28.1 Feature List

FEATURE LIST

The GTM module is comprised of two main parts:

- the GTM IP v3.1.5.1, designed by Bosch
  - The GTM IP consists of many different sub-modules, offering a wide-variety of functionality to address all the most common applications that are relevant for a timer module
- the GTM Wrapper[1] designed by Infineon

The following is a list of some of the most important GTM IP features found in the sub-modules:

- Central/Edge aligned PWM Generation (TOM/ATOM)
- Dedicated module for asymmetric dead time generation (DTM)
- Dedicated support for DC-DC phase shift operation (DTM)
- Logical combination of digital signals (DTM)
- Provide common time base for system (TBU)
- Multiple capture/compare of external signals and combination with time stamps (TIM/ATOM/TBU)
- Complex digital signals generation (PSM, ATOM, MCS)
- Digital signals filtering and characterization (TIM)
- Input signal measurement and timeout detection (TIM)
- BLDC motor control using Block Commutation Mode (SPE, TIM, TOM)
- Engine angle clock for engine management applications (DPLL, TIM, MAP, TBU)
- Injection/Ignition pulses generation with dedicated HW support (DPLL, ATOM, MCS)
- Programmable RISC-like cores to offload the CPU (MCS)
- Automatic data sharing between GTM modules without CPU/DMA (ARU,BRC)
- Configurable operating frequency up to 200MHz (CCM,CMU)

28.1.1 Delta to AURIX

Backward compatibility

- The GTM IP v3.1.5.1 is fully backward compatible with previous generations
- The GTM wrapper is not fully backward compatible
  - Some parts of the wrapper has been changed to increase the GTM flexibility and to address the higher number of connectivities required by the AURIX second generation

GTM IP differences

The main differences between GTM2.x and GTM3.1.x are the following:

- Maximum operation frequency extended up to 200MHz[2]
- GTM architecture divided in clusters
- Enhanced the MCS RISC-like processor enhanced with new instructions (i.e. MUL,DIV)

1) For the GTM Wrapper details, please refer to the GTM Implementation chapter
2) Only for the first five clusters

- Every MCS can access all the other GTM modules' registers inside the same cluster
- Every MCS can get interrupts from all the other GTM modules inside the same cluster
- MCS memory write protection against CPU/DMA accesses and other MCS
- Added new configurable scheduling schemes to the ARU
- Added the emergency switch off feature to the DTM modules
- Improved the DPLL ticks generation and the bi-directional sensors support
- Added new ADC Interface to the MCS
- Added new TBU modulo counter (engine angle clock)
- Added new up-down counter mode to (A)TOM modules
- Added new scheduling schemes to the MCS

GTM Wrapper differences

With the TC3xx devices, there are significant changes with the Wrapper:

- Increased the number of selectable GTM output resources connected to each Port (from 4 to 12)
- Added three more triggers towards ADC (from 2 to 5)
- Implemented a new multiplexer to connect Port and ADC signals to DTM
- Created a new interface to connect all the EVADC and EDSADC result registers to the MCS