

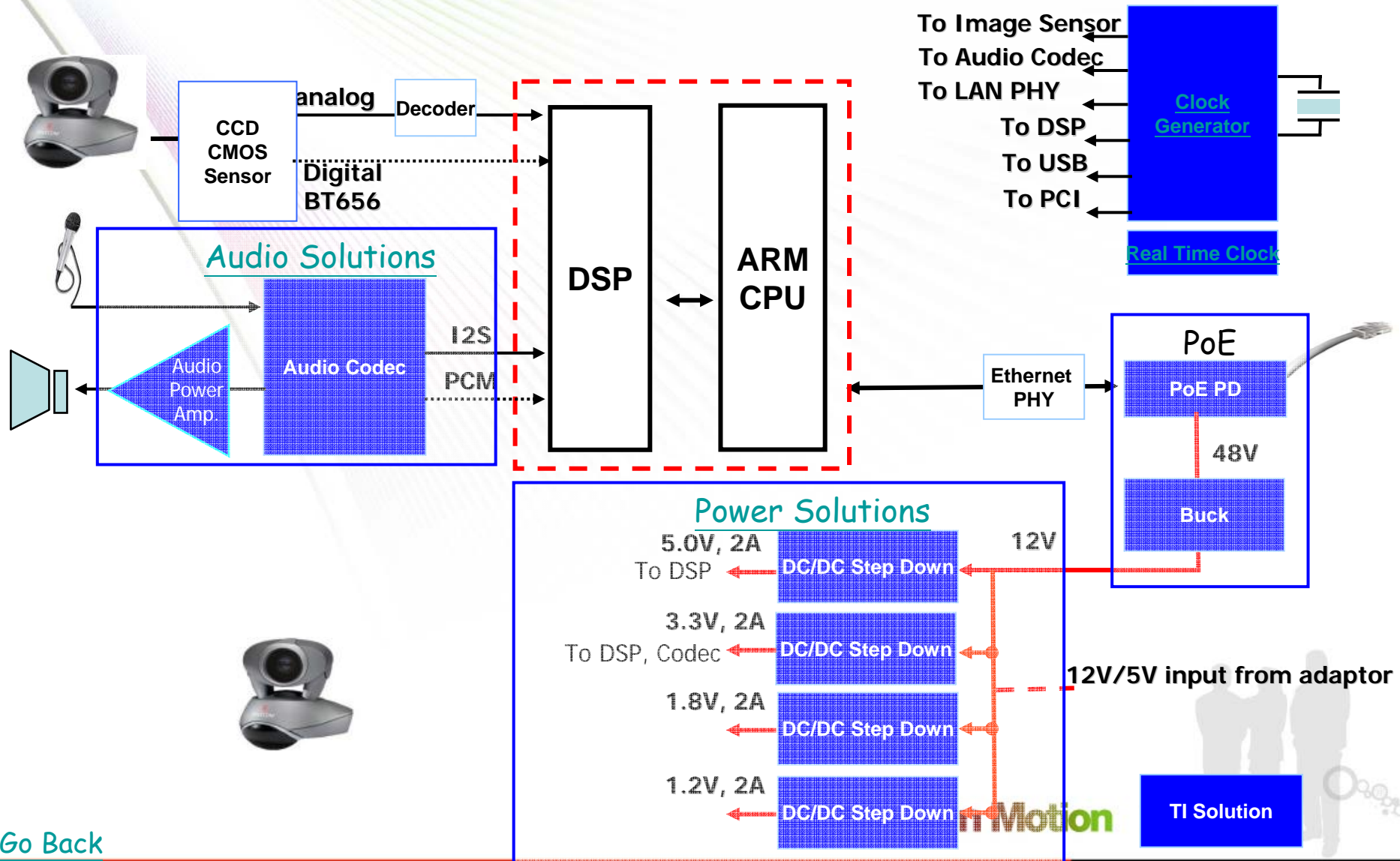
Surveillance - IP Camera - DVR

Yewei Dong
Texas Instruments

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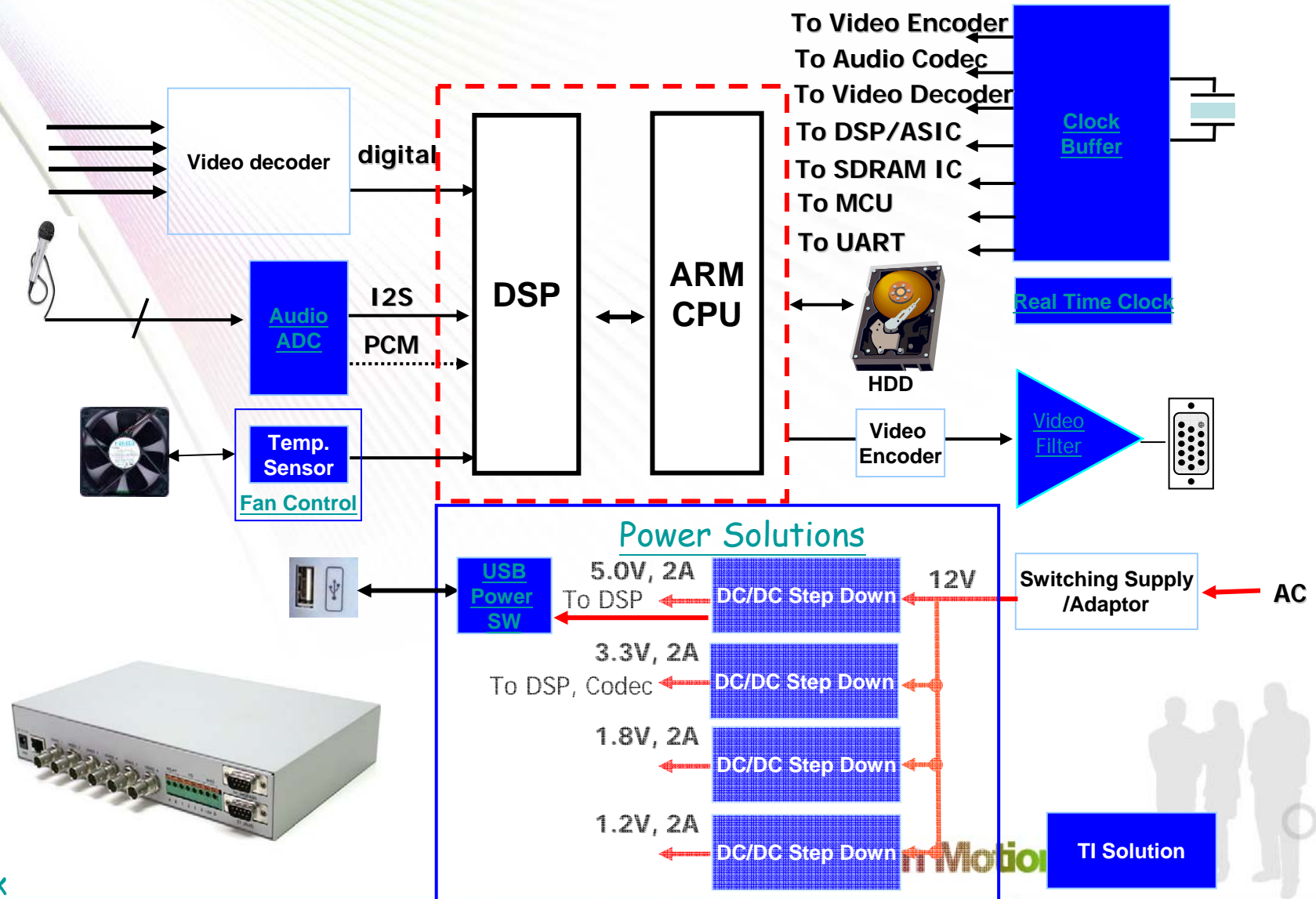


Surveillance – IP CAM



Go Back

Surveillance – DVR



Go Back



Surveillance – Selection Guide

P/N	RTM	Description
PoE		
TPS23750/70	Now	13W PoE PD+ buck controller
TPS2376H	Now	26W PoE PD
Audio		
AIC31/3104	Now	Stereo Audio Codec with/without speaker amp
AIC23	Now	Stereo Audio DAC
AIC12k	Now	Voice audio codec
PCM1801	Now	Mono Audio ADC
PCM17xx	Now	Stereo Audio DAC
TPA2006D1	Now	1.5W mono class D speaker Amp with 1.8V logic compatible
Clock		
CDCE949	Now	4PLL with 9 output and EMI reducing
BQ4802	Now	Real Time Clock with built-in battery



Surveillance – Selection Guide

P/N	RTM	Description
Video Filter		
OPA361	Now	Single channel Video Filter for Davinci DSP
THS7316	Now	VGA filter for VGA output
THS7303	Now	Variable BW video Filter for VGA output
Temperature		
AMC6821	Now	Fan controller with temperature sensor
TMP100	Now	Digital Temperature Sensor with I2C control

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Surveillance – Selection Guide

P/N	RTM	Description
Power Controller		
TPS40040/1	Now	5V input Single Buck Controller
TPS40190	Now	4.5~15V input sync. Single buck controller
TPS40200	Now	4.5~52V input non sync. Single buck controller
TPS51020	Now	4.5~28V input dual buck controller
TPS75003	Now	3~10V input dual buck controller + LDO
Power Converter		
TPS54331	07Q4	3~28V input 3A single buck converter
TPS62111	Now	3~17V input 1.5A single buck converter
TPS5430	Now	5.5~36V input 3A, single buck converter
TPS62040	Now	5V input, 1.2A single buck converter
TPS62020	Now	5V input, 0.6A single buck converter
TPS62300	Now	5V input, 0.5A single buck converter



Surveillance – Selection Guide

P/N	RTM	Description
Power Converter		
TPS54383/6	Now	4.5V~28V input, 3A dual buck converter
TPS54283/6	Now	4.5V~28V input, 2A dual buck converter
TPS62400	Now	5V input dual buck converter
LDO		
TPS767/8	Now	5V input LDO
PMU		
TPS65023	Now	Triple Buck + Triple LDO
Low Voltage Detector		
TPS3803/5	Now	Low Voltage Detector
TPS3808	Now	Programmable Low Voltage Detector
USB Power Switch		
TPS20xx	Now	USB Power Switch



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TPS65023 – PMU

Features

- Input Voltage: 2.5V to 6.0V
- Output Voltage: 0.6V to V_{IN}
- **Dynamic Voltage Scaling** via I²C Bus for Core
- Package: 5x5mm² QFN-40
- Separate Enable Pins for DCDC1/2/3
- 85uA Quiescent Current
- Outputs:
 - **1.2A DCDC1** step-down, system voltage
 - **1.0A DCDC2** step-down, memory bus
 - **1.5A DCDC3** step down, core voltage with DVS
 - **200mA LDO1**
 - **200mA LDO2**
 - **30mA LDO3**

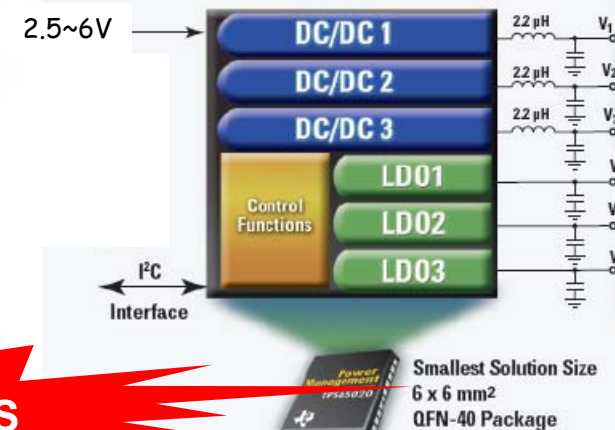
Applications

- IP Camera

[Go Back](#)

Benefits

- Able to operate a variety of voltages
- Power saving capability
- Designed for **DaVinci technology** power needs
- Small foot print
- Supports a variety of sequencing requirements



Our Customer: Pelco US

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Family part numbers: TPS65020, TPS65021, TPS65022, TPS65023

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TPS5430: High Vin Buck Converter

Features

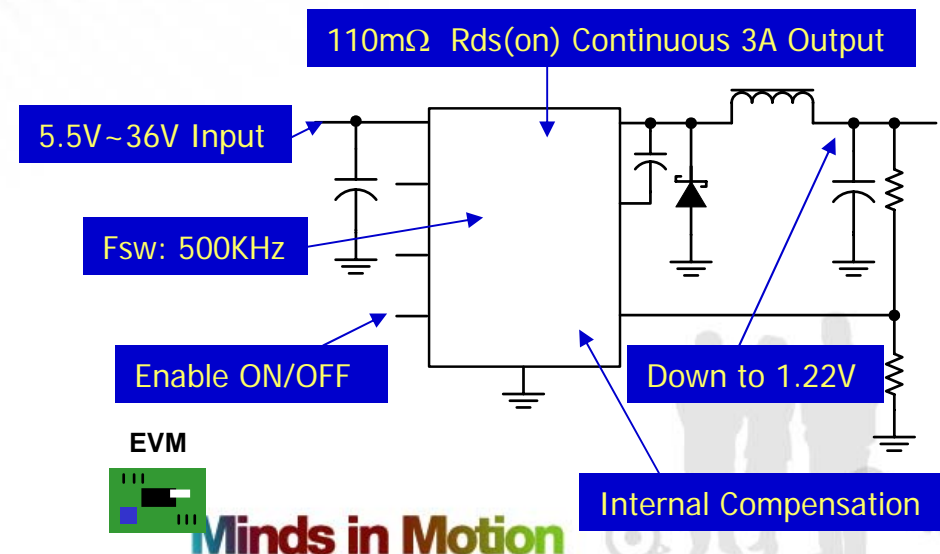
- **5.5-36V Input** Voltage Range; 8pin Power Pad SOIC
- Integrated 110mΩ Rds(on) High Side Switch for **3A** Continuous Output Current
- Adjustable Output Voltages down to 1.22V with 1.5% Accuracy
- Internal Compensation Allows Lower External Part Count
- Internal Slow-start, Under-voltage Lockout, Current limit, Thermal shutdown and Enable

