RZ/G1 SERIES EMBEDDED MICROPROCESSORS

High-End HMI, Video, Embedded Vision and more

BIG IDEAS
FOR EVERY SPACE

2017.01

RZ/G1 SERIES MULTI-CORE MPUS WITH

HIGH-END GRAPHICS AND MULTI-STREAM VIDEO

RZ/G1 Series microprocessors (MPUs) enable rapid development of game-changing Linux, Android, and QNX-based embedded systems. Designed for use in industrial, home appliance, office and medical equipment, the RZ/G1 Series extends the capabilities of the successful RZ/A Series MPUs to deliver high-end performance in applications such as graphics, multi-stream video, and embedded vision.

The RZ/G1 Series features up to 1.5 GHz CPUs, 3D graphics acceleration, 1080p@60fps H.264 video, and DDR3 memory interfaces for ample performance margin. Other features include USB, PCIe, SATA, Fast Ethernet and Gigabit Ethernet interfaces.

RZ/G1 APPLICATIONS

HIGH-END HUMAN MACHINE INTERFACE DISPLAYS

NETWORKED VIDEO CAMERA SYSTEMS

EMBEDDED VISION
(e.g., GESTURE AND OBJECT RECOGNITION)

3D RENDERING FOR MEDICAL IMAGING

2-WAY VIDEO TELEPHONY

CONTENT

RZ/G1 Key Features and Benefits ____ 03
RZ/G1 Series Block Diagrams ____ 04
High-Capability Processing ____ 06
Support for 3D Graphics and Full HD Video ____ 06
Scalable Software Across a ll RZ/G1 Devices ____ 06
Renesas RZ MPU Family ____ 07

