



Gumstix Overo® Computer-on-Module

System Reference Manual—Version 1.12
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This system reference manual for the Gumstix Overo series is published as a general reference on the interface signals and physical dimensions of Overo Computer-on-Modules (COMs) to aid:

- **hardware engineers** needing design support for expansion boards, and
- **programmers** writing software that takes advantage of signal multiplexing.

This document pertains to all COMs of the Gumstix Overo series: OMAP3503, OMAP3530, AM3703 and DM3730-based Overo COMs. For a listing of features available on the different Overo COMs, refer to the product information found at www.gumstix.com.

The schematic and layout (<https://pubs.gumstix.com/boards/>) for expansion boards compatible with Overo COMs are freely available online under a Creative Commons license. Physical models of the Overo COM are also available (<https://pubs.gumstix.com/boards/COMS/>).

Information about software on Gumstix Overo COMs can be found online (<http://www.gumstix.org/software-development.html>).

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1 Product Overview

The Overo computer-on-module, slightly smaller than a stick of gum, delivers ARM Cortex-A8 computing power, up to 1024MB of RAM, up to 512MB of NAND, a microSD card slot and, optionally, wireless communications into this very small and robust form factor. Design engineers can also select models that include on-board graphics processing and a digital signal processor (DSP).

Based on a common mechanical footprint, each Overo COM can be interchanged with any expansion board of the Overo Series or to a custom-design expansion board. The selection of features in openly-available designs includes Ethernet, USB Host, USB OTG, USB console, stereo audio, a power input jack and breakouts for A/D, GPIO, SPI, PWM, I2C, and 1-wire.

Figure 1 shows the main components of an Overo COM which includes a Texas Instruments OMAP™ applications processor (ARM® Cortex™-A8 core), package-on-package (PoP) stack memory, a TPS65950 power management module, interface ICs, and an optional WiFi™ and Bluetooth™ module. 167 signals from the OMAP processor are brought out via three connectors: a pair of 70-pin board-to-board connectors called *J1* and *J4*, and a 27-pin flex-cable connector, *J5*. Section 2 explains these internal interfaces.

