Periodical Interrupts Generation and Measurement

ABSTRACT

The following application note provides different measured values of periodical interrupts generated with the RTI module in the TMS470.

1 Measured Values of Periodical Interrupts

Periodic interrupts can be generated in TMS470 devices using the Real Time Interrupt (RTI) module. Within the possible types of interrupts that can be generated using this module, Tap interrupts have been those chosen for this study (see SPNU189, 5: RTI) [1].

A practical example has been set up in order to measure the period of interrupts generated:

1. A tap interrupt is generated by the RTI module
2. Once the interrupt occurs, a GIO pin is toggled. This generates a signal consisting in short pulse after an interval of time.
3. The signal generated, can be monitored with the help of an oscilloscope and so its period can be measured. The period of the interrupt is the same of the signal generated.

Table 1 summarizes some different possible periodic interrupt values obtained using the RTI module through the variation of programmable parameters "**M**" and "**Tap value**" included in the RTI registers (5.3.1 SPNU189) [1].

Table 1. Periodic Interrupt Intervals

Tap Value	Preload Value M	Interrupt Period Measured
512	0	34.8 ms
512	1	34.1 ms
512	2	51.2 ms
512	3	68 µs
4096	1	273 µs
4096	2	412 µs

NOTE 1: The values showed in this table correspond to a system clock that remains the same and equal to 30 MHz. Please note that clock variations affect to the period obtained during the interrupt generation.

As it is shown in table 1, this measured interrupt period values correspond also to the ones obtained by the formula (Eq 2, 5.3.1 SPNU189) [1],

T=(M+1)x(Tap Value)x(RTICLKperiod)

Some other combinations of parameters can be made applying this formula in order to obtain the desired period for the interrupt to occur.

reference

1. *TMS470R1x System Module Reference Guide* (SPNU189), Texas Instruments Inc.

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