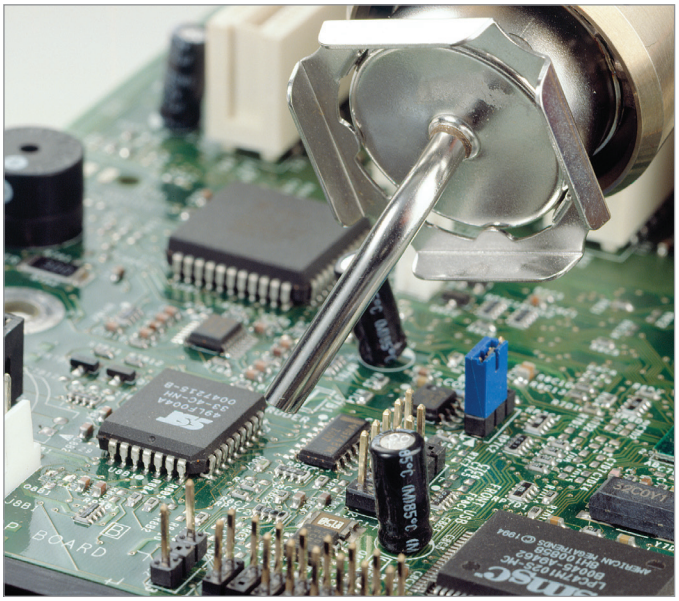
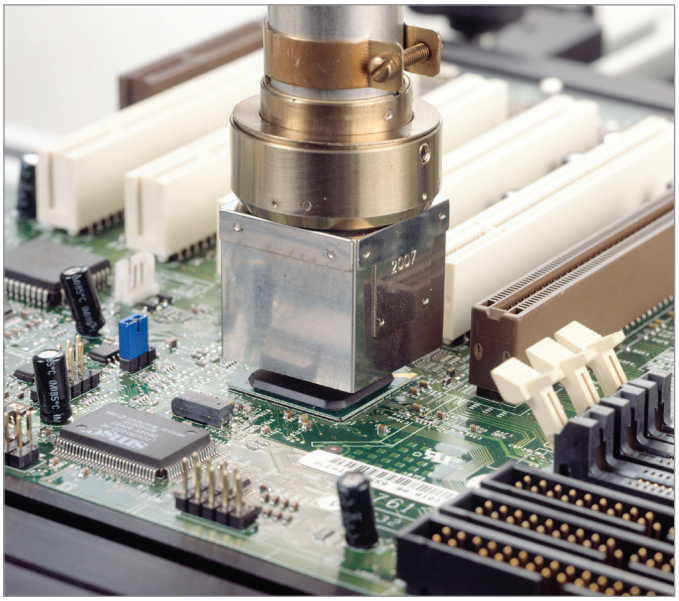
Convective
SMT Rework Systems

Convective systems offer a non-contact heating method for the manual installation and removal of virtually any standard surface mount component including area arrays. These systems use a pump to generate airflow that first passes through a heater, where it is warmed to the appropriate temperature, and then through a nozzle that "shapes" the air stream for the specific component. More than 75 different nozzles are available for these systems! Convective systems are ideal for removing Surface Mount Components as they leave little residual solder on the PCB when compared to conductive techniques. They are also appropriate for installing leaded components with solder paste and for installing components without visible leads, such as BGAs, MLFs, LGAs, and LCCs. The ideal system and accessory items depend on the application, component sensitivity, component type and other factors. For high mass applications and for components without visible leads, it is strongly recommended that a preheater and PCB holder be used in conjunction with the convective system to ensure thorough heating and to eliminate PCB damage and warping. PACE is pleased to offer three systems to meet your exacting specifications. Please refer to the table below to assist with system selection.

