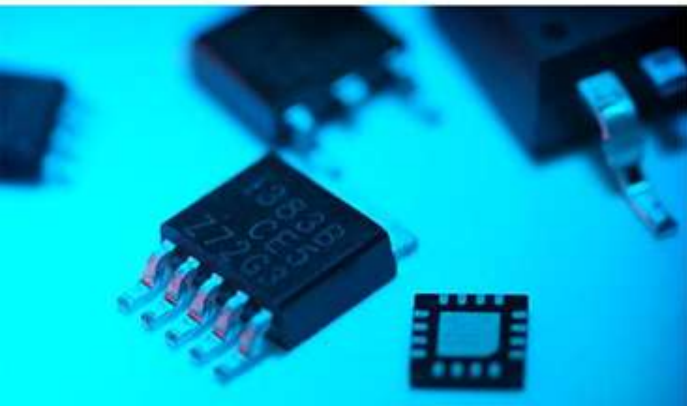




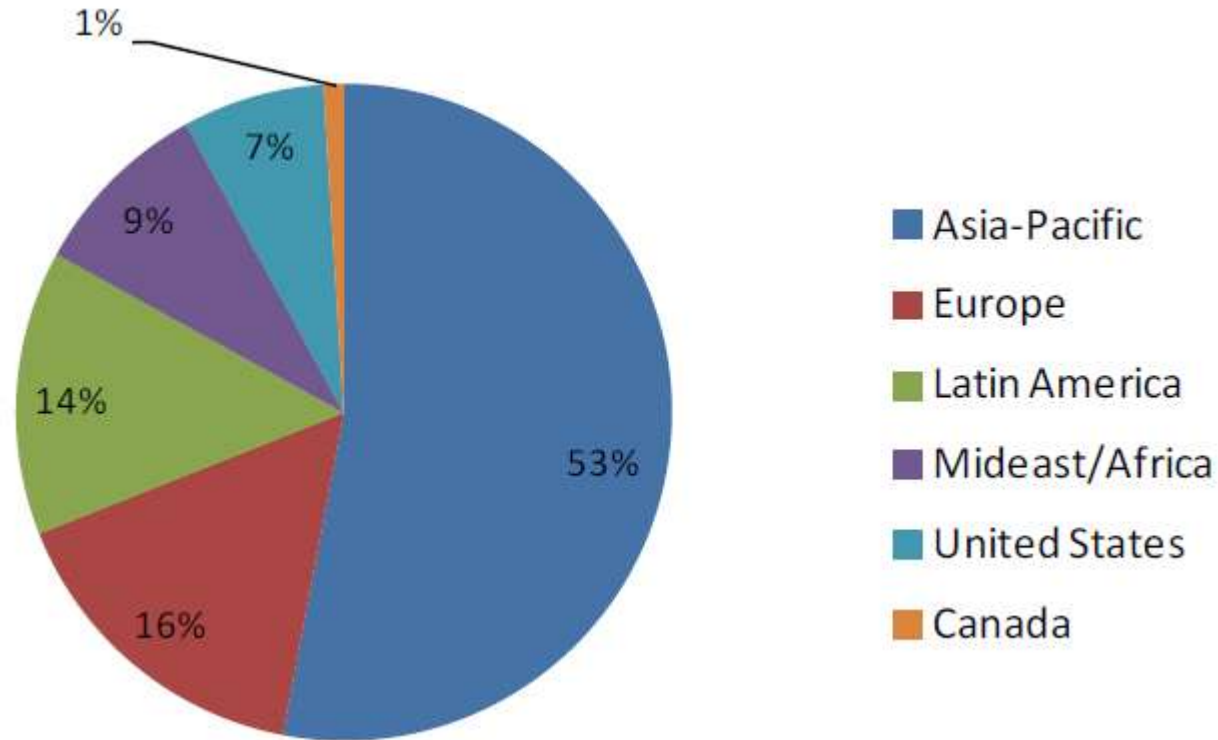
AIC Solutions for POS



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

POS WW Shipment Outlook (2014)



資料來源：The Nilson Report , 2015/07

Global Mobile Point-Of-Sales Terminals Market Revenue and Volume

- The mobile Point-of-Sale terminals market is expected to reach US\$ 43.32 Bn by 2022, expanding at a CAGR of 23.2% from 2015 to 2022. In terms of volume, the mobile POS terminals market is expected to register 242.97 Mn shipments by 2022.



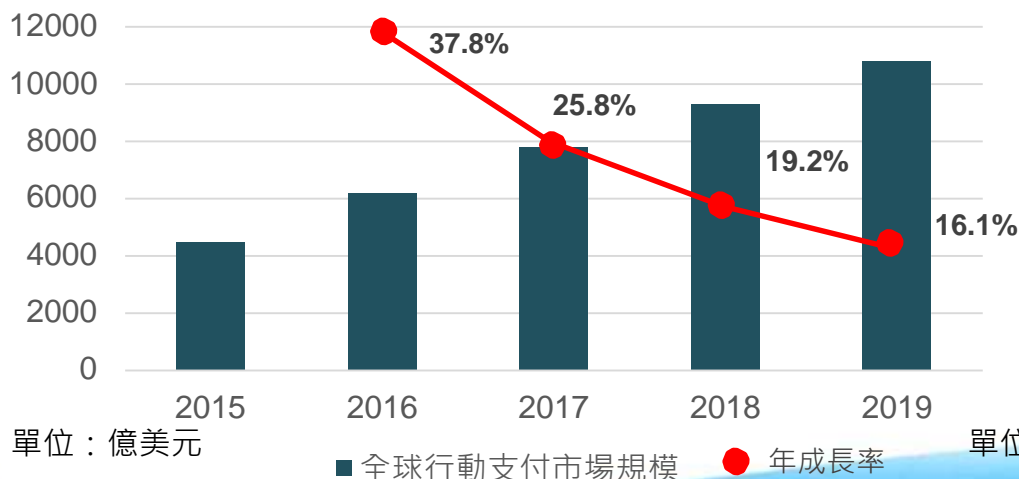
POS Terminal Shipments 2015

'15	'14	Mfg./Headquarters	Units	Chg.
1	1	Ingenico France ¹	9,800,000	7%
2	2	Verifone U.S.	5,961,000	8%
3	4	Fujian Newland China	5,511,300	137%
4	3	Pax Technology China	4,175,180	38%
5	5	BBPOS Hong Kong	2,953,502	30%
6	6	SZT Electronics China	2,645,500	54%
7	8	Shenzhen Xinguodu China	1,392,594	30%
8	14	Dspread Technology China	1,080,000	112%
9	9	New POS Technology China	1,069,112	9%
10	11	Castles Technology Taiwan	1,018,000	37%
11	10	Bitel South Korea	884,050	1%
12	12	Hangzhou Sunyard China	807,005	21%
13	15	Spire Payments U.K., Spain	757,500	55%
14	13	Centerm China	713,978	10%
15	17	First Data U.S.	628,000	64%
16	7	CyberNet South Korea	594,950	-50%
17	16	Spectra Tech. Hong Kong	420,250	8%
18	18	Shenzhen Justtide China	324,000	-12%
19	20	Aisino (was Vanstone) China	315,219	31%
20	19	Yarus Russia	288,700	13%
21	21	Equinox Payments U.S.	222,300	19%
22	34	Bluebird South Korea	205,031	350%
23	32	YouTransactor France	164,000	249%
24	33	UIC Taiwan	163,575	256%
25	24	Worldline Belgium	151,951	29%
26	22	Kwangwoo I&C South Korea	122,000	-16%
27	23	Panasonic Japan	120,000	0%
28	25	SK M&Service Co. South Korea	110,000	7%
29	31	Linkwell Telesystems India	103,568	106%
30	28	Shenzhen Kaifa Tech. China	101,700	21%
31	30	USA Technologies U.S.	100,540	71%
32	27	InfoCrypt South Korea	97,700	7%
33	-	Gertec Brazil	85,432	new

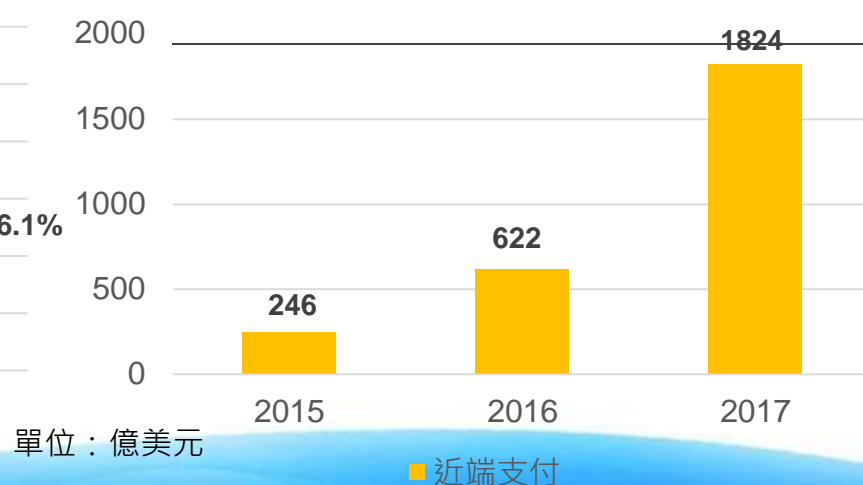
近五年全球行動支付交易占比

- 2015年全球行動支付的市場規模約 4,400 億美元（包含遠端、近端交易規模），全球用戶已成長至6,044萬人。其中遠端行動支付占比達 95%；而2015年透過近端行動支付（包含NFC、掃描條碼等方式）目前約只佔全部行動支付規模之 5%，根據Statista 預估 至2017年近端支付可望成長至25%以上，後續成長速度可望繼續攀升。而2017年預估近端用戶數可望達到兩億。
- 2016年Statista調查顯示，僅有11.6%的人使用過NFC結帳，其他較多使用條碼掃描及P2P付款方式。原因是各國非NFC的行動支付APP（如支付寶等）因使用方便，廣受消費者喜愛，選擇性更多元的情況下，Apple Pay、Samsung Pay 等NFC支付要如何打入各國市場將是一大挑戰。
- 未來非NFC行動支付App如何強化安全性機制將是其抗衡NFC大軍壓境之不二法門。

