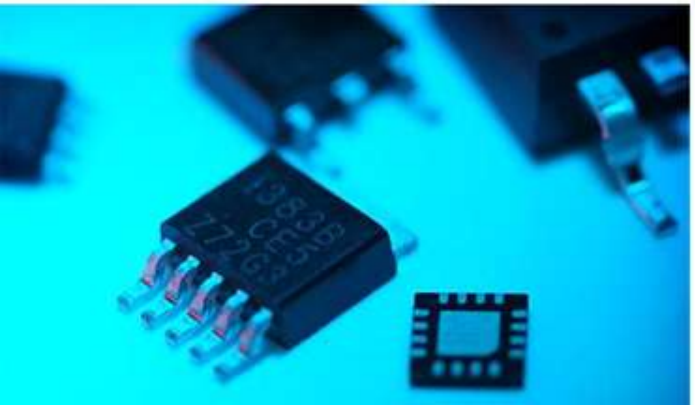
AIC Solutions for Surveillance



2017 AIC REGIONAL SALES MEETING

Agenda

- Market Status & Trend
- Market Forecast
- Supply Chain (Core chip, IDH, Key player)
- New Product Feature
- Application Power Block
- Power Solutions
- Product Roadmap
- Promotion Strategy

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IOT Structure

- Healthcare Management
- Medical Management
- Fitness Technology
- Content Management
- Intelligent Platform

- Marketing Platform
- Customer Management
- Rewards Points

Application Layer

Cloud Data Center

3G/4G

Remote Control

Wi-Fi AP

Network Layer

Local Control

Wi-Fi/Zigbee

Wireless44 Technology

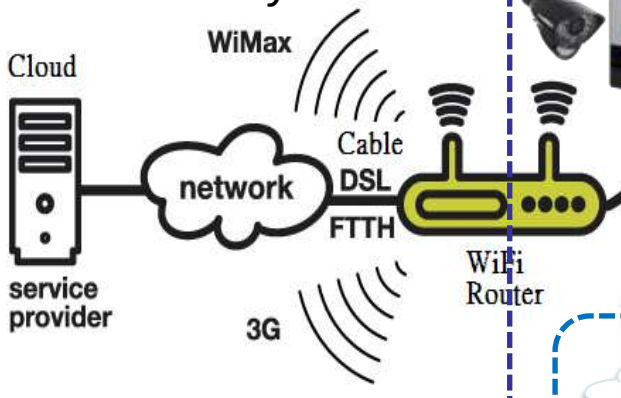
Sensor Module

Transducer

Outside

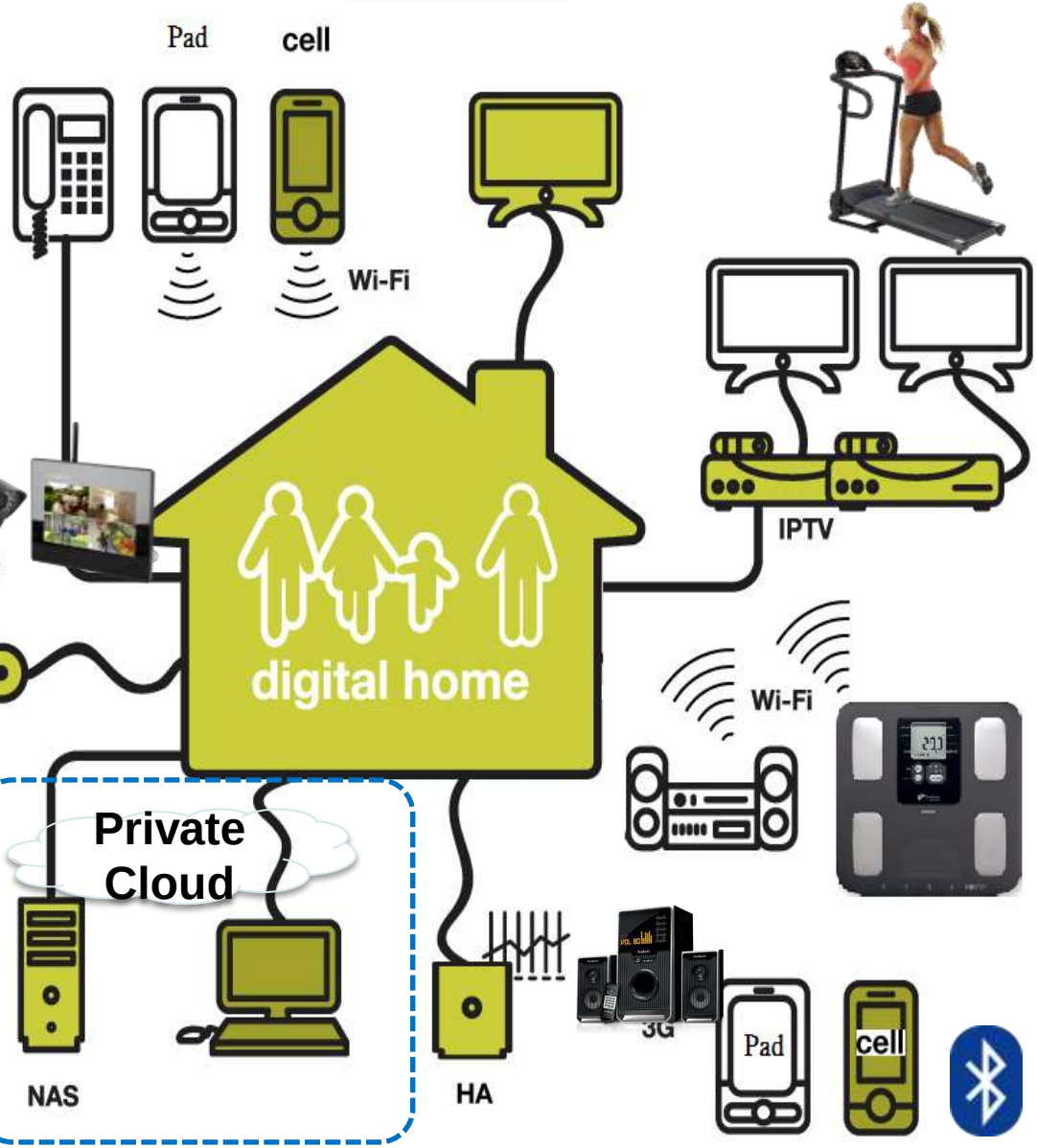
Public Cloud

1. Medical
2. Fitness
3. Entertainment
4. Home Appliances
5. Security



APP

Home



Wi-Fi/Bluetooth/
3G/Cloud /NFC

Blood Glucose &
Blood Pressure

Game
Console

Exercise &
Fitness

Weight Control

Central Control

Music &
Wireless Headset

Home Appliances &
Remote Controller

Wireless Mouse &
Wireless Keyboard

HDTV
Ultra HDTV

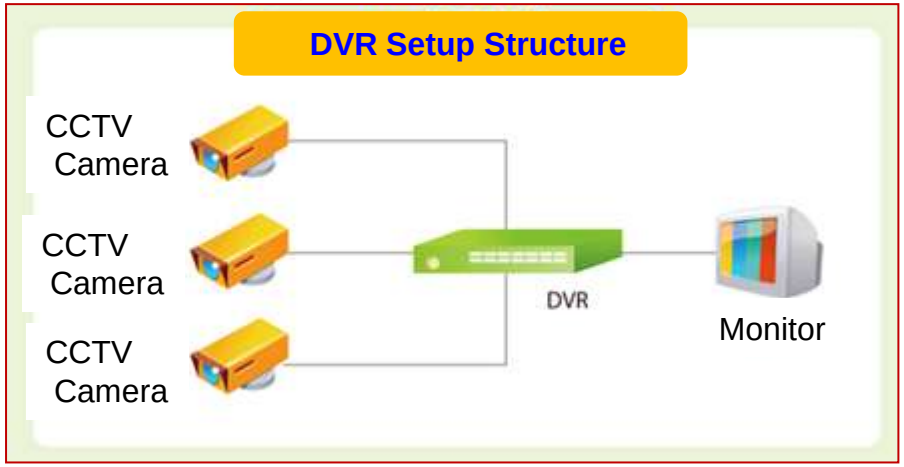
Security System
Surveillance Camera

Lights

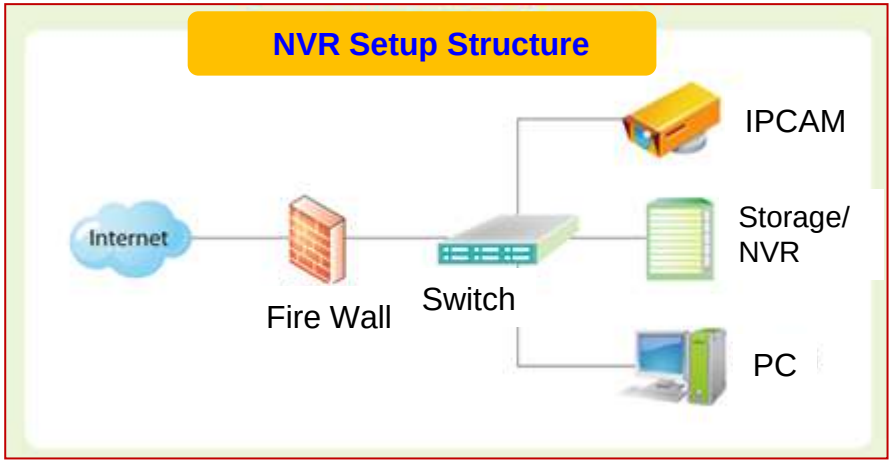
Power Bank

Market Status & Trend

■ Analog



■ Digital



- Analog CCTV Camera with DVR (Digital Video Recorder) used as a digital image storage.
- IPCAM (Camera embedded Internet Protocol) with NVR (Network Video Recorder) used as a digital image storage.