Advantage

- IP-CAM, DVR
- Telecom CPE Side and Automotive

Benefits

- 500kHz Allows Lower Cost, Smaller Passive Components than Competitive Solutions
- Small SOIC Packaging vs. TO263
- Voltage Feed Forward for Better Accuracy over Wide Input Voltage Range
- Easy to Use SWIFT Software Tool Support



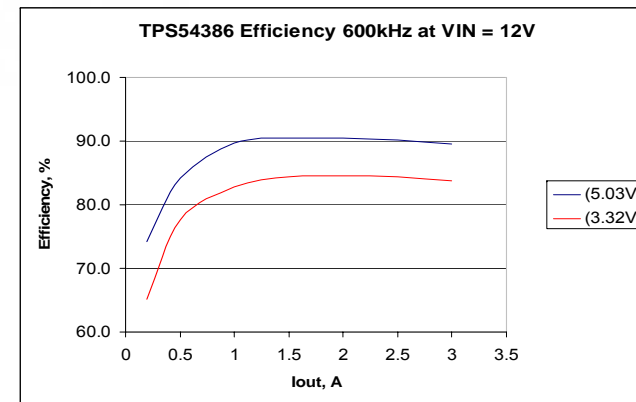
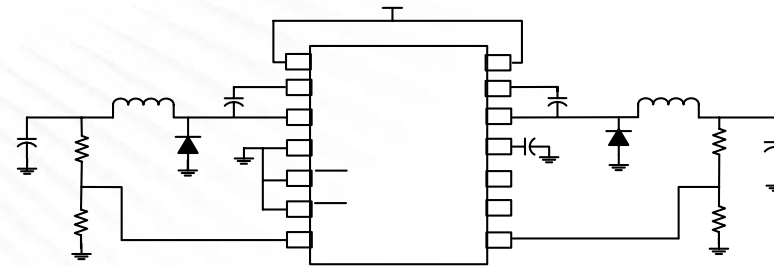
[Go Back](#)

TPS54383/6: 3A Dual Buck Converter

Features

- 4.5V to 28V input; 3A Output Current
- Switching Frequency
 - TPS54383= 300kHz;
 - TPS54386= 600kHz
- ~ 85 mOhm Integrated High Side FET
- Two Configurations
 - Two Buck Converters (shown)
 - Ch 1 Boost and Ch 2 Buck
- 0.8V 1.5% Reference
- Ch 1 Current Limit (~4.2A)
- Ch 2 3 Current Limits ~(4.3A, 2.9A, 1.6A)
- Ch 1 switching 180° out of phase with Ch 2
- 14 lead TSSOP PowerPAD™ package

14 components total!



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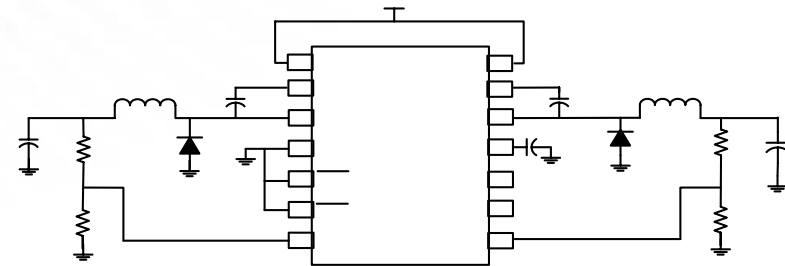
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TPS54283/6: 2A Dual Buck Converter

Features

- 4.5V to 28V input; 2A Output Current.
- Switching Frequency
 - TPS54283= 300kHz;
 - TPS54286= 600kHz
- ~ 85 mOhm Integrated High Side FET
- Two Configurations
 - Two Buck Converters (shown)
 - Ch 1 Boost and Ch 2 Buck
- 0.8V 1.5% Reference
- Ch 1 Current Limit (~2.9A)
- Ch 2 2 Current Limits ~(2.9A, 1.6A)
- Ch 1 switching 180° out of phase with Ch 2
- 14 lead TSSOP PowerPAD™ package

14 components total !



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TPS40200: Non Sync. Buck Controller

Features

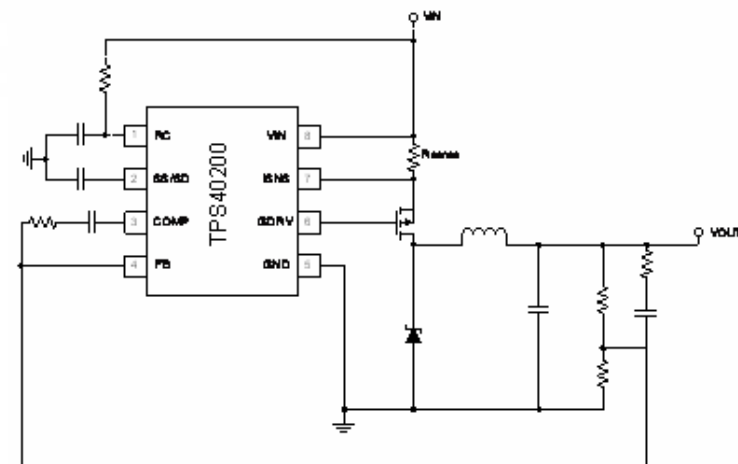
- 4.5V to 52V operation
- Voltage Mode Control (with Feed) Forward Compensation
- Internal Under-Voltage Lockout
- Programmable Frequency ($35K < F_{osc} < 500K$)
- Frequency Synchronization
- Closed Loop Soft Start
- Programmable Overcurrent Protection
- 700mV Voltage Reference
- Integrated Driver
- Package - 8 pin SOIC

Benefits

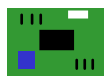
- Wide input range for use in many applications
- Feed-forward – great line regulation, fast transient response
- Programmable features allows flexible design: Frequency, overcurrent protection, softstart
- Simple configuration- minimal external components
- SS provides smooth, well controlled power up
- Supports lower output voltages

Applications

- Industrial control



EVM/Tool



- TPS40200EVM-001 (8-16Vin)
- TPS40200EVM-002 (18-36Vin)

• 1ku pricing- \$0.55

Minds in Motion Only 11 R's/C's required!

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TPS20xx: USB Power Switch

RECENTLY RELEASED USB PRODUCTS

TPS2041B 500mA Single, MSOP and SOIC	TPS2042B 500mA Dual MSOP and SOIC	TPS2043B 500mA Triple SOIC	TPS2044B 500mA Quad
TPS2051B 500mA Single, MSOP and SOIC	TPS2046B 250mA Dual SOIC	TPS2053B 500mA Triple SOIC	TPS2054B 500mA Quad MSOP
TPS2061 1A Single SOIC and MSOP	TPS2052B 500mA Dual SOIC (MSOP TBR 9/15)		
TPS2065 1A Single SOIC (MSOP TBR 9/15)	TPS2062 1A Dual MSOP and SOIC		
	TPS2066 1A Dual MSOP and SOIC		

Why use a USB Switch over a Polyfuse?

FEATURE	Polyfuse	USB Switch
Report over-current condition	NO	YES
Fast Response Time (22 A Load)	NO	YES
Limit Output Current <5A	NO	YES
Meets VDROF Requirements (80mV)	2.5A Device	YES
Enabled/Disabled by controller	NO	YES
Meets all requirements of USB Spec?	NO	YES

USB New Products: A vs. B Comparisons:

Operating Temperature Range
 'B' Family is rated from -40 deg C to +85 deg C
 'A' Family is rated from 0 deg C to +85 deg C

Turn-on and Turn-off Time
 'B' Family has a 3ms Ton and 10ms Toff
 'A' Family has a 20 ms Ton and 40 ms Toff

Available packages
 'B' Family single and dual are available in MSOP-8 and SOIC-8
 'A' Family single and dual only come in SOIC-8

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TPS3803/5: Single/Dual Low Voltage Detector

Features

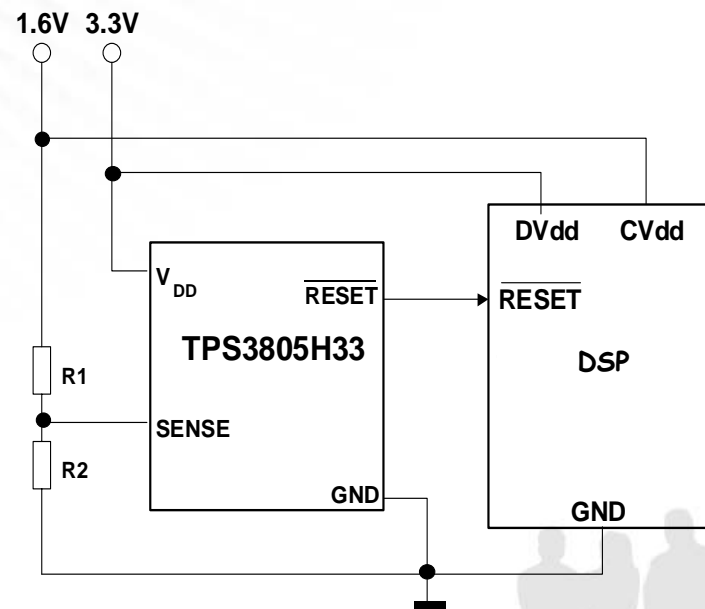
- Defined RESET from $V_{DD} \geq 0.8V$
- 1.5% Threshold Voltage Accuracy
- SC-70 Package

Benefits

- Eliminates undefined states during power-up of system
- Allows for more efficient use of battery capacity
- Saves board space and allows for smaller designs

Available Options

	Voltage Options	Typ. supply current (uA)	Output stage	Package
TPS3803-01	Adj.	2	Open-Drain	SC70-5
TPS3803G15	1.5V	3	Open-Drain	SC70-5
TPS3805H33	3.3V/Adj.	3	Push/Pull	SC70-5



Application

- Power Supply Monitoring for DSPs & μC

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TI HPA for Surveillance PoE

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PoE – Application Types

TPS23750/70 (13W, PoE PD+ Buck Controller)

TPS2376H (26W)



[Next Topic](#)

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PoE Technology

- **Data + Power** over **CAT-5** Ethernet cables
- **IEEE 802.3af** defines 15W max (**13W** load), **48V** nominal supply
- **Both ends** of cable need power management



CAT-5 Ethernet Cables



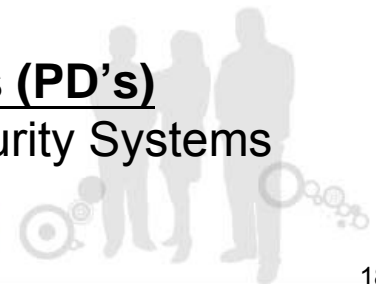
Power Sourcing Equipment (PSE's)

Ethernet Routers, Switches, Hubs

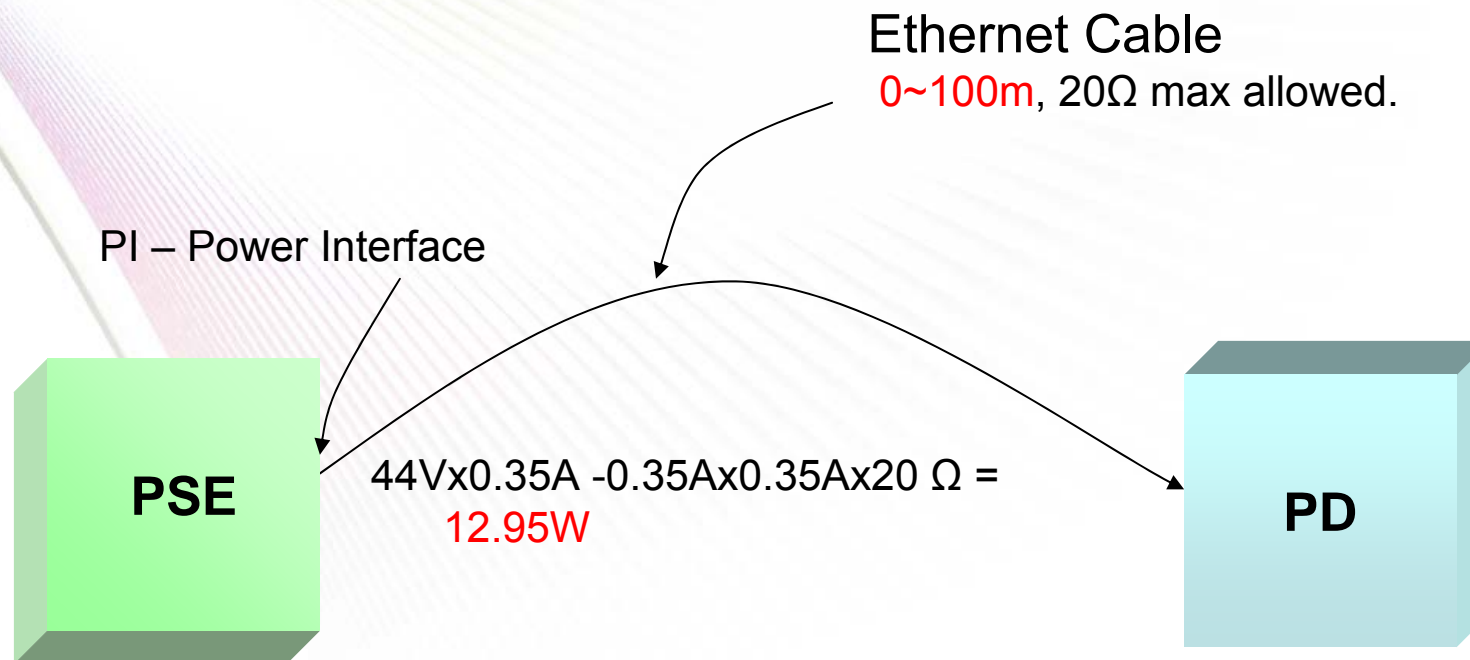
Powered Devices (PD's)

Network Cameras, Security Systems

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Why 13W Guarantee Only?



Power Sourcing Equipment

Nominal supply: 48V

Operation range: 44V~57V

Max load: 350mA.

