conga-SKIT

Starter Kit for congatec SMARC 2.0 Development

Quick Start Guide

Revision 1.2

Preface

This quick start guide provides information on the contents of the conga-SKIT kit and how to set it up.

Disclaimer

The information contained within this quick start guide, including but not limited to any product specification, is subject to change without notice.

congatec AG provides no warranty with regard to this guide or any other information contained herein and hereby expressly disclaims any implied warranties of merchantability or fitness for any particular purpose with regard to any of the foregoing. congatec AG assumes no liability for any damages incurred directly or indirectly from any technical or typographical errors or omissions contained herein or for discrepancies between the product and this guide. In no event shall congatec AG be liable for any incidental, consequential, special, or exemplary damages, whether based on tort, contract or otherwise, arising out of or in connection with this guide or any other information contained herein or the use thereof.

Intended Audience

This guide is intended for technically qualified personnel. It is not intended for general audiences.

Lead-Free Designs (RoHS)

All congatec AG designs are created from lead-free components and are completely RoHS compliant.

Electrostatic Sensitive Device

All congatec AG products are electrostatic sensitive devices. They are enclosed in static shielding bags, and shipped enclosed in secondary packaging (protective packaging). The secondary packaging does not provide electrostatic protection.

Do not remove the device from the static shielding bag or handle it, except at an electrostatic-free workstation. Also, do not ship or store electronic devices near strong electrostatic, electromagnetic, magnetic, or radioactive fields unless the device is contained within its original packaging. Be aware that failure to comply with these guidelines will void the congatec AG Limited Warranty.

Copyright Notice

Copyright © 2017, congatec AG. All rights reserved. All text, pictures and graphics are protected by copyrights. No copying is permitted without written permission from congatec AG.

congatec AG has made every attempt to ensure that the information in this document is accurate yet the information contained within is supplied "as-is".

Trademarks

Product names, logos, brands, and other trademarks featured or referred to within this guide, or the congatec website, are the property of their respective trademark holders. These trademark holders are not affiliated with congatec AG, our products, or our website.

Certification

congatec AG is certified to DIN EN ISO 9001:2008 standard.

Warranty

congatec AG makes no representation, warranty or guaranty, express or implied regarding the products except its standard form of limited warranty ("Limited Warranty") per the terms and conditions of the congatec entity, which the product is delivered from. These terms and conditions can be downloaded from www.congatec.com. congatec AG may in its sole discretion modify its Limited Warranty at any time and from time to time.

The products may include software. Use of the software is subject to the terms and conditions set out in the respective owner's license agreements, which are available at www.congatec.com and/or upon request.

Beginning on the date of shipment to its direct customer and continuing for the published warranty period, congatec AG represents that the products are new and warrants that each product failing to function properly under normal use, due to a defect in materials or workmanship or due to non conformance to the agreed upon specifications, will be repaired or exchanged, at congatec's option and expense.

Customer will obtain a Return Material Authorization ("RMA") number from congatec AG prior to returning the non conforming product freight prepaid. congatec AG will pay for transporting the repaired or exchanged product to the customer.

Repaired, replaced or exchanged product will be warranted for the repair warranty period in effect as of the date the repaired, exchanged or replaced product is shipped by congatec, or the remainder of the original warranty, whichever is longer. This Limited Warranty extends to congatec's direct customer only and is not assignable or transferable.

Except as set forth in writing in the Limited Warranty, congatec makes no performance representations, warranties, or guarantees, either express or implied, oral or written, with respect to the products, including without limitation any implied warranty (a) of merchantability, (b) of fitness for a particular purpose, or (c) arising from course of performance, course of dealing, or usage of trade.

congatec AG shall in no event be liable to the end user for collateral or consequential damages of any kind. congatec shall not otherwise be liable for loss, damage or expense directly or indirectly arising from the use of the product or from any other cause. The sole and exclusive remedy against congatec, whether a claim sound in contract, warranty, tort or any other legal theory, shall be repair or replacement of the product only.

