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MAX20075/MAX20076

36V, 600mA/1.2A Mini Buck Converter with 3.5 μ A I_Q

General Description

The MAX20075/MAX20076 are small, synchronous buck converters with integrated high-side and low-side switches. The MAX20076 is designed to deliver up to 1.2A and the MAX20075 up to 0.6A, with 3.5V to 36V input voltages, while using only 3.5 μ A quiescent current at no load. The devices provide an accurate output voltage of $\pm 2\%$ within the normal operation input range of 6V to 18V. With 20ns minimum on-time capability, the converter is capable of large input-to-output conversion ratios. Voltage quality can be monitored by observing the PGOOD signal. The devices can operate in dropout by running at 99% duty cycle, making them ideal for automotive and industrial applications. The devices offer two fixed output voltages of 5V and 3.3V. In addition, the devices can be configured for 1V to 10V output voltages using an external resistor-divider. Frequency is internally fixed at 2.1MHz, which allows for small external components and reduced output ripple, and guarantees no AM interference. The devices automatically enter skip mode at light loads with ultra-low quiescent current of 3.5 μ A at no load. The devices offer pin-enabled spread-spectrum-frequency modulation designed to minimize EMI-radiated emissions due to the modulation frequency.

The MAX20075/MAX20076 are available in small (3mm x 3mm) 12-pin TDFN and side-wettable TDFN packages with an exposed pad, and use very few external components.

Applications

- Automotive
- Industrial
- High-Voltage DC-DC Converters

Ordering Information appears at end of data sheet.

Benefits and Features

- Synchronous DC-DC Converter with Integrated FETs
 - MAX20075 = 0.6A I_{OUT}
 - MAX20076 = 1.2A I_{OUT}
 - 3.5 μ A Quiescent Current when in Standby Mode
- 20ns Minimum On-Time Small Solution Size Saves Space
 - 2.1MHz Frequency
 - Programmable 1V to 10V Output for the Buck, or Fixed 5V/3.3V Options Available
 - Fixed 2.5ms Internal Soft-Start
 - Fixed Output Voltage with $\pm 2\%$ Output Accuracy (5V/3.3V), or Externally Resistor Adjustable (1V to 10V) with $\pm 1.5\%$ FB Accuracy
 - Innovative Current-Mode-Control Architecture Minimizes Total Board Space and BOM Count
- PGOOD Output and High-Voltage EN Input Simplify Power Sequencing
- Protection Features and Operating Range Ideal for Automotive Applications
 - 3.5V to 36V Operating V_{IN} Range
 - 40V Load-Dump Protection
 - 99% Duty-Cycle Operation with Low Dropout
 - -40°C to +125°C Automotive Temperature Range
 - AEC-Q100 Qualified

