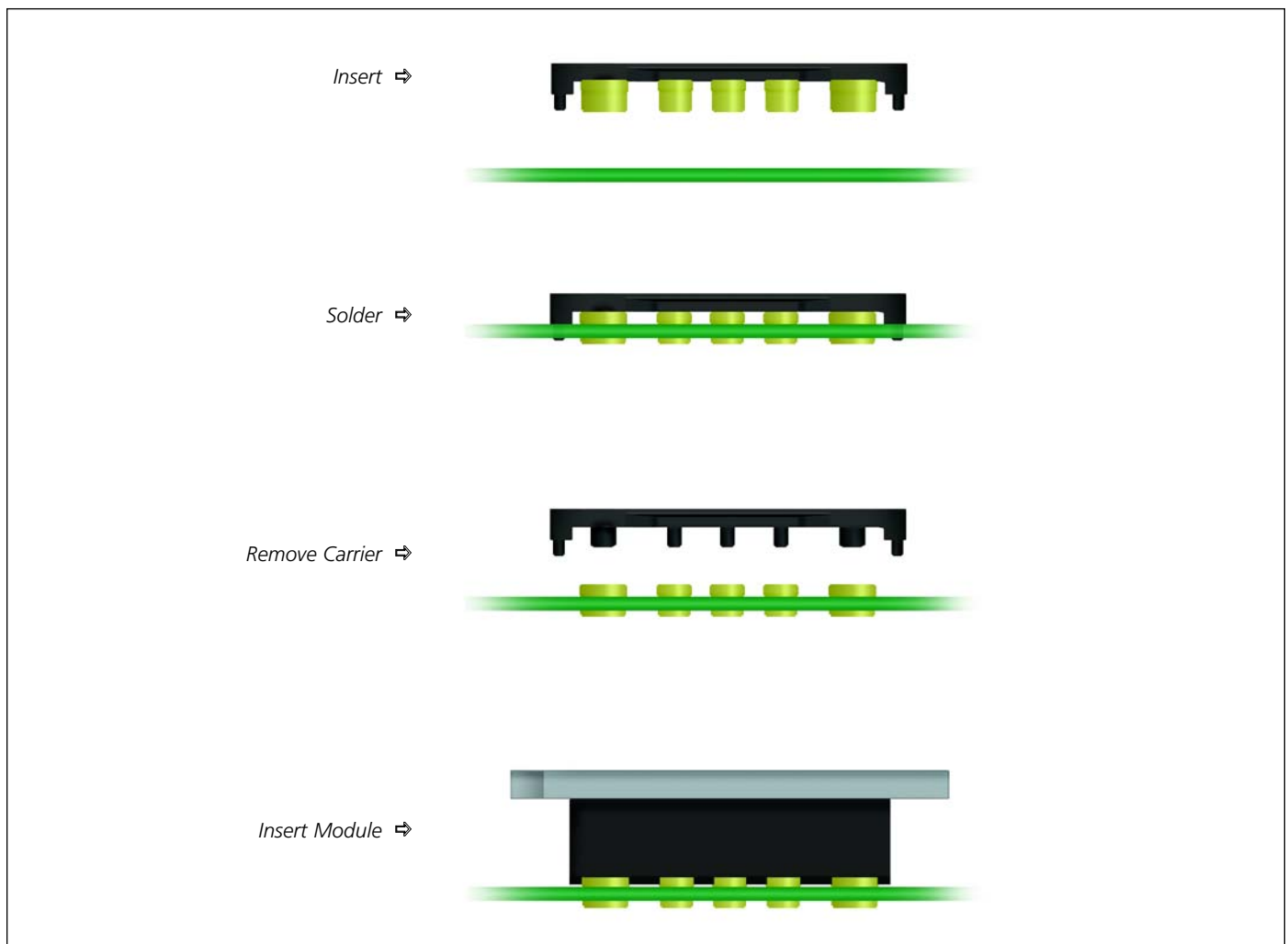


InMates are an innovative solution for through-hole socket requirements. Consisting of individual plastic carriers for the input and the output, each contains an array of sockets for either a full, half or quarter-brick sized module. The sockets are factory loaded into the carrier, which holds them rigidly in place throughout the assembly and soldering process. The carriers are later removed, leaving the sockets accurately positioned.

