



PureBLACK™ Full Bridge CCFL Controller

DESCRIPTION

CCFL backlight controller with integrated 12V gate drivers and 3rd generation PureBLACK™ mega contrast dimming technology for traditional 24V inverter/LCD panel display architectures

The LX6502, Microsemi's latest addition to its CCFL inverter controller family, brings advanced mega-contrast dimming to large-screen displays with fully integrated on-chip 12V gate drivers to support full bridge, high and low side, N-channel power MOSFET configurations with input voltages to 35V. An integrated on-chip voltage regulator with under voltage lockout protection further minimizes the overall system bill of material costs. Additional BOM cost reductions are enabled by a fully integrated suite of protection functions that include soft-start, direct duty cycle control with maximum duty limiting, open lamp, over current, and over voltage protection.

The LX6502 enables quick design turns with its flexible and user configurable feature set. Programmable lamp frequency, programmable strike, open lamp protection, over current protection, and over voltage protection timings. An included synchronization function (SYNC) with selectable frequency ratio, frequency limit, auto detect, and synchronization to lower or higher frequencies enables improved image quality by eliminating inverter interference effects with the video signals.

Key Features

Full-Bridge Controller with 12V Gate Drivers

- > Inverter configurations with high and low side N-channel power MOSFETs
- > 800mA source / 1000mA sink gate drivers

Integrated JIN's PureBLACK™ Mega Dimming

- > BURST PWM dimming for 'true zero' percent D.C. operation
- > Optimized operation with JIN Balancer I for displays greater than 37" and JIN Balancer II for displays upto 37"

Comprehensive Brightness Control Modes

- > Analog only ⇔ adjust lamp current only
- > Analog BURST Dimming ⇔ analog voltage to BURST PWM
- > Digital BURST Dimming ⇔ Direct PWM BURST input

High Accuracy, Programmability, and SYNC

- > Programmable Lamp, Strike, and Burst frequency
- > Direct Duty Control with Max. Duty Limit
- > SYNC w/selectable frequency ratio, AUTO detect, frequency limit, and synchronization above or below free run frequency

Protection, Lamp Strike, Detection, and Operation

- > OLP, OVP (regulation/protection), OIP and Short Circuit
- > Programmable STRIKE and Fault time (run mode)
- > Programmable soft start

Operational Status Indication

- > Tri-state indication of Strike, Run, Fault

Benefits

Reduced System Cost and Simplified Design

- > Reduced component counts and complexity results in quicker design turns and reduced BOM cost
- > Additional gate drivers not required result in reduced system cost

Enhanced Image Quality and more Realistic Video

- > Superior black levels for increased dynamic contrast ratio
- > Great shadow detail for a more enjoyable viewing experience
- > Zero flickering with low duty cycle operation

Increased Flexibility and Performance

- > Wide dimming range and multiple architecture support
- > Ease of implementation
- > Reduced cost with reduction of external components

Ease of Use and Flexibility

- > Operational robustness and protection
- > Improved image quality with reduced interference artifacts
- > Superior performance and image uniformity

Reliability, Flexibility, Ease of Use, and Reduced Cost

- > User configurable, supports multiple panel types and customer need
- > Enhanced operation at very low duty cycles to avoid false open lamp protection while detecting true open lamp detection