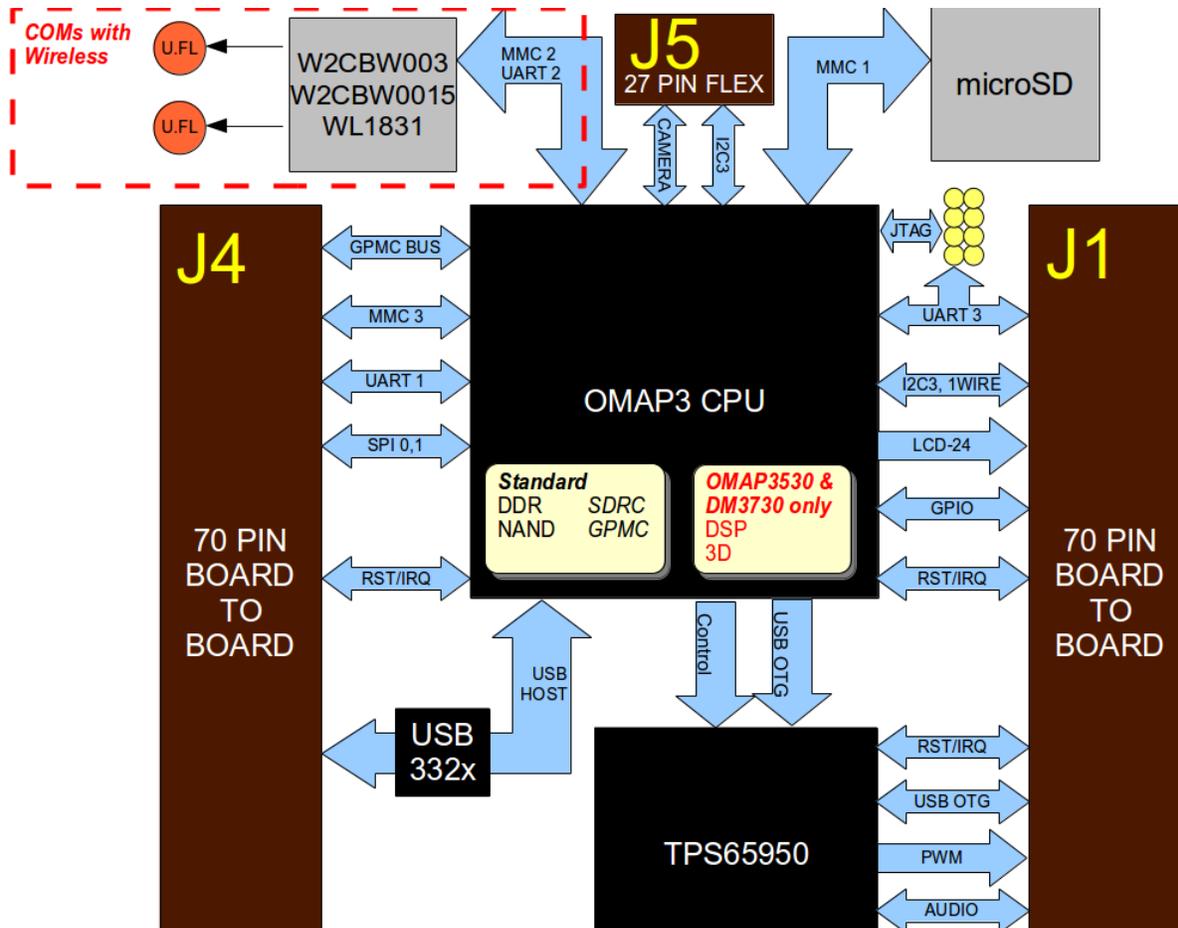


Figure 1: Overo COM Functional Block Diagram

Section 3 documents the externally available signals broken out from the Overo COM. Unless otherwise noted, signals are internally connected to the processor and all general-purpose input-output (GPIO), external memory, reset and interrupt signals are 1.8V logic. Signal names are determined first by the GPIO, then the standard usage on the COM or as allocated for the most common external interface modules. These signals are available for alternate usage providing the bootloader and kernel are built to avoid conflicting interpretation of the lines. Please refer to Texas instruments documentation (<http://www.ti.com/lit/gpn/omap3503>) for a complete

description of the available alternate signals. Be sure to reference balls for the correct processor package; the OMAP35xx-based COMs use a 'CBB' package and the 'CBP' is used for AM3703 and DM3730-based models. Note, for each Overo COM that includes NAND memory, the NAND is interfaced via the GPMC lines on chip-select 0. To modify this 'pin MUXing', edit the *overo.h* file in the U-Boot bootloader source.

Analog to Digital (A/D) converter lines feed directly to the TPS65950 power-management IC (PMIC) and use a 2.5V Reference against AGND. Headset signals are wired to support "Analog mode: pseudo-differential".

OMAP3 processors can boot from one of several sources and can, as such, always be recovered from a corrupted software state. Overo COMs are set with peripheral boot priority, in order USB, UART, MMC1, NAND i.e. `sysboot[5:0] = 0b101111`. This boot order setting can be altered by the factory for volume orders.

CE and FCC approvals for the Wi2Wi Bluetooth™ and WiFi™ module can be found online (<http://pubs.gumstix.com/documents/Approvals/Wi2Wi/>).

2 Signals Internal to the Overo COM

As shown in Figure 1, many processor interfaces are used directly on-board the Overo COM. Table 1 specifies which signals are used internally and as such their functionality should not be changed.

On-board MicroSD	
MMC1	GPIO_120:125
Wifi and Bluetooth Module	
GPIO164_BT_nRESET	GPIO164
GPIO16_W2W_nRESET	GPIO16
GPIO54_BT_nPOWERON	GPIO54
GPIO58_WIFI_IRQ	GPIO58*
USB Control	
USBH Signals	GPIO24:29, GPIO177:182**
GPIO183_USBH_nRESET	GPIO183
Bluetooth Interface	
GPIO_BTUART2	GPIO140:143
GPIO_BT_BSP4	GPIO152:155†
Wifi Interface	
GPIO_WLAN_MMC2	GPIO130:139
4030 Interrupt	
FAB revisions ≤ 2410	GPIO112_4030 IRQ
FAB revisions ≥ 2516	GPIO_0_4030 IRQ
GPIO_149_START_ADC	GPIO149
LED Controls on Board	
D1: Blue	WLAN Active from the wifi module
D2: Green	Power
D3: Blue	LED_B Signal from TPS65950‡
Board Description	
	GPIO_127:129 (for future use)

* only used with w11831 modules

** GPIO_24 is USBH_CLK

† FAB revisions ≥ 3118

‡ FAB revisions ≥ 2765

Table 1: Internal Signals

3 Externally Available Signals

Signals are accessible via the J1, J4, and J5 interface connectors. The following tables indicate the available signals grouped by their default function; these signals can be MUXed for a different purpose. The *overo.h* file in the U-boot bootloader source code implements this MUXing; it is both the definitive reference and the place to make changes as required. The “Internal Connection” column indicates where the signal originates on the Overo COM and, if required, where users should look for further details.

Note: As per the OMAP Technical Reference Manual, GPIOs 99, 100, 112, 113, 114, and 115 are specified as ‘input-only’.