Technical Support

congatec AG technicians and engineers are committed to providing the best possible technical support for our customers so that our products can be easily used and implemented. We request that you first visit our website at www.congatec.com for the latest documentation, utilities and drivers, which have been made available to assist you. If you still require assistance after visiting our website then contact our technical support department by email at support@congatec.com

1   Introduction

1.1   conga-SKIT

The conga-SA5 features a quad-core Intel® Atom™ x7-E3950 processor with up to 2.0 GHz, Gen 9 graphics with 18 execution units and 8 GB LPDDR4 RAM. Other features are 433 Mbit/s WLAN 802.11 b/g/n/ac, Bluetooth LE, dual GbE, USB 3.0, 32 GB eMMC 5.0 flash memory and TPM 2.0.
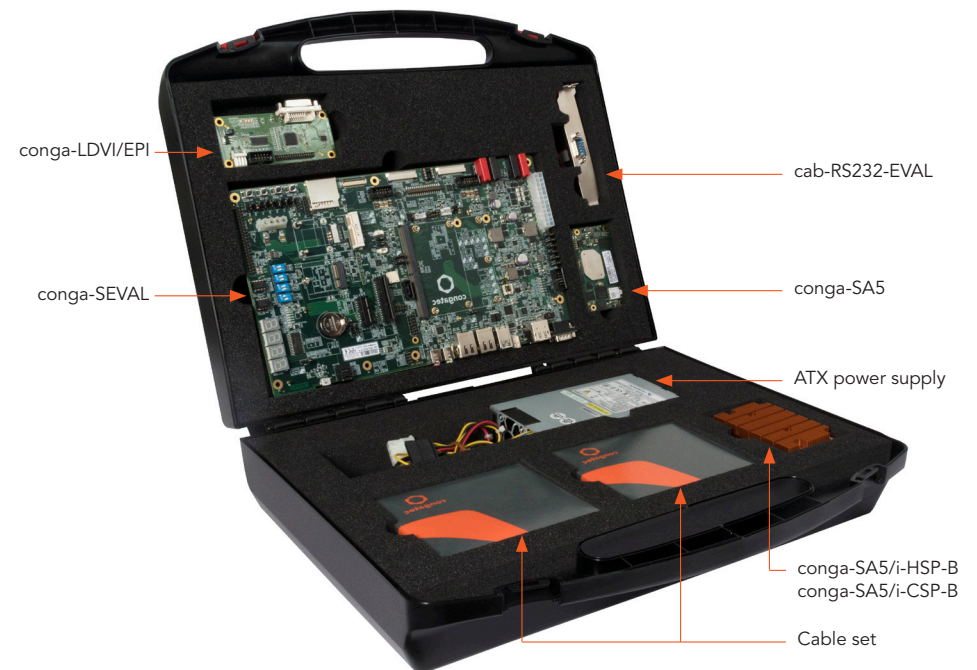
The conga-SEVAL evaluation carrier board provides 1x PCIe x4, 1x PCIe x1, 1x mini PCIe, 1x M.2 Key E, 2x USB 3.0, and 4x USB 2.0 for generic extensions. It also provides 2x RJ45 for Gigabit Ethernet, 4x COM, 1x CAN bus, 12x GPIO, Digital and analog audio I/Os for I2S and HDA. Displays can be connected via dual channel LVDS, eDP, DP and HDMI. Additional storage media are available via a SD/MMC socket and 1x SATA 6G.

The conga-SKIT also includes an ATX power supply, WLAN pigtail cable, LVDS adapter, SATA, USB cables, as well as a heatspreader and cooling solution for the module.