全球行動支付市場規模



全球近端支付規模



中國行動支付以既有第三方儲值平台為主



藉由綁定之銀行帳戶與手機號碼之方式，透過手機使用銀行帳戶進行各種支付，銀聯於**2016年2月**推出「雲閃付」，並與**Apple Pay**、**Samsung Pay**合作



目前多以**APP平台與帳戶儲值**為主—獨立於金融機構及移動電信運營商之外的**第三方支付平台業者**為主導，是目前大陸行動支付市場**主要推動者之一**。

未來中國政府推動以**金融機構、電信運營商、中國銀聯**的**NFC**行動支付為主導，**第三方支付機構**為輔，實現**多方共贏**。

電信運營商既是行動支付業務的數據傳輸網路提供者，亦是行動支付帳戶的管理者

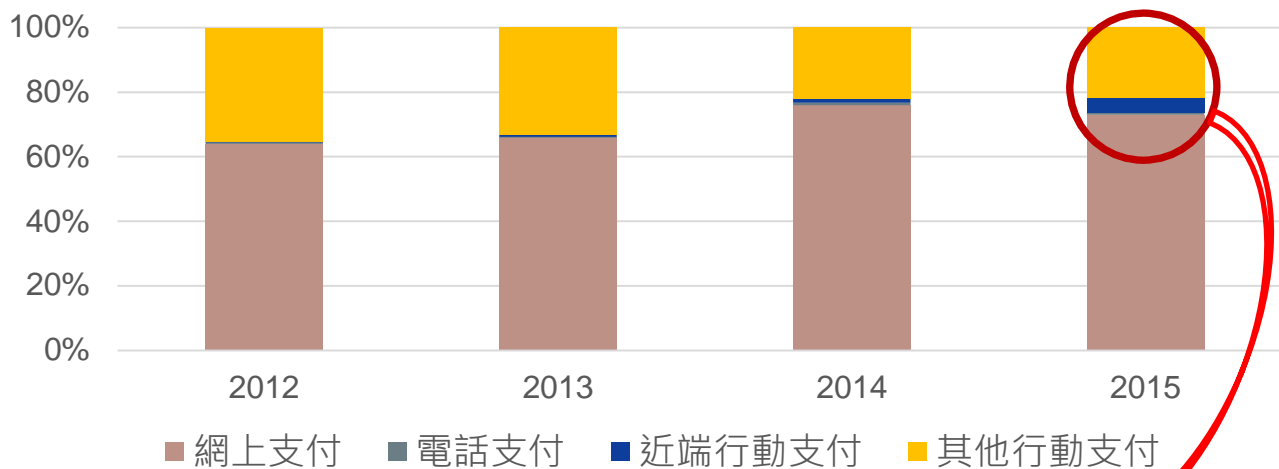


中国移动通信
CHINA MOBILE

中國近五年近端行動支付交易規模

- 中國從2003年支付寶創立後開始快速發展第三方支付平台，電商市場交易額不斷攀升，而智慧型手機與裝置普及後，更從2014年開始許多傳統電商第三方平台加入行動支付產業，利用舊有累積的大量用戶，從電商進入與實體店家的合作，近期甚至發展至跨境交易，成長速度非常可觀。