3.1 Serial Ports

The Tobi board (<http://pubs.gumstix.com/boards/TOBI/PCB30002-R3474/PCB30002.pdf>) provides a sample implementation of UART3 used as a USB console port.

External Connection	Signal	Internal Connection
J1 Pin 47	GPIO170_HDQ_1WIRE	OMAP J25
J1 Pin 13 & J5 Pin 26	GPIO184_I2C3_SCL	OMAP AF14
J1 Pin 10 & J5 Pin 27	GPIO185_I2C3_SDA	OMAP AG14
J1 Pin 22	GPIO163_IR_CTS3	OMAP H18
J1 Pin 31	GPIO165_IR_RXD3	OMAP H20*
J1 Pin 26	GPIO166_IR_TXD3	OMAP H21*
J4 Pin 48	GPIO151_RXD1	OMAP Y8
J4 Pin 24	GPIO148_TXD1	OMAP AA8

* console port

Table 2: Serial Port Signals

3.2 Camera Signals

A 27-pin connector has been mounted on the top surface of each Overo COM. This connector J5 provides camera control signals. As an example, the Caspa expansion boards (<http://pubs.gumstix.com/boards/CASPA/PCB30009-R2496/PCB30009.pdf>) interface with Overo COMs via the J5 connector.

External Connection	Signal	Internal Connection
J5 Pin 6	GPIO99_CAM_D0*	OMAP AG17
J5 Pin 7	GPIO100_CAM_D1*	OMAP AH17
J5 Pin 8	GPIO101_CAM_D2	OMAP B24
J5 Pin 9	GPIO102_CAM_D3	OMAP C24
J5 Pin 10	GPIO103_CIF_DD04	OMAP D24
J5 Pin 11	GPIO104_CIF_DD05	OMAP A25
J5 Pin 12	GPIO105_CAM_D6	OMAP K28
J5 Pin 13	GPIO106_CIF_DD07	OMAP L28
J5 Pin 14	GPIO107_CIF_DD08	OMAP K27
J5 Pin 15	GPIO108_CIF_DD09	OMAP L27
J5 Pin 16	GPIO109_CAM_D10	OMAP B25
J5 Pin 17	GPIO110_CAM_D11	OMAP C26
J5 Pin 25	GPIO63_CAM_IRQ	OMAP L8
J5 Pin 20	GPIO126_CAM_STROBE	OMAP P27
J5 Pin 19	GPIO167_CAM_WEN	OMAP B23
J5 Pin 18	GPIO111_CAM_XCLKB	OMAP B26
J5 Pin 1	GPIO94_CAM_HS	OMAP A24
J5 Pin 2	GPIO95_CAM_VS	OMAP A23
J5 Pin 3	GPIO96_CAM_XCLKA	OMAP C25
J5 Pin 4	GPIO97_CAM_PCLK	OMAP C27
J5 Pin 5	GPIO98_CAM_FLD	OMAP C23

* When used as a GPIO, this pin is 'input-only'.

Table 3: Camera Signals

3.3 Display Signals

These signals are used to drive the HDMI/DVI interface on expansion boards such as the Tobi (<http://pubs.gumstix.com/boards/TOBI/PCB30002-R3474/PCB30002.pdf>) or the LCD screens on boards such as Chestnut43 (<http://pubs.gumstix.com/boards/CHESTNUT/R3596/B30005.pdf>).

External Connection	Signal	Internal Connection
J1 Pin 32	GPIO66_L_PCLK	OMAP D28
J1 Pin 35	GPIO67_L_LCLK	OMAP D26
J1 Pin 34	GPIO68_L_FCLK	OMAP D27
J1 Pin 43	GPIO69_L_BIAS	OMAP E27
J1 Pin 3	GPIO70_L_DD00	OMAP AG22
J1 Pin 2	GPIO71_L_DD01	OMAP AH22
J1 Pin 6	GPIO72_L_DD02	OMAP AG23
J1 Pin 4	GPIO73_L_DD03	OMAP AH23
J1 Pin 7	GPIO74_L_DD04	OMAP AG24
J1 Pin 5	GPIO75_L_DD05	OMAP AH24
J1 Pin 33	GPIO76_L_DD06	OMAP E26
J1 Pin 29	GPIO77_L_DD07	OMAP F28
J1 Pin 30	GPIO78_L_DD08	OMAP F27
J1 Pin 28	GPIO79_L_DD09	OMAP G26
J1 Pin 11	GPIO80_L_DD10	OMAP AD28
J1 Pin 12	GPIO81_L_DD11	OMAP AD27
J1 Pin 60	GPIO82_L_DD12	OMAP AB28
J1 Pin 17	GPIO83_L_DD13	OMAP AB27
J1 Pin 19	GPIO84_L_DD14	OMAP AA28
J1 Pin 20	GPIO85_L_DD15	OMAP AA27
J1 Pin 44	GPIO86_L_DD16	OMAP G25
J1 Pin 24	GPIO87_L_DD17	OMAP H27
J1 Pin 25	GPIO88_L_DD18	OMAP H26
J1 Pin 27	GPIO89_L_DD19	OMAP H25
J1 Pin 45	GPIO90_L_DD20	OMAP E28
J1 Pin 23	GPIO91_L_DD21	OMAP J26
J1 Pin 15	GPIO92_L_DD22	OMAP AC27
J1 Pin 61	GPIO93_L_DD23	OMAP AC28
J1 Pin 63	TV_OUT1 (Luminance)	*
J1 Pin 62	TV_OUT2 (Chroma)	*

