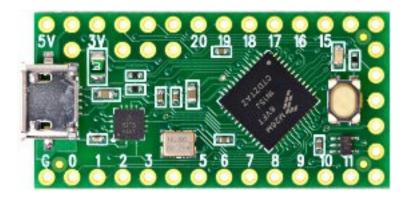# RB-Pjr-02
Teensy LC USB Microcontroller Development Board

Teensy-LC (Low Cost) is a powerful 32 bit microcontroller board, with a rich set of hardware peripherals. Teensy-LC delivers an impressive collection of capabilities to make modern electronic projects simpler. It features an ARM Cortex-M0+ processor at 48 MHz, 62K Flash, 8K RAM, 12 bit analog input & output, hardware Serial, SPI & I2C, USB, and a total of 27 I/O pins. Teensy-LC maintains the same form-factor as Teensy 3.1, with most pins offering similar peripheral features.

Real Hardware Serial
Most modern projects involve serial communication with sensors, other chips, other systems, or even the internet. Hardware serial ports greatly simplify projects and enable excellent performance. Teensy-LC provide plenty of serial connectivity: 2 SPI ports, 2 I2C, and 3 Serial ports. All 3 serial ports are supported by high quality drivers in Teensyduino, with both transmit and receive buffering, and even support for RS485 transmitter enable. Teensy-LC will be ideal for inexpensive "Internet Of Things" projects when paired with a ESP8266 Wifi module, which requires a fast hardware serial or SPI port.

Efficient USB Communication
Teensy-LC has the same powerful USB hardware as Teensy 3.1. All USB data transfer is done directly to memory with minimal CPU overhead. Teensy-LC supports USB Serial, MIDI, Keyboard (international layouts), Mouse, Joystick, and RawHID protocols. A full set of 16 bidirectional USB endpoints are supported by the hardware, allowing any type of USB device. As more USB protocols are added to Teensyduino, despite its low cost, Teensy-LC will be up the task.

Hardware Timers
Many Arduino libraries require a hardware timer. Traditional Arduino products have 3 or 4 timers, with only 1 or 2 providing more than 8 bit resolution. Teensy-LC has a total of 7 timers, all of them with 16 or more bits of resolution, to allow excellent compatibility with easy-to-use libraries. Many combinations of popular libraries, which would normally conflict, can seamlessly run together on Teensy LC and Teensy 3.1.

Analog Input & Output at 12 Bit Resolution
Analog signals are critically important to many projects. Teensy-LC has 13 pins than can function as analog inputs. The effective analog resolution is 12 bits. It also has a true 12 bit digital to analog converter, for an analog output signal.

32 bit ARM Cortex M0+ Processor

The Cortex-M0+ processor is a powerful, full 32 bit CPU, designed for lower power, lower cost devices. Cortex-M0+ has fewer instructions and a simpler bus structure than the more powerful Cortex-M4 on Teensy 3.1. For simple code, M0+ often runs at similar speed, when running at the same clock frequency. For math-intensive applications, Cortex-M4 can be significantly faster, and of course it supports higher clock rates. Cortex-M0+ at 48 MHz is much faster than 8 bit AVR processors at 16 MHz, especially when manipulating 16 and 32 bit variables!

5 Volt Buffer For WS2812/Neopixel LED Projects

Teensy-LC provides a 5V output to directly drive WS2812/Neopixel LEDs. A 74LV1T125 buffer is connected to pin 17, with the increased output voltage available on another pin.

Specifications

- Processor: MKL26Z64VFT4
- Core: Cortex-M0+
- Rated Speed: 48 MHz
- Flash Memory: 62kbytes
- Bandwidth: 96 Mbytes/sec
- Cache: 64 Bytes
- RAM: 8kbytes
- Digital I/O: 27 Pins
- EEPROM: 1/8 (emu)kbytes
- Direct Memory Access: 4 Channels
- Voltage Output: 3.3V + one, 5V Volts
- Voltage Input: 3.3V Only Volts
- Analog Input: 13 Pins
- Converters: 1
- Resolution: 16 Bits
- Usable: 12 Bits
- Touch Sensing: 11 Pins
- Comparators: 1
- Analog Output: 1 Pins
- DAC Resolution: 12 Bits
- Timers: 7 Total Pins
- FTM Type: 3
- PWM Outputs: 10
- LPTMR Type: 1
- PIT (interval) Type: 2
- Systick: 1

Communication

- USB: 1
- Serial: 3
- Fast Clock: 1
- SPI: 2
- With FIFOs: 1

- I2C: 2
- I2S Audio: 1
- FIFO Size: 4