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cm **PMAAC COMPETITIVE ADVANTAGES**

PMAAC Competitive Advantages

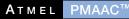
An Atmel System Solution:

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- Companion Chip to Atmel application products: MP3, Bluetooth headset, WLAN, VoIP phone, DSC, ARM-based microcontroller
- Designed for optimal interface to application product
- Saves development time and cost
- Lower system cost from single-source supplier
- Atmel, a Unique Supplier of Mixed Analog/Digital Products:
 - Power management and high-guality audio interfaces
 - Highly integrated analog/digital products for portable audio devices

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Power MANAGEMENT & AUDIO ANALOG COMPANION (PMAAC[™])

"THE SIMPLEST WAY TO MAKE YOUR APPLICATION CHEAPER, SMALLER AND MORE ENERGY EFFICIENT"



ATMEL PMAAC[™]



| Product | LDO | DCDC | Battery Charger | Audio Amplifier | ADC | DAC | Osc | LED Driver | Level Shifters | SPI | Application | Package | Available | Leadfree |
|----------|-----|------|--------------------|--------------------|-----|--------------|-----|---------------|-------------------|-----|-------------------------------------|--------------|-----------|----------|
| AT73C201 | 8 | 1 | 1 | 2 | | 2x8bit | 2 | 2 | 5x channels | 1 | Audio and PM single chip | BGA100 9x9mm | Y | Y |
| AT73C202 | 8 | 1 | 1 | | | | 1 | 1 | SIM | | High integration PMU | BGA49 5x5mm | Y | Y |
| AT73C203 | 2 | 4 | 2 | | 1 | | 1 | | SIM | 1 | Ideal for ARM based design | BGA100 9x9mm | Y | Y |
| AT73C204 | 7 | | 1 | | | | 1 | 1 | 3x channels | | Middle integration PMU | BGA49 5x5mm | Y | Y |
| AT73C209 | 2 | 1 | | 1 | | Stereo Audio | 1 | | | 1 | Audio and PM single chip | QFN32 7x7mm | Y | Y |
| AT73C211 | 5 | 1 | | | | | 1 | | | | Wireless module PMU | BGA32 5x5mm | Y | Y |
| AT73C212 | 5 | 1 | | | | | 1 | | | | Small integration PMU | BGA36 5x5mm | Y | Y |
| AT73C213 | | | | 2 | | Stereo Audio | | | | 1 | Auxiliary Stereo Input Output | QFN32 7x7mm | Y | Y |
| AT73C221 | 7 | 1 | 1 | | | | 1 | 1 | | | High efficiency multichannel PMU | BGA49 5x5mm | Y | Y |
| AT73C239 | 4 | | | | | | 1 | | | 1 | Tiny PMU | QFN16 3x3mm | Q205 | Y |
| AT73C224 | 2 | 2 | | | | | 1 | 1 | | 1 | Universal PMU for Li-Ion/Ni-Mh | QFN32 5x5mm | Q305 | Y |
| AT73C207 | 5 | 6 | 1 | | | | 1 | 2 | | 1 | Multimedia PMU | BGA/QFN | Q305 | Y |
| AT73C210 | | | | | | Stereo Audio | 1 | | | 1 | Audio codec | QFN | Q405 | Y |

PMAAC PRODUCT FAMILY

ATMEL SYSTEM SOLUTION USING PMAAC

| Part# | ATMEL Synergy | Available | Application |
|----------|---------------|-----------|-------------------|
| AT73C202 | AT91M55800A | NOW | Satellite phones |
| AT73C202 | AT91 (ARM) | NOW | GSM/GPRS |
| AT73C202 | AT76C901/2 | Q305 | VOIP mobile |
| AT73C202 | ATR06x0 | Q305 | GPS module |
| AT73C203 | AT91SAM9261 | Q405 | Portable GPS |
| AT73C203 | AT76C120 | Q305 | PVP with HDD |
| AT73C207 | AT76C113/4/5 | Q405 | DSC |
| AT73C209 | AT8xC51SND1C | NOW | USB MP3 |
| AT73C212 | AT76C515 | Q305 | WLAN |
| AT73C213 | AT8xC51SND1C | NOW | MP3 mobile |
| AT73C213 | AT91SAM9261 | NOW | Multimedia |
| AT73C213 | AT76C113/4/5 | NOW | DSC |
| AT73C213 | AT76C120 | NOW | PVP with HDD |
| AT73C213 | AT76C901/2 | Q205 | VOIP mobile |
| AT73C213 | AT76C120 | NOW | Picture Viewer |
| AT73C213 | ASIC | NOW | Medical |
| AT73C221 | AT76C557 | NOW | Bluetooth Headset |
| AT73C224 | AT76C120 | Q305 | PVP with HDD |
| AT73C239 | ATR06x0 | Q405 | GPS module |

LDO (Low Drop Out): Linear Regulator. Efficiency = Vout/Vin. 1 external Capacitor needed. Very good to supply RF, Audio, ADC, DAC, Sensitive Analog.

DCDC (Direct Current to Direct Current): Switching Regulator. Efficiency = around 90%. 1 external Capacitor and Inductor needed. Supply MCU core.

Battery Charger: Recharge battery in portable applications. Input could be USB or wall adapter. Audio Amplifier: Could be speaker driver (e.g. 80hm speaker) up to 1W or headset driver.

ADC (Analog to Digital Converter): up to 10-bit used for monitoring (battery voltage, temperature,

voltages,...). Stereo Audio used for music encoding.

DAC (Digital to Analog Converter): Used to drive RF stages. Stereo Audio for music decoding.

Osc (Oscillator): Provide time basic scale for internal state machine (used for start up and shutdown) or main clock for DCDC converter or DAC/ADC cells.

- LED driver (Light Emitting Diode): Provide voltage supply for standard matrix LED for monochronome displays or TFT white LED in colour displays).
- Level Shifters: Provide voltage translation of input signals to output. Usefuls to interface I/O at different voltages (MCU, memories, external memory cards).

SPI (Serial Port Interface): Serial interface used to program voltages/monitor voltages.