

512-bit EEPROM IP with configuration 16p1w32bit
OVERVIEW

The block is a nonvolatile electrically erasable programmable read-only memory (EEPROM) with volume 512 bits (32(bit per word) x 1(word per page) x 16(page)), which is organized as 16 pages of 1 words by 32 bit with single-bit output data and parallel write data.

Data writing in EEPROM consists of 2 phases - erasing and writing. Written EEPROM page data comes to input `din<31:0>`.

Erasing of words from page, performed by setting a signal `hv_on`, with the signal erase is at state «1». The address of erased page is defined the bus `adr<3:0>`. Value of the bus `adr<3:0>` doesn't change throughout all cycle of deleting (while `hv_on` = «1»).

Data writing from latches to the words is produced by signal setting `hv_on`, thus the signal `write` is in a state «1».

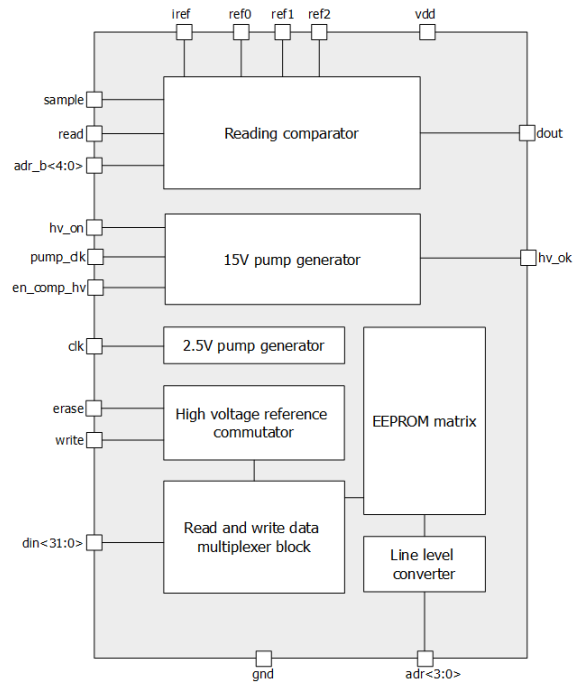
Data reading is performed using the `sample` signal.

Memory is optimized for usage in the industrial and commercial applications, requiring low power consumption and supply voltage.

IP technology: SMIC EEPROM CMOS 0.18um

IP status: silicon proven

Area: 0.07mm²


ELECTRICAL CHARACTERISTICS

Parameter	Symbol	Condition	Value			Unit	
			min	typ.	max		
Low level supply voltage	V _{dd}	-	0.9*	1.1	1.8	V	
Operating temperature range	T	-	-40	+27	+90	°C	
EEPROM size	S	-	-	512	-	bit	
Clock frequency for power supply generators	F _{clk}	-	400	500	600	kHz	
Clock frequency for power supply generators for programing	F _{clk_pump}	-	800	1000	1200	kHz	
Reference current	I _{ref}	-	40	50	60	nA	
Access time	t _{acc}	@V _{dd} 1.0-1.8V	-	200	300	ns	
		@V _{dd} 0.9-1.0V	-	-	1000*		
Active pulse width of hv_on signal	t _{hv_on}	-	1000	1500	2000	us	
Current consumption in read mode	I _{read}	F _{clk} =500kHz, F _S =500kHz	V _{dd} =0.9V	1.46	-	2.42	uA
			V _{dd} =1.0-1.5V	1.64	-	3.82	
			V _{dd} =1.5-1.8V	2.42	-	4.68	
Current consumption in write mode	I _{write}	F _{clk} =500kHz, F _{clk_pump} =1MHz	V _{dd} =1.0V*	4.20	-	9.19	uA
			V _{dd} =1.1V	5.42	-	10.33	
			V _{dd} =1.2-1.4V	6.74	-	14.20	
			V _{dd} =1.4-1.8V	8.04	-	20.11	
Standby current	I _{std}	-	-	-	0.1	uA	
High level input voltage	V _{IH}	For digital inputs	0.7*V _{dd}	-	-	V	
Low level input voltage	V _{IL}		-	-	0.3	V	

*Note – In case V_{dd} drops below 1 V to 0.9 V (wherein, F_{clk} = 512kHz, F_{clk_pump} = 1MHz), writing occurs, but hv_ok indicator does not work. Verification of writing should be done by reading after writing. Data reading speed at voltage less than 1V also decreases and is not guaranteed