2012-2015大陸非現金交易比重變化














大陸行動支付交易規模變化

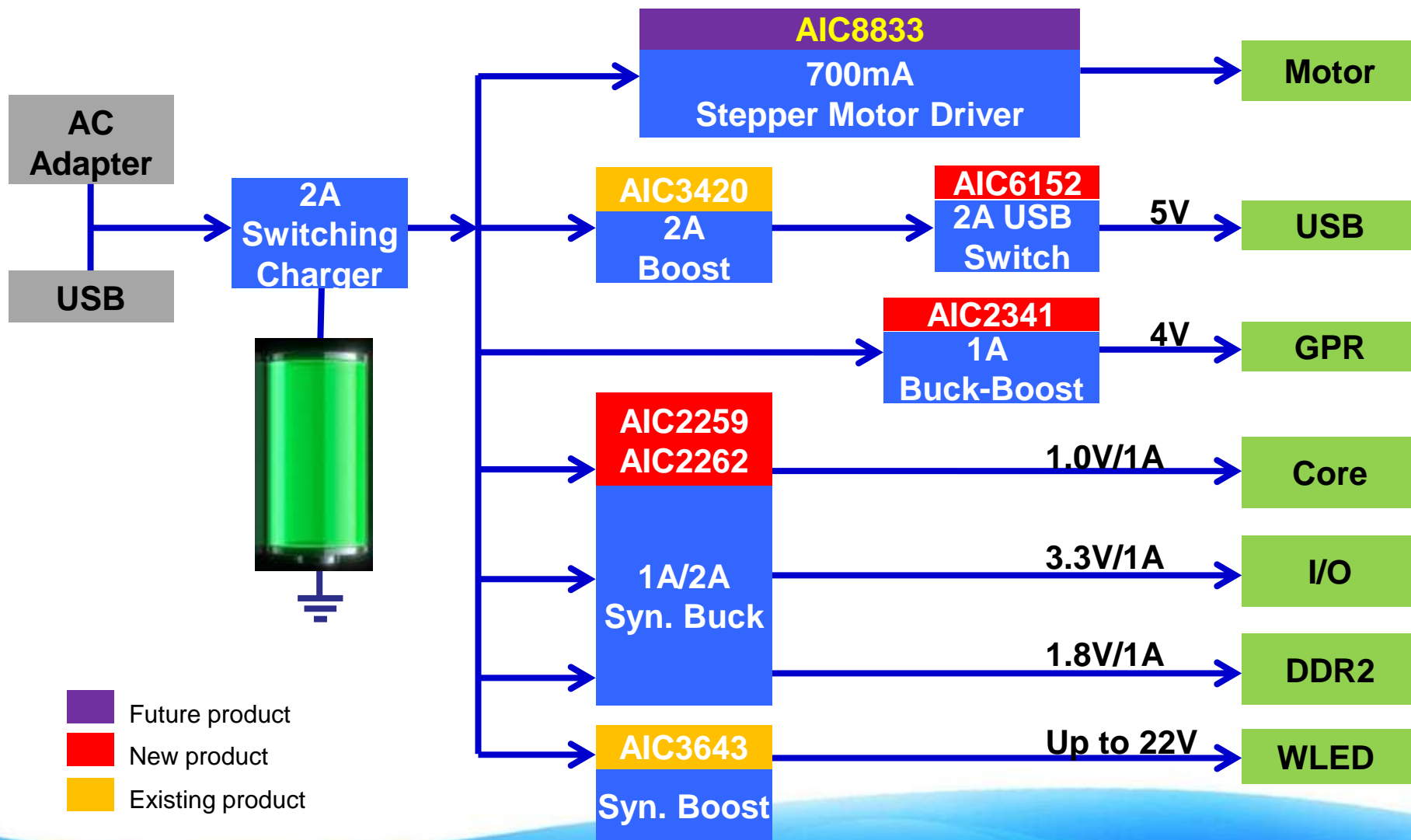
單位：兆元人民幣

	2012	2013	2014	2015
近端行動支付交易規模	2.3	9.6	22.6	39.8

Supply Chain

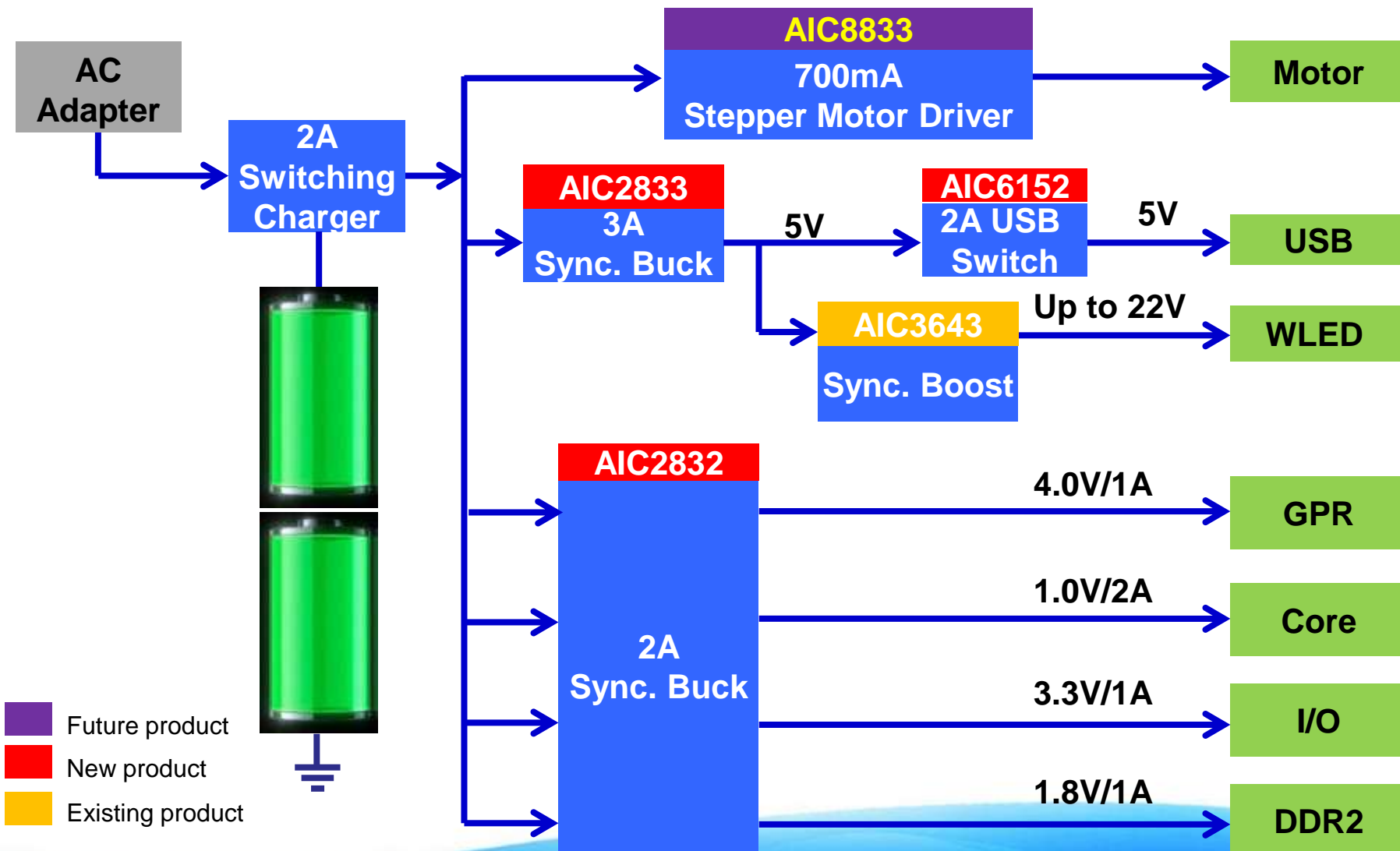
Region	Key Customers	Core Chip Vendors
Overseas	 	
China	      	
Taiwan		

1-Cell Mobile POS Power Block

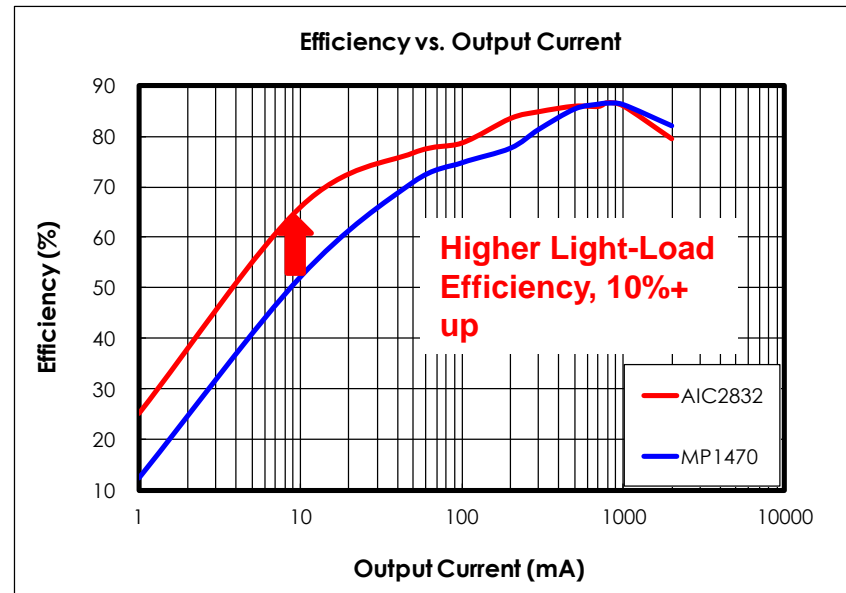
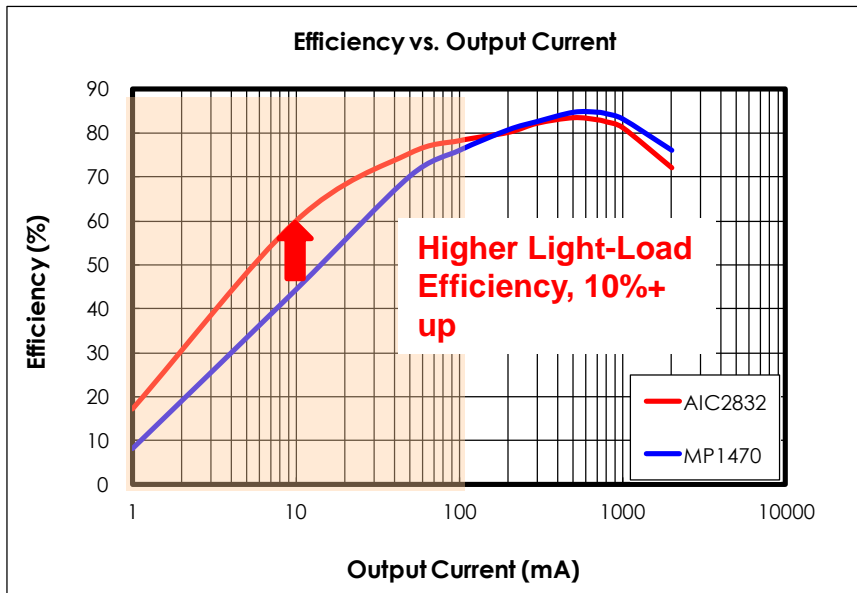


