UTDC-CAM 16 Megabit Dynamically Configurable Content Addressable Memory (DC-CAM)

Advanced Product Information

UTMC
MICROELECTRONIC SYSTEMS

January 1998

FEATURES

❑ Configurable 16 megabit CAM storage capacity

❑ Multiple key widths (1 to 32 bytes)

❑ Programmable association widths
- 0 to 32 bytes
- 2^0 through 2^{12} bytes

❑ Configurable data bus
- 32 bit bi-directional bus
- 64 bit bi-directional bus

❑ Separate input and output FIFOs for pipelined operation

❑ Rapid association matching for exact match seeks (110ns typical)

❑ Partitions into multiple tables of various sizes
- Sized for 2^8 through 2^{17} records

❑ Longest prefix matching feature

❑ Hierarchical search feature

❑ Table overflow support

❑ Proximity match (closest match) feature
- Supports Manhattan or Euclidean distance formulas
- Supports 4, 8, 16, or 32 bit element boundaries

❑ Bulk table load and unload capabilities

❑ Supports polled or interrupt driven architecture

❑ Operates on same clock as host or different clock

❑ 3.3 volt operation

❑ Available in 120 lead plastic quad flat pack

INTRODUCTION

The UTMC DC-CAM greatly simplifies and enhances systems which require rapid access to large lookup tables.

The DC-CAM combines a large SDRAM with a powerful CAM engine running at up to 100 MHz to achieve unprecedented CAM depth, flexibility, and value.

The DC-CAM can be configured as a single table or partitioned into as many as 512 uniquely configured tables. When configured as a single table, the IC's record capacity can be represented by the following equation:

$$\text{Record Capacity} = 260K/\text{Width}$$

where Width equals the combined key and association widths in units of 64 bit words.

The DC-CAM partitions into multiple CAM tables in any combination of table sizes as long as the sum of each tables record capacity times the table width does not exceed 260K 64 bit words.

A special feature supports longest prefix matching.

A unique hierarchical search capability allows tables with different key lengths to be linked hierarchically and searched in sequence for the most significant bytes of the key. This feature also facilitates table overflow.

When performing a proximity match, as many as 50 million keys can be examined for closeness in a second. This feature is designed to support real time AI recognition and learning applications.
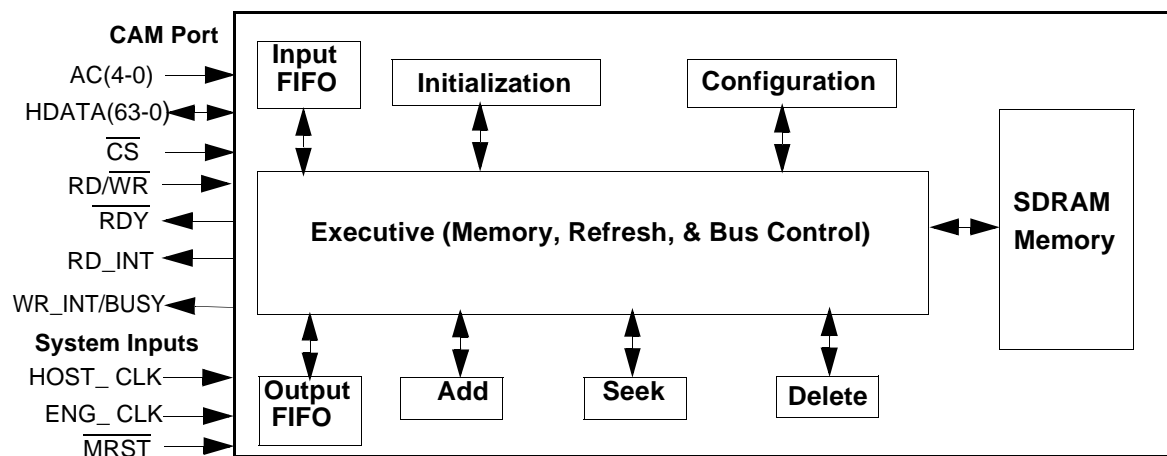

Figure 1. DC-CAM Block Diagram

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