Simple_OTA_VCR_FLOATING

```
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* www.idea2ic.com
*
*   VIN      R1                                           R2
*     _/\  /\  /\_ OUT0                         OUT1 __/\  /\  /\__
*    |   \/  \/    |         IABC= 1mA->0            |    \/  \/   _|_
*   _|_           |                                 |             \\\
*  /_  \          |        INP0=INN1    INP1=INN0   |
* // \  \     /|  |      /|________    _____|\      |  |\  VOUT1
* \   \//  __/ |__|_/\/\/ |        |  |     | \/\/\_|__| \__
*  \___/  |  \ |    \/\/\ |_______/|\_|   __| /\/\/ |  | /  |
*   _|_   |   \|         \| |      |_____|  |/         |/   |
*   ///   |B_BUF0  B_OTA0   |            | B_OTA1           |
*         |           R3    |   R4       |       R5         |
*         |_____/\  /\  /\__|_/\  /\  /\_|____/\  /\  /\____|
*       VOUT0     \/  \/  INN0  \/  \/  INN1    \/  \/
*
*
*

VIN         VIN          0     SIN(    0     10m    1000     )
R1          VIN          OUT0  10K
R2          OUT1         0     10K
R3          VOUT0        INN0  100K
R4          INN1         INN0  1K
R5          VOUT1        INN1  100K
B_OTA0      OUT0         0     I =    -1*v(VIABC)*tanh(( v(INN1) -v(INN0) )/.052)
B_BUF0      VOUT0        0     V =     v(OUT0) -1.2
B_OTA1      OUT1         0     I =    -1*v(VIABC)*tanh(( v(INN0) -v(INN1) )/.052)
B_BUF1      VOUT1        0     V =     v(OUT1) -1.2
V_Iabc      VIABC        0     PWL     ( 0  1m 10m 0  )
.tran       1u           10m   0       1u

.control
run
set         pensize = 2
plot        v(vin)     v(out0) v(out1)
.endc

.end
```

=====================END_OF_SPICE============================

To Covert PDF to plain text click below
http://www.fileformat.info/convert/doc/pdf2txt.htm
This code works with winspice.

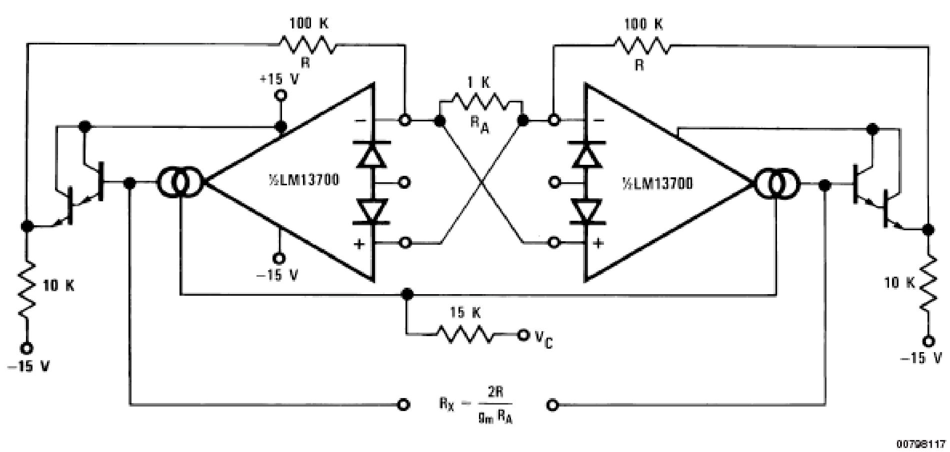
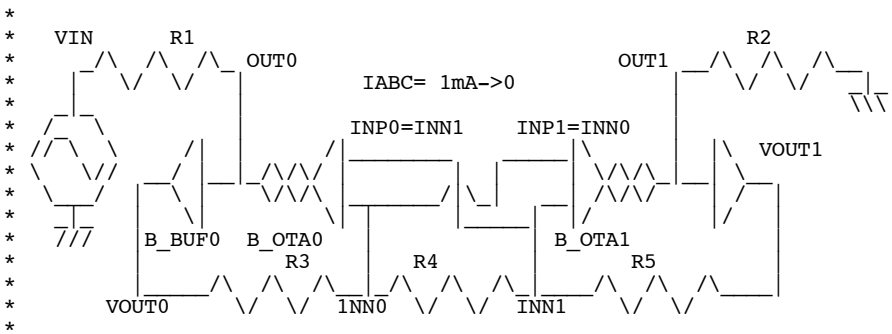


