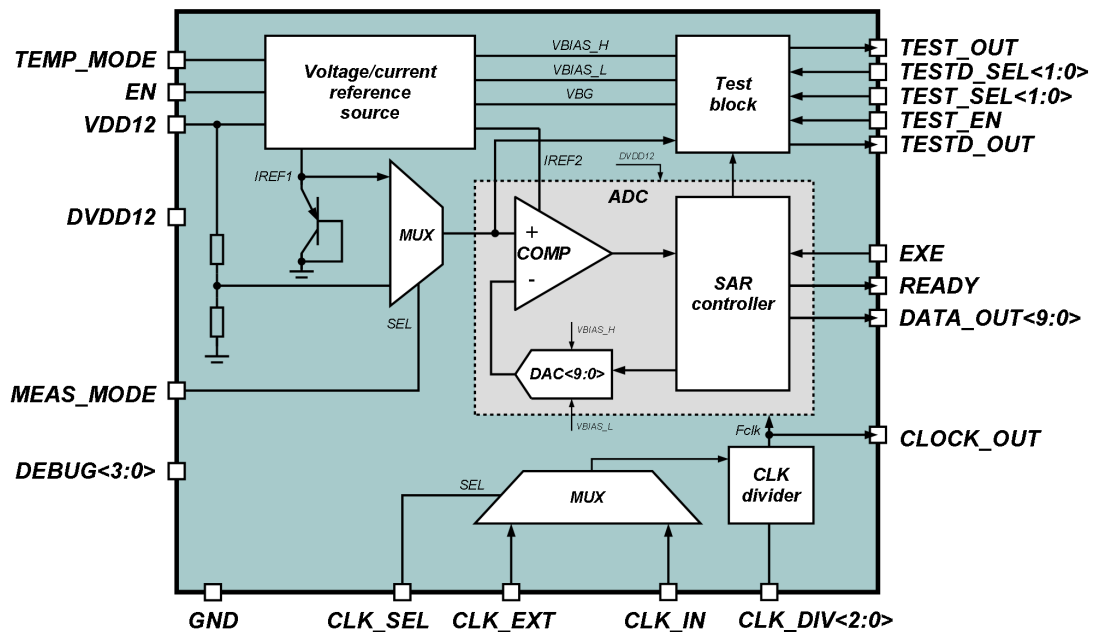


**-40 to +85 °C Temperature sensor**
**OVERVIEW**


130GF\_TS\_01 is a Temperature detector with unique solution intended to continuously monitor IC temperature. It converts temperature between  $-20^{\circ}\text{C}$  and  $+45^{\circ}\text{C}$  to a 10-bit digital word with  $\pm 0.5^{\circ}\text{C}$  accuracy,  $\pm 0.3^{\circ}\text{C}$  accuracy for temperature range  $+30^{\circ}\text{C} \div +45^{\circ}\text{C}$  and  $\pm 1^{\circ}\text{C}$  accuracy for temperature range  $-40^{\circ}\text{C} \div +85^{\circ}\text{C}$ . Temperature detector consists of temperature sensor unit, voltage and current reference block, ADC and test block.

IP technology: GF 130nm Embedded EEPROM

Total area:  $0.29\text{mm}^2$

**ELECTRICAL CHARACTERISTICS**

Parameter	Symbol	Conditions	Value			Units	
			min	typ.	max		
Supply voltage	VDD12	-	1.12	1.2	1.32	V	
	VDD15	-	1.35	1.5	1.65		
Operating temperature	$T_j$	-	-40	35	+85	$^{\circ}\text{C}$	
Temperature measurement range	$T_{\text{meas}}$	-	-40	-	+85	$^{\circ}\text{C}$	
Current consumption in operating mode	$I_{\text{CC}}$	$T_{\text{meas}} = -40 \div 85^{\circ}\text{C}$ , CLK_EXT = 10kHz, CLK DIV = "111"	@VDD12=1.2V	-	13	25	uA
		@VDD15=1.5V	-	14	35		
Current consumption in standby mode	$I_{\text{STB}}$	$T_{\text{meas}} = -40 \div 85^{\circ}\text{C}$ , CLK_EXT = 10kHz, CLK DIV = "111"	@VDD12=1.2V	-	45	800	nA
			@VDD15=1.5V	-	150	1200	
Output DATA resolution	K	-	-	10	-	bits	
Input clock frequency	$F_{\text{in}}$	-	-	2	10	MHz	
Operating clock frequency	$F_{\text{clk}}$	-	-	10	50	kHz	
Conversion time		-	-	$35/F_{\text{clk}}$	-	kHz	
Temperature measurement accuracy with trimming	AT	$T_{\text{meas}} = -40 \div 85^{\circ}\text{C}$	Method T3	-0.49	-	+0.49	$^{\circ}\text{C}$
			Method T2	-0.69	-	+0.69	
		$T_{\text{meas}} = -20 \div 45^{\circ}\text{C}$	Method T3	-0.2	-	+0.2	
			Method T2	-0.3	-	+0.3	
		$T_{\text{meas}} = 30 \div 45^{\circ}\text{C}$	Method T3	-0.12	-	+0.12	
			Method T2	-0.13	-	+0.13	

Notes:

Method T3 - Three-point trimming;

Method T2 - Two-point trimming.