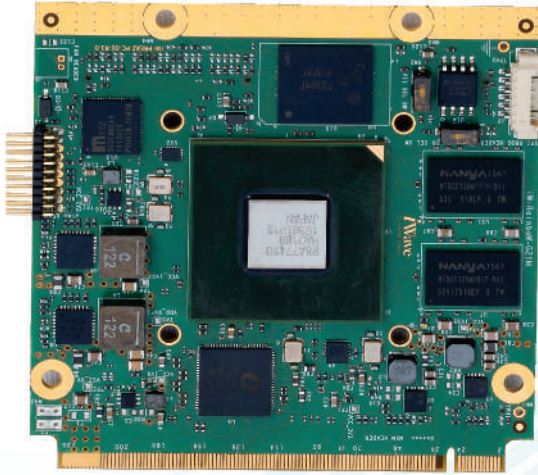## System On Module iW-RainboW-G21M-Q7
RZ/G1H Qseven Module

iWave's RZ/G1H based Qseven CPU module integrates Renesas RZ/G1H Quad core ARM Cortex A15 @1.4GHz & Quad core ARM Cortex A7 @ 780MHz CPU with rich set of features and IO peripherals. It integrates full HD hardware codecs, graphic acceleration, DDR3 RAM, eMMC Flash, Micro SD slot, USB HUB, HDMI transmitter and Gigabit Ethernet PHY. The SOM is ideally suitable for high performance video intensive and graphic rich applications.

APPLICATIONS: Video Surveillance, Digital Signage, Amusement, Vehicle infotainment & Nagivation, Real time image recognition, Network & high vision Camera, Gaming console, Industrial control, Point of sale & ATM.

iW-RainboW-G21M-Q7 HIGHLIGHTS

Quad Core ARM Cortex-A15 @ 1.4GHz

Quad Core ARM Cortex-A7 @ 780MHz

Dual channel HD encode & decode

PowerVR G6400 hardware graphic accelerator

Up to Four Channel Video input

USB3.0 support

Industrial temperature support available

SPECIFICATIONS

MPU :	
Renesas RZ/G1H MPU	
Quad Core ARM Cortex A15 @ 1.4GHz	
Quad Core ARM Cortex A7 @ 780MHz	
PowerVR G6400 Graphics core @ 520MHz	
Memory :	
2GB DDR3 (Expandable[1])	
4GB eMMC Flash (Expandable[1])	
2MB SPI NOR Flash (boot code)	
Communication :	
Gigabit Ethernet PHY - 1 Port [2]	
10/100 Ethernet PHY - 1 Port	
2 Port USB HUB	
Qseven Edge Interfaces :	
PCIe - 1 Port [3]	
SATA - 1 Port [3]	
USB3.0 host - 1 Port	
USB2.0 host - 3 Ports	
USB2.0 device - 1 Port	
LVDS display - 1 Port [4]	
HDMI display - 1 Port [4]	
Gigabit Ethernet - 1 Port	
SDHC - 1 Port	

I2S audio - 1 Port
PWM - 2 Nos
I2C - 3 Ports
SPI - 1 Port
UART - 1 Port
CAN - 1 Port
GPIO - 8 Nos
JTAG or UART console
Expansion connector Interfaces :
Up to 4 x 8-bit CSI camera or 2 x 16-bit CSI camera
10/100 Ethernet or RMII - 1 Port
UART - 2 Ports
SSI/I2S Audio - 1 Port
SPI - 1 Port
CAN - 1 Port
PWM & GPIOs
Power Supply :
5V @ 2.5A through Qseven Edge
Temperature Support :
-40°C to + 85°C Industrial
OS Support : Linux 3.10.31, QNX 7.0.0*
Form Factor : 70mm x 70mm
Qseven 2.0 compatible

