

MC68332 TPU MASK SETS

Motorola currently offers two TPU ROM mask sets for the MC68332 MCU. The mask set used in a device is designated by a letter 'A' or 'G' in the device part number preceding the temperature designator. Devices with the 'A' designator contain a modified version of the original TPU mask set, which is also referred to as the "Standard" TPU mask set. Devices with the 'G' designator contain a newer TPU mask set, which is also referred to as the "Motion Control" TPU mask set.

MC68332 devices made prior to this change have no TPU mask designator, and 'A' version mask functions differ from the original mask functions in the following ways:

1. The Quadrature Decode (QDEC) function has been added to the mask. QDEC is an input function that is used to decode quadrature signals in motor control applications. Addition of the QDEC function to the mask has no effect on the operation of other functions.
2. The Period/Pulse-Width Accumulator (PPWA) function has been improved. In the original version, the 24-bit High Time or Period Measurement mode of PPWA could operate incorrectly when the measurement value exceeded 16 bits. This deficiency has been corrected, but the new version of the function is less immune to input noise than the old version — take care to ensure that noise-free signals are applied to pins assigned to the PPWA function.

Although the "Standard" TPU mask set functions were designed for automotive engine control, most functions have a wide range of applicability, and many customers have used the functions for other purposes.

The "Motion Control" TPU mask set functions were designed for AC and DC motor control applications and for general-purpose applications. Many general-purpose applications that use "Standard" TPU functions can be implemented more efficiently with "Motion Control" functions. While changing from one function set to another can require that control code be re-written, increased capabilities may make the switch worthwhile.

Tables 1 and 2 show mask set functions and describe the primary use of each function.




SUMMARY OF TPU FUNCTIONS

Table 1 Standard Mask Set

Function	Description
PPWA — Period and Pulse Width Accumulator	Measures input pulse widths and periods
OC — Output Compare	Generates a change in output level after a predetermined time
SM — Stepper Motor	Generates output signals to control stepper motor speed and position
PSP — Position Synchronized Pulse	Generates output pulses for auto engine ignition or fuel control
PMA — Period Measurement with Additional Transition Detection	Measures auto engine speed and provides reference values for PSP function
PMM — Period Measurement with Missing Transition Detection	Measures auto engine speed and provides reference values for PSP function
ITC — Input Capture/Transition Counter	Measures time when input changes level, or counts number of changes in level
PWM — Pulse Width Modulator	Generates continuous output pulses with pre-defined period and duty cycle
DIO — Discrete Input/Output	Generates a change in output level or records the level of an input
SPWM — Synchronized Pulse Width Modulator	Generates multiple time-related PWM waveforms
QDEC — Quadrature Decoder	Measures position and direction of motion, for rotating motor shaft or linear movement

Table 2 Motion Control Mask Set

Function	Description
QOM — Queued Output Match	Generates a predetermined sequence of changes in output level
FQD — Fast Quadrature Decode	Same as QDEC, but has optional fast mode
FQM — Frequency Measurement	Measures the number of input signal periods that occur during a predetermined interval
TSM — Table Stepper Motor	Same as SM, but offers more control options
MCPWM — Multichannel Pulse Width Modulator	Generates a wide range of time-synchronized PWM waveforms, suitable for AC & DC motor control
PTA — Programmable Time Accumulator	Similar to PPWA, but has better noise immunity
UART — Asynchronous Serial Interface	Transmits and receives serial data using RS232-type protocols
NITC — New Input Capture/Transition Counter	Same as ITC, but can also capture other data for motor control applications
COMM — Multiphase Motor Commutation	Generates control signals to drive a brushless DC Motor
HALLD — Hall Effect Decode	Decodes 2 or 3 input levels from motor shaft sensors into a value used by COMM function

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