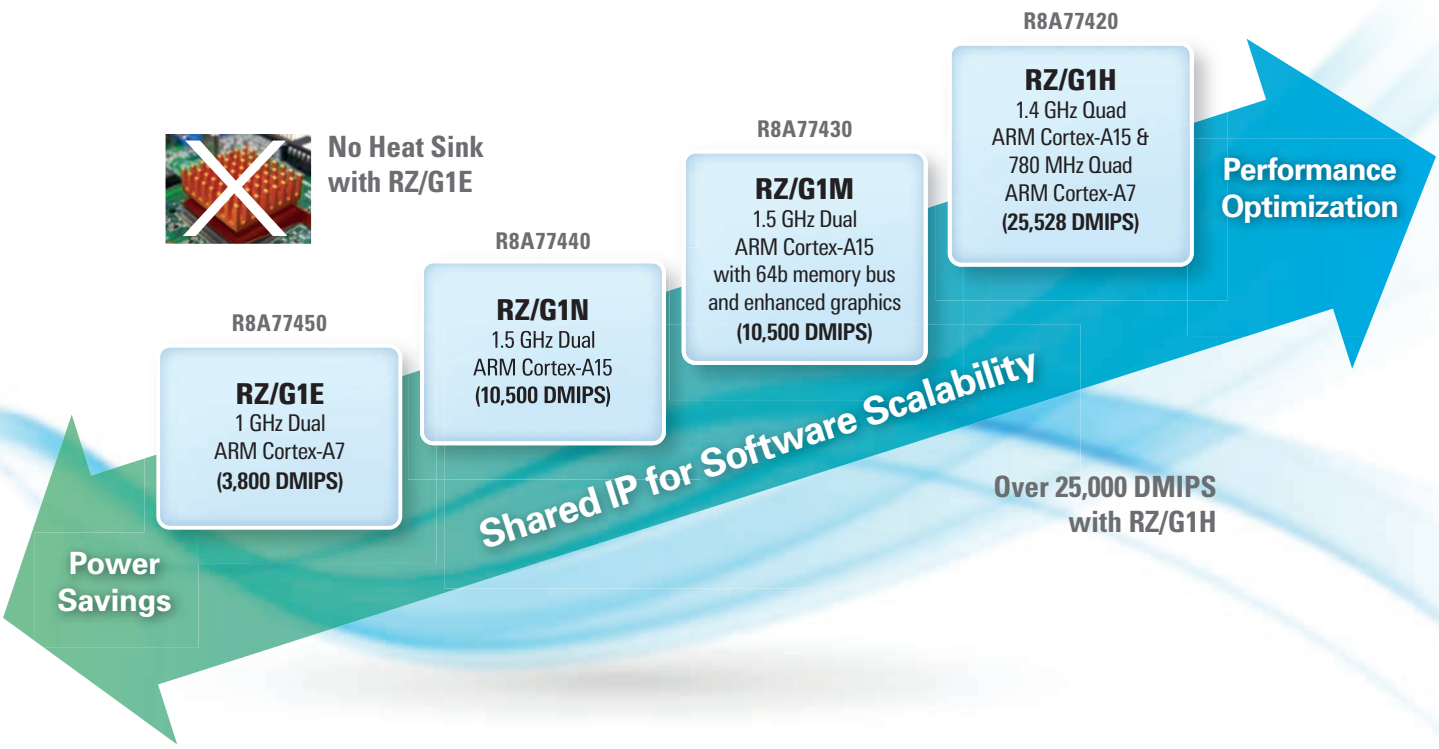
RZ/G1 KEY FEATURES AND BENEFITS

KEY FEATURES

- World-class Imagination Technologies 3D graphics engine for image rendering, plus 1080p 60fps video codec
- ARM® Cortex®-A7 and A15 CPU cores in dual and quad configurations for power or performance optimization
- Shared IP and memory map over entire RZ/G1 MPU series lineup
- Rich ecosystem of line-up design and system integration partners

KEY BENEFITS

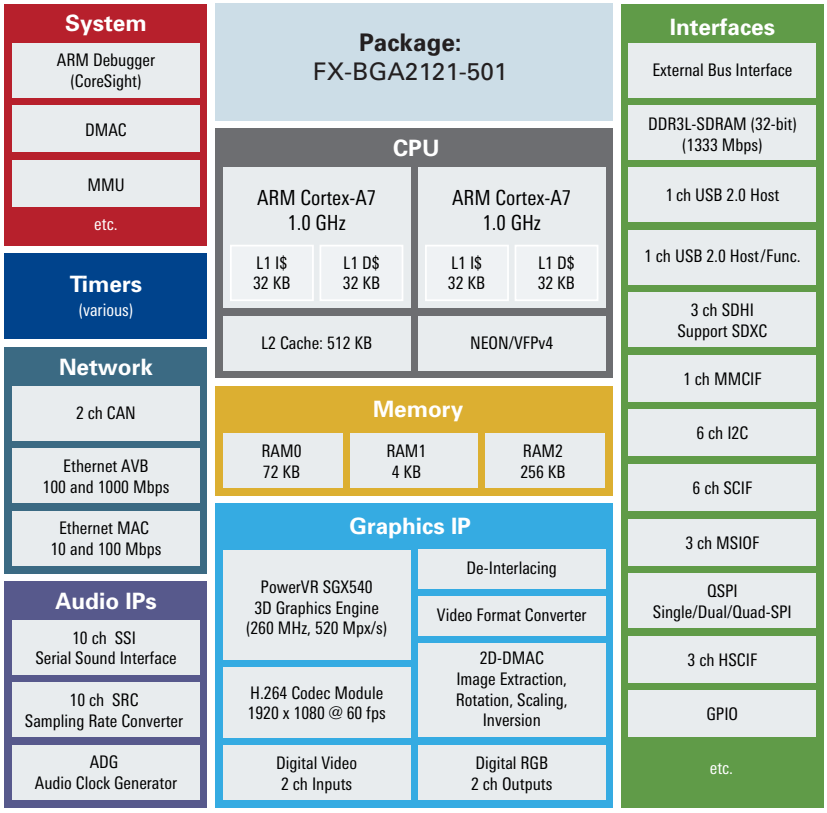
- Enhance GUI expressiveness and add value to your end application with 3D graphics and real-time video
- Tune your design to minimize power dissipation or maximize performance to suit your specific requirements
- Build scalable software thanks to common device drivers
- Compress your development cycle by tapping into a growing network of RZ/G1 MPU design experts



