

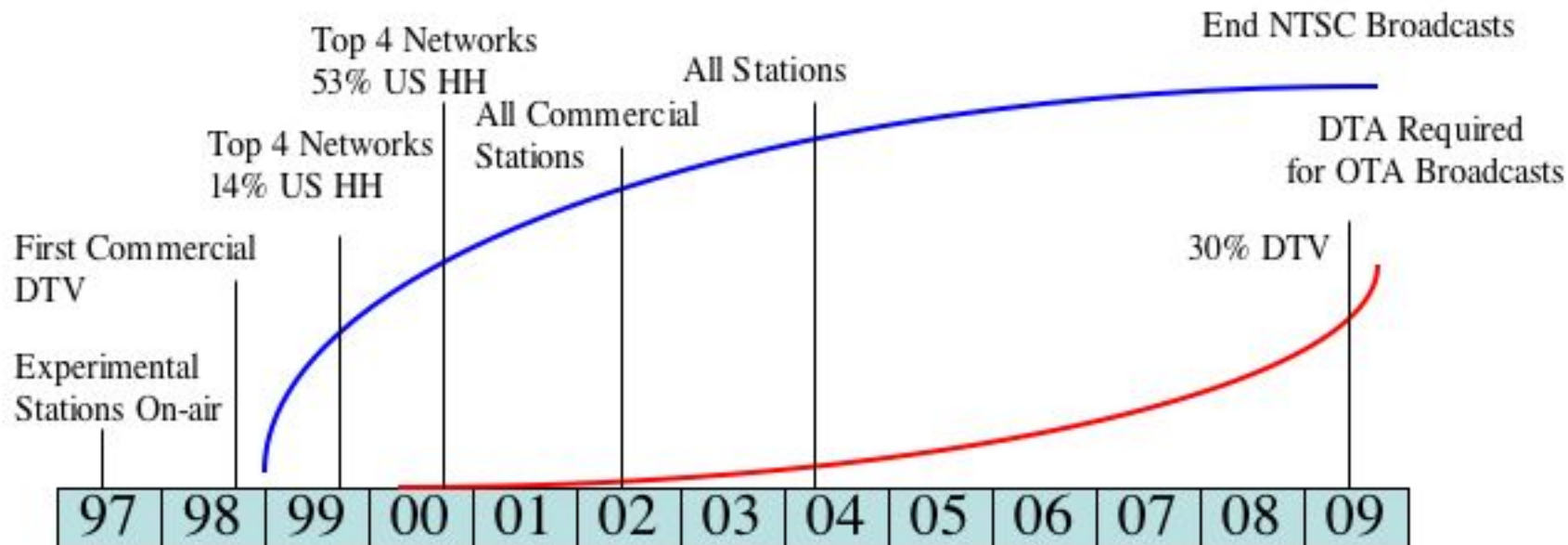


# Low Power DTA Designs

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21 July 2006



# HDTV History





## DTA Status

- Analog broadcast signals will go dark in 2009
  - Digital broadcast only after 2009
- Existing televisions will require a DTA
- California has a mandatory standard:
  - 8W power dissipation on, 1W standby
  - Title 20 regulation
  - Standard applicable to DTAs only
  - Standard NOT applicable to other STBs
- Market for DTAs will not exist until 2009