ABRIDGED DATA SHEET

MAX20075/MAX20076

36V, 600mA/1.2A Mini Buck Converter
with 3.5 μ A I_Q

Typical Application Circuits

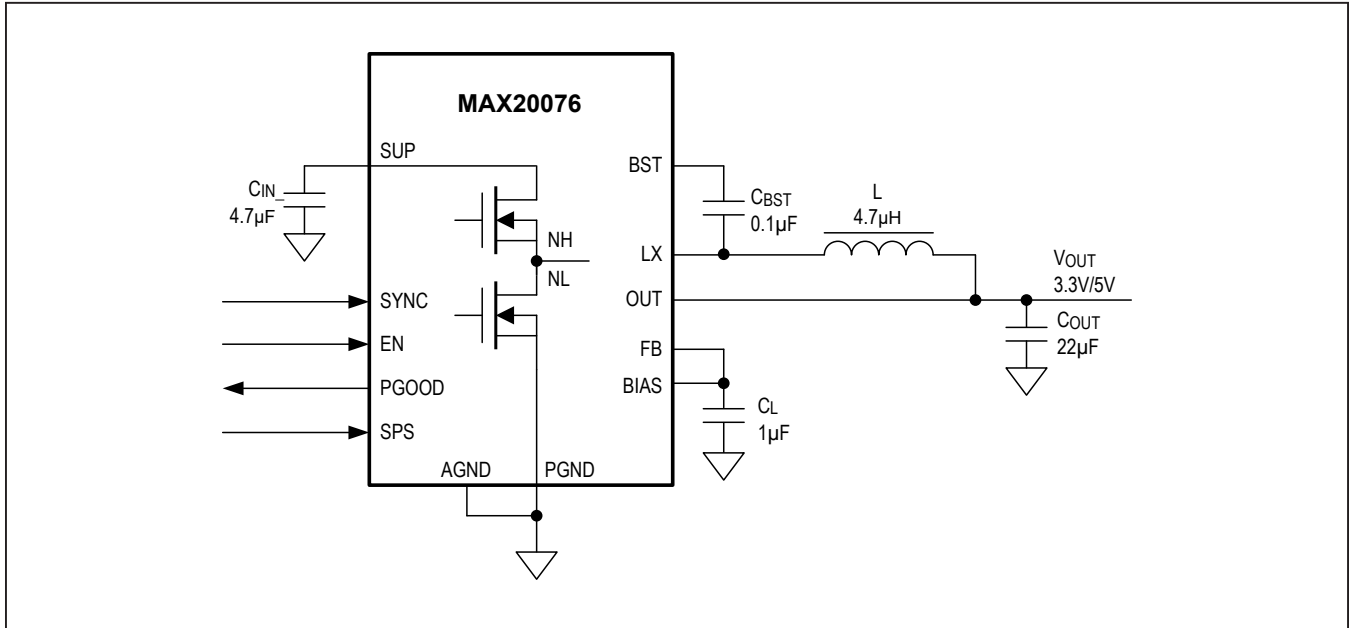


Figure 2. MAX20076 3.3V/5V Fixed 1.2A Output in 12-Pin TDFN Package

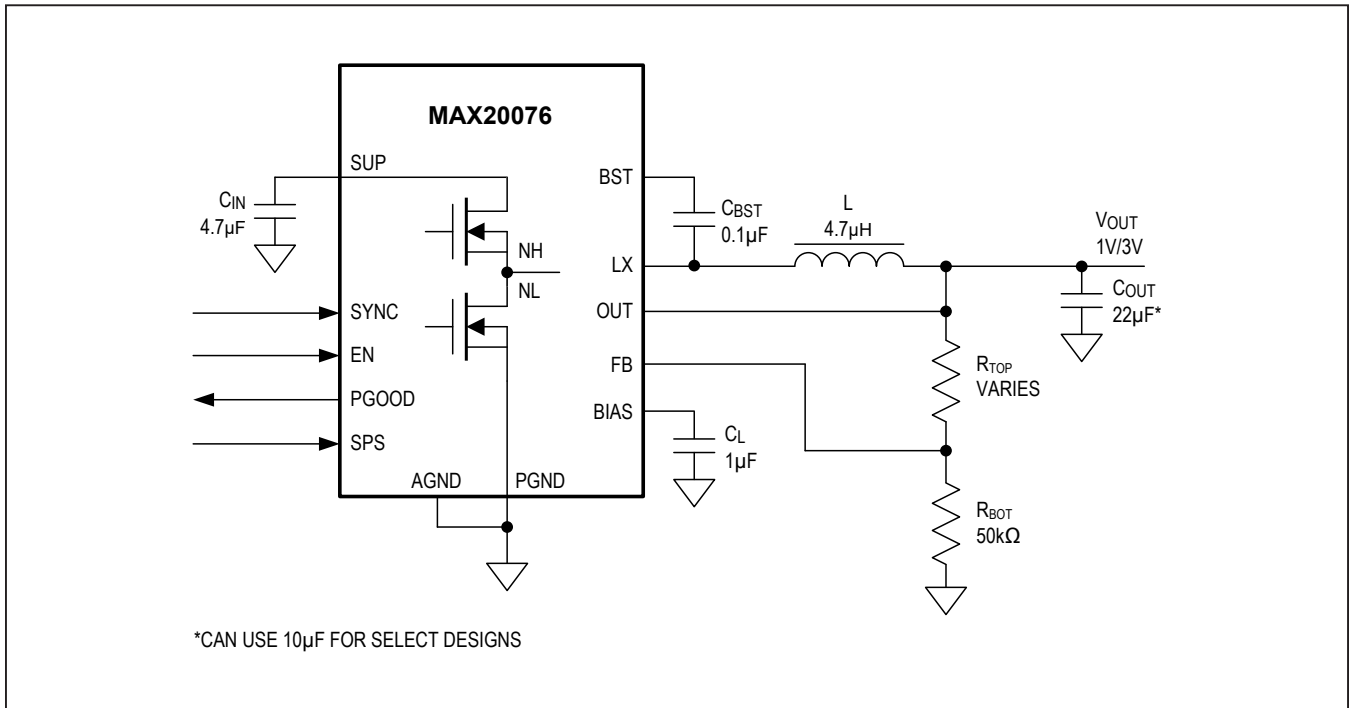


Figure 3. MAX20076ATCC/V+ 1V/3V Variable 1.2A Output in 12-Pin TDFN Package

ABRIDGED DATA SHEET

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36V, 600mA/1.2A Mini Buck Converter
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Typical Application Circuits (continued)

