

# Test Procedure for the NCN6001

ON Semiconductor®



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## EQUIPMENT:

- Regulated Power Supply
  - 7V to 20V / 100mA DC current capability (TEKTRONIX)
- Oscilloscope
  - 200MHz Bandwidth , four channels (TEKTRONIX)
- Digital Analyzer
  - 100MHz Bandwidth, eight channels (HEWLETT-PACKARD)
- Voltage Probes
  - 4 probes, 200MHz Bandwidth (TEKTRONIX)
- Smart Card (Asynchronous )
  - MPCOS-EMV GEMPLUS
- Smart Card (Synchronous)
  - French Public Pay Phone
- Control software
  - PC dedicated application (ON semiconductor)
- Serial cable
  - Male /Male, subD 9 pins
- PC with W2000
  - Minimum available memory : 64 Mo
- Dummy connector
  - Standard 16 pins, H10 format

## FINAL TEST PROCEDURE:

- Connect the RS232 cable to the demo board and to the PC RS232 port
- Insert the dummy connector into the MON-08 socket J3 ( right side edge of the demo board ).
- Adjust the output voltage power supply to 7V, current limited to 100mA
- Connect the digital analyzer probe as follow:
  - Digital ground → GROUND jumper located on the top right side of the demo board.
  - D0 → Test point CS Chip Select, will be use to trig the analyzer capture
  - D1 → Test point MOSI SPI message from the MCU to the NCN6001
  - D2 → Test point SPI\_CLK SPI clock from the MCU
  - D3 → Test point MISO SPI message from the NCN6001 to the MCU
  - D4 → Test point I/O Transaction line to the MCU
  - D5 → Test point CRD\_IO Transaction line to the smart card
  - D6 → Test point CRD\_RST Reset bit to the smart card
  - D7 → test point CRD\_CLK Clock line to the smart card \*Note : avoid long wire connection to this test point to minimize noise
- Connect the oscilloscope probes as follow:
  - Analog ground → GROUND jumper located on the right top side of the demo board.
  - Channel 1 → Test point CRD\_VCC Smart card operating voltage

- Launch the NCN6001CONTROL software on the PC. The control panel will come up once you have accepted the license agreement. The system will automatically open up the RS232 port.
- Connect the power supply to the demo board : the message “ON semiconductor v5.0” shall be displayed on the control panel window. If the message does not come up, press the RESET push button located on the bottom right side ( S2 ) of the NCN6001 demo board. At this point, the green LED /D1 shall turns on to confirm the power supply is correct.
- Insert the asynchronous card into the socket, make sure the chip is face up. The yellow LED/D2 shall turns on to confirm the card has been properly inserted and detected by the NCN6001. At this point, the system is ready to accept data transaction.
- With reference to the NCN6001 control software, in the sub panel “CHIP SELECT”, make sure the ASYNC #5 button is selected
- With reference to the NCN6001 control software, in the sub panel “CRD\_CLK” click the RUN button : this will activate the CRD\_CLK clock.
- With reference to the NCN6001 control software, in the sub panel “CRD\_VCC”, select the CRD\_VCC = 5.0V button. The red LED /D3 shall turns on to confirm the NCN6001 is now active. At this point, the card is ready to accept commands from the PC.
- Clear the NCN6001 control panel window (CLEAR WINDOW push button) . The window is now clean to receive data from the smart card.
- Push the “SEND ATR” button: the sequence is launched by the software and the card shall send the initial message. A string of up to 16 bytes shall be printed on the window. At this point, you can decode the message by pushing the “DECODE ATR” button. A sub window shall pop-up with the details of the ATR related to the inserted card.