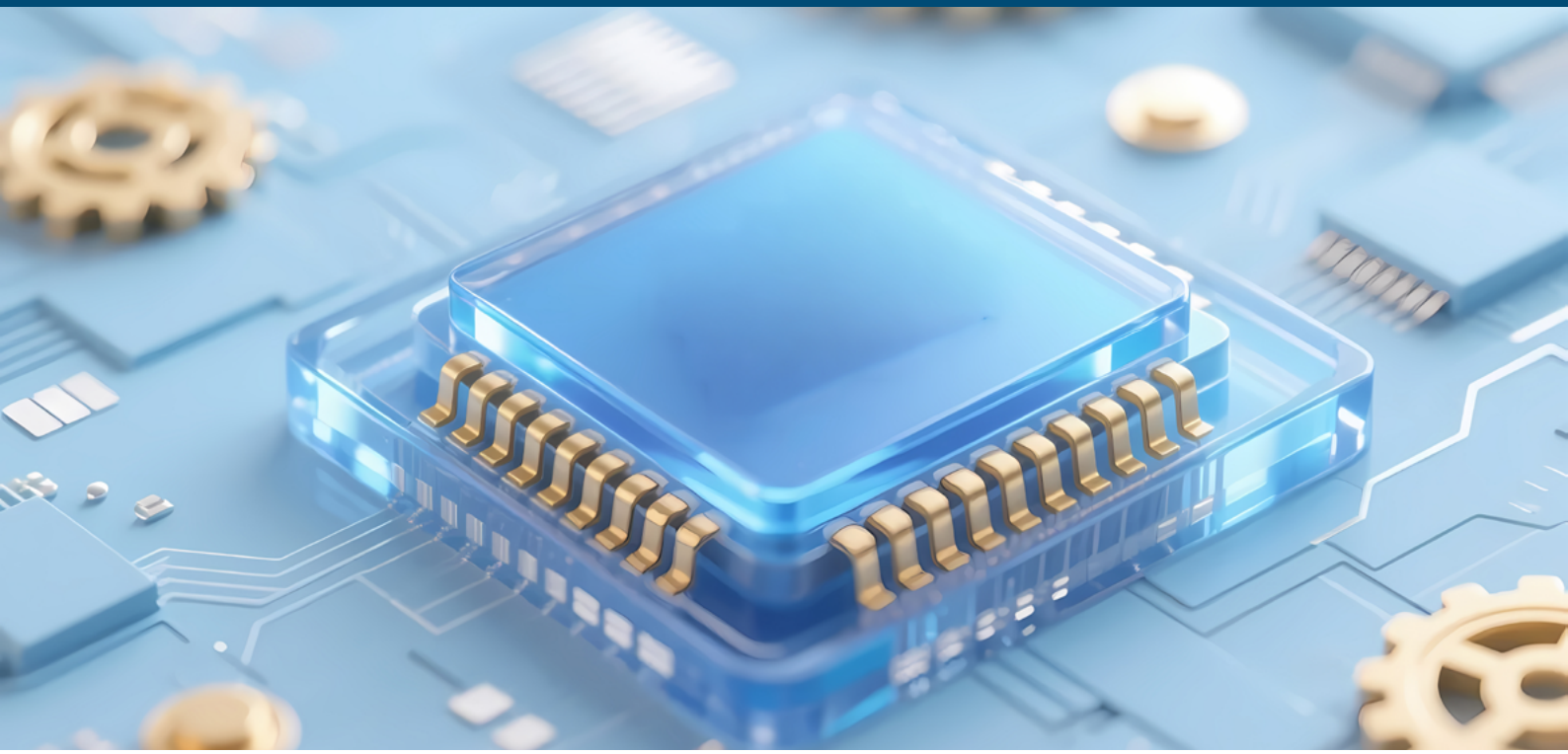
A3ACPNLDO 14V Low Dropout Regulator



About eInfochips

eInfochips is a product engineering and semiconductor design services company offering ASIC/SoC design, Analog & Mixed-Signal IP development, FPGA design, and embedded engineering services across multiple industry segments.

eInfochips provides silicon-proven Analog IPs and custom design solutions for power management, data conversion, connectivity, and mixed-signal applications. The company enables customers to accelerate chip development and deliver high-performance, power-efficient semiconductor products.

eInfochips A3ACPNLDO 14V Low Dropout Regulator

This LDO takes supply from Low Side Charge Pump (16V) and generates an output of 14V (w.r.t ground) which will act as a supply of the Gate Driver block in low side channel. It takes reference 1.2V from BGR. When the external MOSFET turns on it takes current from this LDO to charge the gate capacitor of the external MOSFET & the load current depends on the rise time of the external MOSFET's gate voltage. At the output of the LDO 10uF External ceramic capacitor has been used. This LDO can source up to 17mA constant current.