Market Status & Trend

Why fast increase in field of surveillance camera

Demand for High resolution and High quality Video/Audio

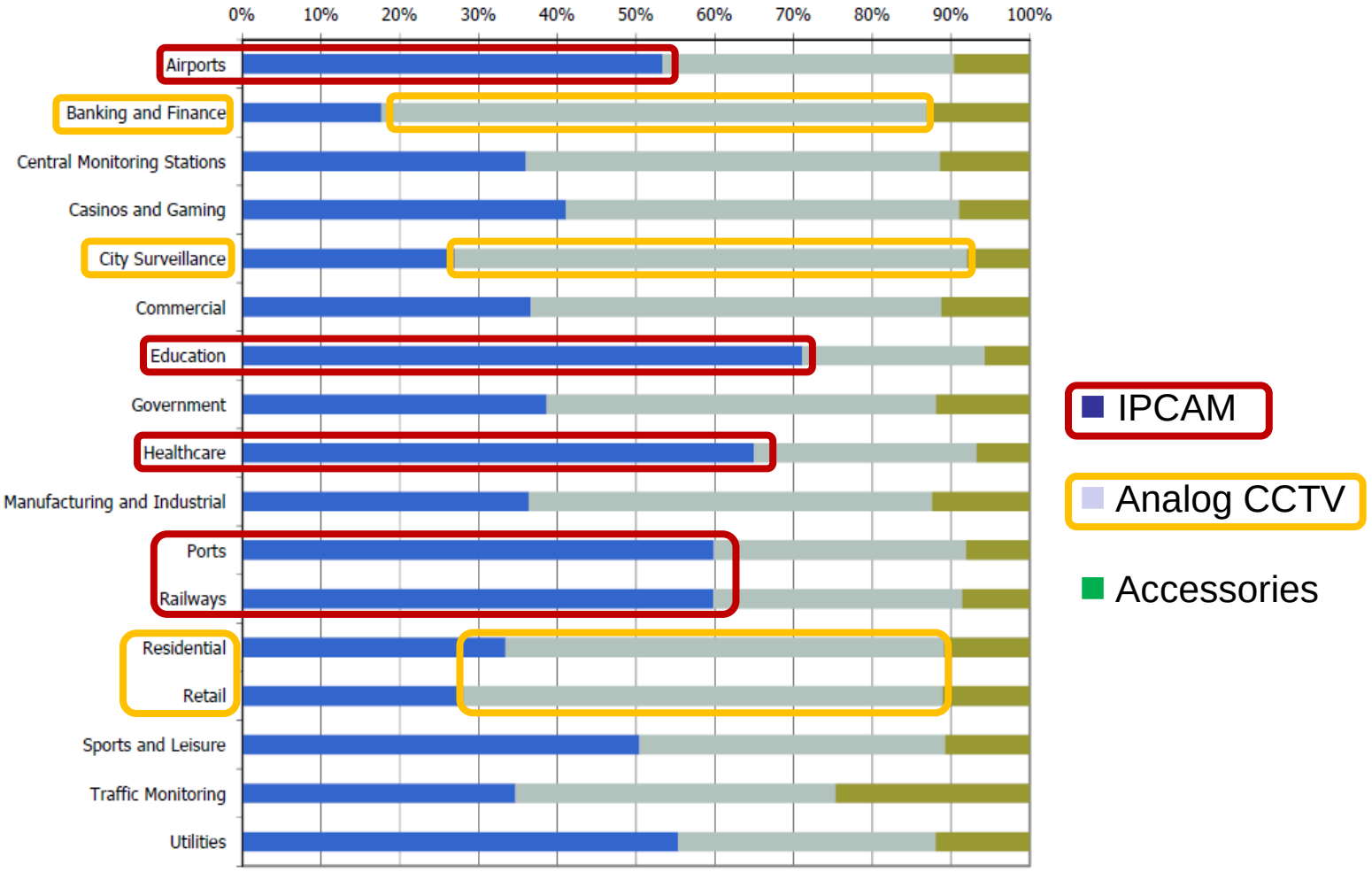
CMOS Sensor quality improved in Surveillance Camera

H.264/H.265 technology Improved to reduce transmission loading and storage cost

Emerging country Infrastructure built Including airports, harbors, stations, and gyms, etc.

Remote Monitoring demand increase Website and Network access point expansion

Market Status & Trend



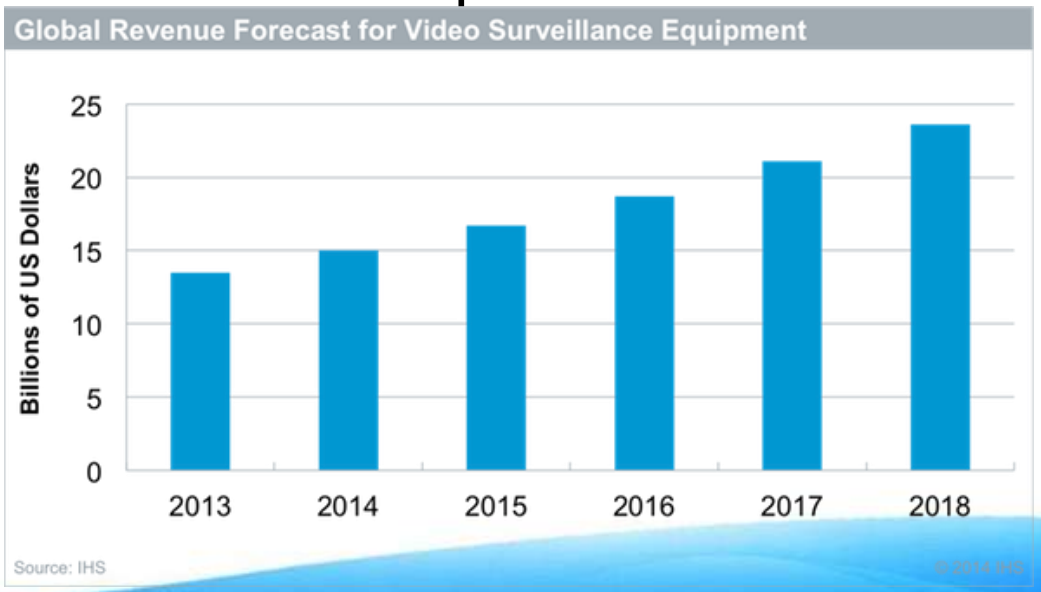
- In Education, Healthcare, Airport, Port, Railway environments are widely used for the IPCAM
- In Banking and Finance, City Surveillance, Residential, Retail places are widely used for the Analog CCTV

Source: IMS Research VIVOTEK

Market Forecast

Video Surveillance Growth Set to Exceed 10 Percent in 2015

- The global market for video surveillance equipment was worth an estimated $15.0 billion by the end of 2014, up from $13.5 billion in 2013. By 2018, worldwide revenue will reach a projected $23.6 billion, as shown in the attached figure, equivalent to a five-year compound annual growth rate of 12 percent.



IHS Inc. (2015/01)

Supply Chain

Camera & Storage

Core Chip

- HISILICON
- Grain Media
- Ambarella
- Texas Instruments
- NXP

Sensor (CCD/CMOS)

- SONY
- Panasonic ideas for life
- TOSHIBA
- OmniVision
- Micron

Brand I.

- Honeywell
- BOSCH
- AXIS COMMUNICATIONS
- SAMSUNG
- 3S POCKETNET
- PELCO by Schneider Electric
- Security-Vision-Systems MOBOTIX

Brand II. China/TW

- HIKVISION
- alhua TECHNOLOGY
- TIANDY
- ZNV
- KEDACOM
- VIVOTEK BUILT WITH RELIABILITY
- AVTECH
- DYNACOLOR always watching
- GeoVision

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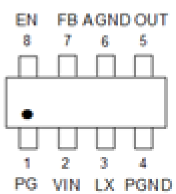
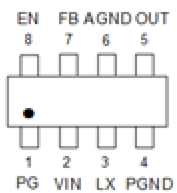
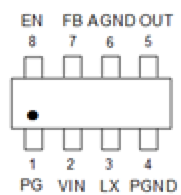
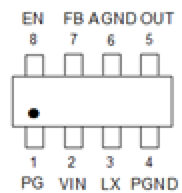
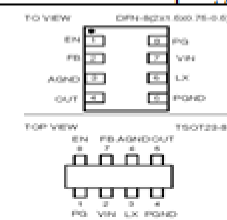
New Product Feature

Part Number	AIC2253	AIC2256	AIC2259	AIC2258	AIC2262
Vin(Min)(V)	2.5	2.5	2.5	2.5	2.5
Vin(Max)(V)	6	6	6	6	6
Iout(Max)(A)	1	1	1	1	2
Switching Frequency(Min)(kHz)	1500	3000	1500	1500	1500
Switching Frequency(Max)(kHz)	1500	3000	1500	1500	1500
Iq(Typ)(uA)	8	17	17	17	17
Control Mode	AOT	AOT	AOT	AOT	AOT
Operating Temperature Range(C)	-40 to 85	-40 to 85	-40 to 85	-40 to 85	-40 to 85
Process	W/B	W/B	W/B	F/C	F/C
Package	TSOT-23-8	TSOT-23-8	TSOT-23-8	TSOT-23-8	DFN-8 TSOT-23-8
Remark	P2P MP2159 Sampling in Nov. 16'	P2P MP2159	P2P MP2159 Sampling now		參閱MP2162 Sampling now
Outline					

New Product Feature

- **AOT**

  Adaptive **O**n **T**ime control that provides a fast transient response without external compensation component.