Note1 : By default 2GB DDR3 and 4GB eMMC only supported. Contact iWave systems for memory expansion support.
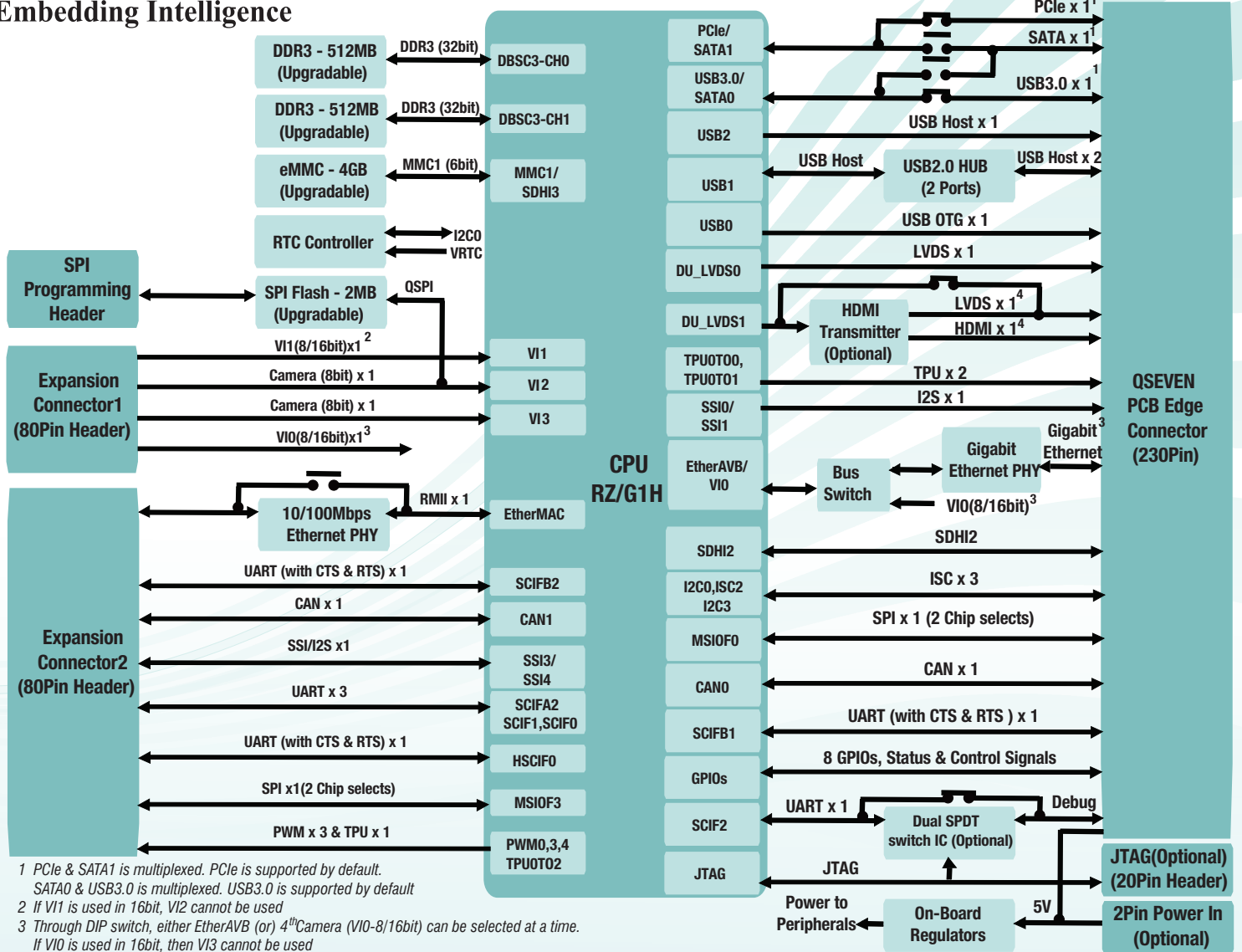Note2: Through DIP switch, either EtherAVB (or) 4 Camera(VI0-8/16bit can be selected at a time. if VI0 is used in 16bit, then VI3 cannot be used.
Note3 : PCIe & SATA is multiplexed on the CPU. At a time anyone can be used. By default PCIe is supported.
Note4: Either LVDS 2nd port or HDMI can be supported by software configuration. By default HDMI is supported.
Note *:Optional features are not supported by default

![iWave - Embedding Intelligence]

RENESAS PARTNER Gold

RZ/G1H Qseven SOM - BLOCK DIAGRAM

Block diagram labels:

