SIM800 GSM/GPRS Dev kit

Technical Manual Rev 1r0

FEATURES:

- Arduino Compatible
- Can be used for AT commands for data stream
- Full modem interface with status and control lines
- SIMCOM 800 Module
- On board manual power switch
- On board SIM Card and uSD Card slot

The **SIM800 GSM/GPRS Development kit** is a quad-band GSM/GPRS module designed with power saving technique so that the current consumption is as low as 0.7mA in sleep mode. In application, controlling device controls the GSM engine by sending AT Command via its serial interface. One SIM card interface. One full function UART port, witn programmable general purpose input and output. Support one PWM. Using FS application features a local storage space is mapped to the drive, where in the user can create directory in local drive and the storage space of SD card is mapped to the drive. The keypad interface consists of 5 columns output and 5 row inputs, module keys support 25 keys.

GENERAL SPECIFICATIONS:

- **Input Supply:** *5-9VDC* (External)
- **Req. current:** *1A-2.6A* (External)
- **Interface:** *Serial communication*
- **Normal Operation:** *(-40 degC to 85 degC)*
- **SIM interface:** *Support SIM card 1.8V, 3V*
- **Physical characteristics:**
    Size: 24mmX24mmX3mm
    Weight: 3.2g
- **PCB Dimensions: 64mmx64mm**
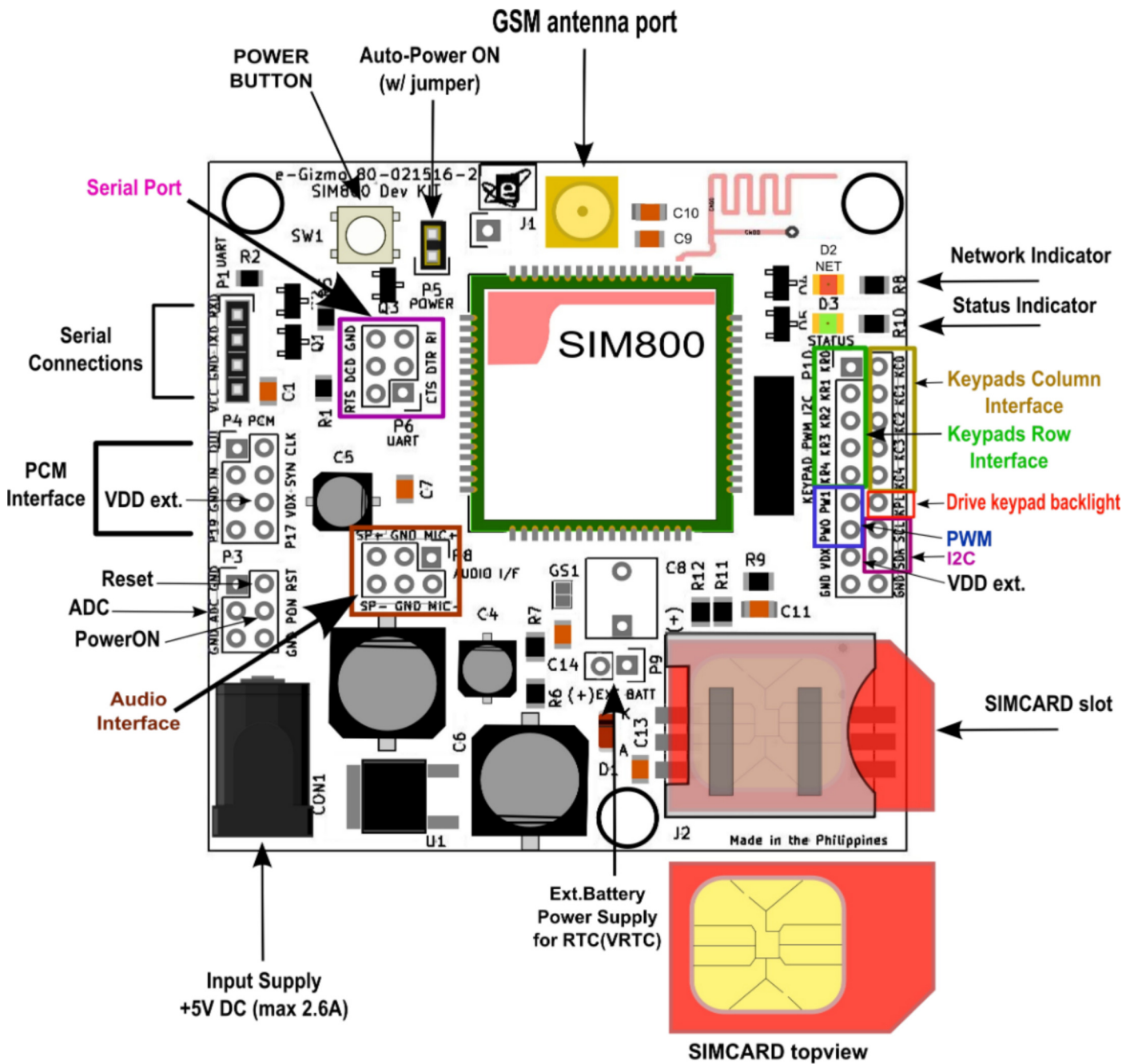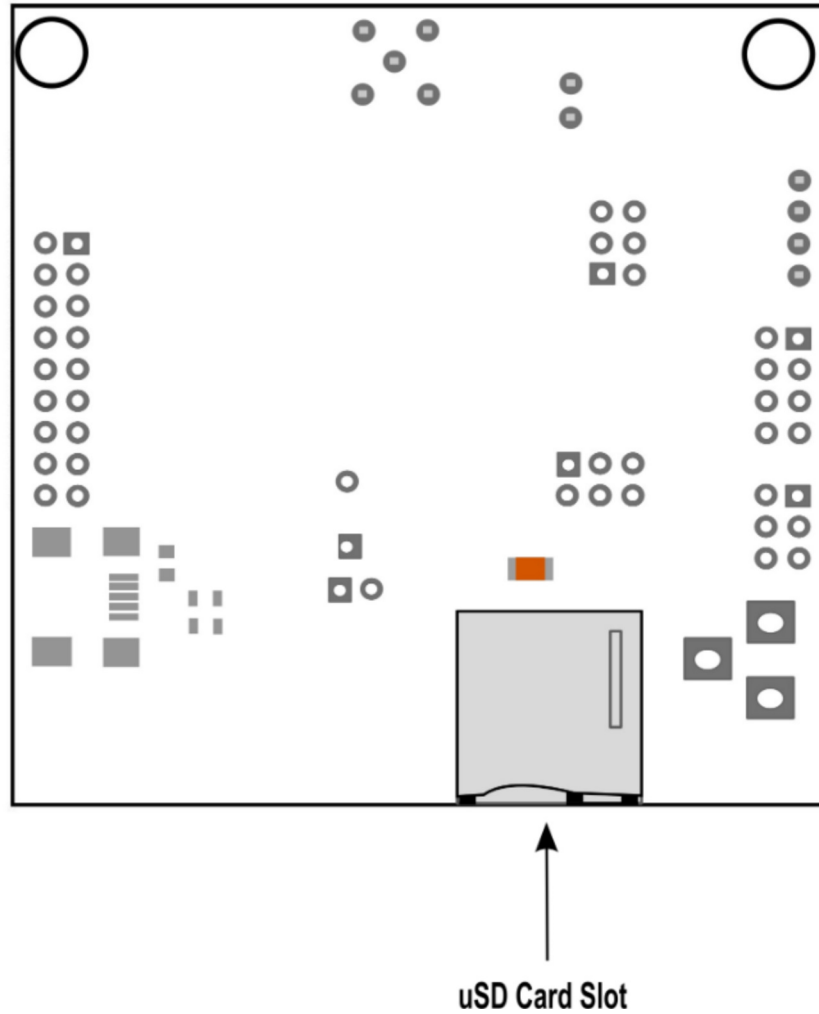
SIM800 Development Kit

