

ANPEC Always Around



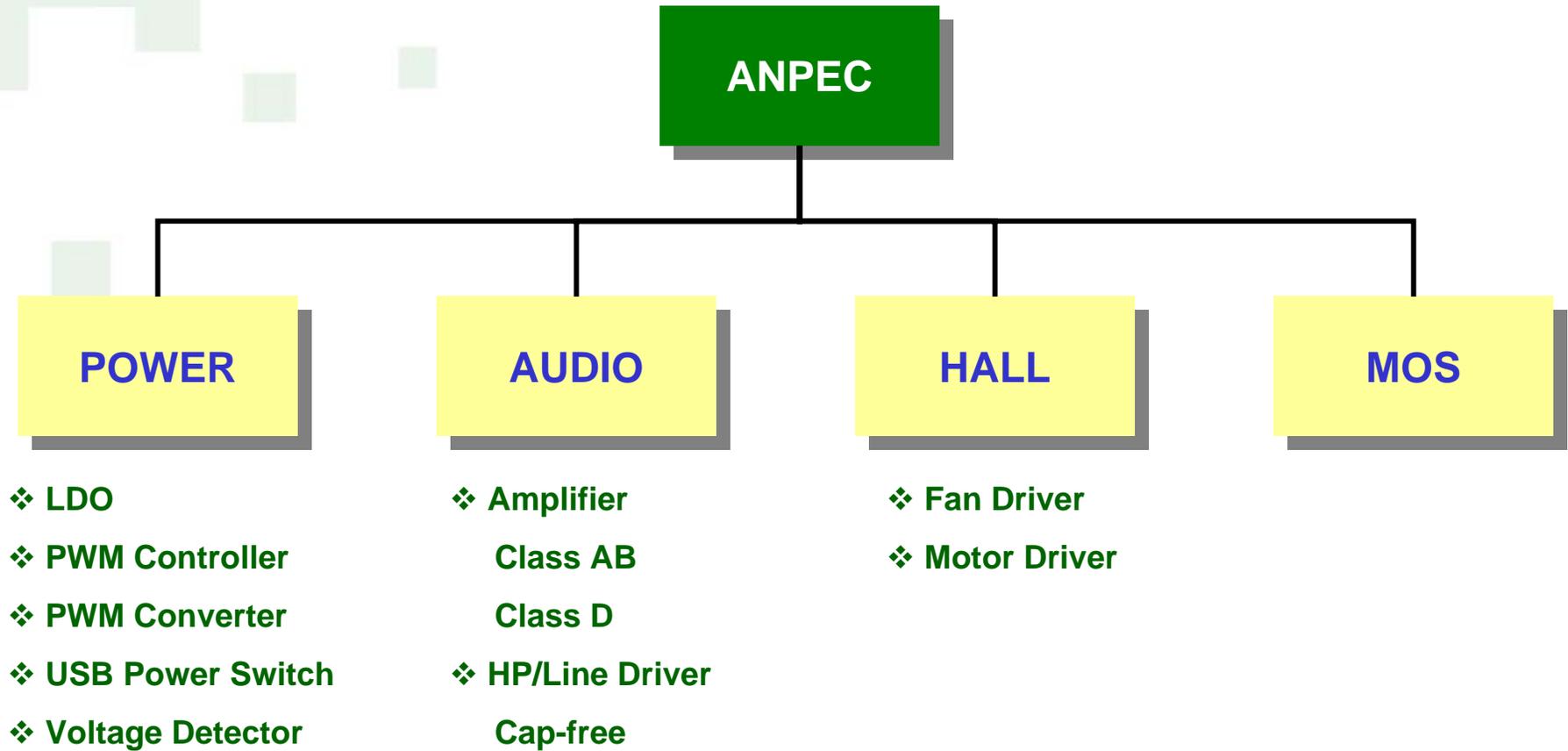
ANPEC POWER SOLUTION

Prepared by TME

Agenda

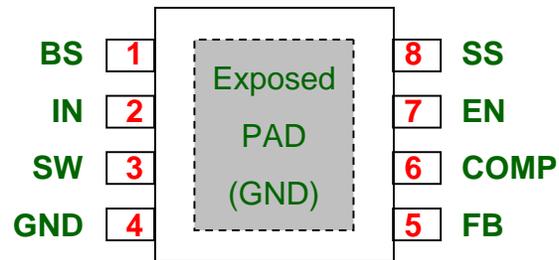
- ❑ **ANPEC Solution Block Diagram**
 - Advantage
 - Block Diagrams
- ❑ **Roadmap**
 - Highlight Power Products
 - HV/LV Products Roadmap
- ❑ **Parts Introduction**
 - Switching Converters
 - Regulators
 - MOSFETs

ANPEC Solution



Same Package for Easy Design

The 2A/3A HV Buck converter be designed in SOP-8(-P) package and with the same pin configuration



2A, APW7170/2, APW7155, APW7302

3A, APW7171/4, APW7156, APW7303

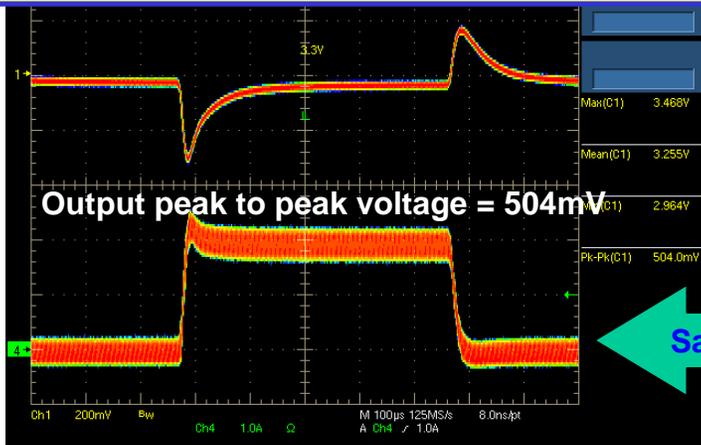
Same package and pin configuraiton for 2/3A application

Fully MPS Compatible (As MPS's Compensation)

