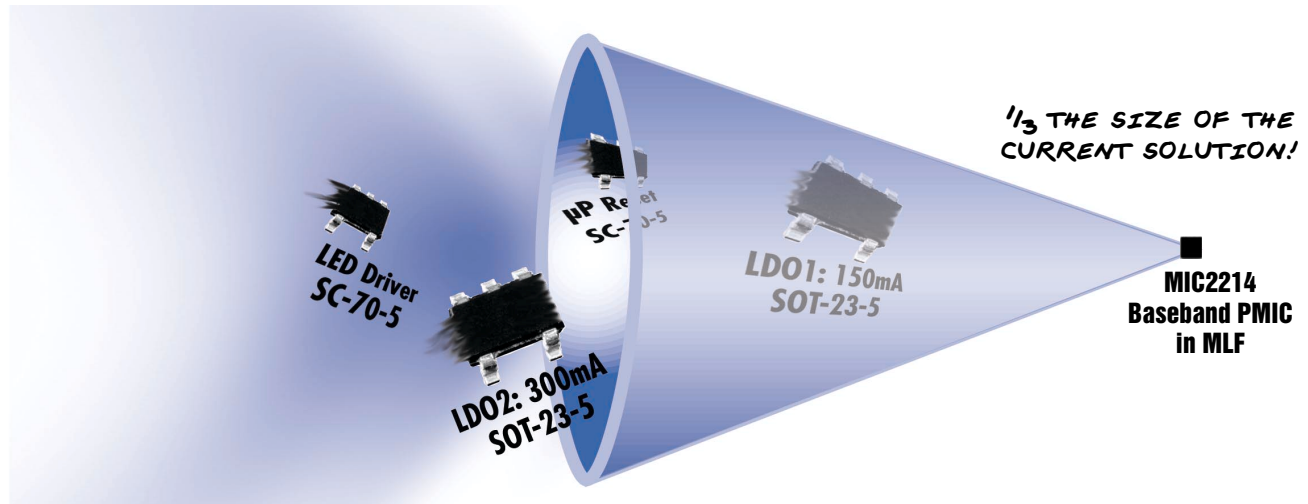


## Small & Efficient Power ICs for Portable Applications

Micrel Semiconductor offers a range of ultra-small micropower ICs targeted for handheld battery-operated applications. These ICs manage the power delivery to various system functions such as RF, digital baseband, display, etc. They range from high performance industry standard low-dropout regulators (LDOs), to the industry's simplest switching regulator for driving white LEDs, to the industry's lowest on-resistance P-Channel MOSFET; all are optimized for power efficiency and space savings.



### MIC2214 — Newest Member of the Micropower IC Family

The newest addition to Micrel's micropower IC family is the MIC2214, a complete baseband power management solution for cellular phones, PDAs and other handheld electronics. It packs two low noise, high performance  $\mu$ Cap LDOs (150mA and 300mA), a Power-On-Reset (POR) with user-programmable delay, and a keypad backlight driver into the thin and light 3mm x 3mm MLF™ package. Ideally suited for power conscious applications, the MIC2214 consumes less than 50 $\mu$ A total, in full operation. This power-saving capability allows the system to operate longer on a single Li-Ion battery charge cycle.

### MIC2214 Highlights

- ◆ Fully-integrated baseband power IC
- ◆ Supply voltage: 2.25V to 5.5V
- ◆ Two low noise LDOs:
  - LDO1: 150mA
  - LDO2: 300mA
- ◆ Ultra-low dropout voltage: 120mV @ 150mA
- ◆  $\mu$ Cap: stable with small ceramic capacitors
- ◆ Superior noise performance: 30 $\mu$ V<sub>RMS</sub>
- ◆ Maintains  $\pm$ 2% accuracy, over temperature
- ◆ Consumes <50 $\mu$ A, total
- ◆ Thermal shutdown and current limit protection
- ◆ POR with programmable delay time
- ◆ Open drain driver for keypad backlight
- ◆ Space saving 3mm x 3mm MLF™ package

### Micrel's Micropower IC Packages

#### Actual Sizes



Micrel's  $\mu$ Cap LDOs are stable with small ceramic capacitors.