Specifications	ST 300	ST 325	ST 350
Standard Pitch Component Removal	✔	✔	✔
Fine Pitch Component Removal	✔	✔	✔
Standard Pitch Area Array Component Removal	✔	✔	✔
Fine Pitch Area Array Component Removal	✔	✔	✔
Standard Pitch Component Installation	✔	✔	✔
Fine Pitch Component Installation			✔
Standard Pitch Area Array Component Installation		✔	✔
Fine Pitch Area Array Component Installation			✔



ST 300 Reflowing a PLCC



ST 350 Reflowing a BGA Component

Convective
Reflow Systems

ST 300

The ST 300 is an analog, self-contained system for the manual installation and removal of SMD's. Easy-to-read dials allow adjustment of air temperature and flow rate. The handpiece features an integrated, spring loaded vacuum pick with interchangeable vacuum cup sizes for holding and lifting components. The heavy-duty, durable metal housing ensures years of service and the sloped face of the front panel is a standard feature for ease of use. Other ST systems can be stacked on to the ST 300 to preserve bench space. Both cycle start and vacuum functions are activated with conveniently located switches on the handpiece. The ST 300 features the Quiet-Flo turbine for close to silent operation. Additionally, the system comes with the Lo-Flo pump and the vacuum wand (PV-65) for manipulating components manually. The capabilities of the ST 300 can be greatly enhanced when coupled with the ST 500, ST 525, or ST 550.

Specifications	ST 300
Part Number	8007-0427 ST 300 8007-0428 ST 300E
Dimensions	134mm (5.25") **H** x 245mm (10") **W** x 254mm (10.4") **D**
Weight	4.3kgs (9.5lbs)
Power Requirements	97-127 VAC, 50/60 Hz, 575 Watts max. 197-253 VAC, 50/60 Hz, 575 Watts max.
Temperature Control	Closed loop temperature control
Temperature Stability	± 9°C (± 15°F) at idle tip temp.
Temperature Range	149° to 482°C (300° to 900°F) nominal
Airflow Range	5-22 slpm

Features

- Lockable Temperature and Airflow adjustment knobs.
- Automatic shut off for safety.
- Functional LED Indicator lights on front panel.
- Quiet-Flo turbine blower reduces operating noise.
- Hi-Flo Vacuum Pump for holding component securely.
- Lo-Flo Vacuum Pump for component wand.

See pages 23-24 for universal stand work holders and pre-heaters.

Convective
Rework Systems

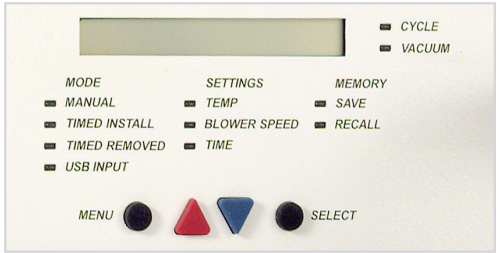
ST **325**

The ST 325 is a digital, self-contained and fully programmable system for the manual installation and removal of SMD's. Programming features allow the development of thermal profiles using up to 4 zones which include: pre-heat, soak, reflow and cool down. Each programmed zone allows for unique parameters to be set for times, temperatures and air flow rates. The handpiece features an integrated, spring loaded vacuum pick with interchangeable vacuum cup sizes for holding and lifting components. From the front panel, the system can be used in either manual or "timed" modes. Manual mode means that the system generates heated airflow when the cycle button is pressed; when it is pressed a second time the system shuts off. "Timed" modes allow the operator to create up to 20 "Profiles" that consist of time and temperatures parameters to ensure process control and repeatability. Both cycle start and vacuum functions are activated with conveniently located switches on the handpiece.

The ST 325 comes standard with one K-type thermo-couple input that can be used to monitor the thermal environment at the work site with optional software. The system also comes with the Lo-Flo pump and the vacuum wand (PV-65) for manipulating components manually. The heavy-duty, durable metal housing ensures years of service and the sloped face of the front panel is a standard feature for ease of use. Other ST systems can be stacked on to the ST 325 to preserve bench space. The capabilities of the ST 325 can be used to remove or install just about any type of standard pitch surface mount component when coupled with the ST 500, ST 525, or ST 550.

