

# PMU ( $V_{IN} = 1.65-3.6V$ , $V_{OUT} = 0-1.2V$ ) FOR IOT AND SENSOR NODE ICs IN TSMC 40NM CMOS

Imec's silicon-proven 40nm CMOS Power Management Unit IP supports a wide range of battery to supply voltage conversion ranges, targeting IoT and sensor node ICs (e.g., radio ICs, biomedical sensor hubs, etc.).

## DESCRIPTION

Imec's 40nm power management unit (PMU) for lower power sensor node and IoT ICs contains a high-efficiency DCDC converter for generating a programmable IC supply voltage ( $V_{out} = 0 - 1.2V$ ) from the voltage as supplied by the battery ( $V_{in} = 1.65 - 3.6V$ ), while minimizing power consumption and leakage in sleep mode. The power management unit is designed for on-chip integration and is silicon proven.

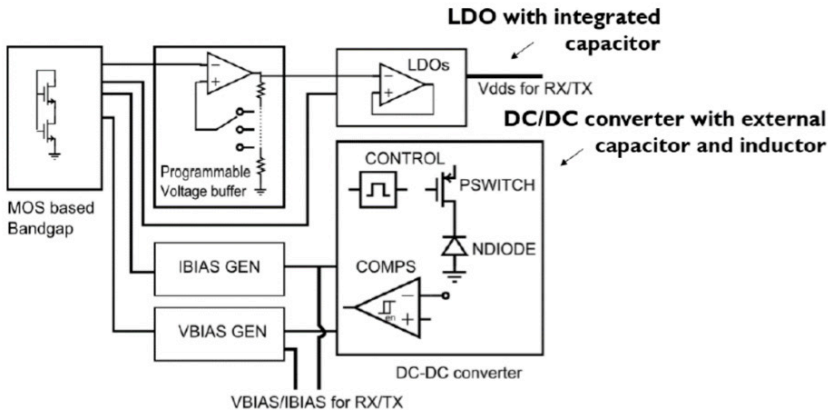
The PMU contains a sub- $\mu W$  MOS voltage reference, bias current and voltage generation based on the reference voltage, and low drop-out (LDO) voltage regulators, requiring a minimum number of external components.

The DC-DC converter can deliver up to 120mA at high efficiency. The output voltage is programmable up to 1.2V. Furthermore, a 1.5V version of the PMU is available ( $V_{in} = 1.3-1.8V$ )

## KEY FEATURES

- 1.65 - 3.6 V input
- Output voltage programmable 0 - 1.2 V
- Efficiency >75% above 1 mA
- Programmable current limit
- IP programmable via SPI bus
- Low number of external components (1L, 1C)
- Designed in TSMC 40nm LP/ULP
- White box IP; easy to adapt to different voltage or current ranges
- 1.5V version also available ( $V_{in} = 1.3-1.8V$ )

## PMU OVERVIEW



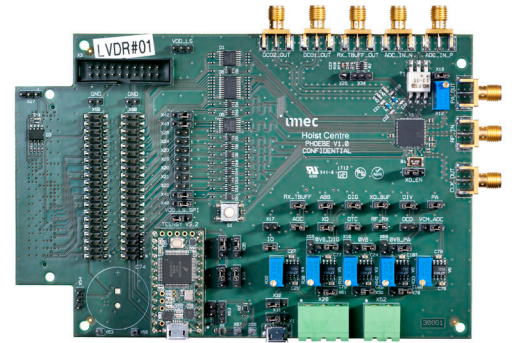
	min	typ	max	
Input voltage	1.65	3	3.6	V
Output voltage			1.2	V
Output voltage step		43		mV
Efficiency	75			%
Peak load current			120	mA
Quiescent current		80		uA
Shutdown current		150		nA

## SPECIFICATIONS - LDO (GENERAL TYPE)

	min	typ	max	
Input voltage	1.2	1.5	1.7	V
Output voltage		1.0		V
Max Current	2			mA
Quiescent Current		1.5		uA

## APPLICATIONS

- Sensor node ICs
- IoT ICs



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