Figure 1. *Major parts presentation of SIM800 GSM/GPRS Development kit.*

Figure 2. *Bottom View of SIM800 GSM/GPRS Dev kit.*

Table 1. P1 Serial Connection Descriptions

NAME	TYPE	DESCRIPTION
RXD	Input	Receive Data
TXD	Output	Transmit Data
GND		Ground
VCC	Input	Power Input

Table 2. P2 USB Interface Descriptions

NAME	TYPE	DESCRIPTION
USB_VBUS	Input	Debug and firmware upgrading*
USB_DN	I/O	
USB_DP	I/O	
GND		Ground

Table . P3 Descriptions

NAME	TYPE	DESCRIPTION
RST	Input	Reset input(Active low)
ADC	Input	10-bit general analog to digital conv

Table 4. P4 PCM Interface Descriptions

NAME	TYPE	DESCRIPTION
OUT	Output	PCM interface for Audio*
IN	Input	
SYNC	Output	
CLK	Input	
VDX	Output	2.8V power output

(For GPIO17 and 19 see page 46 of SIM800-Hardware-Design-V1.08.pdf)

Table 5. P5 Power Descriptions

NAME	TYPE	DESCRIPTION
POWER	Input	Auto-Power ON (if with jumper)

Table 6. P6 UART Descriptions

NAME	TYPE	DESCRIPTION
DTR	Input	Data terminal ready*
RI	Output	Ring indicator*
DCD	Output	Data carrier detect*
CTS	Output	Clear to send*
RTS	Input	Request to send*

Table 7. P7 RF Synchronization Descriptions

NAME	TYPE	DESCRIPTION
RF_SYNC	Output	RF burst synchronous signal (Do not pull up)

Table 8. P8 Audio Interface Descriptions

NAME	TYPE	DESCRIPTION
SP+	Output	Differential audio output*
SP-	Output	Differential audio output*
MIC+	Input	Differential audio input*
MIC-	Input	Differential audio input*

Table 9. P9 Ext. Batt Descriptions

NAME	TYPE	DESCRIPTION
Ext.Batt	I/O	Power supply for RTC*

Table 10. P10 KEYPAD PWM I2C Descriptions

KEYPAD Interface

NAME	TYPE	DESCRIPTION
COLUMNS		
KC0	Input	Support up to 50 buttons (5*5*2)*
KC1	Input	
KC2	Input	
KC3	Input	
KC4	Input	
ROWS		
KR0	Output	
KR1	Output	
KR2	Output	
KR3	Output	
KR4	Output	

PWM

NAME	TYPE	DESCRIPTION
PWM0	Output	Pulse-width modulation, multiplex with GPIO22.*
PWM1	Output	Pulse-width modulation, multiplex with GPIO23.*

(For more info See page 47 of SIM800-Hardware-Design-V1.08.pdf)

I2C

NAME	TYPE	DESCRIPTION
SDA	I/O	I2C Serial bus data
SCL	Output	I2C Serial bus clock
KPLED	Input	Drive Keypad backlight
VDX	Output	2.8V power output*

Table 11. LED Indicator Descriptions

NAME	TYPE	DESCRIPTION
D2	NET	Network Indicator status
D3	STATUS	Power ON status Indicator

Table 12. Antenna Descriptions

NAME	TYPE	DESCRIPTION
J1	GSM_ANT	GSM antenna port
	BT_ANT	Bluetooth antenna port*

NOTE: ***Keep floating if unused

Figure 3. Sample Connection to GizDuino MCU.

Figure 4. Bottom View of SIM800 GSM/GPRS Dev kit with uSD card inserted.

