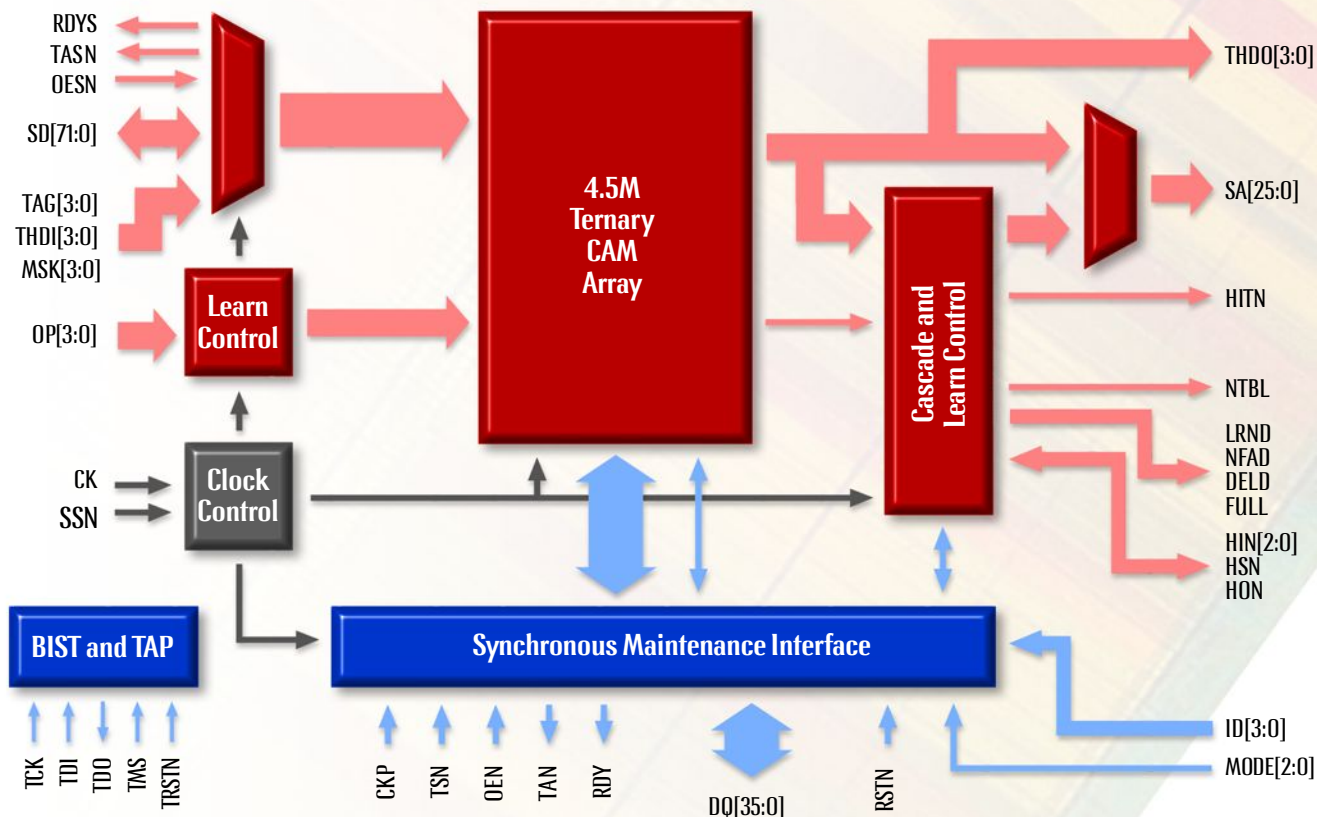# SiberCAM

Ultra-4.5M

SCT4502

The SCT4502 Packet Forwarding Engine (PFE) offers the optimal price performance trade off for today's system requirements. Based on ternary Content Addressable Memory (CAM) technology, the SCT4502 is fully compatible with other, higher capacity members of the SiberCAM family (SCT9022 and SCT1842).

SiberCore's proprietary advanced ternary CAM architecture allows the SCT4502 to improve the speed and efficiency of classification and routing table look-up functions in switching and routing equipment, performing up to 100 million multi-layer, multi-protocol look-ups per second. The SCT4502 is capable of maintaining wire speed while performing up to two look-ups at OC-192 (10 Gbit/s) or up to eleven look-ups at OC-48 (2.5 Gbit/s) per minimum sized packet.