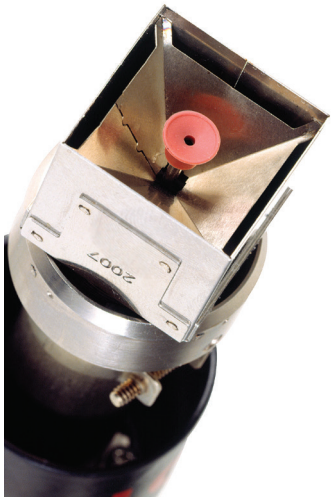
When additional programming capability is required, such as 4 zone profile creation, an optional software package is available that can be used with a PC or laptop (1199-0019-P1). The optional software package further allows the ST 325 to control the ST 450 Preheater when bottom side heating of the PCB is required. Once the 4 zone profiles have been created with the software, they can be downloaded to the ST 325 and can be run WITHOUT the PC or laptop being connected!

The system can install standard BGA packages when fitted with the ST 500, ST 525 or ST 550, ST 450 or ST 400, and the optional PC or laptop software. Course pitch area array components are aligned using a proven, reliable template method that is easy to use.



ST **325**
Front Panel

ST **325**



Patented, Adjustable, Spring Loaded Vacuum Pik

The handpiece is fitted with an adjustable, spring loaded vacuum pik to lift components from the PCB and to hold the component in the nozzle during alignment.

The “give” in the spring loading is set, but the absolute position of the vacuum pik is adjustable over a 1.5" length.

Features

- Multi-level password lock-out prevents unauthorized changes.
- User definable temperature zone.
- Audible countdown timer for end of cycle indication in the Timed and Program modes.
- On-screen display of parameters (temperature, time) during operation.
- Store and recall up to 20 profiles (40 with optional software).
- Quiet-Flo turbine blower offers nearly silent operation.
- Hi-Flo Vacuum Pump for holding component securely.
- Lo-Flo Vacuum Pump for component wand.
- 4 zone profiling capability with optional PC software.

Specifications	ST 325
Part Number	8007-0429 ST 325 8007-0432 ST 325E
Dimensions	134mm (5.25") **H** x 245mm (10") **W** x 254mm (10.4") **D**
Weight	4.5kgs (9.9lbs)
Power Requirements	97-127 VAC, 50/60 Hz, 575 Watts max. 197-253 VAC, 50/60 Hz, 575 Watts max.
Temperature Control	Closed loop, digital temperature control
Temperature Stability	± 9°C (±15°F) at idle tip temp.
Temperature Range	149° to 482°C (300° to 900°F) nominal
Airflow Range	5-22 slpm

Convective
Rework Systems

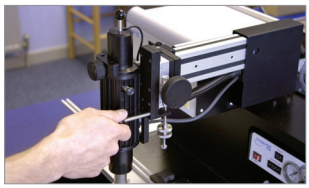
ST 350

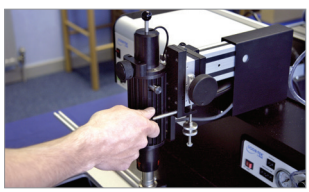
The ST 350 is the ultimate in cost effective, programmable, convective rework equipment. No other system on the market at the same price level can compete! The system is completely self-contained and is capable of installing virtually any type of surface mount component. The system is ideal for service centers, prototyping shops, low volume production or remanufacturing centers that want to purchase a single piece of equipment that can handle just about anything!

The ST 350 has all of the process control built into the unit and boasts digital controls for temperature, time, and airflow. The electronic controls are fully integrated and are simple to use and program to meet your needs, unlike the "off the shelf PID control modules" used on competitive equipment. This means that you can "set it and forget it" instead of being tied to the unit to perform tasks during the process which can be more than 6 minutes long! Your time can be better spent preparing for the next operation than waiting to activate non-intergrated control modules.

