

Mask Set Errata 1

68HC705MC4 8-Bit Microcontroller Unit

INTRODUCTION

This errata provides information concerning the PWM duty cycle transition anomaly on these 68HC705MC4 MCU mask set devices:

- 0F21S
- 1F21S

MCU DEVICE MASK SET IDENTIFICATION

The mask set is identified by a four-character code consisting of a letter, two numerical digits, and a letter (for example, F21S). Slight variations to the mask set identification code may result in an optional numerical digit preceding the standard four-character code (for example, 1F21S).

MCU DEVICE DATE CODES

Device markings indicate the week of manufacture and the mask set used. The data is coded as four numerical digits where the first two digits indicate the year and the last two digits indicate the work week. The date code "9115" would indicate the 15th week of the year 1991.

MCU DEVICE PART NUMBER PREFIXES

Some MCU samples and devices are marked with an "SC" or "XC" prefix. An "SC" prefix denotes special/custom device. An "XC" prefix denotes device is tested but is not fully characterized or qualified over the full range of normal manufacturing process variations. After full characterization and qualification, devices will be marked with the "MC" prefix.

Whenever contacting a Motorola representative for assistance, please have the MCU device mask set and date code information available.

Specifications and information herein are subject to change without notice.



PWM DUTY CYCLE TRANSITION ANOMALY

The pulse width modulation (PWM) module has a timing problem that resides in the duty cycle generation circuitry. Specifically, between transitions of certain changing duty cycles, one inactive PWM period can occur before the new duty cycle stabilizes. For example, a duty cycle shift from \$FF to a lower value of \$F0 can generate the inactive transition period. However, most duty cycles are unaffected.


When $\$FF \geq P \geq \$F8$, changing the PWM data value to or from P to any other value may result in one inactive PWM period between the two values. However, changing the PWM data value to or from any value within the range $\$F7 \geq P \geq \00 will cause the PWM module to operate correctly.

The anomaly appears to be independent of these qualities:

- PWM A or PWM B
- PWM channels 1, 2, or 3
- Voltage (range 4.5 V to 5.5 V)
- Oscillator frequency
- Interlock path
- PWM polarity
- PWM rate

Since more than 65,000 transitions would need to be tested per part, these findings are based only on module response to known problem transitions.

As a temporary solution, set the full scale duty cycle to \$F7 or a 100% duty cycle. Calculated duty cycle values in the range $\$F8 \rightarrow \FF can be reduced to \$F7. If full scale resolution is needed, use control register mask bits to set up a 100% duty cycle.

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