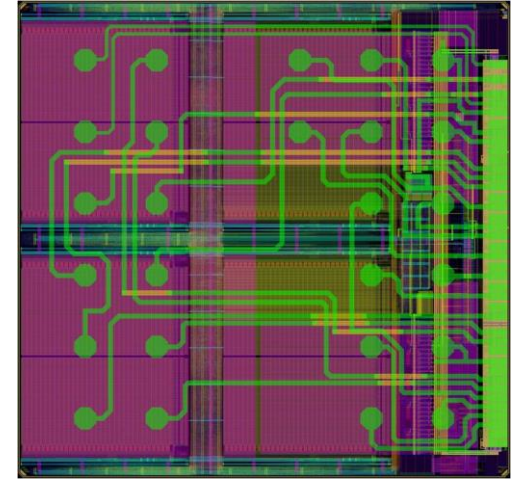


NxH5104 4MBit SPI EEPROM

February 2017, by Karolien De Baere

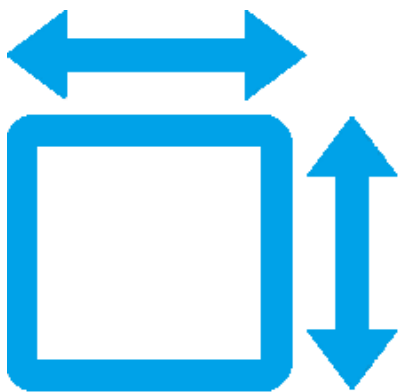


SECURE CONNECTIONS
FOR A SMARTER WORLD

Introducing NxH5104 4MBit EEPROM



4MBit or 500kByte



2.8mm by 2.7mm



**Av. write current
at 0.7mA**



Write protection

NxH5104 – ultra low power 4MBit SPI EEPROM

Minimal footprint	4Mbit in 7.8mm² area (2.80mm by 2.74mm) WL-CSP package with 13 bumps, 400um pitch Highly integrated: 1 external cap
Supply direct from battery	With integrated Power Management Unit to support ZnAir, NiMH and Silver-Zink batteries, offering direct operation from 1.0 .. 2.0V supply
Ultra low power	Designed for minimal average and peak currents: <ul style="list-style-type: none">• Power-down < 5 uA• Average read current at .6 mA
Interfaces	128-byte and 256-byte page access via SPI <ul style="list-style-type: none">• Speed up to 10MHz
Auxiliary supply	Auxiliary supply with current limiting allows supplying e.g. a LED <ul style="list-style-type: none">• 2mA up to 3.2V
Reliable	Operating temperature -20 to 85 degrees >10 years data retention 500 000 program cycles

EEPROM application domains – some examples



**Hearing
Aids**



Metering

**Headset
Hearables**



Medical



NxH5104 Competitor benchmark

There are no 4MBit EEPROM devices announced. Thus benchmark against existing 2MBit EEPROM and 4MBit flash.

