swissbit®

DRAM Memory Products

Solutions for Industrial and Embedded Applications
Chip-On-Board Technology (COB)

DDR3
DDR2
DDR
SDRAM

swiss powered
made in germany
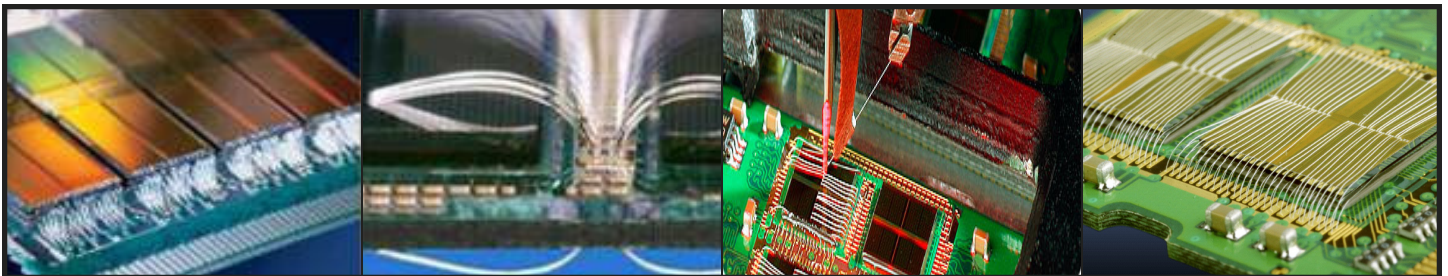
INTRODUCTION TO COB

Swissbit is the worlds only manufacturer utilizing Chip-On-Board (COB) technology to produce a robust line of memory modules that lend themselves to demanding Industrial and Embedded applications. With over 12 years of experience and success in the assembly of COB memory modules, Swissbit enables its customers to take advantage of COB features not found in SMT memory modules.

COB Description

Chip-On-board (COB) technology involves mounting DRAM or Flash semiconductor die directly on a substrate without the need of a packaged component. Eliminating the FBGA or TSOP component package reduces the required substrate area and assembly weight. The saving in area can be as much as 20% in some cases. Using conventional printed circuit boards (PCBs) and standard wire bonding technology, COB technology can yield up to a factor of 5 in weight and volume reduction. COB technology also reduces the number of interconnects between an active die and the substrate (i.e., the package pins), which improves the overall circuit speed, leads to higher clock rates, better electrical performance and improved signal quality and increases the overall reliability of the module. A coating of an Epoxy encapsulent (or Glob Top) is applied that hermetically seals and protects the die and the wire bonded interconnections. The Glob Top also acts like a heat spreader between dies, improves heat emission, adds low coefficients of thermal expansion (CTEs), and provides a hermetically sealed module assembly. The die is glued directly to the PCB and provides for increased heat dissipation from the die through the PCB. Swissbit encapsulates the semiconductor die onto the PCB as a total module package, the complete assembly is extensively temperature tested as a unit, not separate components prior to SMT assembly. This also enables Swissbit to offer its line of COB modules in four temperature grade levels.
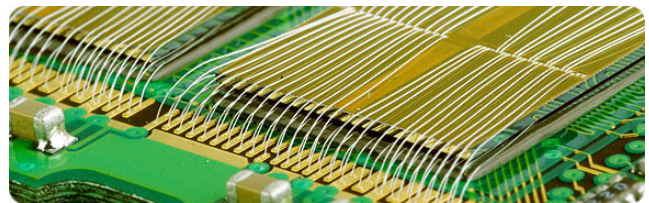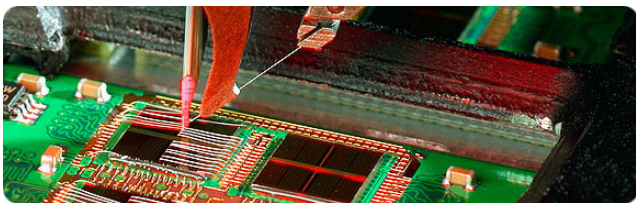
COB FEATURES & BENEFITS

A COB memory module as offered by Swissbit provide customers with the following advantages:

- Typically Swissbit SODIMMS are 1.00" (25.4mm) high, low profile format. Typical SMT modules are 1.25" (31.75mm). This enables Swissbit's modules to be used in more applications and allows better airflow.