RZ/G1 SERIES BLOCK DIAGRAMS

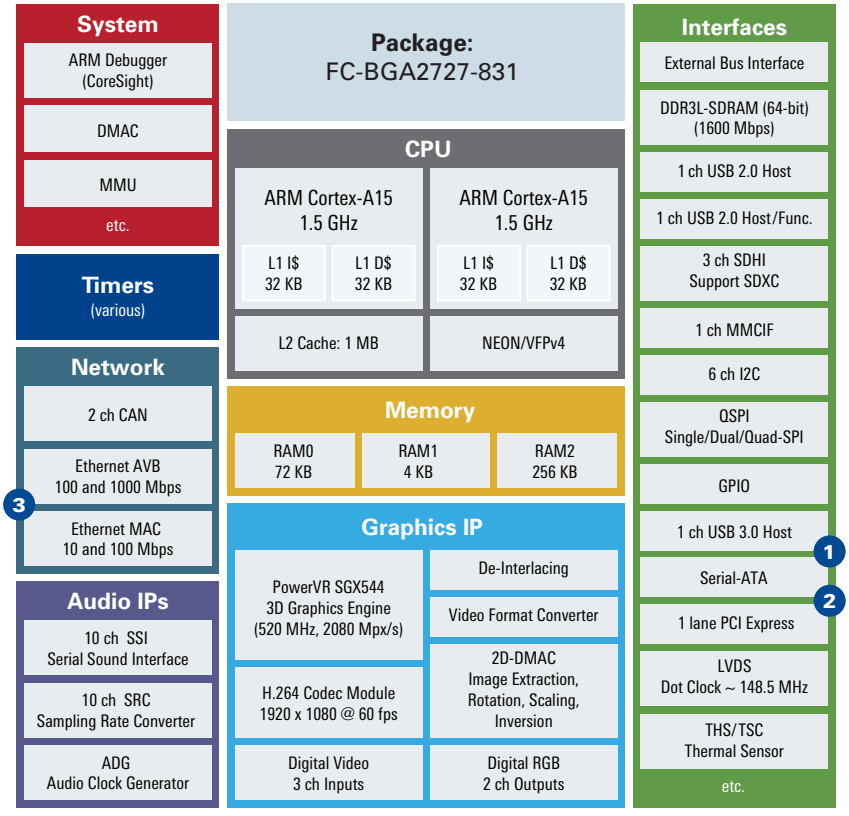
RZ/G1E (R8A77450)

Bring huge value to your low-cost embedded design with over 3,800 Dhrystone (DMIPS) performance at a low power footprint via ARM's lowest power processor, the Cortex-A7, while enjoying dual Ethernet, 3D graphics and a 1080p60 H.264 video codec.