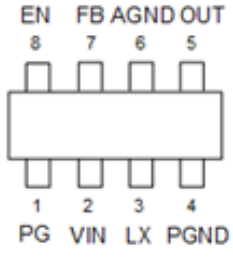
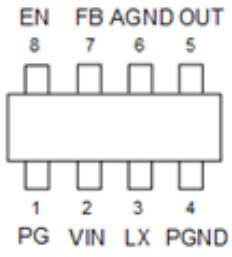
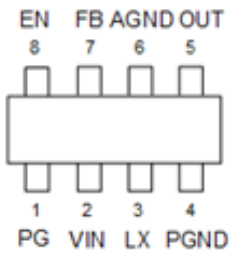
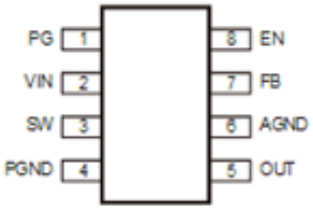
- **Sync.**

  The device features an internal synchronous rectifier for high efficiency, it requires no external Schottky diode.

- **Small Package**

  TSOT-23-8

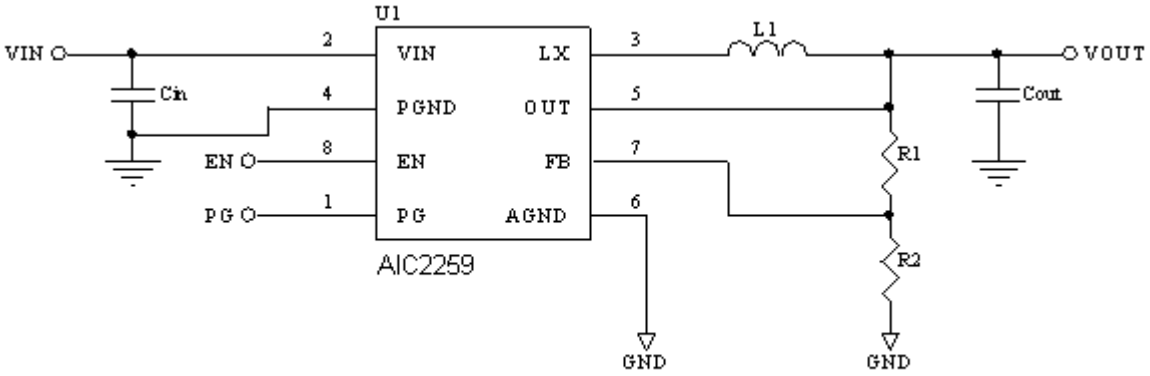
New Product Feature

Part Number	AIC2259	AIC2256	AIC2253	MP2159
Vin(Min)(V)	2.5	2.5	2.5	2.5
Vin(Max)(V)	6	6	6	6
Iout(Max)(A)	1	1	1	1
Switching Frequency(Min)(kHz)	1500	3000	1500	1500
Switching Frequency(Max)(kHz)	1500	3000	1500	1500
Iq(Typ)(uA)	17	17	8	17
Control Mode	AOT	AOT	AOT	COT
Operating Temperature Range(C)	-40 to 85	-40 to 85	-40 to 85	-40 to 85
Package	TSOT-23-8	TSOT-23-8	TSOT-23-8	TSOT-23-8
Remark	P2P with MP2159 Sampling now	P2P with MP2159	P2P with MP2159 Sampling now	
Outline				

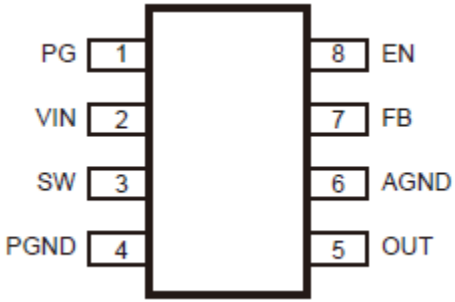
New Product Feature

New Product Feature

Typical application circuit



PIN configuration



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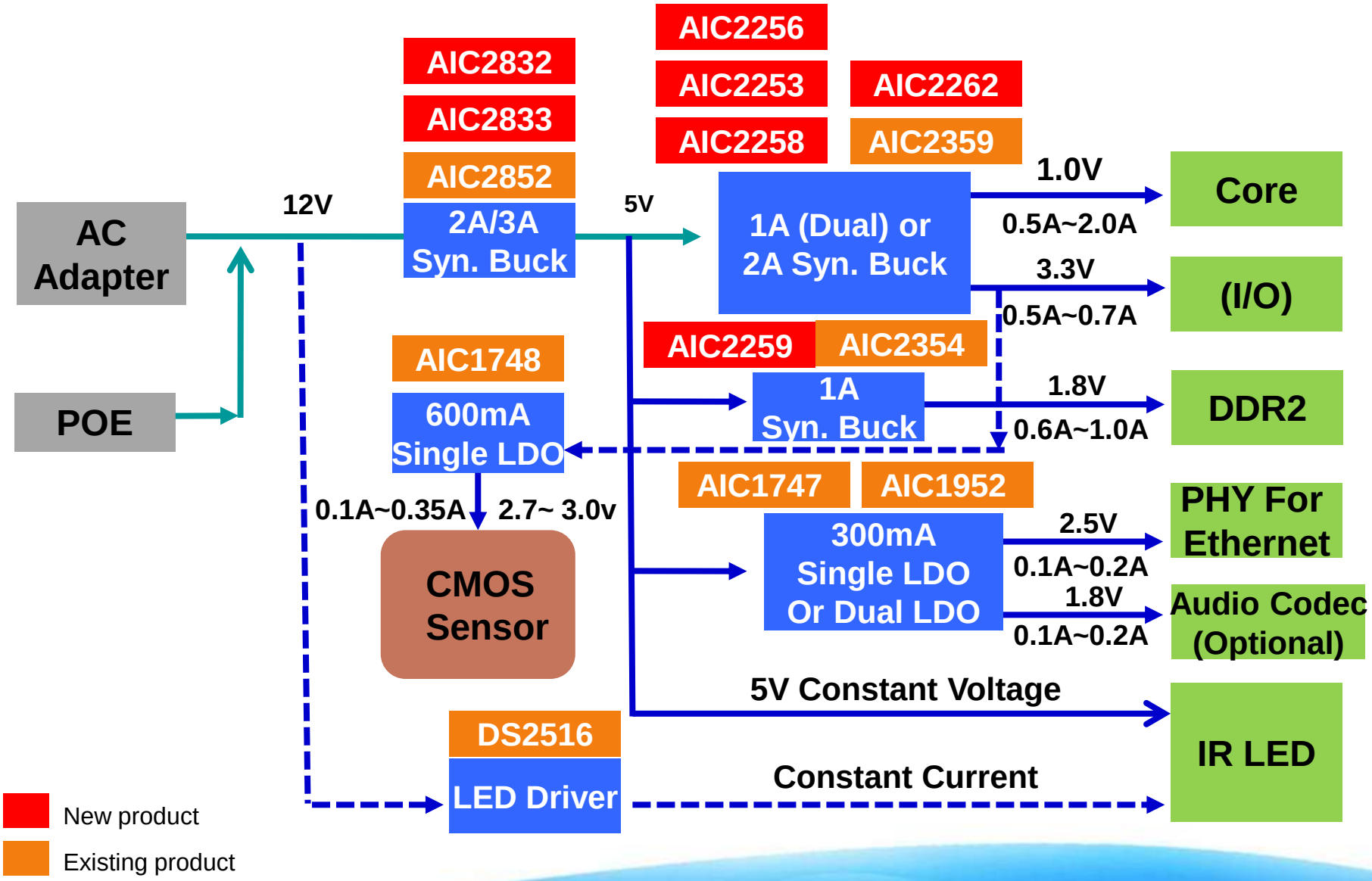
AIC Power Solutions