- COB modules are 3.0mm thin; typical SMT modules are 3.8mm thick. A thinner design allows for better air flow around the installed module in most applications resulting in cooler operation.

- The thermal properties of Swissbit modules are superior to typical SMT modules. COB modules dissipate heat more efficiently and will run lower die junction temperatures in demanding convective cooling conditions. A cooler operating module runs faster and lasts longer.

- Our COB module has less lead frame connections then the typical SMT modules, which results in better signal integrity and higher reliability.

- Swissbit COB modules are available in commercial temperature grade (0°C to +70°C) and three extended temperature grades up to industrial grade (-40°C to +85°C).

- COB modules accept conformal coating better then the typical SMT modules do to their low profile and Glob Top encapsulation.

- Swissbit COB modules are inherently ruggedized for shock and vibration due to the COB technology and the Glob Top encapsulation process; typical SMT modules are not ruggedized.

- Swissbit COB modules are burned in and 100% tested at the module level as finished product, not at the IC level before assembly.

- All Swissbit COB modules are RoHS compliant.

THERMAL ADVANTAGES OF COB
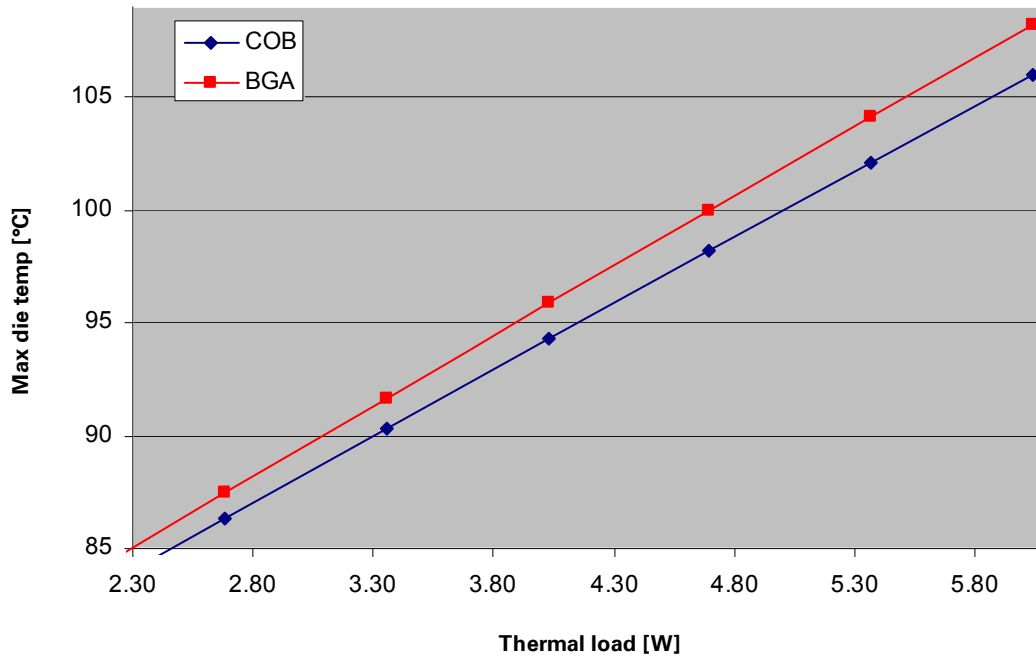
In low convection cooling situations COB can be up to 3°C cooler than BGA
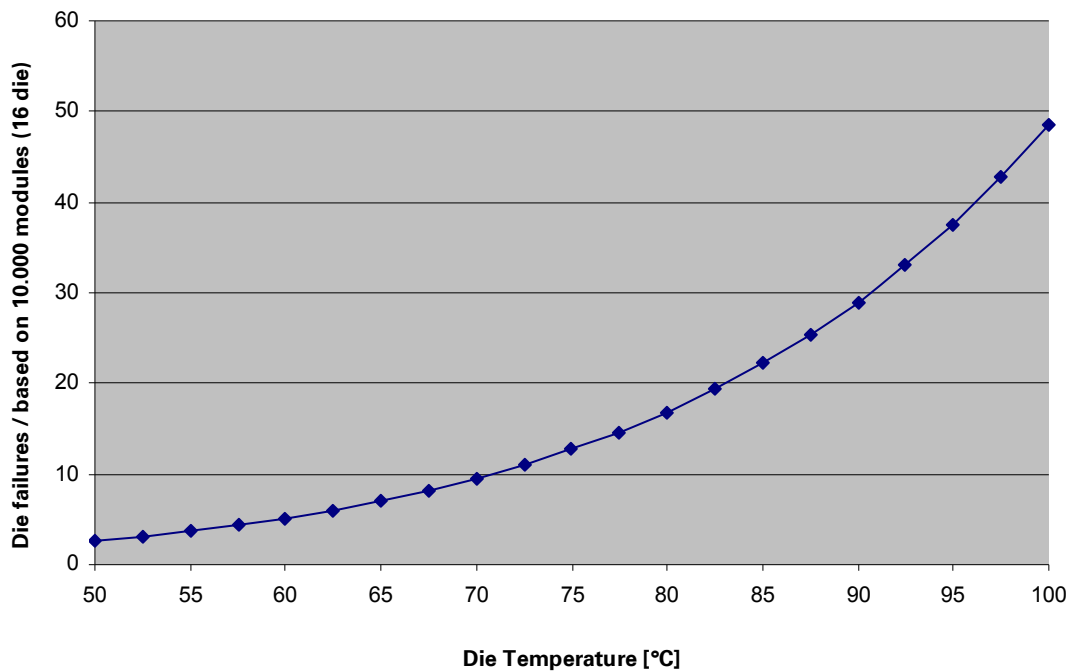
A 3°C higher die temperature increases module failure rates by approximately 15%