- Future product
- New product
- Existing product

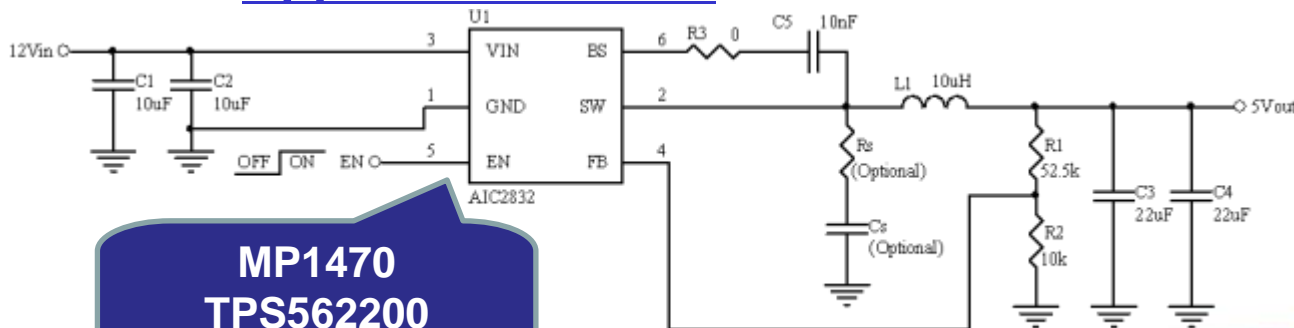
2-Cell Mobile POS Power Block



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

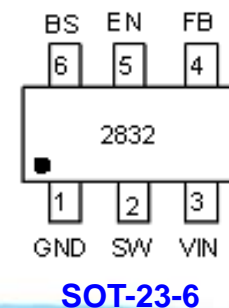


Application Circuit

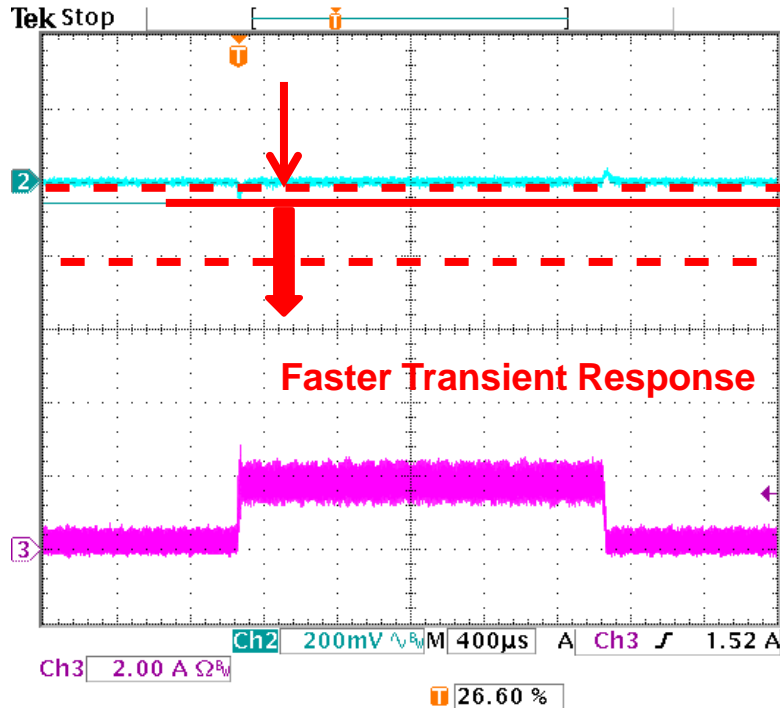


**MP1470
TPS562200
Compatible**

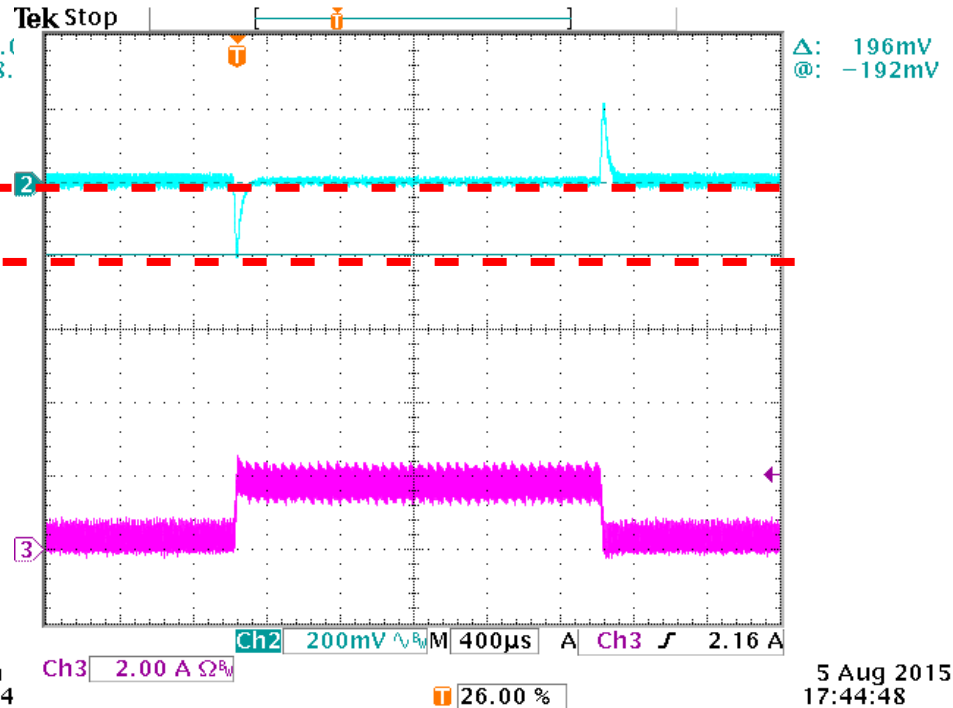
Package



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



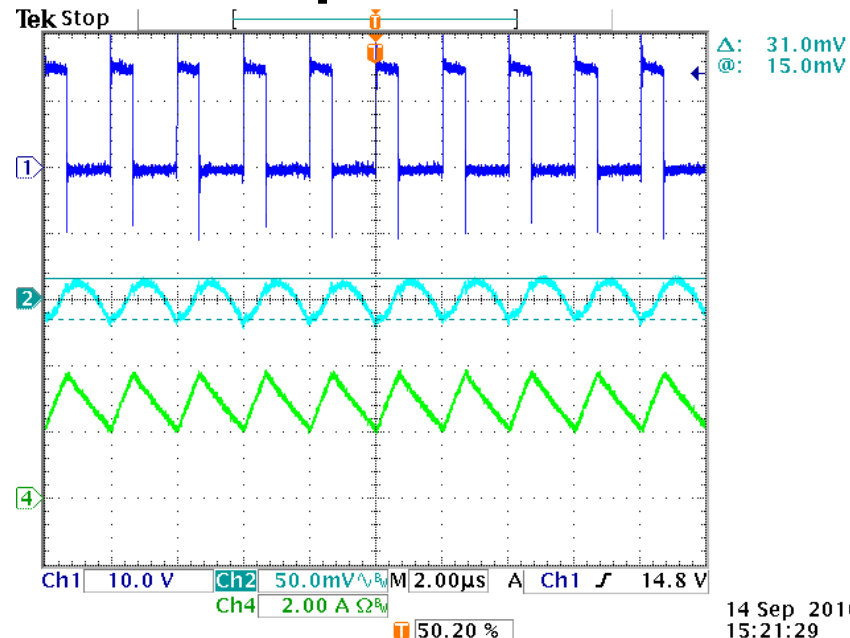
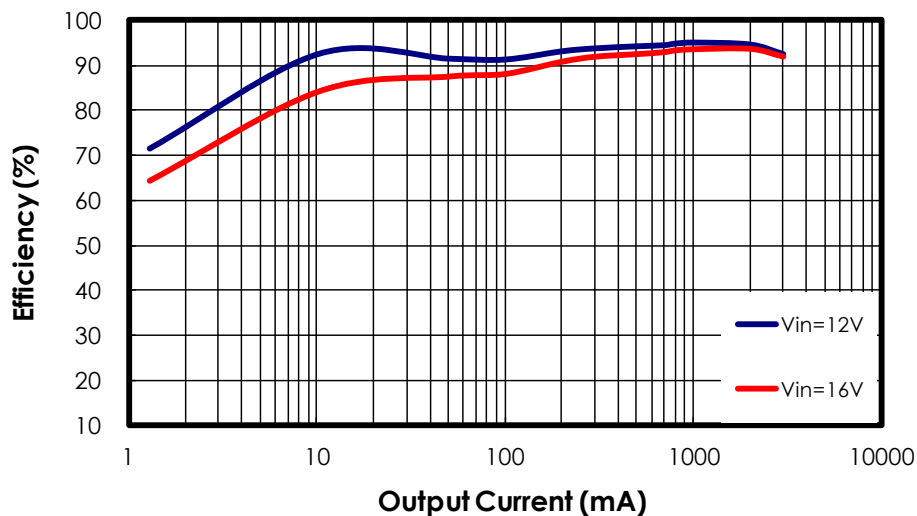
AIC2832 $V_{IN}=12V$, $V_{OUT}=1.05V$, $I_O=0.2 \sim 1.8A$,
drop=59mV
 CH2: Output Voltage, CH3: Inductor Current



