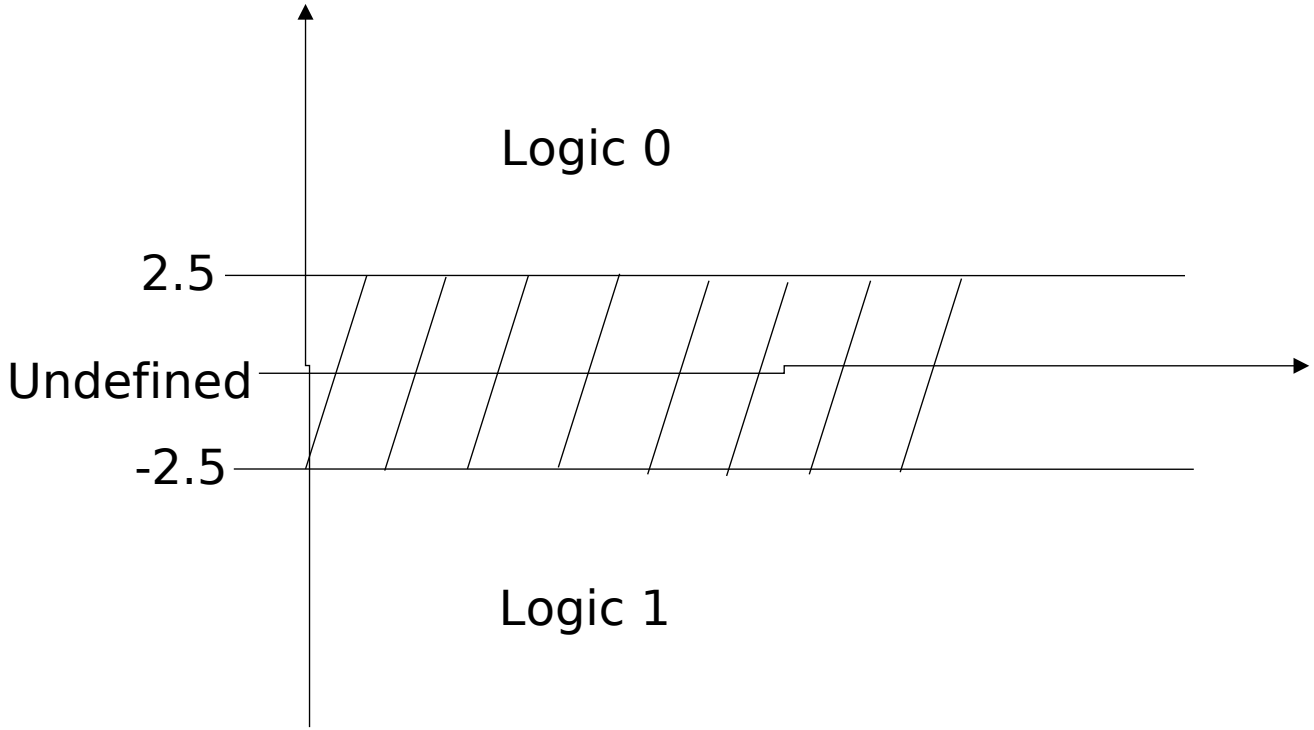
RS232 Electric Characteristics

CMOS Electric Characteristic:
 logic 0: 0 VDC
 logic 1: 3.3 VDC

