Network Search Engine Solutions

80Mbit Dual-Port Interlaken-LA NSEs Achieve 2Bsps Deterministic Lookups

System engineers at network equipment makers rely on high-performance hardware-based search technology instead of software alternatives to meet dual challenges; i.e., the huge volumes of traffic being generated by mobile and video applications and the transition from IPv4 addresses to the more complex IPv6 protocol.

Renesas enables ultra-fast search engine designs with the top-quality, industry-leading S-series 28nm true NSE devices. Our latest serial-interface network search engines provide unprecedented performance for a wide range of high-end packet processing applications.

These new 80Mbit NSEs are ideal solutions for high-performance network applications requiring ultra-fast deterministic packet lookup results – especially Edge and Core routers, as well as Enterprise, Datacenter and Carrier Ethernet switches. Their optimized, dynamically configurable memory core supports over one million records in a single chip and achieves up to two billion searches per second (2Bsps) with deterministic latency.

Because reliable S-series NSEs have two independent request ports, each search engine can be shared by two host processors and can handle two simultaneous request threads. By adopting the industry-standard Interlaken-LA serial interface, the S-series NSEs eliminate the need for a custom memory controller in the host ASIC or FPGA, drastically reducing the time and cost of developing higher-bandwidth next-generation network equipment.

System engineers creating packet-processing equipment with Renesas 80Mbit NSEs also benefit from the chips dynamic configurable memory array and high-speed SerDes lanes. Support for 80-, 160-, 320- and 640-bit search keys and low-power requirements are among the other design features that make these flexible, scalable devices, ideal solutions for multiple, eco-friendly platforms that have to meet a wide range of performance requirements.

Features

- ■High Density
  - – 80 Mbits
- ■High Speed
  - – 2 Billion searches per sec.
  - – 12.5 Gbps SerDes for 150 Gbps per port
- ■Low Power Consumption
  - – 28 nm process
- ■Flexible & Scalable
  - – Two Interlaken-LA ports
  - – Fully configurable SerDes lanes
  - – Dynamic table-size remapping
  - – Multi-bank architecture
- ■Key Map Engine (KME)

Why Choose Renesas?

- ■Global network memory supplier, worldwide support
- ■Extremely fast memory cell performance
- ■28 nm process technology for high density, low power
- ■Proven First-in-Class quality and reliability

Renesas NSE Product

Part Number : R8A20686BG-G
Density : 80 Mbits
SerDes Speed : 10.3125 Gbps and 12.5 Gbps
Search Speed : 2 Bsps max.
Search Key : 80 / 160 / 320 / 640 bits
Package : 1292-pin FCBGA, Pb-Free

Renesas Electronics Corporation
www.renesas.com
2016.01

Platform for minimizing design TAT in 200Gbps network equipment design

Network Search Engine RDK

Renesas H/W search engine with dynamically reprogrammable Xilinx FPGA

Features

Eliminate the bottleneck at 200Gbps network equipment
2Billion searches can be achieved with Renesas H/W search Engine

Minimize TAT of network equipment designs
Provides verified solution with Xilinx SDNet™ and Renesas user friendly design support systems (API, reference code, debug tools)

