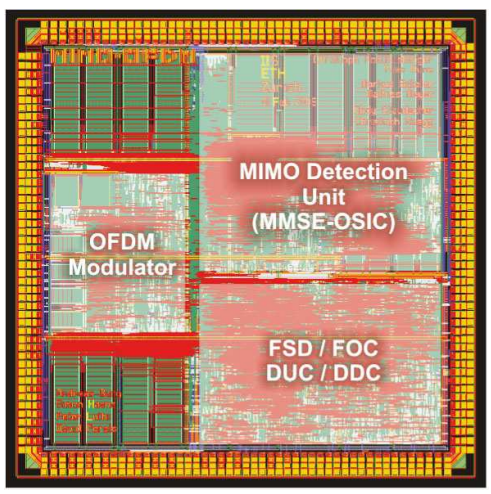
IIS ASICs for Wireless MIMO Communication - Part 1

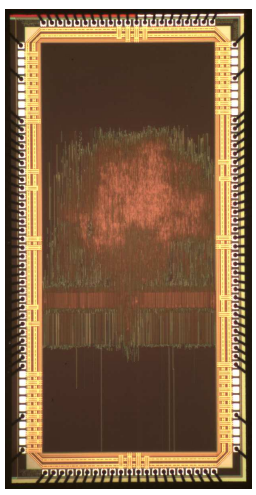
4-Stream MIMO Transceiver



Description
- First 4-stream MIMO transceiver ASIC

Technical Data
- Process: UMC 0.25 µm 1P/5M CMOS technology
- Clock: 80 MHz
- Area: 12.8 mm^2
- Achieves 192 Mbit/s in 20 MHz bandwidth

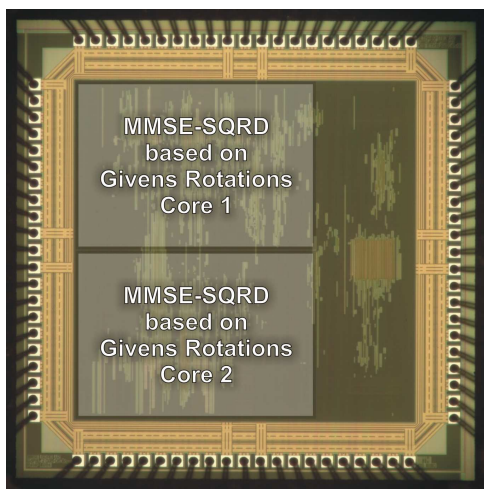
Programmable LDPC Decoder



Description
- IEEE 802.11n-compliant programmable low-density parity check (LDPC) decoder

Technical Data
- Process: UMC 0.18 µm 1P/6M CMOS technology
- Clock: 208 MHz
- Area: 3.39 mm^2
- Throughput: 780 Mbit/s

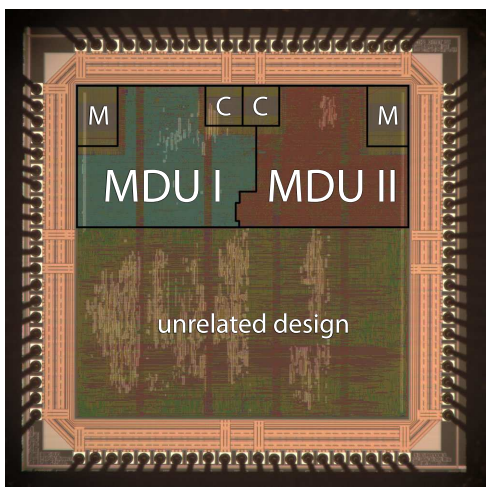
MMSE Sorted QR Decomposition



Description
- MMSE sorted QR decomposition based on Givens rotations

Technical Data
- Process: UMC 0.18 µm 1P/6M CMOS technology
- Clock: 152 MHz
- Total Area: 2.28 mm^2 (four different architectures)
- Delivers up to 3.8 M SQRD/s