TTL Electric Characteristic:
 logic 0: 0 VDC
 logic 1: 5.0 VDC

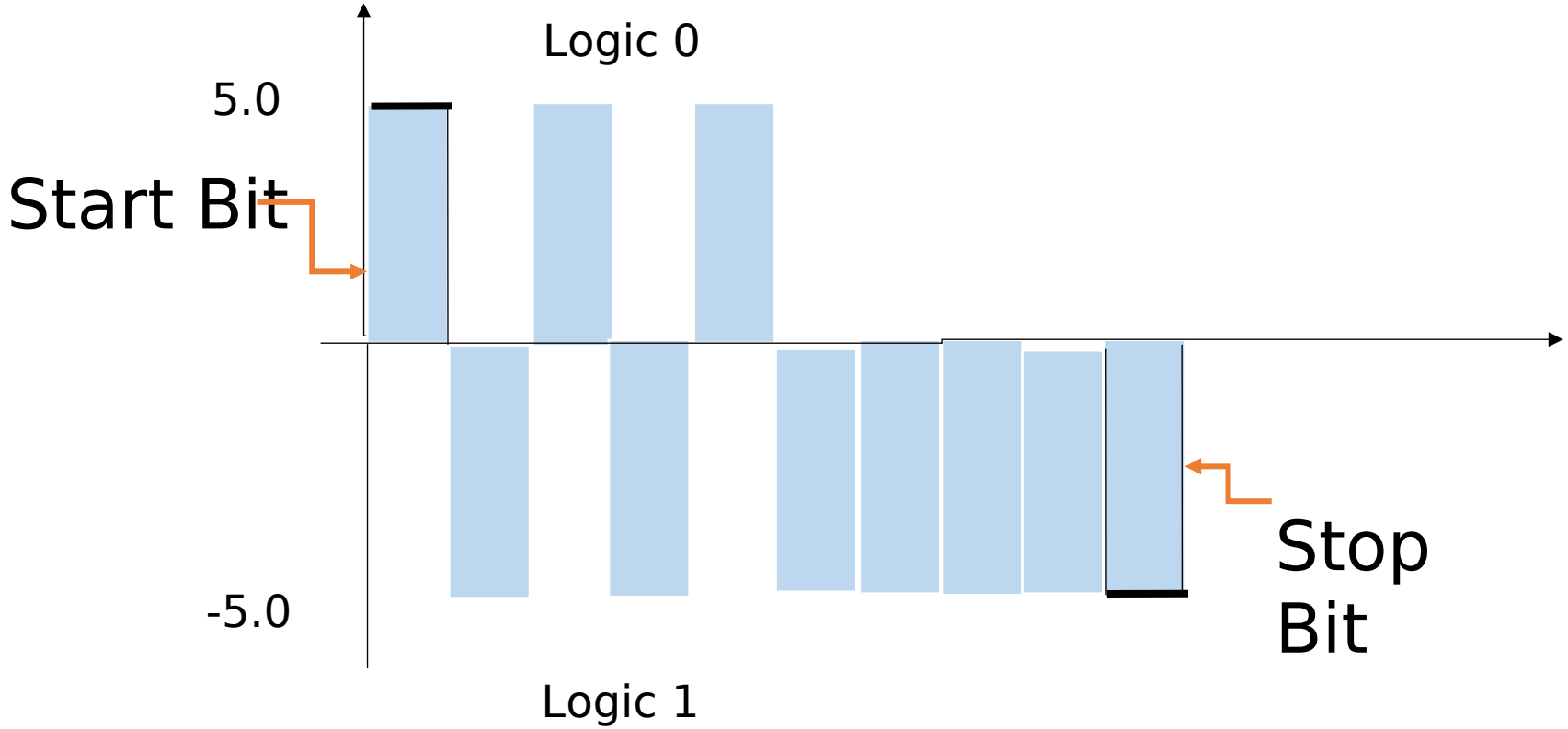
RS232
 logic 0: [+2.5, +18 VDC]
 logic 1: [-18, -2.5 VDC]