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<--- to PC

Put a jumper
for Auto-Power ON

Put an antenna
for the signal

Insert Simcard here!
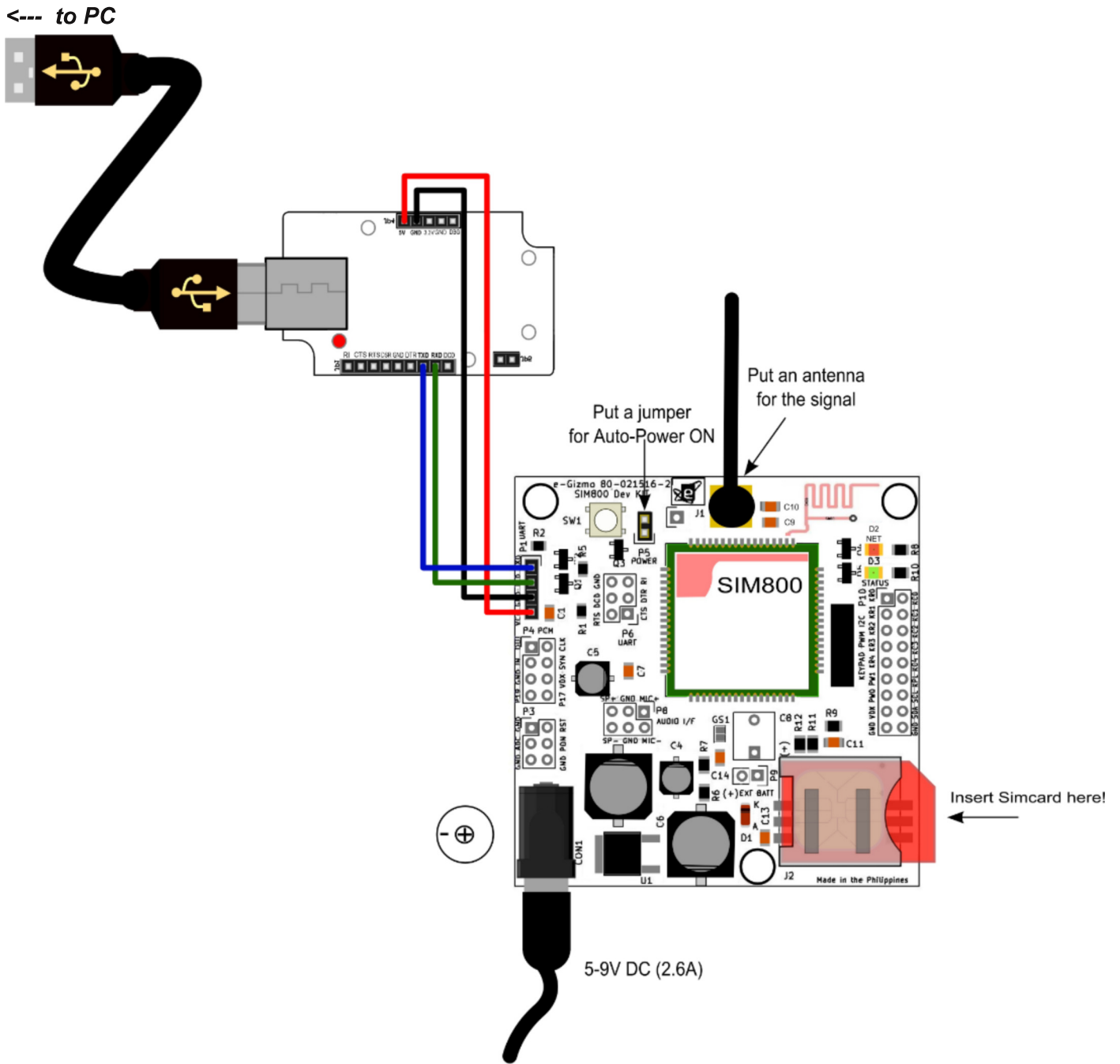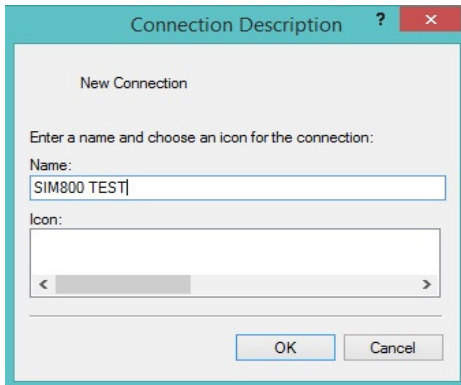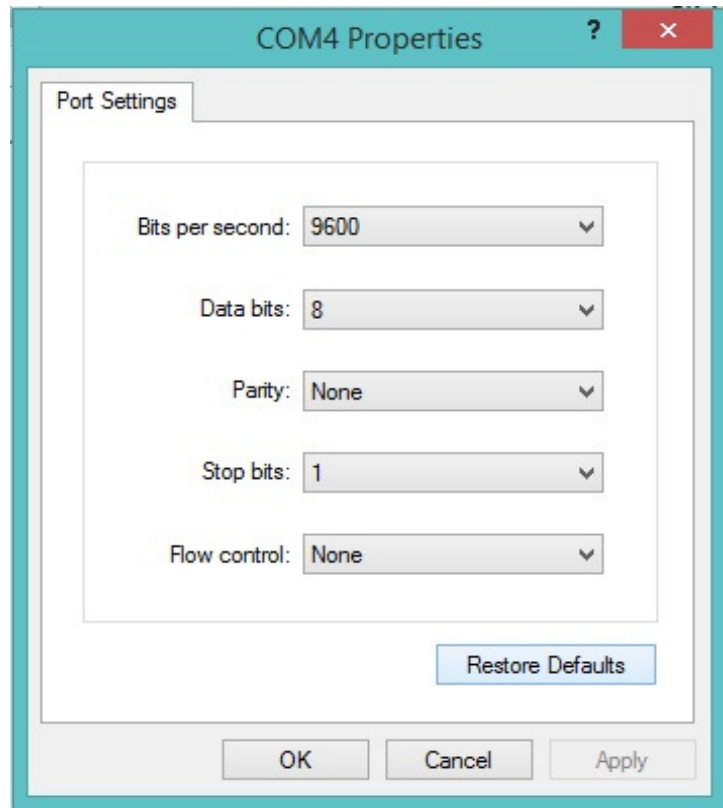
5-9V DC (2.6A)

Figure 5. Sample Connection with USB-TTL converter.

