



ngff-cardem: M.2 WWAN modem carrier with SIMtrace and cardem support

The ngff-cardem modem carrier board is a useful utility for evaluating any kind of cellular modem in the more and more popular M.2 form-factor.

M.2 form-factor modems are pretty commonly found for all cellular technologies, but particular with LTE-A and 5G modems. Contrary to their predecessor mPCIe, M.2 supports higher transmission speeds of USB 3.0 super-speed.

Key Features

The main features of the board can be described as follows:

- on-board SAM3S controller suitable for operating SIMtrace2 tracing or cardem (remote SIM) firmware.
- on-board switching power regulator generating the 3.3V supply voltage for the M.2 modem
- SIM and Modem Power switchable by firmware
- USB 2.0 high-speed and USB 3.0 super-speed signals exposed on USB 3.0 micro-B connector (microB-A cable included)
- One 2FF (mini-SIM) slot for RUIM/CSIM/SIM/USIM.
- M.2 PCM/I2S pins are exposed on a 2.54mm break-out header.
- PERST, GPS_DISABLE and W_DISABLE can be configured via jumper
- Power LED, Modem Status LED and VBUS LED

Compatibility

As the M.2 modem carrier adheres to the M.2 mechanical form factor and standardized pin-out, it should work with any 3042 or 3052 sized WWAN modem, irrespective of the supplier.

Open Source Hardware

The ngff-cardem was created as an OSHW (Open Source Hardware) design.

This means not only schematics are available, but also the full design files including PCB layout. Anyone may create derivative works under the terms of the Creative Commons Attribution Share-Alike (CC-BY-SA) license.

For more information, see

<https://projects.osmocom.org/projects/ngff-cardem/wiki/Wiki>

Ordering

The ngff-cardem is available for direct purchase from the sysmocom webshop:

<http://shop.sysmocom.de/products/ngff-cardem>

For volume orders, please inquire at sales@sysmocom.de.

Included Accessories



Related Products

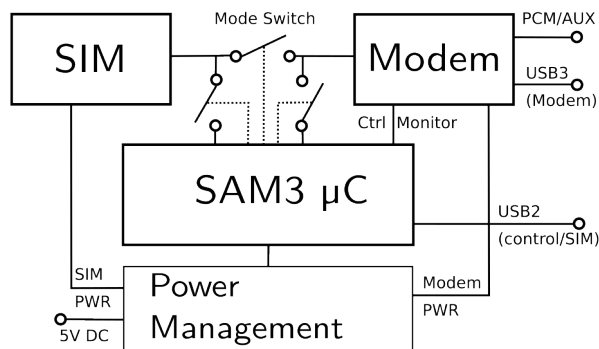
If you are looking for a M.2 carrier without SIMtrace2/cardem functionality, check out our “ngff-breakout board”. If you are interested in stand-alone SIM tracing or forwarding, have a look at the SIMtrace2 board.

If you are interested in a carrier board that hosts more than one modem, please check out our **sysmoQMOD** product. It hosts four mPCIe modems with an on-board USB hub.

Mechanical / Electrical Specification

Dimensions of PCB	100 x 90 mm ²
Mounting	M3 Mounting Holes for spacers/stands
NGFF / m.2 Slot	3042 form factor; B key
SIM/UICC smart card slot	ETSI/3GPP 2FF form factor
USB port	USB3-micro-B (modem), USB-mini-B (SAM3S)
Debug facilities	Serial Console of SAM3S on 3.3V UART (2.5mm 3-pin jack); JTAG
LED	Power (green), Modem Status (yellow), VBUS present (green), SAM3S
Input Voltage	5 V DC (typ) on 5.5/2.5mm barrel type, current consumption as per modem

Block Diagram



Further Documentation

See <https://gitea.osmocom.org/electronics/osmo-small-hardware/src/branch/master/ngff-cardem/ngff-cardem.sch.pdf> for a PDF rendering of the full electrical schematics of this board.

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