* FAB revisions \geq 3265

Table 4: Display Signals

3.4 Analog Signals

A number of expansion boards including Chestnut43 (<http://pubs.gumstix.com/boards/CHESTNUT/R3596/B30005.pdf>) provide a sample implementation of audio line-in and line-out. The Gallop43 (<http://pubs.gumstix.com/boards/GALLOP43/PCB30014-R3175/PCB30014.pdf>) shows a headset implementation (see also the software audio (<http://wiki.gumstix.org/index.php?title=AudioIn>) configuration).

External Connection	Signal	Internal Connection
J1 Pin 58	ADCIN2	TPS65950
J1 Pin 48	ADCIN3	TPS65950
J1 Pin 40	ADCIN4	TPS65950
J1 Pin 51	ADCIN5	TPS65950
J1 Pin 53	ADCIN6	TPS65950
J1 Pin 64	ADCIN7	TPS65950
J1 Pin 42	PWM0	TPS65950
J1 Pin 49	PWM1	TPS65950
J1 Pin 55	GPIO145_GPT10_PWM	OMAP AB25
J1 Pin 21	GPIO146_GPT11_PWM	OMAP AA25
J1 Pin 16	GPIO147_GPT8_PWM	OMAP AD25
J1 Pin 18	GPIO144_GPT9_PWM	OMAP AB26
J1 Pin 38	AUXLF	TPS65950
J1 Pin 41	AUXRF	TPS65950
J1 Pin 68	HSOLF	TPS65950
J1 Pin 69	HSORF	TPS65950
J1 Pin 57	MIC_MAIN_MF	TPS65950
J1 Pin 39	MIC_SUB_MF	TPS65950

Table 5: Analog Signals

3.5 Control Signals

All expansion boards need to provide power and need to interface with some of these control signals. Pinto-TH (<http://pubs.gumstix.com/boards/PINTO-TH/PCB30011-R2731/PCB30011.pdf>) shows a basic implementation.

External Connection	Signal	Internal Connection
J1 Pin 9	GPIO31_WAKEUP	OMAP AA10
J1 Pin 1	N_MANUAL_RESET	OMAP AH25
J1 Pin 65	POWERON	TPS65950
J1 Pin 59	SYSEN	TPS65950
J1 Pin 52	VBACKUP	TPS65950
J1 Pin 66	VSYSTEM	Power
J1 Pin 67	VSYSTEM	Power
J1 Pin 50	AGND	TPS65950
J1 Pin 56	GND	
J1 Pin 70	GND	
J4 Pin 1	VSYSTEM	Power
J4 Pin 2	VSYSTEM	Power
J4 Pin 3	GND	
J4 Pin 33	GND	
J5 Pin 22	SYSEN	TPS65950
J5 Pin 21	VDDS_1.8	TPS65950 (VIO)
J5 Pin 24	VSYSTEM	Power
J5 Pin 23	GND	

Table 6: Control Signals

3.6 High Speed Buses: MMC, SPI, USB Host and OTG

High-bandwidth communication is possible over several standard interfaces as shown, for example, on the Tobi (<http://pubs.gumstix.com/boards/TOBI/PCB30002-R3474/PCB30002.pdf>) board.