Open the HYPERTEMINAL.exe

1. Type Name: SIM800 TEST. Click OK.

2. Select the correct COMPORT. Click OK
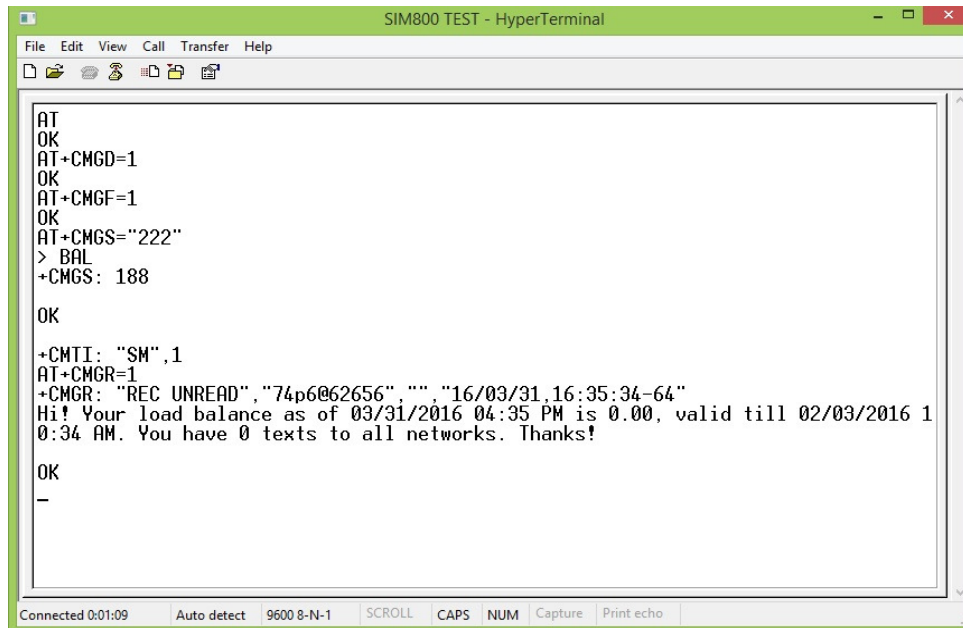
3. Click the RESTORE DEFAULTS.
9600,8,None,1,None

Click OK.

4. Turn ON the CAPS LOCK mode. Type AT commands.

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List of basic "AT commands"
The characters <CR> represent a 'Carriage Return' command.
It is simply an 'ENTER' key command on the keyboard.

TYPE	DESCRIPTION
AT<CR> OK	This is just the commands previously done.
ATE1<CR> OK	This command tells the GSM Modem to echo the characters you type into the Hyper Terminal ,which allows the display of every character typed.
AT+CMGD=1<CR> OK	Delete an SMS message
AT+CMGF =1<CR> OK	This command tells the GSM Modem to display SMS messages in the Human Read able Text Format.

AT+CMEE=2<CR> OK	This command lets the GSM Modem report any errors found in a readable format.
AT+_CFUN=1<CR> OK	This command sets all the GSM Modem functions to be available to the user.
AT+COPS=0<CR> OK	This command lets the GSM Modem functions choose an available network operator automatically. The process may take some time to complete, and its completion is marked by the 'OK' response. This usually takes around 30 seconds to complete.

AT+CPAS<CR> OK	Whenever this command is executed during the processing time from the above command, it reports on the status of the loading process. When the GSM modem is still loading, it will respond with an 'OK'. Otherwise, if it is done it will respond 'Ready'. If the GSM modem responds ,an 'Error' up until a minute then the problem may result in the improper attachment of the SIM card. To remedy this, turn off the GSM modem power, carefully reattach the SIM card and check if it is properly placed, and resume with the start up process once again.

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AT+CNUM<CR>   Display SIM Number

AT+COPS?<CR>   Show operator network

AT+CSQ<CR>   Show signal quality

AT+CMGL="ALL"<CR>   Display all SMS messages
                                   []WARNING: If there are large amounts of SMS
                                    messages in the SIM card, this command will
                                    flood your HyperTerminal with SMS messages.

AT+CMGS="SIM number"<CR> Send an SMS message
User Message: For example, if the user types in
PRESS   AT+CMGS="09123456789" and
<CTRL>+<Z>   executes 'ENTER', and types in for the
                                   message 'Hello There!' (excluding the
                                   apostrophes) and presses down both 'CTRL'
                                   and 'Z' simultaneously, the GSM modem will
                                   send a 'Hello There!' message to the desired
                                   number.Note that this will cost an amount of
                                   credit or load depending on the network service
                                   provider.

AT+CMGR=1<CR>   Display an SMS message
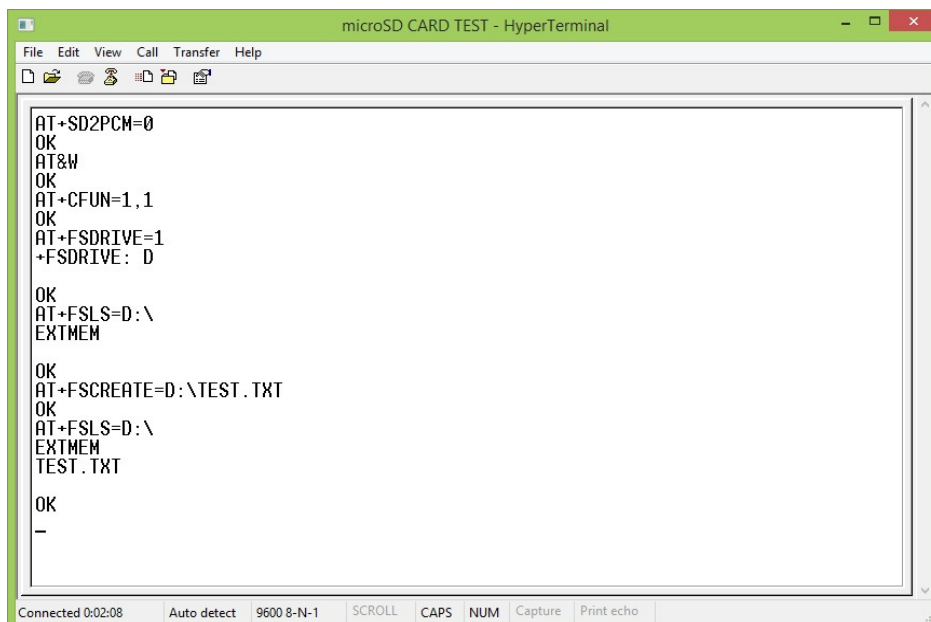   [If there are no messages in storage of the SIM
                                    card, it will return an Error' message]