1.2   Kit Contents

PN. No	Name	Description	Qty
077650	conga-SKIT	Starterkit for SMARC 2.0 modules	
007010	conga-SEVAL	Evaluation carrier board for standard SMARC modules based on SMARC Specification 2.0	1
050030	conga-SA5/E3950-8G eMMC32 WiFi/TPM	SMARC 2.0 module with Intel® Atom™ x7-E3950 quad core processor with 1.6 GHz core frequency up to 2.0 GHz, 2 MB L2 cache, 8 GB 2400MT/s LPDDR4 onboard memory and 32 GB eMMC onboard flash. Intel AC3165 WiFi/BT module and TPM 2.0 onboard.	1
050051	conga-SA5/i-CSP-B	Passive cooling for SMARC 2.0 module conga-SA5. All stand-offs are bore hole 2.7mm	1
050053	conga-SA5/i-HSP-B	Standard Heatspreader for SMARC 2.0 module conga-SA5. All stand-offs are bore hole 2.7mm	1
500016	ATX power supply	FSP180-50L max. 180 W (150 x 81.5 x 40.5 mm)	1
10000251	WLAN Twin Antenna	25cm 802.11 ac/a/h/b/g/n 5dBi WLAN antenna	1
48000029	SATA III cable	30cm SATA III cable, straight / straight	1
033331	cab-LVDV-DAT-34-15	15cm data cable LVDS to DVI adapter	1
052147	cab-LVDV-PWR-10-15	15cm power cable LVDS to DVI adapter	1

14000199	USB Type-C to Type-A	15cm USB Type-C to Type-A adapter cable	1
14000200	cab-RS232-EVAL	20cm 2x5pin female to D-Sub 9P male	1
14000202	SATA power cable	12cm SATA HDD 15pin SATA to 4pin ATX	1
91500002	Safety and Regulatory Information	Safety and Regulatory Information	1
91500003	Wireless Content Information	Wireless Content Information	1
85500012	Quick Start Guide	Quick Start Guide	1
011115	conga-LDVI/EPI	LVDS to DVI converter board for digital flat panels with onboard EEPROM	1

conga-LDVI/EPI
cab-RS232-EVAL
conga-SEVAL
conga-SA5
ATX power supply
conga-SA5/i-HSP-B
conga-SA5/i-CSP-B
Cable set

1.3   Connecting the Hardware

Steps:

1. Ensure the hardware is protected from the effects of electrostatic discharge (ESD).

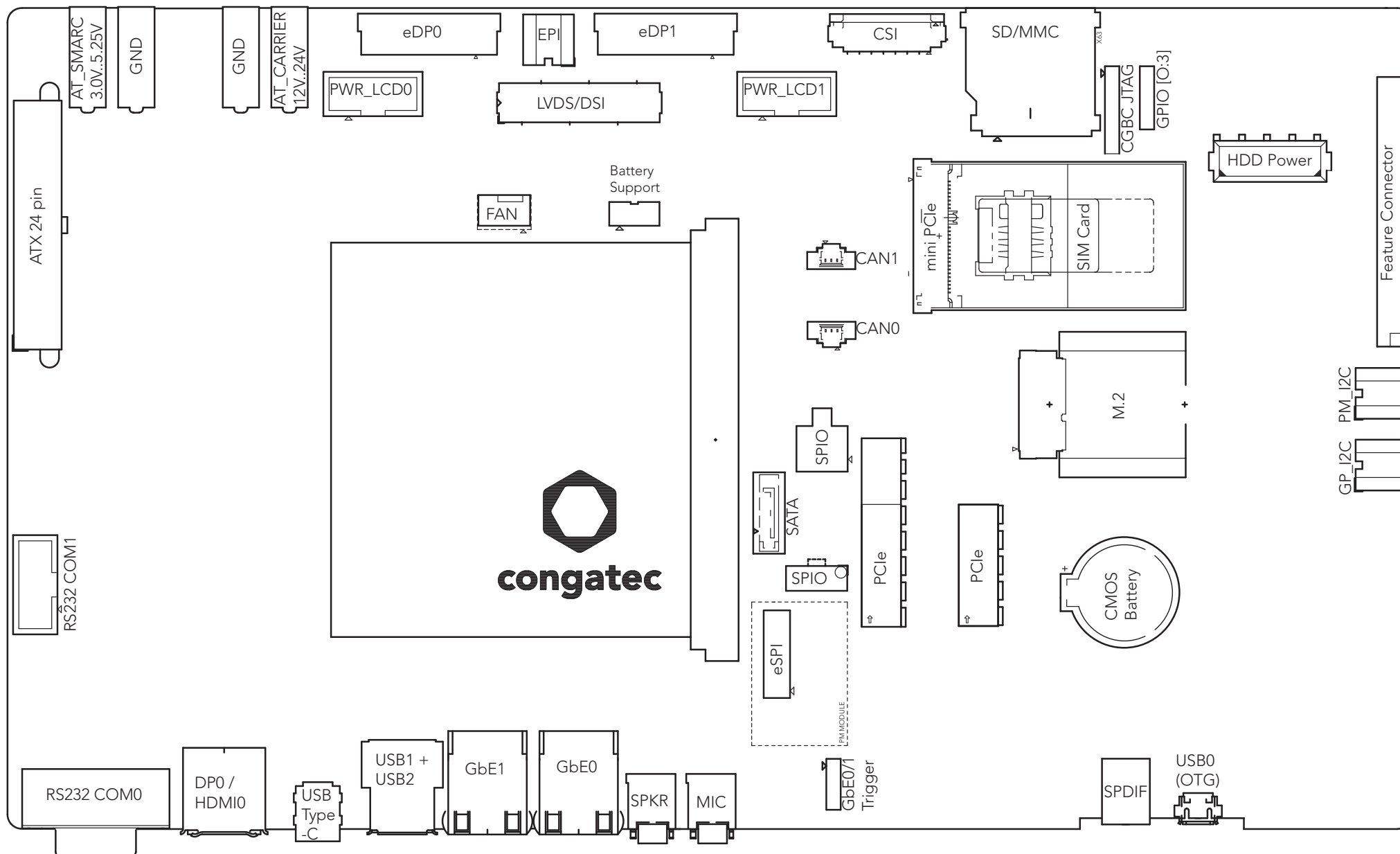2. Attach the WLAN antenna cable to the MAIN connector of the conga-SA5 module.