Designed for use with pin-compatible Maxi, Mini, and Micro Family converters, InMates are available for a wide range of PCB sizes and mounting styles. PCB thicknesses can range from 0.055" (1,39 mm) to 0.1375" (3,49 mm).

Sockets also allow for mounting modules either inboard, with a cutout in the PCB for the module, to minimize the height above the board, or onboard. InMates are compatible with the ModuMate or RoHS pin style.

InMates are available in standard recyclable JEDEC style trays for use with automated pick-and-place equipment and are compatible with most standard wave or hand solder operations. The sockets are soldered into the board as part of the PCB assembly process. The module can then be plugged into place at anytime later.



**Figure 18-1** — InMate carrier / socket assembly and soldering process

## 18. Through-hole Socket Mount System (InMate)

| InMate: Through-hole Sockets                                 |                |                   |        |        |                   |        |        |                       |        |        |           |
|--------------------------------------------------------------|----------------|-------------------|--------|--------|-------------------|--------|--------|-----------------------|--------|--------|-----------|
| 1.                                                           | 2.             | 3.                |        |        | 4.                |        |        | 5.                    |        |        |           |
| Board Thickness                                              | Mounting Style | Full Brick (Maxi) |        |        | Half Brick (Mini) |        |        | Quarter Brick (Micro) |        |        | Pin Style |
| Norm.<br>(Min. / Max.)                                       |                | Input             | Output | 5 Sets | Input             | Output | 5 Sets | Input                 | Output | 5 Sets |           |
| 0.062"<br>(0.055" / 0.071")<br>1,5 mm<br>(1,4 mm / 1,8 mm)   | Inboard        | 18374             | 18382  | 18362  | 18374             | 18384  | 18366  | 18376                 | 18386  | 18370  | S or F    |
|                                                              | Onboard        | 18378             | 18388  | 18364  | 18378             | 18390  | 18368  | 18380                 | 18392  | 18372  | N or G    |
| 0.093"<br>(0.084" / 0.104")<br>2,4 mm<br>(2,1 mm / 2,6 mm)   | Inboard        | 18375             | 18383  | 18363  | 18375             | 18385  | 18367  | 18377                 | 18387  | 18371  | S or F    |
|                                                              | Onboard        | 18379             | 18389  | 18365  | 18379             | 18391  | 18369  | 18381                 | 18393  | 18373  | N or G    |
| 0.125"<br>(0.1125" / 0.1375")<br>3,1 mm<br>(2,8 mm / 3,5 mm) | Onboard        | 21539             | 21543  | 21510  | 21539             | 21544  | 21511  | 21540                 | 21545  | 21512  | N or G    |

**Table 18-1** — Guide to InMate selection

- Select Board Thickness.**  
Nominal 0.062" (1,5 mm), 0.093" (2,4 mm) or 0.125" (3,1 mm).
- Select Mounting Style.**  
Inboard requires a PCB cutout for the "belly" of the module. See dotted lines in PCB drawing links on Page 80 for cut out area.
- Identify Module Type.**  
Full brick (Maxi), half brick (Mini) or quarter brick (Micro).
- Select the Ordering Part Number.**  
Order packages of five input / output sets or in higher quantities order input and output InMates separately. For individual input or output InMates, minimum orders of 35 for Maxi or Mini and 40 for Micro apply.
- Verify Correct Pin Style for the Module.**  
For predefined parts, "S" or "F" = short ModuMate and "N" or "G" = long ModuMate  
See Table 18-4 for standoff recommendations.