AT+CLAC<CR>   Show list of all available commands

AT+CPOWD<CR>   Switches GSM Module power to OFF

For more information regarding all the available commands of the GSM
module, the user may refer to the SIM800 'AT Command' manual.

```
AT+SD2PCM=0                    SD mode is valid

OK

AT&W

OK
AT+CFUN=1,1                    reboot the module


AT+FSDRIVE=1                   Get SD Card drive

+FSDRIVE:E

OK

AT+FSLS=E:\
Images\
Audio\

OK

AT+FSCREATE=E:\test.txt        Create test.txt

 OK

AT+FSLS=E:\
Images\
Audio\
test.txt

OK
```

```
                    microSD CARD TEST - HyperTerminal
File   Edit   View   Call   Transfer   Help

AT+SD2PCM=0
OK
AT&W
OK
AT+CFUN=1,1
OK
AT+FSDRIVE=1
+FSDRIVE: D

OK
AT+FSLS=D:\
EXTMEM

OK
AT+FSCREATE=D:\TEST.TXT
OK
AT+FSLS=D:\
EXTMEM
TEST.TXT

OK
_

Connected 0:02:08    Auto detect    9600 8-N-1    SCROLL   CAPS   NUM   Capture   Print echo
```

Reference: see page 13-14 the *SIM800 Series_FS_Application Note_v1.01 datasheet*)

```
AT+FSFLSIZE=E:\test.txt

+FSFLSIZE: 20

OK
```

```
AT+FSREAD=E:\test.txt,0,100,1

qwertyuiopasdfghj

OK
```

```
AT+FSWRITE=E:\test.txt,0,2,10          Write "cc" at the beginning of the file

>

OK
```

```