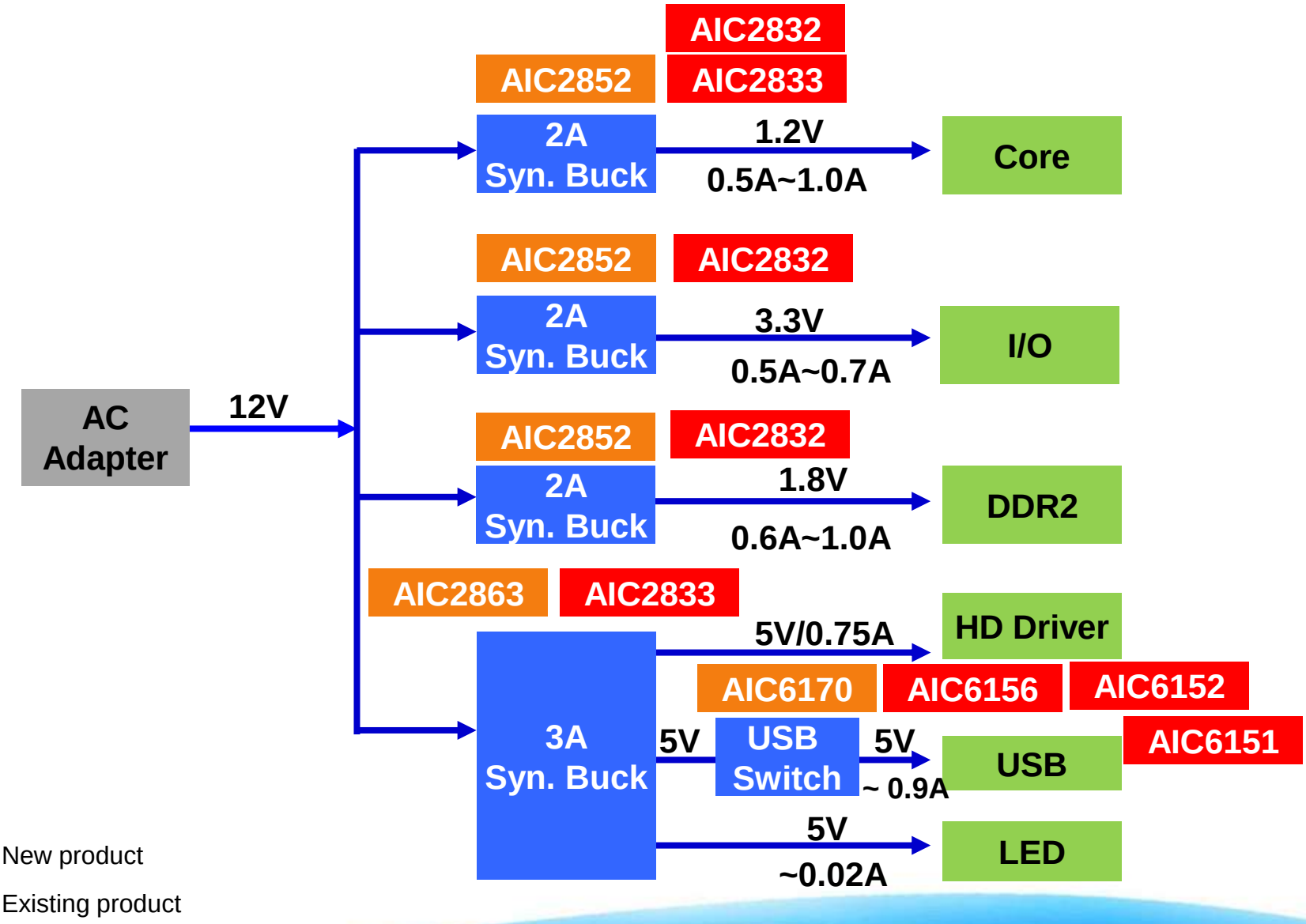
Surveillance Camera

- **AIC2253/AIC2258/AIC2259/AIC2256**
  - 1A AOT Synchronous 6V Buck Converter TSOT23-8
- **AIC2262**
  - 2A AOT Synchronous 6V Buck Converter TSOT23-8
- **AIC6156/AIC6152/AIC6151**
  - 3A/2A/1A Fast SCP USB Switch SOP-8EP/SOT23-6
- **AIC2832/AIC2833**
  - 2A/3A Synchronous 16V Buck Converter SOT23-6

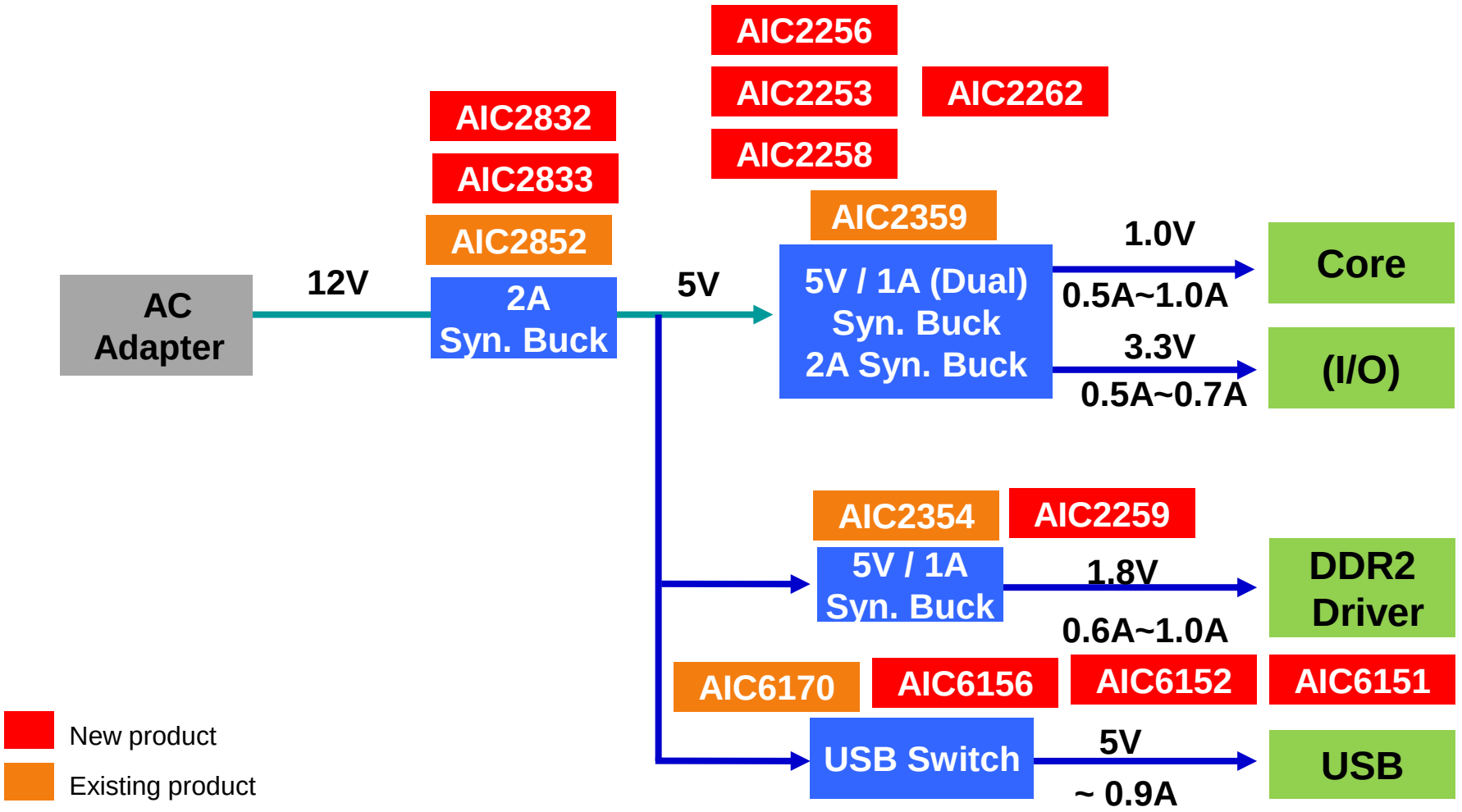
IP CAM Power Block



DVR Power Block



NVR Power Block



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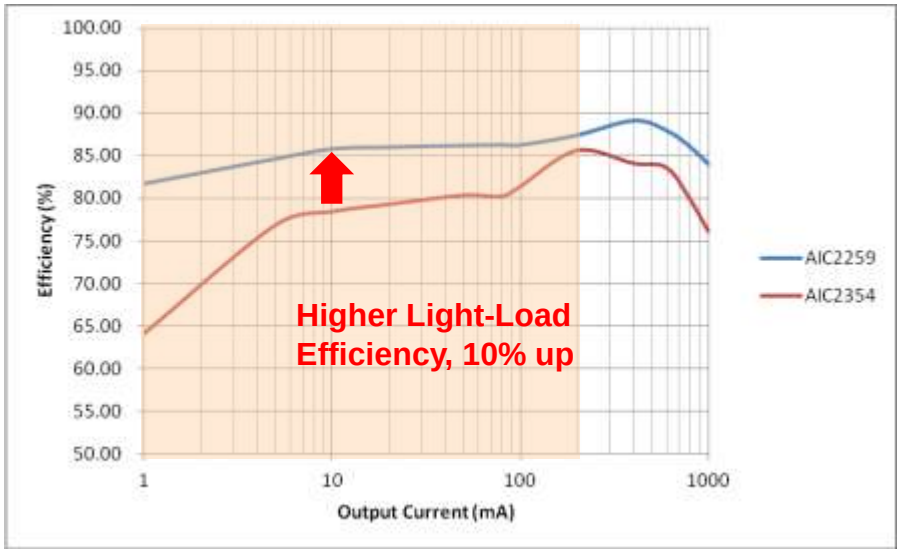
Highlights

