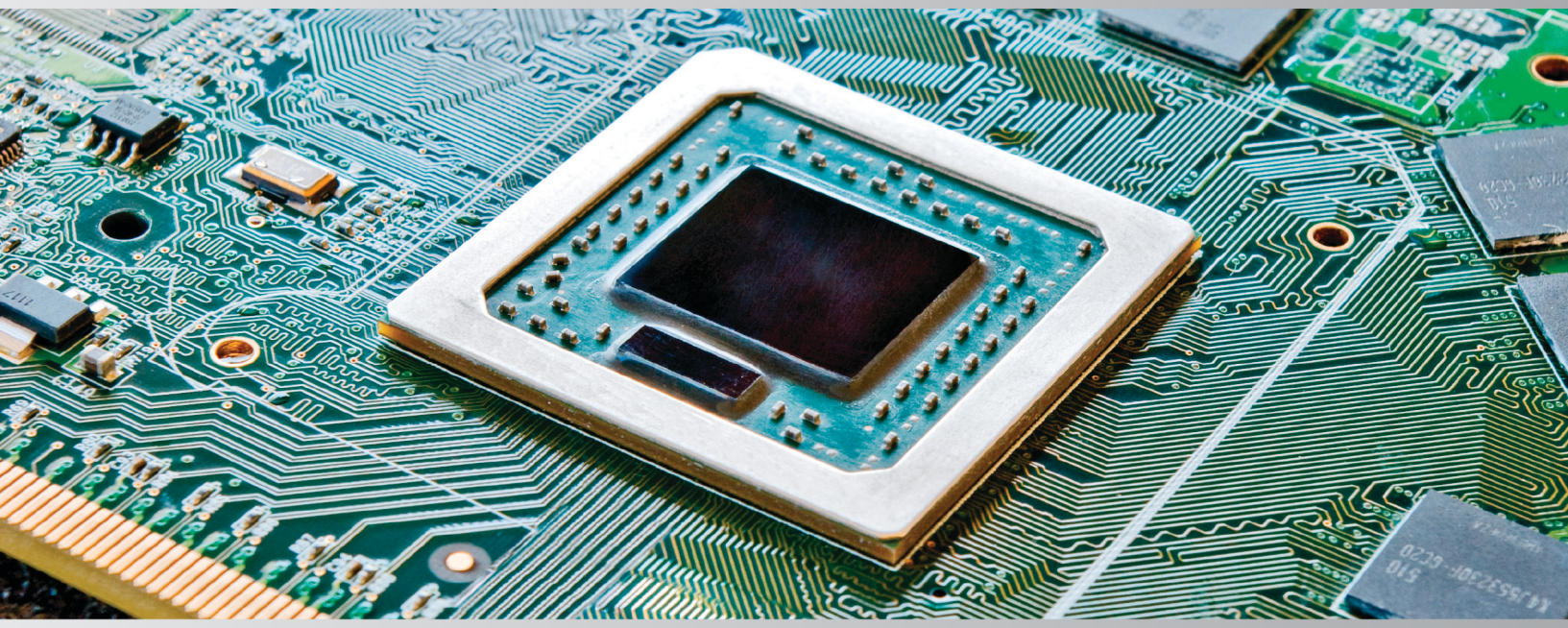
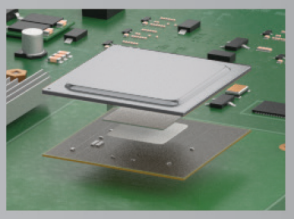
LOCTITE®

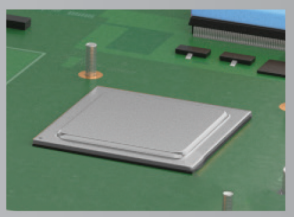


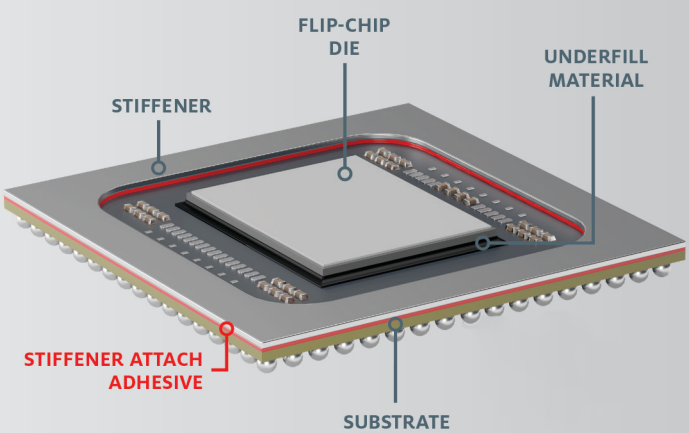
LID ATTACH AND STIFFENER ATTACH ADHESIVES

