

Click [here](#) for production status of specific part numbers.

MAX20096/MAX20097 Dual-Channel Synchronous Buck, High-Brightness LED Controller with and without SPI Interface

General Description

The MAX20096/MAX20097 are dual-channel, high-voltage, synchronous n-channel high-current buck LED drivers. The ICs use a proprietary average current-mode-control scheme to regulate the inductor current. This control method does not require any control-loop compensation, maintaining nearly constant switching frequency. Inductor current sense is achieved by sensing the current in the bottom switching device. The ICs integrate two fully synchronous buck-converter controllers, and operate over a wide 4.5V to 65V input range. The ICs are designed for high-frequency operation and can operate at switching frequencies as high as 1MHz.

In the MAX20096, the output voltages and currents on both channels and the junction temperature can be read back through the SPI interface. Protection features include inductor current-limit protection, overvoltage protection, and thermal shutdown. The MAX20096 is available in a space-saving thermally enhanced (5mm x 5mm), 32-pin side-wettable TQFN package and is specified to operate over the -40°C to +125°C automotive temperature range.

The MAX20097 is available in a 28-pin thermally enhanced TSSOP package, but does not have the SPI interface. It includes an open-drain fault flag (FLT_B) that goes low in case of an open string, shorted string, or overvoltage activation in any one of the channels, or also in thermal shutdown.

Applications

- Automotive Exterior Lighting
 - High-Beam/Low-Beam/Signal/Position Lights
 - Daytime Running Lights (DRLs)
 - Fog Light and Adaptive Front Light Assemblies
- Commercial, Industrial, and Architectural Lighting

Benefits and Features

- Integration Minimizes BOM for High-Brightness LED Driver, Saving Space and Cost
 - Wide 4.5V to 65V Input Voltage Range
 - No Compensation Components
 - Programmable Switching Frequency
 - External MOSFETs that are Sizable for the Appropriate Current
- Wide Dimming Ratio Allows High-Contrast Ratio
 - Analog Dimming
 - PWM Dimming
- Suitable for Matrix Lighting
 - Maintains Current Regulation While Shorting/Opening Individual LEDs in the String
 - Ultra-Fast Response Control Loop Prevents Overshoots and Undershoots
- Protection Features and Wide Temperature Range Increase System Reliability
 - Short Circuit, Overvoltage, and Thermal Protection
 - -40°C to +125°C Operating Temperature Range
 - Thermal Monitor and LED Current Monitor
- Fault Diagnosis Through SPI Interface and Through FLT_B Pin for Applications without SPI Interface

Ordering Information appears at end of data sheet.