15.4W (44Vx350mA) minimum power offering guaranteed

Powered Device

12.95W minimum available power guaranteed

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Benefits of PoE

Data and Power over a single CAT-5 cable means



- **Convenient**
No Adapters
- **Flexible for power distribution**
Wireless access points no longer need to be located near **AC power sources** or need power lines and outlets
- **Remote management capability**
IP phones, WLAN access points can be powered up or down remotely
- **Higher reliability**
Uninterruptible power supplies (**UPS**) can be used to provide IP phone service
- **Worldwide compatibility**
RJ-45 is a power connector that can be used worldwide

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TPS23750/70: PoE PD+ DCDC Controller

Features

- Complete 802.3af PoE Interface
- 100V Vin Max
- Features derived from the TPS2375
- **Primary Side DC/DC Controller**
- Current Mode Control
- Isolated or Non-Isolated Topologies
- Programmable Operating Frequency
- Current Sense Leading-edge Blanking
- 50% Duty Cycle Limiting
- Voltage Output Error Amplifier
- Industry-Standard 20 TSSOP Package
- **Industrial Temperature Range**
- TPS23750 = IEEE802.3af UVLO Thresholds
- TPS23770 = “Legacy” UVLO Thresholds

Applications

- Security Cameras

EVM

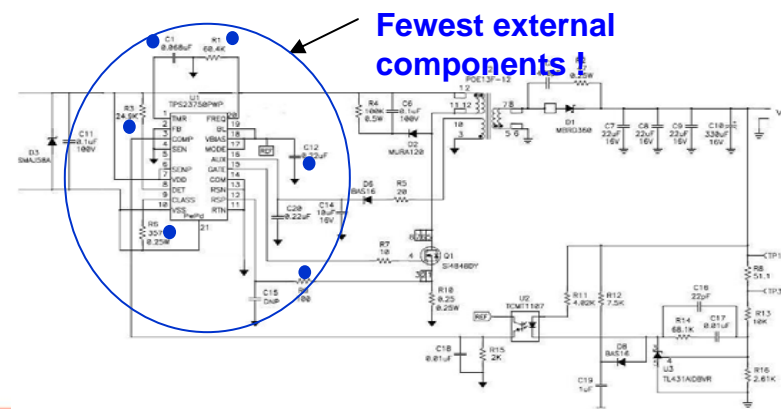


\$1.75 1Ku Price

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Benefits

- **Fully Integrated PoE Solution**
- Reduces component count
- Reduces board area
- Eliminates PD - DC/DC interface issues
- DC/DC optimized for PoE
- Flexibility to create isolated or non-isolated designs
- Adjustable switching frequency
- Allows reuse of existing power circuits
- Allows optimum operation of different topologies
- Enhanced package thermal performance



TPS2376H: High Power PD Controller

Features

- Permits 26W high power designs
- Adjustable turn-on threshold
- Integrated 0.58Ω, 100V Low-side switch
- 15kV ESD
- Industrial temperature range
- Current limit above 802.3af requirements
- Meets latest IEEE802.3at recommendations
- Power Pad SOIC package

Applications

- Security cameras

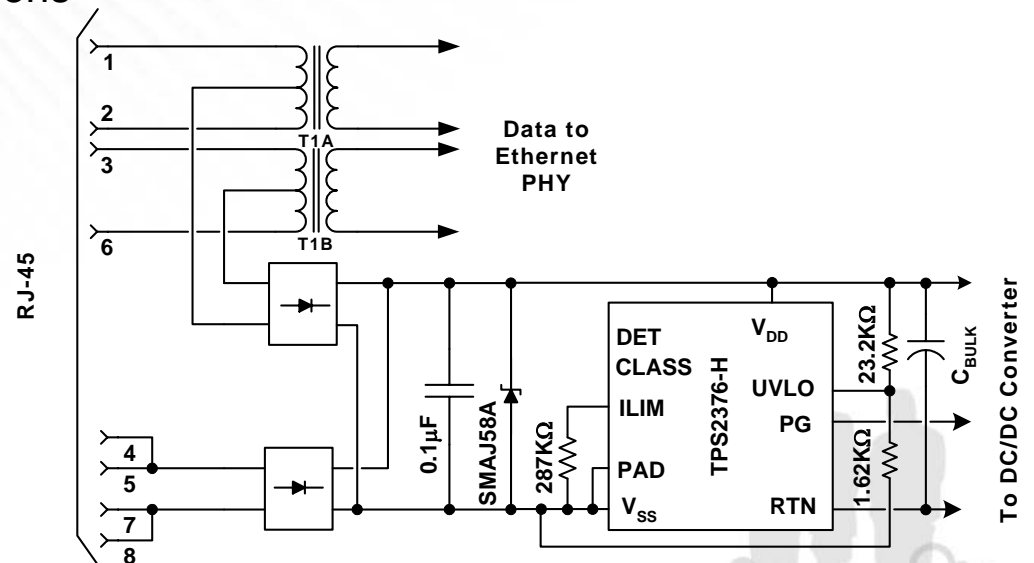
\$1.25 1ku pricing

EVM



Benefits

- Twice the 802.3af (13W) power
- Any high voltage supply can be used
- Low resistance allows more power
- More robust than competitors
- Able to use in 24V Industrial and Medical



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PD Reference Designs

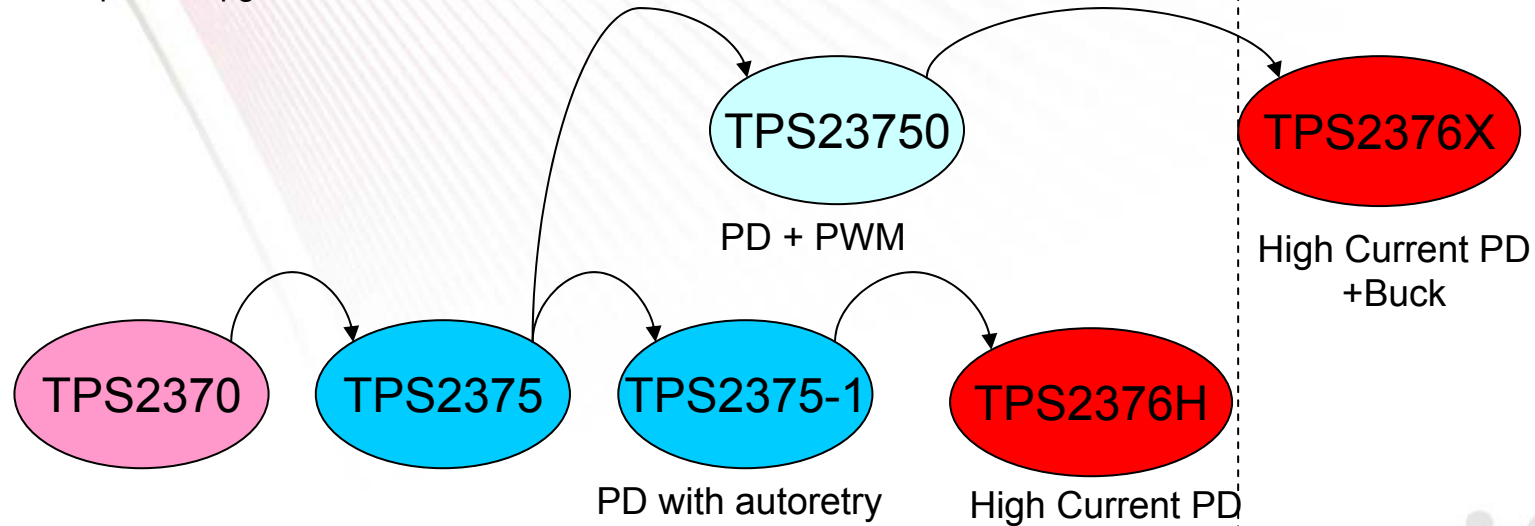
Reference Design	Topology	Outputs	Isolation
PMP717 (TPS2375 + UCC3809)	buck-boost	3.3V @1.5A	Yes
		1.8V @0.5A	
PMP940 (TPS2375 + UCC3809)	buck-boost	12V @1A	Yes
PMP974 (TPS2375 + UCC3809)	buck-boost	3.3V @3.1A	Yes
		5V @1A	
		12 - 24V @20mA	
		1.5V @250mA	
PMP1012 (TPS2375 + UCC3809)	buck-boost	5V @1A	Yes
PMP1013 (TPS2375 + UCC3809)	buck-boost	9V @1.2A	Yes
PMP1038 (TPS2377 + UCC3809)	buck-boost	3.3V @1.5A	Yes
		5V @200mA	
		12V @200mA	
PMP1057 (TPS2375 + UCC3809)	buck-boost	3.3V @2.85A	Yes
		2.5V @0.36A	
		1.3V @1.2A	
PMP1234 (TPS23750)	buck-boost	24V @ 0.5A	Yes
PMP1276 (TPS2375 + UCC3844)	buck-boost	5V @0.3A	No
PMP1287 (TPS23750)	buck-boost	5V @ 0.3A	No

PD Roadmap

- 1st Gen
- 2nd Gen
- 3rd Gen
- Pin compatible upgrade

Production

Coming



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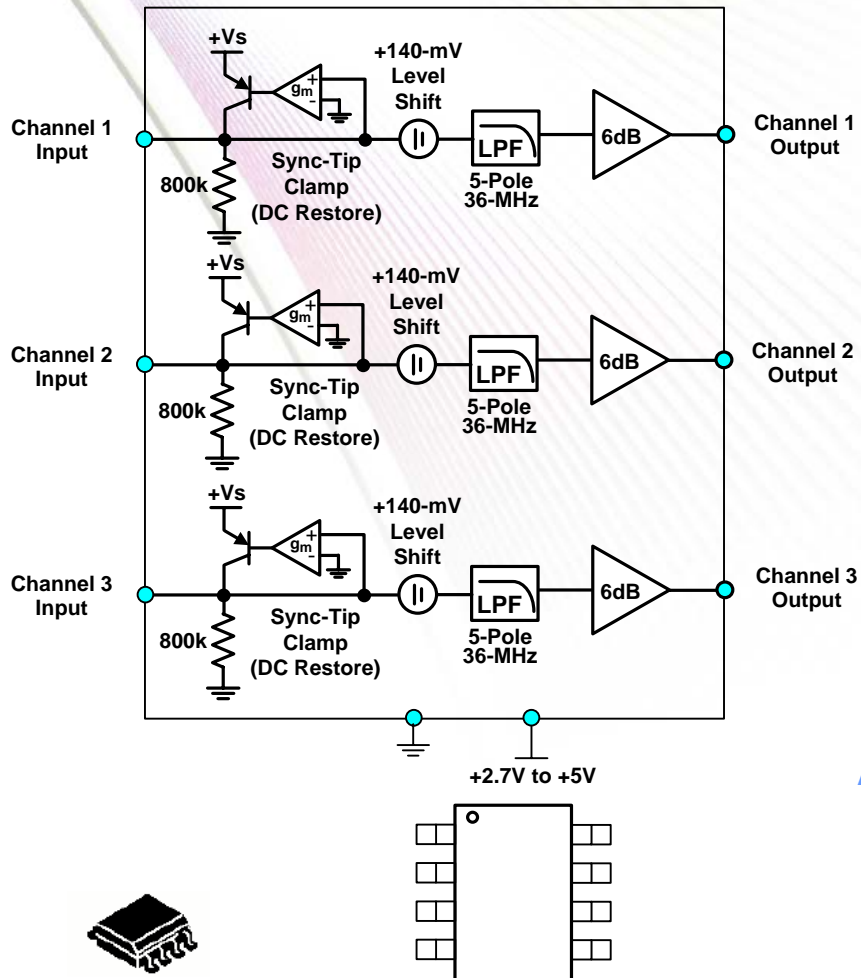
TI HPA for Surveillance Video Filters

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THS7316: VGA Filter



SOIC-8

Features

- **\$1.20 @ 1ku**
- **3V to 5V** operation
- **5-Pole Butterworth Low Pass Filter @ 36-MHz**
- **Input Allows DC Coupling with Internal Level Shifter**
- **Input also has Transparent STC / DC Restore for AC Coupled Applications if Desired**
- **Fixed +6dB Gain**
- **18-mA Total Quiescent Current (60mW @ 3.3V)**
- **Rail-to-Rail Output - DC or AC Coupled**
- **V_{ICR} Includes Ground**
- **SOIC-8 package - Lead Free (RoHS) and Green**

Applications

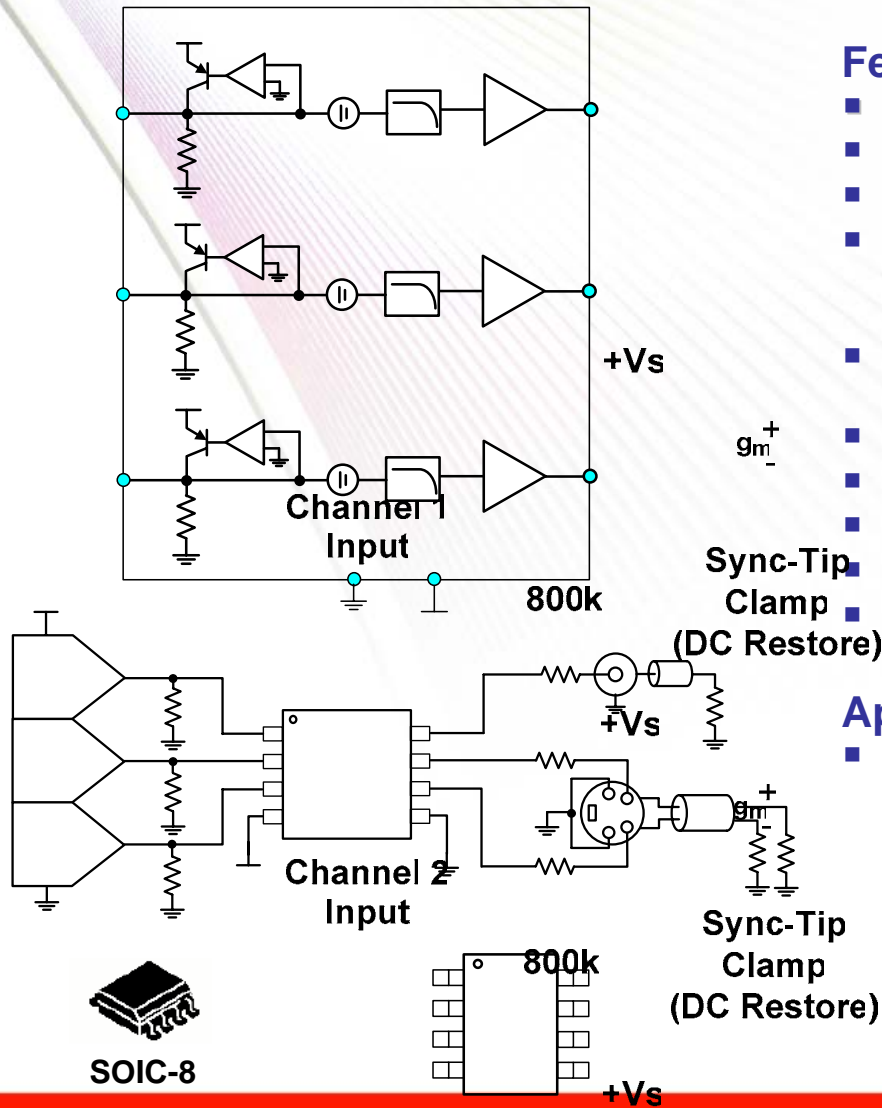
- **DVR VGA Output Buffering**
- **DVDR / PVR DAC Output Buffering**
- **Low Power for Portable / USB Powered Systems**



