

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 0.055in [1,39mm] to 0.1375in [3,49mm].

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.

NOTE: Please refer to [Section 13](#) of the design guide for the InMate soldering procedure.

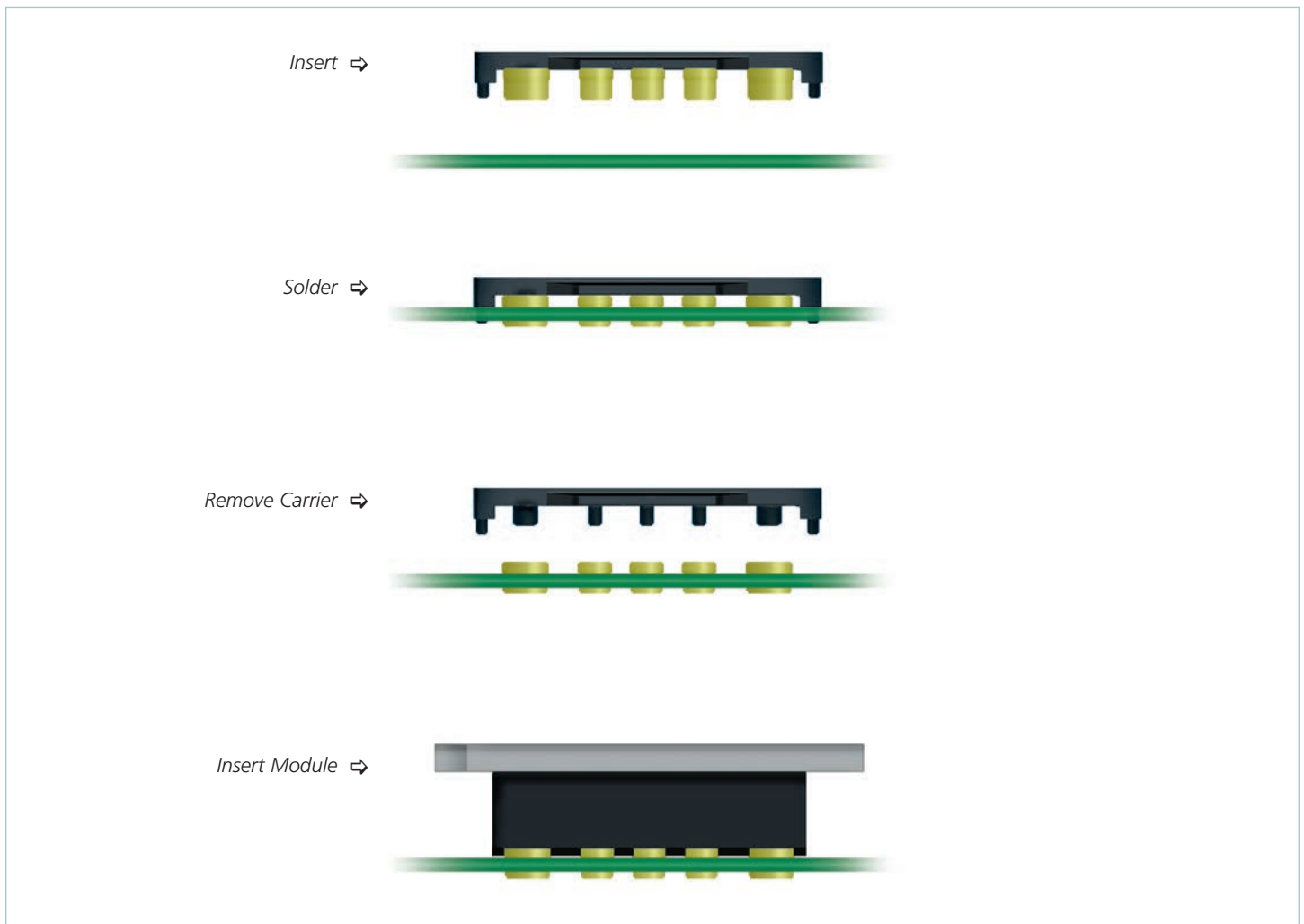


Figure 16.1 — InMate carrier / socket assembly and soldering process

InMate: Through-Hole Sockets											
Board Thickness	Mounting Style	Full Brick [Maxi]			Half Brick [Mini]			Quarter Brick [Micro]			Pin Style
Normal [Min / Max]		Input	Output	Five Sets	Input	Output	Five Sets	Input	Output	Five Sets	
0.062in (0.055in / 0.071in) 1,5mm (1,4mm / 1,8mm)	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
0.093in (0.084in / 0.104in) 2,4mm (2,1mm / 2,6mm)	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
0.125in (0.1125in / 0.1375in) 3,1mm (2,8mm / 3,5mm)	Onboard	21539	21543	21510	21539	21544	21511	21540	21545	21512	N or G

Table 16.1 — Guide to InMate selection

- Select Board Thickness:**
Nominal 0.062in [1,5mm], 0.093in [2,4mm] or 0.125in [3,1mm].
- 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 16.4 for standoff recommendations.

