

System In Package

Highlights

Fast Time to Market

Lower cost vs. System on Chip

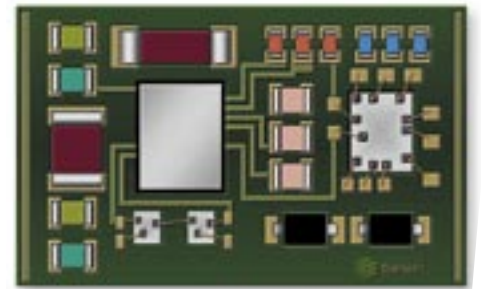
Product customization

SiP

Carsem's SiP (System in Package) is the advanced technology of placing multiple ICs and passive components into a single package. We can integrate a variety of die technologies and discrete components using flip chip, wire bond and stacked die capabilities on organic (BT) and ceramic (LTCC) substrates in both **BGA** (Ball Grid Array), and **LGA** (Land Grid Array) options, as well as our leadframe based **MLP** (Micro Leadframe Package) technology. For enhanced performance, we can "laser trim while testing" using our RF, mixed signal and digital testers. We offer the ability to test your device in our MLP package and mount it into an array based SiP to address potential die yield issues making the SiP a very cost effective solution. We can do all of this, plus final test your product and ship direct to your end customer.

Applications:

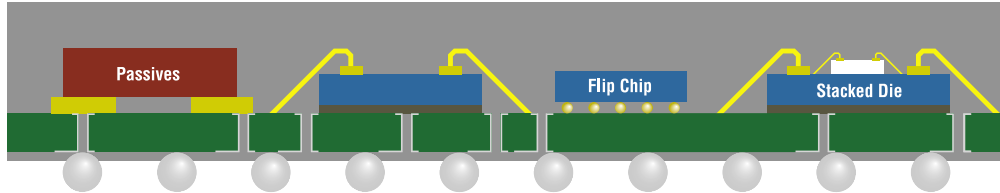
Carsem's SiP technology provides a fast and cost effective solution for providing complex innovative products when compared to the more traditional System on Chip (SOC) technology. Our customers can go from design concept to volume production in a matter of weeks, not the several months to a few years associated with SOC. SiP devices are typically used in power management, sensor, RF & wireless applications for mobile phones, PDA's, GPS, WiFi and Bluetooth™ products.



Features:

- Array package sizes from 3x3 mm to 30x30 mm, with pitches as small as 0.5mm in mold thickness options from 0.68 mm to 2.5 mm.
- Custom SiP's using specially designed MLP leadframes.
- Any combination of flip chip and wire bond technology plus stacked die for optimum device performance.
- Ability to laser trim while testing.
- Ability to mount a tested MLP or Micro Package into an array based SiP for improved yields.
- Passive sizes as small as 0201.
- Flexibility of design and rapid time to market.
- Reduced area of PCB in final application.
- Complete Assembly & Test Solution including RF testing, tape and reel plus drop ship.

System in Package



Capability Highlights

- Organic(BT), Ceramic & LTCC Substrates
- Custom designed MLP leadframes for SiP's
- Chip shooters for passives as small as 0201
- Multi-wafer die attach equipment
- Stacked die
- High volume Flip Chip and under-fill equipment
- Wire bond including chip to chip
- Laser trim while testing
- Saw singulation for custom body sizes
- Fast turn MLP, BT and LTCC prototypes
- Design & simulation
- Thermal & mechanical modeling
- Board level reliability testing
- Pb-Free and Green options available

Examples of Products

Package (mm)	I/O's	Substrate	# Passives	# IC's	# Flip Chip	MSL
1.42x1.18	8	BT		4		1
4.9 x 3.2	8	BT	2	3		3
5 x 5	28	MLP	4	2		3
7 x 7	48	BP	6	1	1	3
11 x 9	24	BT	1	1	1	3
10 x 14	34	Ceramic	49	1	1	3
11.4 x 10.2	36	FR4	1	1	1	3
11.5 x 7.5	56	BT	13	3		3
11 x 11	133	BT	3	6	2	3
14 x 14	219	BT	16	6	1	3
15.5x9.25	161	BT	10	12		3

SiP Reliability Testing

Description	Condition
Board Level (PCB)	Temp Cycle, Real time monitor, 1000 Cycles
MSL	85°C/85%RH for 168 Hrs; 3 x IR @ 235°C
Auto Clave	121°C/100%RH; 15PSIG; 336 Hrs
Temperature Cycle	-65°C/150°C; Air; 1000 Cycles
Thermal Shock	-55°C/125°C; Liquid; 1000 Cycles
High Temperature Storage	150°C; 1000 Hrs

This guide is for reference only and Carsem makes no warranty or guarantee of its accuracy. For inquiries or official Carsem documentation, please contact any of our Sales Offices or visit our web site.

Malaysia

Ipoh (M-site)
tel: 60-5-3123333
fax: 60-5-3125333

Malaysia

Ipoh (S-site)
tel: 60-5-5262333
fax: 60-5-5265333

China

Suzhou
tel: 86-512-6258-8883
fax: 86-512-6258-8885

Europe

UK
tel: 44-1793-853888
fax: 44-1793-853888

USA

Silicon Valley
tel: 831-438-6861
fax: 831-438-6863

USA

Los Angeles
tel: 626-854-0939
fax: 626-854-9139

USA

Dallas
tel: 972-580-1706
fax: 972-580-1806

USA

Boston
tel: 508-699-4720
fax: 508-699-4512

Taiwan

Taichung
tel: 886-917-210285



www.carsem.com
info@carsem.com

A Member of
the Hong Leong Group Malaysia