External Connection	Signal	Internal Connection
J4 Pin 40	GPIO12_MMC3_CLK	OMAP AF10
J4 Pin 23	GPIO13_MMC3_CMD	OMAP AE10
J4 Pin 26	GPIO18_MMC3_D0	OMAP AE11
J4 Pin 36	GPIO19_MMC3_D1	OMAP AH9
J4 Pin 39	GPIO20_MMC3_D2	OMAP AF13
J4 Pin 31	GPIO17_MMC3_D3	OMAP AE13
J4 Pin 29	GPIO14_MMC3_DAT4	OMAP AF11
J4 Pin 38	GPIO23_MMC3_DAT5	OMAP AG9
J4 Pin 37	GPIO22_MMC3_DAT6	OMAP AF9
J4 Pin 30	GPIO21_MMC3_DAT7	OMAP AH14
J4 Pin 47	GPIO150_MMC3_WP	OMAP W8
J4 Pin 46	4030GP.2!/MMC3_CD	TPS65950
J4 Pin 43	GPIO171_SPI1_CLK	OMAP AB3
J4 Pin 27	GPIO174_SPI1_CS0	OMAP AC2
J4 Pin 42	GPIO175_SPI1_CS1	OMAP AC3
J4 Pin 45	GPIO173_SPI1_MISO	OMAP AA4
J4 Pin 44	GPIO172_SPI1_MOSI	OMAP AB4
J4 Pin 41	GPIO114_SPI1_NIRQ	OMAP AG18
J4 Pin 35	USBH_DM	USB3326
J4 Pin 34	USBH_DP	USB3326
J4 Pin 32	USBH_VBUS	USB3326
J4 Pin 28	GPIO168_USBH_CPEN	OMAP AF15
J1 Pin 37	USBOTG_DM	TPS65950
J1 Pin 36	USBOTG_DP	TPS65950
J1 Pin 46	USBOTG_ID	TPS65950
J1 Pin 54	USBOTG_VBUS	TPS65950

Table 7: High Speed Buses

Note: The Overo COM exports two signals related to USB Host power:

1. GPIO168_USBH_CPEN: This GPIO signal is, by convention on Gumstix expansion boards, used as an active-high enable signal to trigger a circuit that provides +5V to the USBH_VBUS pins of the COM. It is not necessary to switch USBH_VBUS in this manner.
2. USBH_VBUS: This signal (input to the COM) should be held at +5V when using the USB Host interface; the USB332x data sheet(http://www.smsc.com/media/Downloads_Public/Data_Sheets/3320.pdf). When designing expansion boards, ensure this line has adequate over-voltage and over-current protection.

3.7 GPIO Lines Allocated for Peripheral Resets and Interrupts

External Connection	Signal	CPU Ball
J1 Pin 14	GPIO186_GPS_PPS	OMAP AE22
J1 Pin 8	GPIO10_TS_IRQ	OMAP AG25
J4 Pin 25	GPIO176_ETH0_IRQ	OMAP AB1
J4 Pin 10	GPIO64_ETH0_NRESET	OMAP K8
J4 Pin 9	GPIO65_ETH1_IRQ1	OMAP J8

Table 8: Conventional GPIO Usage

3.8 Memory Bus Signals

The General-Purpose Memory Controller (GPMC) provides a direct, memory-mapped interface to the processor. This is useful for interfacing FPGAs, attaching external memories, or, as shown on the Chestnut43 (<http://pubs.gumstix.com/boards/CHESTNUT/R3596/B30005.pdf>) board, providing a network interface.

External Connection	Signal	Internal Connection
J4 Pin 58	EM_A1	OMAP N4
J4 Pin 11	EM_A2	OMAP M4
J4 Pin 59	EM_A3	OMAP L4
J4 Pin 61	EM_A4	OMAP K4
J4 Pin 13	EM_A5	OMAP T3
J4 Pin 57	EM_A6	OMAP R3
J4 Pin 14	EM_A7	OMAP N3
J4 Pin 12	EM_A8	OMAP M3
J4 Pin 62	EM_A9	OMAP L3
J4 Pin 60	EM_A10	OMAP K3
J4 Pin 56	EM_D0	OMAP K1
J4 Pin 53	EM_D1	OMAP L1
J4 Pin 15	EM_D2	OMAP L2
J4 Pin 17	EM_D3	OMAP P2
J4 Pin 19	EM_D4	OMAP T1
J4 Pin 21	EM_D5	OMAP V1
J4 Pin 51	EM_D6	OMAP V2
J4 Pin 49	EM_D7	OMAP W2
J4 Pin 54	EM_D8	OMAP H2
J4 Pin 55	EM_D9	OMAP K2
J4 Pin 16	EM_D10	OMAP P1
J4 Pin 18	EM_D11	OMAP R1
J4 Pin 20	EM_D12	OMAP R2
J4 Pin 52	EM_D13	OMAP T2
J4 Pin 50	EM_D14	OMAP W1
J4 Pin 22	EM_D15	OMAP Y1
J4 Pin 70	EM_CLK	OMAP T4
J4 Pin 7	EM_NADV_ALE	OMAP F3
J4 Pin 65	EM_NBE0	OMAP G3
J4 Pin 69	EM_NBE1	OMAP U3
J4 Pin 66	EM_NCS0	OMAP G4
J4 Pin 64	EM_NCS1	OMAP H3
J4 Pin 5	EM_NCS4	OMAP T8
J4 Pin 4	EM_NCS5_ETH0	OMAP R8
J4 Pin 67	EM_NCS6	OMAP P8
J4 Pin 8	EM_NOE	OMAP G2
J4 Pin 6	EM_NWE	OMAP F4
J4 Pin 63	EM_NWP	OMAP H1
J4 Pin 68	EM_WAIT0	OMAP M8

Table 9: External Memory Bus Signals

3.9 JTAG Signals

JTAG signals are available via test pads on each Overo COM.