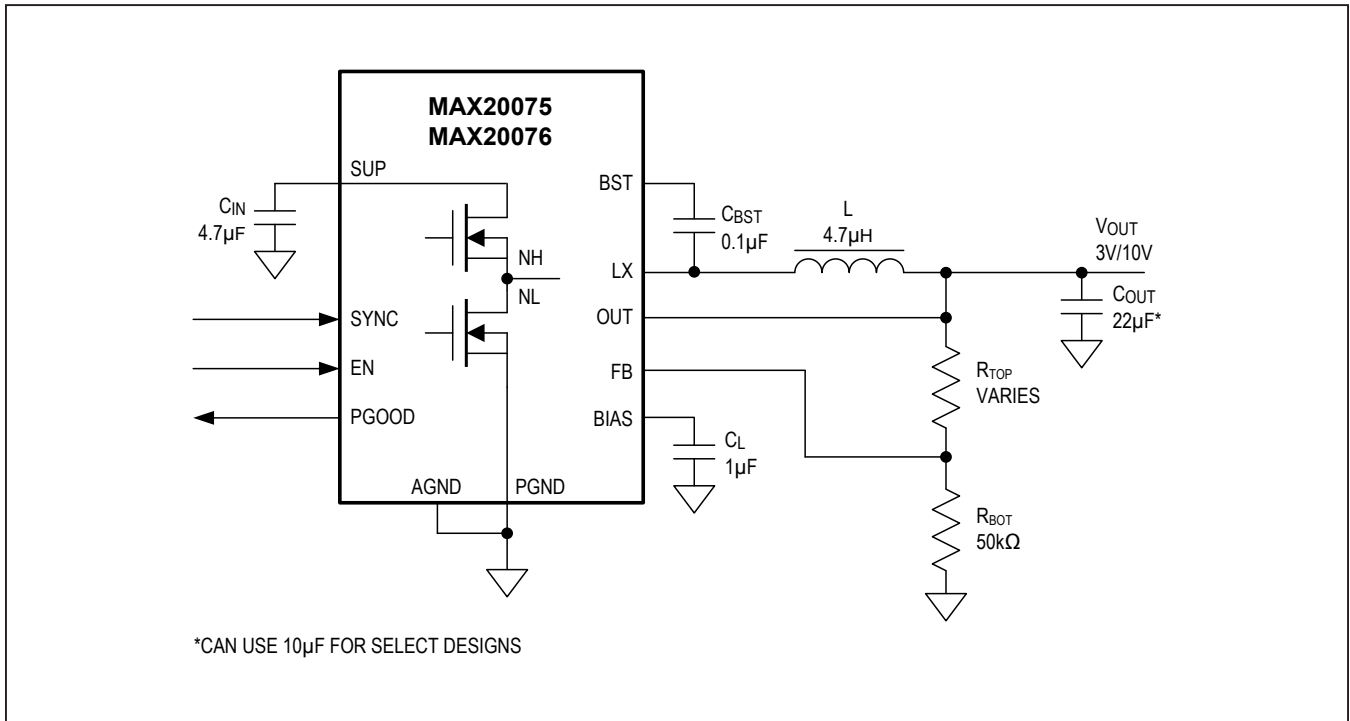


Figure 4. MAX20075/MAX20076 3V/10V Variable Output

ABRIDGED DATA SHEET

MAX20075/MAX20076

36V, 600mA/1.2A Mini Buck Converter
with 3.5 μ A I_Q

Ordering Information

PART	TEMP RANGE	PIN-PACKAGE	DESCRIPTION	I _{LIM}
MAX20075 ATCA/V+	-40°C to +125°C	12 TDFN-EP*	Fixed 5V output or 3V to 10V external resistor-divider	0.6A
MAX20075ATCB/V+	-40°C to +125°C	12 TDFN-EP*	Fixed 3.3V output or 3V to 10V external resistor-divider	0.6A
MAX20075ATCC/V+	-40°C to +125°C	12 TDFN-EP*	1V to 3V external resistor-divider	0.6A
MAX20076 ATCA/V+	-40°C to +125°C	12 TDFN-EP*	Fixed 5V output or 3V to 10V external resistor-divider	1.2A
MAX20076ATCB/V+	-40°C to +125°C	12 TDFN-EP*	Fixed 3.3V output or 3V to 10V external resistor-divider	1.2A
MAX20076ATCC/V+	-40°C to +125°C	12 TDFN-EP*	External resistor-divider from 1V to 3V	1.2A
MAX20076BATCB/VY+	-40°C to +125°C	12 TDFN-EP*	Fixed 3.3V output or 3V to 10V external resistor-divider	1.2A
MAX25276 ATCA/VY+	-40°C to +125°C	12 SW TDFN-EP*	2.1MHz, fixed 5.147V output or 3V to 10V external resistor-divider	1.2A

Note: All parts are OTP versions, no metal mask differences.

/V denotes an automotive qualified part.

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

*EP = Exposed pad.

Chip Information

PROCESS: CMOS