3. Attach the conga-SA5 module to the conga-SEVAL carrier board.

4. Install the conga-SA5/i-HSP-B heatspreader or conga-SA5/i-CSP-B passive cooling solution using four screws.

5. Connect the desired adapters, cables and devices as shown in the image.

6. Connect the ATX power supply to the conga-SEVAL carrier board.

7. Plug a power cable into the ATX power supply (cable not included).

8. Plug the power cable into a power outlet (110V-240V).

conga-LDVI/EPI
PN: 011115

cab-LVDV-DAT-34-15
PN: 033331

cab-LVDV-PWR-10-15
PN: 052147

ATX power supply
PN: 500016

SATA power cable
PN: 14000202

conga-SEVAL
PN: 007010

conga-SA5
PN: 050030

conga-SA5/i-HSP-B
PN: 050053

conga-SA5/i-CSP-B
PN: 050051

SATA III cable
PN: 48000029

cab-RS232-EVAL
PN: 14000200

WLAN Twin Antenna
PN: 10000251

USB Type-C to Type-A
PN: 14000199

1.4 Interfaces

AT_SMARC 3.0V..5.25V
GND
GND
AT_CARRIER 12V..24V
eDP0
EPI
eDP1
CSI
SD/MMC
CGBC JTAG
GPIO [O:3]
PWR_LCD0
LVDS/DSI
PWR_LCD1
HDD Power
Feature Connector
ATX 24 pin
Battery Support
FAN
mini PCIe
SIM Card
CAN1
CAN0
M.2
PM_I2C
GP_I2C
RS232 COM1
SPIO
SATA
SPIO
eSPI
PCIe
PCIe
CMOS Battery
congatec
PM MODULE
RS232 COM0
DP0 / HDMI0
USB Type -C
USB1 + USB2
GbE1
GbE0
SPKR
MIC
GbE0/1 Trigger
SPDIF
USB0 (OTG)

1.5 DIP Switch Settings

M11 - DIP Switch (Wireless Disable Signal 1, 2)

