

VehChain Testbed ECU's Technical Specifications

	PIC32MX795F512L	PIC32MZ1024EFH064/ PIC32MZ2048EFH144	S32K144	S32K344
Processor	MIPS32® M4K® processor core architecture	MIPS32® microAptiv® processor core architecture	ARM Cortex M4F processor core architecture	ARM Cortex M7 processor core architecture
Instruction Size	32 Bit	32 Bit	32 Bit	32 Bit
Clock Speed	80 MHz	200 MHz	112 MHz	160 MHz
RAM	128 KB	512 KB	64 KB	512 KB
Flash Memory	512 KB	1024 / 2048 KB	512 KB	4096 KB
CAN Controller Chip	Inside same chip	Inside same chip	Inside same chip	Inside same chip
CAN Transceiver Chip	Inside same chip	Sn65Hvd230/ Inside same chip	Inside same chip	Inside same chip
Operating Temperature	-40° to 125° C	-40° to 125° C	-40° to 150° C	-40° to 150° C
Voltage	2.3 to 3.6V	2.3 to 3.6V	2.7 to 5.5V	2.7 to 5.5V
Used for Personal Cars, Buses & Trucks	Yes	Yes	Yes	Yes
Vehchain Overhead (ms)	1.55 - 7.400	0.69 - 3.38	0.49 – 2.08	Result Pending

End-to-End Latency Comparison Among Different Hardware To Process 1 CAN 2.0 Packet

Short Name	Key Size	Hash Algorithm	Overall End-to-End Latency (Milliseconds)				
			Arduino	Raspberry Pi	PIC32MX795F51L	PIC32MZ1024EFH064/ PIC32MZ2048EFH144	S32K144
AES 128-SHA1	128	SHA1	29.98	0.21	1.55	0.69	0.49
AES 192-SHA1	192	SHA1	30.06	0.24	1.95	0.88	0.60
AES 256-SHA1	256	SHA1	30.13	0.28	2.18	0.98	0.64
AES 128-SHA3(512)	128	SHA3(512)	138.27	0.41	6.54	3.10	1.82
AES 192-SHA3(512)	192	SHA3(512)	138.35	0.41	7.18	3.29	2.01
AES 128-SHA3(256)	128	SHA3(256)	87.84	0.34	6.53	3.08	1.82
AES 256-SHA3(512)	256	SHA3(512)	138.43	0.43	7.40	3.38	2.08
AES 192-SHA3(256)	192	SHA3(256)	87.92	0.37	7.17	3.26	1.99
AES 256-SHA3(256)	256	SHA3(256)	87.99	0.35	7.40	3.36	1.98
AES 128-SHA256	128	SHA256	68.28	0.22	1.79	0.81	0.55
AES 192-SHA256	192	SHA256	68.34	0.25	2.21	0.98	0.64
AES 256-SHA256	256	SHA256	68.34	0.25	2.43	1.08	0.70
AES 128-SHA512	128	SHA512	68.41	0.32	2.82	1.09	0.89
AES 192-SHA512	192	SHA512	68.41	0.34	3.24	1.26	1.01
AES 256-SHA512	256	SHA512	68.47	0.32	3.47	1.36	1.05