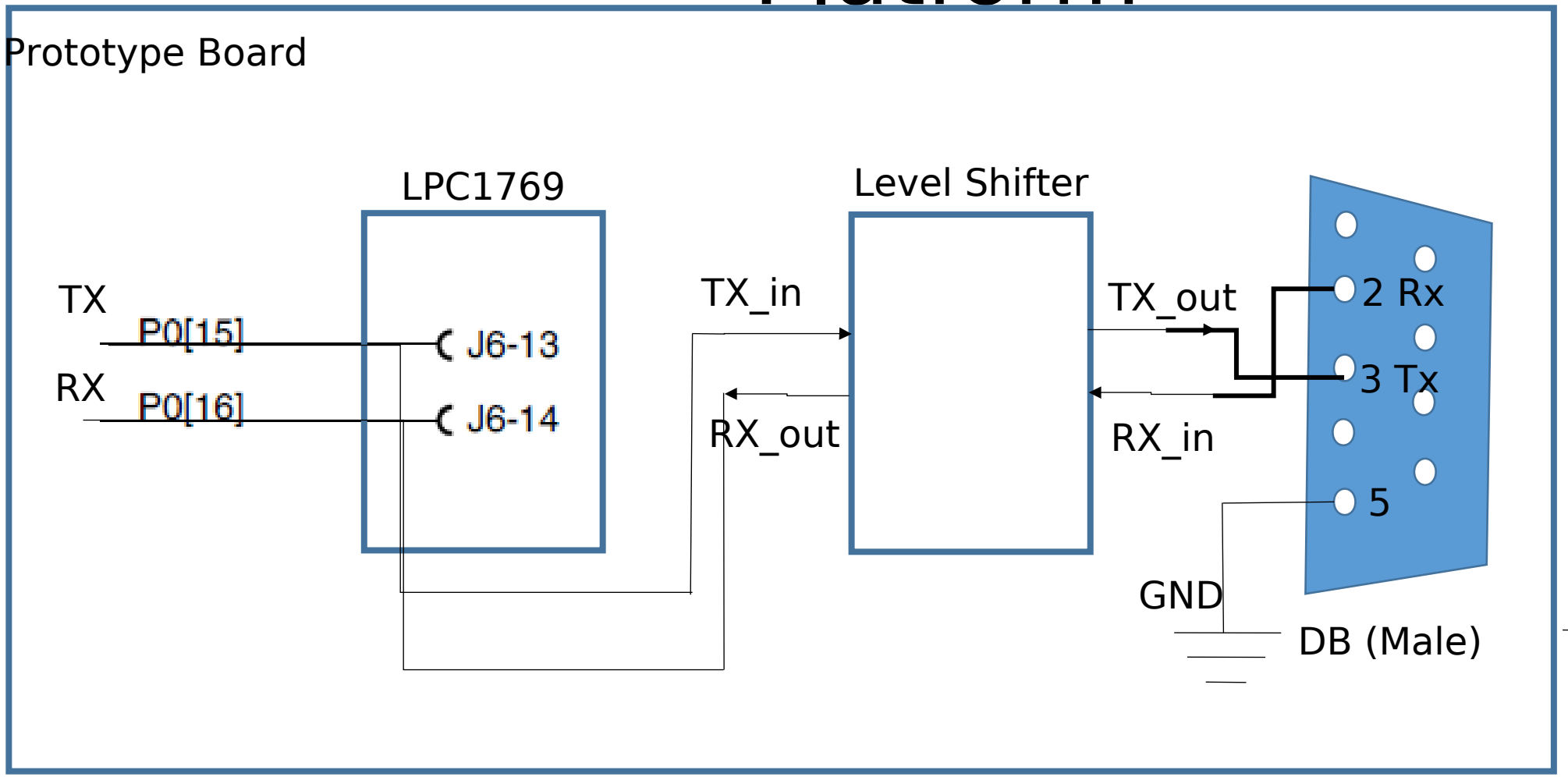
Note: if using devices like MAX232, the range will be [+2.5, +5.0] and [-5.0, -2.5].

RS232 Waveforms

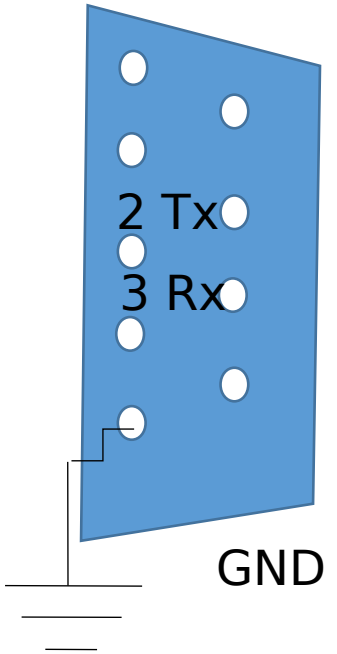
Example: Suppose hex number 0xaf is to be transmitted via RS232 link, as 8N1 at 9600 bps bit rate. Draw its waveform. (MSB out first) Note: 0xaf in binary 1010 1111 with stop and start bit fields 0 1010 1111 1