Test Point	X	Y	Signal
TP1	-1424	627	GPIO165_IR_RXD3
TP2	-1593	524	GPIO166_IR_TXD3
TP3	-1035	475	GND
TP4	-1304	164	VSYSTEM
TP5	-1061	175	NTRST
TP6	-806	447	TCK
TP7	-862	291	RTCK
TP8	-1155	531	TMSC
TP9	-1170	219	TDI
TP10	-1175	323	TDO
TP11	-868	181	GPIO11_JTAG_EMU0
TP12	-804	95	GPIO31_JTAG_EMU1*

* absent in FAB revisions R2889 through R3265

Table 10: JTAG Test Points

1. X and Y position values expressed in mils.
2. The origin is identified in the hardware documentation (<http://pubs.gumstix.com/boards/COMS/Overo/>).
3. Negative values for X indicate bottom side with respect to the reference drawings.

4 Expansion Board Design Recommendations

To help improve the design of a custom expansion board for the Overo series, this list offers hints and tips with some potential design pitfalls to be avoided:

1. Use the SYSEN line to protect any IO pins to the OMAP CPU. SYSEN is brought high when the Overo is ready to communicate; driving GPIOs before this point can damage the processor.
2. Like SYSEN, USB_CPEN can be used as an enable line for USB_VBUS; this is done on several Gumstix expansion boards such as Tobi. However, it is not necessary to gate the USB_VBUS line; as long as VBUS on the USB connector gets 5V, the USB interface should work correctly.
3. For high-speed signal lines, consider adding small-valued series resistors to limit signal reflections. Users have reported success adding 33 ohm series resistors to the CLK and CMD lines of the MMC3 external interface.
4. Noise on the UART_RX3 line during boot can interrupt the normal booting sequence. Consider adding a pull-up resistor to a SYSEN-gated 1.8V supply on this line.
5. VBACKUP provides battery backup to the real-time clock. It should be left open or connected to a rechargeable lithium coin cell which is trickle charged when the Overo is powered on. Do not tie this pin to ground as suggested in the PMIC documentation without disabling the trickle charge feature in software.
6. ADC inputs should not be driven above 2.5V.
7. The white Overo retaining spacers (https://www.gumstix.com/store/product_info.php?products_id=238) should be used for a PCB of thickness 48mils (1.22mm) with standard manufacturing tolerances.
8. The blue Overo retaining spacers (https://www.gumstix.com/store/product_info.php?products_id=278) should be used for a PCB of thickness 62mils (1.57mm) with standard manufacturing tolerances.
9. Mounting hole diameter should be 1.65mm.

Other key links for designing with Gumstix can be found here: <https://www.gumstix.com/cbg-industrial-strength.html>

5 Overo COM FAB Revisions

From time to time, minor changes are made to the design of the PCB in order to make new features available, adjust for component supply or make minor improvements to the design. To the greatest extent possible, changes are invisible to the user and are backward compatible with previous revision of the COM. Gumstix does not anticipate making any major development or design changes to the Overo COM series.

Changes made since Overo COMs FAB Revision R2889:

FAB Revision R3118 Low-voltage 26MHz oscillator and Bluetooth PCM connections added.*

FAB Revision R3265 S-video signals wiring correction.

FAB Revision R3358 Improved SD card signalling. Added TP12.

FAB Revision R3949 Wired card detect (active low) and improved s-video and audio quality.

FAB Revision R4168 Support the W2CBW0015 Wifi/Bluetooth Module.

FAB Revision R4405 Support the w11831 Wifi/Bluetooth Module.

The term *FAB* refers specifically to the printed circuit board (PCB) not the components populated on that PCB. The FAB revision number is silk-screened directly on the PCB. The revision number of the assembled board is printed on the white label of each COM. The identifying information for Overo COMs is discussed in more detail at http://pubs.gumstix.com/boards/AA_README.txt.