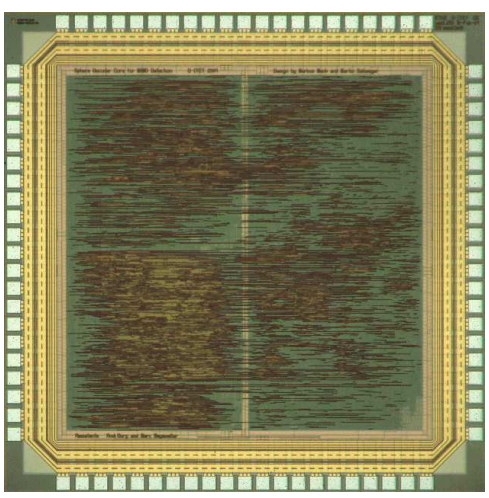
Singular Value Decomposition Processors



Description
- First singular value decomposition ASIC for MIMO communication

Technical Data
- Process: UMC 0.18 µm 1P/6M CMOS technology
- Clock: MDU-I 133 MHz / MDU-II 272 MHz
- Area: 0.41 mm^2 / 0.37 mm^2
- 86.4 k SVD/s / 63.2 k SVD/s

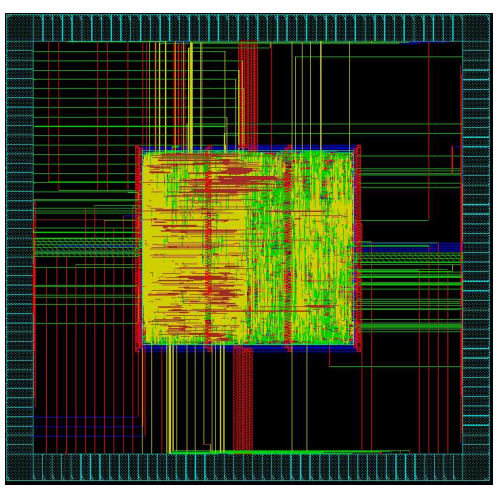
Hard-Output Sphere Decoder



Description
- First 4-stream hard-output sphere decoder ASIC

Technical Data
- Process: UMC 0.25 µm 1P/5M CMOS technology
- Clock: 57 MHz
- Area: 117 k gate equivalents
- Achieves 75 Mbit/s at 20 dB SNR

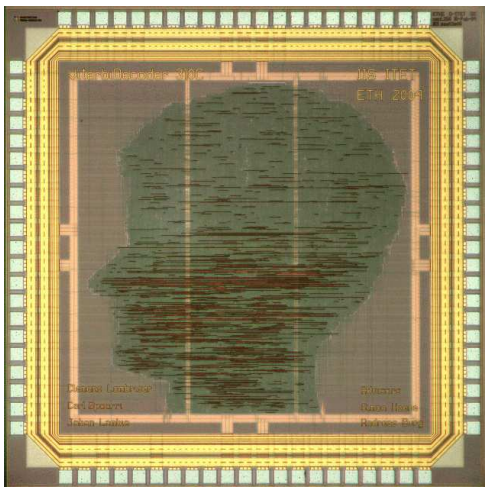
Soft-Output STS Sphere Decoder



Description
- First 4-stream soft-output sphere decoder based on the single tree search (STS) strategy

Technical Data
- Process: UMC 0.25 µm 1P/5M CMOS technology
- Clock: 71 MHz
- Area: 1.9 mm^2
- Throughput ranges from 10 Mbit/s to 95 Mbit/s

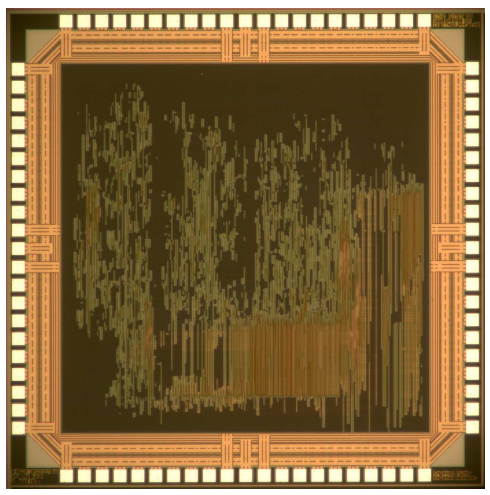
Viterbi Decoder for MIMO WLAN



Description
- IEEE 802.11n-compliant Viterbi decoder ASIC

Technical Data
- Process: UMC 0.25 µm 1P/5M CMOS technology
- Clock: 310 MHz
- Area: 1.7 mm^2
- Designed for 310 Mbit/s throughput

BCJR Decoder for Iterative MIMO Detection



Description
- First 64-state BCJR decoder for iterative MIMO detection

Technical Data
- Process: UMC 0.18 µm 1P/6M CMOS technology
- Clock: 375 MHz
- Area: 2.95 mm^2
- Throughput: 375 Mbit/s

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IIS MIMO