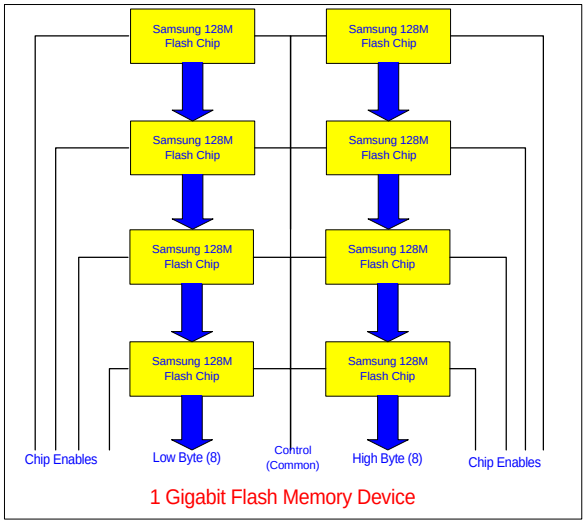
Irvine Sensors Corporation
Microelectronics Products Division

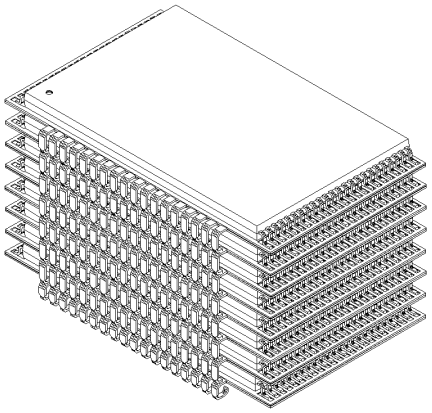
1 Gigabit FLASH Memory Stack

Features:

- Low Profile: same PCB area as a single device
- Identical footprint for ¼, ½, and 1 Gigabit Stacks
- User configurable as x8 or x16
- Utilizes factory tested, state of the art Samsung 128Mbit TSOPs
- Highest density memory available today



- Low cost, economical for volume commercial applications
- Single power supply (2.7V – 3.6V) operation; no high programming voltage required
- Organization
  - Memory Cell Array : (16M + 512K)bit x 8bit
  - Data Register : (512 + 16)bit x8bit
- Automatic Program and Erase
  - Page Program : (512 + 16)Byte
  - Block Erase : (16K + 512)Byte
- 528-Byte Page Read Operation
  - Random Access : 7 µs (Max.)
  - Serial Page Access : 50ns (Min.)
- Fast Write Cycle Time
  - Program time : 200 µs (typ.)
  - Block Erase time : 2ms (typ.)
- Command/Address/Data Multiplexed I/O port
- Hardware Data Protection
  - Program/Erase Lockout During Power Transitions
- Reliable CMOS Floating-Gate Technology
  - Endurance : 1M Program/Erase Cycles
  - Data Retention: 10 Years



Dimensions: 0.824”L x 0.532”W x 0.460”H

General Description

The Irvine Sensor’s Microelectronics Products Division’s 1 Gigabit flash memory provides the highest density, lowest cost memory products available today. This product provides for 1 Gigabit (128 Mbytes) of non-volatile Flash memory in a footprint of less than ½ square inch. It also provides a cost-effective method to reduce PCB count and size in systems requiring large amounts of memory.

The device is configured as a 16 bit wide device and can be user configured as a 8 bit wide or 16 bit wide device. Separate chip enables are available for each chip in the stack. For 8 bit applications the data pins needing to be tied together are adjacent to each other to simplify the PCB design. Similarly, in 16 bit, applications the CEs needing to be tied together are adjacent. This device is the optimum solution for large nonvolatile storage applications such as solid state file storage, digital voice recorder, digital still camera, and other portable applications requiring non-volatility.

For more information contact MPD Sales:
Phone 1-714-549-8211 Fax 1-714-444-8840 E-mail mpdsales@irvine-sensors.com
Irvine Sensors Corporation, 3001 Redhill Avenue, Building 3, Costa Mesa, CA 92656-4529

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This 4-high stack is available in commercial and industrial temperature ranges, and with single supply voltages from 2.7 to 3.6 volts. It utilizes Samsung's 128 Mbit device, the KM29U128. This device is a 16M (16,777,216) x 8bit NAND Flash Memory with a spare 512K (524,288) x 8bit. Its NAND cell provides the most cost-effective solution for the solid state mass storage market. A program operation programs the 528-byte page in typically 200ms and an erase operation can be performed in typically 2ms on a 16K-byte block. Data in the page can be read out at 50ns cycle time per byte. The I/O pins serve as the ports for address and data input/output as well as command inputs. The on-chip write controller automates all program and erase functions including pulse repetition, where required, and internal verify and margining of data. Even the write-intensive systems can take advantage of the KM29U128's extended reliability of 1,000,000 program/erase cycles by providing either ECC (Error Correcting Code) or real time mapping-out algorithm. These algorithms have been implemented in many mass storage applications. Also, the spare 16 bytes of a page combined with the other 512 bytes can be utilized by system-level ECC. Samsung's detailed data sheet is available at the following Internet address:
http://www.usa.samsungsemi.com/products/prodspec/flash/KM29U128T/index.htm

Significant Parameters

Parameter	Min	Typ	Max	Unit
Supply Voltage	2.7	3.3	3.6	Volts
Operating Current (Read, Program & Erase)	-	80	160	mA
Stand-by Current	-	80	400	µA
Valid Block Number (per chip)	1004	1014	1024	Blocks
Program Time	-	0.2	1.0	ms
Block Erase Time	-	2	4	ms
Write Cycle Time	50			ns
Data transfer from cell to register	-	-	7	µs
Read Cycle Time	50	-	-	ns
Device Resetting time(read/program/erase)			5/10/500	µs
Temperature range	-40	-	+85	°C

Pin Numbering

Pin #	Name
1	WP
2	WE
3	ALE
4	CLE
5	Vss
6	Vcc
7	CEH
8	CEF
9	Vss
10	Vss
11	D3
12	D11
13	D2
14	D10
15	D1
16	D9
17	D0
18	D8

Name	Pin#
SE	36
R/B	35
RE	34
CEA	33
CEC	32
CEB	31
CED	30
CEG	29
CEE	28
Vcc	27
D4	26
D12	25
D5	24
D13	23
D6	22
D14	21
D7	20
D15	19

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