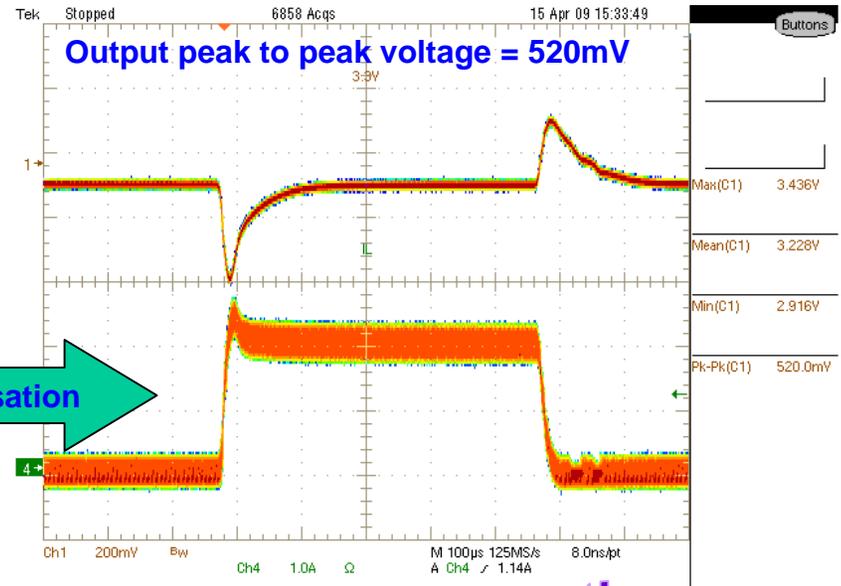
APW7172

MP1412

Better Load Transient Performance

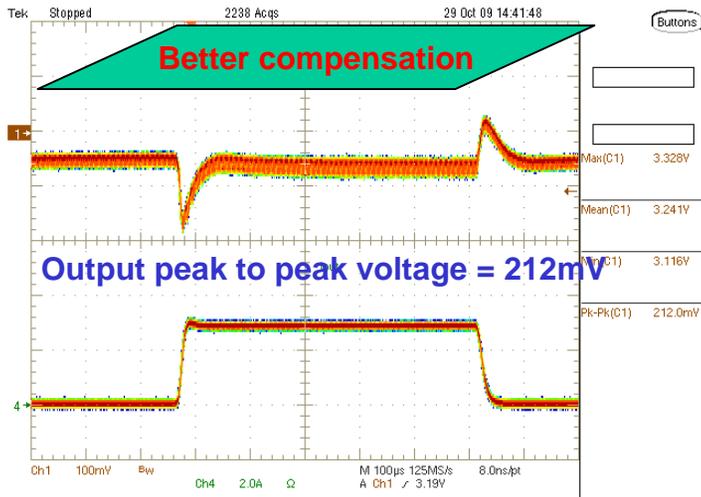


Same compensation

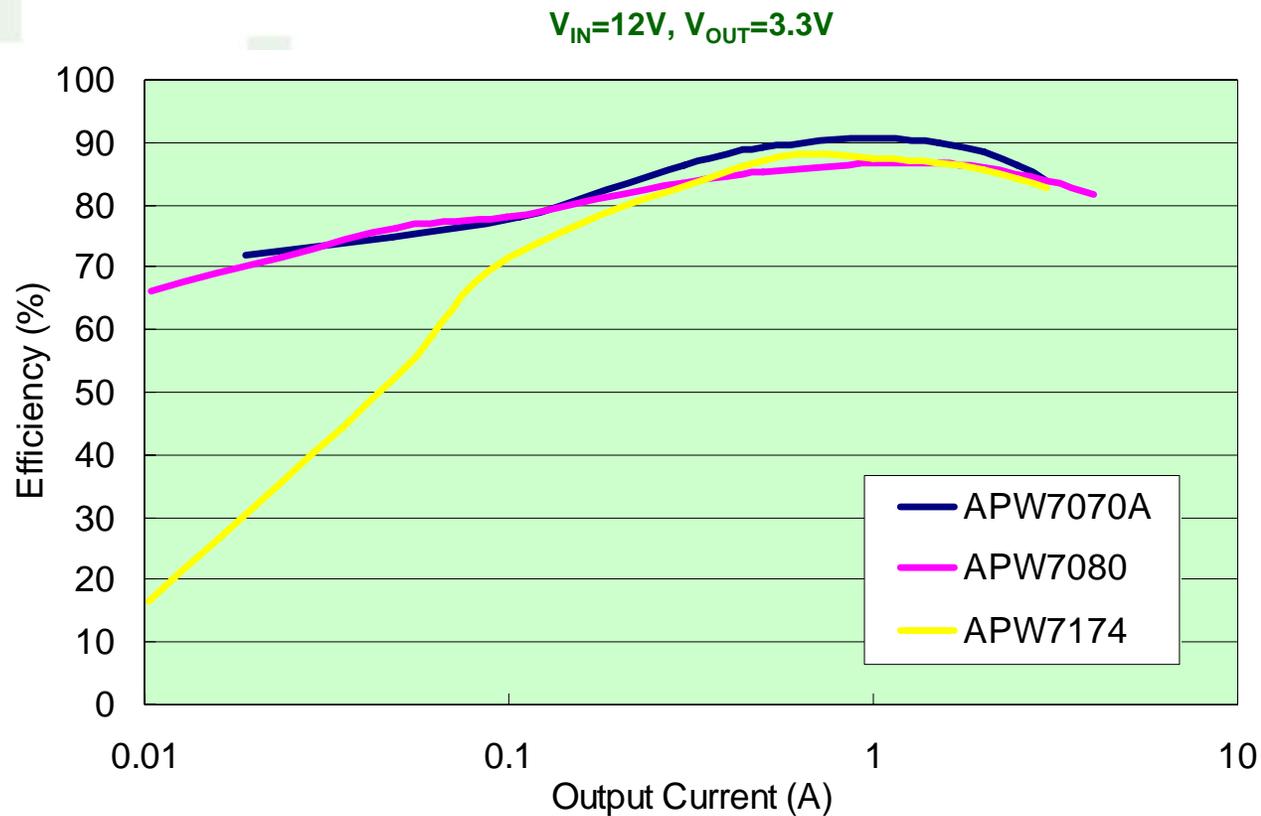


Replacing directly

Better compensation



Good Light Load Efficiency



Getting higher efficiency under 100mA load

Super Ultra LDO Product Line

- ❑ Less to **120mV** Super Ultra Low Dropout Voltage
- ❑ Regulating the core voltage by LDO topology



1A, APL5910

2A, APL5920

4A, APL5930

6A, APL5912

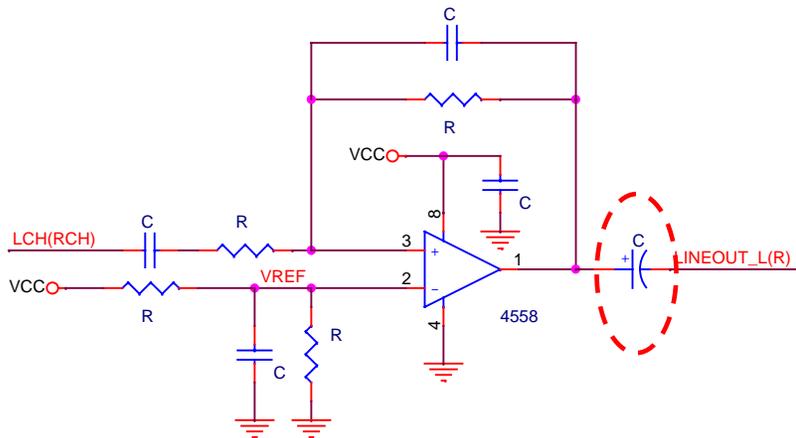
7A, APL5917

Smaller ripple voltage and lower BOM cost

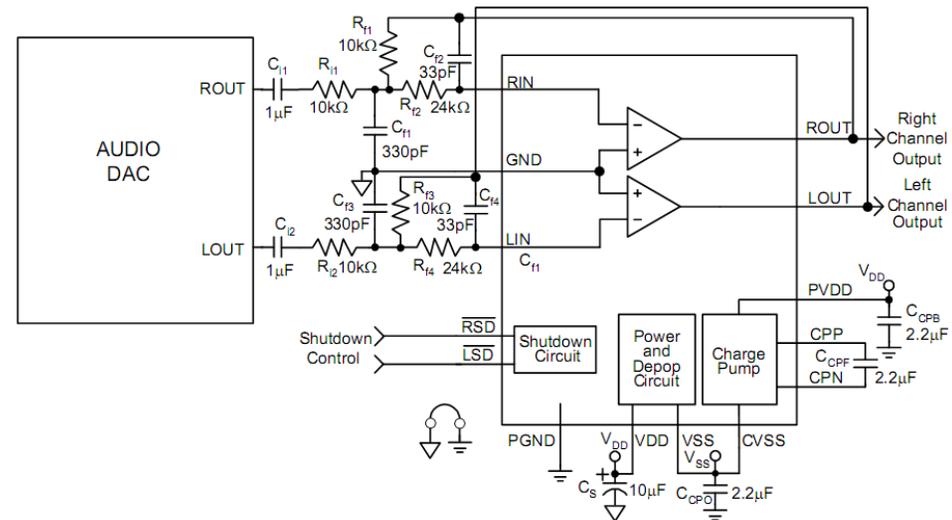
Cap-Free Line Driver

- ❑ No output capacitor required (for DC blocking)
- ❑ Saving the PCB space
- ❑ Reducing the BOM costs
- ❑ Improving the low frequency response
- ❑ Integrated de-pop circuitry

