Digital PFC Controllers

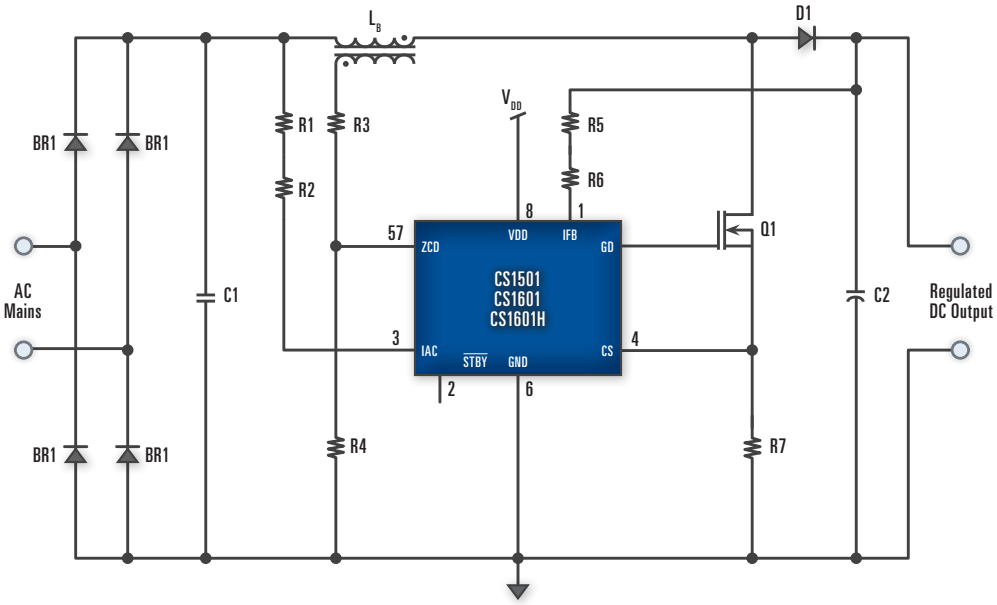
POWER FACTOR CORRECTION IC FOR POWER SUPPLIES

CS1501/1601

(actual size: 5 mm x 5 mm)

DTV

LED POWER SUPPLY



OVERVIEW:

The CS1501/1601 are high-performance Variable Frequency Discontinuous Mode, active digital power factor correction (PFC) controllers. They feature Cirrus Logic's EXL Core® technology that brings innovative digital energy control which elevates performance and reduces total solution size.

The unique digital architecture of our PFC controllers enables a reduction in the boost inductor value (L_B), the size of the EMI filter stage and many external passive components.

Variable on-time/ variable frequency algorithm is used in achieving close to unity power factor and spreading the EMI frequency spectrum, thus reducing the conducted EMI filtering requirements. The feedback loop is closed through an integrated compensation network within the IC, eliminating the need for additional external components. Protection features (such as overvoltage, overcurrent, overpower, open and short circuit protection, over temperature, and brownout) help protect the device during abnormal transient conditions.

FEATURES:

- Superior light-load efficiency, top-end power factor correction, unsurpassed THD
- Smaller boost inductance needed versus critical conduction mode (CRM)
- Digital EXL Core enables intelligent and adaptive switching
- Pin-out similar to top analog CRM solutions
- Current sense and zero crossing detect (ZCD) functionality added
- Brownout protection
- Overvoltage protection
- Overpower protection with shutdown
- UVLO with wide hysteresis
- Thermal shutdown with hysteresis