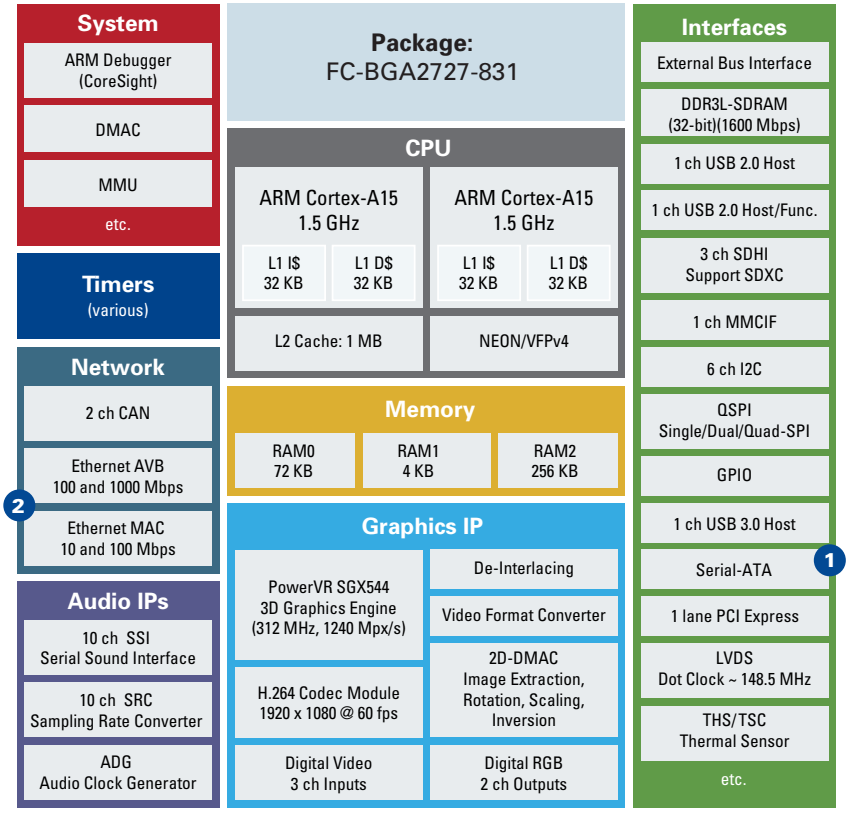


RZ/G1M (R8A77430)

Take your high-end MPU design to the next level with over 10,000 DMIPS performance from two ARM Cortex-A15 cores; USB 3.0, SATA and PCIe interfaces; 3D graphics; a 1080p60 H.264 video codec; and a 64-bit wide external DDR3 SDRAM bus to deliver immense memory bandwidth and an incredible end-user experience.



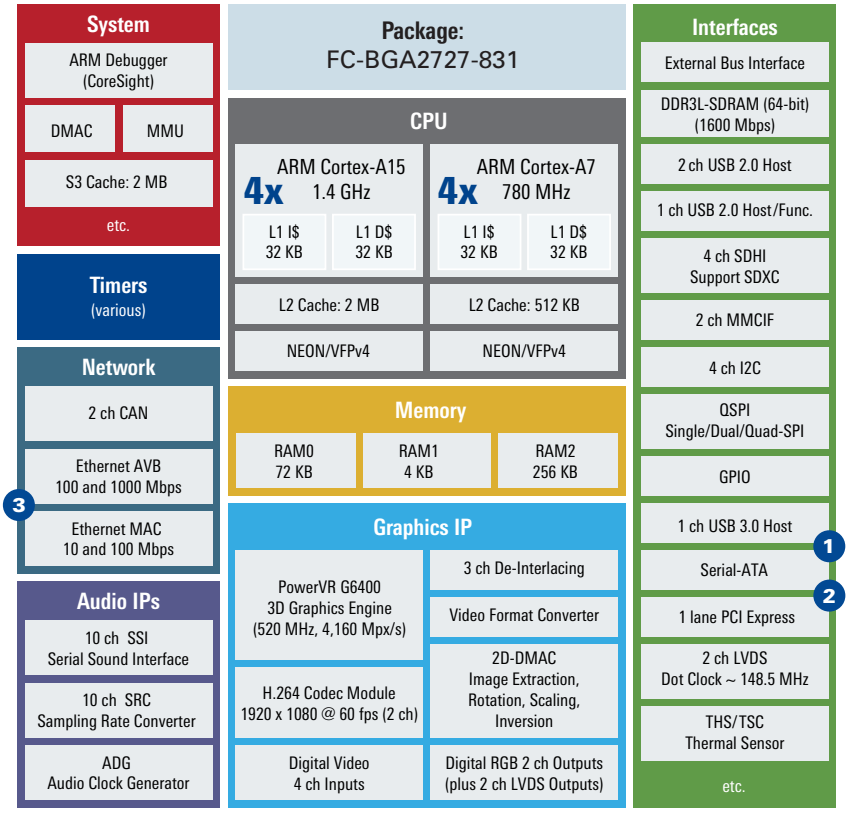
1. USB 3.0 and SATA0 share same PHY.
2. PCIe and SATA1 share same PHY.
3. Ethernet AVB and 10/100 Ethernet share the same pins.