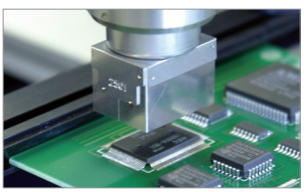
From the front panel, the system can be used in either manual or "timed" modes. Manual mode means that the system generates airflow when the cycle button is pressed the first time. When pressed a second time, the system shuts off. "Timed" modes allow the operator to set up "profiles" that consist of time and temperature parameters to ensure process control and repeatability. All of the interface controls for the ST 350 are also located in a remote control box that can be placed on either side of the unit for maximum convenience to the operator.

Reflow head moves back and out of the way to give you clear PCB access for board prep and clean up.



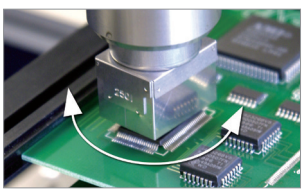


Fast and repeatable nozzle height adjustment with mechanical stop for consistency of process.



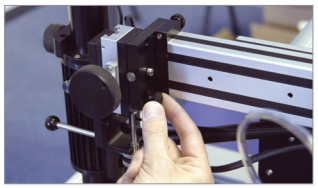
PACE unique feature (twist)

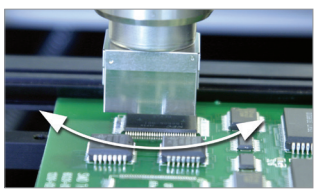
Simple coplanarity adjustment allows for exact nozzle adjustment, much better than fixed head systems.

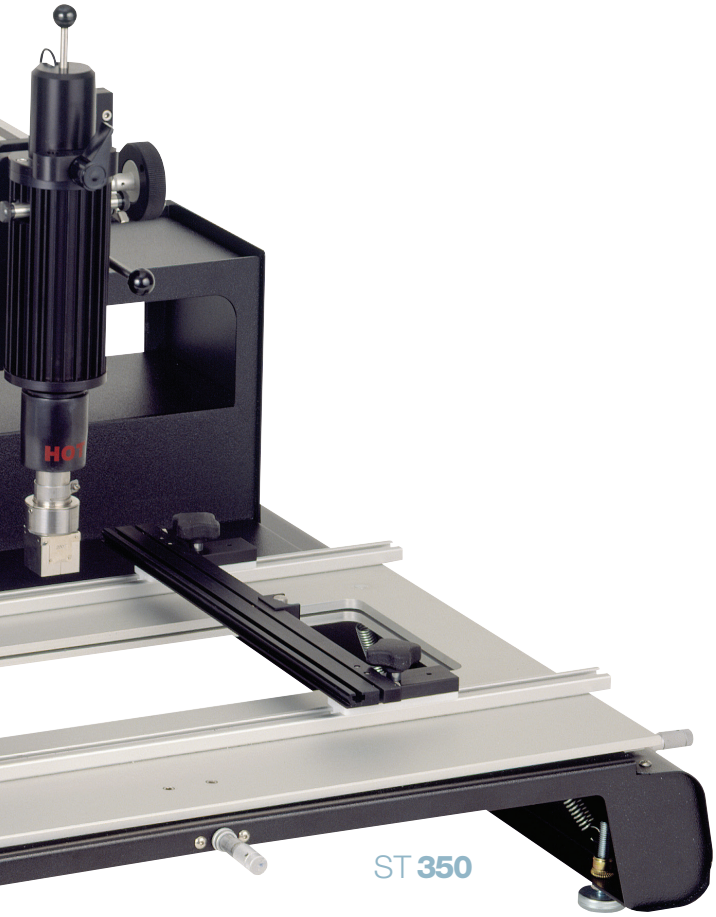


PACE unique feature

Simple coplanarity adjustment allows for exact nozzle adjustment, much better than fixed head systems.