Overo COMs are interchangeable with individual models providing different features. Customers switching between OMAP35xx-based Overo COMs and AM3703 or DM3730-based Overo COMs who have developed custom versions of boot loaders may wish to review the software migration notes here: http://processors.wiki.ti.com/index.php/OMAP35x_To_AM37x_Software_Migration_Guide.

6 Physical Design

Each Gumstix Overo COM mates with a Gumstix or custom expansion board via the pair of 70-pin connectors located on the bottom side of the COM. These connectors, identified as J1 and J4, mate with AVX 5602 series connectors such as 245602670001829H (https://www.gumstix.com/store/product_info.php?products_id=218). Connector J5, located on the top surface of each Overo COM, is Hirose FH26-27S which accepts 27-pin flex circuit connectors such as this flex ribbon cable (https://www.gumstix.com/store/product_info.php?products_id=258). For COMs that include a wireless module, two u.FI antenna connectors are located on the top-side of the board marked as J2 and J3 in Figure 2. On boards using the W2CBW003 module, J2 is the connector for the wifi antenna and J3 is the connector for the bluetooth antenna. For 'Plasma' series COMs using the W2CBW0015 module and those using the Wilink8 module, only one, shared, antenna is required in the position of J3; the connector in the position of J2 is not populated.

Note: For boards using the Wilink8 module, the sole antenna connector has been moved down the board by 1mm i.e. the '4.94mm' dimension is now '3.94mm'.

*The PoP memory chip on many models of the COM is a 512MB RAM and 512MB NAND part. Overo COMs with R3018 or R3118 on the WHITE LABEL have been populated with Hynix memory. Other COMs use Micron memory.

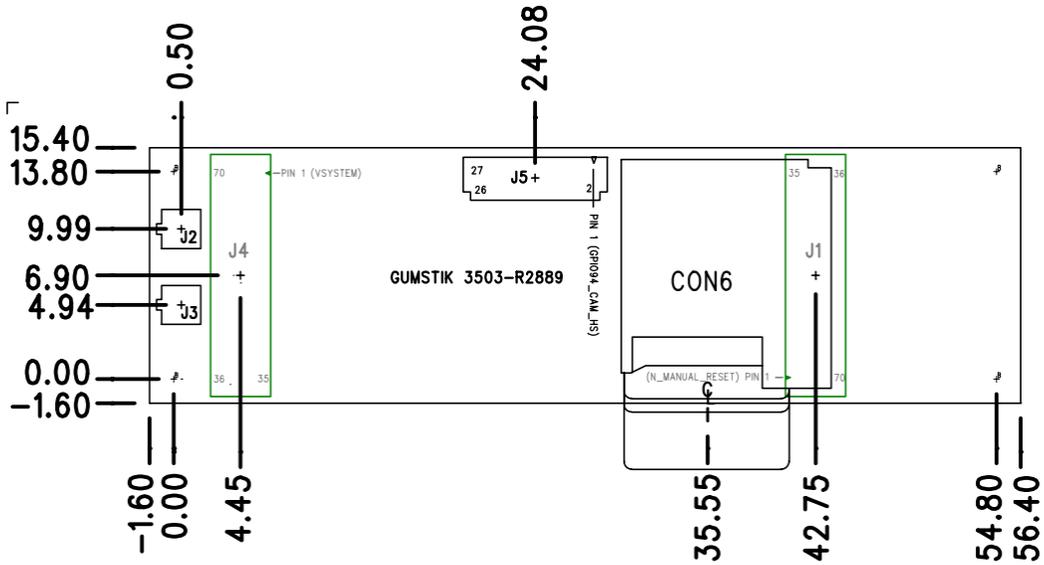


Figure 2: Overo COM Physical Design

The board to board spacing for Overo COMs is 1.5mm. Red-shaded areas of Figure 3 show absolute keep-out regions beneath the Overo COM. The yellow-shaded regions show zones with a height restriction of 0.95mm. When designing custom expansion boards for Overo COMs, be cautious placing components directly beneath the Overo COM, even in the yellow-shaded regions, to avoid mechanical interference problems.