Build RS232 Interface for LPC1769 Platform



Note This is cable side

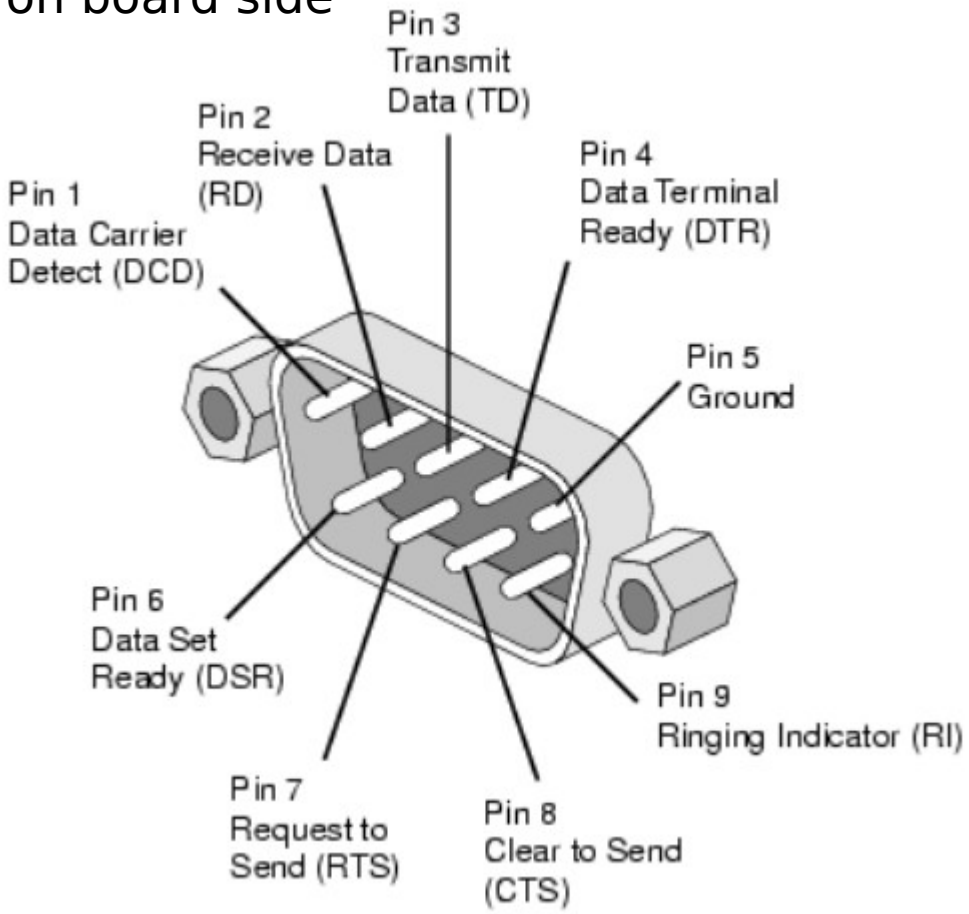


USB-to-RS232 Cable Connector (Female)