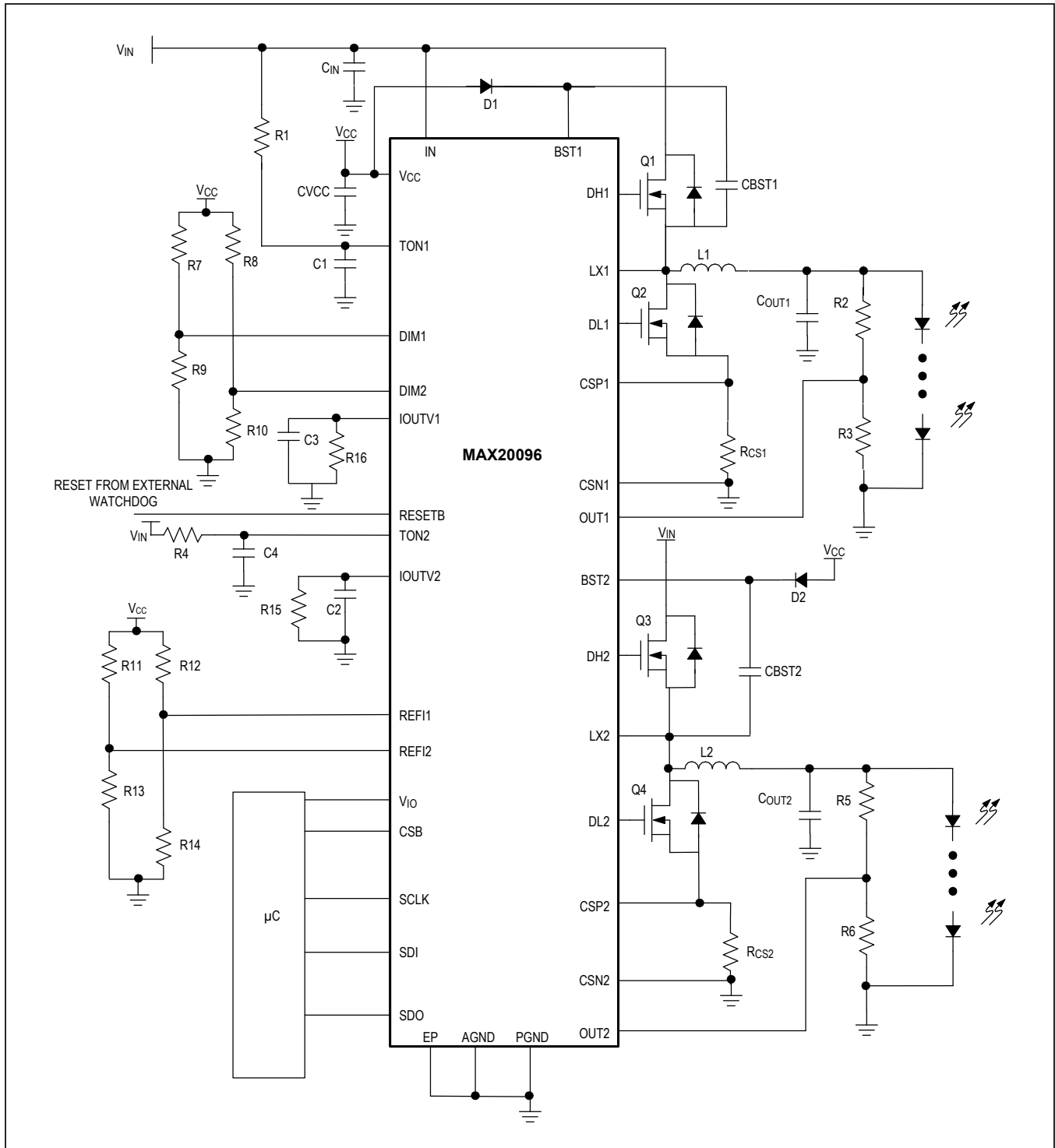
ABRIDGED DATA SHEET

MAX20096/MAX20097

Dual-Channel Synchronous Buck, High-Brightness LED Controller with and without SPI Interface

