

TYPE: APPLICATION NOTE

TITLE: How to program 87C11/1202/1408 OTP for many times?

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SCOPE: Try to use up the unused space of the 87C1102/1202/1408 OTP

Reference material: Hyundai GMS87C1102/1202/1408 user manual

Revision: 0

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Information from

1. Hyundai GMS87C1102 user manual

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1. In this application note, the final result was not really test out, but logically works
2. We are not magician and cannot squeeze any used space for an OTP to re-program the software again, but we can make use the left space and store the program if the first time programming failed.
3. Of course, the program is shorter enough so that we can program again into the 2K or 8K ROM size.
4. Since the OTP will allow second time programming for any space will data 00, so we can make use this advantage to program the otp file again into the OTP.
5. However, how do we make it works again?
6. Actually there are many method to do, suggest below is first thinking.
7. A very simple implementation is to left a i/o to test your software to jump somewhere for the second program starting program
8. Since reset vector is locked in first programming , so we cannot change it in second programming, so the possible way is to select which software to run by external switch.

9. Software list below for reference only. Base on 87C1102

```

                ORG    F800H
RESET:  LDM    RAI0, #00H    ;assign ra to be input port
        LDM    RAFUNC, #00H ;assign ra to be normal port
        LDA    RA           ;load ra into A

        BBS    A.0, newlocation ;RA.0 =1, jump to new location
        JMP    normal       ;RA.0=0, jump to old location

                ORG    F900H
Newlocation: LDA    #01H
        .....

                ORG    FC00H
Normal:    LDA    #00H
        .....

                END
```

10. So from the above selection program, you can reverse my proposal for new or old program.
11. In my proposal , the first programming will program a few instructions from F800 and then the main program will be started from FC00h.
12. In second programming, we just burn from F900h.
13. To make the it works, we must select fill 00 for unused space in the programmer.
14. To partition the ROM size to how many pieces will allow you to program it to how many times.