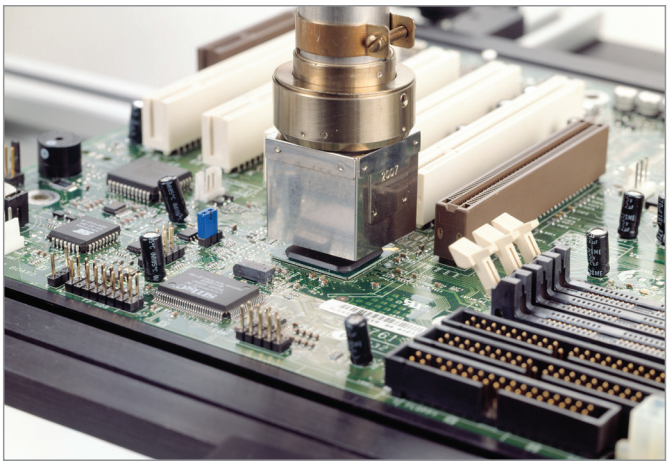






Features

- Multi-level password lock-out prevents unauthorized changes.
- User definable temperature zone.
- Audible countdown timer for end of cycle indication in the Timed and Program modes.
- Store and recall up to 20 profiles (40 with optional software).
- Quiet-Flo turbine blower offers nearly silent operation.
- On-screen display of parameters (temperature, time) during operation.
- Integrated PCB holder with micrometer adjustments.



The reflow head features Theta rotation for alignment, Z axis motion as well as Y axis motion so the reflow head can be moved safely out of the way so it doesn't interfere with the operator's ability to see while the component land site is being dressed, cleaned, or inspected. The standard PCB holder is capable of holding a PCB that is 457mm (18") x 457mm (18") and has micrometer adjustments in the X and Y directions for easy alignment.

The ST 350 features the Quiet-Flo turbine and has one K-type thermo-couple input that can be used to monitor the thermal environment at the work site with optional software. Additionally, the system comes standard with the Lo-Flo pump and the vacuum wand (PV-65) for manipulating components manually.

When additional programming capability is required, such as 4 zone profile creation for area array components, an optional software package is available that can be used with a PC or laptop (1199-0019-P1). The optional software package further allows the ST 350 to control the ST 450 Preheater when bottom side heating of the PCB is required. Up to three preheaters (any combination of ST 400s and ST 450s) can be placed under the PCB holder. After 4 zone profiles have been created with the optional software, they can be downloaded to the ST 350 and can be run WITHOUT the PC or laptop being connected! Area array components are aligned using a proven, reliable template method that is easy to use.

Specifications	ST 350
Part Numbers	8007-0437 ST 350 8007-0438 ST 350E
Power Requirements	97-127 VAC, 50/60 Hz, 575 Watts max. 197-253 VAC, 50/60 Hz, 575 Watts max.
Dimensions	578mm (22.75") **H** x 930mm (36.75") **W** x 665mm (26.25") **D**
Weight	26.4Kg (58lbs.)
Temperature Control	Closed loop, digital temperature control
Temperature Stability	± 9°C (±15°F) at idle tip temp.
Temperature Range	149° to 482°C (300° to 900°F) nominal
Airflow Range	5-22 slpm