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THS7315: Video Filter for DaVinci



Features

- **LOW COST** - Budgetary Pricing = **\$0.50 @ 1ku**
- **3V to 5V** operation
- 5-Pole Butterworth Low Pass Filter @ 8.5-MHz
- Input Allows DC Coupling with Internal Level Shifter that Internally Shifts the Signal 280mV at the Output to Eliminate Saturation Issues.
- Input also has Transparent STC / DC Restore for AC Coupled Applications if Desired
- Gain of **5.2V/V** (14.3dB) Optimized for **DaVinci**.
- 16-mA Total Quiescent Current (53mW @ 3.3V)
- Rail-to-Rail Output - DC or AC Coupled
- Drives 2 Video Lines (75-ohm loading)
- SOIC-8 Package - Lead Free (RoHS) and Green

Applications

- Perfect Fit with DaVinci/DMxx/OMAP processors

FIRST SAMPLES & EVM AVAILABLE NOW

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Channel 3 Input

Level Shift

LPF

5.2 V/V

Channel 3 Output

OPA361: Video Filter For Davinci

Features

- Internal Gain: 5.2 V/V
- Compatible With 0.5Vpp Video Input
- Supports TV-Detection
- 2-pole Reconstruction Filter
- Input Range includes Ground
- Integrated Level Shifter
- Rail-to-Rail Output
- Shutdown Current: 3 μ A
- Single-Supply: 2.5V to 3.3V
- SC70-6 Package: 2.0mm X 2.1mm

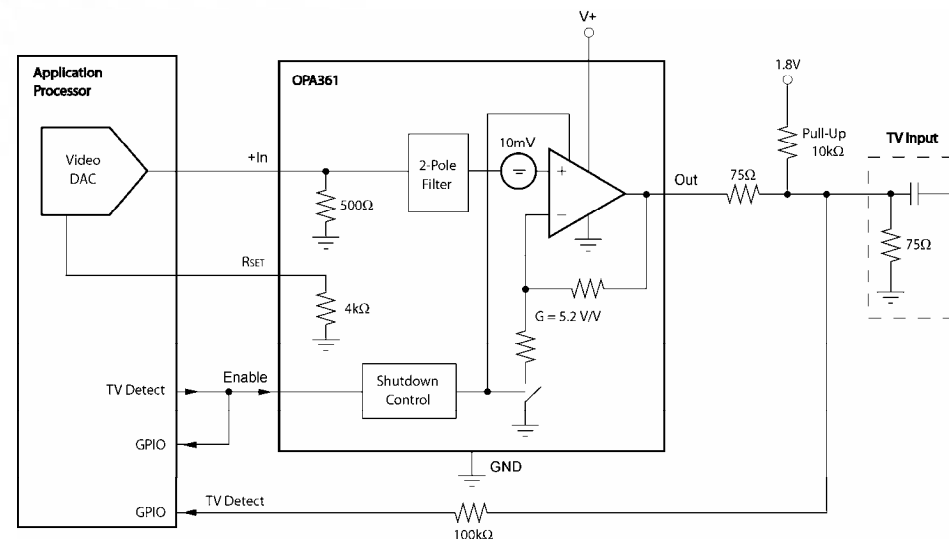
Applications

- DVR
- Video Server
- IP Camera

\$0.49 in 1ku

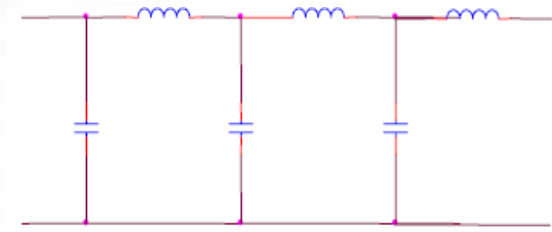
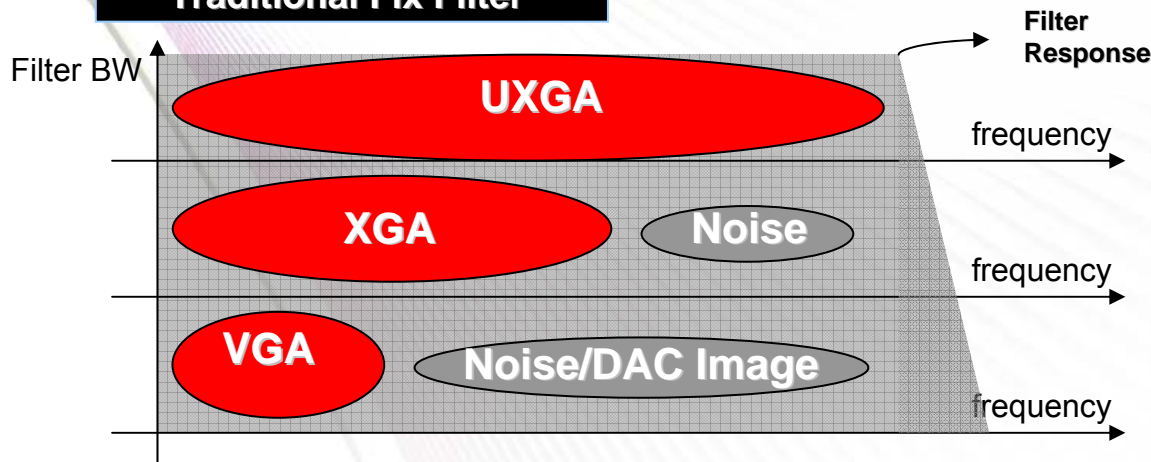
Benefits

- Optimized for **DaVinci Multimedia Processors**.
- Simplifies End-User Interface by facilitating automatic Start/Stop of Video
- DC-coupled In- and Output saves costly coupling caps
- Sleep Mode preserves Battery Life
- Small Package Ideal for Mobile Phones

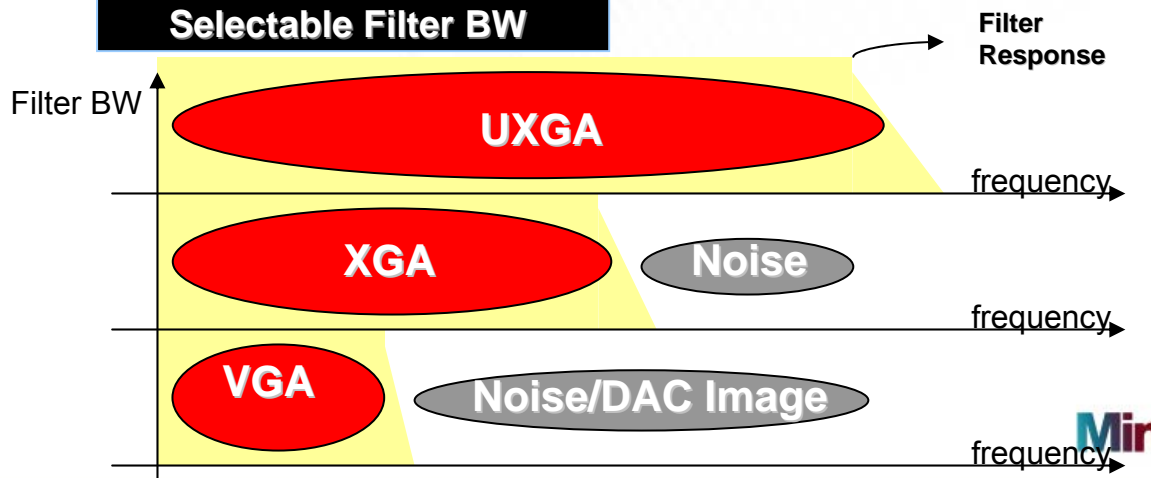


THS7303 – Variable Filter Advantage

Traditional Fix Filter



Selectable Filter BW



Fully Programmable Analog Video Processor Family

Channel 1 of 3 Channels

Channel 1 Input A

Channel 1 Input B

2:1 MUX

Input Mode Select

LPF

9/16/35-MHz Bypass

6dB

SAG

Channel 1 Output

TEXAS INSTRUMENTS

THS7303

Mind

TI HPA for Surveillance Audio Solutions

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PCM1801: Audio ADC

Features

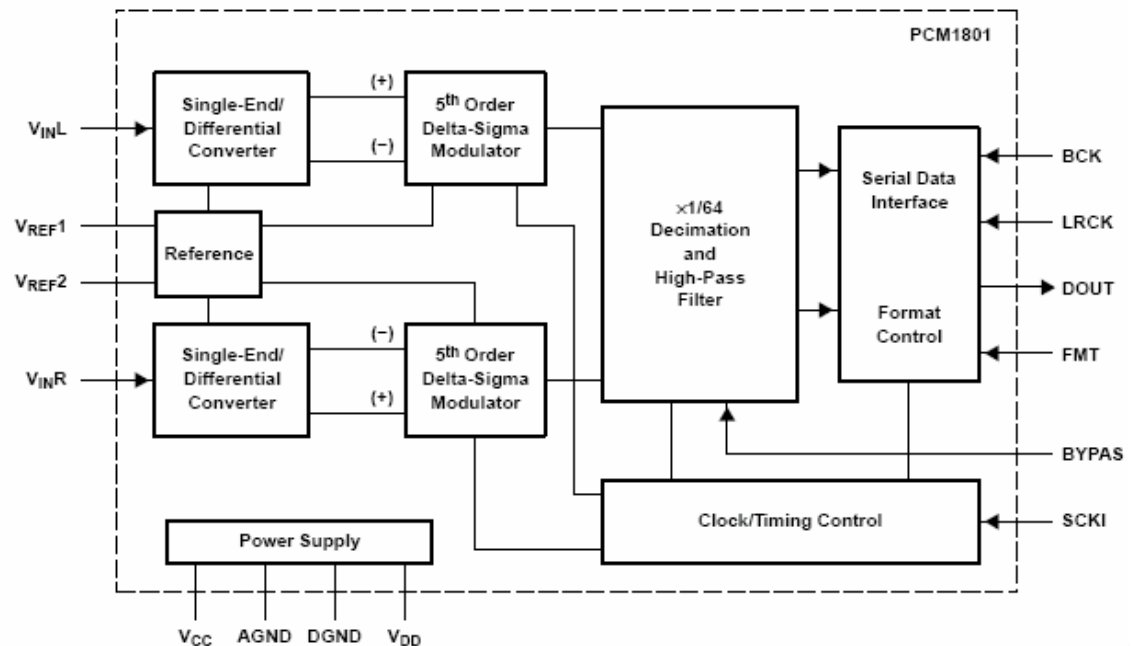
- Dynamic Range / SNR:
 - 93dB typical
 - 101dB at $f_s = 96\text{kHz}$
- THD+N: -88dB
- Oversampling Frequency: x 64
- Stop-band Attenuation: -65dB
- On-chip High-pass Filter:
 - $F_c = 0.91\text{Hz}$ (@48kHz)

Applications:

- Security Cameras & DVRs

Key Differentiators

- Optimized features for general audio applications
- Cost-effective mono Audio ADC
- Anti-aliasing filter integrated on analog inputs
- Small 14-TSSOP package



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AIC12k: 16bit Voice Codec

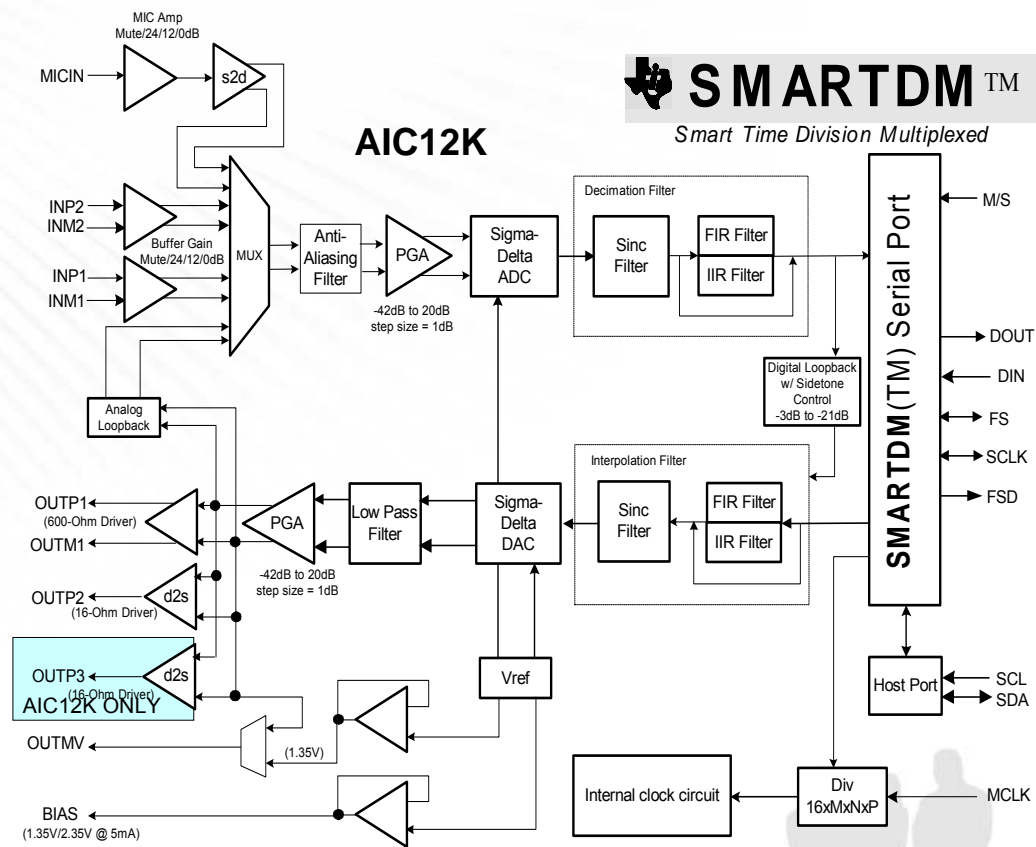
Features:

- 16-bit, programmable Fs up to 26ksp/s
- Built in microphone bias/preamp, handset/headset preamps, antialiasing filter, and programmable gain amplifier
- Built in side tone
- Flexible host port - I2C or S2C
- SMARTDM serial port
- 30-pin TSSOP
- 16-Ohm drive (*only on TLV320AIC12K*)

Applications:

- DVR
- IP CAM

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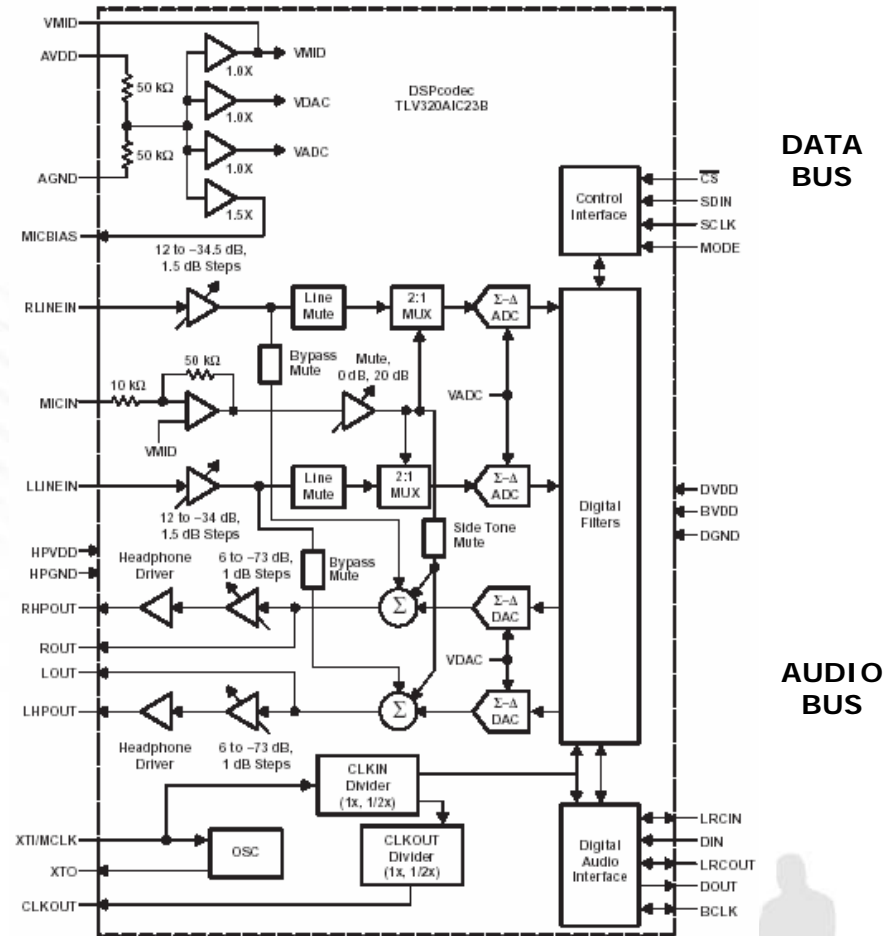
AIC23B: 16~32bit Audio Codec

Features

- Stereo 8-96Ksps audio DAC with 100dB SNR
- Stereo 8-96ksps audio ADC with 90dB SNR
- Microphone input with bias and analog side-tone
- Stereo Line Inputs / Outputs
- Analog Stereo mixer for DAC and analog bypass path
- Analog volume control with mute
- 2-wire and SPI Control
- I²S Audio or Standard MSB and LSB justified data transfers data interface
- **30mW** into 32W stereo headphones
- **Small package:** 5 x 5 32-QFN
5 x 5 mm 32-BGA
28-TSSOP

Applications

- DVR
- IP CAM



Digital supply: 1.42V – 3.6V
Analog supply: 2.70V – 3.6V

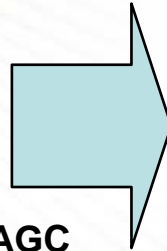
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AIC31: Stereo Audio Codec + Amp

Features

- 14mW stereo 48ksps playback
- Stereo DAC 8-96ksps **100dB** SNR !
Stereo ADC 8-96 ksp **92dB** SNR !
- Programmable digital **audio processor**
- **3** differential microphone or line inputs
- Integrated **microphone bias, preamp, AGC**
- **Integrated phase locked loop**
- Speaker & cap-free headphone drivers
- Audio interface: I²S, DSP and TDM
- Control interface: I²C
- 5mmx5mm 32pin QFN



Benefits

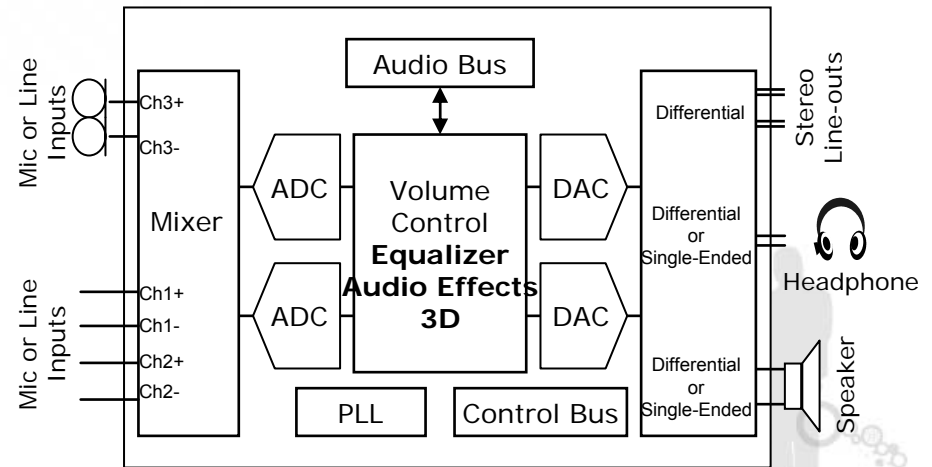
- Ultra low power for extended battery run time
- Ultra low noise for excellent audio quality
- 3D, bass, treble, EQ, and de-emphasis effects
- Accepts multiple audio sources
- Seamless interface to electret microphones
- No ext crystal required, use 512kHz-50MHz input
- High integration - fewer external components
- Flexible interfaces and ability to multiplex devices
- Small footprint, saving board space and cost

AIC3104: AIC31 without Speaker Driver

Application

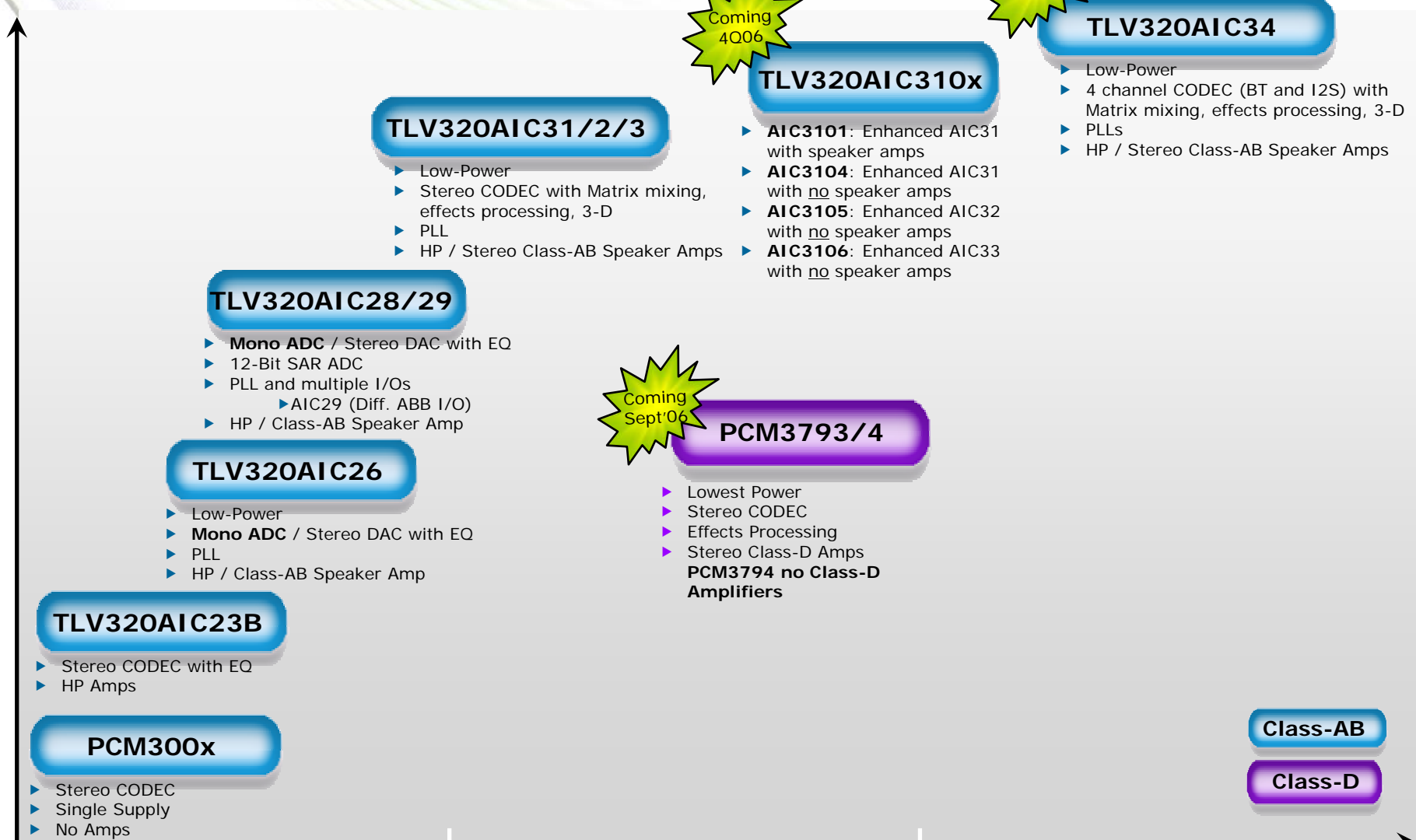
- IP CAM
- DVR

Power Supply Voltages
 Analog: 2.7 – 3.6V
 Digital Core: 1.525 – 1.95V
 Digital I/O: 1.1 – 3.6V



[Go Back](#)

Audio CODEC: Family



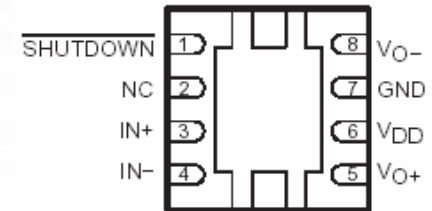
[Go Back](#)

TIME

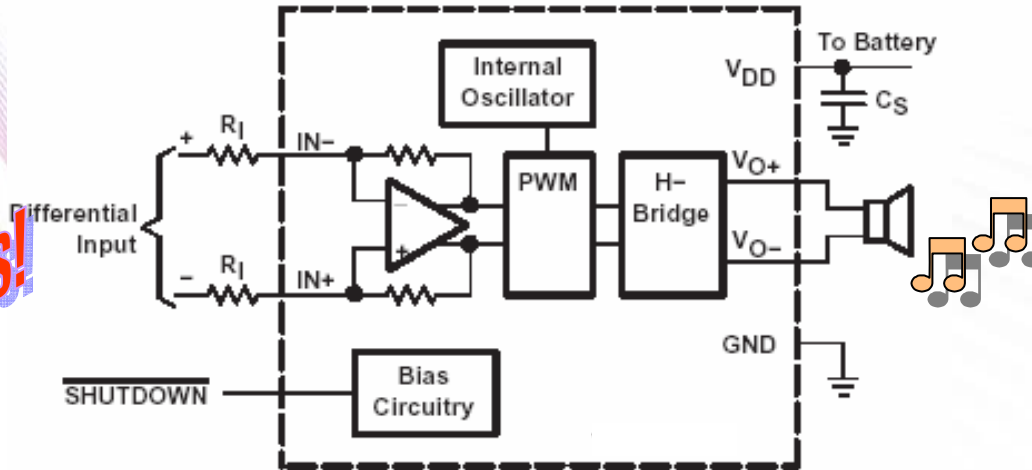
TPA2006D1-1.8V logic, 1.45W Class-D

Packaging

- 3x3mm QFN (DRB) [Pb-Free]



**ONLY 3
external
components!**



*** QFN Package pin-to-pin compatible with TPA6204A1 Class-AB Amplifier ***

Features

- 1.8V Thresholds on /SHUTDOWN pin
- Class-D architecture
- Filter-Free modulation scheme
- **Pin compatible to Class AB Amp (TPA6204/5)**
- Supply Voltage: 2.5 to 5.5 V
- Small QFN packaging
- No input coupling caps required
- Fully differential amplifier

Benefits

- Compatible with 1.8V DSP/ASIC
- Longer battery life compared to class-AB
- No LC Filter required
- Many choices
- Direct-Connect to battery
 - More power, Even higher efficiency
- Saves board space
- Reduces external components
- Low Noise input