AT+FSREAD=E:\test.txt,0,100,0          The first two characters is "cc"

ccertyuiopasdfghj

OK
```

```
AT+FSREAD=E:\test.txt,1,100,2          The offset of reading position is 2

ertyuiopasdfghj

OK
```
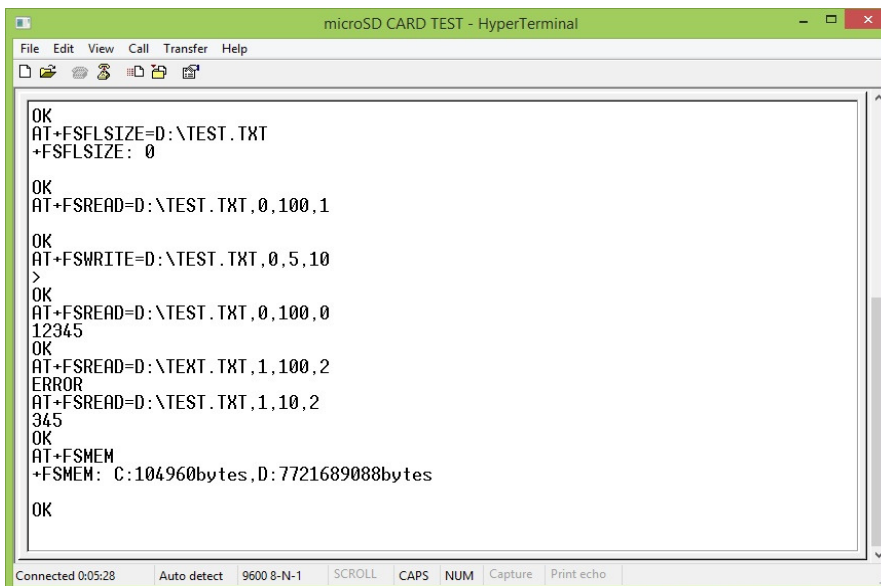
```
AT+FSMEM

+FSMEM: C:1024v=bytes,E:49152bytes

OK
```

```
microSD CARD TEST - HyperTerminal

File   Edit   View   Call   Transfer   Help

OK
AT+FSFLSIZE=D:\TEST.TXT
+FSFLSIZE: 0

OK
AT+FSREAD=D:\TEST.TXT,0,100,1

OK
AT+FSWRITE=D:\TEST.TXT,0,5,10
>
OK
AT+FSREAD=D:\TEST.TXT,0,100,0
12345
OK
AT+FSREAD=D:\TEXT.TXT,1,100,2
ERROR
AT+FSREAD=D:\TEST.TXT,1,10,2
345
OK
AT+FSMEM
+FSMEM: C:104960bytes,D:7721689088bytes

OK

Connected 0:05:28   Auto detect   9600 8-N-1   SCROLL   CAPS   NUM   Capture   Print echo
```
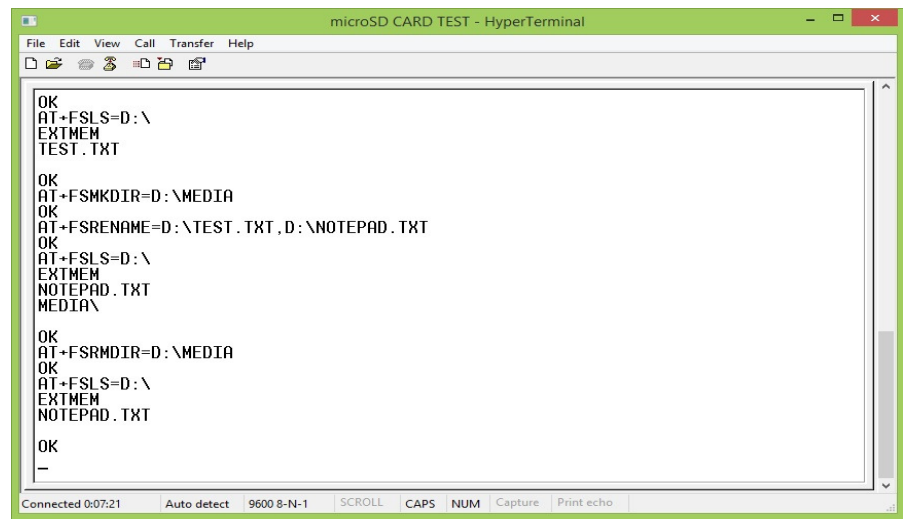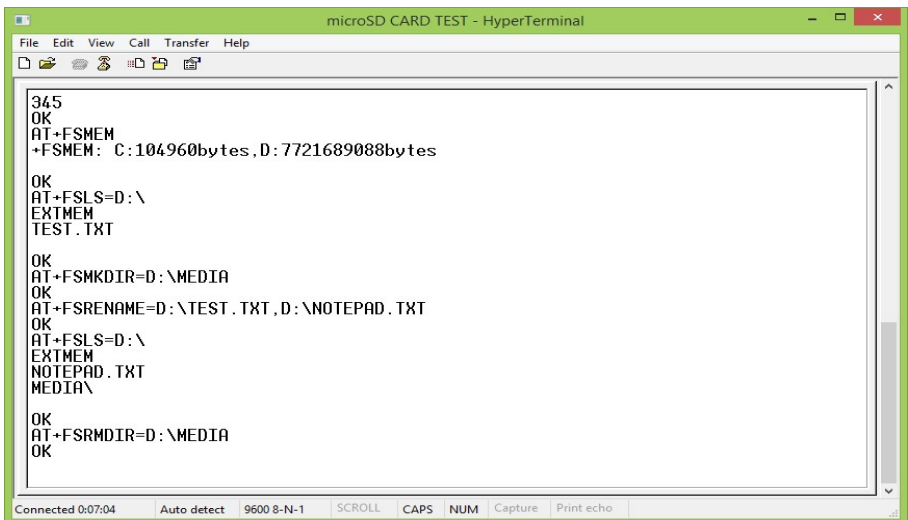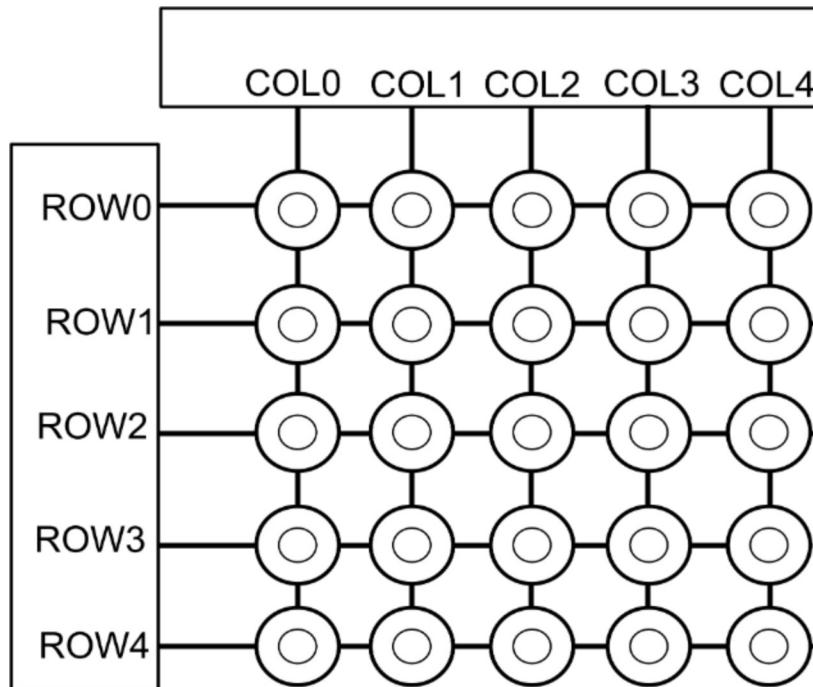
```
AT+FSLS=E:\

test1.txt

OK

AT+FSMKDIR=E:\media                    Make media directory

OK

AT+FSRENAME=E:\test1.txt,E:\test2.txt   Rename test1.txt

OK

AT+FSLS=E:\

test2.txt
media\

OK

AT+FSRMDIR=E:\media                    Delete media directory

OK

AT+FSLS=E:\

test2.txt

OK
```
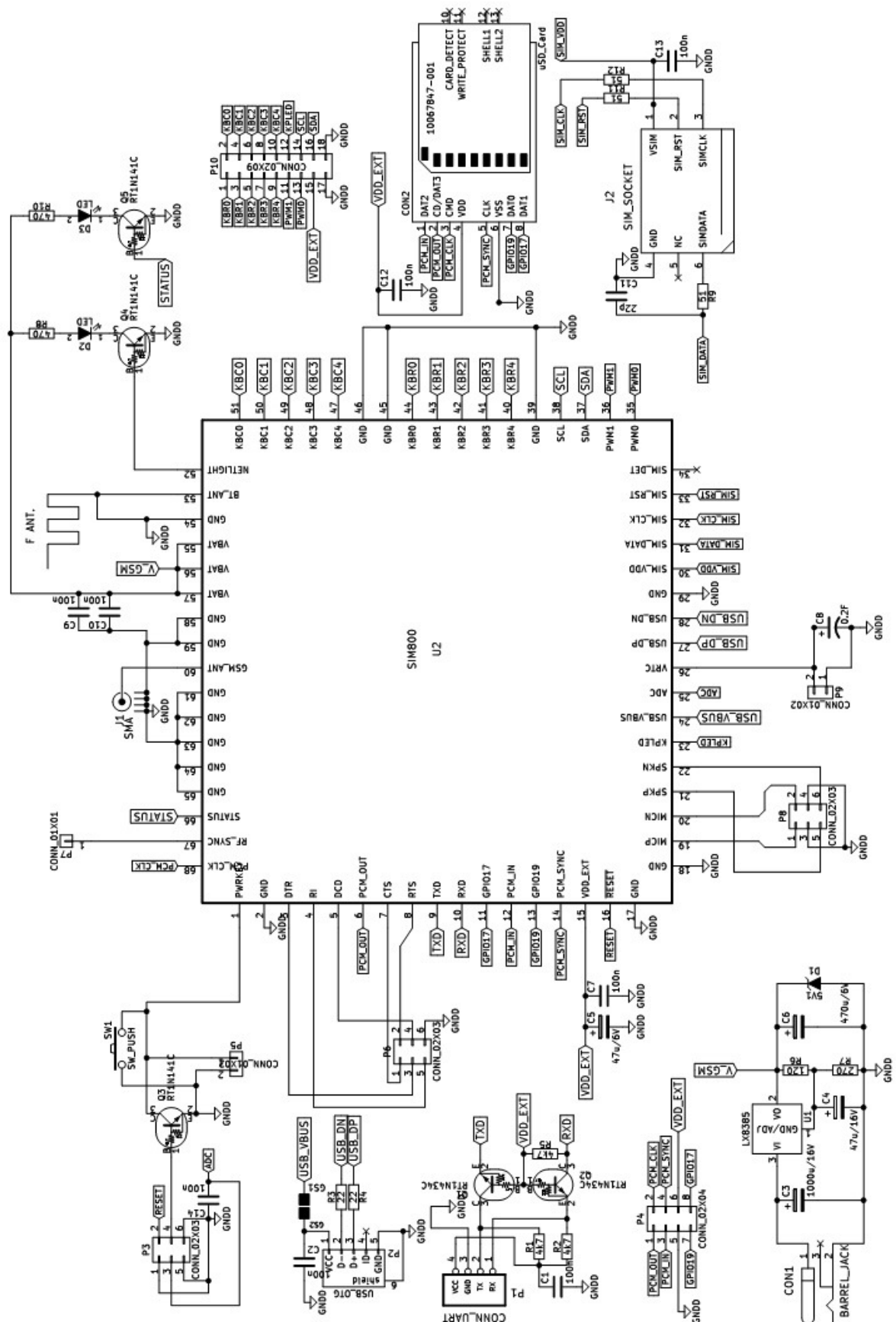
microSD CARD TEST - HyperTerminal