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

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

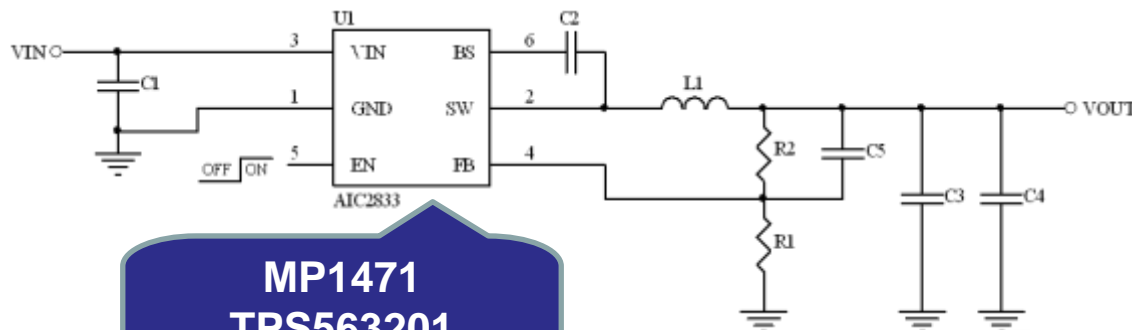
Efficiency vs. Output Current



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

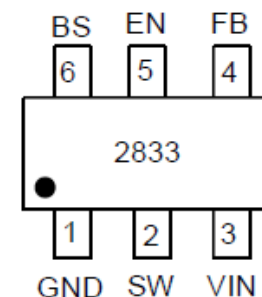
14 Sep 2016
15:21:29

Application Circuit



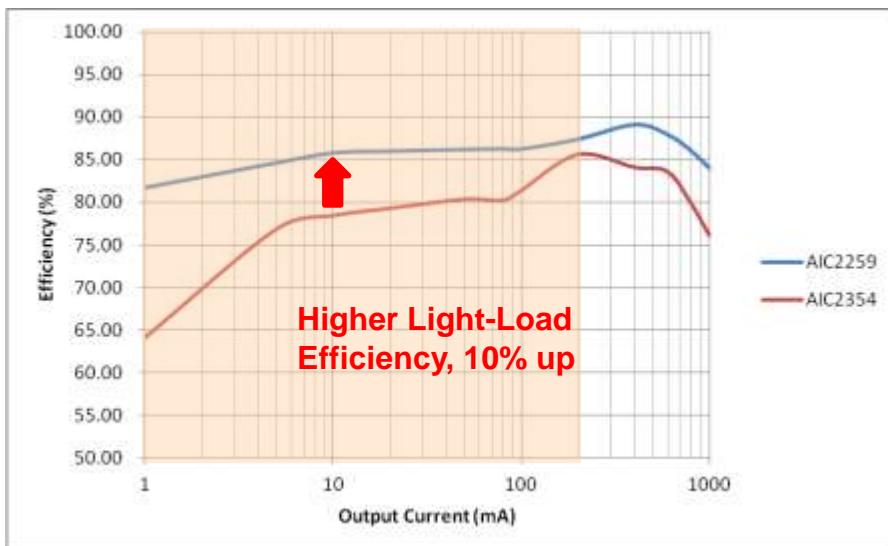
**MP1471
TPS563201
Compatible**

Package

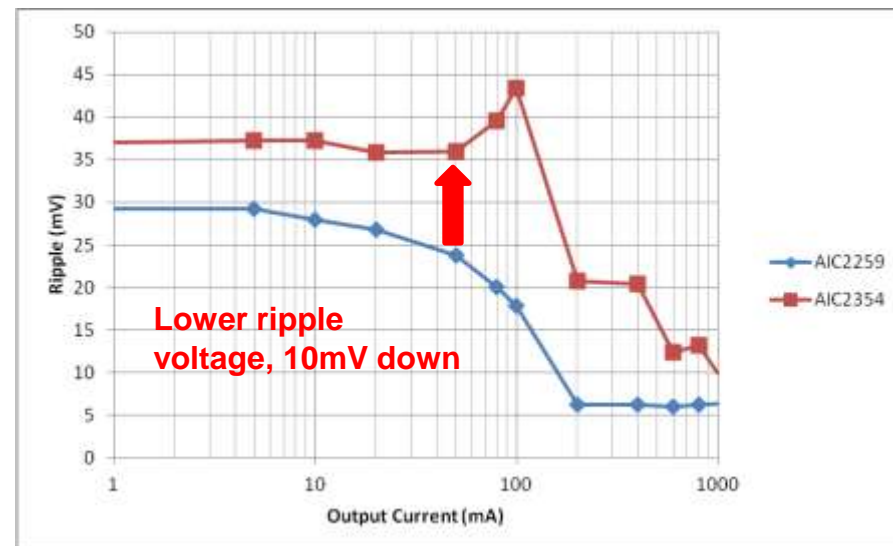


SOT-23-6

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

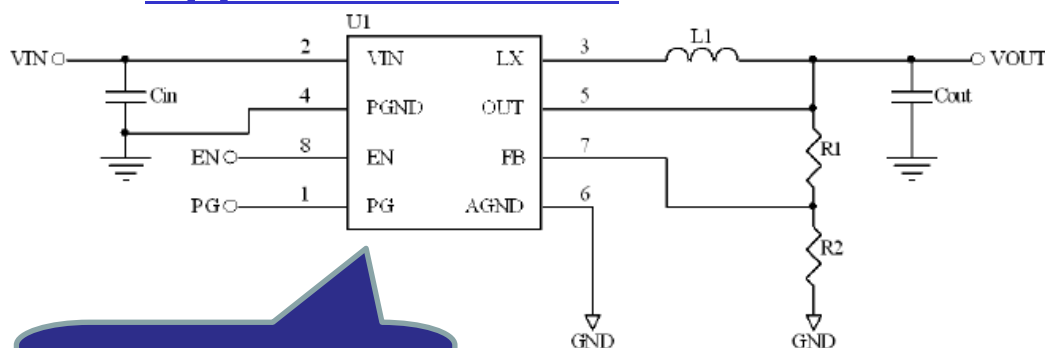


$V_{OUT}=1.0V$ Efficiency at $V_{IN}=5V$



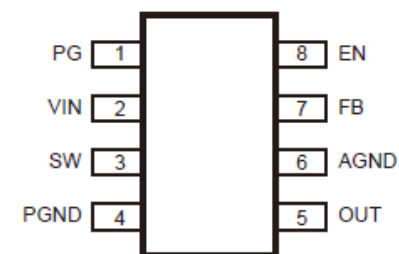
$V_{OUT}=1.0V$ Ripple at $V_{IN}=5V$

Application Circuit



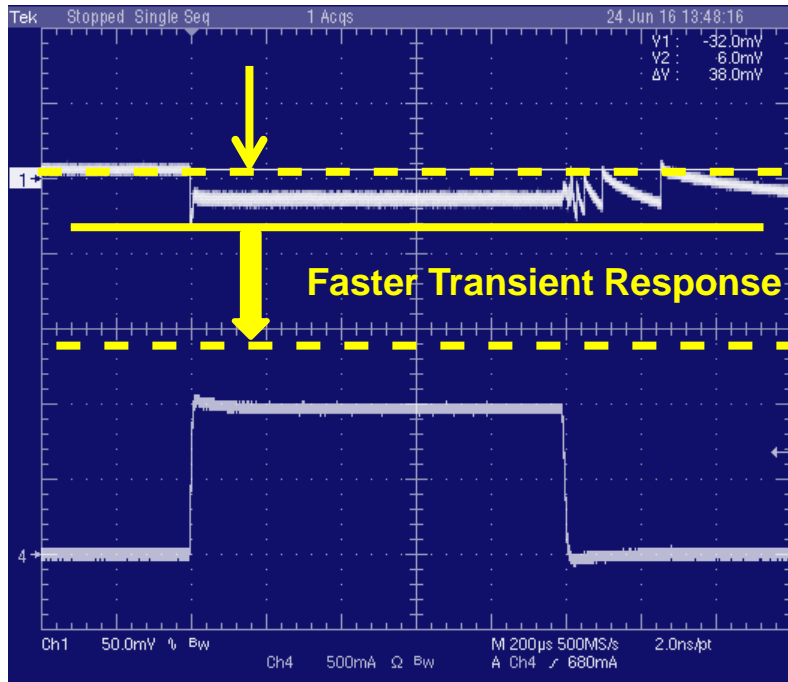
**MP2159
Compatible**

Package

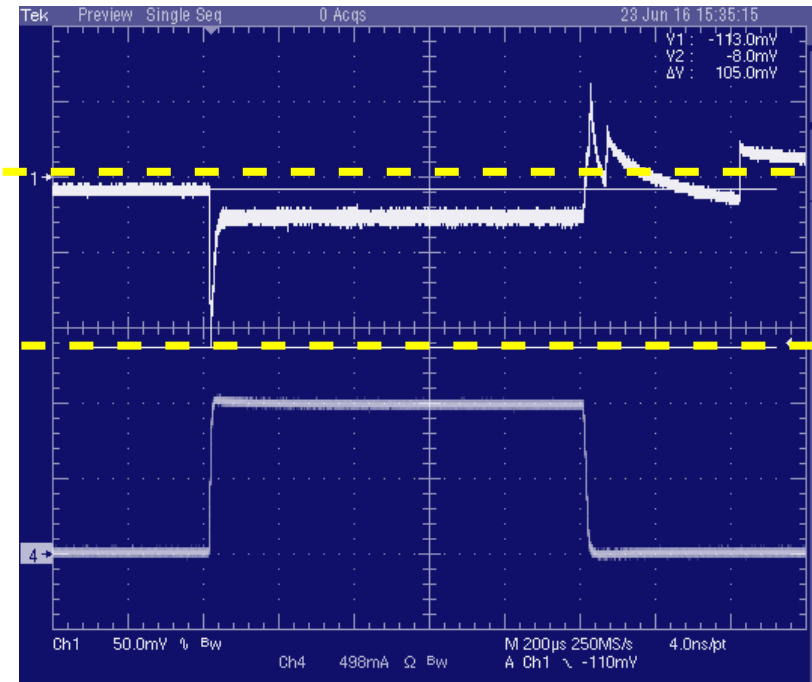


SOT-23-8

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

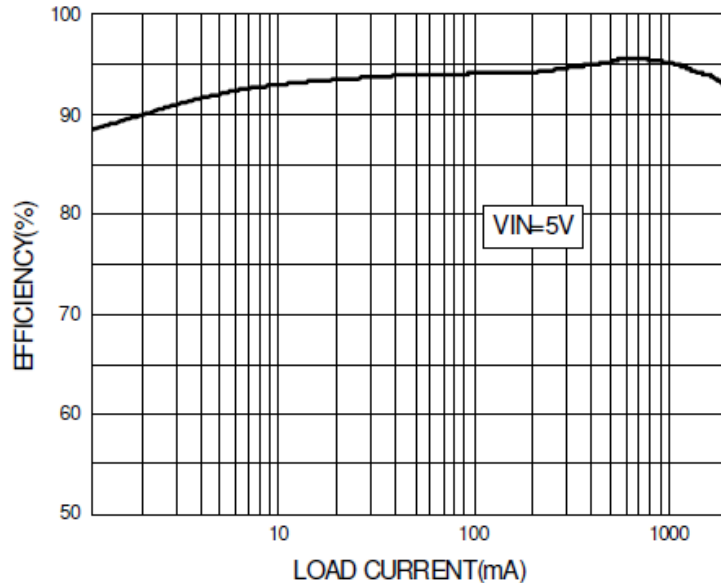


AIC2259 $V_{IN}=5V$, $V_{OUT}=1.0V$, $I_O=0 \sim 1A$,
drop=38mV
 (CH1: Output Voltage, CH4: Output Current)



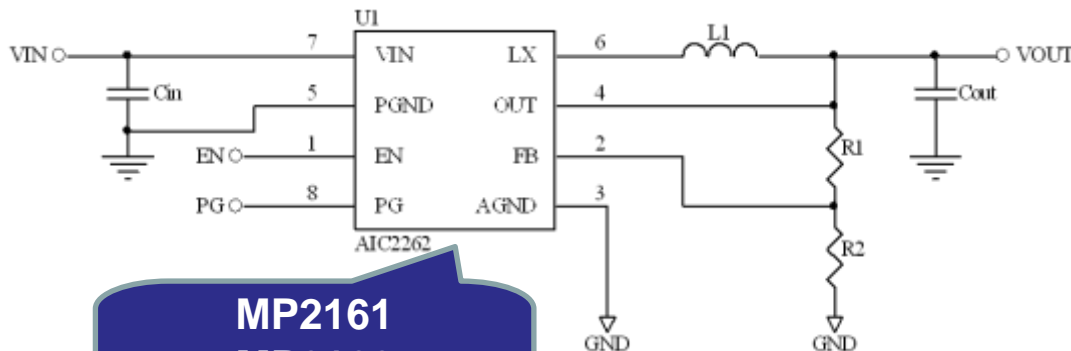
AIC2354 $V_{IN}=5V$, $V_{OUT}=1.0V$, $I_O=0 \sim 1A$,
drop=105mV
 (CH1: Output Voltage, CH4: Output Current)

