

Cellular Engine TC35

The extra compact module for voice and data transmission

Application Note: **SIM Interface**

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1 Introduction

This Document describes how to design the SIM-card interface for connection onto the Siemens GSM engine TC35.

Specifications subject to change without notice. This product is an original Siemens product protected by US, European and other patents.

1.1 Terms and Abbreviations

EMC	Electro Magnetic Compatibility
DSB35	Development Support Box (for GSM engine TC35)
GSM	Global System for Mobile Communication
SIM	Subscriber Identifier Module

2 General

Additionally to the five wire SIM interface according to GSM 11.11 a CCIN Pin is added. This pin is used to mechanically recognise if a card is inserted into a special card holder. The default level of this pin on TC35 is low (internal pull down resistor, no card inserted) and **must be driven to high if the card is inserted !**

It is not allowed to reject the SIM card during normal operation of the GSM Engine. You must only change the card in power down-mode. Otherwise the SIM will not be destroyed but proper operation cannot be guaranteed.

Attention:

For Europe (R&TTE) it is not necessary by law to make a delta type approval for the SIM interface but we are recommend it for the quality of the customer application.

In other countries all changes to this schematics will involve a delta type approval for the SIM interface of the TC35.

3 SIM Interface Schematic

In the following schematic you will see a sample connection of the SIM card holder on the DSB35

Note :

- To ensure EMC compliance, only a maximum line length of 200 mm is permitted between the GSM engine and the SIM card holder.
- The switch (X1202) is only for developing if you need a simulating of an empty SIM card holder.

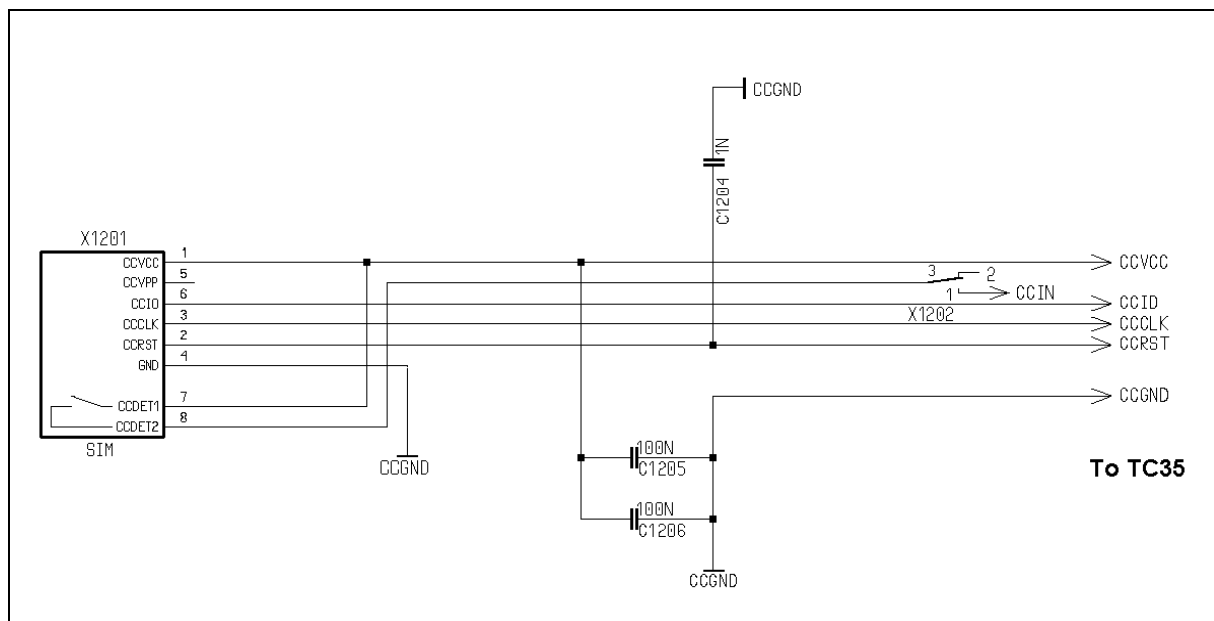


Figure 1 : Connection of the SIM card holder

4 Pin assignment - SIM card holder

Pin no.	Designation	I/O	Function
1	CCVCC	I	Supply voltage for SIM card, generated by the GSM engine
2	CCRST	I	Chip card reset, prompted by the GSM engine
3	CCCLK	I	Chip card clock
4	CCGND	-	Individual ground line for the SIM card to improve EMC
5	CCVPP	-	Not connected
6	CCIO	I/O	Serial data line, bi-directional
7	CCDET1	-	Connect to CCVCC (see Figure 1)
8	CCDET2		Connected at the CCIN input of the GSM engine for recognition of SIM is in the holder. If the SIM card is removed during operation, signals to the card are immediately shut down in the usual way in order to prevent damage to the card.