Audio Power Amp : Family

Mono

17W

Class-AB
TPA6204A1
TPA6205A1
Power @ 4Ω

2.5-5.5V Supply
External RIN and RF
Fully Differential
BGA

3.1W

Class-AB
TPA6211A1
Power @ 4Ω

2.5-5.5V Supply
External RIN
Fully Differential
QFN

14W

Class-D
TPA2005D1
TPA2006D1
Power @ 8Ω

2.5-5.5V Supply
External RIN
Fully Differential
BGA, QFN and MSOP

2.5W

Class-D
TPA2010D1
Power @ 4Ω

2.5-5.5V Supply
External RIN
Fully Differential
WCSP

2.8W

Class-D+Booster
TPA2013D1
Power @ 4Ω

1.5-5.5V Supply
Fully Differential
WCSP/QFN

Stereo

2Wx2

Class-D
TPA2012D2
Power @ 4Ω

2.5-5.5V Supply
4 Gain Select
Differential Input
WCSP and QFN

2.6W

Class-AB
TPA6011A4
Power @ 3Ω

2.5-5.5V Supply
With Volume control/HP Driver
TSSOP

Class-D

Class-AB

[Go Back](#)

Power rating @ 5.5V and 10% THD

Sounds in Motion

TI HPA for Surveillance Clock

Minds in Motion



BQ4802– Real Time Clock

Features

- Counts seconds through centuries in BCD format
- Less than 500nA of clock operation current in backup mode
- On-chip battery-backup switchover circuit with nonvolatile control for external SRAM
- Battery low warning
- 3.3V (LY) and 5.0V (Y) operation voltage
- **SNAPHAT package**

Applications:

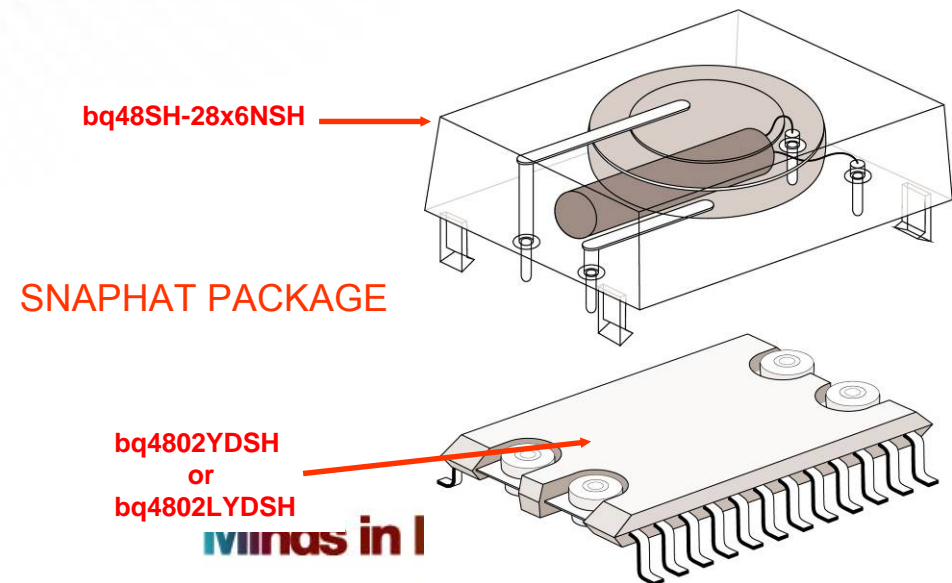
- Surveillance Equipment
- Set-top Boxes

Why Buy?

Highly integrated device with 3 subsystems in a 1 chip solution. (CPU supervisor, NVSRAM control and Real Time Clock)

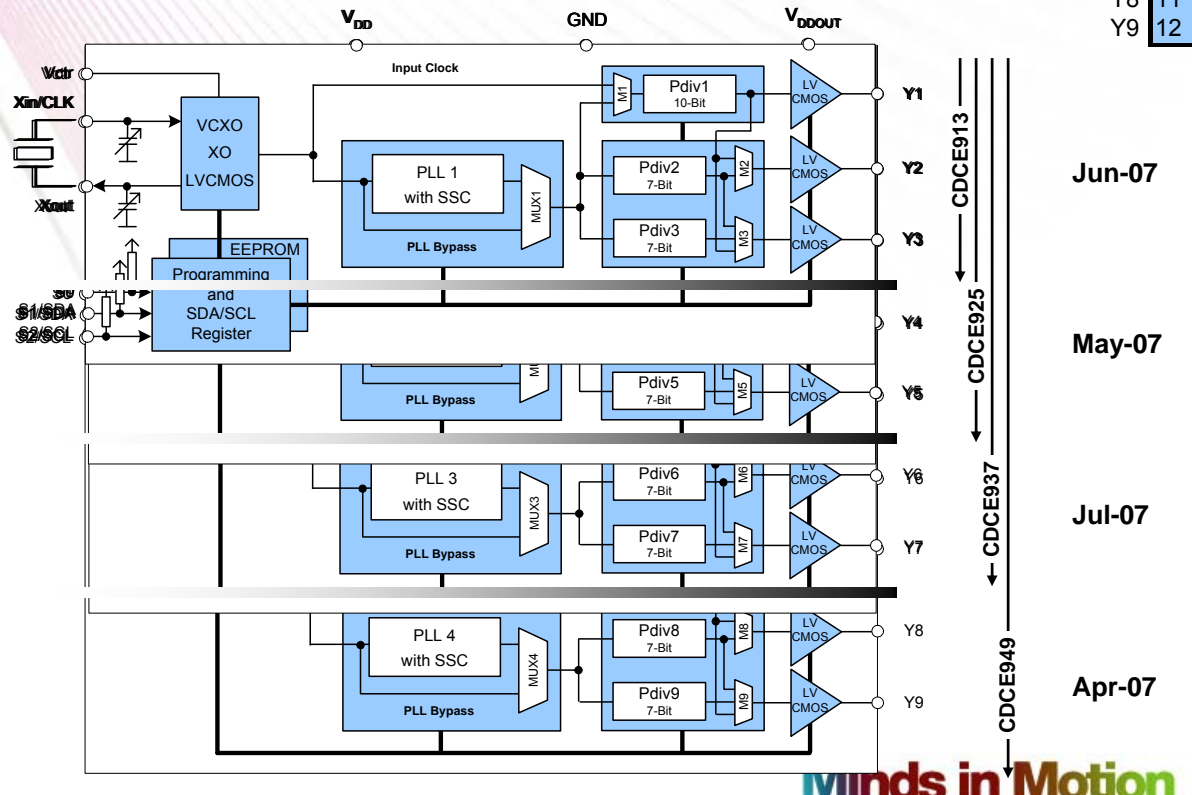
Benefits

- Complete clock / calendar solution
- Can run for 10 years with a low cost button cell battery
- Flexible, low cost non-volatile static memory solution
- Alerts the system that the button cell should be replaced
- Compatible with common bus voltages
- **Simplifies battery and crystal PCB mounting**



Jupiter – Clock Family

Xin/Clk	1	14	Xout	Xin/Clk	1	16	Xout	Xin/Clk	1	20	Xout	Xin/Clk	1	24	Xout
S0	2	13	S1/SDA	S0	2	15	S1/SDA	S0	2	19	S1/SDA	S0	2	23	S1/SDA
Vdd	3	12	S2/SCL	Vdd	3	14	S2/SCL	Vdd	3	18	S2/SCL	Vdd	3	22	S2/SCL
Vctr	4	11	Y1	Vctr	4	13	Y1	Vctr	4	17	Y1	Vctr	4	21	Y1
GND	5	10	GND	GND	5	12	GND	GND	5	16	GND	GND	5	20	GND
Vddout	6	9	Y2	Vddout	6	11	Y2	Vddout	6	15	Y2	Vddout	6	19	Y2
Vddout	7	8	Y3	Y5	7	10	Y3	Y4	7	14	Y3	Y4	7	18	Y3
				Y5	8	9	Vddout	Y5	8	13	Vddout	Y5	8	17	Vddout
								GND	9	12	Y6	GND	9	16	Y6
								Vddout	10	11	Y7	Vddout	10	15	Y7
												Y8	11	14	GND
												Y9	12	13	Vdd



Jun-07
 May-07
 Jul-07
 Apr-07

sample date

Minds in Motion



Jupiter is ...

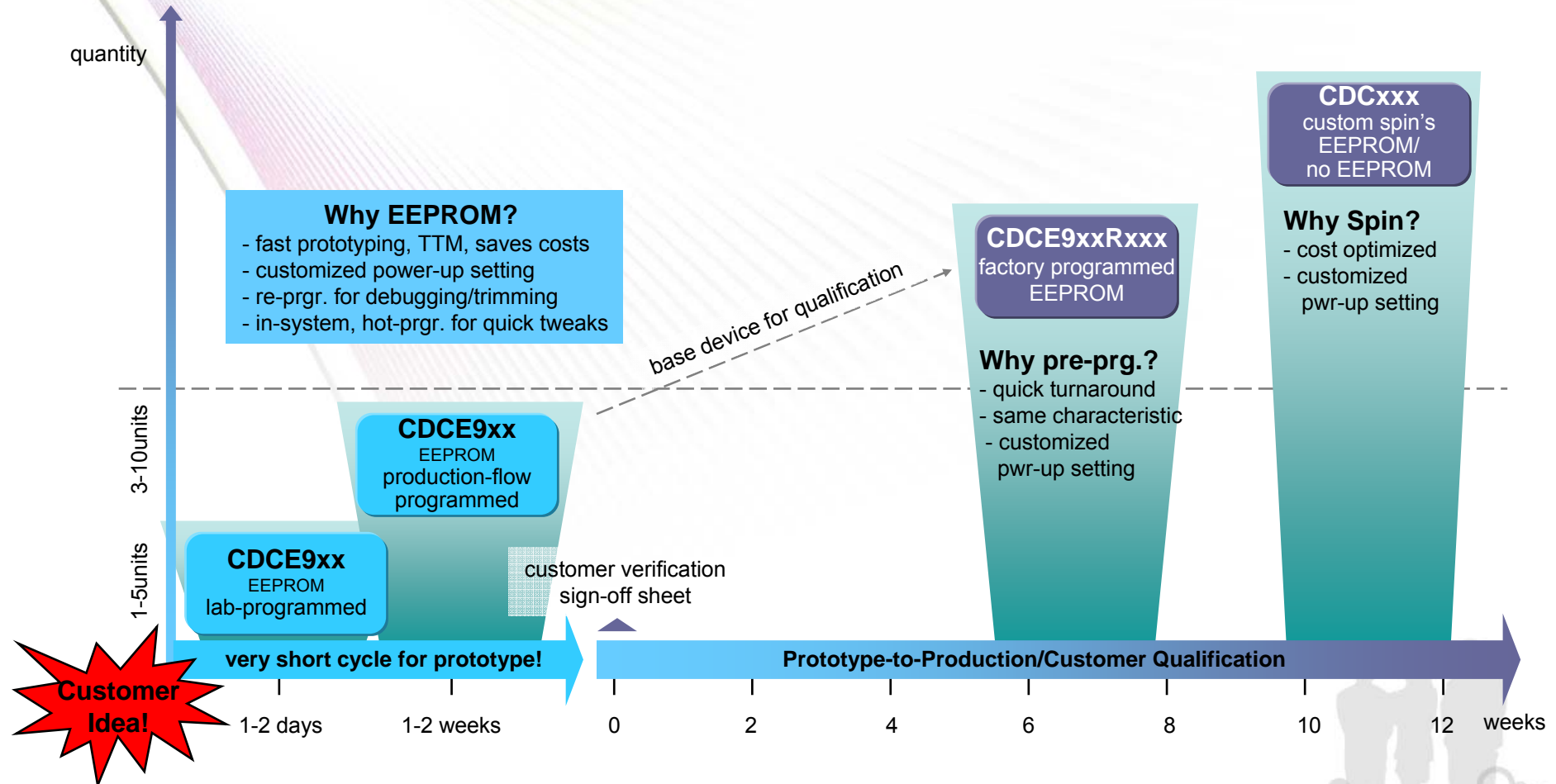
... an universal, customizable, low cost consumer clocking solution!

- High-Flexible Clock Generator for Digital Media Applications and DaVinci™
- Family of 4 multi-PLL Clock Synthesizer
- 1.8V Ready – Low Power but 1.8V/3.3V I/Os
- Very Fast Turnaround Time for Proto' and Production (customized solution)
- Easy to Customize by I²C and EEPROM
- In-System, Hot-Programmable via SDA/SCL (I2C) and EEPROM
- Enable Zero PPM Audio/Video Clock Generation
- Replaces Multiple Components (Crystals, Oscillators, PLLs, Buffers)
- Reduced Power Consumption by 1.8V Process and Frequency Scaling

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TI | Developer Conference “Proto-to-Production” Approach



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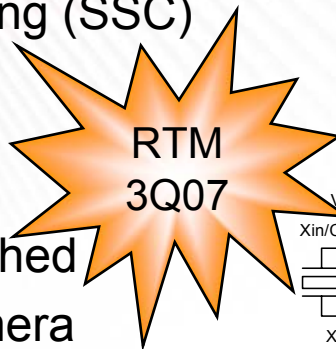
CDCE949– Universal Clock Generator

Features

- Accepts crystal (8-to-32MHz), single-ended or differential inputs
- Output frequencies up to 200MHz
- Nine low-jitter, low-skew outputs
- 3 definable control inputs by On-board EEPROM & I2C bus
- Spread-Spectrum Clocking (SSC)
- 1.8V supply voltage

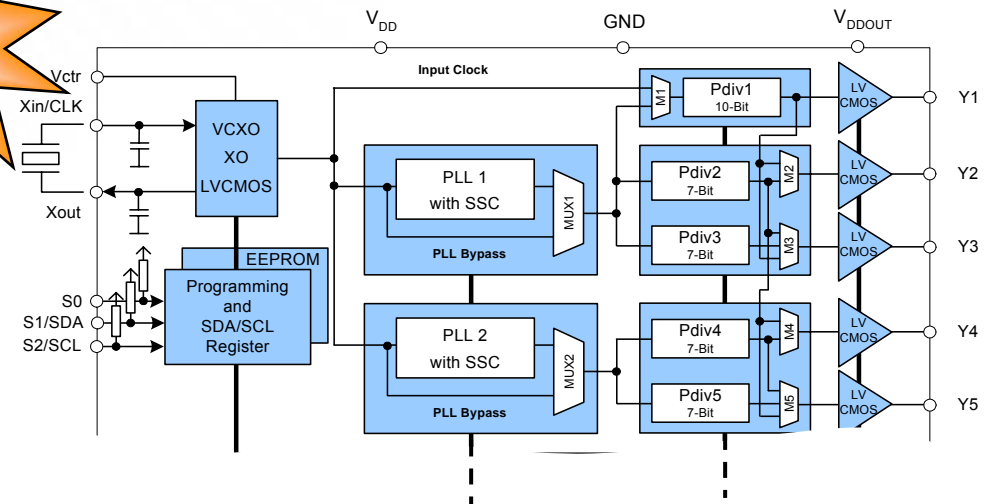
Applications

- DSP and DaVinci attached
- IP-STB/TV/Phone/Camera
- Streaming Media (i.e. DVD-P/R)



