

### Single-Chip USB-to-SPI Bridge

- Integrated clock; no external crystal required
- Integrated USB transceiver: No external resistors required
- Integrated 348 Byte one-time programmable ROM for product customization
- On-chip power on reset circuit
- On-chip voltage regulator: 3.45 V output
- Uses USB Bulk Mode transactions for high throughput
  - Configurable priority for reads and writes

### USB Peripheral Function Controller

- USB specification 2.0 compliant; full-speed (12 Mbps)
- USB suspend states supported and indicated via suspend output pins

### USB Interface

- Windows 8<sup>®</sup>, 7<sup>®</sup>, Vista<sup>®</sup>, and XP<sup>®</sup>
- Open access to interface application

### Windows Libraries

- APIs for quick application development
- Supports Windows 8<sup>®</sup>, 7<sup>®</sup>, Vista<sup>®</sup>, and XP<sup>®</sup> (SP2 and SP3)

### Packages

- RoHS-compliant 24-QFN package (4 mm x 4 mm)

### SPI Controller

- 3 or 4-wire master mode operation
- Configurable clock rate
  - 12 MHz, 6 MHz, 3 MHz, 1.5 MHz, 750 kHz, 375 kHz, 187.5 kHz, 93.75 kHz
- Clock phase and polarity control
- Chip select mode and toggle
- Programmable SPI delay (post-assert, inter-byte, pre-deassert)

### 11 Configurable GPIO Pins with Alternate Functions

- Usable as inputs, open-drain outputs, or push-pull outputs
- Up to 11 chip select outputs
- Ready-to-read pin allows for external signal to trigger SPI read operations
- Ability to count edges or pulses using the Event Counter
- Up to 11 USB remote wakeup sources
- SPI activity indication (toggles to indicate SPI activity)
- Configurable clock output (93.75 kHz to 24 MHz)

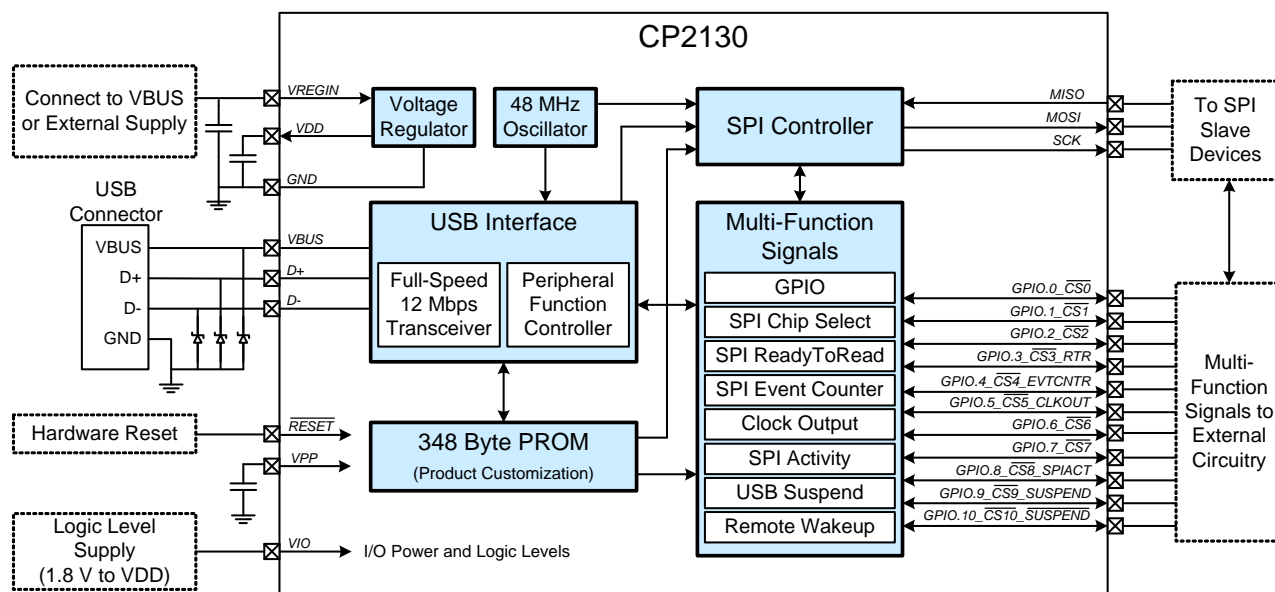
### Supply Voltage

- Self-powered (regulator disabled): 3.0 to 3.6 V
- Self-powered (regulator enabled): 3.0 to 5.25 V
- USB Bus powered: 4.0 to 5.25 V
- I/O voltage: 1.8 to  $V_{DD}$