Switch #	Switch ON	Switch OFF
1	W_DISABLE1# ON	W_DISABLE1# OFF
2	W_DISABLE2# ON	W_DISABLE2# OFF
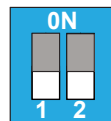
M12 - DIP Switch (Audio and Display)

Switch #	Switch ON	Switch OFF
1	HDA	I²S
2	eDP	LVDS / DSI

M18 - DIP Switch (SPI_HOLD#)

Switch #	Switch ON	Switch OFF
2	SPI_HOLD# ON	SPI_HOLD# OFF

M18 - DIP	M17 - DIP		Selected
Switch 1	Switch 2	Switch 1	Boot Source
ON	ON	ON	Carrier SATA
ON	ON	OFF	Carrier SDIO
ON	OFF	ON	Carrier eSPI
ON	OFF	OFF	Carrier SPI
OFF	ON	ON	Module device
OFF	ON	OFF	Remote boot
OFF	OFF	ON	Module eMMC
OFF	OFF	OFF	Module SPI

SW1 - DIP				Selected
Switch 1	Switch 2	Switch 3	Switch 4	I2C Address
ON	OFF	OFF	OFF	A0
OFF	ON	OFF	OFF	A1
OFF	OFF	ON	OFF	A2
OFF	OFF	OFF	ON	WP
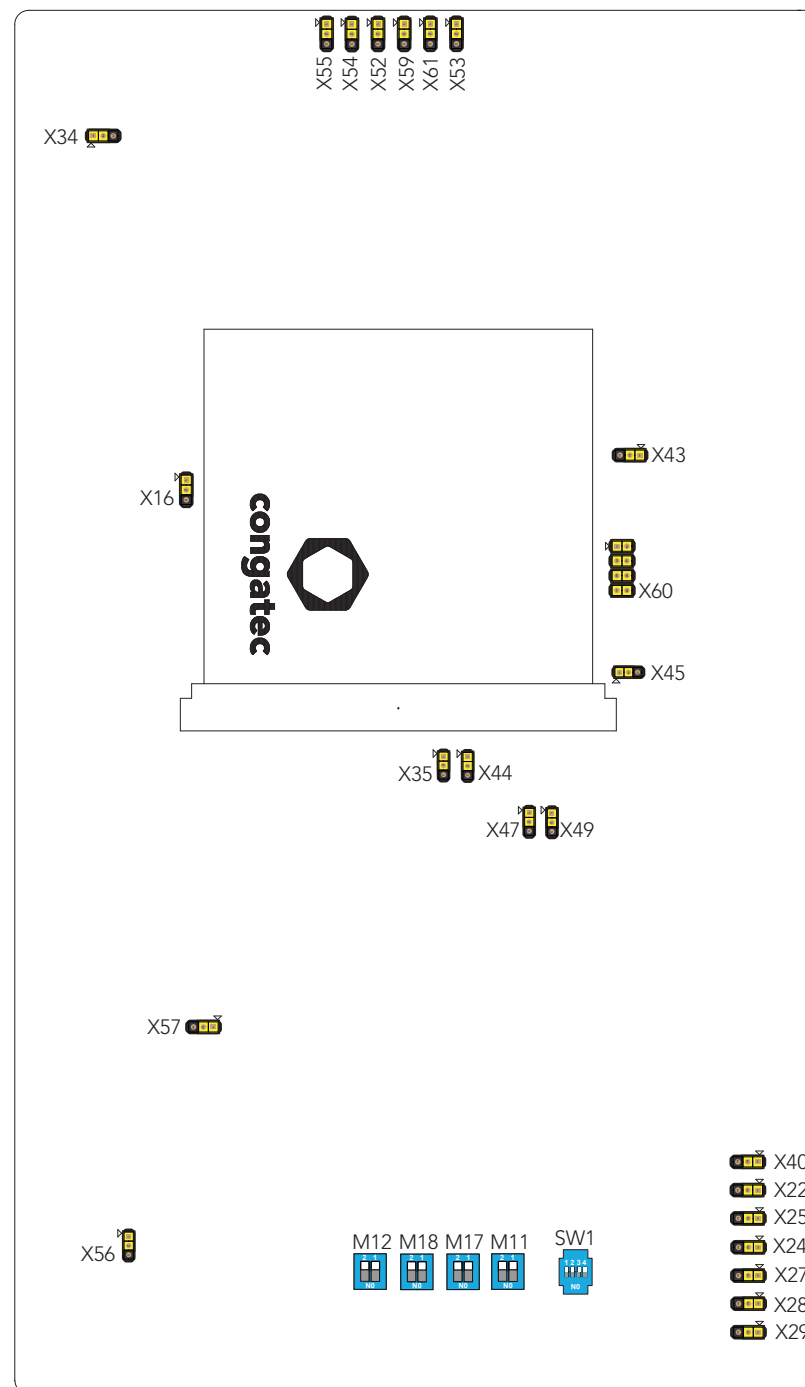
1.6 Jumper Settings
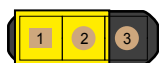
X16 - LAN LEDs