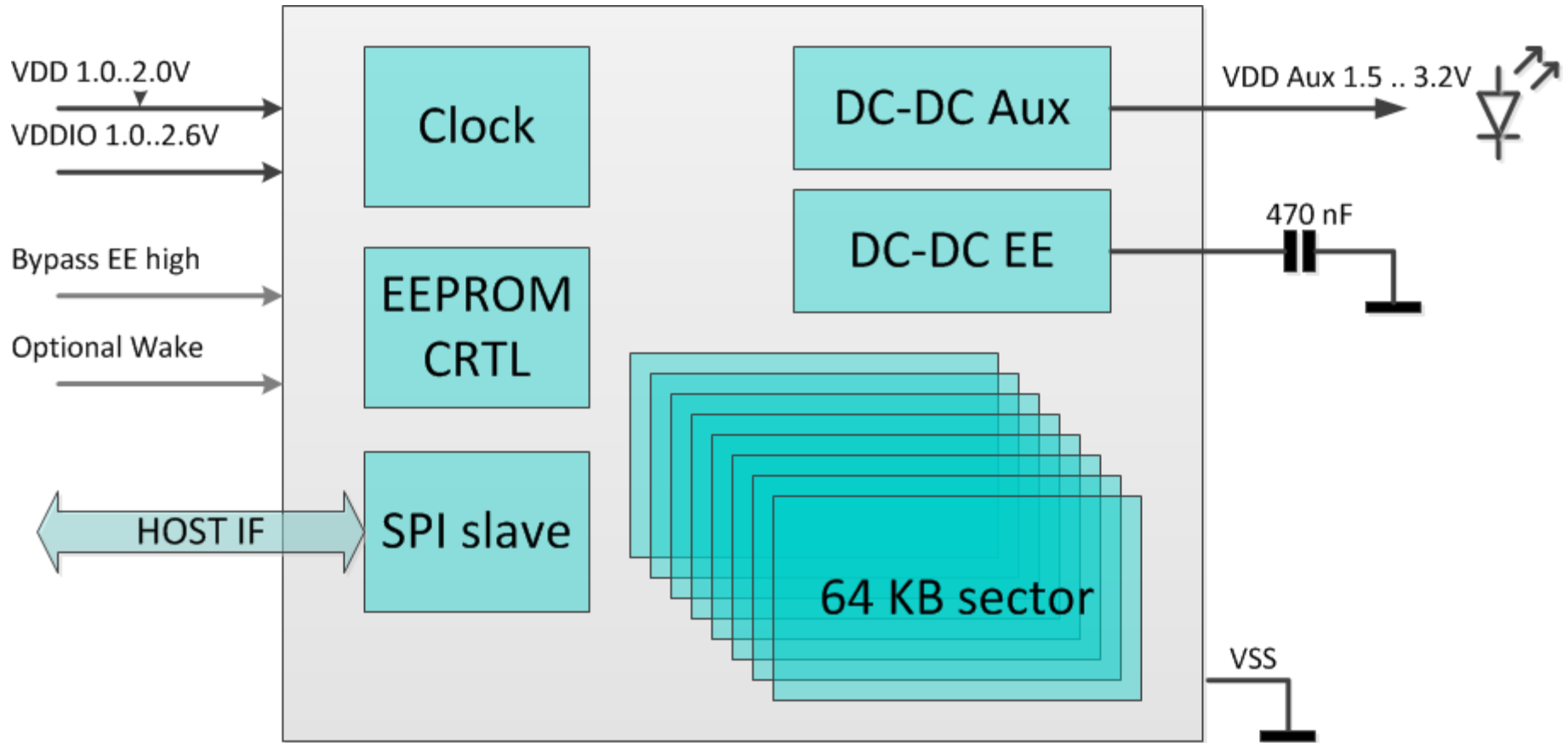
	ST M95M02-DR 2MBit SPI EEPROM	NXP NxH5104 4MBit SPI EEPROM	OnSemi CAT25M02 2MBit SPI EEPROM	MicroChip SST26WF040B 4MBit SPI Flash
Features	2Mbit SPI @ 5MHz	4Mbit SPI @ 10MHz	2MBit SPI @ 5MHz	4Mbit SPI @40MHz
Supply	1.8-5.5V	0.9-2.0V	1.6..3.6V	1.65-1.95V
Current @1.8V	<ul style="list-style-type: none"> •Standby <5uA •Read 3mA •Write 3mA 	<ul style="list-style-type: none"> •Power down <5uA •Read 600uA •Program 1.5mA 	<ul style="list-style-type: none"> • Standby <3uA • Read >1.2mA • Write <2mA 	<ul style="list-style-type: none"> •Standby 2uA •Read 10 mA •Write 25 mA
Reliability	1 MCycles 200Yrs retention -40°C to +85°C	500 kCycles >10yrs retention -20°C to +85°C	1 MCycles 100yrs retention -40°C to +125°C	100 kCycles 100yrs retention -40°C to +85°C
Drive LED	No	Yes	No	No
Footprint/ package (*)	7.2mm2 WLCSP8 SO8	7.8mm2 WLCSP13	6.4mm2 WLCSP8 SO8	SO8 WSO8 – 30mm2

Alternative recent technologies as MRAM and FRAM require higher supply levels (e.g. 3.3V or 2.5V) and are very expensive.