### Ordering Part Number

- CP2130-F01-GM

Temperature Range: -40 to +85 °C



### Selected Electrical Specifications

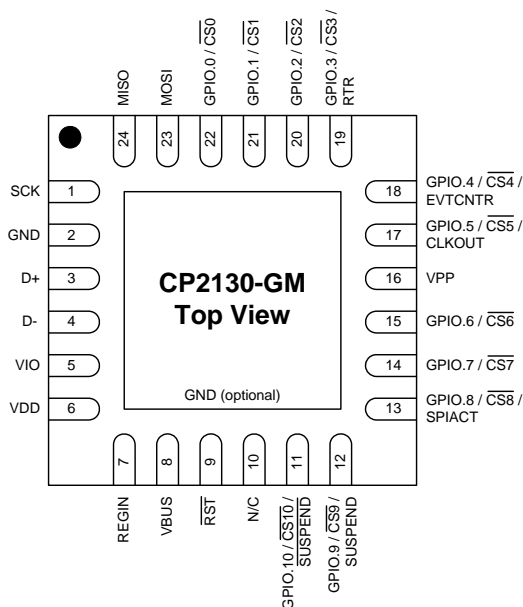
–40 to +85 °C unless otherwise specified

Parameter	Conditions	Min	Typ	Max	Units
Global DC Electrical Characteristics					
Digital Supply Voltage (V <sub>DD</sub> )		3.0	—	3.6	V
Digital Port I/O Supply Voltage (V <sub>IO</sub> )		1.8	—	V <sub>DD</sub>	V
Supply Current—Normal (I <sub>REGIN</sub> ) <sup>1</sup>	Bus Powered; V <sub>REG</sub> Enabled	—	14.4	18.8	mA
Supply Current—Suspended (I <sub>REGIN</sub> ) <sup>1</sup>		—	170	360	μA
Supply Current—USB Pull-up (I <sub>PU</sub> ) <sup>2</sup>		—	200	230	μA
Voltage Regulator Electrical Specifications					
Input Voltage Range (V <sub>REGIN</sub> ) <sup>3</sup>	Regulator Enabled	V <sub>DD</sub> +V <sub>DO</sub>	—	5.25	V
Output Voltage (V <sub>DDOUT</sub> ) <sup>4</sup>	Output current = 1 to 100 mA	3.3	3.45	3.6	V
VBUS Detection Input Threshold (V <sub>BUSTH</sub> )		2.5	—	—	V
Dropout Voltage (V <sub>DO</sub> )	I <sub>DD</sub> = 1 mA I <sub>DD</sub> = 100 mA	— —	1 100	— —	mV
Bias Current		—	—	120	μA
Notes:					
1. USB Pull-up current should be added for total supply current. Normal and suspended supply current is current flowing into V <sub>REGIN</sub> . Normal and suspended supply current is guaranteed by characterization.					
2. The USB Pull-up supply current values are calculated values based on USB specifications. USB Pull-up supply current is current flowing from V <sub>DD</sub> to GND through USB pull-down/pull-up resistors on D+ and D–.					
3. Input range specified for regulation. When the internal regulator is not used, should be tied to V <sub>DD</sub> .					
4. The maximum regulator supply current is 100 mA. This includes the supply current of the CP2130.					

### Typical SPI Throughput

CP2130 Device Configuration	SPI Write Throughput	SPI Read Throughput	SPI WriteRead Throughput	Units
High Priority Write	5.8	3.9	3.9	Mbps
High Priority Read	4.3	6.6	2.6	Mbps
<b>Note:</b> SPI clock rate: 12 MHz, block size: 64 kB				

### Package Information



QFN-24 Pinout Diagram (Top View)

### CP2130EK Evaluation Kit

The CP2130EK allows for the complete evaluation and customization of the CP2130 USB-to-SPI bridge, including USB descriptors and all GPIOs/special functions.

- Easy-to-use evaluation board with an external SPI-based EEPROM, ADC, and temperature sensor
- Mini USB cable
- Demo application that exercises all external SPI devices on the evaluation board
- Includes Windows libraries