2A 1.5MHz AOT Synchronous Step-Down Converter

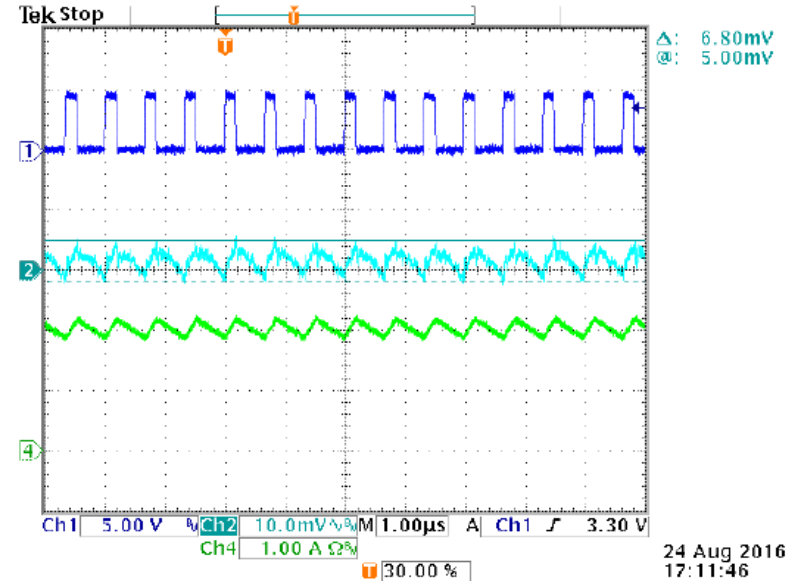


$V_{OUT}=3.3V, V_{IN}=5V$

Application Circuit

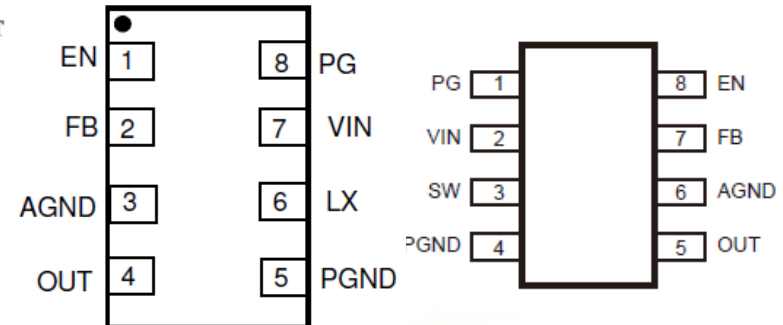


**MP2161
MP2162
Compatible**



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

Package

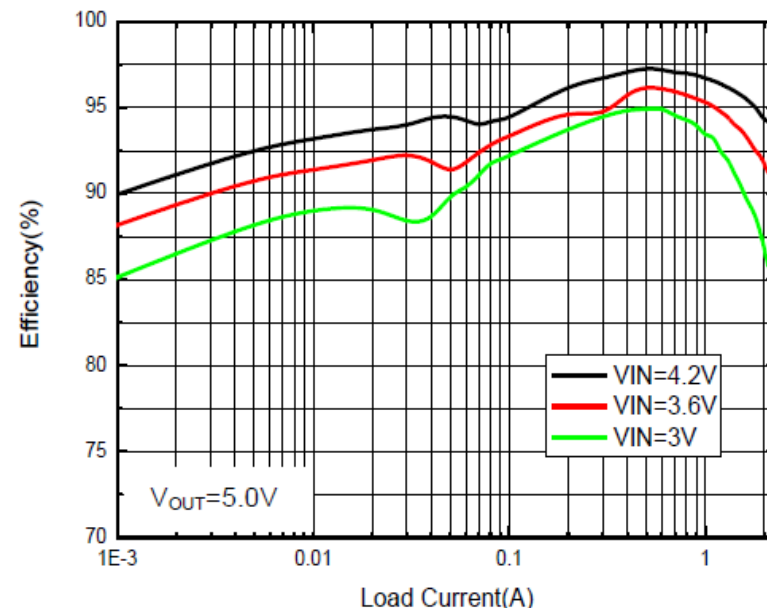


8-pin DFN 2mm x 1.5mm

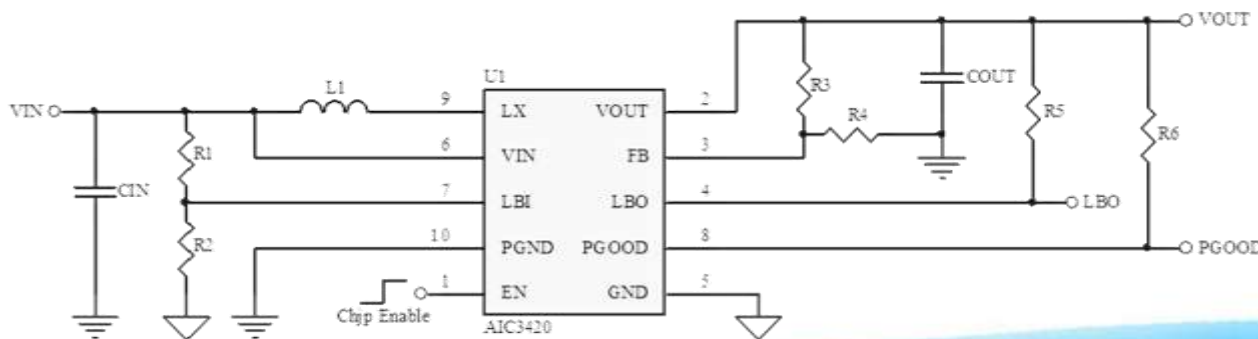
SOT-23-8

2.1A Synchronous Step-Up Converter

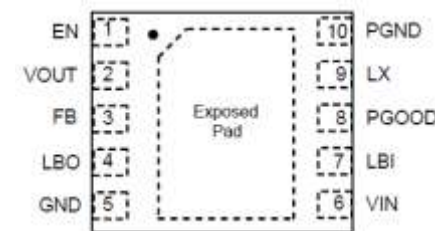
- Vin Start Up Voltage: 0.9V
- Output Voltage Range: from 2.5V to 5.5V.
- Up to 94% Efficiency
- Up to 2.1A Continuous Output Current
- Allow EN pin Floating
- Built-in current mode compensation
- Built-in Protection: Over Current, Over Voltage, Over Temperature
- Optional Active High/Low EN pin
- Logic Controlled Shutdown: < 1μA
- Output Disconnect by Shutdown Function
- Built-in Soft Start



Application Circuit



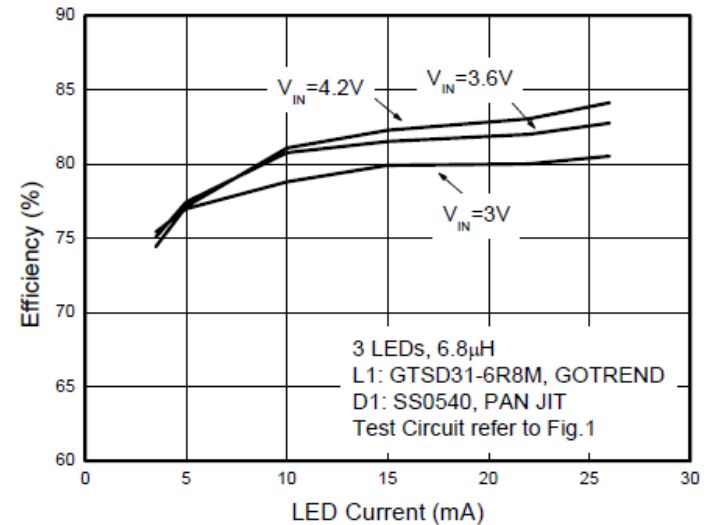
Package



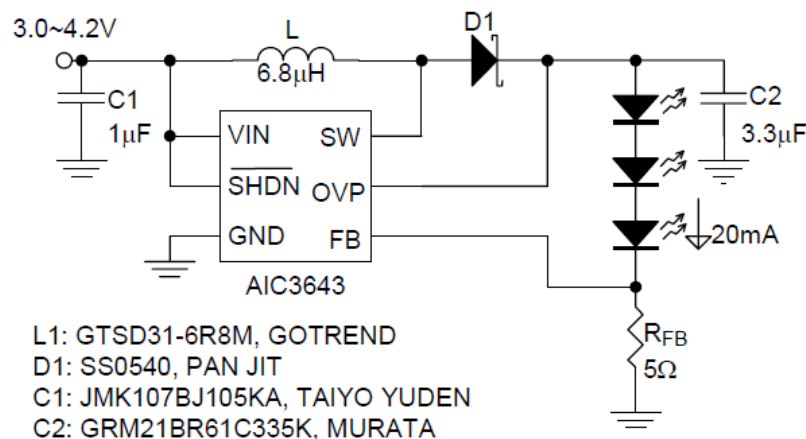
DFN-10

Built-in OVP White LED Step-Up Converter

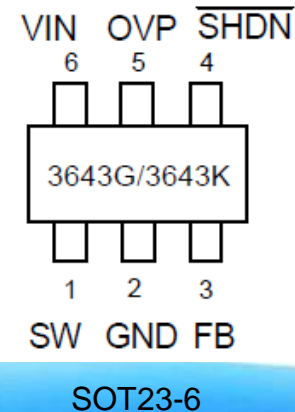
- Built-In Open Circuit Protection
- Over Voltage Protection
- Efficiency Up to 83% at $V_{IN}=4.2V$, 3LEDs, $I_{LED}=20mA$
- 1.2MHz Fixed Switching Frequency
- Drives Up to 5LEDs in series
- 2.5V to 5.5V Input Voltage
- Low Supply Current: 150 μA
- Matches LED Current
- Requires Tiny Inductor and Capacitors
- TSOT-23-6, and SOT-23-6 Packages