Low-side gate driver supply in smart power / IPS ICs

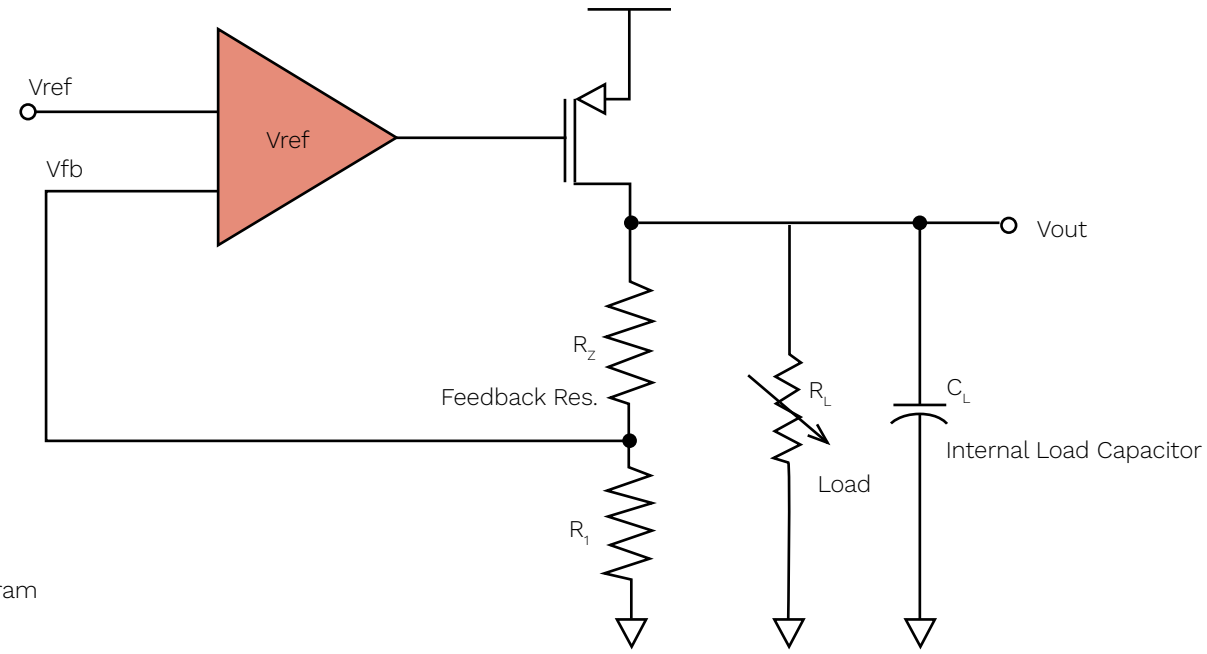
Half-bridge and full-bridge MOSFET/IGBT gate drivers

Motion control and power conversion pre-drivers

Automotive and industrial gate-drive rails

eInfochips Advantages

- **30** Years of experience in system design
- **17** Design centres worldwide
- **400+** Tapeouts
- **100M+** Product deployments across globe
- **180nm to 18A** expertise



Block Diagram

Features

- **Input Voltage Range:** 16 V
- Output Voltage : 14V
- Excellent Load Regulation
- Specified 17mA Output Current

DC Simulation Results (Pre-Layout)

- **LDO Output Voltage:** 13.92 V to 13.96 V
- **Feedback Voltage:** 1.195 V to 1.198 V
- **Total Current Consumption – No Load:** 73.26 µA to 114.6 µA
- **Total Current Consumption – Full Load:** 16.99 mA to 17.02 mA
- **Operating Conditions:** VIN = 15 V to 16 V, TJ = –40°C to +150°C, TT/FF/SS corners

DC Simulation Results (Post-Layout)

- **LDO Output Voltage (VOUT):** 13.92 V to 13.96 V
- **Feedback Voltage:** 1.195 V to 1.198 V
- **Total Current Consumption – No Load:** 73.36 µA to 116.9 µA
- **Total Current Consumption – Full Load:** 16.99 mA to 17.02 mA
- **Operating Conditions:** VIN = 15 V to 16 V, TJ = –40°C to +150°C, TT/FF/SS corners

Stability Simulation Results (Pre-Layout)