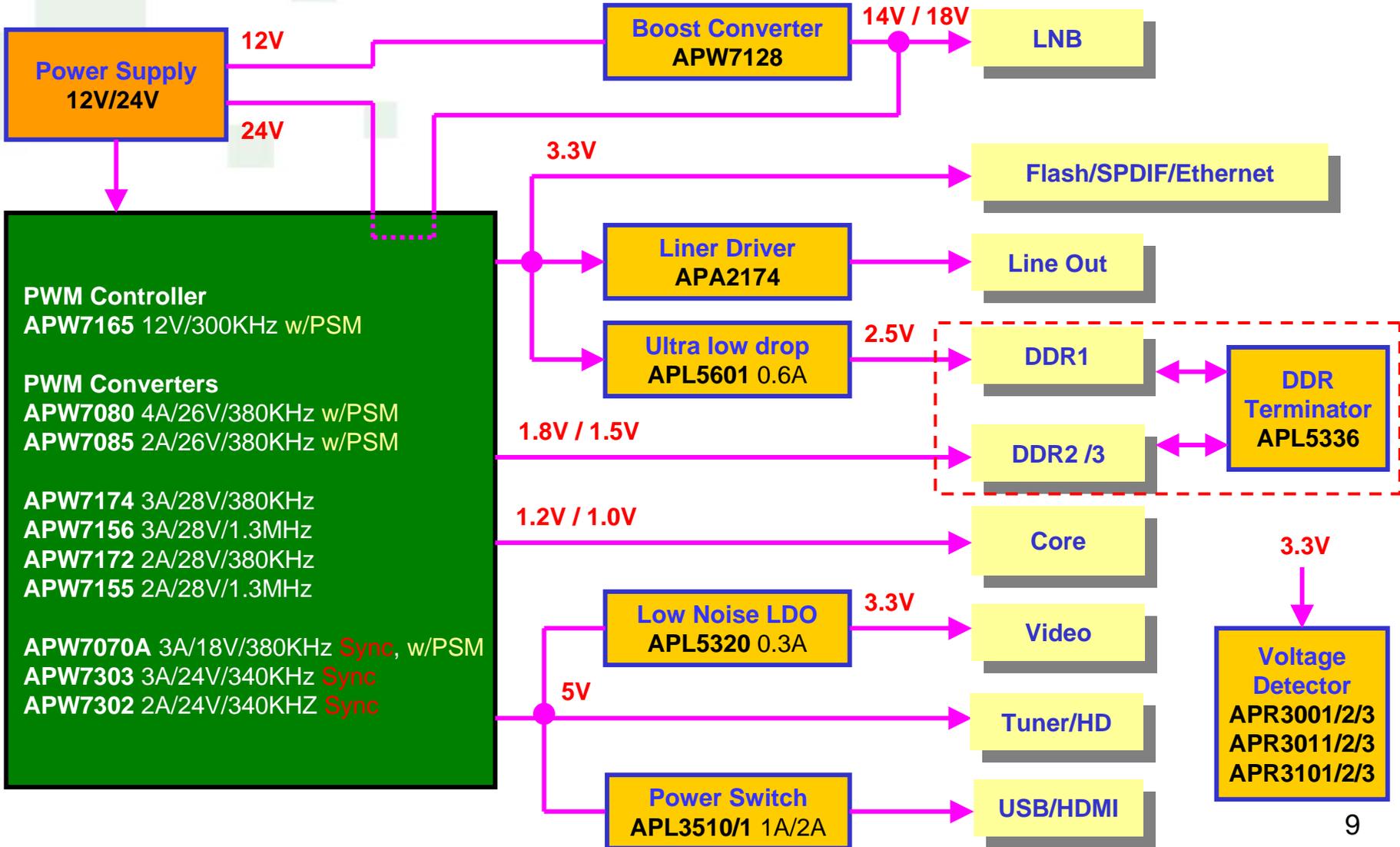
Tradition Solution



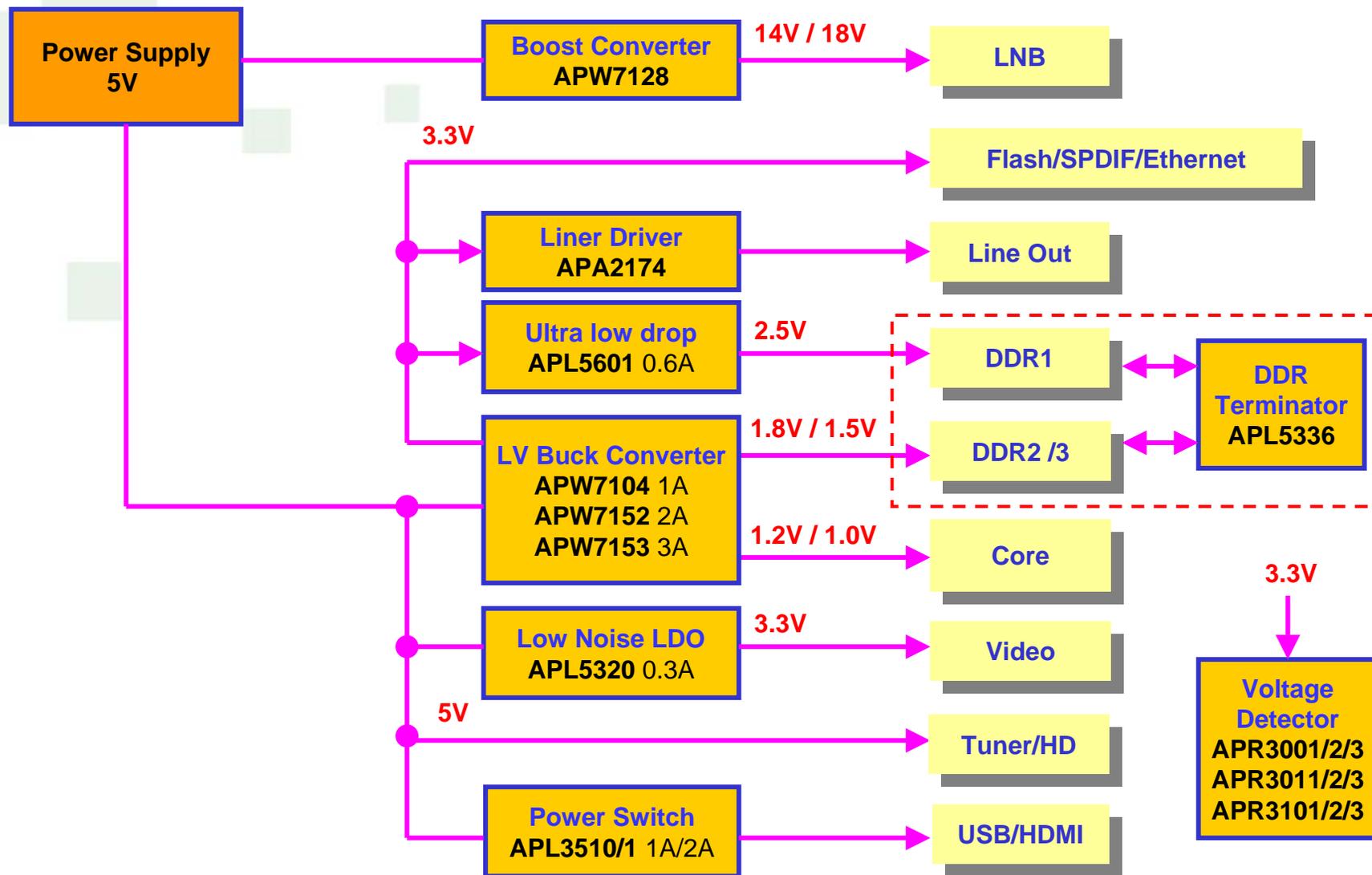
Cap-free Solution



STB Power Solution I



