



SELECTOR GUIDE

WIRELESS DATACOM INFRASTRUCTURE

ISOTROPIC ELECTRICALLY CONDUCTIVE ADHESIVES - THERMAL MANAGEMENT ADHESIVES - INSULATING ADHESIVES

EMERSON & CUMING IN WIRELESS DATACOM INFRASTRUCTURE

For many years, Emerson & Cuming has been a recognised supplier of high performance assembly materials for electronics in wireless datacom equipment infrastructure. Thanks to unique RF grounding adhesives in either film or paste format, Emerson & Cuming has obtained a leading position in the assembly of base station electronics, as well as point-to-point and point-to-multipoint radiolink devices, satellite electronics and wireless office and home equipment. Typical applications for which Emerson & Cuming's novel materials are used, include the assembly of power amplifiers, transmitters, receivers, couplers, filters as well as RF modules such as system-in-packages, power transistors, oscillators, etc.

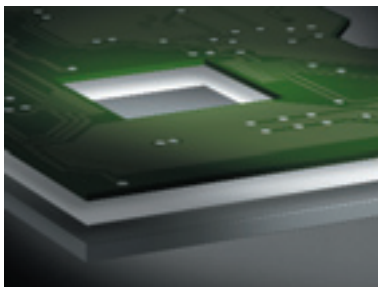
ECCOBOND, ECCOCOAT and STYCAST are Emerson & Cuming's well-recognised trademarks in the wireless datacom industry.

To meet the future demand of improved RF performance in next generation wireless datacom equipment, combined with increased thermal dissipation requirements for achieving longer distance communication capabilities, Emerson & Cuming has positioned itself with a unique product line of high performance materials. These include RF grounding adhesives in film or paste format, thermal interface materials for heat dissipation of high power components, electrically conductive adhesives for active and passive component attach, lid seal adhesives and underfills for component re-inforcement .

FILM ADHESIVES FOR HIGH FREQUENCY MODULE ASSEMBLY : POWER AMPLIFIERS, TRANSMITTERS, RECEIVERS AND

Product	Chemistry	Thermal Conductivity (W/m.K)	Recommended Cure Schedule(s)	CTE (ppm/°C)	Tg (°C)	Weight Loss at 300°C (%)
CF 3350	Epoxy / Ag	7,0	10 min. @ 170°C 30 min. @ 150°C 120 min. @ 125°C	65	90	0,60
ABLEFILM™ ECF561E	Epoxy / Ag / Glass Fabric	1,7	60 min. @ 150°C	38	47	0,55
ABLEFILM 563K	Epoxy / Al ₂ O ₃	1,1	30 min. @ 150°C	45	97	N.A.

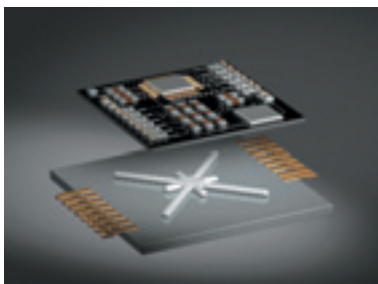
OUR TECHNOLOGIES



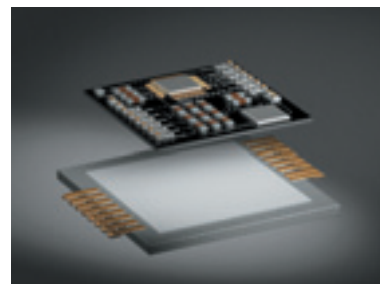
PCB to Carrier Attach in Amplifiers, Transceivers, Transmitters, ...



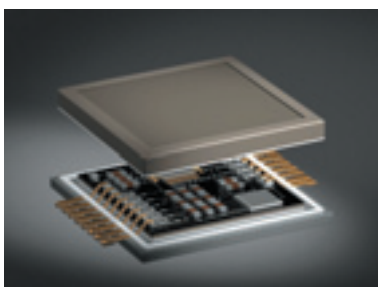
Component to Board Attach in Amplifiers, transmitters, transceivers and other equipment in WTI



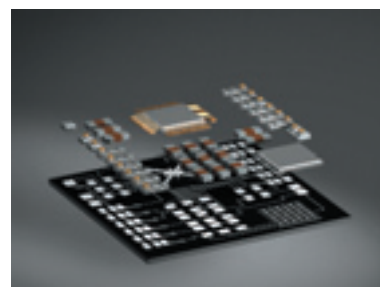
Substrate to Carrier Attach in RF Components : Paste Adhesive



