

## CactusIC Ultra Low Power Programmable Voltage Reference

### Functional Description

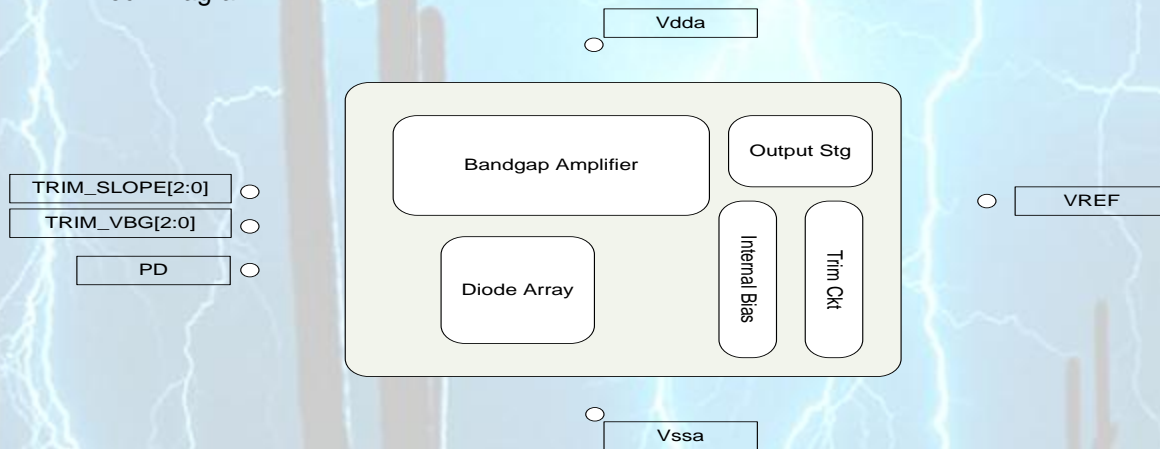
The DSVREF [Digitally Programmable Sub Voltage Reference] is designed for ultra-low power applications where a precise voltage reference is required. Typical supply current is 70nA. The DVREF has two 7 bit digital input busses that allow users to precisely program slope and output voltage levels. This allows digital trimming to correct for process skew or simply to make the voltage reference more useful in a wide range of applications.

Digital voltage level trimming allows the voltage reference over a wide enough range to cover expected process and device variations. Typical output voltage is 700mV.

The voltage reference requires a single power supply from 900mV up to 1.8V (other voltage ranges are available) and typically consumes only 70nA supply current.

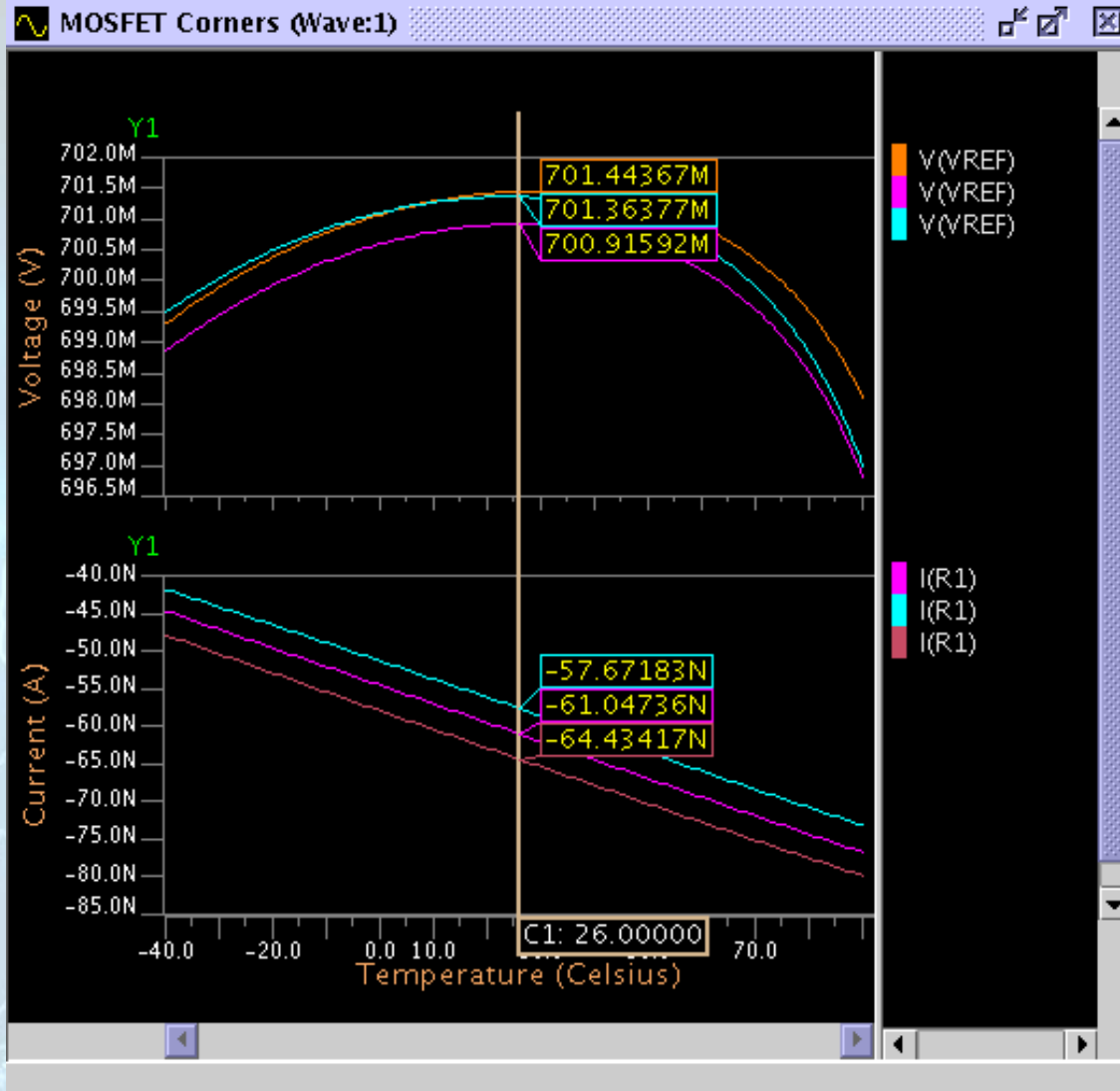
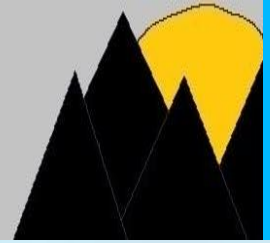
The DVREF is designed in IBM 0.18 processes and is compatible with other general 0.18um CMOS processes and well as other process nodes such as Tower and TSMC.

VREF Block Diagram



### Operating Conditions

Symbol	Parameter	Min	Typ	Max	Unit
V <sub>DD</sub>	Positive Supply Voltage	0.9	1.2	1.8	V
V <sub>SS</sub>	Negative Supply Voltage		0.0		V
T	Temperature	-40	27	100	°C



Sub Bandgap Output Voltage (Top) and Supply Current (Bottom)