

SMT

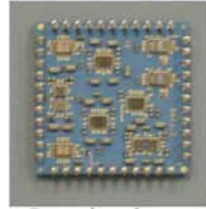
SMT - meets microelectronic modules

The mature and proven technology of SMT has finally been accepted as a sub-assembly process for some of today's highly sophisticated high frequency, broad band circuits. Additionally, automatic SMT is becoming the chosen way of applying capacitors, resistors and other small soldered components to a microelectronic substrate. This process is usually done as a sub-assembly prior to the assembly of the chip and wire, flip chip or other bare die assembly techniques. The SMT sub-assembly can be completed, cleaned and inspected prior to being kitted as part of the microelectronic module assembly. Natel has made significant capital investments in both SMT and microelectronic automatic assembly equipment to keep their customers on the leading edge of microelectronic assembly techniques. The following are handy facts required when considering SMT as a process.

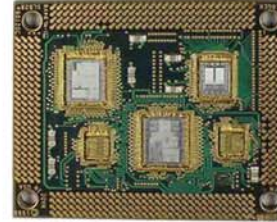
Melting point of commonly used solder alloys

Alloy Composition	Liquidus Melt Point	
	°C	°F
63Sn/37Pb	183	361
60Sn/40Pb	190	374
50Sn/50Pb	216	421
10Sn/90Pb	302	576
10Sn/88Pb/2Ag	290	554
62Sn/36Pb/2Ag	179	354
5Sn/90Pb/5Ag	292	558
5Sn/92.5Pb/2.5Ag	296	565
5Sn/93.5Pb/1.5Ag	301	574
96.5Sn/3.5Ag	221	430

Examples of SMT combined with
Conventional chip/wire microelectronics



Ceramic substrate combining both SMT and chip/wire.



FR4 PCB with both SMT and 900 gold wire bonds.

Melting points of common solders

Element	Symbol	Melting Point	
		°C	°F
Tin	Sn	232	450
Lead	Pb	328	622
Silver	Ag	961	1762
Bismuth	Bi	272	521
Indium	In	157	314
Antimony	Sb	631	1167
Cadmium	Cd	321	610

FLUX

Water soluble flux systems are the preferred systems used at Natel. Natel has characterized a water soluble solder paste/flux system designed so that its residue after solder re-flow can be removed by using either pure water or a water + saponifier additive.

Considering performance, process, reliability, and cost, the flux chemistry that requires only water for the cleaning agent (water-soluble) is, by far the preferred method especially when wire or ribbon bonding must be done down stream of the solder operation.

"Your Job"
Innovation and Marketing

"Our Job"
Quality Manufacturing
Quick Turnaround
Low Cost

With over 25 years of microelectronics experience, Natel understands and has participated in most of the dramatic changes that have taken place in the manufacturing of products for the Defense, Medical, Opto-electronic and RF/Microwave industries, meeting the need for lower cost, high quality components produced by innovative techniques.

With automatic and, in most cases, hands-free assembly capabilities for modules, hybrids, MCM and chip-on-board, Natel has pioneered the precision capabilities necessary for 10G-40G high frequency products -- products such as DWDM, clock drivers, transmitters/receivers and limiting amplifiers.

This level of automation has allowed Natel to address the market's need for cost, performance and size with increased levels of reliability never before possible. Due to our quick response, we are able to shorten "time-to-market" for your prototype as well as "time-to-volume" for your production needs. We realize how critical it is to your success.

**Natel stands ready as your
Manufacturing Partner!**



Automatic SMT Line

To be placed on our mailing list to receive other issues of "Quick Reference Design Guide" simply call, fax or e-mail.

NATEL

www.natelengr.com
dguide@natelengr.com

ISO 9001

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MIL-PRF-38534

9340 OWENSMOUTH AVE., CHATSWORTH, CA 91311
FAX: (818) 734-6530 TEL: (818) 734-6500

How can we help?

So that we can tailor an information package specific to your needs, please answer the following questions and **fax this page to Natel at 1-800-590-5764.**

For urgent need please call 1-800-590-5774.

What stage is your microcircuit module in?

- Initial design
- Prototype
- Product redesign
- Production

Would you consider packaging assistance?

- Essential
- Nice but not required
- No thank you

What type of module are you considering?

- Hybrid
- MCM
- Chip on board
- Flipchip/BGA
- Other _____

What type of package are you considering?

- Hermetic
- Non hermetic
- Metal
- Other _____

Comments:

YOUR

Name: _____

Phone: _____

email: _____

Please make necessary changes on the address label.

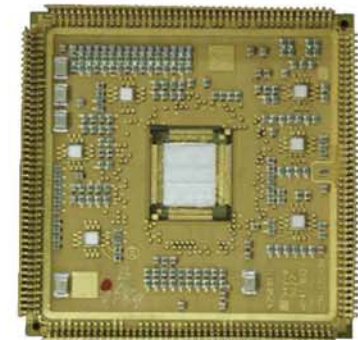
NATEL Engineering Co., Inc.

NATEL Engineering Co., Inc.
9340 Owensmouth Ave.
Chatsworth, CA 91311

	The microelectronic packaging experts!
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Design Guide #4

Quick Reference Design Guide



SMT for Microelectronics

NATEL Engineering Co., Inc.

9340 OWENSMOUTH AVE., CHATSWORTH, CA 91311

FAX: (818) 734-6530

TEL: (818) 734-6500

www.natelengr.com
dguide@natelengr.com