Substrate to Carrier Attach in RF Components : Film Adhesive



Lid Seal Adhesives for RF Components and/or Sub-Assemblies



Active and Passive component attach in RF Components

TRANSCEIVER MODULES, AS WELL AS PHASED ARRAY RADAR DEVICES

Tensile Lap Shear Strength (Al to Al) (MPa)		Features
17		CF 3350 is a silver filled, epoxy, film adhesive, backed with polyester liner. Thanks to its void free and uniform bondline and its ease of handling and applying, it is ideal for bonding large surface areas. CF3350 was specifically developed for bonding substrates with big CTE mismatches. CF 3350 features high electrical and thermal conductivity, ensuring a reliable RF ground plane and minimum thermal resistance to the bonded substrate. CF 3350 has a work life of 3 months at room temperature, which can be extended to 6 months by storing at 5°C. CF3350 has been used for several years for assembly of transmitters, transceivers and power amplifiers, both at low and high frequencies (from 450 MHz up to 80 GHz)
14		ABLEFILM ECF561E is a silver filled, flexible, rubber modified epoxy film adhesive, with electrical conductivity in x-, y- and z- direction. ABLEFILM ECF561E is designed for bonding material with severely mismatched coefficients of thermal expansion. ABLEFILM ECF561E is available in sheet stock or die cut preforms.
21		ABLEFILM 563K is a thermally conductive epoxy adhesive film, which provides good thermal dissipation and thin, uniform bondlines. This adhesive film is designed for bonding hot devices onto heatsinks where electrical insulation and good heat transfer are required. It is available in thicknesses of either 50 or 75 µm. ABLEFILM 563K exhibits low squeeze out during bonding.

ELECTRICALLY CONDUCTIVE ADHESIVES FOR SYSTEM-IN-PACKAGE RF COMPONENTS, TRANSCEIVERS, TRANSMITTERS,

Product	Chemistry	Viscosity at 25°C (Pa.s)	Work Life at 25 °C	Application Method			Recommended Cure Schedule(s)	Volume Resistivity (Ohm.cm) Typical Value
				Dispensing	Printing	Jet		
CE 3103	Epoxy / Ag	$\dot{\gamma} = 15 \text{ s}^{-1} : 40 - 60$	24 h	*			3 min @ 150°C or 5 min @ 125°C	$4 \cdot 10^{-4}$
CE 3103 WLW	Epoxy / Ag	$\dot{\gamma} = 15 \text{ s}^{-1} : 15 - 25$	3 days	*		*	3 min @ 150°C or 5 min @ 125°C	$9 \cdot 10^{-4}$
CE 3104 WXL / CE 3104 XL	Epoxy / Ag	$\dot{\gamma} = 15 \text{ s}^{-1} : 60 - 85$	24 h		*		3 min @ 150°C or 5 min @ 125°C	$3 \cdot 10^{-4}$
CE 3050	Epoxy / Ag	$\dot{\gamma} = 5 \text{ s}^{-1} : 60$	2 weeks	*	*	*	15 min @ 165°C	$1 \cdot 10^{-4}$
CE 3051	Epoxy / Ag	$\dot{\gamma} = 5 \text{ s}^{-1} : 30$	2 weeks	*	*	*	1 hour @ 150°C	$1 \cdot 10^{-4}$
CE 3504 FP	Epoxy / Ag	# TD @ 10 rpm: 35-55	2 days	*	*		30 min @ 100°C or 30 s hot plate 180°C	$2 \cdot 10^{-4}$
CE 8500	Modified Epoxy / Ag	120-140	8 h	*	*		1,5 hour @ 120°C and 15 min @ 175°C	$2 \cdot 10^{-4}$

ELECTRICALLY AND THERMALLY CONDUCTIVE DIE ATTACH ADHESIVES : MMIC, GaAs, GaN, LDMOS

Product	Chemistry	Viscosity at 25°C (Pa.s)	Work Life at 25 °C	Application Method			Recommended Cure Schedule(s)	Volume Resistivity (Ohm.cm) Typical Value
				Dispensing	Printing	Jetting		
ABLEBOND™ 8177	Epoxy / Ag	12	24 h	*		*	4 min @ 130°C	$1 \cdot 10^{-4}$
ABLEBOND 84-1 LMI T1	Epoxy / Ag	22	2 weeks	*		*	1 h @ 150°C 2 h @ 125°C	$1 \cdot 10^{-4}$
ABLEBOND 965-1L	Epoxy / Ag	12	5 days	*		*	1 h @ 150°C	$5 \cdot 10^{-4}$
ABLEBOND 8370C	Epoxy / Au	18	2 days	*		*	1 h @ 150°C	$5 \cdot 10^{-4}$

COMBINERS, SPLITTERS

Tensile Lap Shear Strength (MPa) Typical Value	Service Temperature	Features
8	-45°C to +150 °C	One component epoxy adhesive with stable contact resistance on all traditional printed circuit board metal finishes including Sn. Compatible with existing SMT assembly lines
13	-45°C to +150 °C	One component epoxy adhesive with stable contact resistance on all traditional printed circuit board metal finishes including Sn. Provides consistent, small dot dispensing
8	-45°C to +150 °C	One component epoxy adhesive with stable contact resistance on all traditional printed circuit board metal finishes including Sn. Compatible with existing SMT assembly lines. CE 3104 XL is the US version of CE 3104 WXL.
11	N.A.	CE 3050 is designed as a solder alternative in applications where solder's high peak reflow temperatures will result in component or substrate damage. Because of the stress-absorbing nature of the product, CE 3050 is well suited in applications that require both die and component attach. The stress absorbing features also provide excellent reliability under both thermal and mechanical shock conditions.
11	N.A.	CE 3051 is designed as a solder alternative in applications where solder's high peak reflow temperatures will result in component or substrate damage. CE 3051 works well in die attach, component attach and lid seal applications. CE 3051's rheology was designed for superior dispense performance. However also by use of a stainless steel metal mesh screen or metal mask stencil the product can be applied.
13	-45°C to +150 °C	Silver filled epoxy adhesive. Features excellent electrical conductivity, high bond strength and heat resistance after cure. Low temperature cure allows the use of heat sensitive polyester substrates.
3,0	-45°C to +200 °C	CE 8500 has outstanding high temperature characteristics, useable up to 200 °C. One component, low stress adhesive for mismatched TCE applications.