- **Focused Products**
  - AIC2865 – 5A HVB in SOP8-EP, HLLη, pin-compatible with TPS54528
  - AIC2832 – 2A HVB in SOT23-6, HLLη, pin-compatible with MP1470/TPS56220x
  - AIC2833 – 3A HVB in SOT23-6, HLLη, pin-compatible with MP1471/TPS56320x
  - AIC2259 – 1A LVB in SOT23-8, HLLη, AOT, pin-comp. with MP2159
  - AIC2256 – 1A LVB in SOT23-8, HLLη, AOT, 3MHz Frequency, pin-comp. with MP2159
  - AIC2253 – 1A LVB in SOT23-8, HLLη, AOT, 8uA Low Iq, pin-comp. with MP2159
  - AIC2262 – 2A LVB in SOT23-8/DFN8, HLLη, AOT, pin-comp. with MP2161
  - AIC6156/52/51 – 3A/2A/1A UPS in SOP8-EP and SOT23-6, 1.3uS Fast SCP, ±7~15% current accuracy
- **Advanced Technology**
  - AOT (Adaptive On-Time Control) –
    - ***H**igher* light-load eff., ***S**maller* ripple V., ***F**aster* transient
  - Low Iq – Power-saving, extending battery life, 30uA -> 3uA -> 0.3uA (Q2 '17)
  - Fast Short-Circuit Response Time – 1.3uS

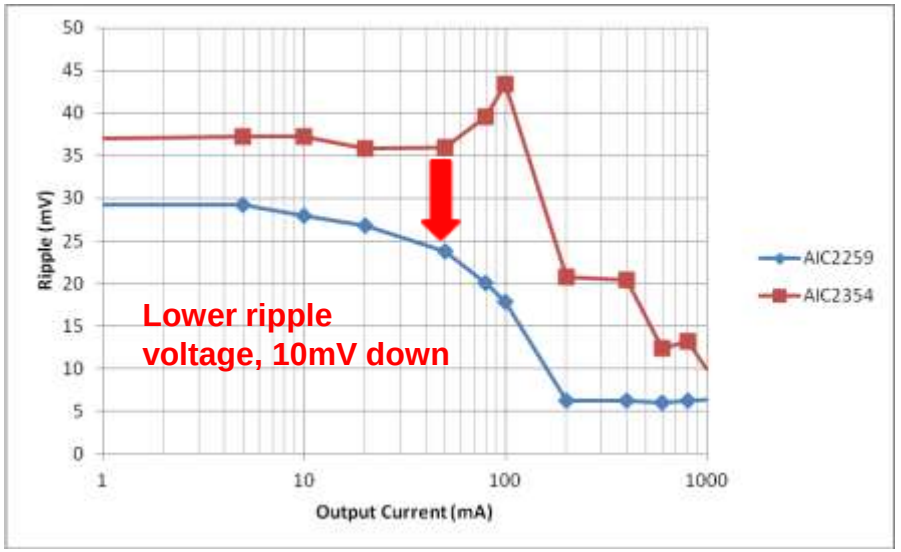
Sampling Now!!

AIC2259

1A, 1.5MHz AOT Synchronous Step-Down DC/DC Converter

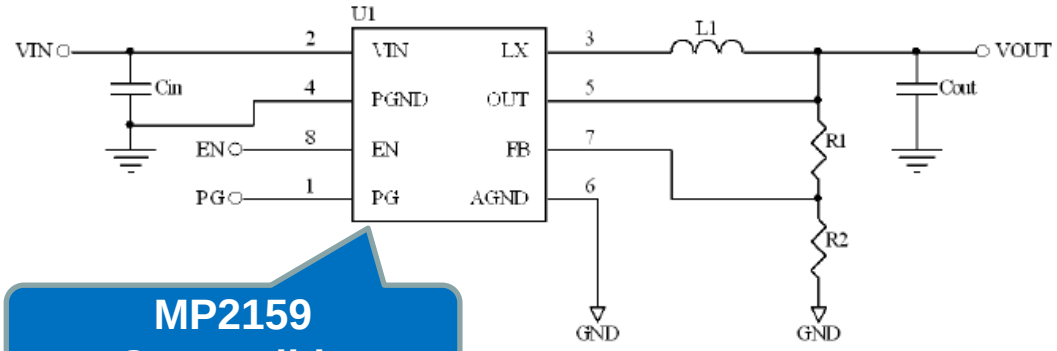


V_{OUT}=1.0V Efficiency at V_{IN}=5V



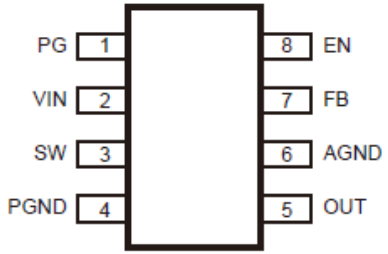
V_{OUT}=1.0V Ripple at V_{IN}=5V

Application Circuit



MP2159 Compatible

Package

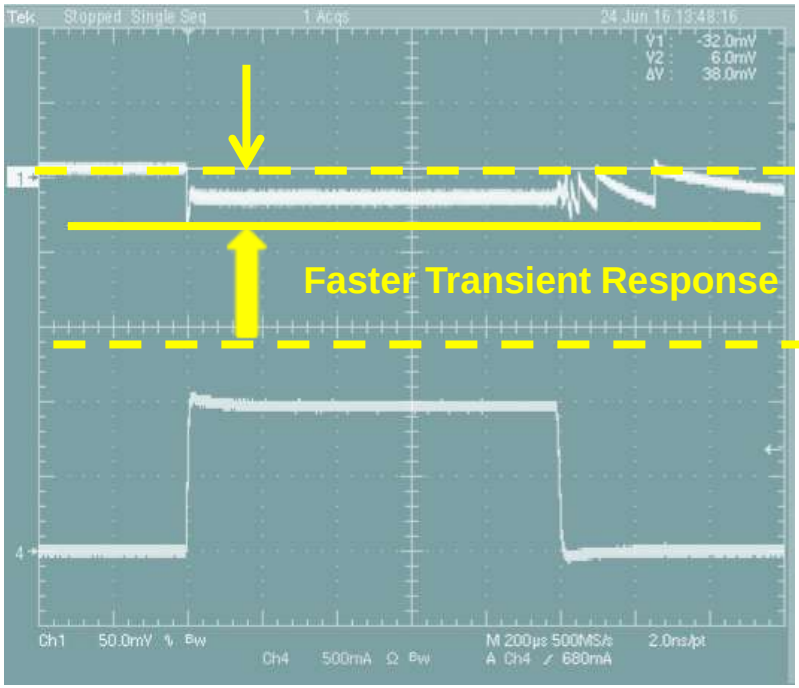


TSOT-23-8

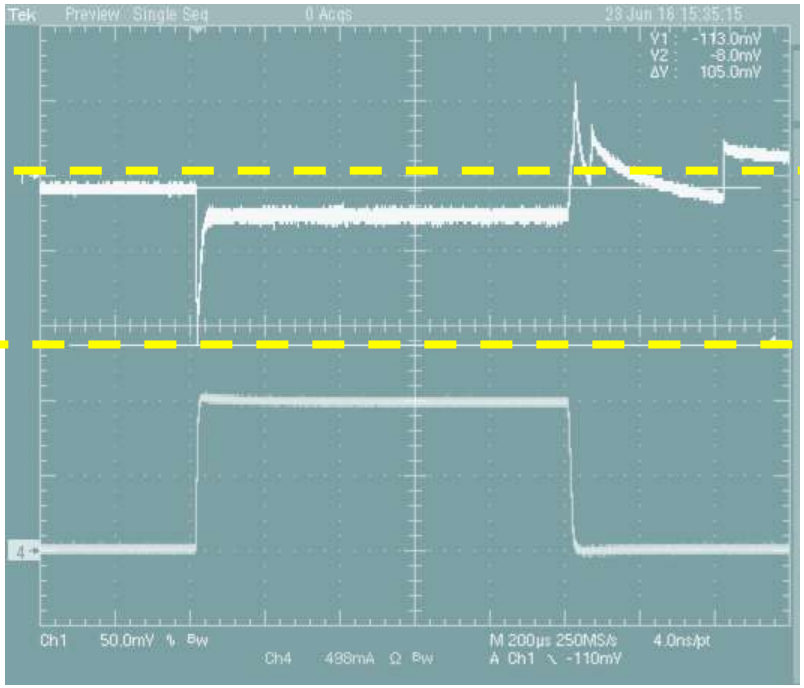
Sampling Now!!