RZ/G1N (R8A77440)

Leverage a rich set of high-end embedded capabilities with 10,500 DMIPS from two ARM Cortex-A15 CPUs; a USB 3.0, SATA or PCIe interface; a 3D graphics engine; and a 1080p60 H.264 video codec to propel your application beyond the reach of your competition.

1. USB 3.0, SATA and PCIe share same PHY.
2. Ethernet AVB and 10/100 Ethernet share the same pins.



RZ/G1H (R8A77420)

Harness the ultimate in embedded MPU performance with this 8-core “Big-Little” quad ARM Cortex-A15 and quad ARM Cortex-A7 based MPU that delivers over 25,000 DMIPS; USB 3.0, SATA and PCIe interfaces; ultra high-end 3D graphics with two-channel 1080p60 H.264 codecs; and a 64-bit wide DDR3 SDRAM memory bus.

1. USB 3.0 and SATA0 share same PHY.
2. PCIe and SATA1 share same PHY.
3. Ethernet AVB and 10/100 Ethernet share the same pins.

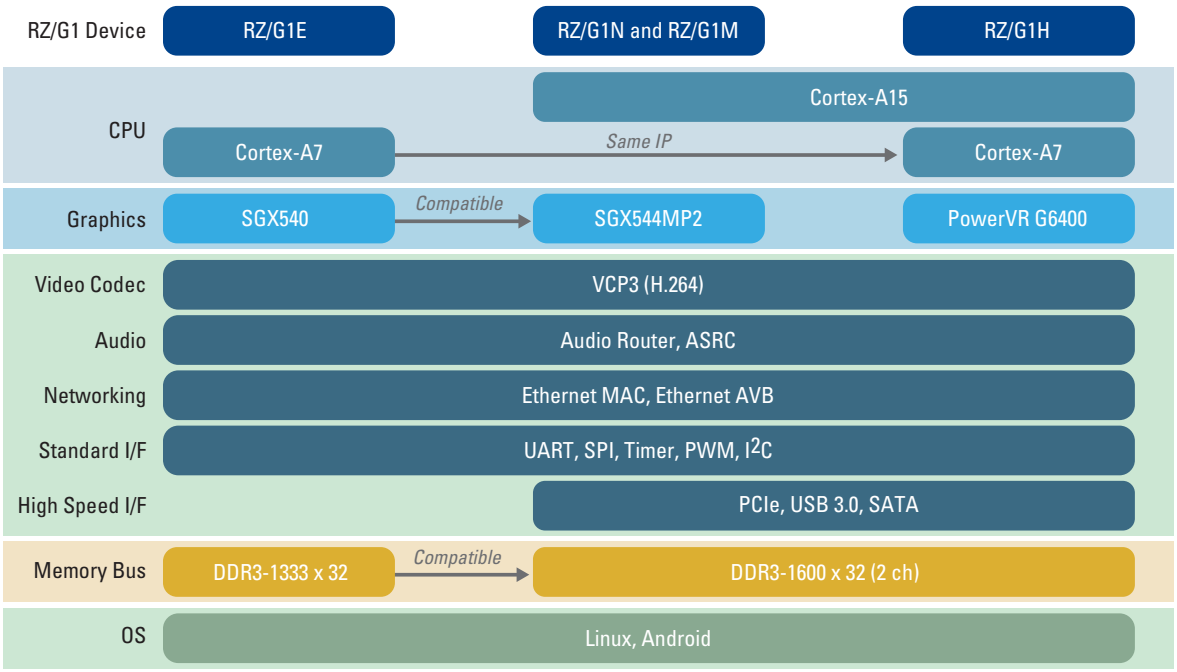
HIGH-CAPABILITY PROCESSING

	RZ/G1E R877450	RZ/G1N R877440	RZ/G1M R877430	RZ/G1H R877420
Core	Dual Cortex®-A7	Dual Cortex®-A15	Dual Cortex®-A15	Quad Cortex®-A15 Quad Cortex®-A7
Operating Frequency	1.0 GHz	1.5 GHz	1.5 GHz	1.4 GHz 780 MHz
Processing Performance	3,800 DMIPS	10,500 DMIPS	10,500 DMIPS	25,528 DMIPS
Cache Size	L1 cache I/32 KB D/32 KB L2 cache 512 KB	L1 cache I/32 KB D/32 KB L2 cache 1 MB	L1 cache I/32 KB D/32 KB L2 cache 1 MB	L1 cache I/32 KB D/32 KB L2 cache 2 MB (A15) 512 KB (A7) S3 cache 2 MB
MMU	Yes			
NEON/VFP	SIMDv2/VFPv4			

SUPPORT FOR 3D GRAPHICS AND FULL HD VIDEO

	RZ/G1E R877450	RZ/G1N R877440	RZ/G1M R877430	RZ/G1H R877420
3D Graphics	SGX540 520 Mpx/s	SGX544MP2 1240 Mpx/s	SGX544MP2 2080 Mpx/s	SG6400 4160 Mpx/s
Video Functions	2 ch digital video inputs	3 ch digital video inputs		4 ch digital video inputs