Thermal Conductivity (W/m.K)	Die Shear Strength (Si to Ag) (MPa)	Features
3,0	43	ABLEBOND 8177 is an electrically conductive epoxy adhesive designed for MMIC die attach. The unique silver particle size makes ABLEBOND 8177 a die attach adhesive, featuring very thin bond lines. This offers a low thermal contact resistance and excellent heat dissipation from high frequency, and high power MMIC dies. Additionally, ABLEBOND 8177 has a fast cure mechanism, making it an ideal solution for high volume assembly processes.
3,6	45	ABLEBOND 84-1LMIT1 hybrid chip adhesive is a silver filled, electrically and thermally conductive adhesive. ABLEBOND 84-1LMIT1 meets the requirements of MIL-STD-883C, Method 5011. ABLEBOND 84-1 LMI T1 features a pot life of 2 weeks at room temperature.
3,0	25	ABLEBOND 965-1L is a one-component, stress-absorbing die attach adhesive for bonding large integrated circuits to substrates with mismatched coefficients of thermal expansion. ABLEBOND 965-1L exhibits very low levels of ionic contaminants and is designed for high speed, automated assembly processes. ABLEBOND 965-1L allows very thin bond lines (5-10µ) resulting in minimal thermal resistance.
5,0	25	ABLEBOND 8370C gold filled, electrically conductive epoxy adhesive is designed for automatic dispensing operations where silver migration is a critical concern.

DIELECTRIC THERMAL INTERFACE MATERIALS

Product	Chemistry	Thermal Conductivity (W/m.K)	Filler	Recommended Cure Schedule(s)
ABLEFILM 563K	Epoxy	1,1	Al ₂ O ₃	30 min. @ 150°C
ECCOBOND E 3503-1	Epoxy	1,0	Boron Nitride	30 min. @ 100°C
ECCOBOND 285	Epoxy	1,3	Al ₂ O ₃	24 hours @ RT (Catalyst 9)
ECCOBOND E 8502-1	Modified Epoxy	1,0	Boron Nitride	1 hour @ 150°C
STYCAST TC 8 M	Silicone	1,5	Al ₂ O ₃	N/A

N/A : not applicable

LID SEAL ADHESIVES FOR (MICRO)-ELECTRONIC PACKAGES SUCH AS OSCILLATORS, POWER TRANSISTORS, CERAMIC R

Product	Chemistry	Appearance	Work Life at 25 °C	Shelf Life after B-stage	Recommended B-Stage Condition	Recommended Cure Schedule
E 1470	B-Stage Epoxy	White	2 months	1 month @ 25°C	45 min. @ 100°C	5 min. @ 180 °C
ECCOBOND™ 3193-17	Epoxy	Grey	48 hours	N.A.	N.A.	20 min. @ 120°C

Service Temperature(s)	Features
-45 to +150°C	ABLEFILM 563K is a thermally conductive epoxy adhesive film, which provides good thermal dissipation and thin, uniform bondlines. This adhesive film is designed for bonding hot devices onto heatsinks where electrical insulation and good heat transfer are required. It is available in thicknesses of either 50 or 75 µm. ABLEFILM 563K exhibits low squeeze out during bonding.
-45 to +150°C	One component, low temperature curing, thermally conductive epoxy adhesive.
-55 to +180°C (Catalyst 11) or 2 hours @ 120°C (Catalyst 11)	Two component, epoxy adhesive with good thermal shock resistance.
-45 to +200°C	One component, flexible adhesive for mismatched TCE applications, non abrasive filler.
-40 to +200°C	Silicone grease containing alumina.

ESONATORS, ATTENUATORS, POWER SPLITTERS, COMBINERS, DUPLEXERS, ...

Die Shear Strength (MPa)	Features
17	E 1470 is a one component, thermosetting, B-stage capable, non-conductive adhesive that was designed for component and lid attach applications. The product can be applied using syringe dispense. E 1470 bonds well to engineering plastics, such as LCP, as well as silicon and metals such as aluminum.
45	ECCOBOND 3193-17 is one component, elastomer modified epoxy adhesive with fast cure characteristics. It is designed for bonding ABS, Lexan, Nylon, PBT and other heat sensitive plastics. Its rheology is optimised to high volume dispensing processes, which require consistent flow and dispensing characteristics.



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