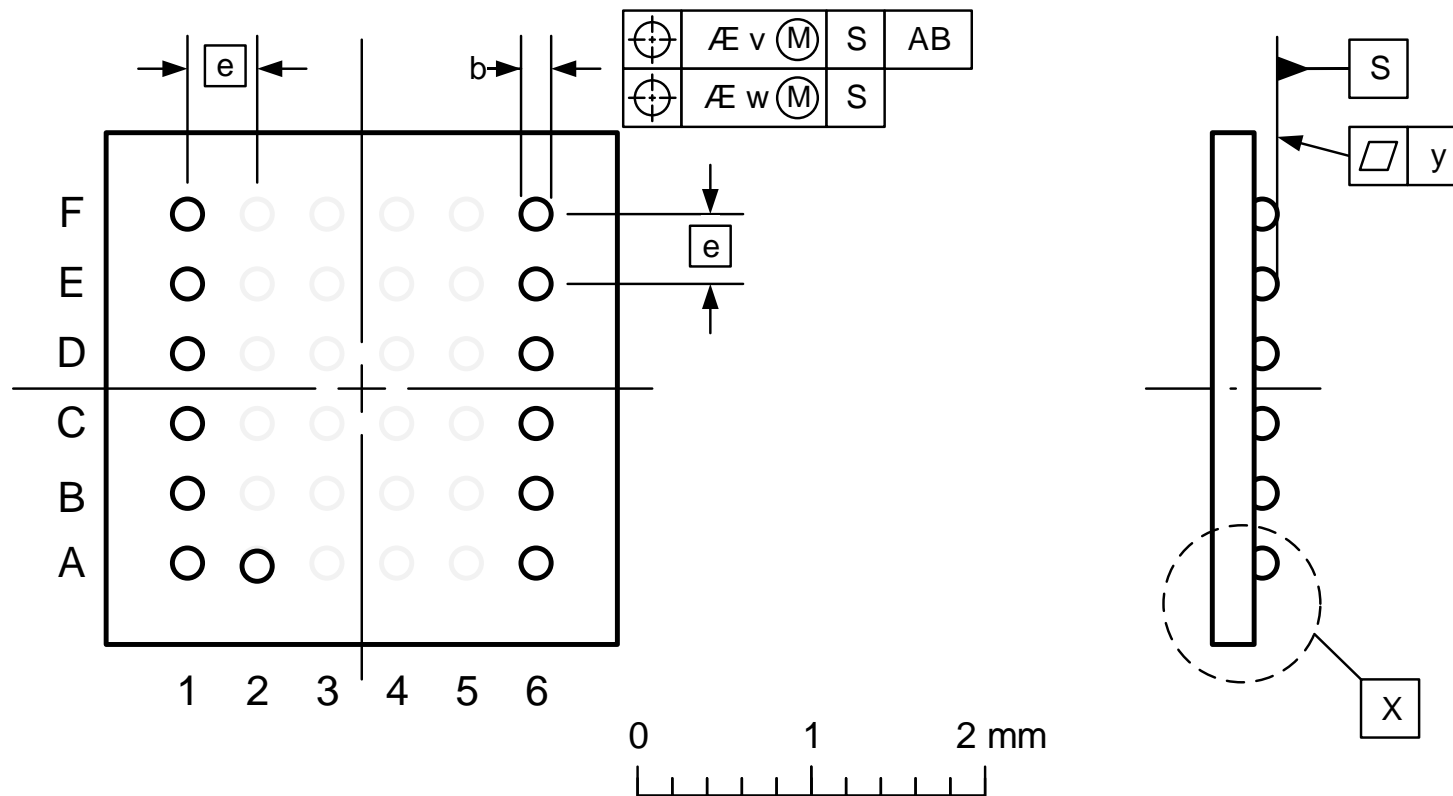
NxH5104 4MBit SPI EEPROM

Block diagram



NxH5104 4MBit SPI EEPROM

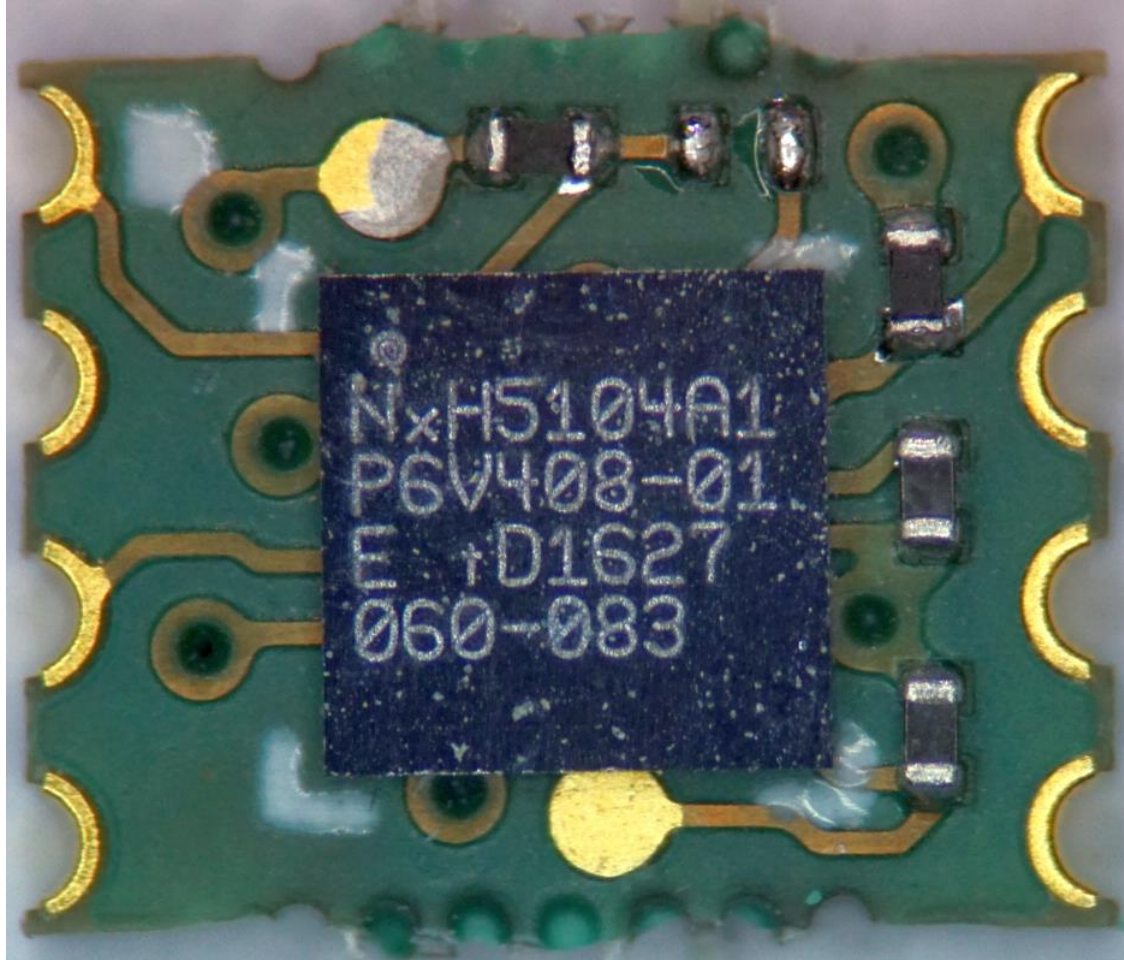
Package outline



Dimensions (mm are the original dimensions)

Unit	A	A ₁	A ₂	b	D	E	e	e ₁	e ₂	v	w	y
max	0.42	0.115	0.305	0.140	2.83	2.77						
nom	0.38	0.100	0.280	0.125	2.80	2.74	0.4	2.0	2.0	0.15	0.05	0.05
min	0.34	0.085	0.255	0.110	2.77	2.71						

SO-8 style evaluation board



NxH5104 4MBit SPI EEPROM

Application modes

- Single supply for VDD and VDDIO
- Single HIGH supply for VDD and VDDIO
- Dual supply for VDD and VDDIO