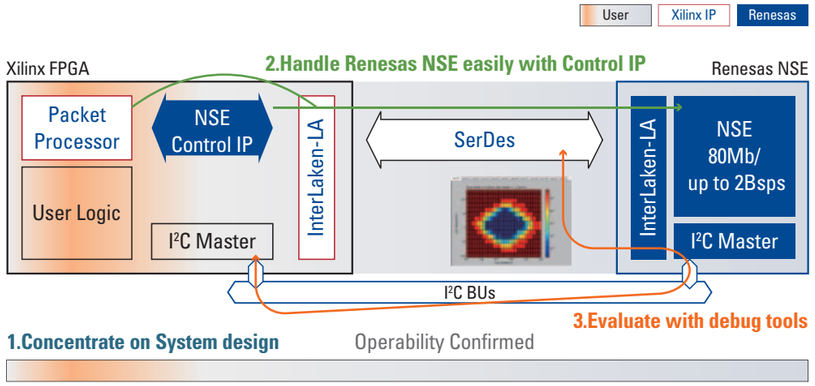
Solutions

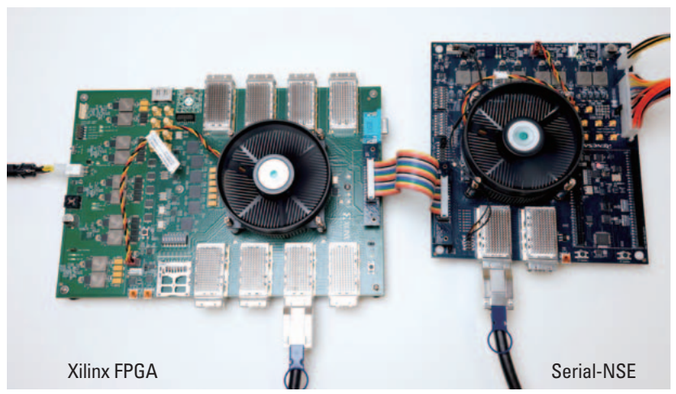
Benefits for customers

1.RDK is functionally verified. Customers can concentrate on system design

2.Customers can use **NSE control IP** easily with API

3.Minimize evaluation time with user friendly **Debug tools**



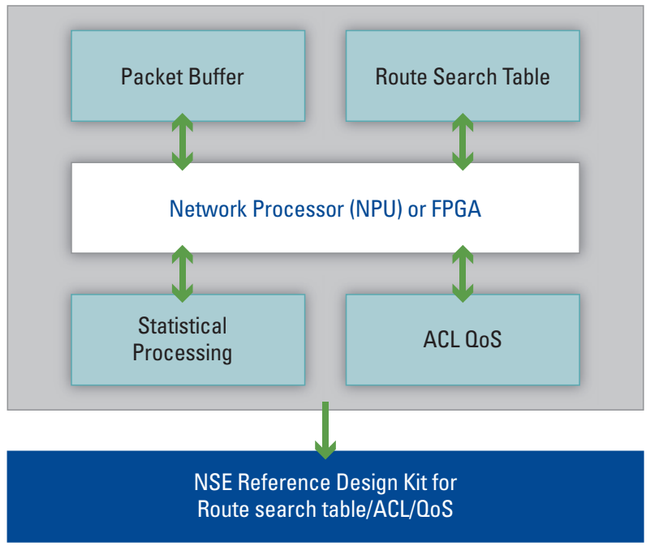


Network Memories Lineup

• Renesas Provides Memory Solutions for Network Equipment Manufacturers

Renesas Network Memories		
Application	Renesas Products	Functions
Packet Buffer	LLDRAM/ QDR/DDR SRAM	Low Latency Density Random Access
Route Search Table	LLDRAM/NSE	Exact Match Longest Prefix Match Density
Statistical Processing	QDR/DDR SRAM	Low Latency Random Access
ACL QoS	NSE (Network Search Engine)	Ternary Search Search Performance Low Latency

(*) Router, Switch, Firewall, etc.



Renesas Electronics Corporation

Notes:

1. Descriptions of circuits, software and other related information in this document are provided only to illustrate the operation of semiconductor products and application examples. You are fully responsible for the incorporation of these circuits, software, and information in the design of your equipment. Renesas Electronics assumes no responsibility for any losses incurred by you or third parties arising from the use of these circuits, software, or information.
2. Renesas Electronics has used reasonable care in preparing the information included in this document, but Renesas Electronics does not warrant that such information is error free. Renesas Electronics assumes no liability whatsoever for any damages incurred by you resulting from errors in or omissions from the information included herein.
3. Renesas Electronics does not assume any liability for infringement of patents, copyrights, or other intellectual property rights of third parties by or arising from the use of Renesas Electronics products or technical information described in this document. No license, express, implied or otherwise, is granted hereby under any patents, copyrights or other intellectual property rights of Renesas Electronics or others.
4. You should not alter, modify, copy, or otherwise misappropriate any Renesas Electronics product, whether in whole or in part. Renesas Electronics assumes no responsibility for any losses incurred by you or third parties arising from such alteration, modification, copy or otherwise misappropriation of Renesas Electronics product.
5. Renesas Electronics products are classified according to the following two quality grades: "Standard" and "High Quality". The recommended applications for each Renesas Electronics product depends on the product's quality grade, as indicated below.
   "Standard": Computers; office equipment; communications equipment; test and measurement equipment; audio and visual equipment; home electronic appliances; machine tools; personal electronic equipment; and industrial robots etc.
   "High Quality": Transportation equipment (automobiles, trains, ships, etc.); traffic control systems; anti-disaster systems; anti-crime systems; and safety equipment etc.
   Renesas Electronics products are neither intended nor authorized for use in products or systems that may pose a direct threat to human life or bodily injury (artificial life support devices or systems, surgical implantations etc.), or may cause serious property damages (nuclear reactor control systems, military equipment etc.). You must check the quality grade of each Renesas Electronics product before using it in a particular application. You may not use any Renesas Electronics product for any application for which it is not intended. Renesas Electronics shall not be in any way liable for any damages or losses incurred by you or third parties arising from the use of any Renesas Electronics product for which the product is not intended by Renesas Electronics.
6. You should use the Renesas Electronics products described in this document within the range specified by Renesas Electronics, especially with respect to the maximum rating, operating supply voltage range, movement power voltage range, heat radiation characteristics, installation and other product characteristics. Renesas Electronics shall have no liability for malfunctions or damages arising out of the use of Renesas Electronics products beyond such specified ranges.
7. Although Renesas Electronics endeavors to improve the quality and reliability of its products, semiconductor products have specific characteristics such as the occurrence of failure at a certain rate and malfunctions under certain use conditions. Further, Renesas Electronics products are not subject to radiation resistance design. Please be sure to implement safety measures to guard them against the possibility of physical injury, and injury or damage caused by fire in the event of the failure of a Renesas Electronics product, such as safety design for hardware and software including but not limited to redundancy, fire control and malfunction prevention, appropriate treatment for aging degradation or any other appropriate measures. Because the evaluation of microcomputer software alone is very difficult, please evaluate the safety of the final products or systems manufactured by you.
8. Please contact a Renesas Electronics sales office for details as to environmental matters such as the environmental compatibility of each Renesas Electronics product. Please use Renesas Electronics products in compliance with all applicable laws and regulations that regulate the inclusion or use of controlled substances, including without limitation, the EU RoHS Directive. Renesas Electronics assumes no liability for damages or losses occurring as a result of your noncompliance with applicable laws and regulations.
9. Renesas Electronics products and technology may not be used for or incorporated into any products or systems whose manufacture, use, or sale is prohibited under any applicable domestic or foreign laws or regulations. You should not use Renesas Electronics products or technology described in this document for any purpose relating to military applications or use by the military, including but not limited to the development of weapons of mass destruction. When exporting the Renesas Electronics products or technology described in this document, you should comply with the applicable export control laws and regulations and follow the procedures required by such laws and regulations.
10. It is the responsibility of the buyer or distributor of Renesas Electronics products, who distributes, disposes of, or otherwise places the product with a third party, to notify such third party in advance of the contents and conditions set forth in this document, Renesas Electronics assumes no responsibility for any losses incurred by you or third parties as a result of unauthorized use of Renesas Electronics products.
11. This document may not be reproduced or duplicated in any form, in whole or in part, without prior written consent of Renesas Electronics.
12. Please contact a Renesas Electronics sales office if you have any questions regarding the information contained in this document or Renesas Electronics products, or if you have any other inquiries.