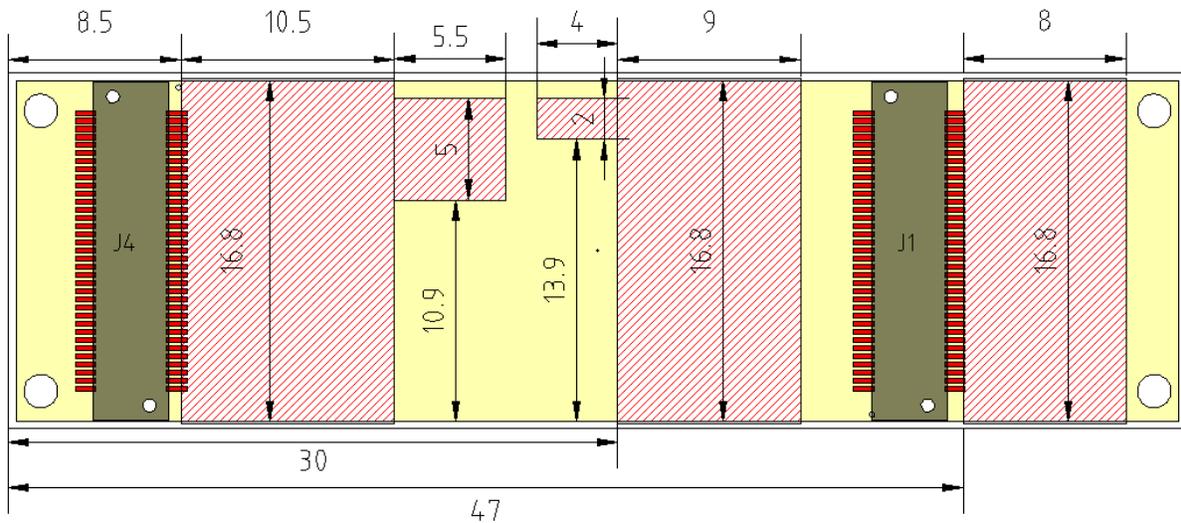


Figure 3: Overo COM Keepout

7 Additional Resources

This System Reference Manual is unique to the design and use of the Gumstix Overo COMs. Resources from Gumstix and related suppliers that may also be of interest include:

Gumstix Developer Center <http://gumstix.org/hardware-design/overo-coms.html>

Getting Started <http://gumstix.org/get-started.html>

Hardware Design for the Overo Series <http://gumstix.org/hardware-design/overo-coms.html>

Custom Expansion Board Design Recommendations

<http://gumstix.org/hardware-design/overo-coms/73-overo-design/199-overo-expansion-board-design-requirements.html>

Software Development <http://gumstix.org/software-development.html>

2D and 3D CAD Layout and Expansion Board Schematics (openly published)

<http://gumstix.org/hardware-design/overo-coms/73-overo-design/113-schematics.html>

Vibration Testing Results

<http://gumstix.org/hardware-design/overo-coms/76-performance-and-power/110-overo-vibration-testing.html>

OMAP3503 Applications Processor <http://www.ti.com/product/omap3503>

OMAP3530 Applications Processor <http://www.ti.com/product/omap3530>

AM3703 Sitara ARM Processor <http://www.ti.com/product/am3703>

DM3730 Digital Media Processor <http://www.ti.com/product/dm3730>

TPS65950 Data Manual, OMAP Power Management and System Companion Device <http://www.ti.com/product/tps65950>

8 Document History

- Document Revision 1.1

Section 1 Reference to TI OMAP35xx for complete list of alternate uses.

Section 1 Reference to TI OMAP35xx usage of PoP signals.

Figure 1 Identified CBB package and use of GPMC and SDRC on-board

Table 7 GPIO174_SPI1_CS0 *IS NOT* reserved for future use in an SPI1 connection to a bluetooth module.

Table 8 Corrected signal names to reflect GPIO 10 and GPIO 186.

- Document Revision 1.2

Table 1 Corrected GPIO_126:129 to be GPIO_120:125

Table 1 Corrected GPIO164 for GPIO16_W2W_nRESET

- Document Revision 1.3

Table 6 Corrected GPIO31_WAKEUP (It can be used as a GPIO)

Section 3.9 Added JTAG Signals table

- Document Revision 1.4

Table 1 Description of LEDs on board

- Document Revision 1.5

Section 1 A general description of the sysboot pin settings

Section 2 Description of Bluetooth PCM interface ≥ 3118

Table 4 Addition of S-Video signals for Fab revisions ≥ 3265

Section 3.9 Added reference to documentation for JTAG test-point details

- Document Revision 1.6

Section 3.6 Clarification of USB Host power signals

- Document Revision 1.7

Section 1 Added note about Wi2Wi approvals

Section 4 Added an 'Expansion Board Design Requirements' section.

- Document Revision 1.8

Section 3.7 Added note about input-only GPIOs

General Minor typos and clarifications.

- Document Revision 1.9

General Transition to new template.

Section 5 Described FAB revisions.

Section 6 Grouped hardware details into a section.

- Document Revision 1.10

Section 4 Added link for "Designing with Gumstix".

- Document Revision 1.11

Section 4 Added details for PCB revision R3949.

- Document Revision 1.12

General Added details for COMs using W2CBW0015 modules.

General Added details for COMs using Wilink8 modules.

General Minor types and clarifications.