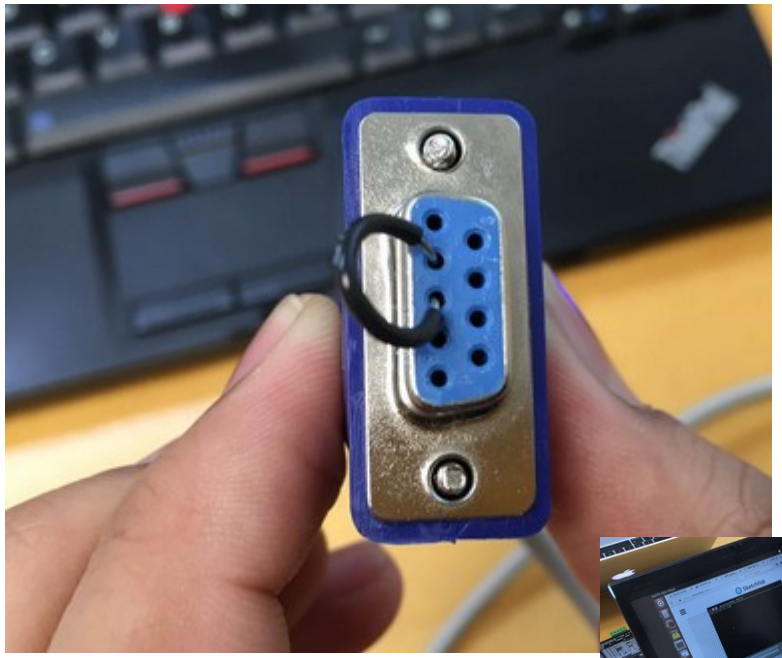
P0.15	TXD1/SCK0
P0.16	RXD1/SSEL0

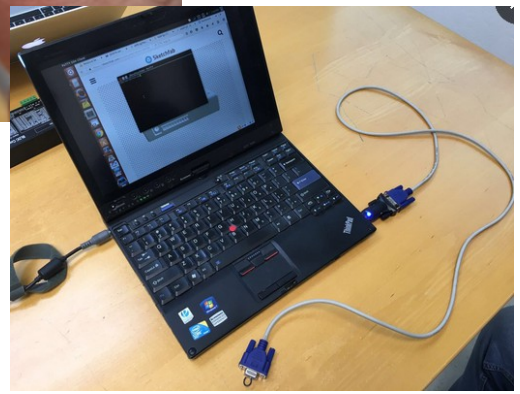
DB9 Connectors Both Genders

Note This DB-9 connector (male) is on board side



Note This DB-9 connector is on cable side

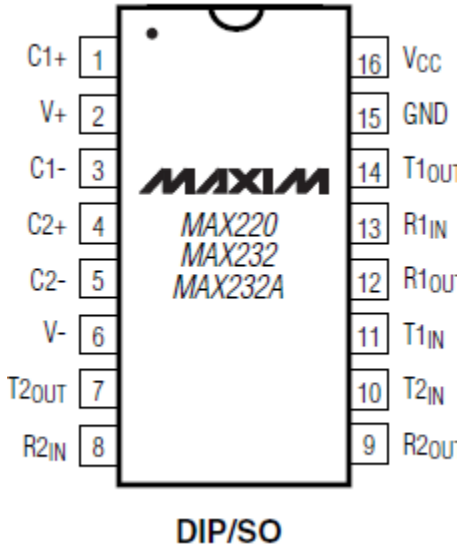




https://www.google.com/search?q=DB9+connector&biw=1025&bih=493&source=lnms&tbm=isch&sa=X&ved=0ahUKEwiNxpj0g7bQAhVoAcAKHYkFA5UQ_AUIBygC#imgrc=oLXSmrvj4tMqHM%3A