Application Circuit

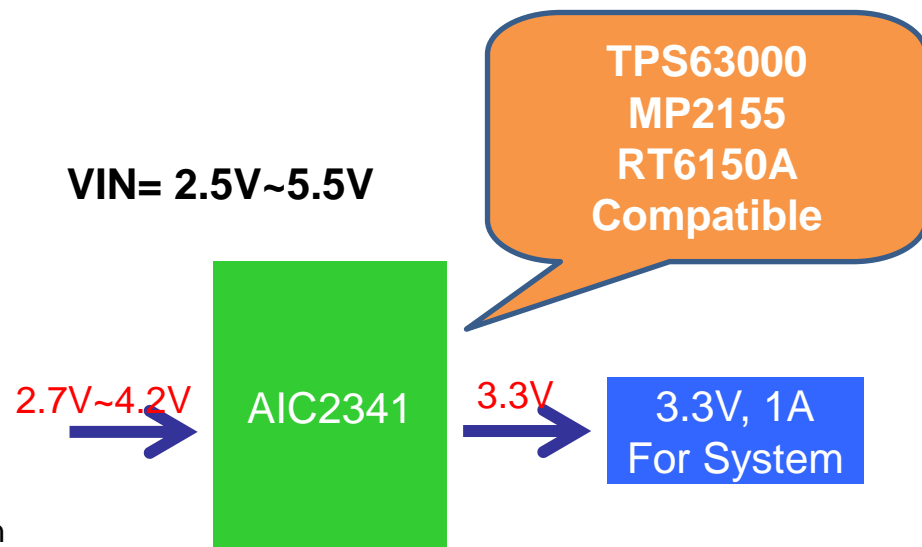


Package

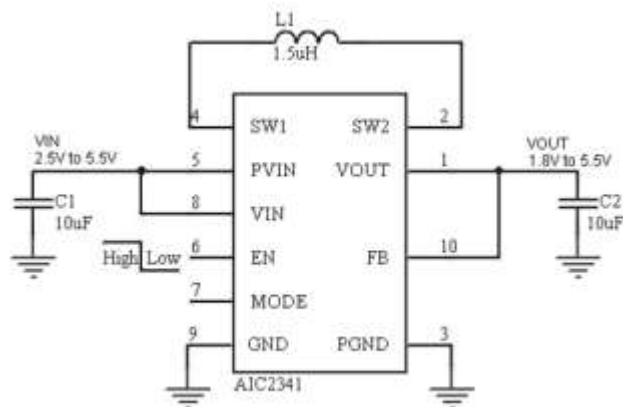


1A 2.5MHz Synchronous Buck-Boost DC/DC Converter

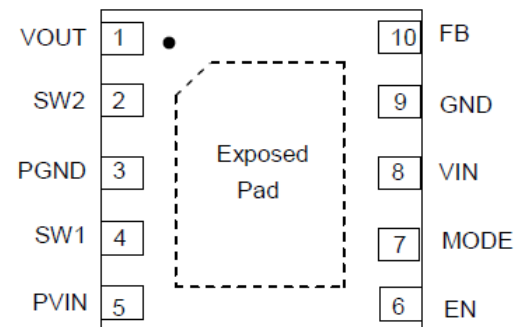
- Regulated Output with Input Voltage Above, Below, or Equal to The Output
- 1A Output Current at 3.3V in Step-Down Mode
- Up to 800mA Output Current at 3.3V in Boost Mode
- Single Inductor
- 2.5V to 5.5V Input Voltage Range
- Fixed and Adjustable Output Voltage Options from 1.8V to 5.5V
- Up to 95% Efficiency
- Stable with Low ESR Ceramic Capacitors
- No Schottky Diode Required
- Output Disconnect in Shutdown
- <1uA Shutdown Current
- <65uA Quiescent Current
- Power Saving Mode for Improved Light-Efficiency Operation
- Forced Fixed Frequency Operation Mode
- Load Disconnect During Shutdown
- Undervoltage Lockout Protection



Application Circuit



Package



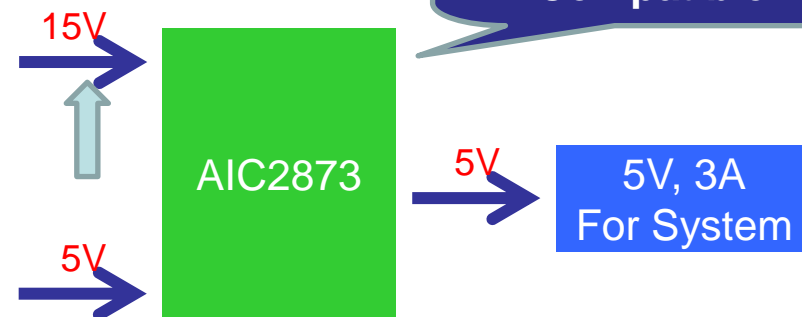
1A 2.5MHz Synchronous Buck-Boost DC/DC Converter

	AIC2341	TPS63000	MP2155	RT6150A
Input Voltage	2.5V~5.5V	1.8V~5.5V	2V~5.5V	1.8V~5.5V
Vout range	1.8V~5.5V	1.2V~5.5V	1.5V~5V	1.8V~5.5V
Quiescent current	50mA	40mA	80mA	60mA
Switching Frequency	2.5MHz	1.5MHz	1MHz	1MHz
Output Current	1A@Buck 0.8A@Boost	1.2A@Buck 0.8A@Boost	1A@Buck 1A@Boost	0.8A@Buck 0.8A@Boost
Current Limit	1.8A	1.8A	2.2A	1.6A
Package	DFN10	QFN10	QFN10	QFN10
Cin/Cout	10uF/10uF	10uF/10uF	10uF/22uF	10uF/20uF
Inductor	1.5uH	2.2uH	3.3uH	2.2uH

3A 17V Synchronous Step-Down Converter with AOT Control

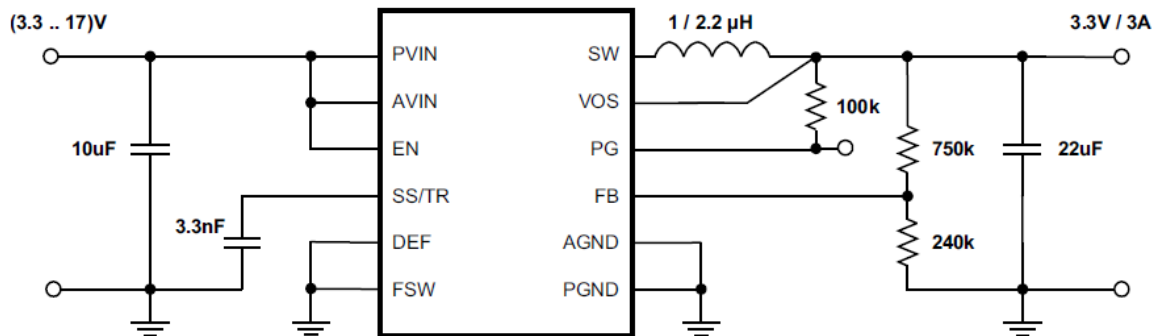
- AOT Topology
- Input Voltage Range: 4.5 V to 17 V
- Up to 3A Output Current
- Adjustable Output Voltage From 0.9 V to 5 V
- Pin-Selectable Output Voltage (Nominal, + 5%)
- Programmable Soft Start and Tracking
- Seamless Power Save Mode Transition
- Quiescent Current of 19 μ A (Typical)
- Selectable Operating Frequency
- Power Good Output
- 100% Duty Cycle Mode
- Short-Circuit Protection
- Over-Voltage Protection with Latch
- Over Temperature Protection
- Available in a 3-mm \times 3-mm, VQFN-16 Package

