20Mbit QUAD-Search Content Addressable Memory

Features & Benefits

- **20Mbit density**
  Supports large routing tables and enables low-cost, low-power, more reliable system designs
- **360 Million Searches per Second (MSPS) per table**
  Delivers the industry's highest packet look-up performance for 40G applications and beyond
- **40-, 80-, 160-, 320-, 480-, or 640-bit search key-width support**
  Provides flexible search conditions that support multiple search-key configurations
- **Multi-device cascading**
  Allows the TCAM array capacity to effectively be doubled to 40Mb by connecting two identical QUAD-Search TCAMs together using the cascade interface signals
- **Sub-core pre-charge technology**
  Uses patented design techniques to greatly reduce power consumption, even during high-speed operation
- **Compact package**
  576 FC-BGA (27mm x 27mm, flip-chip type)

Applications

- **Enterprise Switches and Routers**
- **Metro Switches and Routers**
- **Core Switches and Routers**
- **Edge Switches and Routers**
- **3G/4G Mobile Access Platforms**
- **IPv4 / IPv6 Packet Forwarding**
- **Layer-4 to Layer-7 Deep Packet Inspection**
- **Internet Protocol Security (IPsec)**

360-MSPS TCAM maximizes multi-layer packet processing in routers and switches

Switches and routers must deliver bandwidth-hungry services such as voice over IP (VoIP), IPTV, video on demand (VOD), and wireless 3G/4G with the appropriate Quality of Service (QoS) levels. To create the platforms necessary to optimally manage large amounts of network traffic quickly and effectively, system designers are increasingly relying on advanced Ternary Content Addressable Memory (TCAM) devices for performing ultra-fast data packet searches.

The new Renesas R8A20410BG QUAD-Search TCAM has been developed to address the stringent requirements of high data throughput combined with Deep Packet Inspection (DPI) for multi-service routers and switches. This 20Mbit device can make deterministic packet searches at speeds up to 360 Mega Searches Per Second (MSPS)/table — the industry's highest packet look-up performance.

Allows 40G+ rates

Operating at 360MHz, the QUAD-Search TCAM chip enables data transfer rates of 40Gbps and higher. Search bit lengths can be set to 40, 80, 160, 320, 480, or 640 bits. The device also has a multi-bank architecture with four parallel, independently operating search engines which significantly boosts look-up performance, while supporting a wide range of network applications.

To accommodate very large routing tables, the R8A20410BG allows expansions up to 40-Mbit density through cascade connections. Incorporating a full-custom configurable CAM array with an easy-to-use interface, the QUAD-Search TCAM redefines the state of the art in network search technology. The chip is planned to be interoperable with Cavium Networks' OCTEON™ 58xx multi-core processors, as well as Xelerated's HX family of network processors.

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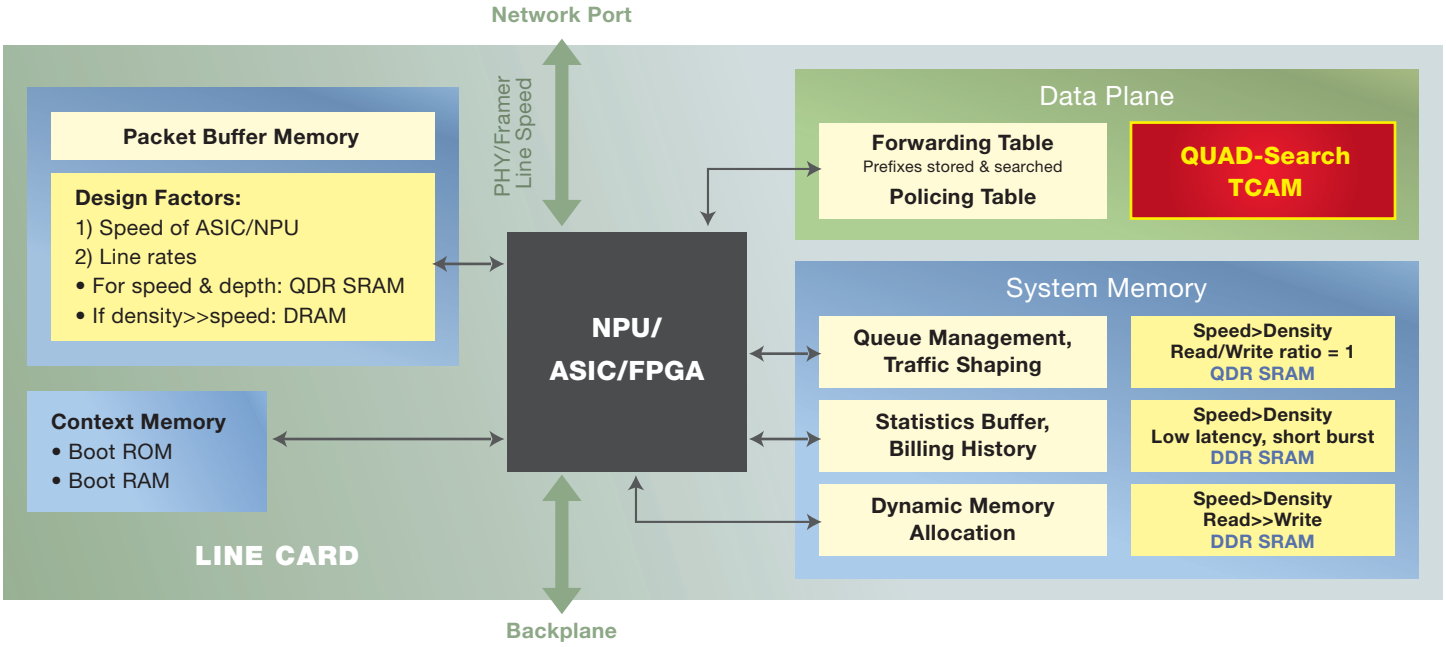
Typical application

The 20Mbit, 360MHz device can make deterministic packet searches at 360 MSPS/Table rates, for data transfer rates of 40Gbps and higher. Renesas also provides a full portfolio of high-performance QDRII+ and DDRII+ SRAMs.



Specifications

Item	R8A20410BG
Memory capacity	20Mbit
Max. clock operating frequency	360MHz
Search speed	360 MSPS/table max. at 80/160/320 bits
Search key	40L/H, 80, 160, 320, 480, or 640 bits
General-purpose NPU connectivity	Planned connectivity includes links to Cavium Networks OCTEON multi-core processors and Xelerated HX network processors
Package	576-pin FCBGA (27mm × 27mm, 1.0mm ball pitch)

Why Renesas?

- Demonstrated success in TCAM development and large-volume production
- Advanced design techniques, plus state-of-the-art process technology
- First-in-class TCAM quality, worldwide
- High reliability
- Electrical characteristics with generous design margins
- In-house manufacturing technology
- Patented sub-core technology for “Green technology” designs

Contact your local sales rep for more information and device samples, or visit:

am.renesas.com

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Renesas Electronics America Inc.
450 Holger Way, San Jose, CA 95134
Tel:408-382-7500 Fax:408-382-7501
am.renesas.com