MAX 232 Level Shifter

Reference : from MAX232 Datasheet

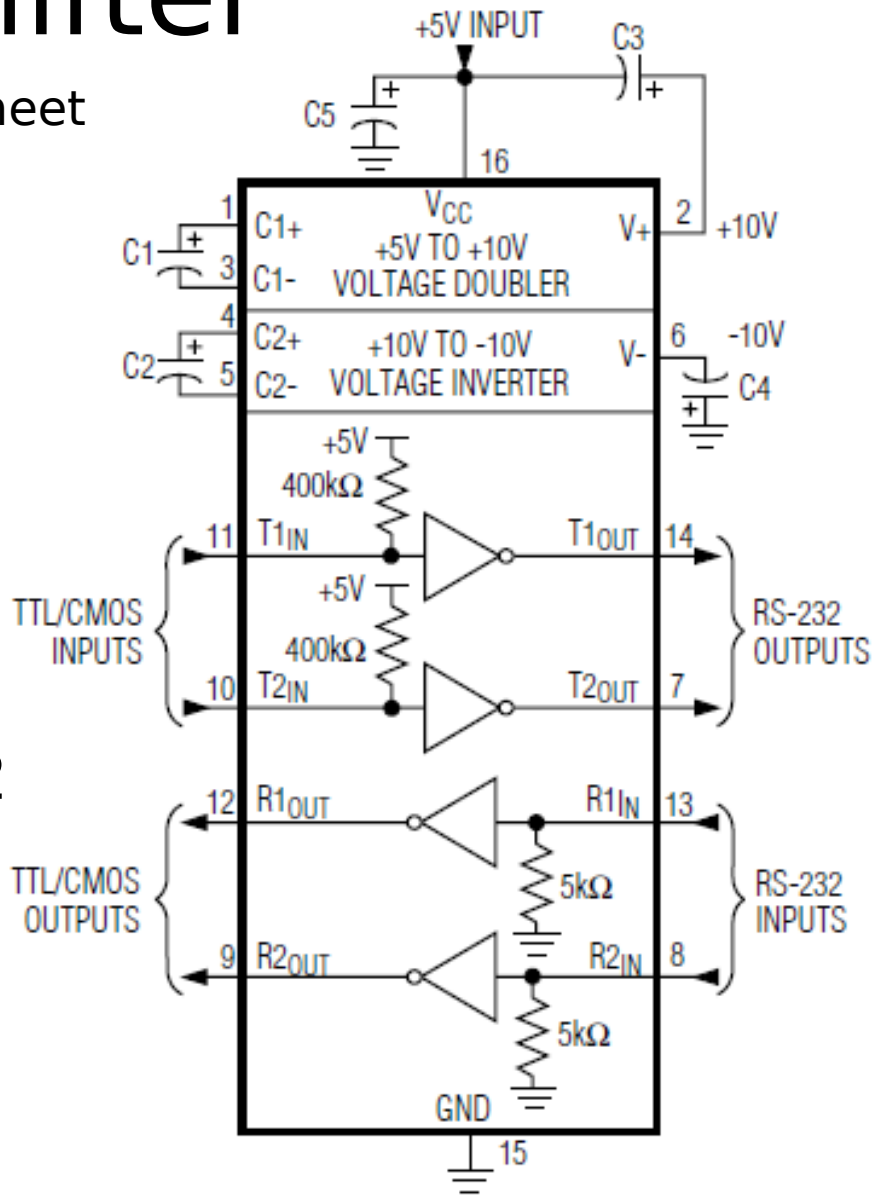


DIP/SO

CAPACITANCE (µF)					
DEVICE	C1	C2	C3	C4	C5
MAX220	0.047	0.33	0.33	0.33	0.33
MAX232	1.0	1.0	1.0	1.0	1.0
MAX232A	0.1	0.1	0.1	0.1	0.1

