Fighting Guide PIC64 GX

Competitive Positioning

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Competitive Overview

PIC64GX competes against other quad core processors

- NXP i.MX 8M Nano and Mini
- TI Sitara
- Renesas RZ

Competitors have a range of family members with different feature sets. Comparing apples to apples is important

PIC64GX is the only RISC-V based MPU in this class

PIC64GX has extra value depending on the application requirements

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Positioning PIC64GX

PIC64GX Delivers a Differentiated Solution

	PIC64GX	NXP i.MX8M Nano	Renasas RZ	TI Sitara
64-bit Multicore CPU	●	●	●	●
Flexible Asymmetric Multi-Processing	●	○	○	○
Real-Time Support	●	On isolated ARM CPU Only	On isolated ARM CPU Only	On isolated ARM CPU Only
Embedded NVM	●	○	○	○
PCIe	●	○	●	○
2x Gigabit Ethernet	●	Only 1	●	Only 1
User Crypto, Secure Boot	●	● AES/RSA Only	● >SHA-256	● No ECDSA
Anti-tamper, DPA Resistance	●	○	○	○
MIPI CSI-2	●	●	●	●
HDMI	●	MIPI DSI-2	MIPI DSI-2	MIPI DSI-2
Large L2 Cache	●	○	○	○
x32 DDR	●	○ x16	●	○ x16

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Value Drivers for PIC64GX

- **Flexible asymmetric multi-processing**
  - More flexible configuration for mixed RTOS and Linux applications
  - Large 2MB L2 Cache with deterministic operation. Faster operation.
  - Worth incremental $5 for the right customers
- **Best-in-class security**
  - Full crypto accelerator with differential power analysis (DPA) to counter physical side channel attacks. Invaluable security beyond secure boot.
- **Embedded non-volatile memory**
  - 128KB for boot. 56KB for secure keys and user data
  - Faster, secure boot times than from internal ROM

Value Drivers for PIC64GX (cont.)

- **PCIe Root Port**
  - Only available in more expensive competitive devices which cost $5-10 more
- **X32 DDR4/LPDDR4 interface**
  - Only available in more expensive competitive devices which cost $5-10 more
- **2x 1GigE rather than 1 in the low-cost competitor devices**

What Applications Will PIC64GX Not Address?

- PIC64GX does not have a GPU built in
- PIC64GX does not have digital audio interfaces
- Low-cost dual and quad core applications with no need for value add features in PIC64GX family
- AI/ML intensive capabilities available in higher-cost MPUs like i.MX 95 or those from Nvidia

➢ PIC64GX is very competitive with MPUs $5 cheaper if needing any of the value drivers for the family

Value Driver Details

Asymmetric Multi-Processing

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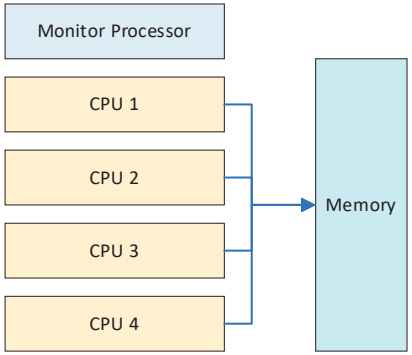
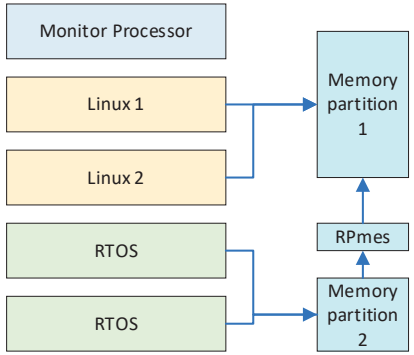
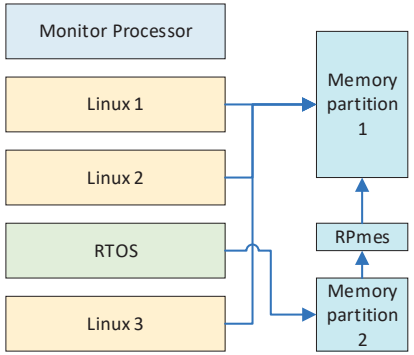