ST 300/ST 325/ST 350
Hot Air Nozzles

BGA Nozzles	Component	BGA Size (Nominal)	Part Number
	BGA-204/225/256/272/292/320/324	27mm (1.1") **L** x 27mm (1.1") **W**	4028-5001
	BGA-169/168	23mm (0.91") **L** x 23mm (.91") **W**	4028-5002
	BGA-313/352	35mm (1.38") **L** x 35mm (1.38") **W**	4028-5003
	BGA-144	13mm (0.51") **L** x 13mm (0.51") **W**	4028-5004
	BGA-121/196	15mm (0.59") **L** x 15mm (0.59") **W**	4028-5005
	BGA-86	16.25mm (0.64") **L** x 17.75mm (0.70") **W**	4028-5006
	BGA-68	13.45mm (0.53") **L** x 14.97mm (0.59") **W**	4028-5007
	BGA-32	10.42mm (0.41") **L** x 10.42mm (0.41") **W**	4028-5008
	BGA-40/44	11.97mm (0.47") **L** x 13.21mm (0.52") **W**	4028-5009
	BGA-18	8.64mm (0.34") **L** x 8.90mm (0.35") **W**	4028-5010
	BGA-357	25mm (0.98") **L** x 25mm (0.98") **W**	4028-5011
	BGA-421/432/736	40mm (1.57") **L** x 40mm (.57") **W**	4028-5012
	BGA-560	42.5mm (1.67") **L** x 42.5mm (1.67") **W**	4028-5013
	BGA-240/304/432	31mm (1.22") **L** x 31mm (1.22") **W**	4028-5014
	BGA-256	17mm (0.67") **L** x 17mm (0.67") **W**	4028-5015
	BGA-252/255/256	21mm (0.83") **L** x 21mm (0.83") **W**	4028-5016
	BGA (Short Adpt.)	21mm (0.83") **L** x 21mm (0.83") **W**	4028-5017
	BGA-479/493/584	37.5mm (1.48") **L** x 37.5mm (1.48") **W**	4028-5018
	BGA-96/121	19mm (0.75") **L** x 19mm (0.75") **W**	4028-5019
	BGA-240/324	32mm (1.26") **L** x 32mm (1.26") **W**	4028-5020
	BGA-256/400	29mm (1.14") **L** x 29mm (1.14") **W**	4028-5021
	BGA-100	16mm (0.63") **L** x 16mm (0.63") **W**	4028-5022
	BGA-119	22mm (0.87") **L** x 14mm (0.55") **W**	4028-5023
	BGA-169	19.25mm (0.76") **L** x 19.25mm (0.76") **W**	4028-5024
	BGA-196	18.5mm (0.73") **L** x 18.5mm (0.73") **W**	4028-5025
	BGA-240	26.4mm (1.04") **L** x 26.4mm (1.04") **W**	4028-5026
	BGA-256	30mm (1.18") **L** x 30mm (1.18") **W**	4028-5027
	BGA-475	25mm (0.98") **L** x 32.3mm (1.27") **W**	4028-5028
	BGA-521	43mm (1.69") **L** x 43mm (1.69") **W**	4028-5029
	BGA-540	44mm (1.73") **L** x 44mm (1.73") **W**	4028-5030
	BGA-169	22mm (0.87") **L** x 22mm (.87") **W**	4028-5032
	BGA-361	33mm (1.29") **L** x 33mm (1.29") **W**	4028-5033
	BGA-720	47.5mm (1.87") **L** x 47.5mm (1.87") **W**	4028-5034
	BGA-303	21mm (0.83") **L** x 25mm (0.98") **W**	4028-5035
	BGA (Short Adpt.)	17mm (0.67") **L** x 17mm (0.67") **W**	4028-5036
	BGA (Small Cup)	21mm (0.83") **L** x 21mm (0.83") **W**	4028-5037
	Assembly	10mm (0.39") **L** x 13mm (0.51") **W**	4028-5038
	Micro BGA-48	7.75mm (0.31") **L** x 5.6mm (0.22") **W**	4028-5501
	Micro BGA-48	7.85mm (0.31") **L** x 6.40mm (0.25") **W**	4028-5502
	Micro BGA	7mm (0.28") **L** x 4.5mm (0.18") **W**	4028-5503
	Calibration Nozzle	27mm (1.1") **L** x 27mm (1.1") **W**	4028-2010-P1