swissbit®

COB MEMORY MODULE PRODUCT LINE

Density	Swissbit PN	Data Rate (MT/s) – CL	Height	# IC's	IC Org	Rank
DDR3 SDRAM SODIMM (204 pin)						
512MB (64Mx64)	SGN06464xxCB1MT-ssR	800-CL5 / 1066-CL7 / 1333-CL9	1.18" (30.00mm)	4	64Mx16	1
1GB (128Mx64)	SGN12864xxBD1MT-ssR	800-CL5 / 1066-CL7 / 1333-CL9	1.18" (30.00mm)	8	128Mx8	1
2GB (256Mx64)	SGN25664xxBD2MT-ssR	800-CL5 / 1066-CL7 / 1333-CL9	1.18" (30.00mm)	16	128Mx8	2
DDR2 SDRAM SODIMM (200 pin)						
512MB (64Mx64)	SEN06464S2CE1MT-ssR	533-CL4 / 667-CL5 / 800-CL5	1.00" (25.40mm)	4	64Mx16	1
1GB (128Mx64)	SEN12864S1BE1MT-ssR	533-CL4 / 667-CL5 / 800-CL5	1.18" (30.00mm)	8	128Mx8	1
2GB (256Mx64)	SEN25664S1BE2MT-ssR	533-CL4 / 667-CL5 / 800-CL5	1.18" (30.00mm)	16	128Mx8	2
DDR SDRAM SODIMM (200 pin)						
256MB (32Mx64)	SDN03264O3B41MT-ssR	266-CL2.5 / 333-CL2.5 / 400-CL3	1.00" (25.40mm)	8	32Mx8	1
256MB (32Mx72)	SDN03272S4B41MT-ssR	266-CL2.5 / 333-CL2.5 / 400-CL3	1.06" (27.00mm)	9	32Mx8	1
512MB (64Mx64)	SDN06464O3B42MT-ssR	266-CL2.5 / 333-CL2.5 / 400-CL3	1.00" (25.40mm)	16	32Mx8	2
512MB (64Mx64)	SDN06464S4B51MT-ssR	266-CL2.5 / 333-CL2.5 / 400-CL3	1.06" (27.00mm)	8	64Mx8	1
512MB (64Mx72)	SDN06472S4B51MT-ssR	266-CL2.5 / 333-CL2.5 / 400-CL3	1.06" (27.00mm)	9	64Mx8	1
1GB (128Mx64)	SDN12864S4B52MT-ssR	266-CL2.5 / 333-CL2.5 / 400-CL3	1.06" (27.00mm)	16	64Mx8	2
1GB (128Mx72)	SDN12872S4B52MT-ssR	266-CL2.5 / 333-CL2.5 / 400-CL3	1.06" (27.00mm)	18	64Mx8	2
2GB (256Mx64)	SDN25664S3A62MT-ssR	266-CL2.5 / 333-CL2.5 / 400-CL3	1.06" (27.00mm)	32	128Mx4	2
DDR SDRAM MicroDIMM (172 pin)						
512MB (64Mx64)	SDM06464A1B41MT-ssR	266-CL2.5 / 333-CL2.5 / 400-CL3	1.18" (30.00mm)	8	64Mx8	1
1GB (128Mx64)	SDM12864A1B42MT-ssR	266-CL2.5 / 333-CL2.5 / 400-CL3	1.18" (30.00mm)	16	64Mx8	2
DDR SDRAM UDIMM (184 pin)						
256MB (32Mx64)	SDU03264O1B41MT-ssR	266-CL2.5 / 333-CL2.5 / 400-CL3	1.00" (25.40mm)	8	32Mx8	1
512MB (64Mx64)	SDU06464O1B51MT-ssR	266-CL2.5 / 333-CL2.5 / 400-CL3	1.00" (25.40mm)	8	64Mx8	1
1GB (128Mx64)	SDU12864O1B52MT-ssR	266-CL2.5 / 333-CL2.5 / 400-CL3	1.00" (25.40mm)	16	64Mx8	2
SDRAM SODIMM (144 pin)						
128MB (16Mx64)	SSN01664O3B31MT-ssR	100-CL2 / 133-CL3 / 133-CL2	1.00" (25.40mm)	8	16Mx8	1
128MB (16Mx72)	SSN01672O4B31MT-ssR	100-CL2 / 133-CL3 / 133-CL2	1.00" (25.40mm)	9	16Mx8	1
128MB (16Mx64)	SSN01664R1C41MT-ssR	100-CL2 / 133-CL3 / 133-CL2	1.00" (25.40mm)	4	16Mx16	1
256MB (32Mx64)	SSN03264O3B32MT-ssR	100-CL2 / 133-CL3 / 133-CL2	1.00" (25.40mm)	16	16Mx8	2
256MB (32Mx72)	SSN03272O4B32MT-ssR	100-CL2 / 133-CL3 / 133-CL2	1.00" (25.40mm)	18	16Mx8	2
256MB (32Mx64)	SSN03264R1C42MT-ssR	100-CL2 / 133-CL3 / 133-CL2	1.00" (25.40mm)	8	16Mx16	2
512MB (64Mx64)	SSN06464P3B42MT-ssR	100-CL2 / 133-CL3 / 133-CL2	1.00" (25.40mm)	16	32Mx8	2
1GB (128Mx64)	SSN12864S2B22MT-ssR	100-CL2 / 133-CL3 / 133-CL2	1.25" (31.75mm)	16	64Mx8	2