Table 1 : Pin assignment - SIM card holder

5 Switch on the DSB35 for SIM interface (signal CCIN)

The X1202 (optional) switch for the CCIN signal of the SIM interface enables the CCIN connection to the GSM engine to be opened even if a SIM is inserted.

Therefore, if the switch is pushed open, the system simulates an empty SIM card holder i.e. SIM card not inserted.

Switch	Function	Description
X1202	CCIN switch 3 to 2	Simulation SIM empty
X1202	CCIN switch 3 to 1	Normal operation

Table 2 : Switch on the DSB35 for SIM - Interface

6 Electrical characteristics

SIM	CCIN	24	I	IDLE-/ TALK mode: SIM contact (active high) $R_{PD} = 100k\Omega$ (internal Pull Down resistor to GND) $R_i = 1k\Omega$ (serial resistor) $V_{in,low,max} = 0.4V @ I_{OUT} = 0.1mA$ $V_{in,high,min} = 1.95V, V_{i,h,max}=3.3V$ Power Down: be aware of backward supply	<u>All</u> signals of SIM interface are protected against electrostatic discharge with spark gaps to GND and clamp-diodes to 2,9V and GND if a card is inserted then CCIN has to be at high-level if not used then connect to CCVCC
	CCRST	25	O	$R_o \leq 220\Omega$ (serial resistor) external C = 1nF to CCGND required	usage is mandatory Signal levels according to GSM Rec. (2)
	CCIO	26	I/O	Input $R_i \geq 1M\Omega$ Output $R_o \leq 220\Omega$ (serial resistor)	length of wire must be not larger than 200mm to fulfil the timing requirements of GSM Rec. 11.10
	CCCLK	27	O	$R_o \leq 220\Omega$ (serial resistor)	
	CCVCC	28	O	$CCVCC_{min} = 2.84V$ $CCVCC_{max} = 2.96V$ $I_{max} = 20mA$ external C $\geq 200nF$ to CCGND required	usage is mandatory
	CCGND	29	-	Ground (0V)	usage is mandatory do not connect CCGND to GND of the application

Table 3 : Electrical characteristic

7 Electrostatic Discharge

The GSM-engine is not protected against Electrostatic Discharge (ESD) in general. That means that it is to handle like an ESD sensitive component.

Despite of this the antenna port, the SIM-interface, the Port Akku_Temp and Battery lines are equipped with spark gaps and clamp diodes to protect especially this lines against overvoltage.

Note: All other ports must be protected against ESD by the external application.

Pin No.	Signal name	Contact discharge (environment)	Air discharge (direct to TC35)
1 - 5	Batt+	>4kV	1.5kV
6 - 10	GND	>4kV	15kV
11 - 12	POWER	>4kV	15kV
13	VDD	>4kV	1.5kV
14	Akku_Temp	>4kV	15kV
15	IGT	>4kV	1.5kV
16 - 23	RS232-signals	>4kV	1.5kV
24 - 29	SIM-signals	>4kV	15kV
30	VDDL	>4kV	1.5kV
31	PD	>4kV	1.5kV
32	SYNC	>4kV	1.5kV
33 - 40	Audio	>4kV	1.5kV
Antenna	HF-signal	>4kV	15kV
Antenna	HF-GND	>4kV	15kV

Table 4 : Measured Electrostatic withstanding

8 SIM card holder (X1201)

For detailed information of the SIM card holder like PCB footprint or mechanical dimensions please contact Molex GmbH

8.1 Order Information

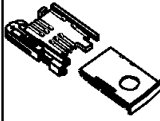
	Description	Mounting Type	Mating Cycles	Switch	Height Above PCB	Width	Packaging	Order No.
	Base with Push Button Ejector & Slide-In Card Tray	SMT	5,000	yes	3.10mm	25.0mm	Tape & Reel	91228-0001 91236-0001

Table 5 : Ordering information

8.1.1 Sales Contact

Molex Deutschland GmbH
 Felix-Wankel-Strasse 11
 D-74078 Heilbronn-Biberach
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Far East North Headquarters
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Far East South Headquarters
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