General Description

The MSU3022 is a monolithic talking microcomputer that can memorize voice up to 60 seconds using MOSEL qualified coding method (MPCM-5). It's an integration of traditional 4-bit microcotroller and voice chip with minimal external components. LCD driver and miscellaneous interface by 20-bit i/o are provided for versatile applications. With more than bit 10K bits ROM/RAM inside, this chip meets every intelligent novelty. Customer requested function and voice data will be built in by changing masks during fabrication.

Hardware Features

- Low current consumption
- Maximal function with minimal cost
- Current output could drive 8 ohm speaker with a transistor, Vout could drive buzzer directly.
- The voice content is stored up to 60 seconds at 6 KHz (58000h) and can be separated to 256 sections.
- Duration of each section can be different and is multiples of 100h.
- Duration of section with appended memory-less mute is up to 40 seconds (100000h).
- Each trigger can access a sentence, up to 256 sentences could be access. 1024 entry count are provided.

- Working at 2.4V through 6.0V
- Precise voice sample rate 8 KHz is provided.
- Auto ramp up and ramp down.
- Halt mode is provided.
  Very low current consumption at Halt mode.
- LCD driver is provided
  25 segment x 3 common
- Built-In clock generator
- Built-In doubler, halver, tripler
- Internal program ROM : 1024 x 15 bits;
- Internal program RAM : 64 x 4 bits
- Internal stack RAM: 4x10 bits.
- Two 4-bit input ports
- Two 4-bit input/output ports
- One 4-bit output port

Software Features

- 76 instructions, in 39 mnemonics
- 4-level subroutine nesting (also used for interrupt)
- Two external factors (INT, S&M) for interrupt
- Two internal factors (timer, divider) for interrupt

Mask Options

- either open or hold transistor on S port & M port
- either pull down or pull up on Interrupt switch
- either leading edge or trailing edge on Interrupt edge
- either power back-up activated or not when power on
- either with reset or not when power on
- either 8 ms or 2 ms chattering removal time on S port & M port
- either slow (by 15.625 ms) or fast (by 224.14 us) set time timer
- either fast system clock (Fosc) or slow system clock (Fosc / 2)
- either Rosc or 32768 Hz crystal to play voice

Development Supports

- Development tools are provided
- Software / Hardware programming guide is provided
- Evaluation chip U3040 is to be available soon

Sample Applications

- handy game with LCD
- versatile timepiece with LCD
- talking timer with LCD
- intelligent calculator with LCD
- smart stationery with LCD
- talking home electronics with LCD
- talking education kit with LCD

Development Supports

- Pid321 Voice Smart Programmer's Guide
- Pid345 Voice Smart ICE M9068 User's Manual

MSM9068   Developing Card
MSM9088   Program code emulation board
MSM9018   120" Sound emulation board