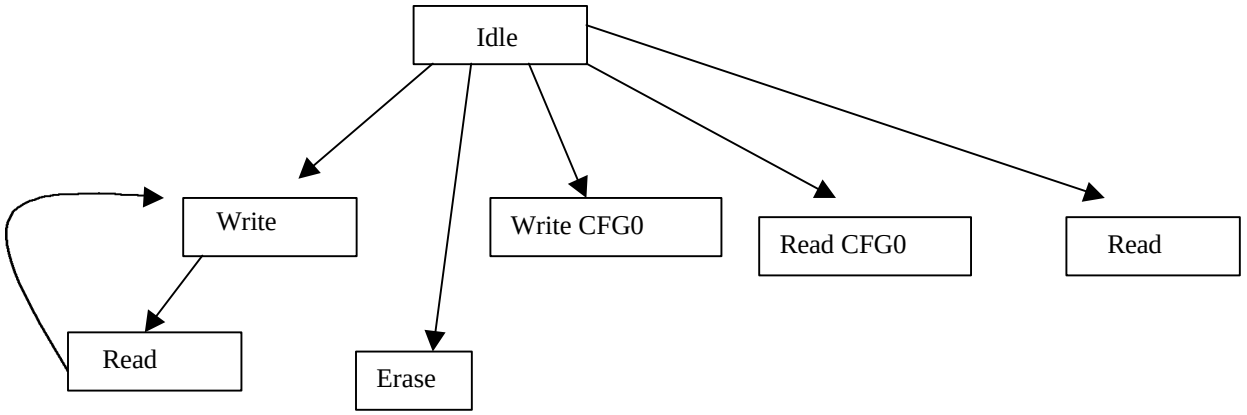
PRELIMINARY

SX PARALLEL MODE PROGRAMMING SPECIFICATION

The SX chip can be programmed in parallel mode also. The pins that are used for parallel mode programming are Vdd, MCLR_/VPP, portB, portA, RTCC and OSC1 pins. To program one location in EEPROM, following commands need to be executed:

1. ERASE (Issue the ERASE command and allow sufficient time to erase the memory.)
2. PROGRAM (Issue PROG command and allow sufficient time to program. The PROGRAM command does WRITE and READ operation.)

Fig.1 shows the necessary timing diagram of the signals needs to be applied at the pins to program the chip in parallel mode.
The state machine for the parallel programming block is as follows.



Commands:	Hex Code:
Erase	hx1x
Read device info	h001
Read FUSEX	h002
Write FUSEX (SX28)	h003
Write FUSEX (SX18)	hx2x
Read	h004
Program	hFFE