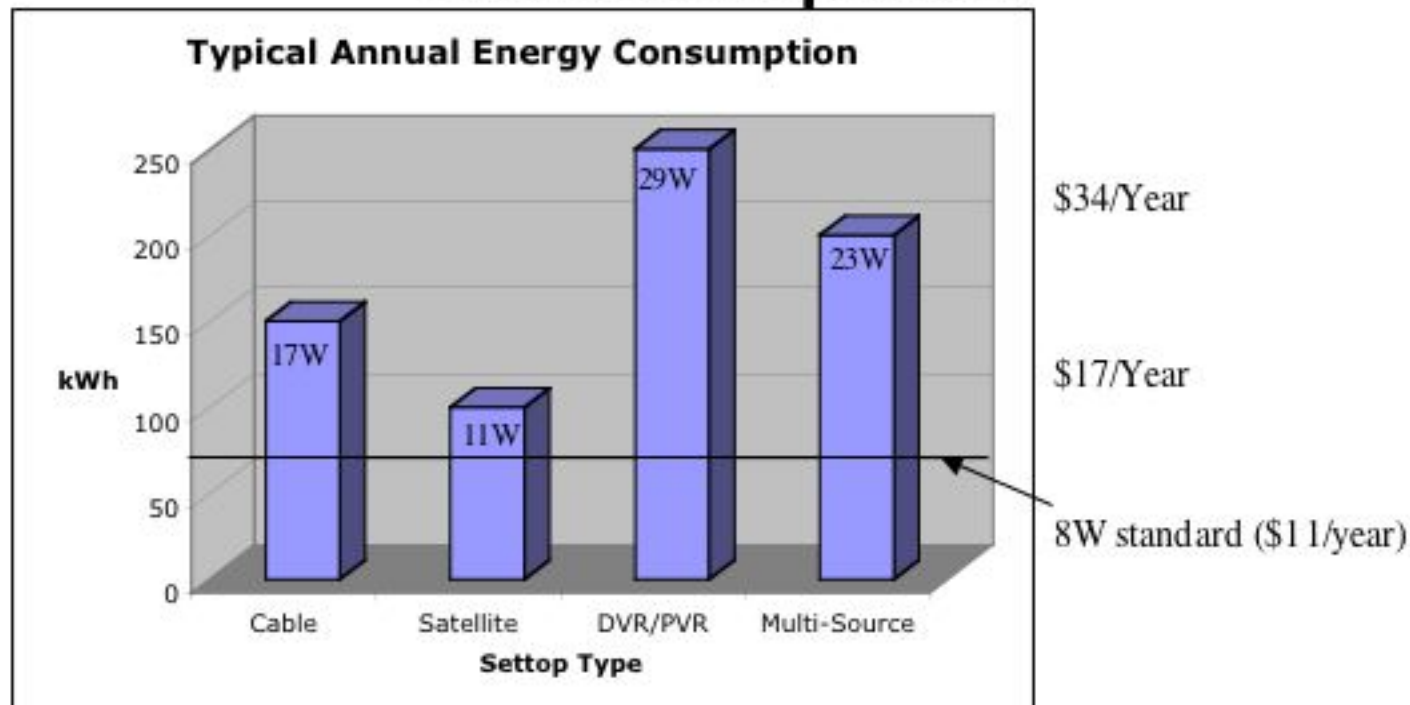


# Typical STBs

- Cable and satellite STBs were designed using 5 year old technology
  - High power consumption (10 to 40W on)
  - Over 120 component Bill of Materials (BOM)
  - Standby mode (when available) does not reduce power consumption
- Designs are complex and feature-rich
  - Pay per view
  - Internet access
  - Network connectivity
- Focus on security and management not power
- Physically large enclosures