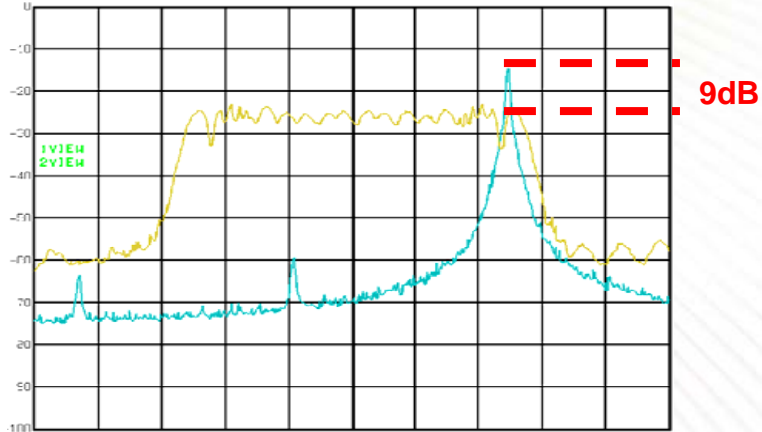
Benefits

- Wide in/out frequency range for all applications.
- Enables Zero PPM clocking generation
- Supports frequency scaling and power saving set in EEPROM -hot-programmable by I²C
- Reduce EMI noise
- Low power consumption

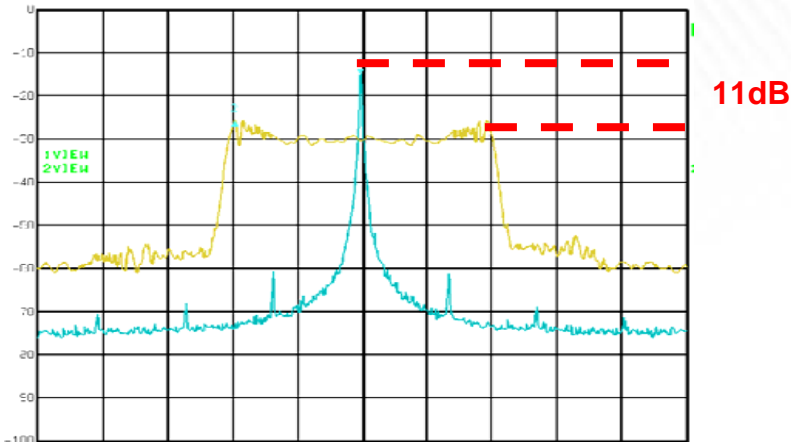


Spread Spectrum Clocking

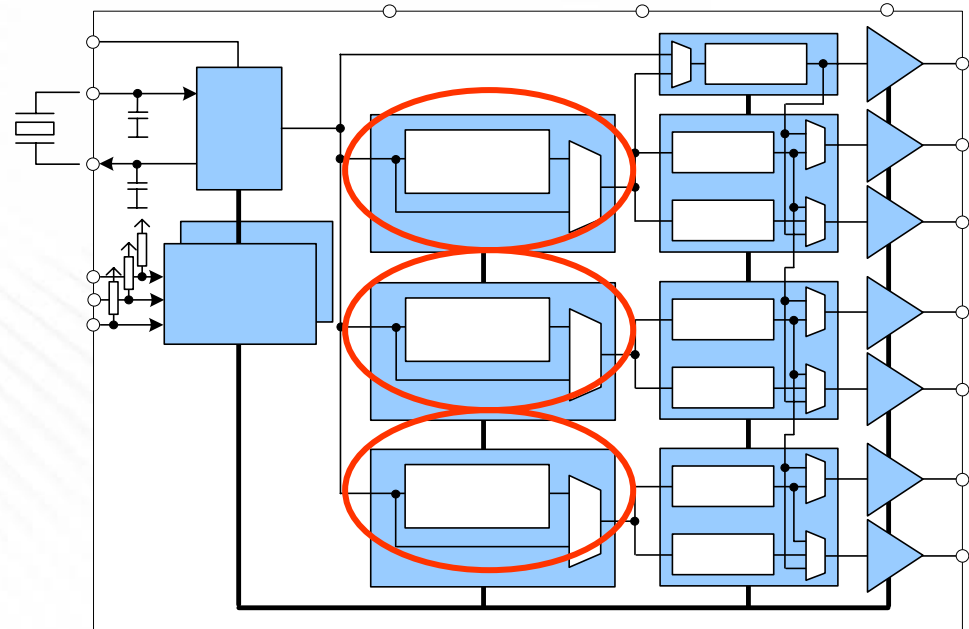
Each PLL supports down-spread and center-spread!



2% DOWN SPREAD 9TH HARMONIC Fc=54MHz



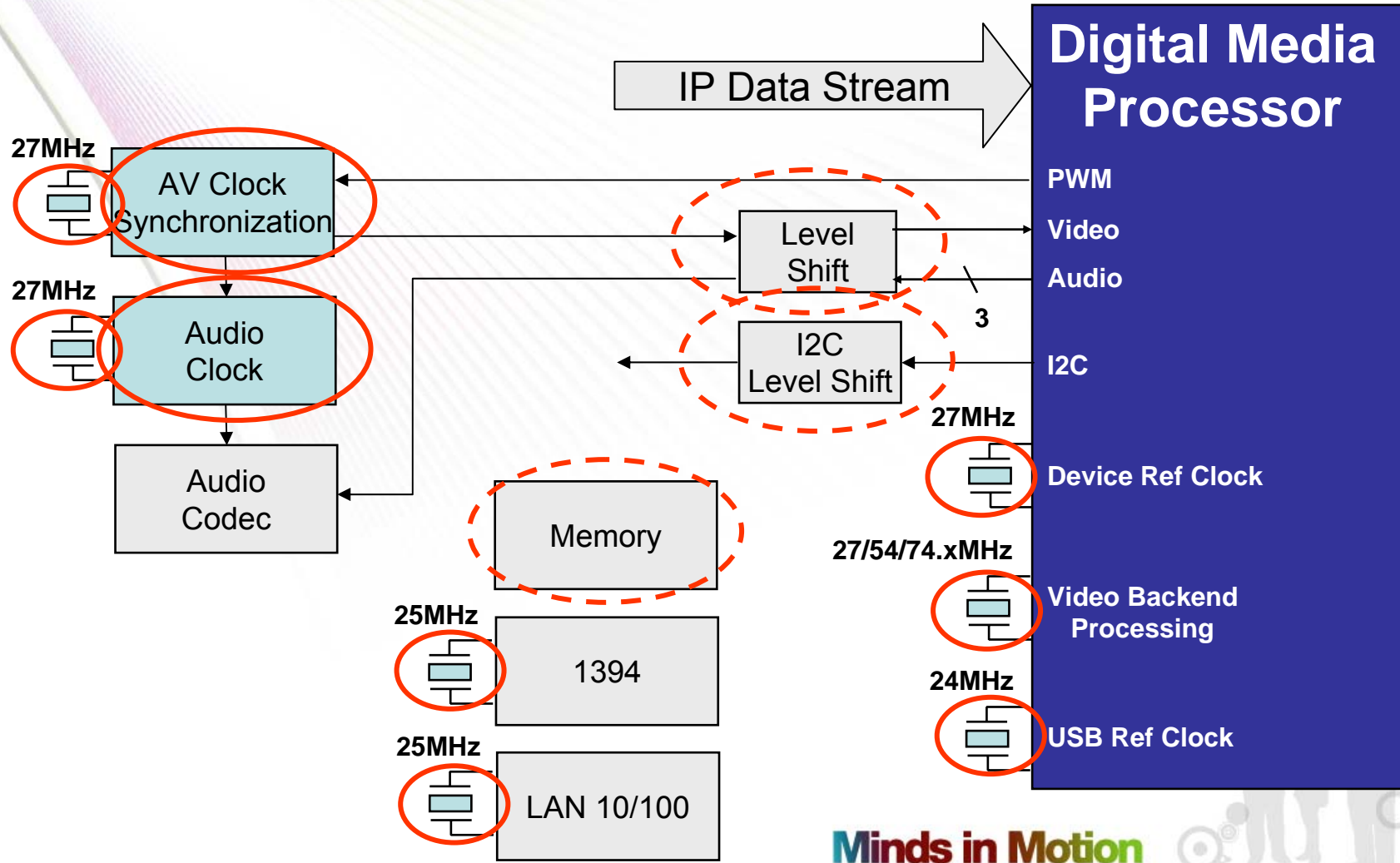
2% CENTER SPREAD 9TH HARMONIC Fc=54MHz



SSC Selection (Center/Down)			
SSCx [3-bits]			function
0	0	0	0% (off)
0	0	1	0.25%
0	1	0	0.5%
0	1	1	0.75%
1	0	0	1.0%
1	0	1	1.25%
1	1	0	1.5%
1	1	1	2.0%

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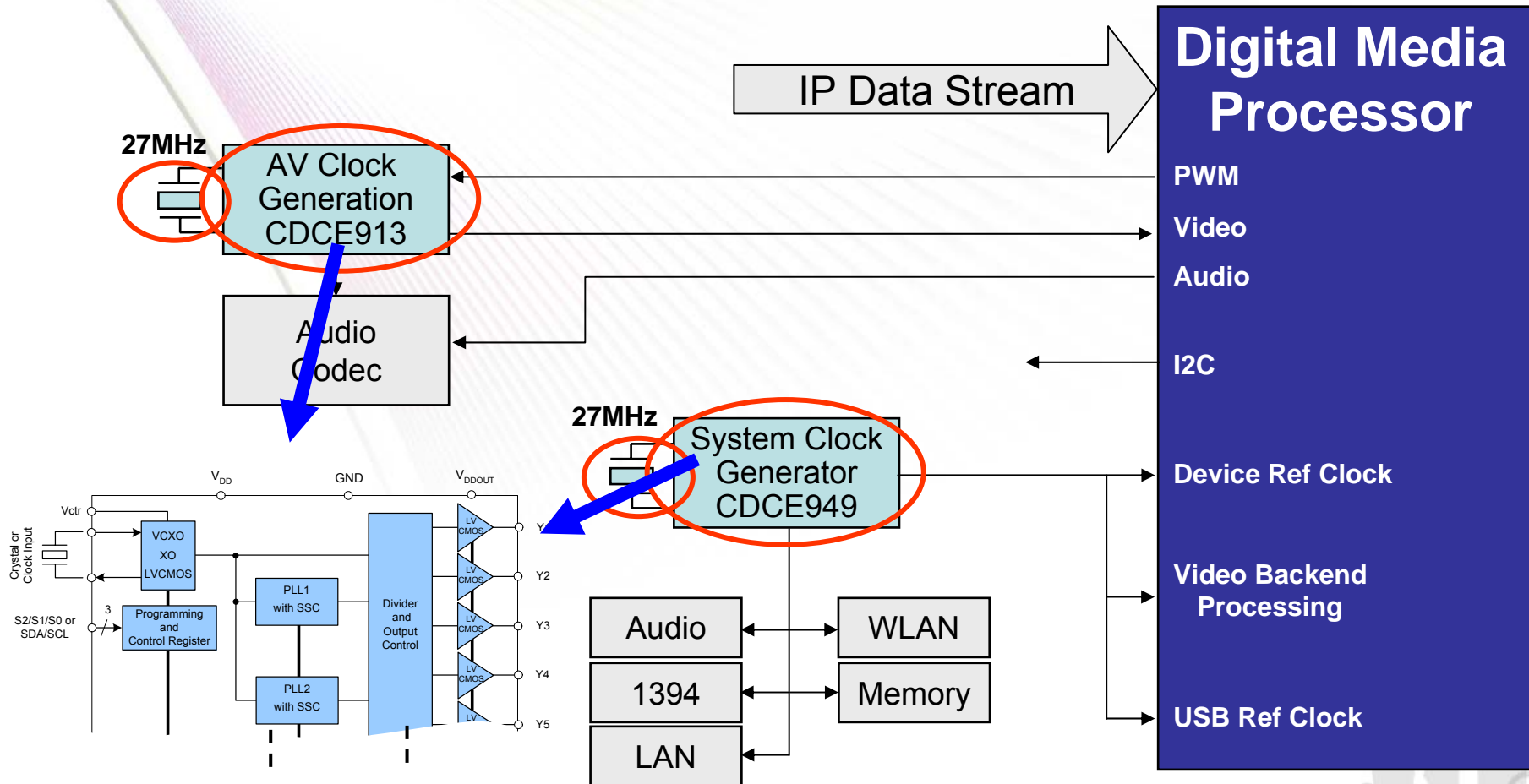
Streaming Media: Current Clocking Implementation



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Streaming Media: Advance Clocking Architecture



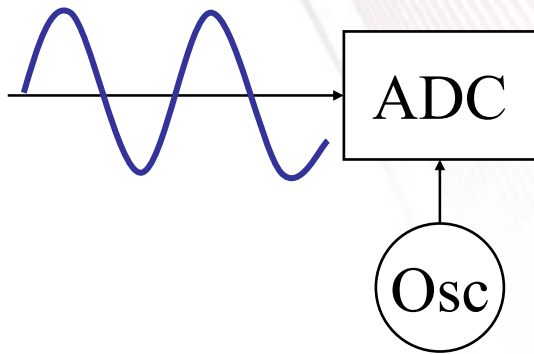
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Jitter influence on Video-ADC

Remember the ADC does have **two** inputs:

- Analog Input
- Clock Input

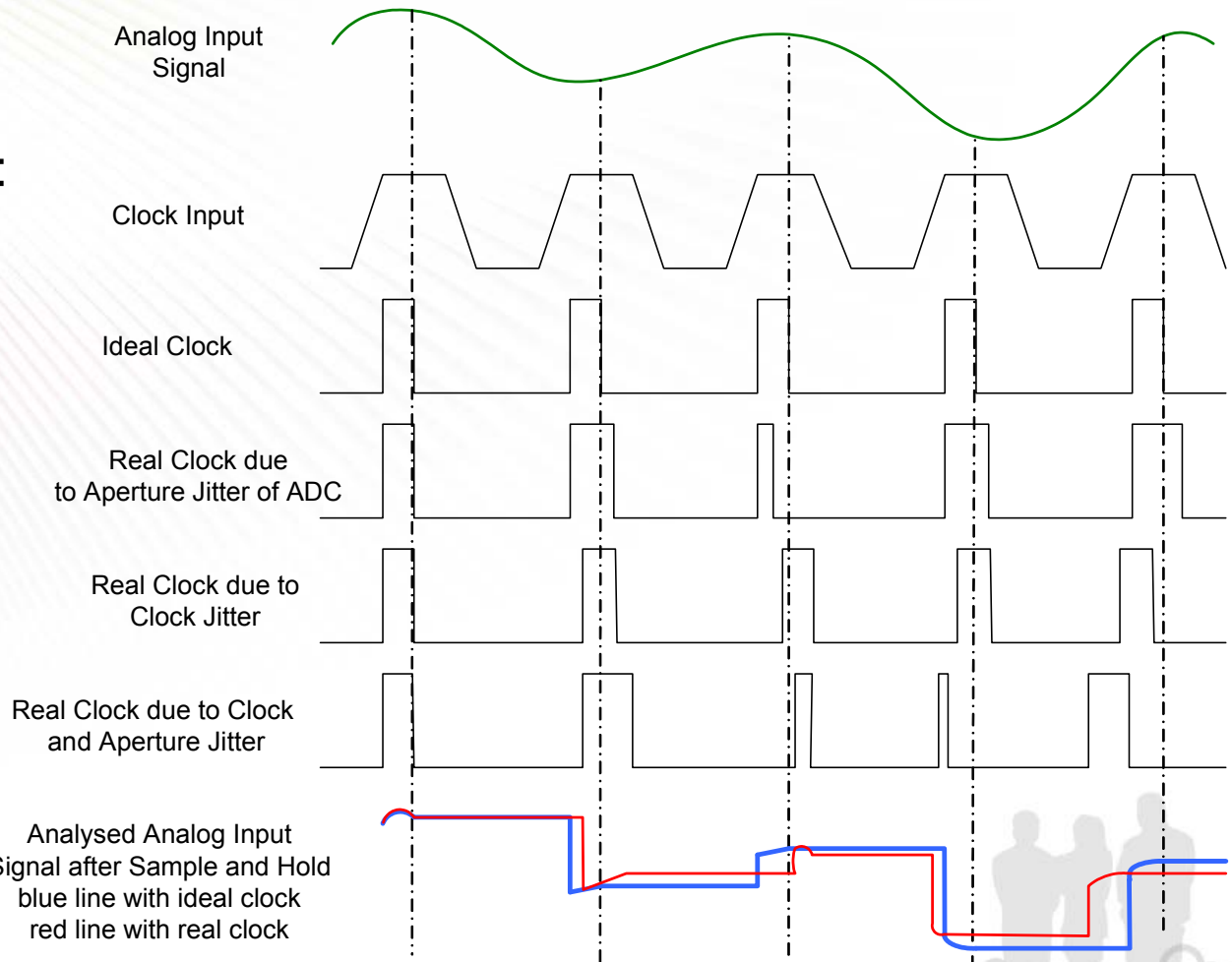


Typical Numbers:

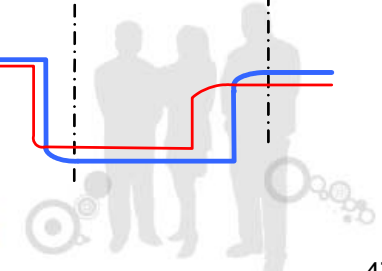
Aperture Jitter \approx **0.5 ps rms**

Clock Jitter @ 80 MHz \approx **10 ps rms**

Note: Clock Jitter is 20 times higher than Aperture Jitter



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TI HPA for Surveillance Temperature & Fan Control

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TMP100– Digital Temp. Sensor with I2C

Features

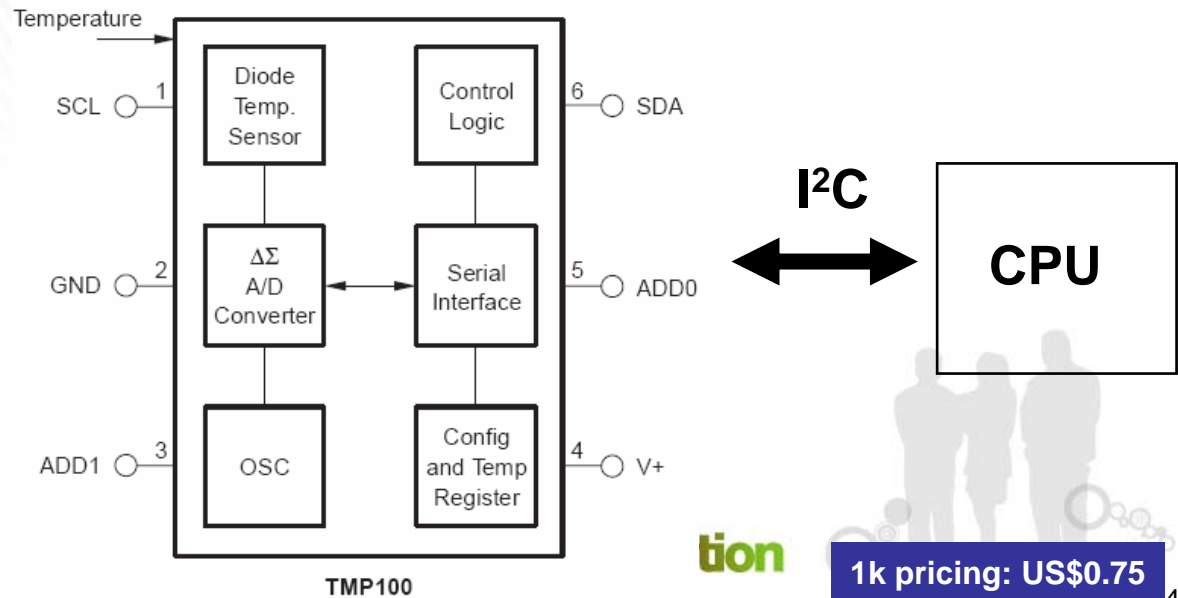
- 2°C accuracy
- True 12-bit resolution
- 2.7V to 5.5V operation
- Small SOT23-6 package

Benefits

- Industry’s most modern design topology
- Excellent stability over temperature
- Lowest power consumption
 - Extends battery life
 - Minimizes self-heating

Applications

- Security DVRs

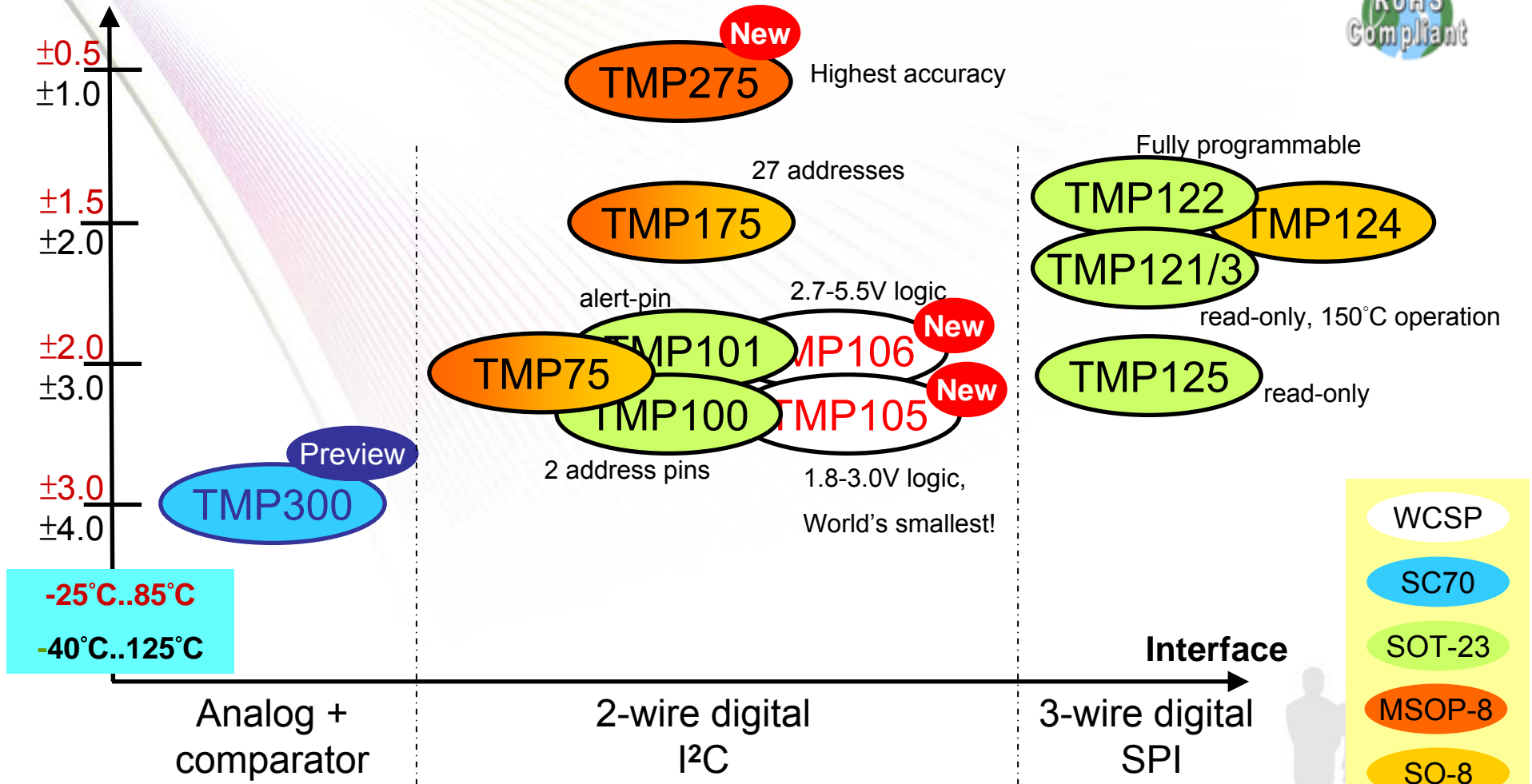


tion

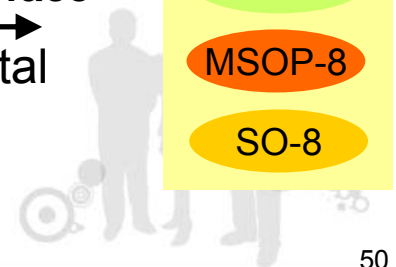
1k pricing: US\$0.75

49

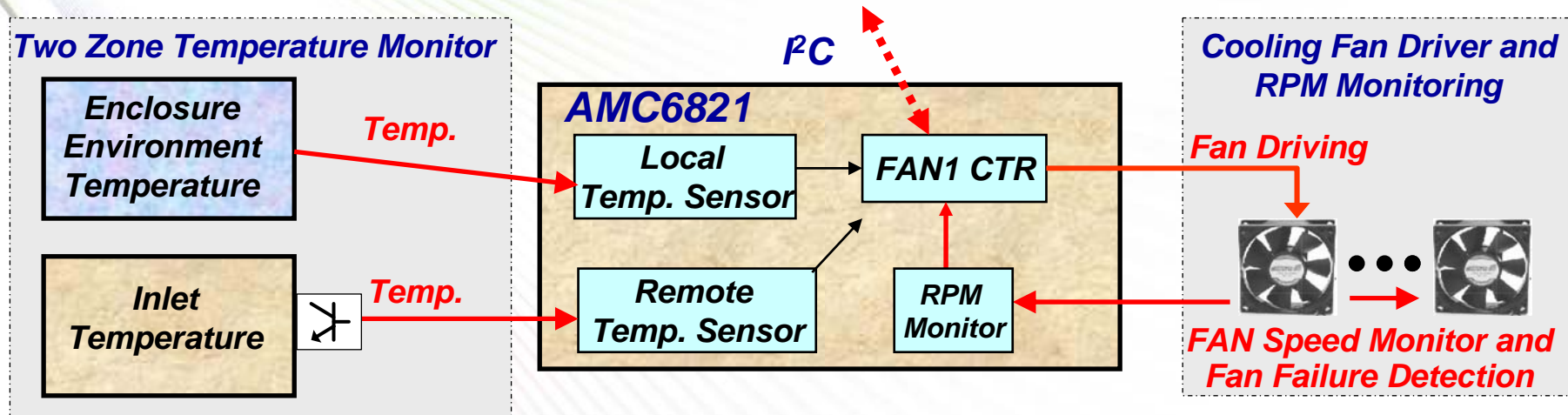
Digital Temp. Sensor : Family



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AMC6821– Fan Controller



Major Functions of AMC6821:

- ❖ **Monitor Two Temperature Zones;**
- ❖ **Adjust Duty Cycle to Control Fan Speed:**
 - **AUTO Temperature– Fan Speed Control (Close-Loop):**
AMC Adjusts the DCY to make the Fan Speed Optimum when the Temperature Changes.
No Controller Interference is needed. Run Stand Alone.
 - **RPM-Feedback (as Speed Regulator, Close-Loop):** Embedded Controller sets the Target Speed, AMC Monitors the Speed and Adjusts DCY to Keep the Speed at the Target Value.
Run Stand Alone after setting the Target Speed.
 - **Software – DCY (Open-Loop):** Embedded Controller Writes Duty Cycle Register Directly.

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TI Developer Conference

19 - 26 June 2007 • Beijing • Shanghai • Shenzhen • Taipei

Thanks!

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Technology for Innovators™

 TEXAS INSTRUMENTS