AIC2259

1A, 1.5MHz AOT Synchronous Step-Down DC/DC Converter



AIC2259 V_{IN}=5V, V_{OUT}=1.0V, I_O=0 ~ 1A, drop=38mV
(CH1: Output Voltage, CH4: Output Current)

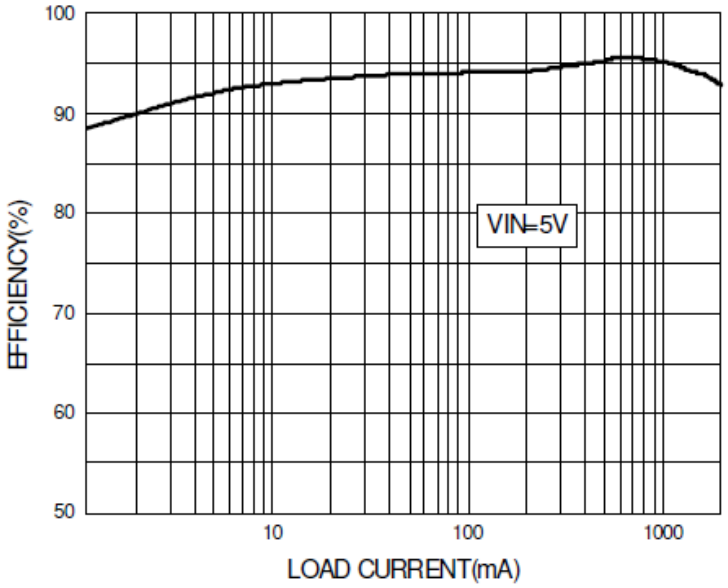


AIC2354 V_{IN}=5V, V_{OUT}=1.0V, I_O=0 ~ 1A, drop=105mV
(CH1: Output Voltage, CH4: Output Current)

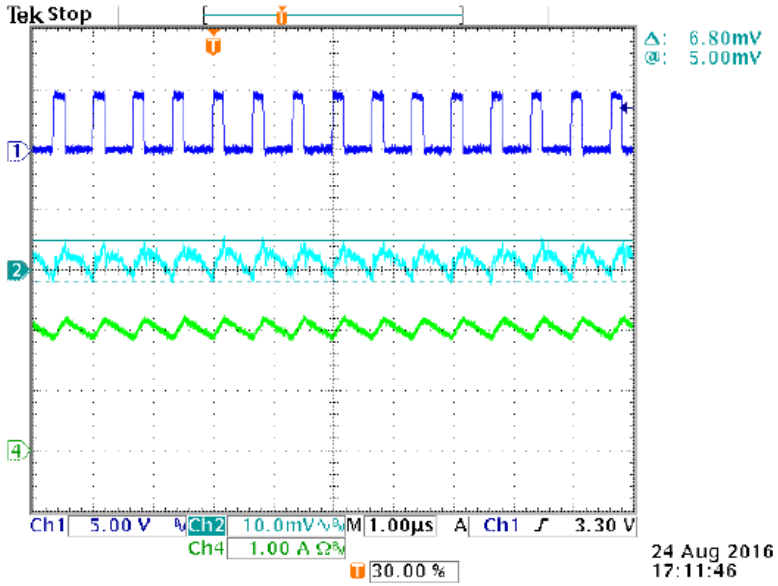
Sampling Now!!

AIC2262

2A 1.5MHz AOT Synchronous Step-Down Converter

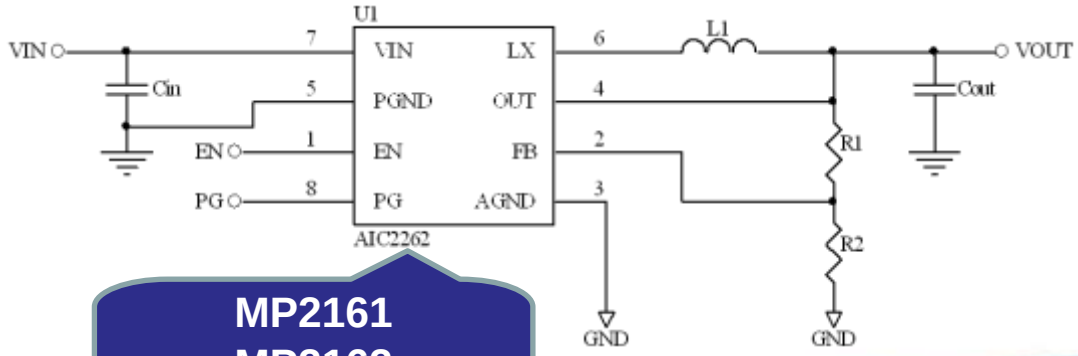


V_{OUT}=3.3V, V_{IN}=5V



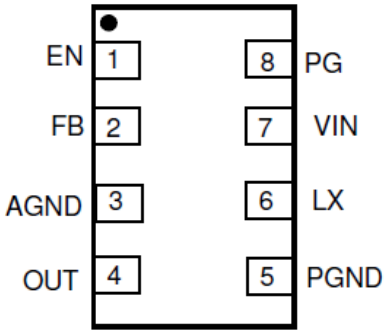
V_{OUT}=1.2V, I_{OUT}=2A Ripple at V_{IN}=5V

Application Circuit

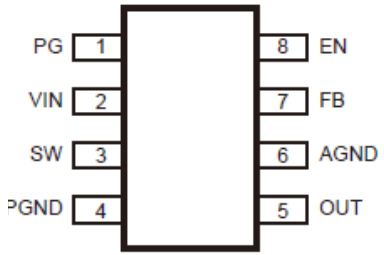


MP2161
MP2162
Compatible

Package



8-pin DFN 2mm x 1.5mm

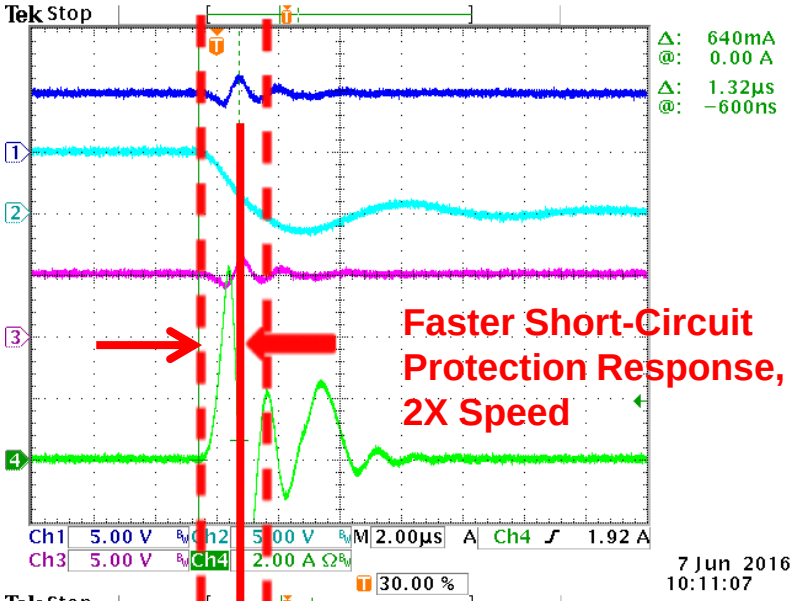


TSOT-23-8

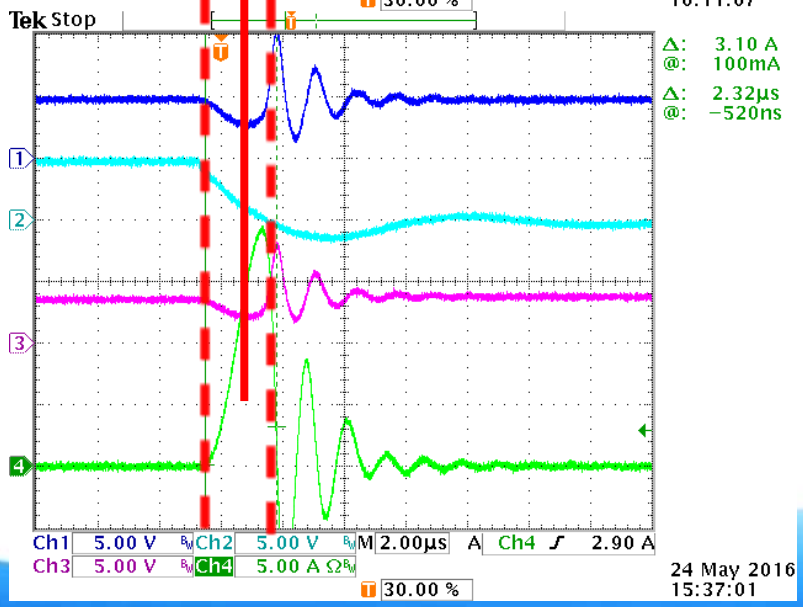
Sampling Now!!

AIC6156

Single Channel USB Switch with Adjustable Current Limit

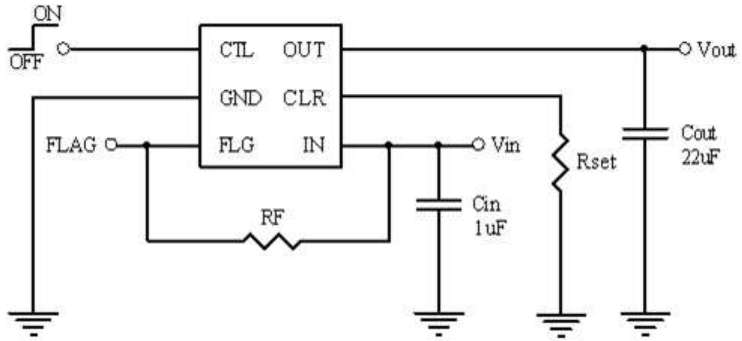


AIC6156 V_{IN}=5V, I_{CL}=0.5A, **Res. Time=1.32uS**
(CH1: Input Voltage, CH2: Output Voltage, CH3: FLG, CH4: Input Current)

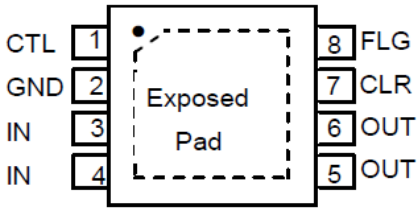


TPS2554 V_{IN}=5V, I_{CL}=0.5A, **Res. Time=2.32uS**
(CH1: Input Voltage, CH2: Output Voltage, CH3: FLG, CH4: Input Current)