STB Power Solution II



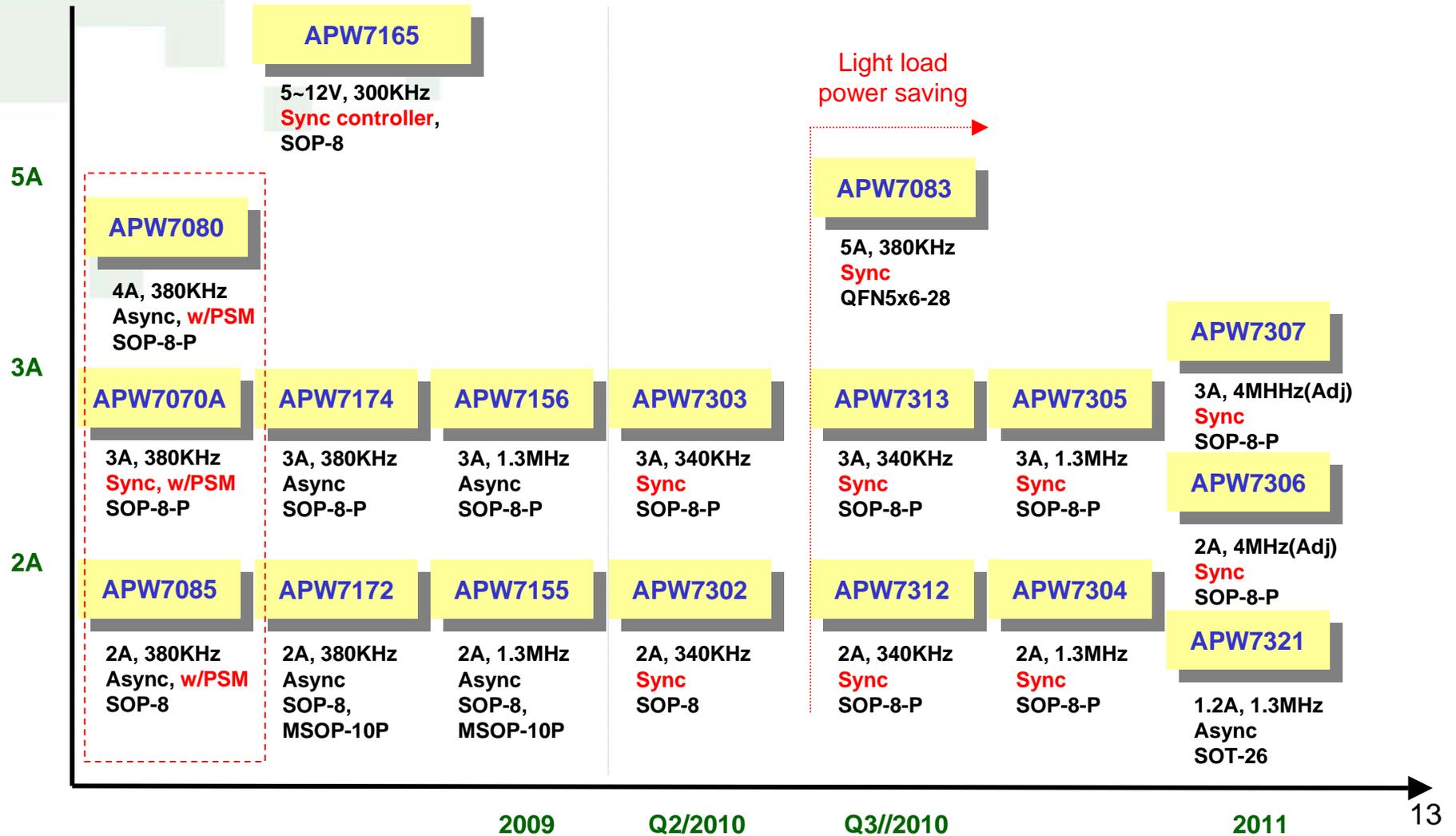
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 - Line Driver
 - Switching Converters
 - Regulators

