

General Description

Creating reference voltages and currents is of major importance in nearly every mixed signal circuit for biasing and 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 analog IP cell generates a reference voltage of 1.19V. Trimming is not required.

The circuit is optimised to give a very low temperature dependency of the output voltage V_{BG} .

Furthermore the bandgap is designed to have no overshoot, if the supply voltage ramps up faster than 1us.

Ratings, Parameters and Conditions, typical conditions

Parameter / Condition	Symbol	Min	Typ.	Max	Unit	Comment
Operating Conditions:						
Operating Temperature	T_{range}	-40		125	°C	
Supply Voltage	V_{dd}	2.5		5.5	V	
Supply Current	I_{dd}	2		17	µA	
Output Voltage	V_{BG}	1.11	1.19	1.27	V	±7% in monte carlo
Startup Time	t_{su}			250	us	V_{DD} ramps up in $t \leq 50us$
Temp. Coeff. V_{BG}	$TC_{V_{BG}}$			60	ppm/K	
PSRR V_{BG}	$RR_{V_{BG}}$	-20			dB	@100kHz
Absolute Maximum Ratings:						
Supply Voltage	V_{dd}	-0.3		7	V	
Input Voltage	V_{in}	-0.3		$V_{dd}+0.7$		
Output Voltage	V_{out}	-0.3		$V_{dd}+0.7$		

IO-Description

Interface	I/O	Function	Comment
GNDA	Input	Supply	ground
VDDA	Input	Supply	supply voltage
VBG	Output	reference voltage	

Symbol / external schematic