File   Edit   View   Call   Transfer   Help

```
345
OK
AT+FSMEM
+FSMEM: C:104960bytes,D:7721689088bytes

OK
AT+FSLS=D:\
EXTMEM
TEST.TXT

OK
AT+FSMKDIR=D:\MEDIA
OK
AT+FSRENAME=D:\TEST.TXT,D:\NOTEPAD.TXT
OK
AT+FSLS=D:\
EXTMEM
NOTEPAD.TXT
MEDIA\

OK
AT+FSRMDIR=D:\MEDIA
OK
```

Connected 0:07:04   Auto detect   9600 8-N-1   SCROLL   CAPS   NUM   Capture   Print echo

microSD CARD TEST - HyperTerminal

File   Edit   View   Call   Transfer   Help

```
OK
AT+FSLS=D:\
EXTMEM
TEST.TXT

OK
AT+FSMKDIR=D:\MEDIA
OK
AT+FSRENAME=D:\TEST.TXT,D:\NOTEPAD.TXT
OK
AT+FSLS=D:\
EXTMEM
NOTEPAD.TXT
MEDIA\

OK
AT+FSRMDIR=D:\MEDIA
OK
AT+FSLS=D:\
EXTMEM
NOTEPAD.TXT

OK
_
```

Connected 0:07:21   Auto detect   9600 8-N-1   SCROLL   CAPS   NUM   Capture   Print echo

TYPE	DESCRIPTION
AT+SKPD=? +SKPD: (0-1)	Keypad Detecting Function
AT+SKPD? +SKPD: <mode>	Display keypad mode

AT+SKPD=<mode>
OK
ERROR
	If key has pressed or released, The URC report is:
	
	+SKPD: <value>,<event>
	
	0 - Disable Keypad detecting function
	1 - Enable Keypad detecting function
	<value> The value of pressed or released keypad
	<event> The status of keypad
	    0 - Key released
	    1 - Key pressed

The Keypad interface consists of 5 keypad column outputs and 5 keypad row inputs. Module keys supports 25 keys.

Reference: AT commands for keypad. See page 193 of *SIM800_Series_AT_Command_Manual_V1.0.5.pdf*