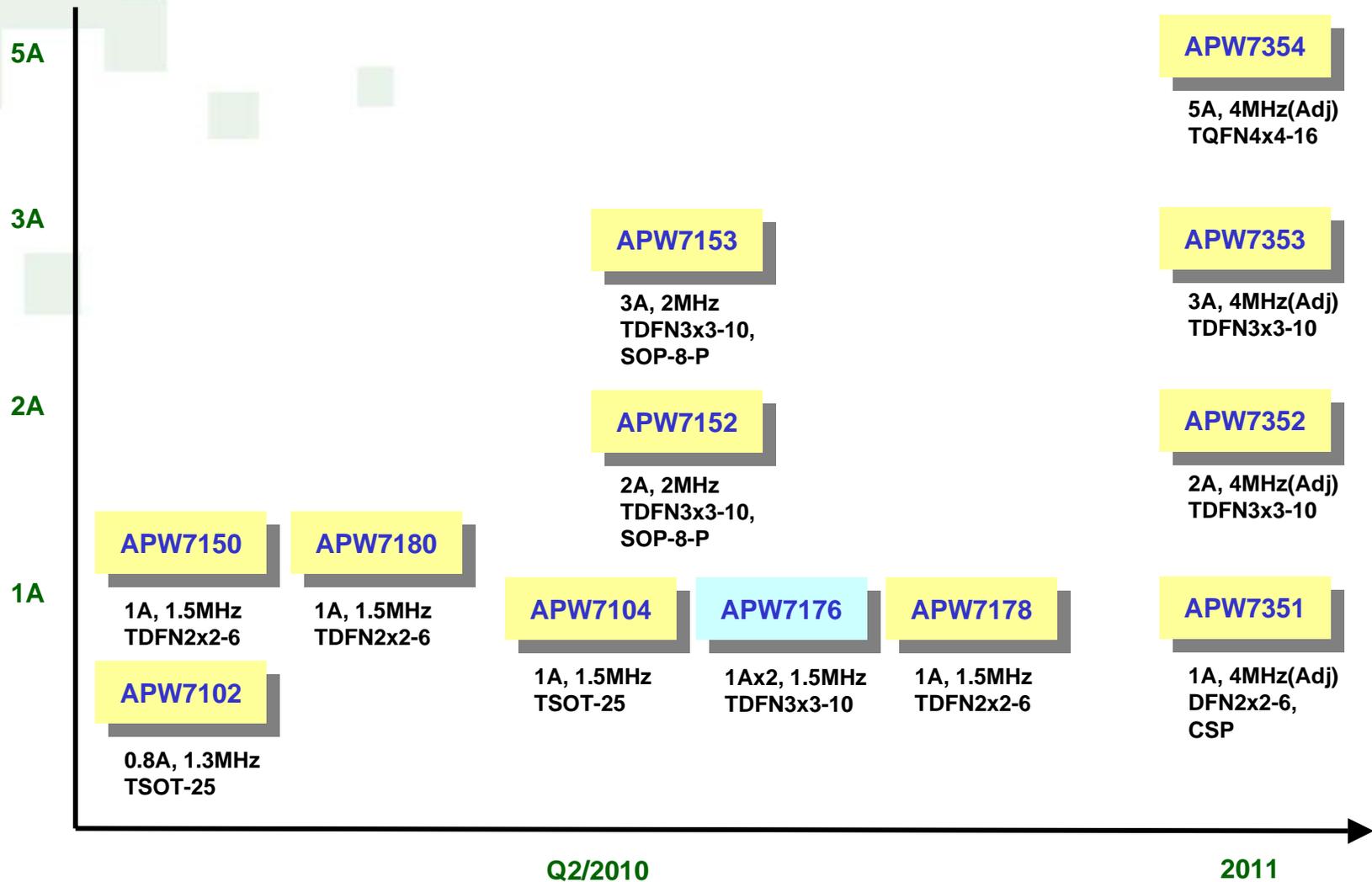
Highlight Power Products

Part Number	Description	Cross Reference	Package
HV Buck Converters			
APW7302	2A, 340KHz, 24V Sync. Buck converter	MP2305/1482	SOP-8/SOP-8-P
APW7303	3A, 340KHz, 24V Sync. Buck converter	MP2307/1484	SOP-8-P
APW7155	2A, 1.3MHz, 28V Async. Buck converter	MP2361	MSOP-10, SOP-8
APW7156	3A, 1.3MHz, 28V Async. Buck converter	MP2365	SOP-8-P
APW7170	2A, 380KHz, 28V Async. Buck converter	MP1410/9141	SOP-8
APW7172	2A, 380KHz, 28V Async. Buck converter	MP1412/1411	MSOP-10-P, SOP-8
APW7171	3A, 380KHz, 28V Async. Buck converter	MP1583/1423	SOP-8-P
APW7173	2A, 380KHz, 28V Async. Buck converter	CM3406/7	SOP-8
APW7174	3A, 380KHz, 28V Async. Buck converter	MP2363	SOP-8-P
APW7083	5A, 380KHz, 26V Sync. Buck converter		TQFN5x6-28
LV Buck Converters			
APW7104	1A, 1.5MHz, 6V Sync. Buck converter	MP2105	TSOT-23-5
APW7176	1Ax2, 1.5MHz, 6V Sync. Buck converter	MP2109	TDFN3x3-10
APW7178	1A, 1.5MHz, 6V Sync. Buck converter	RT8010	TDFN2x2-6
APW7152/3	2/3A, 2MHz, 6V Sync. Buck converter	RT8015/A	SOP-8-P, TDFN3x3-10

HV Products Roadmap



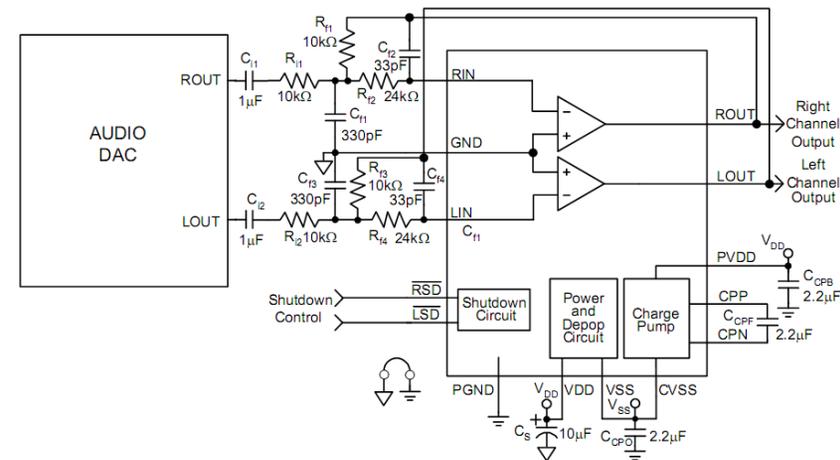
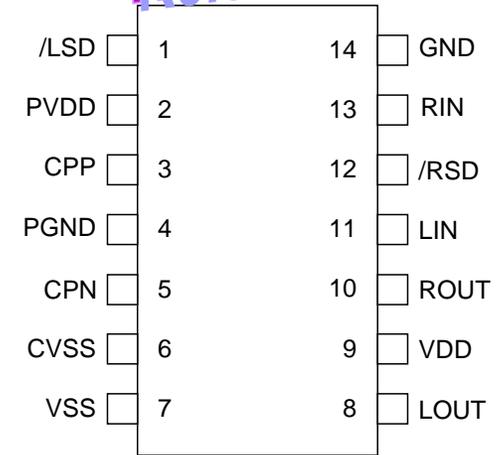
LV Products Roadmap



APA2174, Stereo Cap-Free Line Driver

Released

- ❑ Operating Voltage from 2.3V to 4.5V
- ❑ **Ground Reference Output**
 - No Output Capacitor Required (for DC Blocking)
 - Save the PCB Space
 - Reduce the BOM Costs
 - Improve the Low Frequency Response
- ❑ Output Voltage Swing Can Reach $2V_{rms}/Ch$
- ❑ High PSRR: 90dB at 217Hz
- ❑ Fast Start-Up Time: 500ms
- ❑ Integrate the **De-pop** Circuitry
- ❑ Separate Shutdown Function for Flexible Application
- ❑ Thermal Protection
- ❑ SOP-14 Package

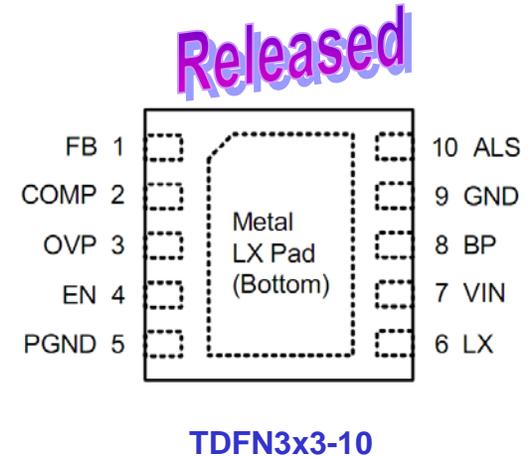


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 - Regulators
 - MOSFETs

APW7128, Boost Converter

- ❑ Operating Voltage from **2.7V to 21V**
- ❑ 0.5V Reference voltage
- ❑ Efficiency up to 95%
- ❑ Fixed switching Frequency : **1.2MHz**
- ❑ Protection :
 - **Current Limit**
 - **Over Temperature Protection**
- ❑ TDFN3x3-10 package