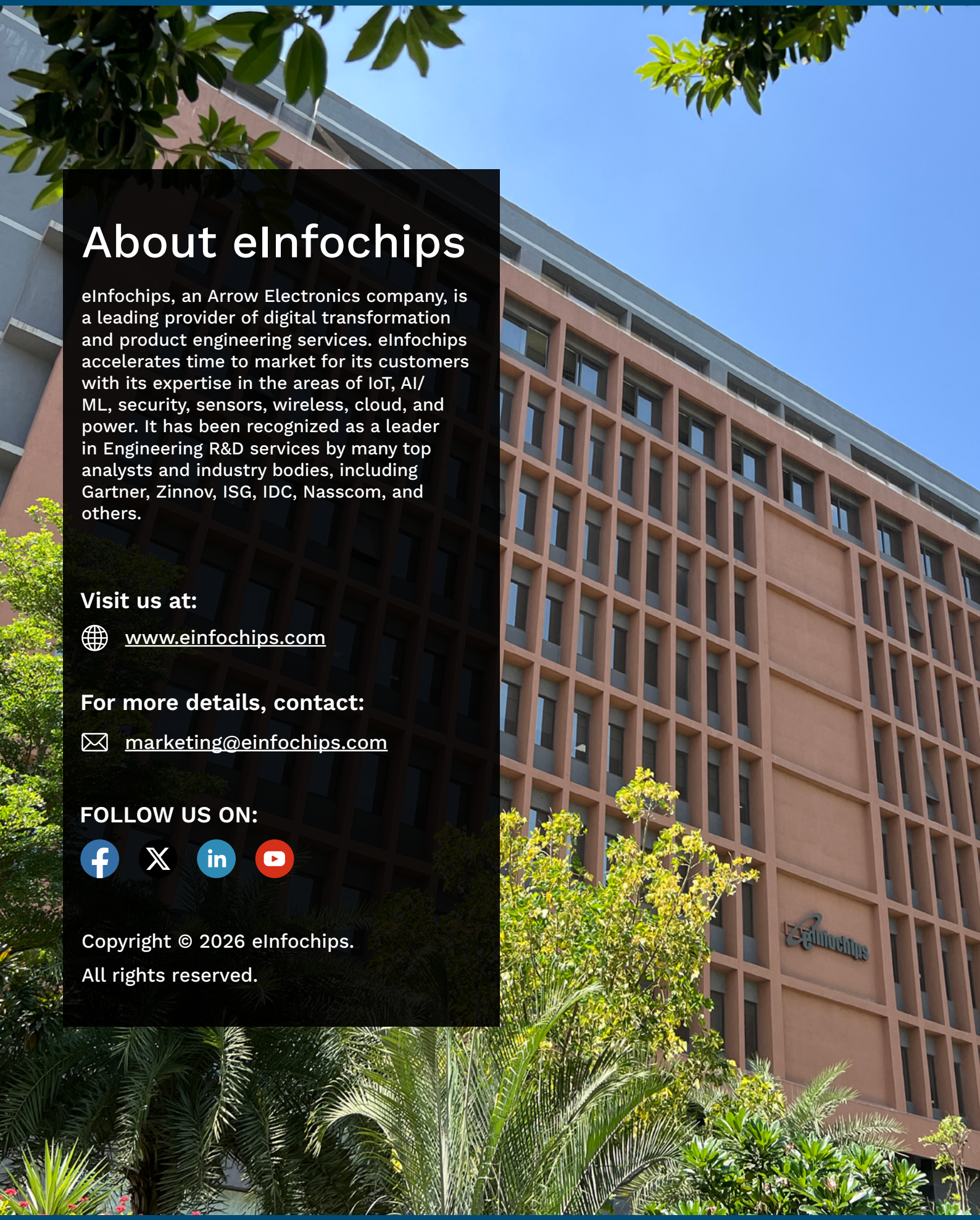
- **Phase Margin:** 80.4° to 99.48°
- **Unity-Gain Bandwidth (UGB):** 70.41 kHz to 1.69 MHz
- **Gain Margin:** 41.05 dB to 79.1 dB
- **Operating Conditions:** VIN = 15 V to 16 V, TJ = –40°C to +150°C, TT/FF/SS corners
- **Load Conditions:** No Load to Full Load (17 mA)

Stability Simulation Results (Post-Layout)

- **Phase Margin:** 84.2° to 130.5°
- **Unity-Gain Bandwidth (UGB):** 179 kHz to 397 kHz
- **Gain Margin:** 49.46 dB to 85.33 dB
- **Operating Conditions:** VIN = 15 V to 16 V, TJ = –40°C to +150°C, TT/FF/SS corners
- **Load Conditions:** No Load to Full Load (17 mA)

AC Simulation Results (Pre vs Post Layout)

- **PSR @ 20 kHz – No Load:** Pre-layout 76.44 to 88.19 dB; post-layout 56.62 to 66.95 dB
- **PSR @ 20 kHz – Full Load:** Pre-layout 42.45 to 44.30 dB; post-layout 22.35 to 23.23 dB
- **PSR @ 100 kHz – No Load:** Pre-layout 75.77 to 88.21 dB; post-layout 56.73 to 68.89 dB
- **PSR @ 100 kHz – Full Load:** Pre-layout 37.52 to 68.89 dB; post-layout 17.30 to 20.62 dB
- **Operating Conditions:** VIN = 15 V to 16 V, TJ = –40°C to +150°C, TT/FF/SS corners



About eInfochips

eInfochips, an Arrow Electronics company, is a leading provider of digital transformation and product engineering services. eInfochips accelerates time to market for its customers with its expertise in the areas of IoT, AI/ML, security, sensors, wireless, cloud, and power. It has been recognized as a leader in Engineering R&D services by many top analysts and industry bodies, including Gartner, Zinnov, ISG, IDC, Nasscom, and others.

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