NOTE: ALL COB MEMORY MODULES AVAILABLE IN 4 OPERATING TEMPERATURE RANGES UP TO INDUSTRIAL TEMPERATURE GRADE (–40°C TO +85°C)

THIS REPRESENTS A PARTIAL LISTING OF OUR PRODUCT LINE

DRAM MODULE PART NUMBER GUIDE

S E N 128 64 D1 B 5 1 MT - 30 - * R *

1 2 3 4 5 6 7 8 9 10 11 12 13 14

Swissbit Memory (1)

Product Group (2)

S: SDRAM SDR
D: SDRAM DDR
E: SDRAM DDR2
G: SDRAM DDR3

Module Type (3)

SDR
U: 168 Pin UDIMM 3.3V
R: 168 Pin RDIMM 3.3V
N: 144 Pin SODIMM 3.3V
DDR
U: 184 Pin UDIMM 2.5V
R: 184 Pin RDIMM 2.5V
N: 200 Pin SODIMM 2.5V
M: 172 Pin Micro-DIMM 2.5V
DDR2
U: 240 Pin UDIMM 1.8V
R: 240 Pin RDIMM 1.8V, w/o Parity
P: 240 Pin RDIMM 1.8V, w/ Parity
F: 240 Pin FBDIMM
N: 200 Pin SODIMM 1.8V
G: 200 Pin SORDIMM 1.8V
DDR3
U: 240 Pin UDIMM 1.5V
R: 240 Pin RDIMM 1.5V
N: 200 Pin SODIMM 1.5V

Data Depth (4)

008:	64MB	256:	2GB
016:	128MB	512:	4GB
032:	256MB	01G:	8GB
064:	512MB	02G:	16GB
128:	1GB		

Data Width (5)