Symmetric Multiprocessing

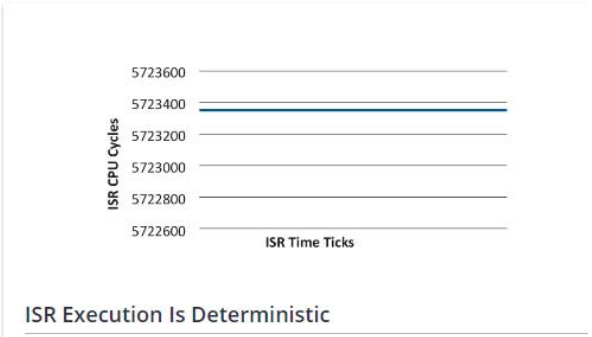


PIC64GX Asymmetric Multiprocessing 1



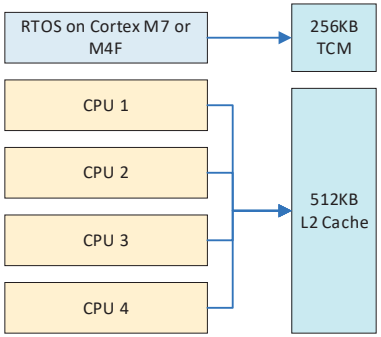
PIC64GX Asymmetric Multiprocessing 2

- Flexible configuration to 2 contexts
- 2MB L2 Cache for better deterministic MPU performance
- Physical Memory Protection



ISR Execution Is Deterministic

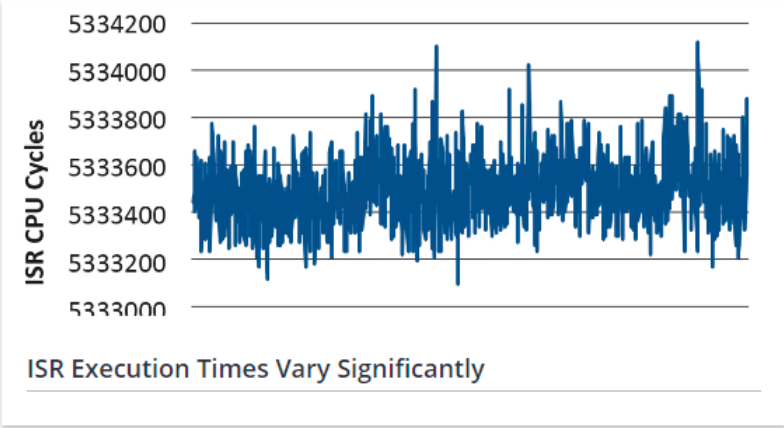
Competition



i.MX 8M Nano and TI Sitara Multiprocessing

Disadvantages

- Only a single context can run in the 4 application processors
- RTOS support only in the MCU class processor
- Only 512KB L2 Cache limits MPU performance



ISR Execution Times Vary Significantly

Crypto Accelerator

- **PIC64GX Value**
  - DPA resistance, tamper detection, PUF protected key storage

Features	PIC64GX	i.MX 8M Nano	TI Sitara	Renasas RZ V2H	Renasas RZ Five
AES	AES-128/192/256 (ECB, CBC, CTR, OFB, CFB, GCM, KeyWrap)	AES-D	AES-128/192/256	AES-128/192/256	AES-128/192/256
SHA	SHA-1/224/256/384/512, Key Tree	x	SHA-2/224/256/384/512	SHA-1/224/256	SHA-1/224/256
HMAC	HMAC-SHA-1/224/256/384/512; GMAC-AES; CMAC-AES	x	×	×	×
RSA	SigGen (ANSI X9.31, PKCS v1.5), SigVer (ANSI X9.31, PKCS v1.5)-1024/1536/2048/3072/4096	Supported (no specifics)	Public Key Accelerator assist of RSA/ECC	RSA 4096	RSA 4096
ECDSA	KeyGen, KeyVer, SigGen & SigVer - NIST & Brainpool (P256/384/521); KAS - ECC CDH, PKG, PKV	×	×	ECDSA256	×
FFC	KAS - DH, DSA SigGen & SigVer (1024/1536/2048/3072/4096)	×	×	×	×
Tamper Sense	Voltage, Temperature, Clock Frequency, Clock Glitch, Active Mesh	×	×	×	×
PUF	PUF protection for Secure Key storage (Secure Boot and Data communication)	×	×	×	×
DPA Resistance	DPA resistant hard crypto co-processor supporting all above Crypto algorithms	×	×	×	×

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