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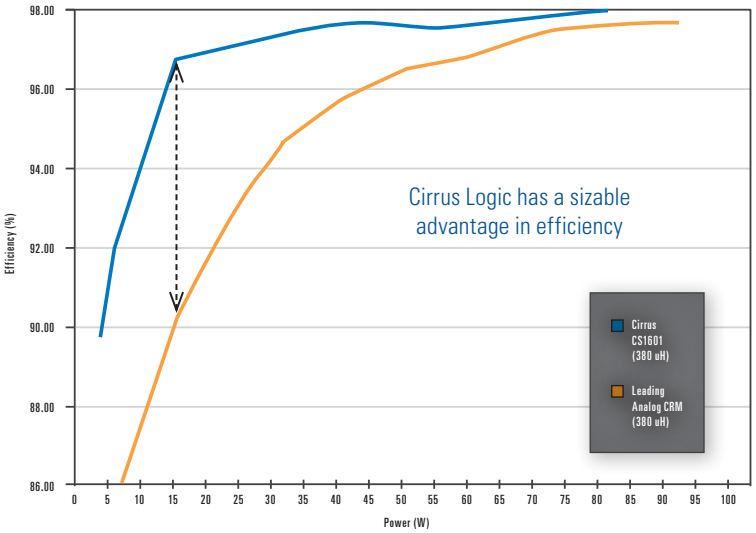
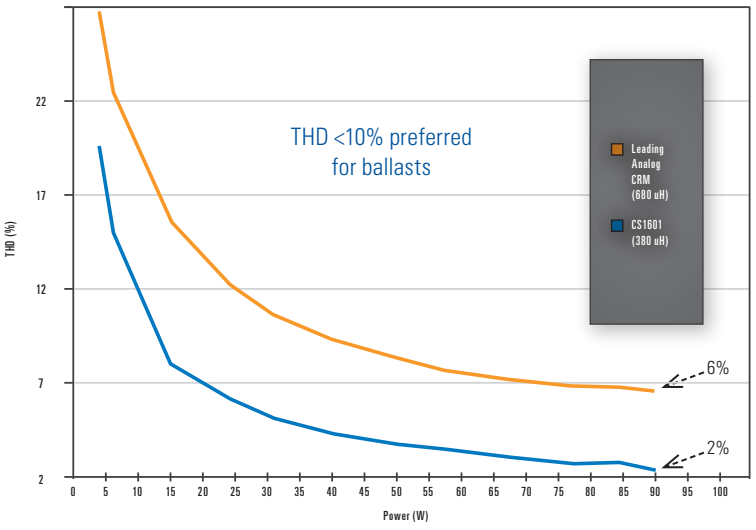
Part	*Control Method	Max fsw [kHz]	Frequency Spreading	Peak Current Spreading	IC Supply Current [mA]	V_{DD} Range [V]	T_J Op. Range [°C]	Gate Driver (Source/Sink) [Ω]	Internal Feedback Compensation	Package
CS1501	*VF-DCM	70	✓	✓	1.5	7.9 – 17.0	-40 to +125	9/6	✓	SOIC-8
CS1601	*VF-DCM	70	✓	✓	1.5	7.9 – 17.0	-40 to +125	9/6	✓	SOIC-8
CS1601H	*VF-DCM	100	✓	✓	1.7	7.9 – 17.0	-40 to +125	9/6	✓	SOIC-8

EFFICIENCY PERFORMANCE



At 277 Vac input, EFF plot across load range

THD PERFORMANCE



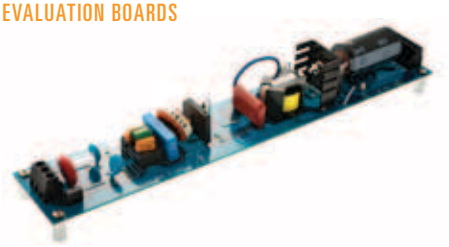
At 120 Vac input, THD plot across load range

EXL CORE TECHNOLOGY

CIRRUS LOGIC EXL CORE

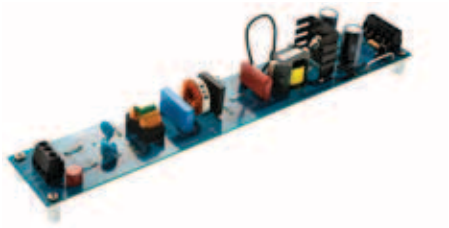
The EXL Core is a digital technology platform at the heart of Cirrus Logic's commitment to develop innovative solutions that help our customers cost effectively create smarter, greener energy products.

EVALUATION BOARDS



▲ CDB150X-01 Demonstration Board

Demonstrates the performance of the CS1501 digital PFC controller with a 90 watt output at a link voltage of 400 volts. This board is 97% efficient at full load. Suited for power supply applications with 90-265Vac input.



▲ CDB1601-120W Demonstration Board

Demonstrates the performance of the CS1601 digital PFC controller with a 120 watt output at a link voltage of 460 volts. This board is 95% efficient at full load. Suited for lighting applications with 108-305Vac input.

▲ CRD1601-120W Reference Design Board

Demonstrates the performance of the CS1601 digital PFC controller in an electronic ballast application. The CRD1601 uses a resonant second stage driver to power up to two T5 fluorescent lamps. The CRD1601 has been designed to fit into a slimline T5 fluorescent electronic ballast form factor.