Pin	Configuration
1-2	Standby powered
2-3	Main powered

X22 - LCD0 VDD

Pin	Configuration
1-2	3.3 V panel power
2-3	5 V panel power

X24 - LCD0 BKLT_EN

Pin	Configuration
1-2	Non-inverted
2-3	Inverted

X25 - LCD0 BKLT

Pin	Configuration
1-2	Backlight power 12 V
2-3	Backlight power 5 V

X27 - LCD1 Panel Power

Pin	Configuration
1-2	3.3 V
2-3	5 V

X28 - LCD1 BKLT1

Pin	Configuration
1-2	12 V
2-3	5 V

X29 - LCD1 BKLT_EN1

Pin	Configuration
1-2	Non-inverted
2-3	Inverted

X34 - HDMI/DP1[*1]

Pin	Configuration
1-2	DP1 @ USB Type-C
2-3	HDMI

X35 - DP1 AUX_SEL[*1]

Pin	Configuration
1-2	Pull-down
2-3	Pull-up

X40 - GPIO [0:7]

Pin	Configuration
1-2	Enabled
2-3	Disabled

X43 - FAN Power

Pin	Configuration
1-2	12V
2-3	5V

X44 - TEST#

Pin	Configuration
1-2	Normal operation
2-3	Test mode

X45 - FORCE_RECOV#

Pin	Configuration
1-2	Normal operation
2-3	Force recovery mode

X47 - CAN0 Term

Pin	Configuration
1-2	Enabled
2-3	Disabled

X49 - CAN1 Term

Pin	Configuration
1-2	Enabled
2-3	Disabled

X52 - SBM3

Pin	Configuration
1-2	Present
2-3	Not present

X53 - ATX PSON#

Pin	Configuration
1-2	ATX Mode
2-3	AT Mode / Always ON

X54 - ATX Control

Pin	Configuration
1-2	CARRIER_SBY#
2-3	CARRIER_PWRON

X55 - SBY Control

Pin	Configuration
1-2	CARRIER_PWRON
2-3	Always ON

X56 - Postcode

Pin	Configuration
1-2	Enabled
2-3	Disabled

X57 - RTC Battery

Pin	Configuration
1-2	Normal operation
2-3	RTC battery disconnected

X59 - Module Power

Pin	Configuration
1-2	3.3 V
2-3	5 V

X60 - VIN PWRBAD#

Pin	Configuration
1-2	ATX_PG (only for debug)
3-4	AT_CARRIER PG
5-6	+3.3V_ATX PG
7-8	AT_SMARC PG
2-4	No VIN PWRBAD# control

X61 - Power Path

Pin	Configuration
1-2	Automatic[*2]
2-3	AT_SMARC

[*1] Only for modules with support for DP++ at HDMI0/DP1.

[*2] Every time +V3.3A gets enabled, the status of +AT_SMARC is used to select the power path (AT vs. 3.3 V / 5 V). This means once activated, the AT_SMARC path is kept active until a full power cycle is performed.

For more information, refer to the conga-SA5 and conga-SEVAL User's Guide or contact congatec technical support.