The SCT4502 supports 72 and 144-bit look-ups at full speed while 36 and 288 bit look-ups are supported at up to 50 Msps. Entry widths of 360 bits (33 Msps), 432 bits (33 Msps) and 576 bits (25 Msps) address the emerging requirements driven by IPv6 classification. Up to 16 SCT4502 devices can be cascaded to support over 500 thousand 144-bit classification entries. Cascading the SCT4502 to create larger tables does not introduce any search throughput performance penalty.

The SCT4502 is the only CAM-based PFE to support fully configurable multi-layer forwarding through a unique memory architecture that accommodates varying entry widths. Entries from 72 to 576 bits can be dynamically and individually configured, enabling vendors to support both IPv4 and IPv6 classification in a single chip.

The SCT4502 provides a unique third-port that uses a non-intrusive interleaving technique allowing table updates to proceed without interrupting or suspending the search path. For applications where pin count is paramount, a pin efficient 2-port mode is also available.

Key Features

- 4,718,592 bits true ternary Content Addressable Memory (CAM) storage

- Supports entry widths of 36, 72, 144, 288, 360, 432 and 576-bits

- 3-port interface for independent search and table management (2-port interface option)

- Up to 100 million look-ups per second throughput

- Glueless cascade support for up to 16 devices allows scaling up to one million IP packet classification entries

- Compatible with all SiberCAM family members

SiberCore TECHNOLOGIES

SILICON SOLUTIONS FOR CYBERSPACE

Block diagram labels:
RDYS, TASN, OESN, SD[71:0], TAG[3:0], THDI[3:0], MSK[3:0], OP[3:0], CK, SSN — Learn Control — Clock Control — BIST and TAP — 4.5M Ternary CAM Array — Cascade and Learn Control — Synchronous Maintenance Interface — THDO[3:0], SA[25:0], HITN, NTBL, LRND, NFAD, DELD, FULL, HIN[2:0], HSN, HON, ID[3:0], MODE[2:0] — TCK, TDI, TDO, TMS, TRSTN — CKP, TSN, OEN, TAN, RDY, DQ[35:0], RSTN

Part Number

- SCT4502

Features

- 4,718,592 bits of ternary CAM storage
- Support for 36-bit, 72-bit, 144-bit, 288-bit, 360-bit, 432-bit and 576-bit entries
- Dynamic variable width architecture allows entry width to be defined on an entry by entry basis
- High-speed synchronous search port – 18-bit, 36-bit and 72-bit bus support
- Search input can be configured for Single Data Rate (SDR) or Double Data Rate (DDR) signaling
- 100 Million look-ups per second sustained search throughput
- Independent maintenance port for non-intrusive table update operations
- 16 programmable global search masks
- 4 programmable entry mask registers
- Automatic learning – entry learned, next free address, entry deleted and full flags
- Aging – entries can be tagged as invalid, valid and has been hit, valid and has not been hit
- Flexible 4-bit programmable thread pipeline for search context identification and glueless connection to context memories
- Glueless cascade support for up to 16 chips
- Simple synchronous maintenance port – 36-bit and 18-bit bus support
- Built-in burst move operation
- IEEE 1149.1 JTAG TAP with BIST
- 1.5 V core supply (VDD); 3.3 or 2.5 V I/O (VCC)
- 27mm package (1.27mm ball pitch)
- Fully compatible with the SCT9022 and SCT1842
- Available in commercial and industrial temperature grades

Applications

- WAN & Internet Core
  - Multi-Gigabit/Terabit Routers
  - Edge Routers
  - ATM, POS, IP
- MAN/LAN/Enterprise
  - Backbone Switch/Routers
  - Aggregation Routers
  - 10Mb/100Mb/1Gb/10Gb Ethernet
- Layer 4 Flow Classification and Filtering
- Classless Inter-Domain Routing (CIDR)
- Longest Prefix Match (LPM)
- Network Address Translation (NAT)
- Class of Service (CoS)
- Quality of Service (QoS)
- Virtual Private Networks (VPN)
- Policy-based Networking
- Server Load Balancing