VIN = 5V~15V

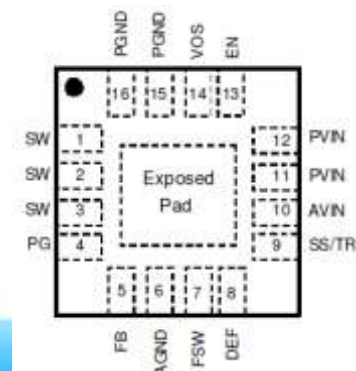


Capable for 100% Duty Cycle Operation

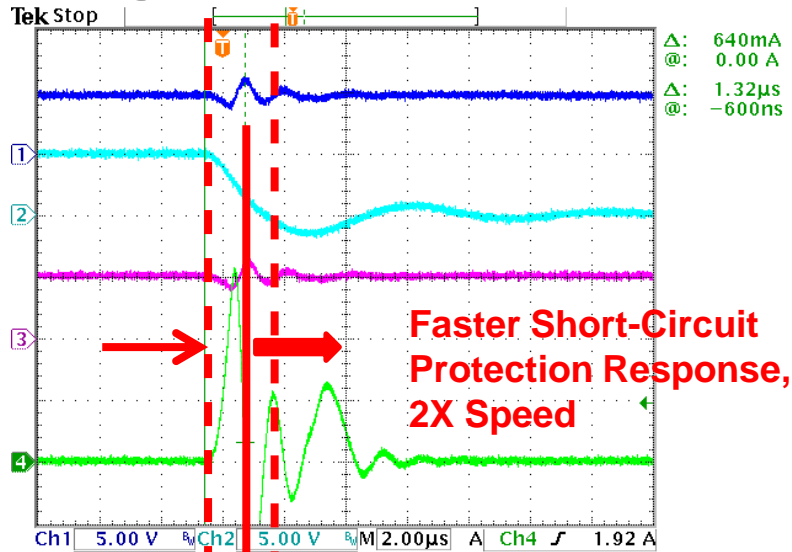
Application Circuit



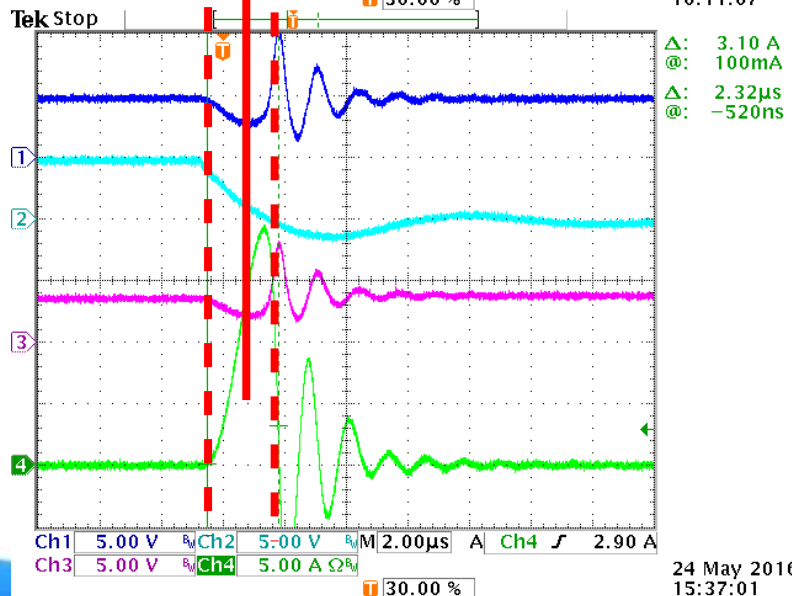
Package



Single Channel USB Switch with Adjustable Current Limit



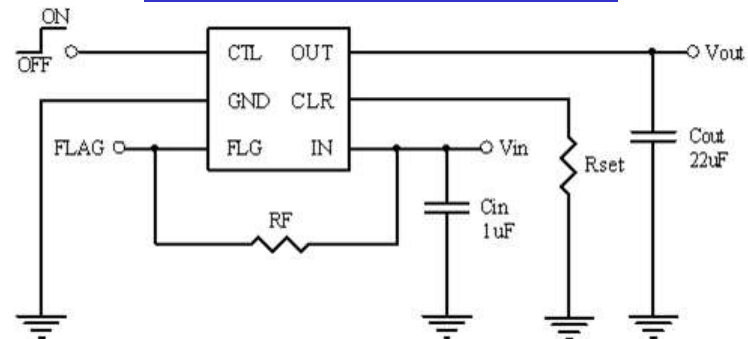
7 Jun 2016 10:11:07



24 May 2016 15:37:01

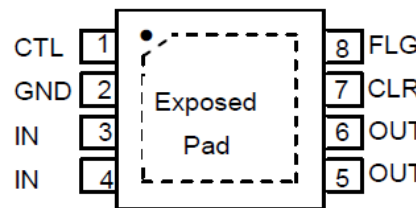
AIC6156 $V_{IN}=5V$, $I_{CL}=0.5A$, **Res. Time=1.32 μ s**
 (CH1: Input Voltage, CH2: Output Voltage, CH3: FLG, CH4: Input Current)

Application Circuit

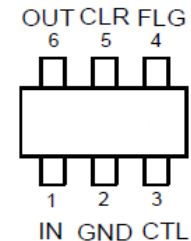


TPS2554 $V_{IN}=5V$, $I_{CL}=0.5A$, **Res. Time=2.32 μ s**
 (CH1: Input Voltage, CH2: Output Voltage, CH3: FLG, CH4: Input Current)

Package



SOP-8 EP

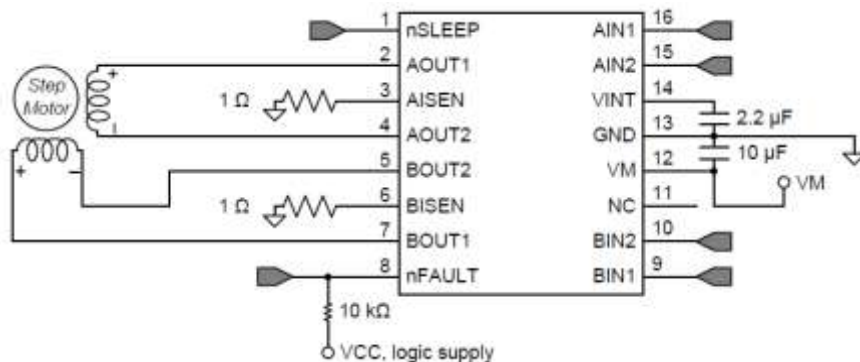


SOT-23-6

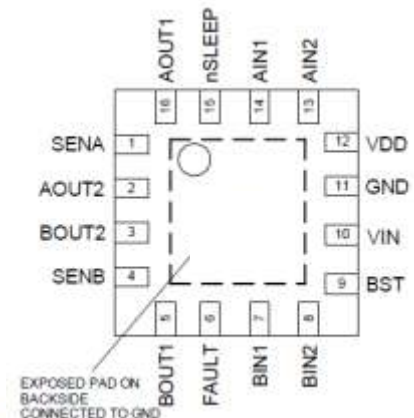
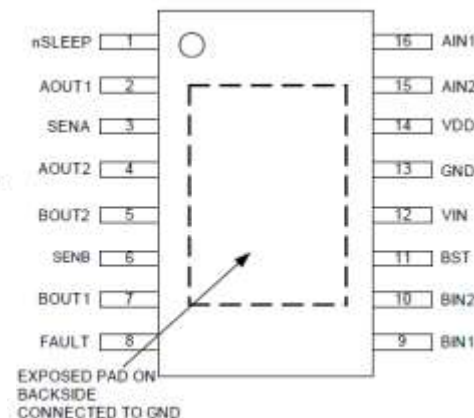
700mA Stepper Motor Driver with Integrated MOSFETs

- Wide 2.7V to 10.8V Input Voltage Range
- Two Internal Full-Bridge Drivers
- Low MOSFET On Resistance (HS + LS = 1735mohm)
- Output Current Capability at 0.7A RMS on HTSSOP, 0.6A RMS on QFN
- Easy PWM Interface
- Low Sleep Current: 1.6uA
- Thermal Shutdown and Under-Voltage Lockout Protection
- Over-Temperature Output Flag
- Thermally-Enhanced Surface-Mount Package

Application Circuit



Package



16pin TSSOP16-EP

16pin QFN 3mm x 3mm

700mA Stepper Motor Driver with Integrated MOSFETs

	AIC	Ti	MPS
Part Number	AIC8833	DRV8833C	MP6507
Output Current (mA)	700	700	700
MOS R-DS-ON (mohm)	1180/555	1180/555 I _{out} =200mA	460/395 I_{out}=500mA
Quiescent current (A)	1.7mA	1.7mA	1.1m
Sleep Mode Current (A)	1.6uA	1.6uA	1uA
Input Voltage Range (V)	2.7~10.8	2.7~10.8	2.7~15
Package	TSSOP16-EP QFN16 3X3	HTSSOP16 QFN16 3X3	TSSOP16-EP QFN16 3X3 QFN16 4X4

Highlights

- **Focused Products**

- AIC2832 – 2A HVB in SOT23-6, HLL η , pin-compatible with MP1470/TPS56220x
- AIC2833 – 3A HVB in SOT23-6, HLL η , pin-compatible with MP1471/TPS56320x
- AIC2259 – 1A LVB in SOT23-8, HLL η , AOT, pin-comp. with MP2159
- AIC2256 – 1A LVB in SOT23-8, HLL η , AOT, 3MHz Frequency, pin-comp. with MP2159
- AIC2253 – 1A LVB in SOT23-8, HLL η , AOT, 8uA Low Iq, pin-comp. with MP2159
- AIC2262 – 2A LVB in SOT23-8/DFN8, HLL η , AOT, pin-comp. with MP2161
- AIC3420 – 2.1A LV Boost in DFN10 and SOP8-EP
- AIC2341 – 1A LV Buck-Boost in DFN10, pin-comp. with TPS63000/MP2155/RT6150A
- AIC6156/52/51 – 3A/2A/1A UPS in SOP8-EP and SOT23-6, 1.3uS Fast SCP, $\pm 7\sim 15\%$ current accuracy

- **Advanced Technology**

- AOT (Adaptive On-Time Control) –
 - **Higher** light-load eff., **Smaller** ripple V., **Faster** transient
- Low Iq – Power-saving, extending battery life, 30uA -> 3uA -> 0.3uA (Q2 '17)
- Fast Short-Circuit Response Time – 1.3uS

Mastering the POWER