Left side (memory & peripherals):
- DDR3 - 512MB (Upgradable) — DDR3 (32bit) — DBSC3-CH0
- DDR3 - 512MB (Upgradable) — DDR3 (32bit) — DBSC3-CH1
- eMMC - 4GB (Upgradable) — MMC1 (6bit) — MMC1/SDHI3
- RTC Controller — I2C0 / VRTC
- SPI Programming Header
- SPI Flash - 2MB (Upgradable) — QSPI
- Expansion Connector1 (80Pin Header)
  - VI1(8/16bit)x1 [2] — VI1
  - Camera (8bit) x 1 — VI2
  - Camera (8bit) x 1 — VI3
  - VI0(8/16bit)x1 [3]
- 10/100Mbps Ethernet PHY — RMII x 1 — EtherMAC
- Expansion Connector2 (80Pin Header)
  - UART (with CTS & RTS) x 1 — SCIFB2
  - CAN x 1 — CAN1
  - SSI/I2S x1 — SSI3/SSI4
  - UART x 3 — SCIFA2 SCIF1,SCIF0
  - UART (with CTS & RTS) x 1 — HSCIF0
  - SPI x1(2 Chip selects) — MSIOF3
  - PWM x 3 & TPU x 1 — PWM0,3,4 TPU0TO2

Center: **CPU RZ/G1H**

Right side:
- PCIe/SATA1 — PCIe x 1 [1], SATA x 1 [1]
- USB3.0/SATA0 — USB3.0 x 1 [1]
- USB2 — USB Host x 1
- USB1 — USB Host — USB2.0 HUB (2 Ports) — USB Host x 2
- USB0 — USB OTG x 1
- DU_LVDS0 — LVDS x 1
- DU_LVDS1 — HDMI Transmitter (Optional) — LVDS x 1 [4], HDMI x 1 [4]
- TPU0TO0, TPU0TO1 — TPU x 2
- SSI0/SSI1 — I2S x 1
- EtherAVB/VI0 — Bus Switch — Gigabit Ethernet PHY — Gigabit Ethernet [3] — VI0(8/16bit) [3]
- SDHI2 — SDHI2
- I2C0,ISC2 I2C3 — ISC x 3
- MSIOF0 — SPI x 1 (2 Chip selects)
- CAN0 — CAN x 1
- SCIFB1 — UART (with CTS & RTS) x 1
- GPIOs — 8 GPIOs, Status & Control Signals
- SCIF2 — UART x 1 — Dual SPDT switch IC (Optional) — Debug
- JTAG — JTAG — JTAG(Optional) (20Pin Header)
- Power to Peripherals — On-Board Regulators — 5V — 2Pin Power In (Optional)

QSEVEN PCB Edge Connector (230Pin)

Notes:
1. PCIe & SATA1 is multiplexed. PCIe is supported by default. SATA0 & USB3.0 is multiplexed. USB3.0 is supported by default
2. If VI1 is used in 16bit, VI2 cannot be used
3. Through DIP switch, either EtherAVB (or) 4th Camera (VI0-8/16bit) can be selected at a time. If VI0 is used in 16bit, then VI3 cannot be used
4. HDMI is optional feature & not supported by default. LVDS1 is supported by default

OS SUPPORT
Linux 3.10.31,
QNX 7.0.0*

DELIVERABLES
RZ/G1H Qseven Module
Board Support Package
User Manual

OPTIONAL KITS/Modules
RZ/G1H Development kit
Camera Daughter Board
Camera Modules

CUSTOM DEVELOPMENT
BSP Development/OS Porting
Custom SOM/Carrier Development
Custom Application/GUI Development
Design Review and Support

iWave Systems Technologies, established in 1999, focuses on Product Engineering Services involving Embedded Hardware, Software & FPGA. The company designs and develops cutting edge products and solutions. iWave has been an innovator in the development of highly integrated, high performance, low power and low cost System On Modules and Development Platforms. iWave's expertise has brought out multiple SOMs based on ARM NXP, Intel Atom, Marvell and TI Processors.

iWave System has won the confidence of its customers over the years by being a reliable partner in developing innovative products. Our engineers combine outstanding System design experience to deliver Quality Solutions. iWave specializes across Industrial, Automotive and Medical domains. We support our customers by being time efficient, which in turn helps our customers accelerate time to market their products. iWave is a Windows embedded Silver partner and a winner of the Partner Excellence Award.

Optional items not included in the standard deliverables.

Note: iWave reserves the right to change these specifications without notice as part of iWave's continuous effort to meet the best in breed specification. The registered trademarks are proprietary of their respective owners.

Ordering the RZ/G1H Qseven Module
The device can be ordered online from the iWave Website
http://www.iwavesystems.com/webforms
Or from our Local Partners in your region
http://www.iwavesystems.com/about-us/business-partner.html

IW-G21M-Q7 BR-R1.3