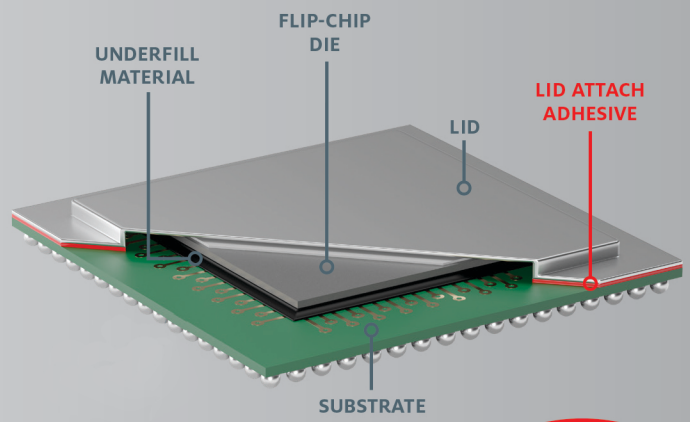
CONDUCTIVE AND NON-CONDUCTIVE

Semiconductor ICs used for high-performance computing and other high-speed processes predominantly use flip-chip technology for packaging the IC chip. These ICs generate a tremendous amount of heat which needs to be extracted away from the IC using a heat spreader like a lid or a cooling fin system. A stiffener ring is normally used in a package if a cooling fin is attached to the die backside without using a lid. Under these thermal loads, the die and the package experience warpage which will impact the stability and reliability of the package. So, the role of an adhesive is extremely important to ensure good adhesion of the lid or stiffener to the substrate and to minimize the impact of warpage. Henkel's portfolio of lid attach and stiffener attach adhesives has strong adhesion to lid, stiffener and substrate materials while providing excellent processability with precise dispensing characteristics, short curing profiles and good reliability performance.









Henkel

LOCTITE®

CONDUCTIVE ADHESIVE

		LOCTITE® ABLESTIK CE3920	LOCTITE ABLESTIK ICP 3920	LOCTITE ABLESTIK 8175	LOCTITE ECCOBOND 3185	LOCTITE ABLESTIK QMI529HT-LV	LOCTITE ABLESTIK 965-1L
Technology		Epoxy	Epoxy	Epoxy	Sycar	BMI/Acrylate	Epoxy
Viscosity (cP)		26,100	26,100	55,000	42,000	185,000	12,000
Thixotropic Index (TI)		5.70	5.70	2.00	4.00	4.68	4.50
Volume Resistivity (Ω-cm)		0.00030	0.00030	0.00050	0.00100	0.00004	≤0.0005
T_g by Post Mold Cure TMA (°C)		119	119	90	-13/37	33	72
Coefficient of Thermal Expansion (ppm/°C)	**Below T_g**	29	29	55	55	53	50
	Above T_g	130	130	200	135	156	190
Storage Modulus at (GPa)	**25°C**	4.96	4.96	6.50	0.29	3.3	4.80
	250°C	0.10	0.10	0.15	0.14	0.30	0.30
Thermal Conductivity (W/m-K)		3.3	3.3	3.2	3.9	6.5	3.0
Cure Condition		5 min. at 150°C	5 min. at 150°C	30 min. at 150°C	60 min. at 175°C	60 sec. at 185°C	60 min. at 150°C

NON-CONDUCTIVE ADHESIVE

		LOCTITE ECCOBOND MC 723	LOCTITE ECCOBOND 3003
Technology		Sycar	Sycar
Viscosity (cP)		57,000	35,000
Thixotropic Index (TI)		1.5	3.3
T_g by Post Mold Cure TMA (°C)		42	49
Coefficient of Thermal Expansion (ppm/°C)	**Below T_g**	28	39
	After T_g	101	162
Storage Modulus (GPa)	**25°C**	3.30	4.00
	250°C	0.14	0.10
Thermal Conductivity (W/m-K)		0.8	1.0
Cure Condition		30 min. ramp to 150°C + 30 min.	90 min. at 100°C + 60 min. at 150°C

KEY BENEFITS OF HENKEL ADHESIVES

- Both conductive & non-conductive types available
- Proven HVM capable with easy dispense application
- Some fast cure chemistry for high UPH
- Highest temperature conductivity 6.5 W/m-K available

KEY APPLICATIONS

- Flip-Chip BGA
- 2.5D

Across the Board, Around the Globe.
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