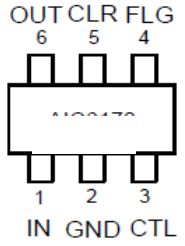
Application Circuit



Package



SOP-8 EP



SOT-23-6

USB Power Switch at 3A

	AIC	TI	Rohm	On-Semi
Part Number	AIC6156	TPS2554 TPS2555	BD82024 BD82025	NCP383
Short Circuit Response Time(uS)	**1.3**	1.5	5	2
Continuous Load Current (A)	0.5~3 (Adj.)	0.5~2.5 (Adj.)	2.5 (Adj.)	0.5~2.1 (Adj.)
MOS R-DS-ON (mohm)	**60**	73	90	45
Supply current (μA)	85	90	95	99
Input Voltage Range (V)	3.5~5.5	4.5~5.5	2.8~5.5	2.7~5.5
Current Limit Threshold (mA)	3060/ 3600/ 4140 1700/ 2000/ 2300 425/ 500/ 575	2550/ 2840 / 3100 2150/ 2430/ 2650 420/ 480/ 530 185/ 230/ 265	2100/2500/3300	2580/2800/3010 900/1000/1100 500/600/700
Current Limit Accuracy (%)	±15	±12	±15	±8
High Side Switch	NMOS	NMOS	NMOS	NMOS
Flag Delay Time (mS)	9	8.5	12	7
Output discharge	**Yes**	Yes	Yes	No
Package	SOP-8/SOT23-6	VSON	SOP8	UDFN10

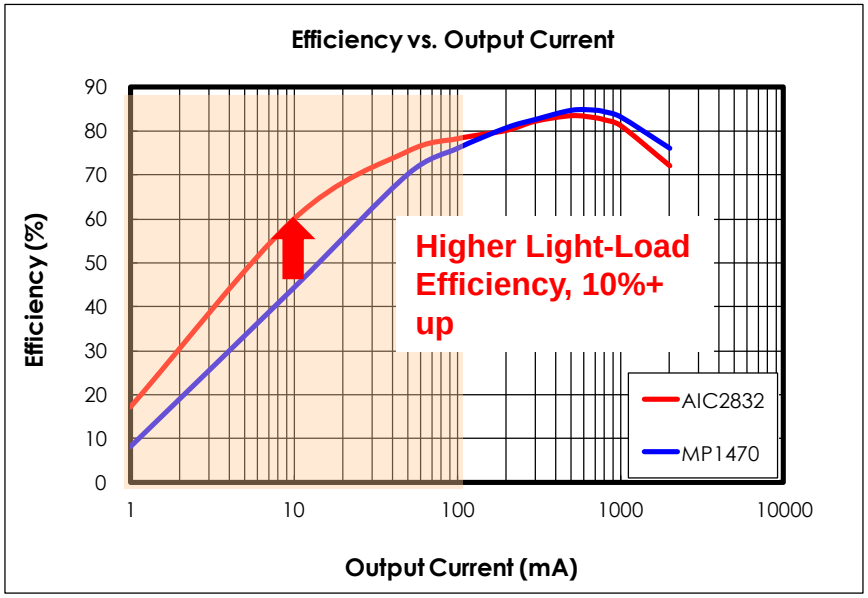
USB Power Switch at 2A

	AIC	TI	Rohm	On-Semi
Part Number	AIC6152	TPS2553	BD2222G BD2242G BD2243G	NCP380 NCV380
Short Circuit Response Time(uS)	1.3	2	5	2
Continuous Load Current (A)	0.5~2 (Adj.)	0.75~1.7 (Adj.)	0.2~1.7 (Adj.)	0.5~2.1 (Adj.)
MOS R-DS-ON (mohm)	60	85	89	70
Supply current (μA)	85	100	120	90
Input Voltage Range (V)	3.5~5.5	2.5~6.5	2.8~5.5	2.5~5.5
Current Limit Threshold (mA)	1700/ 2000/ 2300 425/ 500/ 575	1610/ 1700 / 1800 1215/ 1295/ 1375 490/ 520/ 550 100/ 130/ 150	1566/1696/1826 911/1028/1145 112/212/313	2100/2250/2500 1000/1150/1300 500/580/650
Current Limit Accuracy (%)	±15	±6	±8	±12
High Side Switch	NMOS	NMOS	NMOS	PMOS
Flag Delay Time (mS)	9	8	7	8
Output discharge	Yes	No	BD2242/43	No
Package	SOT23-6	SOT23-6	SSOP6	TSOP-6

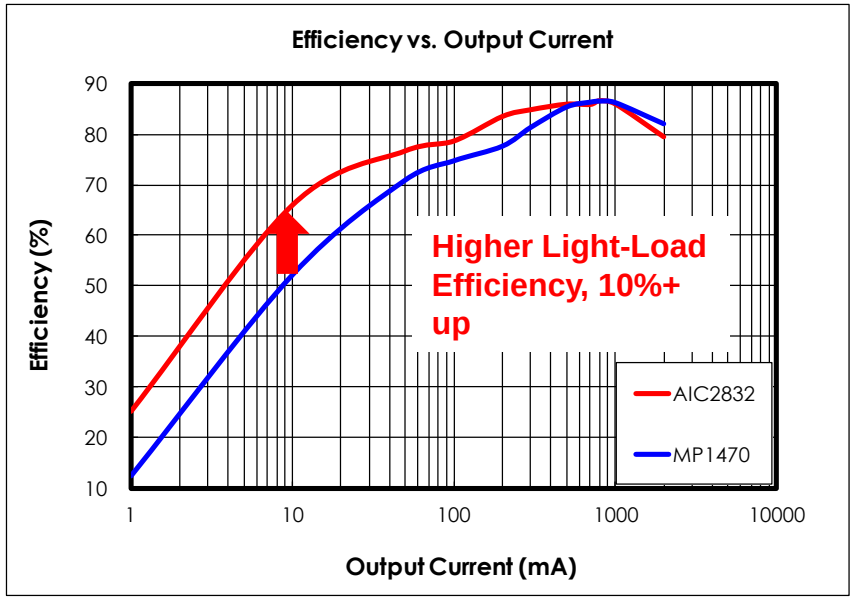
Mass Production!!