32: w/o Parity
36: w/ Parity
64: w/o ECC
72: w/ ECC

Printed Circuit Board with Revision (6)

AMB / Heat Spreader (14)

RoHs / Lead Free (13)

Temperature Rating (12)

C: (or blank) (0°C to +70°C)
E: Ext. Temp. (0°C to +85°C)
I: Ext. Temp. (-25° to +85°C)
W: Ind. Temp. (-40° to +85°C)

Speed (11)

DDR3
AA:	DDR3-800 CL5	AB:	DDR3-800 CL6
BA:	DDR3-1066 CL6	BB:	DDR3-1066 CL7
CA:	DDR3-1333 CL7	CB:	DDR3-1333 CL8
CC:	DDR3-1333 CL9		

DDR2
50:	DDR2-400 CL3	37:	DDR2-533 CL4
30:	DDR2-667 CL5	3A:	DDR2-667 CL4
25:	DDR2-800 CL6	2A:	DDR2-800 CL5

DDR
08:	DDR-200 CL2	75:	DDR-266B CL2.5
70:	DDR-266A CL2	7A:	DDR-266A CL2
60:	DDR-333B CL2.5	6A:	DDR-333A CL2
50:	DDR-400B CL3	5A:	DDR-400A CL2.5

SDR
10:	PC-100 CL3	08:	PC-100 CL2
75:	PC-133 CL3	70:	PC-133 CL2

DRAM Manufacturer (10)

MT: Micron Technology
EP: Elpida
QI: Qimonda
SA: Samsung

Module Ranks (9)

1: 1 Rank Module
2: 2 Rank Module

DRAM Revision (8)

DRAM Organization (7)

A:	x4	D:	x4 TSOP Stack
B:	x8	E:	x8 TSOP Stack
C:	x16	G:	x4 BGA Stack

WHY CHOOSE SWISSBIT

Swissbit is the largest independent DRAM module and Flash storage manufacturer in Europe and is a global leader in technology supplying High Quality Memory solutions to the Industrial, Embedded, Communications & Networking, Military & Aerospace, Automotive, Casino Gaming, and Medical Equipment markets. Swissbit was created from a management buy-out from Siemens Memory Products in 2001 and has over 17 years of combined knowledge and experience in the memory industry. Swissbit's commitment to high quality, reliability, exceptional customer service, and competitive pricing is what enables our customers and partners to enjoy a constant source of supply and product commitment for their past, current, and future requirements.

Product Depth
- Complete line of DRAM modules and NAND Flash Solid State Drives
- Extensive support on DDR3, DDR2, DDR, SDRAM, DRAM memory modules
- Interface expertise SATA, PATA, DMA CFC, UDMA CFC, USB, and SD Flash Products
- Application specific form factors (VLP, UDIMM, RDIMM, miniDIMM, SORDIMM, SOCDIMM)
- Unique Chip-On-Board (COB) technology
- Extended and Industrial temperature grade product offering

Sales Service and Engineering Support
- Fast, effective, and competent sales staff on hand to serve your needs
- Your requirements combined with our market expertise result in tailor-made solutions
- Our expert technical staff is available for quick response
- Fast turn sample and production orders
- Global manufacturing facilities

In-House Manufacturing
- Worlds only COB memory manufacturer
- 1 Million product-per-month capacity
- Faster time-to-market
- Dock-to-stock delivery

Customization
- Custom module and Flash designs
- Electronic Design and Manufacturing Services (EDMS)
- Patented static / active wear leveling
- Patented data loss protection
- Security features
- Thermal simulations
- Labeling

OEM Services
- Controlled Bill of Materials (BOM)
- Serialization and Lot Code Tracking
- Quality and Engineering documents provided
- Support long life cycles
- Vendor Managed Inventory (VMI)

Test for Reliability
- Advantest, KTI, and CST
- System level Test During Burn-In (TDBI)
- Extended and Industrial Temperature Testing
- Environmental testing
- Application testing

Compliance
- RoHS
- WEEE
- UL
- FCC
- CE

Quality
- ISO 9001:2000

Associations
- Member of CompactFlash Association (CFA)
- Member of JEDEC
- Member of Memory Implementers Forum
- Member of SATA-IO
- Member of SecureDigital Association (SDA)
- Member of USB Implementer Forum
- Designs Qualified by Intel Designated Test Laboratory (CMTL)