

General Description

Creating reference voltages and currents is of major importance in nearly every mixed signal circuit for biasing, voltage regulation or comparative purposes.

Because of the ambient temperature's impact on most of the circuit's properties, the Bandgap reference makes use of two temperature dependencies having opposite characteristic:

- a pn junction voltage having a temperature coefficient of appr. -2 mV/K
- a multiple of the temperature voltage V_t having a temperature coefficient of appr. +0.085 mV/K

Combination of both allows achieving a zero first order temperature dependency. This analogue IP cell generates a reference voltage of 1.22V. The voltage is trimmable by 3 control inputs.

Additionally, bias and cascade voltages for N-channel and P-channel MOS transistors are generated.

Ratings, Parameters and Conditions

Parameter / Condition	Symbol	Min	Typ.	Max	Unit	Comment
Electrical Parameters:						
Supply Voltage	V_{dd}	4.75	5	5.25	V	
Active Supply Current	I_{dd}		18		μA	
Supply Voltage Rejection	$PSRR_{VDD}$	50			dB	
N Cascode Voltage	V_{CASN}		1.18		V	
N Bias Voltage	V_{BN}		1		V	
P Cascode Voltage	V_{CASP}		$V_{dd}-1.3$		V	
P Bias Voltage	V_{BP}		$V_{dd}-1.1$		V	
Trimm Range	V_{BG}	1.19	1.22	1.26	V	
Absolute Maximum Ratings:						
Operating Temperature	T_{range}	-40		140	$^{\circ}C$	
Supply Voltage	V_{dd}	-0.3		6	V	
Input Voltage	V_{in}	-0.3		$V_{dd}+0.7$		
Output Voltage	V_{out}	-0.3		$V_{dd}+0.7$		
Operating Conditions:						
Ambient Temperature	T_{amb}	-20	27	80	$^{\circ}C$	

IO-Description

Interface	I/O	Function	Comment
GNDA	input	Supply	
VDDA	Input	Supply	
LSB,NSB,MSB	Input	Trim-Inputs	
VBG	Output	Reference Voltage	
VCASN, VBN	Output	N Bias voltages	
VCASP, VBP	Output	P Bias voltages	

Block schematic, ext. component diagram