APW7302/3, Sync, 2/3A, 24V, 340KHz

- ❑ Output Current up to
 - APW7302 : 2A
 - APW7303 : 3A
- ❑ Operating Voltage from 4.5V to 24V
- ❑ Adjustable output voltage from 0.92V to 20V
- ❑ Fixed switching Frequency : 340KHz
- ❑ Stable with low ESR output ceramic capacitors
- ❑ Protection :
 - Current Limit
 - Fold-back Switching Frequency
 - Over Temperature Protection
- ❑ SOP-8 and SOP-8-P Package
- ❑ P2P with MP1482/4, MP2305/7



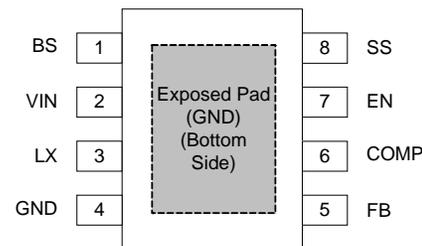
SOP-8-P : APW7303

SOP-8 : APW7302

APW7155/6, Async., 2/3A, 28V, 1.3MHz

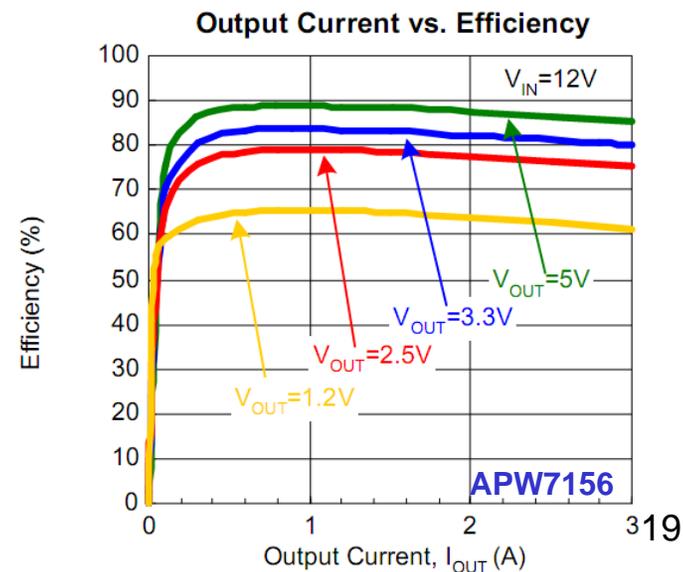
- ❑ Output Current up to
 - APW7155 : 2A
 - APW7156 : 3A
- ❑ Operating Voltage from 4.5V to 28V
- ❑ Adjustable output voltage from 0.92V to 19V
- ❑ Fixed switching Frequency : 1.3MHz
- ❑ Stable with low ESR output ceramic capacitors
- ❑ Protection :
 - Current Limit
 - Fold-back Switching Frequency
 - Over Temperature Protection
- ❑ SOP-8/-P and MSOP-10 Package
- ❑ P2P with MP2361/65

Released



SOP-8-P : APW7156

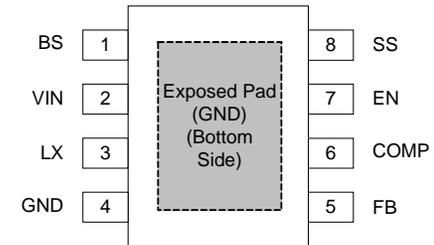
SOP-8 : APW7155



APW7172/4, Async., 2/3A, 28V, 380KHz

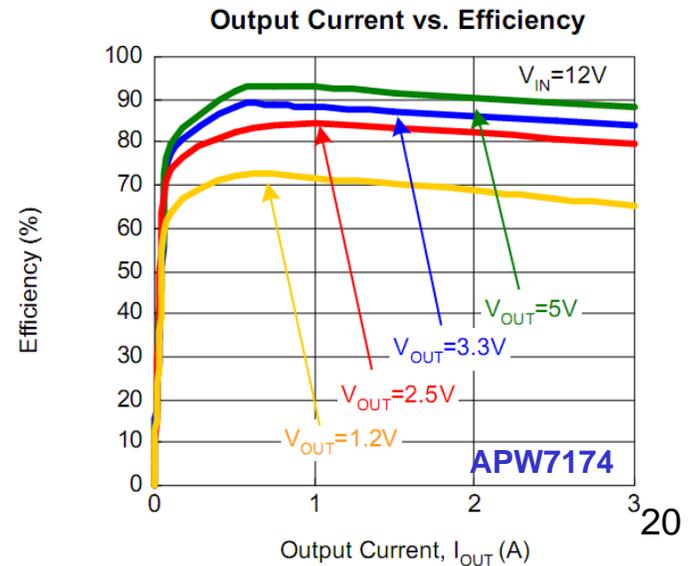
- ❑ Output Current up to
 - APW7172 : 2A
 - APW7174 : 3A
- ❑ Operating Voltage from 4.5V to 28V
- ❑ Adjustable output voltage from 0.92V to 19V
- ❑ Fixed switching Frequency : 380KHz
- ❑ Stable with low ESR output ceramic capacitors
- ❑ Protection :
 - Current Limit
 - Fold-back Switching Frequency
 - Over Temperature Protection
- ❑ SOP-8/-P and MSOP-10-P Package
- ❑ P2P with MP1411/2, MP2363

Released



SOP-8-P : APW7174

SOP-8 : APW7172



APW7080/5, Async, 2/4A, 26V, 380KHz

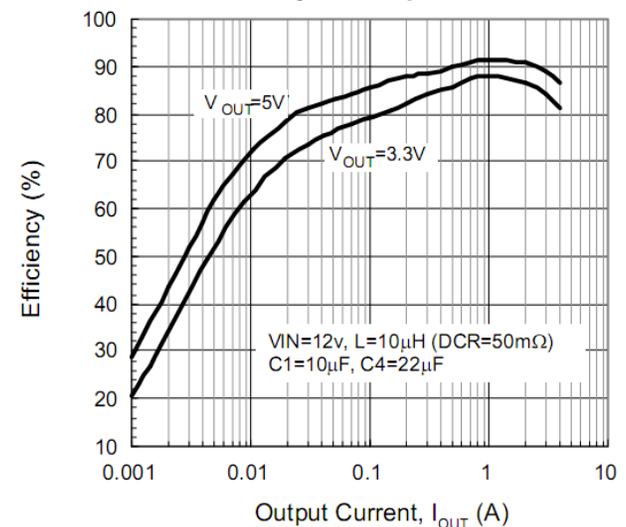
- ❑ Output Current up to
 - APW7085 : 2A
 - APW7080 : 4A
- ❑ Operating Voltage from 4.5V to 26V
- ❑ Adjustable output voltage from 0.8V to 23V
- ❑ Fixed switching Frequency : 380KHz
- ❑ Stable with low ESR output ceramic capacitors
- ❑ Protection :
 - Current Limit
 - Fold-back Switching Frequency
 - Over Temperature Protection
- ❑ SOP-8/-P Package