Ease of Troubleshooting, Debugging, and Protection

- > System level integration and control

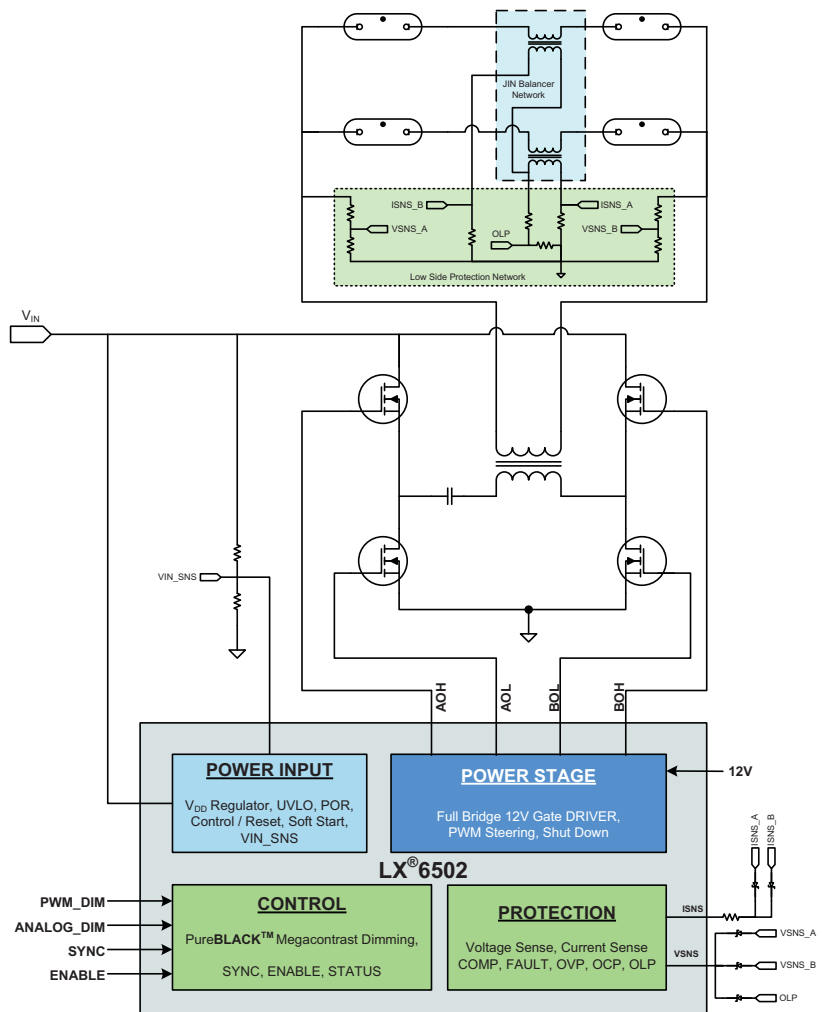
APPLICATIONS

- > LCD Televisions
- > High end graphics and medical imaging monitors requiring highest image quality
- > CCFL, EEFL, FFL Backlight systems

Additional Features

- > 10V to 35V power rail operation
 - For 24V inverter architecture
- > On chip voltage regulator
 - +/-3% accuracy
 - UVLO protection with programmable hysteresis, POR
- > Highly accurate lamp operation
 - Current control ⇔ +/- 2%
 - Frequency set ⇔ +/- 3%
 - Direct PWM DC control ⇔ +/- 3%
 - Burst frequency control ⇔ +/- 5%
- > JIN Balancer optimized to support 'true' zero BURST duty cycle dimming
- > Programmable Soft Start Control
- > Programmable STRIKE time and STRIKE frequency
- > Programmable FAULT time
- > Programmable BURST dimming frequency
- > ENABLE control signal
- > Supports 2:1 Strike/Run frequency ratios (typical)
- > Industrial Temperature Grade
 - -40°C to +85°C
- > 28 lead, Wide body, SOIC package

LX6502 Typical 24V CCFL Inverter Block Diagram with PureBLACK™ Technology



Ordering Information

LX6502IDW	SOIC, 28 lead, Wide Body, RoHS compliant, Pb-free, Industrial Temperature, Tubes	$\theta_{JA} = 58.6^{\circ}\text{C/W}$
LX6502IDW – TR	SOIC, 28 lead, Wide Body, RoHS compliant, Pb-free, Industrial Temperature, Tape and Reel ⇔ 1000 pcs/reel	$\theta_{JA} = 58.6^{\circ}\text{C/W}$

Technical Support Information: For LX6502 and other CCFL or Display family of products, please contact your local Microsemi Field Applications Engineer.

For more information about Microsemi products and the name of a local representative, distributor or sales person, please visit www.microsemi.com or contact us at +1 (714) 898-8121 or +1 (949) 221-7100.