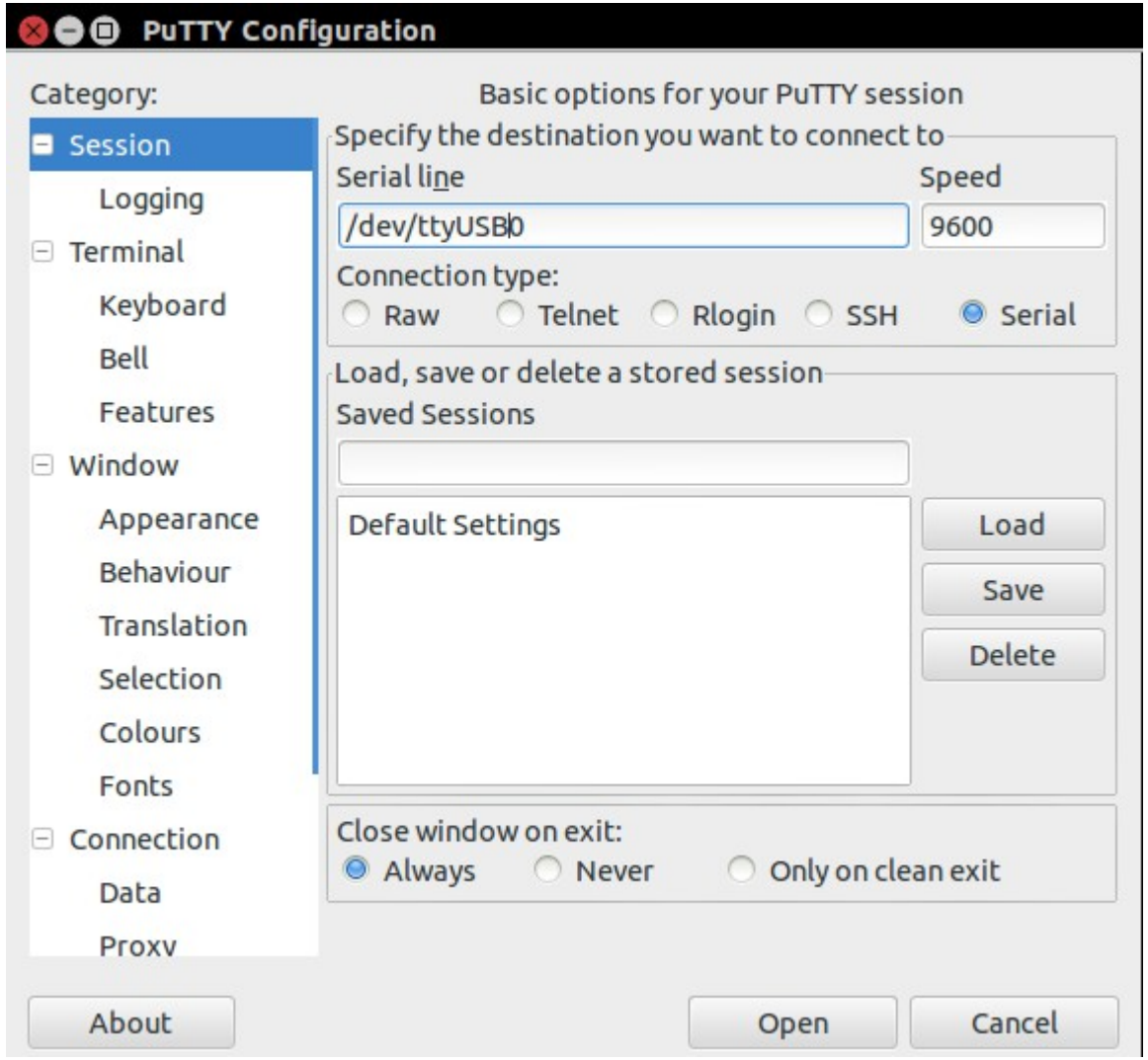
Note: (1) external caps are used to form low pass filter to remove noise; (2) pay attention to the caps polarity.

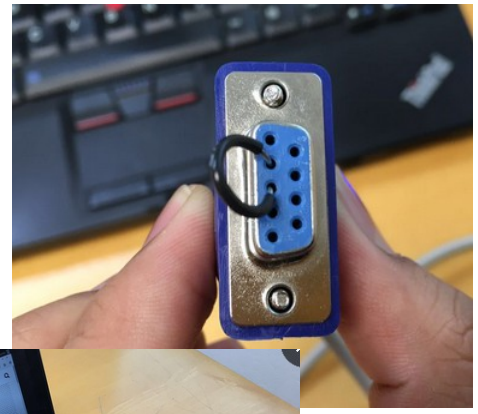
Design: use MAX232 to finish LPC1769 RS232 interface circuit design

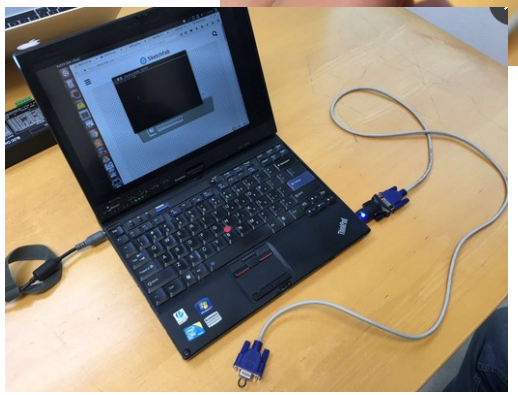


USB-RS232 Loop Back Test Using Putty

Use linux OS, at the console input, type putty to start the putty program (if you do not have putty, then google it and install one.







Then, you will see the GUI as shown on the left, (1) choose Serial connection button, (2) define driver as /dev/ttyUSB0 (3) try baud rate 9600

(4) Use USB-to-Serial cable, plug into your laptop usb, and connect TX and RX pins as shown here (connect pin 2 and 3, where 2 is Tx for this cable), then click on open, you will be prompted with the console, now you can start type in the strings for loop back test