SOP-8-P : APW7080

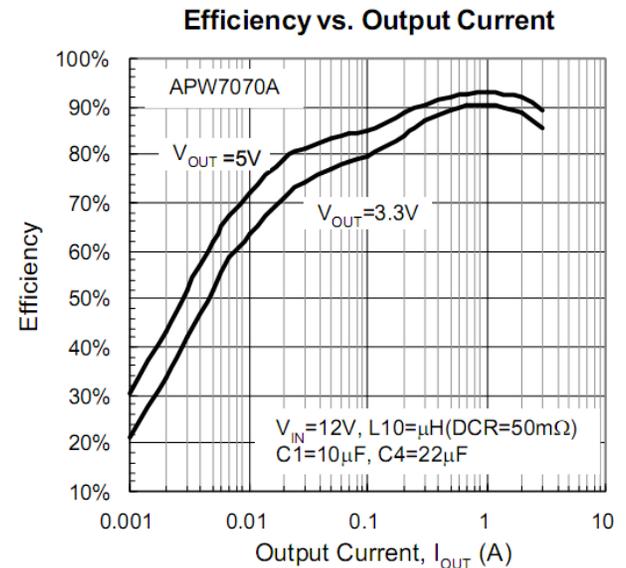
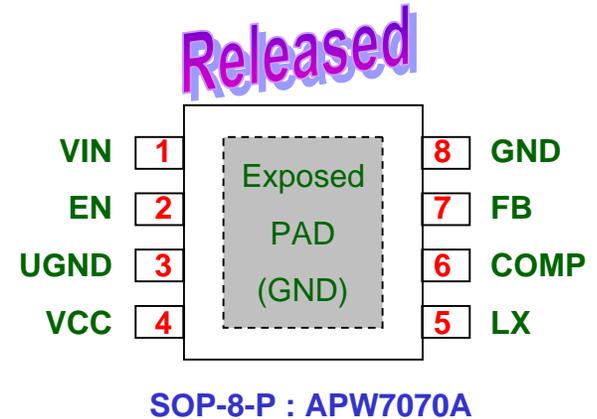
SOP-8 : APW7085

Efficiency vs. Output Current



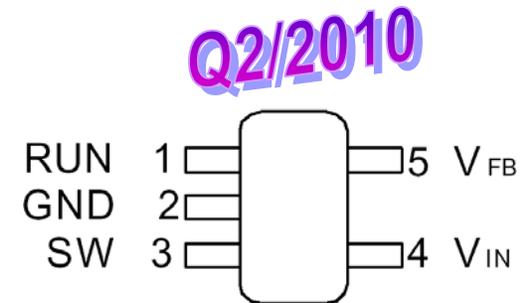
APW7070A, Sync, 3A, 20V, 380KHz

- Output Current up to 3A
- Operating Voltage from 4.5V to 20V
- Adjustable output voltage from 0.8V to 18V
- Fixed switching Frequency : 380KHz
- Stable with low ESR output ceramic capacitors
- Protection :
 - Current Limit
 - Fold-back Switching Frequency
 - Over Temperature Protection
- SOP-8-P Package



APW7104, Sync, 1A, 5.5V, 1.5MHz

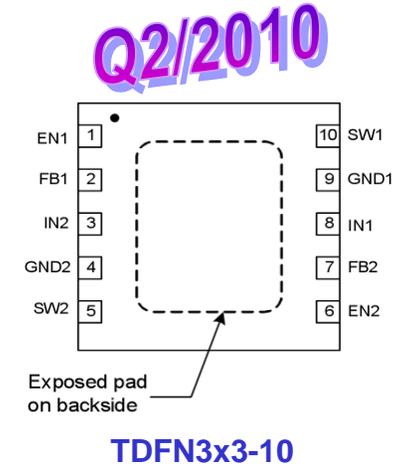
- ❑ 1A Output Current
- ❑ 2.5V to 5.5V Input Voltage Range
- ❑ 1.5MHz Constant Frequency Operation
- ❑ 0.6V Low Reference Voltage
- ❑ Over Temperature Protection
- ❑ Over Current Protection
- ❑ TSOT-23-5 Package
- ❑ P2P with APW7101, MP2104



TSOT-23-5

APW7176, Sync, 1Ax2, 5.5V, 1.5MHz

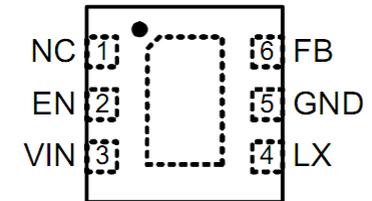
- ❑ Dual channel of **1A** Output Current
- ❑ **2.5V to 5.5V** Input Voltage Range
- ❑ **1.5MHz** Constant Frequency Operation
- ❑ **0.6V** Low Reference Voltage
- ❑ Over Temperature Protection
- ❑ Over Current Protection
- ❑ TDFN3x3-10 Package
- ❑ P2P with APW7139, MP2109



APW7178, Sync, 1A, 5.5V, 1.5MHz

- ❑ 1A Output Current
- ❑ 2.5V to 5.5V Input Voltage Range
- ❑ 1.5MHz Constant Frequency Operation
- ❑ 0.6V Low Reference Voltage
- ❑ Over Temperature Protection
- ❑ Over Current Protection
- ❑ TDFN2x2-6 package
- ❑ P2P with APW7150/80, RT8010

Q2/2010

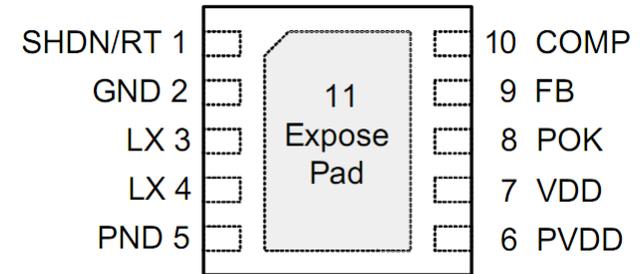


TDFN2x2-6

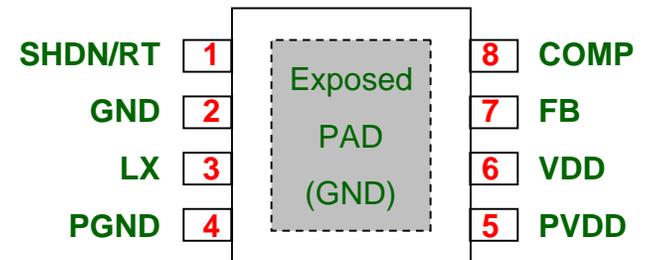
APW7152/3, Sync, 2/3A, 5.5V, 2MHz

- ❑ Output Current up to
 - APW7152 : 2A
 - APW7153 : 3A
- ❑ 2.6V to 5.5V Input Voltage Range
- ❑ Programmable 300KHz ~ 2MHz Frequency
 - Automatic Skip/PWM Operation Mode
- ❑ 0.8V Low Reference Voltage
- ❑ Integrated Soft-Start and Soft-Off
- ❑ Power Good Indicator
- ❑ Protection :
 - High/Low side Current Limit
 - Over/Under Voltage Protection
 - Over Temperature Protection
- ❑ TDFN3x3-10 and SOP-8-P package
- ❑ P2P with RT8015A

