|  |  |  |  |
| --- | --- | --- | --- |
| S.NO | BLOCK AVAILABLE | PURPOSE | SIGNIFICANCE |
| 1. | Connectivity | Connectivity:  Ensures seamless integration and communication between the TDA2x ADAS SoC and various external sensors, cameras, and other peripherals essential for advanced driver-assistance functions. | GMAC enhances the TDA2x ADAS SoC’s capability to handle large volumes of data from various sensors and cameras in real-time, crucial for processing and transmitting data needed for advanced driver-assistance features. |
| 2. | I/O block | Facilitates the exchange of data between the SoC and external systems or devices, supporting real-time data acquisition, control, and monitoring necessary for ADAS applications. | In the TDA2x ADAS System-on-Chip, PCIe is crucial for high-speed data transfer between the SoC and external peripherals, such as cameras and sensors, enabling real-time processing and enhanced performance in advanced driver-assistance systems. |
| 3. | OVER LAY | Combines multiple layers into a single output frame | Enables complex visual compositions and dynamic content changes.  GFX Pipeline |
| 4. | GFX Pipeline | Handles 2D graphics rendering (shapes, text, images). | Enhances visual quality, offloads CPU, crucial for UI elements. |
| 5. | Video Pipeline | Processes video streams (scaling, color conversion, blending) | Ensures high-quality video output, supports multiple formats. |
| 6. | DVOUT (Digital Video Output) | Transmits video data to displays. | High-quality signal transmission, versatile display connection. |
| 7. | HDMI (High-Definition Multimedia Interface) | Transmits uncompressed video and audio to HDMI-compatible displays. | High-definition video/audio transmission, single-cable connection, supports HDCP. |
| 8. | EDMA | Efficient data transfer and Reduces latency for real-time applications | Reduces power consumption & Optimizes performance by allowing the CPU to focus on computation |
| 9. | WDT | Ensures system functionality, Detects malfunctions and Triggers resets or corrective actions upon fault detection. | Ensures system recovery from failures, enhancing reliability and safety. |
| 10. | 15 timer | Manage tasks with precise intervals, Generate PWM signals for controlling peripherals and Provide accurate delays for synchronization | Handle multiple time-sensitive tasks concurrently, enhancing efficiency and Flexibility in implementing various timing-related functions. |
| 11. | ARM A15 | 32 bit general processor | high performance computing tasks |
| 12. | ARM M4 | embedded processor | to address digital signal controls, real time control systems |
| 13. | C66x DSP | DSP core | runs MIMO and other multi antenna signal processing algorithms |
| 14. | DDR2/3 32b and DDR2/3 32b w/ECC | Types of DRAM | wide data bus (32 bits and 40 bits for w/ECC). they are used in consumer grade services and servers/workstations respectively |
| 15. | System mailbox x13 | Communication mechanism | allows different processing units within SoC to send and receive messages |
| 16. | Vision Accelerated Pac upto quad EVEs | integration of multiple EVEs | handle complex vision processing algorithms |
| 17. | Graphics Engine upto dual SGX544 | GPU | graphics performance, parallel processing |
| 18. | Video Codec Acceleration | Hardware Accelerator | designed to handle video encoding and decoding |
| 19. | Video front end | Capture videos and do the initial processing task to make the video data to be compatible | Enhance image quality and supports real time video capture & processing. |