## 18. Through-hole Socket Mount System (InMate)

| Parameter                                                           | Specification Value                                                                                                                                                                                                                                                                                                                                                                                 | Reference                                                                                       |
|---------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------|
| <b>Compatibility</b><br>Module pin styles                           | F = short Au plated<br>S = short Au plated                                                                                                                                                                                                                                                                                                                                                          | Short RoHS pins<br>Short ModuMate pins                                                          |
|                                                                     | G = long Au plated<br>N = long Au plated                                                                                                                                                                                                                                                                                                                                                            | Long RoHS pins<br>Long ModuMate pins                                                            |
| <b>Mechanical</b><br>Contact normal force                           | 100 grams EOL min.                                                                                                                                                                                                                                                                                                                                                                                  | GR-1217-CORE, R5-23                                                                             |
| Number of mating cycles                                             | 5 min.                                                                                                                                                                                                                                                                                                                                                                                              | Exception to GR-1217-CORE which specifies 25 mating cycle                                       |
| Module engagement force                                             | 32 lbs per connector max.                                                                                                                                                                                                                                                                                                                                                                           | GR-1217-CORE, R5-31,32                                                                          |
| Module disengagement force                                          | 32 lbs per connector max.                                                                                                                                                                                                                                                                                                                                                                           | GR-1217-CORE, R5-31,32                                                                          |
| <b>Electrical</b><br>Current rating for output pin sockets          | 50 A Maxi <sup>(Note1)</sup> / 50 A Mini / 25 A Micro<br>(Based on 248°F (120°C) max socket temp. & 86°F (30°C) max temperature rise of contact)                                                                                                                                                                                                                                                    | Gold plating standards, and accepted industry standards such as IICIT, EIA, Bellcore guidelines |
| Low level contact resistance<br>0.080" (2,03 mm) dia socket (LLCR)  | 400 $\mu\Omega$ max.                                                                                                                                                                                                                                                                                                                                                                                | GR-1217-CORE, 6.2.1                                                                             |
| Low level contact resistance<br>0.150" (3,81 mm) dia socket (LLCR)  | 300 $\mu\Omega$ max.                                                                                                                                                                                                                                                                                                                                                                                | GR-1217-CORE, 6.2.1                                                                             |
| Low level contact resistance<br>0.180" (4,57 mm) dia sockets (LLCR) | 200 $\mu\Omega$ max.                                                                                                                                                                                                                                                                                                                                                                                | GR-1217-CORE, 6.2.1                                                                             |
| <b>Thermal</b><br>Max socket temperature                            | 248°F (120°C) max.                                                                                                                                                                                                                                                                                                                                                                                  | Max continuous use temperature for gold plating                                                 |
| Temperature rise                                                    | 86°F (30°C) max.<br>EIA-364-70A <sup>(Note2)</sup>                                                                                                                                                                                                                                                                                                                                                  | GR-1217-CORE <sup>(Note3)</sup>                                                                 |
| <b>Environmental</b><br>Shock and vibration                         | InMate products are tested in random vibration environments to best simulate the broad spectrum of frequencies and amplitudes that may be encountered in typical applications. Actual system resonant frequencies will depend on PCB construction and mounting details. For critical, or unusual, shock and vibration environments, the performance of the system should be independently verified. |                                                                                                 |

**Table 18–2** — InMate specifications and materials

| Materials                                                                               | Ratings                                                                                                                                                                         |
|-----------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Headers</b><br>Material: Ryton™ R-7 PPS, 65% glass fiber and mineral filled compound | Poly-Phenylene Sulfide                                                                                                                                                          |
| Flammability                                                                            | UL94 V-0/5VA                                                                                                                                                                    |
| Thermal stability (short term)                                                          | 500°F (260°C)                                                                                                                                                                   |
| Thermal stability (long term)                                                           | 392°F (200°C)                                                                                                                                                                   |
| <b>Solder Cap</b><br>Material                                                           | 305 stainless steel                                                                                                                                                             |
| Plating                                                                                 | Clear passivate to repel solder                                                                                                                                                 |
| <b>Sockets</b><br>Material                                                              | Brush Wellman Alloy #25<br>C17200 deep draw quality or equiv. 0.010" thick                                                                                                      |
| Plating                                                                                 | Woods nickel strike followed by 50 $\mu$ in. min. low stress sulfamate-based electrolytic nickel, followed by 20 $\mu$ in min hard gold followed by 10 $\mu$ in. min. soft gold |

**Table 18–3** — Material properties of InMate components

(Note1) For 80 A operation with Maxi, contact Applications Engineering.