Maxi, Mini, Micro Family DC-DC Converters and Configurable Power Supplies

Parameter	Specification Value	Reference
Compatibility		
Module Pin Styles	F = short Au plated	Short RoHS pins Short ModuMate pins
	S = short Au plated	
	G = long Au plated	Long RoHS pins Long ModuMate pins
	N = long Au plated	
Mechanical		
Contact Normal Force	100g EOL min	GR-1217-CORE, R5-23
Number of Mating Cycles	5 max ^[h]	Exception to GR-1217-CORE which specifies 25 mating cycle
Module Engagement Force	32lbs per connector set max	GR-1217-CORE, R5-31,32
Module Disengagement Force	32lbs per connector set max	GR-1217-CORE, R5-31,32
Electrical		
Current Rating for Output Pin Sockets	50A Maxi ^[e] / 50A Mini / 25A Micro (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 0.080in [2,03mm] dia socket (LLCR)	400μΩ max	GR-1217-CORE, 6.2.1
Low-Level Contact Resistance 0.150in [3,81mm] dia socket (LLCR)	300μΩ max	GR-1217-CORE, 6.2.1
Low-Level Contact Resistance 0.180in [4,57mm] dia sockets (LLCR)	200μΩ max	GR-1217-CORE, 6.2.1
Thermal		
Max Socket Temperature	248°F [120°C] max	Max continuous-use temperature for gold plating
Temperature Rise	86°F [30°C] max	GR-1217-CORE ^[g] EIA-364-70A ^[f]
Environmental		
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 16.2 — InMate specifications and materials

Materials	Ratings
Headers	
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]
Solder Cap	
Material	305 stainless steel
Plating	Clear passivate to repel solder
Sockets	
Material	Brush Wellman Alloy #25 C17200 deep draw quality or equiv. 0.010in thick
Plating	Woods nickel strike followed by 50μin min low stress sulfamate-based electrolytic nickel, followed by 20μin min hard gold, followed by 10μin min soft gold

Table 16.3 — Material properties of InMate components

^[e] For 80A operation with Maxi, contact Applications Engineering.

^[f] GR-1217-CORE issue 1, November 1995 Generic requirements for separable electrical connectors used in telecommunications hardware.
A module of NEBSFR, FR-2063

^[g] ANSI/EIA-364 American National Standards Institute / Electronic Industries Association (Electronic Components, Assemblies & Materials Association)

^[h] The module and socket must be replaced after five mating cycles.

Standoff Kits for InMate Mounted Modules						
Board Thickness	Mounting Options	Slotted Baseplate		Through-Hole Baseplate		Threaded Baseplate
Nominal (Min / Max]	Mounting Style	Through-Hole Heat Sink	Threaded Heat Sink	Through-Hole Heat Sink	Threaded Heat Sink	Through-Hole Heat Sink
0.062in (0.055in / 0.071in) 1,5mm (1,4mm / 1,8mm)	Inboard	Kit -18153	Kit -18154	Kit -18148	Kit -18149	Kit -18148
		Bag -19129	Bag -19130	Bag -19124	Bag -19125	Bag -19124
	Onboard	Kit -18158	Kit -18159	Kit -18153	Kit -18155	Kit -18153
		Bag -19134	Bag -19135	Bag -19129	Bag -19131	Bag -19129
0.093in (0.084in / 0.104in) 2,4mm (2,1mm / 2,6mm)	Inboard	Kit -18153	Kit -18154	Kit -18148	Kit -18149	Kit -18148
		Bag -19129	Bag -19130	Bag -19124	Bag -19125	Bag -19124
	Onboard	Kit -18156	Kit -18157	Kit -18150	Kit -18152	Kit -18150
		Bag -19132	Bag -19133	Bag -19126	Bag -19128	Bag -19126
0.125in (0.113in / 0.138in) 3,1mm (2,8mm / 3,5mm)	Onboard	Kit -24054	Kit -18157	Kit -24056	Kit -18152	Kit-24056
		Bag -19132	Bag -19133	Bag -19126	Bag -19128	Bag-19126

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.

Table 16.4 — InMate standoff recommendations

References	
InMate PCB layout drawing for Maxi Module	http://asp.vicorpower.com/cadUtil/display_cad.asp?pn=18400&ct=PDF
InMate PCB layout drawing for Mini Module	http://asp.vicorpower.com/cadUtil/display_cad.asp?pn=18399&ct=PDF
InMate PCB layout drawing for Micro Module	http://asp.vicorpower.com/cadUtil/display_cad.asp?pn=18398&ct=PDF
InMate and Socket outline drawing for Inboard Maxi Modules	http://asp.vicorpower.com/cadUtil/display_cad.asp?pn=18483-XX&ct=PDF
InMate and Socket outline drawing for Inboard Mini Modules	http://asp.vicorpower.com/cadUtil/display_cad.asp?pn=18482-XX&ct=PDF
InMate and Socket outline drawing for Inboard Micro Modules	http://asp.vicorpower.com/cadUtil/display_cad.asp?pn=18481-XX&ct=PDF
InMate and Socket outline drawing for Onboard Maxi Modules	http://asp.vicorpower.com/cadUtil/display_cad.asp?pn=18480-XX&ct=PDF
InMate and Socket outline drawing for Onboard Mini Modules	http://asp.vicorpower.com/cadUtil/display_cad.asp?pn=20030-XX&ct=PDF
InMate and Socket outline drawing for Onboard Micro Modules	http://asp.vicorpower.com/cadUtil/display_cad.asp?pn=20029-XX&ct=PDF

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

