



NS9360

USB OVR and USB PWR Application Note

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Overview

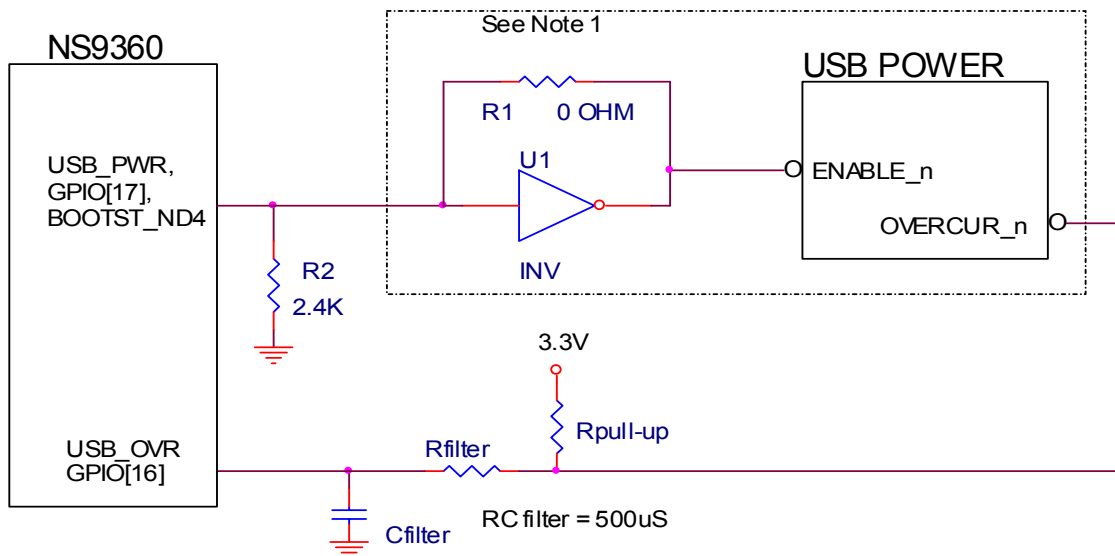
USB OVR (over current) is an *input* on gpio[16] and USB PWR (power control) is an *output* on gpio[17] - Both are located at gpio mode 00. Unlike the NS97xx versions, the polarity of these signals can be changed. Cooper's BBus Utility section, GPIO Configuration Register allows you to invert the polarity of USB OVR and USB PWR.

All GPIO's power up in mode 03 and in addition gpio[17] is bootstrap (ND4) which determines the NS9360's operating speed. Because of this, the USB PWR (power) control output *may* require additional external logic to prevent USB power from being enabled from the time power is valid until the code has set the USB registers and selected gpio[17] to mode 00 at the correct polarity.

USB_OVP should have a noise filter to prevent false indications of over current, unless the USB Power IC has this filter built in.

If using USB Host, gpio[16] and gpio[17] must be reserved for the USB functions.

See **Figure 1** for an example of implementing both of these USB control lines.



- 1) Power-up: GPIO[17] = Bootstrap ND4; Can be high or pulled low depending on required CPU speed.
If pulled low R2 in; Populate inverter U1,
If not pulled low; Populate R1.
R1 and U1 can be eliminated by selecting the ENABLE_n polarity of the USB power IC to match the bootstrap state.
- 2) Code initializes USB registers. USB_PWR driven by USB IP.
- 3) Code sets GPIO[16] and GPIO[17] to mode 0 - USB.
Set the INV function for USB_OVR;
If R2 and U1 are populated, set the INV function for USB_PWR.

Figure 1