM89 serials => *.nce; TM8727 => *.nce
File Format: Binary
Programming Buff start: 0000H