

Reference current and voltage source

SPECIFICATION

1 FEATURES

- iHP SiGe BiCMOS 0.25 μm
- Output voltage 1.17 V
- Reference current termocompensation in wide temperature range
- Voltage termocompensation in wide temperature range
- Low current consumption
- Built-in battery low power indicator
- Small area

2 APPLICATION

- Supply voltage stabilization systems
- Comparison and detection systems
- System-on-chip for different purposes

3 OVERVIEW

Reference current and voltage source is used to supply any analog blocks. It is based on the reference voltage source forming temperature compensation voltage. It coordinates to voltage-to-current converters and forms reference currents from external and internal resistors. The battery low power indicator consists of a comparator which is based on two-stage operational amplifiers. The block is fabricated on iHP SiGe BiCMOS 0.25 μm technology.

4 STRUCTURE

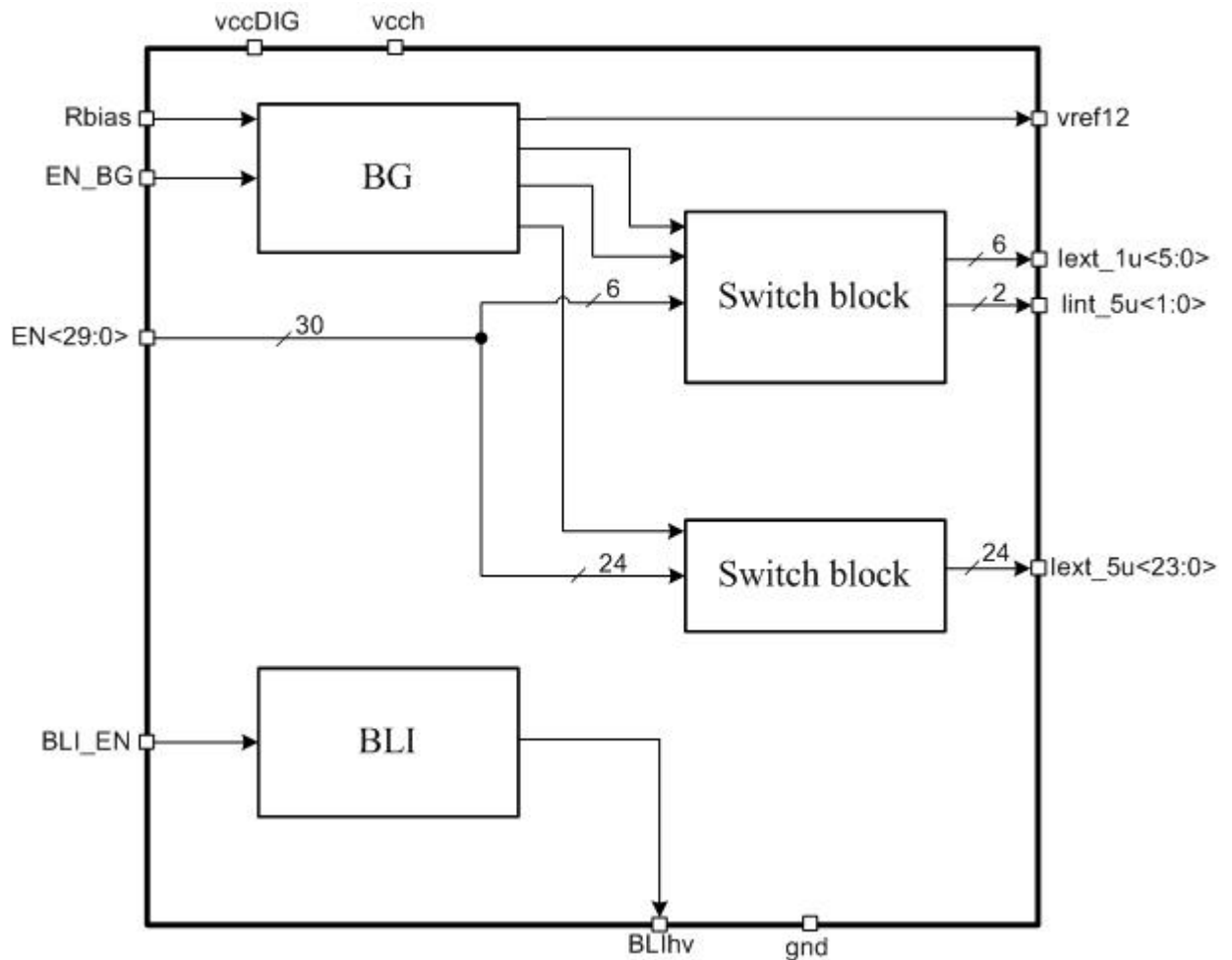


Figure 1: Reference current and voltage source structure.