(Note 1) "Renesas Electronics" as used in this document means Renesas Electronics Corporation and also includes its majority-owned subsidiaries.
(Note 2) "Renesas Electronics product(s)" means any product developed or manufactured by or for Renesas Electronics.

RENESAS

SALES OFFICES http://www.renesas.com

Refer to "http://www.renesas.com/" for the latest and detailed information.

Renesas Electronics America Inc.
2801 Scott Boulevard Santa Clara, CA 95050-2549, U.S.A.
Tel: +1-408-588-6000, Fax: +1-408-588-6130

Renesas Electronics Canada Limited
9251 Yonge Street, Suite 8309 Richmond Hill, Ontario Canada L4C 9T3
Tel: +1-905-237-2004

Renesas Electronics Europe Limited
Dukes Meadow, Millboard Road, Bourne End, Buckinghamshire, SL8 5FH, U.K
Tel: +44-1628-585-100, Fax: +44-1628-585-900

Renesas Electronics Europe GmbH
Arcadiastrasse 10, 40472 Düsseldorf, Germany
Tel: +49-211-6503-0, Fax: +49-211-6503-1327

Renesas Electronics (China) Co., Ltd.
Room 1709, Quantum Plaza, No.27 ZhiChunLu Haidian District, Beijing 100191, P.R.China
Tel: +86-10-8235-1155, Fax: +86-10-8235-7679

Renesas Electronics (Shanghai) Co., Ltd.
Unit 301, Tower A, Central Towers, 555 Langao Road, Putuo District, Shanghai, P. R. China 200333
Tel: +86-21-2226-0888, Fax: +86-21-2226-0999

Renesas Electronics Hong Kong Limited
Unit 1601-1611, 16/F., Tower 2, Grand Century Place, 193 Prince Edward Road West, Mongkok, Kowloon, Hong Kong
Tel: +852-2265-6688, Fax: +852 2886-9022

Renesas Electronics Taiwan Co., Ltd.
13F, No. 363, Fu Shing North Road, Taipei 10543, Taiwan
Tel: +886-2-8175-9600, Fax: +886 2-8175-9670

Renesas Electronics Singapore Pte. Ltd.
80 Bendemeer Road, Unit #06-02 Hyflux Innovation Centre, Singapore 339949
Tel: +65-6213-0200, Fax: +65-6213-0300

Renesas Electronics Malaysia Sdn.Bhd.
Unit 1207, Block B, Menara Amcorp, Amcorp Trade Centre, No. 18, Jln Persiaran Barat, 46050 Petaling Jaya, Selangor Darul Ehsan, Malaysia
Tel: +60-3-7955-9390, Fax: +60-3-7955-9510

Renesas Electronics India Pvt. Ltd.
No.777C, 100 Feet Road, HAL II Stage, Indiranagar, Bangalore, India
Tel: +91-80-67208700, Fax: +91-80-67208777

Renesas Electronics Korea Co., Ltd.
12F., 234 Teheran-ro, Gangnam-Gu, Seoul, 135-080, Korea
Tel: +82-2-558-3737, Fax: +82-2-558-5141

MIX
Paper from responsible sources
FSC® C015138

© 2016 Renesas Electronics Corporation, All rights reserved.