



## MAX20048

### **Automotive 40V, 55 $\mu$ A $I_q$ , 2.2MHz, H-Bridge Buck-Boost Controller**

**Industry's Lowest  $I_q$  Buck-Boost Controller with Best in Class Transient Response**

#### ***Description***

Create a design and simulate using EE-Sim<sup>®</sup> tools: [MAX20048](#)

The MAX20048 is a current-mode buck-boost controller. The device operates with input voltages from 4.5V to 36V while using only 55 $\mu$ A quiescent current at no load. Once the start-up conditions are satisfied, the device can operate over an extended input voltage range of 2V to 36V. The switching frequency is resistor programmable from 220kHz to 2.2MHz and can be synchronized to an external clock.

The device output voltage is available as 5V fixed or adjustable from 4V to 25V. The wide input voltage range, along with its ability to maintain constant output voltage during battery transients, makes the device ideal for automotive applications. In light load applications, a logic input (FSYNC) allows the devices to operate either in skip mode for reduced current consumption, or fixed-frequency, forced- PWM mode to eliminate frequency variation and help minimize EMI. Protection features include cycle-by-cycle current limit, and thermal shutdown with automatic recovery.

The MAX20048 is available in a small 4mm x 4mm 24-pin TQFN-EP SW package.

## ***Key Features***

- Meets Stringent Automotive Quality and Reliability Requirements
  - Operating  $V_{IN}$  Range: 2V to 36V Allows Operation in Cold-Crank Conditions
  - Tolerates Input Transients to 40V • EN Pin Compatible from +3.3V to +40V
  - -40°C to +125°C Automotive Temperature Range
  - AEQ-100 Qualified
- Efficient Solution in a Small Solutions Size
  - Skip Mode for Efficient Low Power Operation
  - Fixed 5V Output Voltage and Adjustable 4V to 25V
  - High Switching Frequency Allows Use of Small External Components
  - Small 4mm x 4mm 24-Pin SWTQFN Package
- Low Quiescent Current Helps Designers Meet Stringent OEM Current Requirements
  - 55 $\mu$ A Quiescent Current When in Stand-By Mode
  - 10 $\mu$ A (max) Quiescent Current in Shutdown
- EMI Mitigation to meet CISPR25 Class 5 Requirements
  - 220kHz to 2.2MHz Operating Frequency
  - Fixed-Frequency PWM Mode
  - External Frequency Synchronization or SYNC OUT Capability (Selectable by OTP Option)
  - Spread Spectrum Can Be Enabled or Disabled for the IC by OTP Option

## ***Applications/Uses***

- Instrument Cluster
- Point of Load Power Supply
- Remote Display
- Start-Stop Systems
- USB Power

Key:  Material Analysis  Non Cancellable Non Reschedulable **NLA**=No longer available

Symbols in part number: **+** Lead-free, RoHS compliant **-** Not qualified as lead-free RoHS **#** RoHS compliant, lead exemption

|                                  |                            |                  |                      |                                                                                                                                                                                                                                                                        |
|----------------------------------|----------------------------|------------------|----------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Part Number<br>MAX20048ATGA/VY+  | Price /Unit*<br><b>BUY</b> | Status<br>Active | Carrier Type<br>Tube | Package<br>TQFN-CU; 24Pin;<br>  See Material Analysis for RoHS info<br>Temp: -40°C to +125°C     |
| Part Number<br>MAX20048ATGA/VY+T | Price /Unit*<br><b>BUY</b> | Status<br>Active | Carrier Type<br>Reel | Package<br>TQFN-CU; 24Pin;<br>  See Material Analysis for RoHS info<br>Temp: -40°C to +125°C     |
| Part Number<br>MAX20048ATGB/VY+  | Price /Unit*<br><b>BUY</b> | Status<br>Active | Carrier Type<br>Tube | Package<br>TQFN-CU; 24Pin;<br>  See Material Analysis for RoHS info<br>Temp: -40°C to +125°C     |
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