(Note2) ANSI/EIA-364 American National Standards Institute/  
Electronic Industries Association  
(Electronic Components, Assemblies & Materials Association)

(Note3) GR-1217-CORE issue 1, November 1995

Generic requirements for separable electrical connectors used in telecommunications hardware. A module of NEBSFR, FR-2063

## 18. Through-hole Socket Mount System (InMate)

**Standoff Kits for InMate Mounted Modules\***

| Board Thickness                                          |                   | Slotted Baseplate          |                            | Through-Hole Baseplate     |                            | Threaded Baseplate         |
|----------------------------------------------------------|-------------------|----------------------------|----------------------------|----------------------------|----------------------------|----------------------------|
| Nom.<br>(Min. / Max.)                                    | Mounting<br>Style | Through-Hole<br>Heat Sink  | Threaded<br>Heat Sink      | Through-Hole<br>Heat Sink  | Threaded<br>Heat Sink      | Through-Hole<br>Heat Sink  |
| 0.062"<br>(0.055"/0.071")<br>1,5 mm<br>(1,4 mm / 1,8 mm) | Inboard           | Kit - 18153<br>Bag - 19129 | Kit - 18154<br>Bag - 19130 | Kit - 18148<br>Bag - 19124 | Kit - 18149<br>Bag - 19125 | Kit - 18148<br>Bag - 19124 |
|                                                          | Onboard           | Kit - 18158<br>Bag - 19134 | Kit - 18159<br>Bag - 19135 | Kit - 18153<br>Bag - 19129 | Kit - 18155<br>Bag - 19131 | Kit - 18153<br>Bag - 19129 |
| 0.093"<br>(0.084"/0.104")<br>2,4 mm<br>(2,1 mm / 2,6 mm) | Inboard           | Kit - 18153<br>Bag - 19129 | Kit - 18154<br>Bag - 19130 | Kit - 18148<br>Bag - 19124 | Kit - 18149<br>Bag - 19125 | Kit - 18148<br>Bag - 19124 |
|                                                          | Onboard           | Kit - 18156<br>Bag - 19132 | Kit - 18157<br>Bag - 19133 | Kit - 18150<br>Bag - 19126 | Kit - 18152<br>Bag - 19128 | Kit - 18150<br>Bag - 19126 |
| 0.125"<br>(0.113"/0.138")<br>3,1 mm<br>(2,8 mm / 3,5 mm) | Onboard           | Kit - 24054                | Kit - 18157                | Kit - 24056                | Kit - 18152                | Kit - 24056                |
|                                                          |                   | Bag - 19132                | Bag - 19133                | Bag - 19126                | Bag - 19128                | Bag - 19126                |

**Table 18-4 — InMate standoff recommendations**

\* Kits include six (6) standoffs and screws. Mini and Micro modules require a minimum of four (4) standoffs.  
Bags of one hundred (100) do not include screws; #4-40 thread hardware required.

### References

|                                                     |                                                                                               |
|-----------------------------------------------------|-----------------------------------------------------------------------------------------------|
| InMate PCB layout drawing for Maxi Module           | <a href="http://vdac2.vicr.com/CADPDF/8SELX4.PDF">http://vdac2.vicr.com/CADPDF/8SELX4.PDF</a> |
| InMate PCB layout drawing for Mini Module           | <a href="http://vdac2.vicr.com/CADPDF/8SELX3.PDF">http://vdac2.vicr.com/CADPDF/8SELX3.PDF</a> |
| InMate PCB layout drawing for Micro Module          | <a href="http://vdac2.vicr.com/CADPDF/8SELX2.PDF">http://vdac2.vicr.com/CADPDF/8SELX2.PDF</a> |
| InMate and Socket outline drawing for Maxi Modules  | <a href="http://vdac2.vicr.com/CADPDF/5KIQII.PDF">http://vdac2.vicr.com/CADPDF/5KIQII.PDF</a> |
| InMate and Socket outline drawing for Mini Modules  | <a href="http://vdac2.vicr.com/CADPDF/5KIQIO.PDF">http://vdac2.vicr.com/CADPDF/5KIQIO.PDF</a> |
| InMate and Socket outline drawing for Micro Modules | <a href="http://vdac2.vicr.com/CADPDF/5KIQIU.PDF">http://vdac2.vicr.com/CADPDF/5KIQIU.PDF</a> |

### Module Exchange Tool

Used in facilitating the proper extraction of modules from InMate or SurfMate sockets.  
**Removal without using the Exchange Tool may cause damage to the sockets.**

| Description         | Part Number |
|---------------------|-------------|
| Maxi Exchange Tool  | 22827       |
| Mini Exchange Tool  | 22828       |
| Micro Exchange Tool | 22829       |