AIC2832

2A 16V 490kHz PWM/PSM Synchronous Step-Down Converter

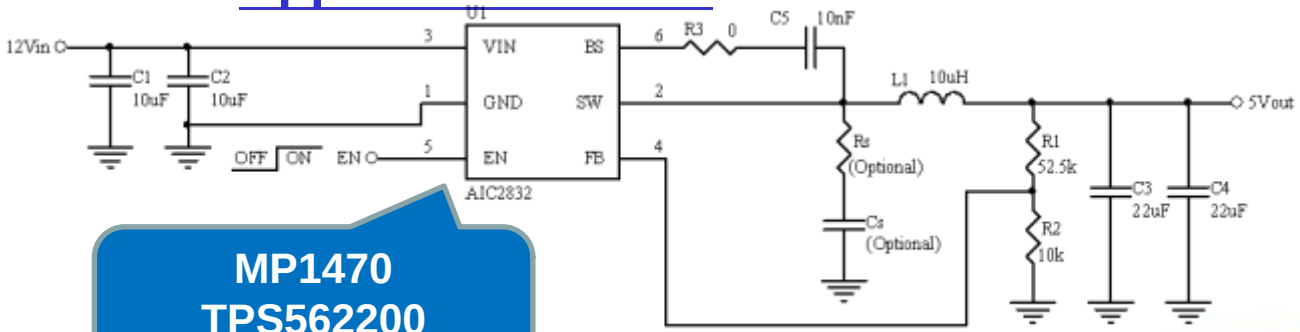


$1.05V_{OUT}$ Efficiency at V_{IN}=12V



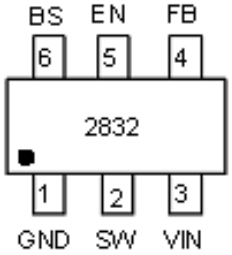
$1.8V_{OUT}$ Efficiency at V_{IN}=12V

Application Circuit



MP1470
TPS562200
Compatible

Package

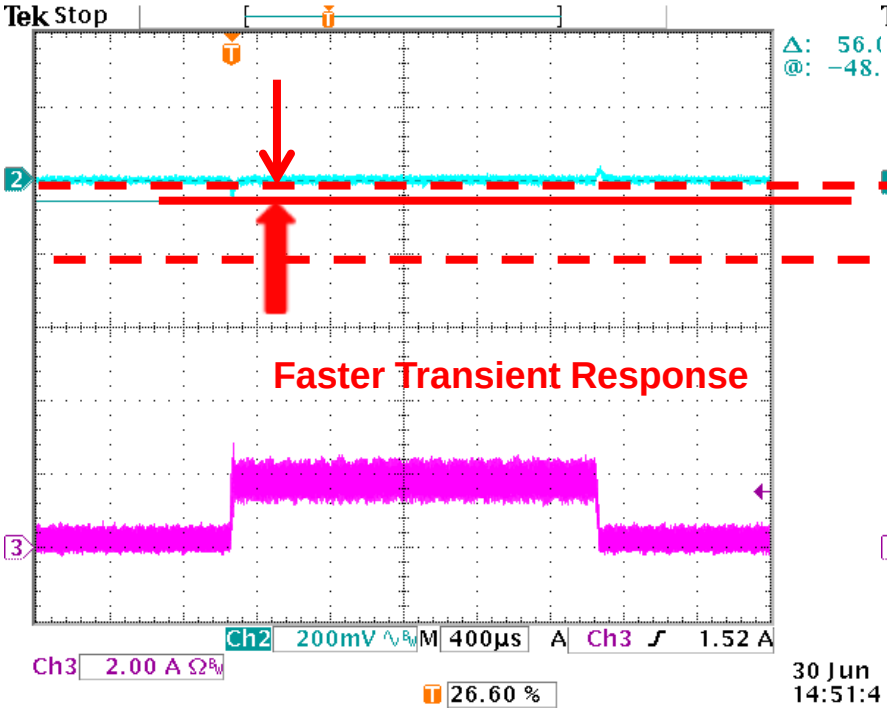


SOT-23-6

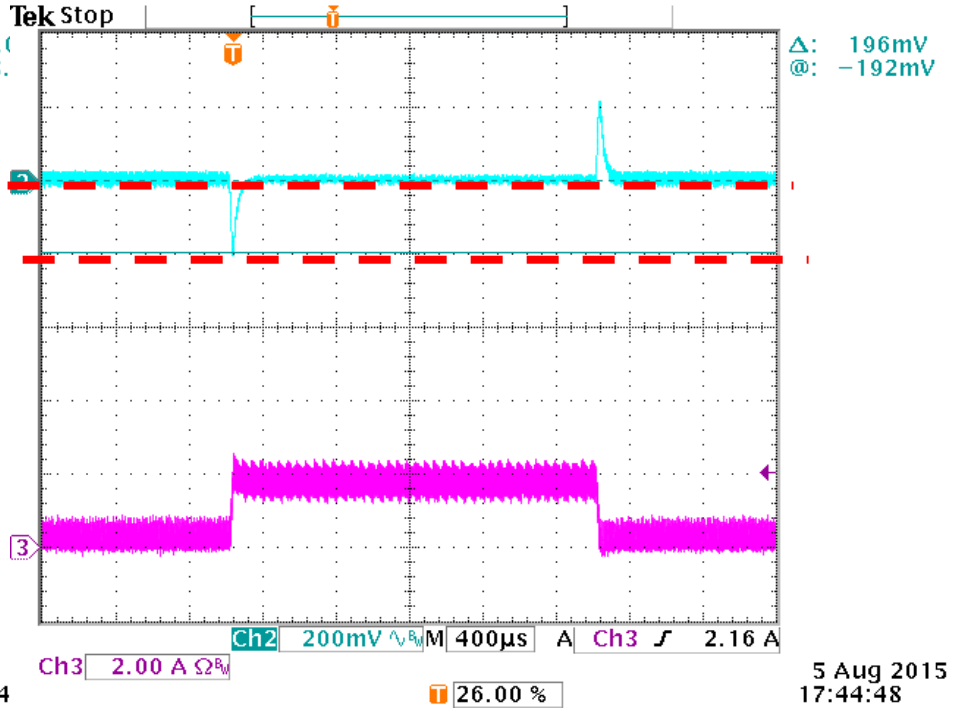
Mass Production!!

AIC2832

2A 16V 490kHz PWM/PSM Synchronous Step-Down Converter



AIC2832 V_{IN}=12V, V_{OUT}=1.05V, I_O=0.2 ~ 1.8A,
drop=59mV
CH2: Output Voltage, CH3: Inductor Current

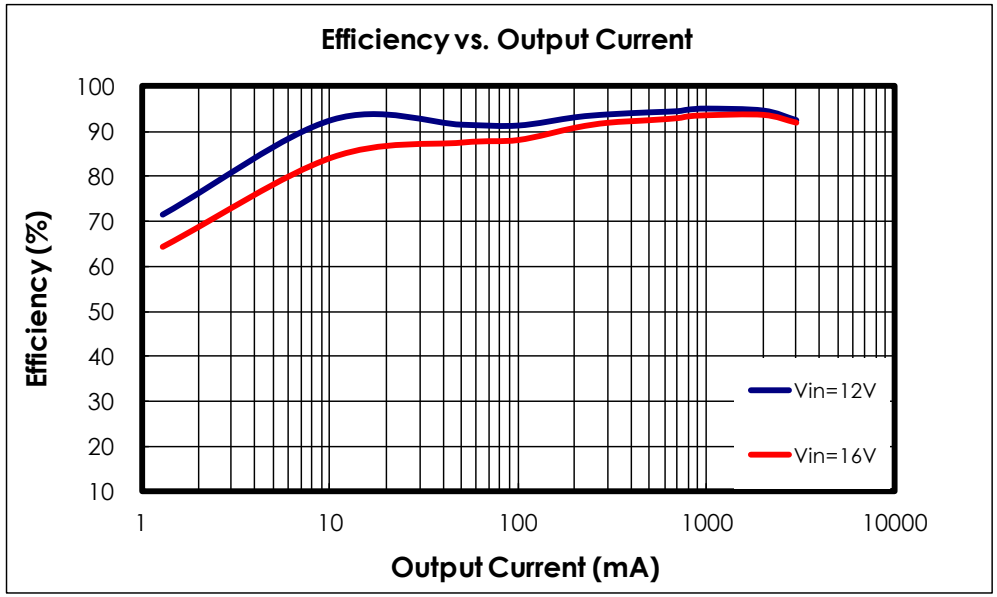


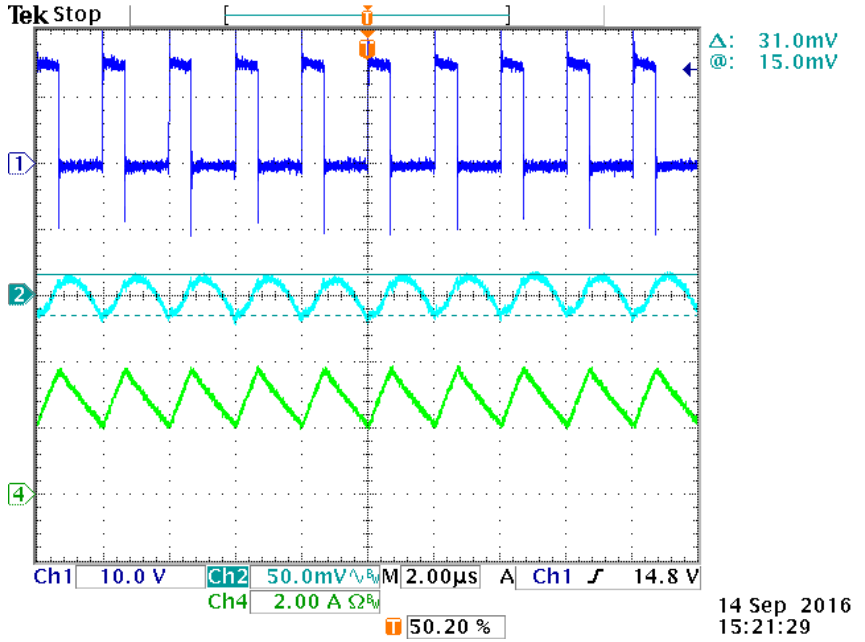
MP1470 V_{IN}=12V, V_{OUT}=1.05V, I_O=0.2 ~ 1.8A,
drop=196mV
CH2: Output Voltage, CH3: Inductor Current

Sampling in Apr.

AIC2833

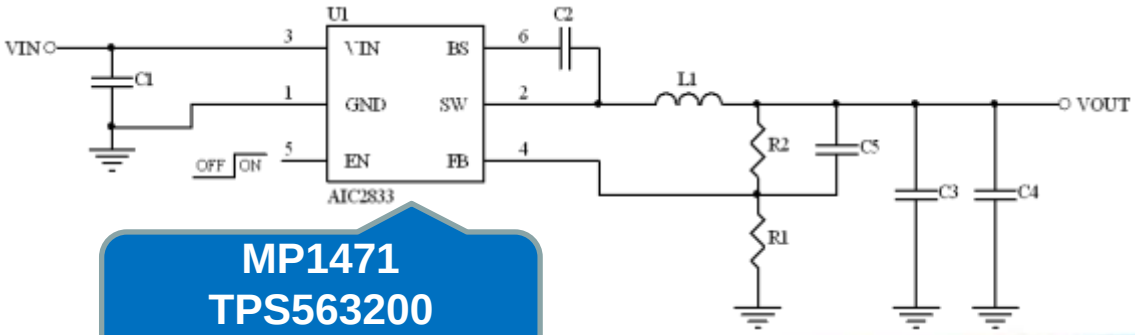
3A 16V 490kHz PWM/PSM Synchronous Step-Down Converter





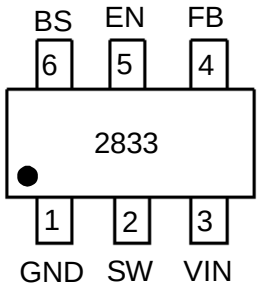
V_{OUT}=5V, I_{OUT}=3A Ripple at V_{IN}=12V

Application Circuit



MP1471
TPS563200
Compatible

Package



SOT-23-6

Q & A !