5 PIN DESCRIPTION

Name	Direction	Description
BG_EN	I	Reference voltage source enable
BLI_EN	I	Battery low power indicator enable
EN<29:0>	I	Enable/disable
Rbias	IO	Output external resistor
BLIhv	O	Battery low power indicator output (0–charged, 1–uncharged)
vref12	O	Reference voltage
lext_1u<5:0>	O	Output reference current (1 μ A, external resistor)
lint_5u<1:0>	O	Output reference current (5 μ A, internal resistor)
lext_5u<23:0>	O	Output reference current (5 μ A, external resistor)
vcch	IO	Supply voltage
vccDIG	IO	
gnd	IO	Ground

6 LAYOUT DESCRIPTION

The block dimensions are given in the table 1.

Table 1: Block dimensions.

Dimension	Value	Unit
Height	242	um
Width	557	um

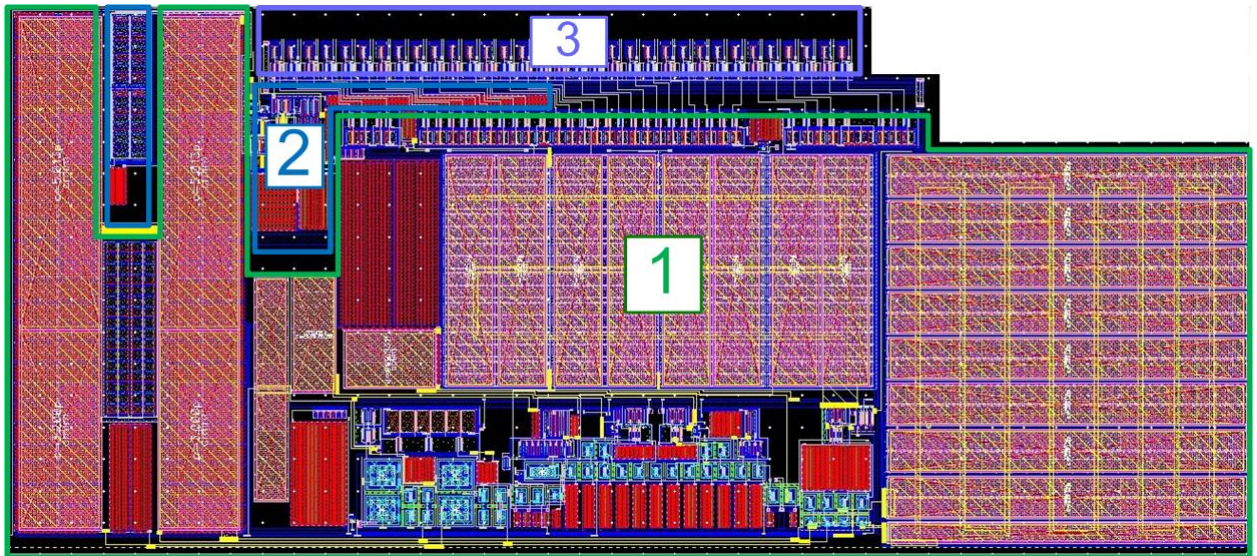


Figure 2: Device layout view.

1. Reference current and voltage former
2. Battery low power indicator
3. Switch blocks

7 OPERATING CHARACTERISTICS

7.1 TECHNICAL CHARACTERISTICS

Technology _____ iHP SiGe BiCMOS 0.25 um
 Status _____ silicon proven
 Area _____ 0.12 mm²

7.2 ELECTRICAL CHARACTERISTICS

The values of electrical characteristics are specified for $V_{cc} = 1.9 \div 2.7$ V and $T_a = -45 \div +85$ °C. Typical values are at $V_{cc} = 2.05$ V and $T_a = 27$ ° C, unless otherwise specified.

Parameter	Symbol	Condition	Value			Unit	
			min	typ	max		
Supply voltage	V_{cc}	-	1.9	2.05	2.7	V	
Operating temperature range	T_a	-	-45	27	85	°C	
Reference voltage	V_{ref}	-	1.15	1.17	1.18	V	
Reference voltage deviation	ΔV_{ref}	-	-	1.02	-	%	
Temperature error	ΔT	-	-	0.21	-	%	
Output current reference	I_{INT5u}	For output $I_{int_5u<1:0>}$	internal resistor	4.52	5.03	5.63	uA
	I_{EXT5u}	For output $I_{ext_5u<23:0>}$	external resistor	4.96	5.01	5.07	
	I_{EXT1u}	For output $I_{ext_1u<5:0>}$	external resistor	1.00	1.01	1.02	
Current consumption	I_{cc}	-	-	45.3	49.4	uA	
Current consumption in a standby mode	I_{stb}	-	-	0.8	5	nA	
Input logic-high level	V_{IH}	For digital inputs	$0.7 V_{cc}$	-	$V_{cc}+0.25$	V	
Input logic-low level	V_{IL}		-0.25	-	$0.3 V_{cc}$	V	

8 DELIVERABLES

IP contents:

- Schematic or NetList
- Layout or blackbox
- Extracted view (optional)
- GDSII
- DRC, LVS, antenna report
- Test bench with saved configurations (optional)
- Documentation