## Micropower LDOs

Part Number	I <sub>OUT</sub> (mA)	V <sub>OUT</sub> * (V)	V <sub>IN</sub>	V <sub>DO</sub> @ I <sub>FULL LOAD</sub>	I <sub>GND</sub> @ 100μA	μCap	Pkg.	Comments
MIC5231	10	2.75, 3.0, 3.3, 5.0	3.5V to 12V	150mV	650nA	Yes	SOT-23-5	Ultra low quiescent current
MIC5211	50	1.8, 2.5, 2.7, 2.8, 3.0, 3.3, 3.6, 5.0, 1.8/2.5, 1.8/3.3, 2.5/3.3, 3.3/5.0	2.5V to 16V	250mV	90μA	Yes	SOT-23-6	Dual LDO
MIC5213	80	2.5, 2.6, 2.7, 2.8, 3.0, 3.3, 3.6, 5.0	2.5V to 16V	300mV	180μA	Yes	SC-70-5	
MIC5203	80	2.8, 3.0, 3.3, 3.6, 3.8, 4.0, 4.5, 4.75, 5.0	2.5V to 16V	300mV	180μA	Yes	SOT-23-5	
MIC5233	100	1.8, 2.5, 3.3, 3.0, 5.0, Adj.	2.3V to 36V	210mV	18μA	Yes	SOT-23-5	Low quiescent current & high input voltage
MIC5270	100	-3.0, -4.1, -5.0, Adj.	-2V to -16V	480mV	70μA	Yes	SOT-23-5	Negative LDO
MIC5238	150	1.1, 1.3	1.5V to 6V	310mV	23μA	Yes	SOT23-5, ThinSOT23-5	Ultra-low quiescent current
MIC5255	150	2.5, 2.6, 2.7, 2.8, 2.85, 2.9, 3.0, 3.1, 3.2, 3.3	2.7V to 6V	135mV	90μA	Yes	SOT-23-5, Thin SOT	Low noise
MIC5256	150	2.6, 2.7, 2.8, 2.85, 3.0, 3.3	2.7V to 6V	135mV	90μA	Yes	SOT-23-5, Thin SOT	Error flag,
MIC5247	150	1.5, 1.8, 2.0, 2.4	2.7V to 6V	150mV	85μA	Yes	SOT-23-5	Low noise & low voltage
MIC5235	150	1.5, 1.8, 2.7, 2.7, 3.0, 3.3, 5.0, Adj. 2.5, 2.7, 2.8, 2.85, 2.9,	2.3V to 24V	310mV	18μA	Yes	SOT-23-5	Low quiescent current & high input voltage
MIC5205	150	3.0, 3.1, 3.2, 3.3, 3.6, 3.8, 4.0, 5.0, Adj.	2.5V to 16V	165mV	80uA	No	SOT-23-5	Low noise
MIC5206	150	2.5, 2.7, 3.0, 3.2, 3.3, 3.6, 3.8, 4.0, 5.0	2.5V to 16V	165mV	80μA	No	SOT-23-5	Error flag
MIC5207	180	1.8, 2.5, 2.9, 3.0, 3.3, 3.6, 3.8, 4.0, 5.0, Adj.	2.5V to 16V	165mV	80μA	No	SOT-23-5	Low noise
MIC5249	300	2.85	2.7V to 6V	400mV	85μA	Yes	MSOP-8	Low noise & Power-On Reset
MIC5219	500	2.5, 2.6, 2.7, 2.8, 2.9, 3.0, 3.1, 3.3, 3.6, 5.0, Adj.	2.5V to 12V	300mV	80μA	No	SOT-23-5, MSOP-8	Peak current; low noise
MIC5216	500	3.0, 3.3, 3.6, 5.0	2.5V to 12V	300mV	80μA	No	SOT-23-5, MSOP-8	Peak current; error flag
MIC5159	—	1.8, Adj.	1.65V to 5.5V	—	—	Yes	SOT-23-6	LDO controller w/adjustable current limit

## Micropower Switching Regulators

Part Number	I <sub>OUT</sub> (A)	V <sub>OUT</sub> * (V)	V <sub>IN</sub>	F <sub>SW</sub>	Pkg.	Comments
MIC2141	0.5	3.0V to 22V	2.5V to 14V	330KHz	SOT-23-5	Dynamically adjustable output voltage
MIC2142	0.5	3.0V to 22V	2.2V to 16V	330KHz	SOT-23-5	Small, simple, efficient boost regulator
MIC2145	1.5	2.4V to 16V	2.4V to 16V	450KHz	MSOP-8	Programmable peak switch current
MIC2204	0.6	1V to V <sub>IN</sub>	2.3V to 5.5V	2MHz	MLF-10, MSOP-8	Ultra-small and efficient buck regulator

## P-Channel MOSFETs

Part Number	V <sub>IN</sub> Range	R <sub>DS(ON)</sub> Typ.	I <sub>D</sub> (max)	Pkg.	Comments
MIC94060	1.8V to 5.5V	77mΩ	2.0A	SC-70-6	Smart load switch.
MIC94061	1.8V to 5.5V	77mΩ	2.0A	SC-70-6	Smart load switch w/capacitive load discharge circuit.
MIC94052	1.8V to 5.5V	70mΩ	2.0A	SC-70-6	P-Channel MOSFET. Pin-to-pin with Si1405.
MIC94053	1.8V to 5.5V	70mΩ	2.0A	SC-70-6	P-Channel MOSFET w/internal gate pull-up resistor. Pin-to-pin with Si1417.
MIC94050	1.8V to 5.5V	125mΩ	1.8A	SOT-143-4	P-Channel MOSFET.
MIC94051	1.8V to 5.5V	125mΩ	1.8A	SOT-143-4	P-Channel MOSFET w/internal gate pull-up resistor.

\*contact Micrel for other voltage options.

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