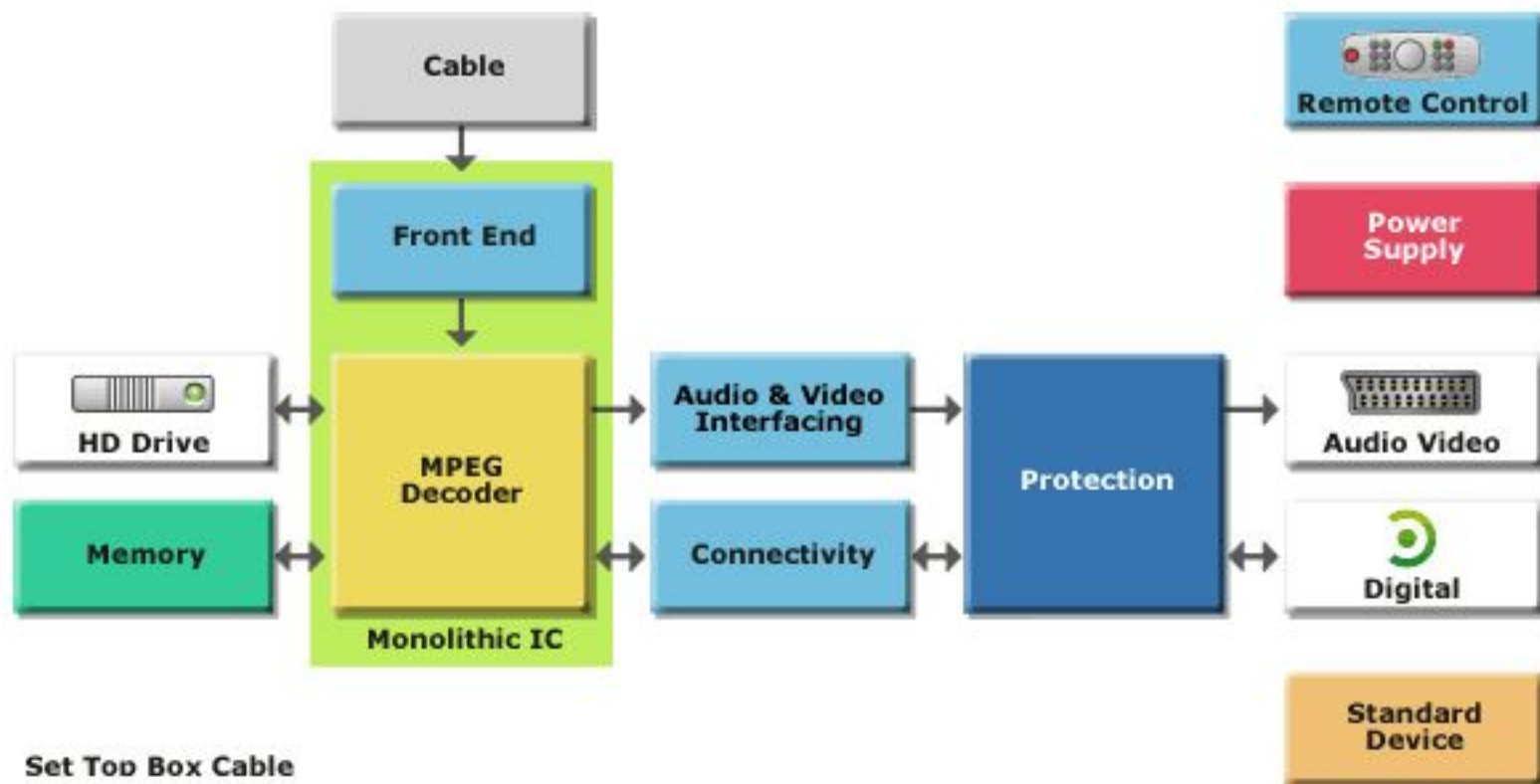
# Current Settop Consumption



EPA Report, June 2005



# Today's Complex STB Design

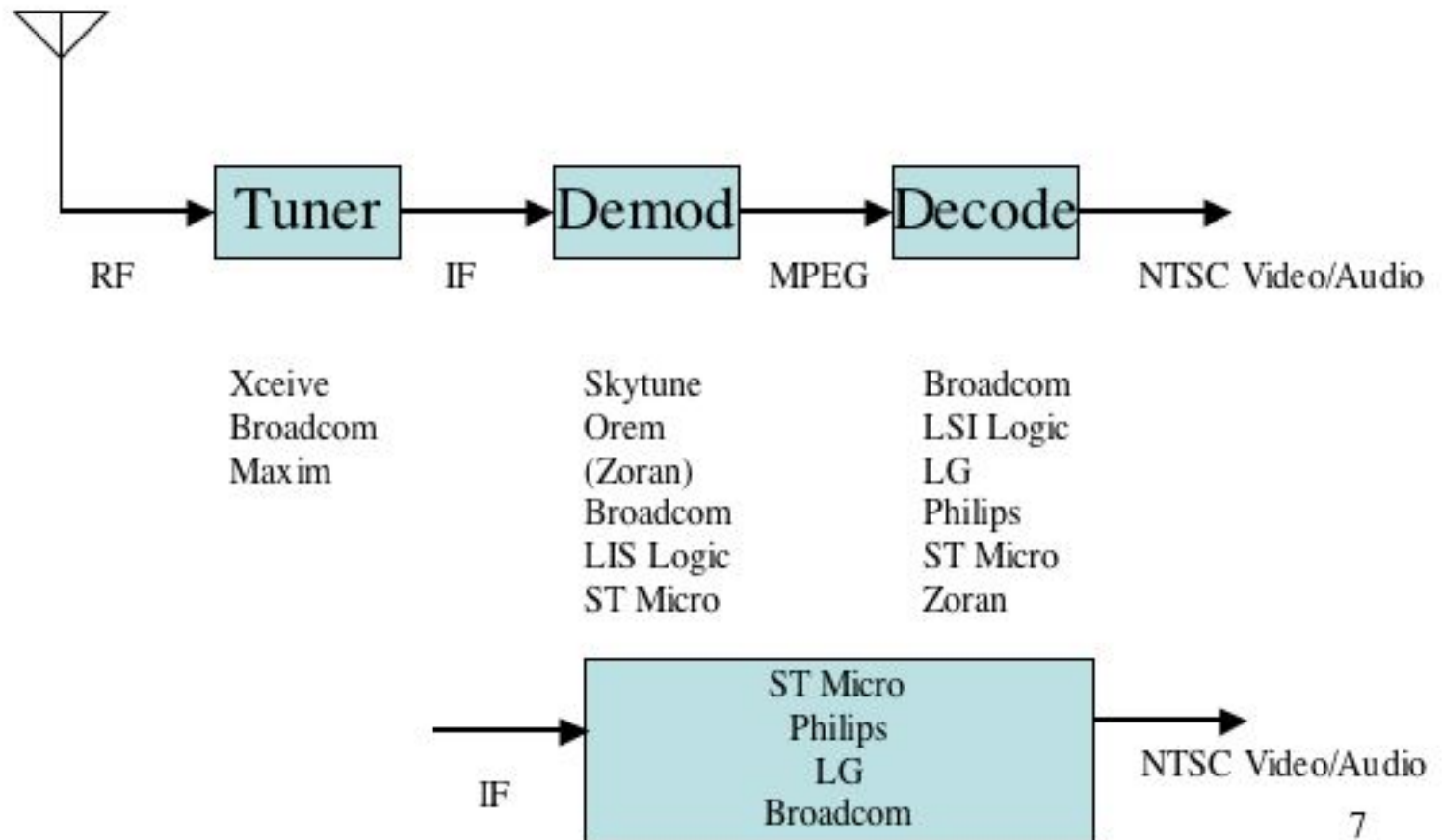


Set Top Box Cable

STMicroelectronics



# Current DTA Architecture





# New Technology for DTAs

- Single chip ATSC tuners (examples on following pages)
  - Low cost, low power
  - Previously designs used “tin cans” with discrete components
- Single chip 8-VSB demodulators
  - replace multiple chips and complex designs
- Single chip MPEG decoders
  - Substitute for PC's/co-processors
- TV manufacturers required to provide all TV's with DTV receivers which expands market and reduces cost



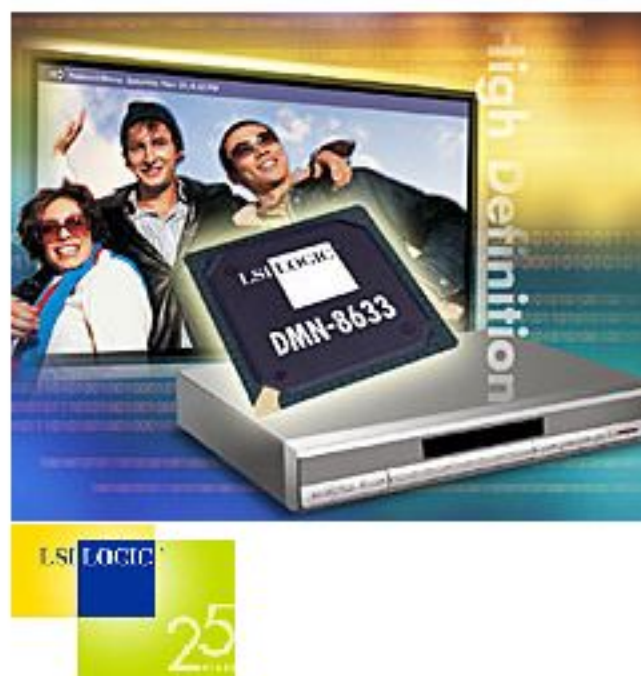
# Single Chip Tuner



Xceive, 2005



# 8-VSB Single Chip Demodulator





# MPEG-2 Single Chip Decoder



STMicroelectronics



## DTA Examples

- Pace DTA (\$140)
  - $< 8W$  on,  $< 1W$  standby
  - Discontinued due to lack of market demand
- VBOX USB-A 3560 (\$130)
  - USB powered, less than  $2.5W$
  - Does not decode MPEG-2 stream
- Miglia TVMini (\$140)
  - USB powered, less than  $1W$
  - Smallest form factor
- High prices are due to small quantities (less than 1K sales)





# DTA Analysis

	Zoran DTA construct (described above)		Zoran Costs	Paul Rudnick Analysis			