	2 ch RGB video display interfaces	1 ch RGB video display interface		
		1 ch LVDS video output		2 ch LVDS video interfaces
	H.264 – 1920x1080 @ 60 x 1 ch			H.264 – 1920x1080 @ 60 x 2 ch
	Video image processing functions, including color conversion and scaling			

SCALABLE SOFTWARE ACROSS ALL RZ/G1 DEVICES



RZ/G1 EXTENDS RENESAS RZ MPU FAMILY WITH 3D GRAPHICS, H.264 VIDEO CODEC, AND HIGH-PERFORMANCE DDR3 MEMORY INTERFACES

Software Development Environment

Linux

Android

QNX

Partners & Affiliations

COGENTEMBEDDED

Witekio
EMBEDDING SUCCESS

embedded VISION ALLIANCE

timesys® Embedded Linux from a Trusted Source

NEC

emtrion embedded systems

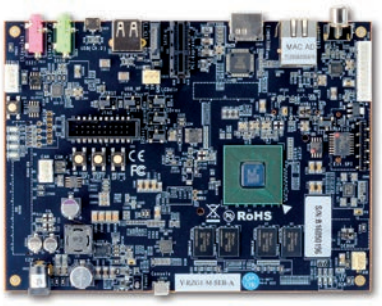
TES Electronic Solutions

Qt

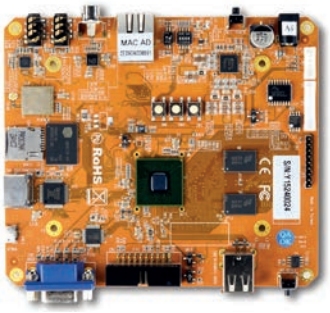
Uncanny Vision®

iWave Embedding Intelligence

Evaluation Kits



RZ/G1M Starter Kit
Part No.: YR8A77430S000BE



RZ/G1E Starter Kit
Part No.: YR8A77450S000BE

Various partner kits are available through emtrion and iWave.

Renesas MCU Ecosystem

Renesas Partner Alliance
Consultant and tool vendor network
renesas.com/Alliance

MyRenesas
Customized updates
renesas.com/MyRenesas

Renesas University Program
University program
RenesasUniversity.com

RenesasRulz.com
Renesas Interactive
Online training
RenesasInteractive.com

Before purchasing or using any Renesas Electronics products listed herein, please refer to the latest product manual and/or data sheet in advance.

FSC
www.fsc.org
MIX
Papier aus verantwortungsvollen Quellen
FSC® C004599

Renesas Electronics Europe

www.renesas.com

© 2017 Renesas Electronics Europe.
All rights reserved. Printed in Germany.
Document No. R01PF0140ED0100