Buck Diagrams

MAX20096



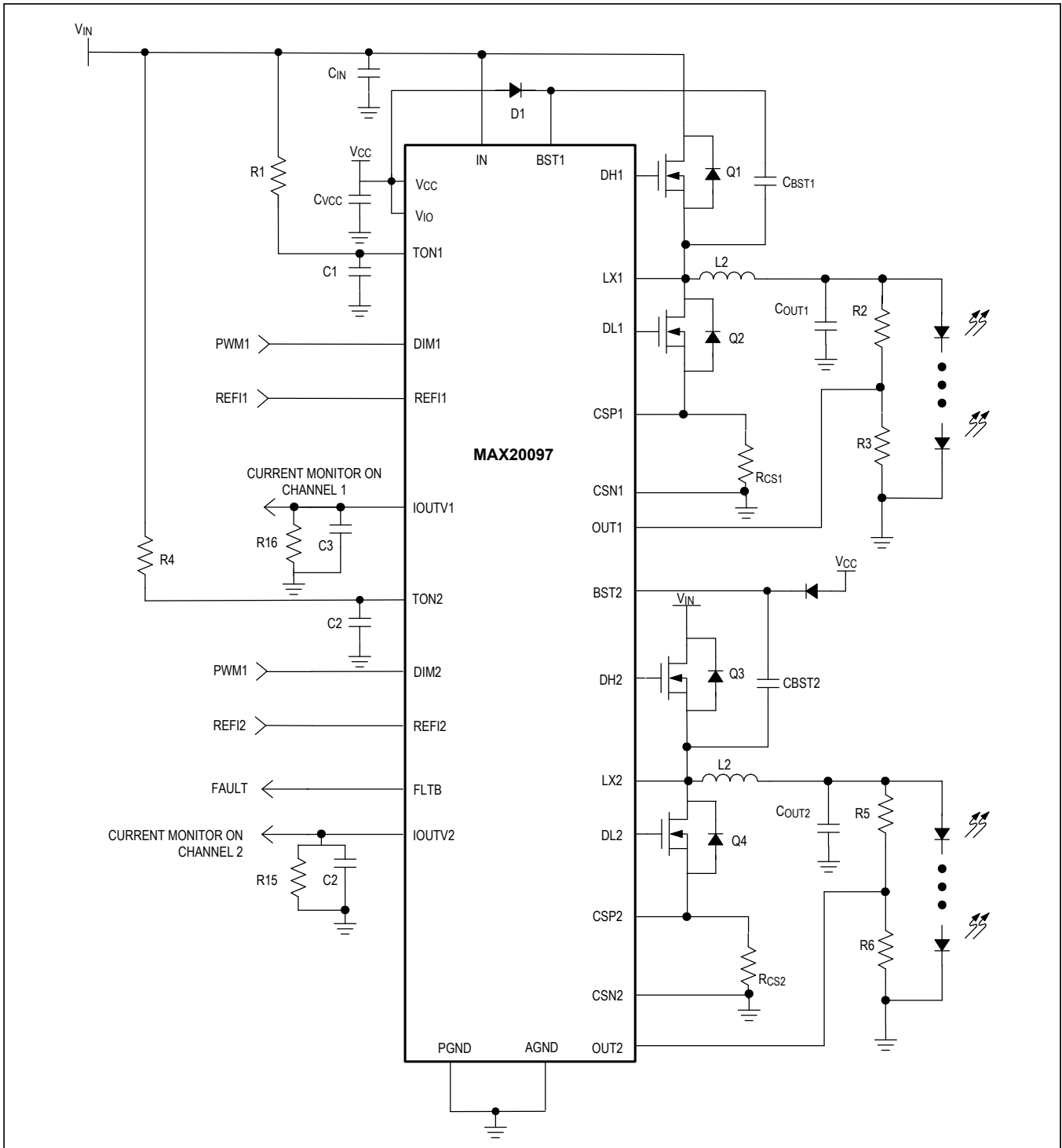
ABRIDGED DATA SHEET

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Buck Diagrams (continued)

MAX20097



ABRIDGED DATA SHEET

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Dual-Channel Synchronous Buck, High-Brightness LED Controller with and without SPI Interface

Ordering Information

PART	TEMP RANGE	PIN-PACKAGE
MAX20096ATJ/VY+	-40°C to + 125°C	32 TQFN-EP*
MAX20097ATJ/VY+	-40°C to + 125°C	32 TQFN-EP*
MAX20097AUI/V+	-40°C to + 125°C	28 TSSOP-EP*

V denotes an automotive qualified part.

+Denotes a lead(Pb)-free/RoHS-compliant package.

*EP = Exposed pad.

Chip Information

PROCESS: BiCMOS

Package Information

For the latest package outline information and land patterns (footprints), go to www.maximintegrated.com/packages. Note that a "+", "#", or "-" in the package code indicates RoHS status only. Package drawings may show a different suffix character, but the drawing pertains to the package regardless of RoHS status.

PACKAGE TYPE	PACKAGE CODE	OUTLINE NO.	LAND PATTERN NO.
TSSOP	U28E+1C	21-100182	90-100069
TQFN	T3255Y+6C	21-100041	91-100066

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