Q2/2010



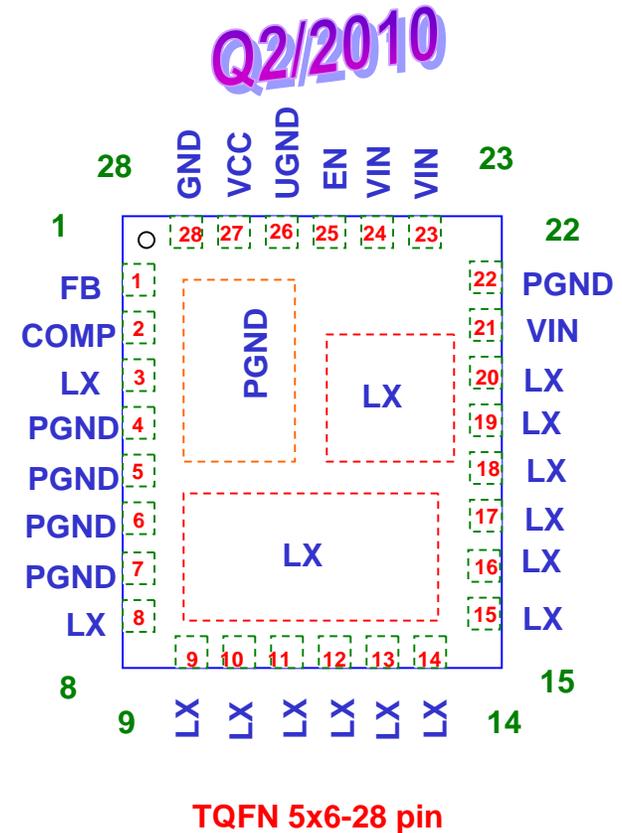
TDFN3x3-10



SOP-8-P

APW7083, Sync, 5A, 26V, 380KHz

- ❑ Output Current up to **5A**
- ❑ Operating Voltage from **4.5V to 26V**
- ❑ Adjustable output voltage from **0.8V to VIN**
- ❑ **Automatic Skip**/PWM mode operation
- ❑ Fixed switching Frequency : **380KHz**
- ❑ Stable with low ESR output ceramic capacitors
- ❑ Protection :
 - **Current Limit**
 - **Fold-back Switching Frequency**
 - **Over/Under Voltage Protection**
 - **Over Temperature Protection**
- ❑ TQFN4x5-28 package

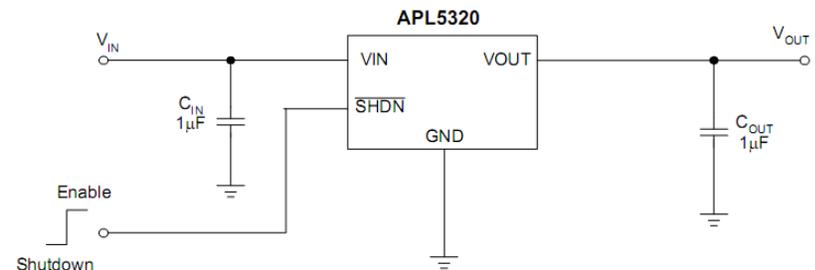
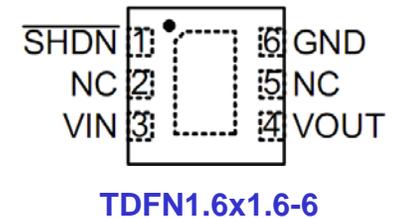
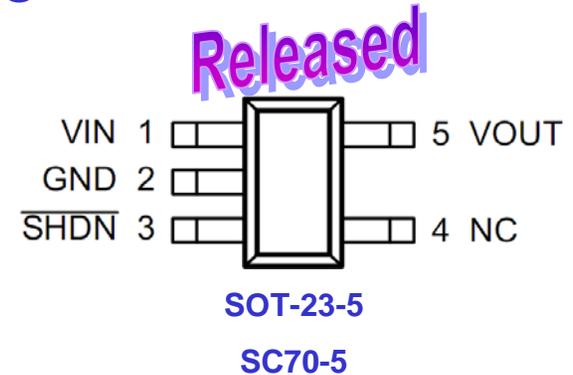


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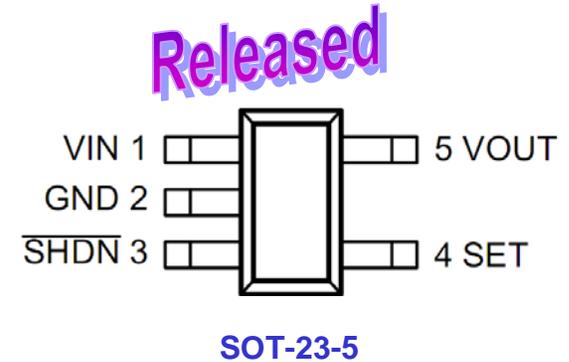
APL5320, High PSRR, Low Noise, Ultra LDO

- ❑ Operating Voltage from **2.5V to 5.5V**
- ❑ Fixed output voltage from **1.2V to 3.6V**
- ❑ Guaranteed 300mA Output Current
- ❑ **70dB** High PSRR (1KHz)
- ❑ **100uV_{RMS}** Low Noise (10Hz ~ 100KHz)
- ❑ Protection :
 - **Current Limit**
 - **Controlled Short Circuit Current : 50mA**
 - **Over Temperature Protection**
- ❑ SOT-23-5, SC70-5, TDFN1.6x1.6-6 package



APL5317, Adjustable Ultra LDO

- ❑ Operating Voltage from **2.8V to 6V**
- ❑ Adjustable output voltage from **0.8V to 5.5V**
- ❑ Guaranteed 300mA Output Current
- ❑ Protection :
 - **Current Limit**
 - **Controlled Short Circuit Current : 50mA**
 - **Over Temperature Protection**
- ❑ SOT-23-5 package



APL5910/20, Super Ultra LDO

- ❑ Input Voltage from **1.0V to 5.5V**
- ❑ Control Voltage from **3.0V to 5.5V**
- ❑ **120mV** Super Ultra Low Dropout Voltage
- ❑ **0.8V** Reference voltage
- ❑ Guaranteed **1A/2A** Output Current (APL5910/20)
- ❑ Power Good Indicator
- ❑ Protection :
 - **Current Limit**
 - **Controlled Short Circuit Current : 0.4A**
 - **Over Temperature Protection**
- ❑ SOP-8-P package



Super Ultra Low Dropout Comparison Table

Part Number	APL5910	APL5920	APL5915	APL5930	APL5912	APL5916
Output Current	1A	2A	1.5A	3A	5A	7A
Feedback Voltage	0.8V	0.8V	0.8V	0.8V	0.8V	0.8V
Accuracy	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%
Line Regulation (Max.)	0.15%/V	0.15%/V	0.13%	0.15%	0.13%	1.5mV/V
Load Regulation	0.06%	0.06%	0.06%	0.06%	0.06%	0.06%
Dropout Voltage (VCNTL=5V)	0.14V	0.24V	0.25V	0.23V	0.25V	0.2V
VCNTL Operation Current	1mA	1mA	1mA	1mA	1mA	1mA
VCNTL Shutdown Current	20uA	20uA	180uA	15uA	180uA	280uA
POR – VCNTL	2.7V	2.7V	2.9V	2.7V	2.9V	2.9V
POR - VIN	0.9V	0.9V	0.9V	0.9V	0.9V	0.9V
Current Limit	2.1A	3.6A	2.8A	5.7A	8A	10A
Short Current Limit	0.4A	0.8A	-	-	-	-
Thermal Shutdown	170°C	170°C	150°C	170°C	150°C	150°C
Under Voltage Threshold	-	-	0.4V	-	0.4V	0.4V
EN Threshold	0.8V	0.8V	0.4V	0.8V	0.4V	0.4V
Soft Start Time	0.6mS	0.6mS	2mS	0.6mS	2mS	2mS
POK Threshold	92% /	92% /	92% / 81%	92% /	92% / 81%	92% / 81%
POK Delay Time	2mS	2mS	3mS	2mS	3mS	3mS

THANK YOU