	Zoran Corporation Estimate	Zoran Corporation Estimate High		Zoran DTA Construct (low) Re- analyzed with 80% efficient power supply	Cost	Similar design to Zoran but with better available parts	Cost (components at min 1M guaranteed one time buy
Component/functional ity	Low						
Tuner	0.9	1.5	\$5	0.9	\$5	0.9	\$3
Receiver/dem odulator	0.75	1.2	\$5	0.7	\$5	2.7	\$4
Decoding	3	3.5	\$5	3	\$5	Inc. Above	\$0
Memory	1.5	1.5	\$1.20	1.5	\$1	0.8	\$1
Assorted analogue	0.5	0.5	\$1	0.5	\$0.50	0.5	\$1
Internal power supply	5	6	\$3	1.7	\$3	1	\$3
Total	11.6	14.2	\$20	8.3	\$20	5.9	\$12
Conversion			\$3		\$3		\$2.50
Remote			\$2		\$2		\$1
Package			\$0.50		\$0.50		\$0.50
Manual			\$0.75		\$0.75		\$0.50
Warranty reserve			\$1.00		\$1.00		\$1
Total cost			\$27		\$27		\$17
GM at \$40			31.4%		31.4%		57.5%



## Summary

- The CEC 8W active standard can be met today with current components and good design practices
- ALL new designs using current receivers meet the FCC A74 recommendation
- Off shore manufacturers are willing to meet a 6 month time window to high volume production
- BOM cost with current components is not a barrier to market entry
- Market dynamics will be driven by the termination of analog broadcast February 2009