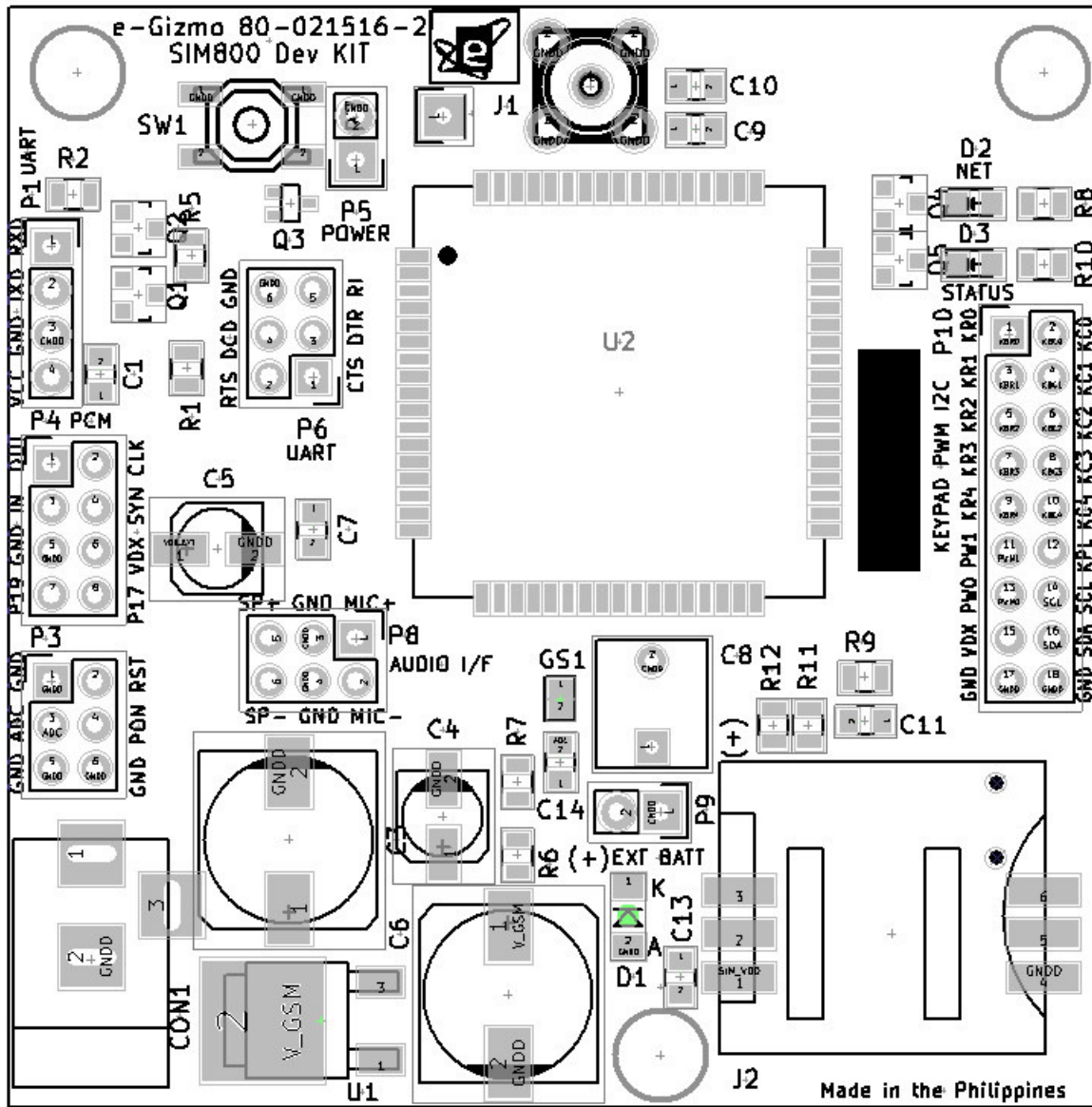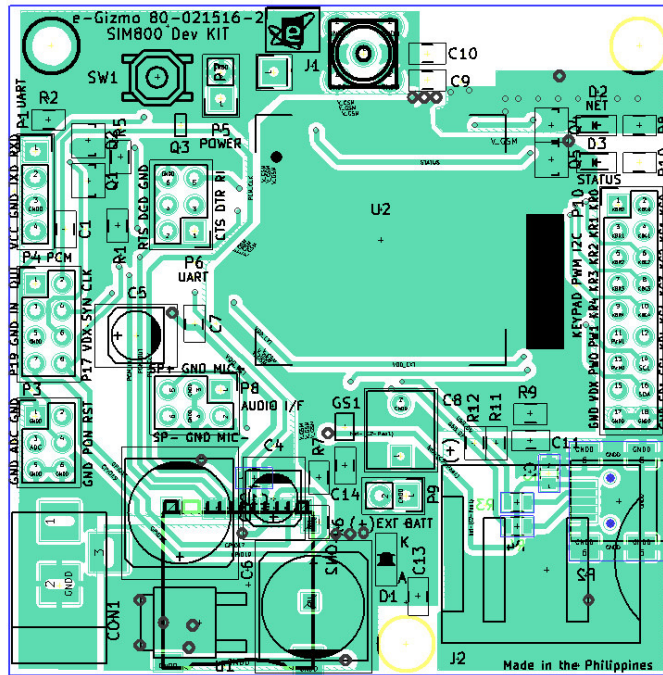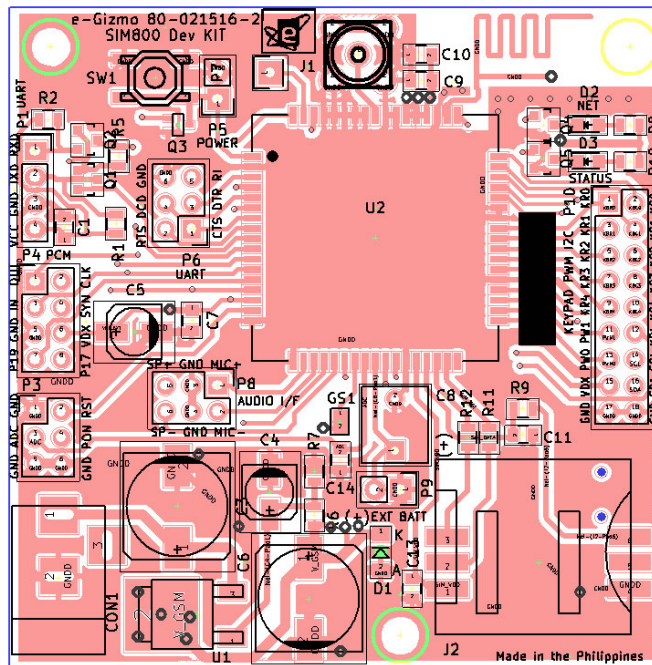e-Gizmo
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Figure 6. Parts Placement

Figure 7. Bottom Guide PCB Layer

Figure 8. Top Guide PCB Layer

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