MPEG-2 Video Encoder

Description
The CXD1922Q is a highly-integrated device including MPEG-2 encoder, motion estimation, and system and rate controller on a single chip. The device is ideal for low-cost solutions in consumer products, storage media, communications and authoring applications. The CXD1922Q supports MPEG-2 MP@ML encoding compliant with ISO/IEC 13818-2 for frame structure encoding.

Features
MPEG-2 Encoding
• High quality, real-time encoding (I, B, P)
• Supports MP@ML, SP@ML
  — Image size: up to NTSC 720x480 @ 30fps
  — up to PAL 720x576 @ 25fps
  — Up to 2 “B-frame” (M ≤ 3)
  — Frame structure
• Encoding rates:
  — Max. bit-rates: 15Mbps (P, B)
  — 25Mbps (I only)
• MPEG-2 Video Elementary Stream Output
  — 4:2:0 chroma format encoding

Motion Estimation
• Adaptive motion estimation algorithms
• Wide motion vector search range:
  — Horizontal: –288 to +287.5
  — Vertical: –96 to +95.5
• Frame/field motion estimation
• Half-pel accuracy
• Dual-prime encoding support

Encoding Controller (Closed)
• Programmable rate and system control
• Host independent operation
• CBR and VBR encoding support
• Constant length coding for storage media
• Adaptive frame/field MC/DCT coding
• Programmable parameters including:
  — Bit rate
  — GOP structure (M&N value)
  — Encoding image size
  — Quantization matrix tables, etc.

Interfaces
• Host: 16-bit controller
• Input video: 4:2:2 YUV CCIR 656 (8-bit parallel)
• Output video: 8-bit video elementary stream (8-bit parallel)
• External memory: 32Mbits
  — Supports SDRAM (e.g. 512K x 16 x 2-chips)

Other:
• Supports MPEG-1 encoding
• Multi-level temporal noise reduction
• Image conversion for free size encoding
• 4:2:2 to 4:2:0 video conversion
• Automatic scene change detection
• Automatic 3:2 pull-down inversion
• Error concealment I-frame motion vectors
• Support for user data insertion in encoded stream

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Block Diagram

SDRAM 16Mbit (1M x 16-bit)

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VIDEO IN

PRE

ME/MC

DCT/IQ, IDCT, IQ

FRM/VLC

Host I/F

Controller (DSP)

SDRAM I/F

VIDEO OUT Elementary Stream

HOST
Pin Configuration