SILICON PHOTONICS ADHESIVES

UV cure adhesives

Dual cure adhesives

- 1 part epoxies
- Suitable for manual or automated production lines
- Syringe dispensing
- UV curable or UV+heat curable
- Easy to process

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Silicon Photonics Packaging Adhesives provide solution to IoT

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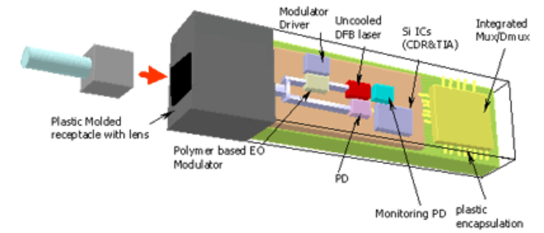
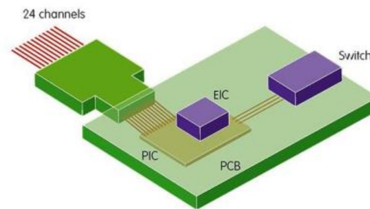
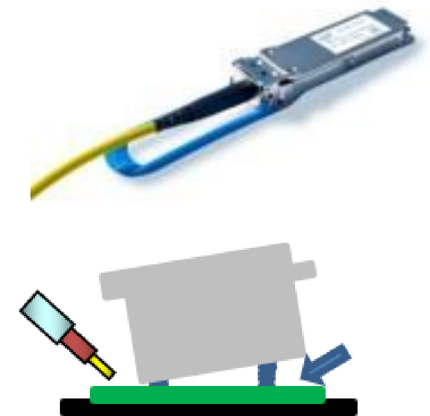
Silicon Photonics is the potential backbone of enterprise communications, servers, wireless distributions, chemical analysis, health, environmental, and chemical monitoring. It is the essence of IoT. The goal of silicon photonics is to develop high-volume, low-cost optical components with silicon as an optical material using standard CMOS processing, the well know and well accepted manufacturing process used for microprocessors and semiconductor devices. Moreover, manufacturing silicon phontonic components in high volume to the specifications needed by optical communications for IoT is cost effective.
One of the most challenging tasks for silicon photonic components is packaging with excellent optical interphase for high reliability performances through the lifetime of the components. Silicon photonic packaging engineers need to balance between performance, flexibility and feasibility for package designs. ACW is poised to partner with engineers for successful design of complex packages that are reliable, low cost and scalable. ACW provides a full range of UV and dual-cure adhesives that offer solutions to many bonding tasks from optically clear adhesives for bonding optical fiber to V-groove to thermal conductive dual cure adhesives for underfill. ACW adhesives are low cost, high performance alternatives to laser welding or gold-tin soldering.



ACW UV or Dual cure adhesives for silicon photonics components for IoT



ACW developed a full line of UV and dual cure adhesives for use in Opto-electronic bonding applications for Telecommunication and silicon photonics packaging applications.



ACW UV or Dual cure adhesives for silicon photonics components for IoT

Applications:

- Fibers to V-Grooves
- Active Alignment
- Lens and mirror to housing or PCB
- V-groove butt to chip bonding
- Wafer level packaging and bonding
- Hermetic package sealing
- Waveguides device bonding

Advantages as compared to competitors and other techniques:

- Solvent free
- Flexible curing processes: UV or UV+heat
- Low outgas: Telcodia GR1221 and MIL STD 883
- No movement in aligned components after reliability testing
- **High yield process** – low manufacturing cost
- Long shelf and working life – low manufacturing cost
- READY-TO-USE package – low manufacturing cost

	AC A535-AN	A539-DM	A1853-TX	AC A1855-TX	A1708-TX	TCR-1003-R1
Typical applications	Fiber to V-groove Glass or polymer lid bonding Lens bonding	V-groove array butt to chip Packaging	Packaging: UV active alignment then heat for shaded areas	Packaging: UV active alignment then heat for shaded areas	Packaging: UV active alignment then heat for shaded areas	**Thermal conductive** Active alignment Underfill
Base chemistry	1-part epoxy	1-part epoxy	1-part epoxy	1-part epoxy	1-part epoxy	1-part epoxy
Active Alignment	By UV	By UV	By UV	By UV	By UV	By UV
Cure in shaded area	No	Yes, by heat	Yes, by heat	Yes, by heat	Yes, by heat	Yes, by heat
Curing LED-365 nm or UV-A light source	UV: 10 J/cm^2 (heat – 80 °C/60 minutes, heat cure step is optional)	UV + heat: 10 J/cm^2 + 100 °C/60 minutes	UV + heat: 3 J/cm^2 + 80-85 °C/60 minutes	UV + heat: 10 J/cm^2 + 80-85 °C/60 minutes	UV + heat: 10 J/cm^2 + 150 °C/60 minutes	UV + heat: 10 J/cm^2 + 150 °C/60 minutes
Depth of UV cure (micron)	2,000	1,000	250	750	750	200 micron
Viscosity (mPa.s or cps at 25 °C)	4,000	2,000	65,000 @ 10/s, thixotropic index: 7	65,000 @ 10/s, thixotropic index: 7	13,000 @ 10/s, thixotropic index: 2	10,000 @ 10/s, thixotropic index: 2
Glass Transition temperature, Tg °C	170	145	165	180	168	166
Young's modulus, MPa	2,300	2,300	2,000	2,000	3,300	15,900
Operating temperature, °C	-60 to 180	-60 to 180	-40 to 150	-40 to 150	-60 to 200	-40 to 150

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