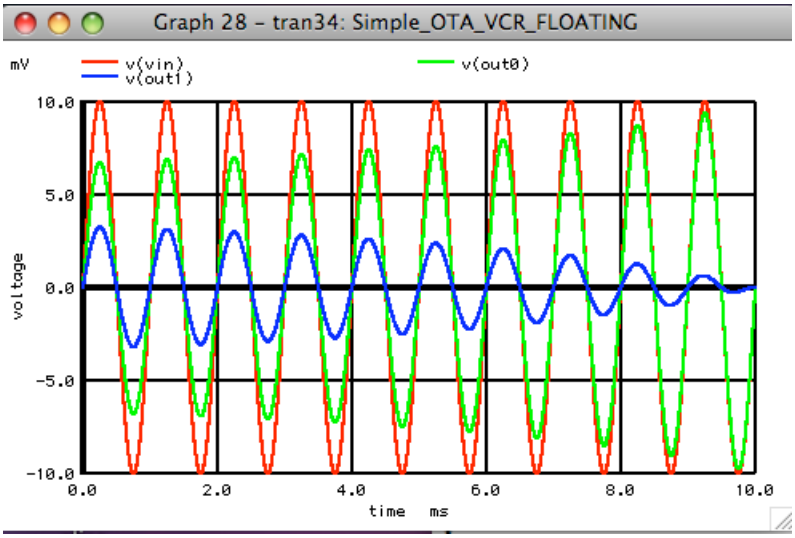
FIGURE 10. Floating Voltage Controlled Resistor

This example shows how the floating resistor shown in the data sheet operates. In this case the actual 1.2V offset of the buffers can be added. All input voltages to the OTAs will float to be 1.2V lower in voltage compared to nodes OUT0 and OUT1.

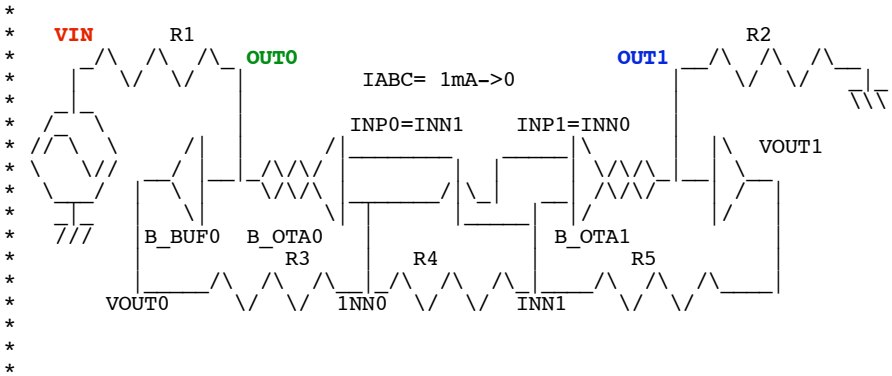



```
B_OTA0     OUT0     0      I =    -1*v(VIABC)*tanh(( v(INN1) -v(INN0) )/.052)
B_BUF0     VOUT0    0      V =     v(OUT0)       -1.2
B_OTA1     OUT1     0      I =    -1*v(VIABC)*tanh(( v(INN0) -v(INN1) )/.052)
B_BUF1     VOUT1    0      V =     v(OUT1)       -1.2
V_Iabc     VIABC    0      PWL     ( 0 1m 10m 0 )
```

The floating resistor can be put in a symmetrical network to view its behavior on both of its nodes as IABC moves from 1mA to zero.



It looks like at 1mA the equivalent input resistance is about 10K Ohms. As IABC decreases, Node OUT0 approaches VIN and Node OUT1 approaches ground.



To make a floating inductor, a capacitor can be placed across R4. To make a floating capacitor, matched capacitors need to be placed across R3 and R5.