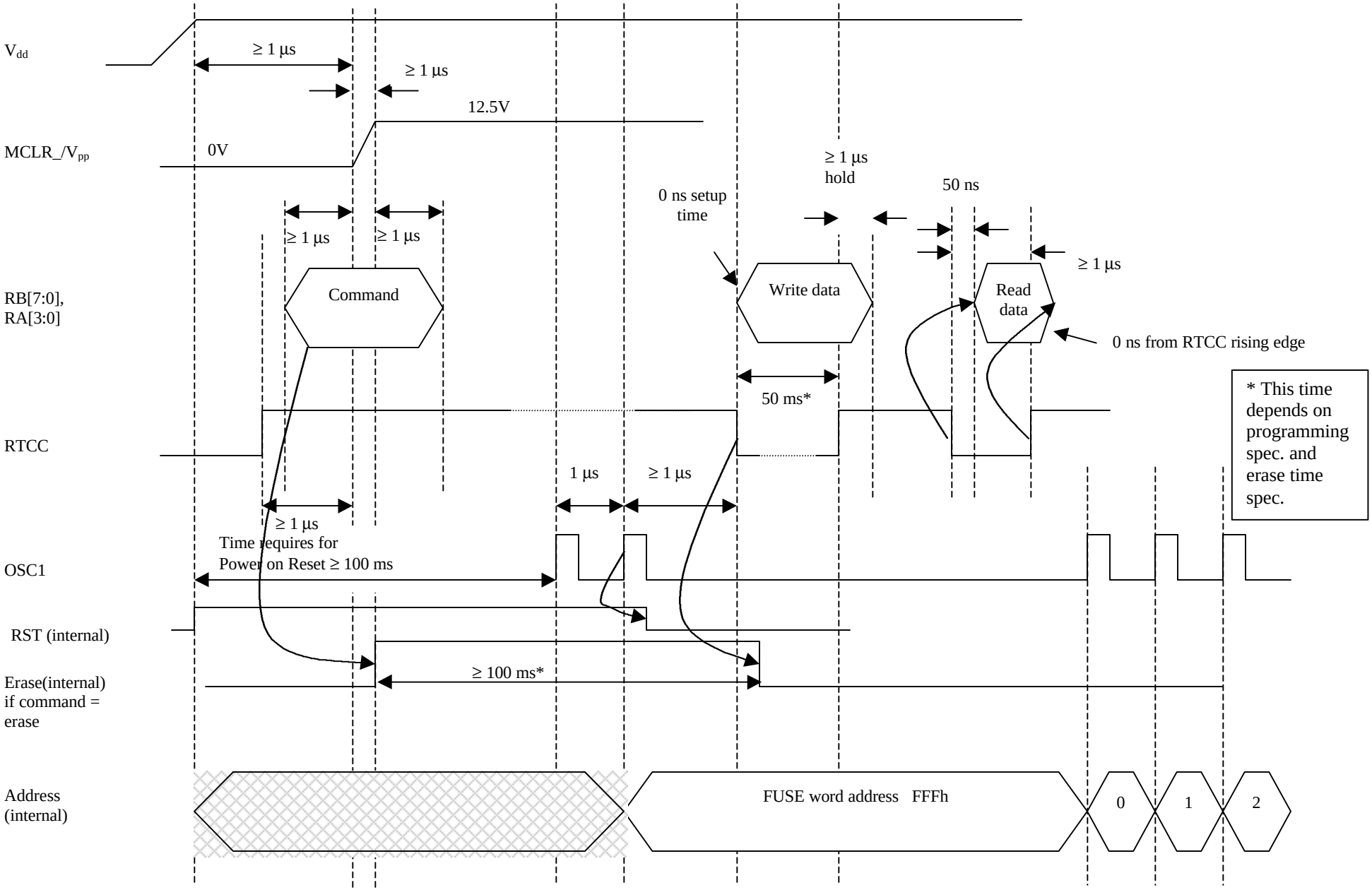
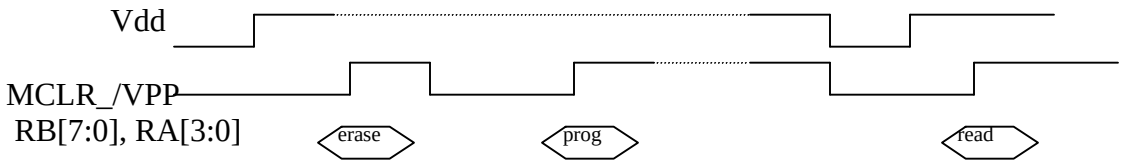

V_{dd}
≥ 1 µs
≥ 1 µs
12.5V
MCLR_/V_{pp}
0V
≥ 1 µs
hold
50 ns
0 ns setup
time
≥ 1 µs
≥ 1 µs
≥ 1 µs
RB[7:0],
RA[3:0]
Command
Write data
Read
data
0 ns from RTCC rising edge
50 ms*
* This time depends on programming spec. and erase time spec.
RTCC
1 µs
≥ 1 µs
≥ 1 µs
Time requires for
Power on Reset ≥ 100 ms
OSC1
RST (internal)
≥ 100 ms*
Erase(internal)
if command =
erase
Address
(internal)
FUSE word address FFFh
0
1
2

Fig. 1

Programming Specification Additional Information:

- Recommend a protection resistor of 100Ω on MCLR_/V_{pp} pin.
  - V_{pp} = 12.5V
- Command is latched at the rising edge of MCLR_/Vpp signal. The rise time of MCLR_/Vpp signal should be greater than 1μs.
- There should be atleast 1μs hold time for the data to be written after the rising edge of RTCC.
- There is a 50ns-delay time for the data to be read after the falling edge of RTCC.
- **For 18 and 20 pin package, after ERASE command, first need to PROGRAM the bit 10 of FUSEX word to 0.**
- Address is incremented on the leading edge transition of OSC1
  - It can be advanced independent of RTCC
  - To skip "X" number of locations, just toggle OSC1 "X" times. Then drive RTCC low to WRITE (if the command is to write) or READ (if the command is to read) the location.
- Operation is specified by command
  To do a series of commands, cycle Vdd, or Vpp, or both.



- SX18 and SX28 use different commands to write to FUSEX word register.