Pattern Nozzles	Component Type	Jet Spacing	Jet Length	Part Number
	SOIC- 8 (JEDEC)	4.1mm (0.16")	6.1mm (0.24")	4028-4001-P1
	SOIC-14/16 (JEDEC)	4.1mm (0.16")	10.9mm (0.43")	4028-4002-P1
	SOICL-16 (JEDEC)	7.9mm (0.31")	10.9mm (0.43")	4028-4003
	SOICL-20 (JEDEC)	7.9mm (0.31")	13.5mm (0.53")	4028-4004
	SOICL-24 (JEDEC)	7.9mm (0.31")	16mm (0.63")	4028-4005
	SOICL-28 (JEDEC)	7.9mm (0.31")	18.5mm (0.73")	4028-4006
	SOICL-32 (JEDEC)	11.68mm (0.46")	20.83mm (0.82")	4028-4007
	TSOP-48 (Type I)	18.6mm (0.734")	11.68mm (0.46")	4028-4505
	TSOP-32/40/44/50 (Type II)	10.4mm (0.41")	21.35mm (0.84")	4028-4506

Single Jet Nozzles	Shape of Jet Tube	Nozzle Size (Nominal)	Part Number
	Curved, Round	3.0mm diameter (0.1" diameter)	4028-1001-P1
	Curved, Round	5.0mm diameter (0.2" diameter)	4028-1002-P1
	Curved, Round	8.0mm diameter (0.3" diameter)	4028-1003-P1
	Straight, Round	3.0mm diameter (0.01" diameter)	4028-1011-P1
	Straight, Round	5.0mm diameter (0.2" diameter)	4028-1012-P1
	Straight, Round	8.0mm diameter (0.3" diameter)	4028-1013-P1
	Flat Jet	13.21mm length (0.52")	4028-1021-P1
	Flat Jet	23.37mm length (0.92")	4028-1022-P1

Box Nozzles	Component Type	Nozzle Size (Inside Dimensions)	Part Number
	PLCC	32.5mm (1.28") **L** x 46.5mm (1.83") **W**	4028-1501
	PLCC-18 (Non Baffled)	8.5mm (0.34") **L** x 12.1mm (0.48") **W**	4028-2001
	PLCC-20 (Non Baffled)	10.2mm (0.40") **L** x 10.2mm (0.40") **W**	4028-2002
	PLCC-28 (Non Baffled)	12.8mm (0.50") **L** x 12.8mm (0.50") **W**	4028-2003
	PLCC-32 (Non Baffled)	12.8mm (0.50") **L** x 15.3mm (0.60") **W**	4028-2004
	PLCC-44 (Non Baffled)	17.9mm (0.70") **L** x 17.9mm (0.70") **W**	4028-2005
	PLCC-52	20.4mm (0.80") **L** x 20.4mm (0.80") **W**	4028-2006
	PLCC-68	25.5mm (1.01") **L** x 25.5mm (1.01") **W**	4028-2007
	PLCC-84	30.6mm (1.20") **L** x 30.6mm (1.20") **W**	4028-2008
	PLCC-100	38.9mm (1.53") **L** x 38.9mm (1.53") **W**	4028-2009
	QFP-80/100	18.1mm (0.71") **L** x 24.1mm (0.95") **W**	4028-2501
	QFP-64/80 (Non Baffled)	17.0mm (0.67") **L** x 17.0mm (0.67") **W**	4028-2502
	QFP-132	26.9mm (1.06") **L** x 26.9mm (1.06") **W**	4028-2503
	QFP-160	31.9mm (1.26") **L** x 31.9mm (1.26") **W**	4028-2504
	QFP-208	31.5mm (1.24") **L** x 31.5mm (1.24") **W**	4028-2505
	QFP-240	34.6mm (1.36") **L** x 34.6mm (1.36") **W**	4028-2506
	BQFP-100	23.5mm (0.925") **L** x 23.5mm (0.925") **W**	4028-2507
	BQFP-84	20.9mm (0.8") **L** x 20.9mm (0.8") **W**	4028-2508
	BQFP-132	27.1mm (1.07") **L** x 27.1mm (1.07") **W**	4028-2602
	TQFP-32 (Non Baffled)	11.5mm (0.453") **L** x 11.5mm (0.453") **W**	4028-3002
	TQFP-120 (Non Baffled)	15.5mm (0.610") **L** x 15.5mm (0.610") **W**	4028-3004