APT Electronics, Inc.
Advanced Packaging Technology
ISO9001 & AS9100 Certified Company, ITAR Registered

Updated 03/01/2022

Precision Electronic Manufacturing for
AEROSPACE – MILITARY – INDUSTRIAL – MEDICAL

APT Electronics, Inc. is a fully automated Ultra Hi-Reliability, High Complexity Electronics Contract Manufacture, specializing in surface mount, through-hole and integration. Our main focus being complex Military/Defense CCA manufacturing of dense designs. APT is a certified Small Business servicing customers nationally and globally. APT is especially adept at Rigid, Flex & Rigid-Flex assembly.

Certified manufacturing process and Quality system in accordance with **ISO 9001** registration #: 10002384 QM08 and **AS9100** registration #: 100002384 ASH09. ITAR registered

EQUIPMENT & CAPABILITIES

Facility:

21k sq/ft

- 3K sq/ft office space
- 18k sq/ft manufacturing/support area

Staff:

(87) Employees
(4) Program Managers
(3) Senior Buyers with (1) Junior Buyer
(1) Engineering Manager
(3) Manufacturing Engineers
(2) Process Engineers
(1) Test Manager/Engineer
(2) Test Engineer
(3) Test Technicians
(1) Subject Matter Expert (SME) PWB
(1) Quality Manager:
(3) Quality Engineers
(8) Quality Inspectors (Certified to IPC-A-610 & J-STD-001)
(1) IPC-A-610 & J-STD-001 Certified Trainer
(1) IPC 7711 & 7721 Certified Trainer

MANUFACTURING

Four (4) SMT Pick and Place lines
One (1) Leaded Wave soldering line
One (1) **Lead Free** Wave soldering line
Water soluble, No clean and RMA Flux available {per customer requirements}
Workmanship Standard: IPC-610C class 2 and 3 and J-STD 001 class 2 and 3
First Articles in compliance with AS9102 (when required)
Rework & Repair Capabilities: IPC-7711 and IPC 7721

SOLDER AND FLUX

SMT, Wave, and Hand Solder: IAW J-STD-001
Leaded/Lead Free/Water Soluble/No Clean/RMA

Selection of solder/flux used based on customer requirements and compatibility with specific process requirements.
Validation analysis and SIR test reports available upon request

SMT

SMT EQUIPMENT

Pick & Place Machines

Hanwha model **HM 520** Cutting-edge Modular Mounter (qty 1)
    Spindle/Gantry: 2 Gantry x 20, 6 Spindle/Gantry
    Speed: 80,000 CPH (Optimum)
    Parts : 0201~□6mm/~□55mm (H15mm)
    Accuracy : ±25 µm @ Cpk ≥ 1.0/Chip
        ±30 µm @ Cpk ≥ 1.0/IC
    PCB Size : 510 x 580(Single lane)
        Max. 750 x 580, 750 x 310
    Intelligent-ready electronic feeders.
    Bar code scan assist

Hanwha model **SM 481 PLUS**, Advanced High Speed Flexible Mounter (Qty 4)
    10 spindle single overhead gantry; megapixel full vision alignment and centering
    Placement speed 32K Cph (IPC9850)
    Component range: 0402 to 16mm (01005 to .65"), H10mm (.39")
    Placement accuracy: 40 microns/chip, 30 microns/QFP
    PCB size Max: 18.11" X 15.74"
    Intelligent-ready electronic feeders.
    Bar code scan assist

Hanwha model **SM 482 PLUS**, Advanced High Speed Flexible Mounter (Qty 3)
    6 spindle single overhead gantry; megapixel full vision alignment and centering
    Placement speed 22K Cph (IPC9850)
    Component range: 0402 to 16mm (01005 to .65"), H10mm (.39")
    Placement accuracy: 40 microns/chip, 30 microns/QFP
    PCB size Max: 18.11" X 15.74"
    Intelligent-ready electronic feeders.
    Bar code scan assist

Hanwha model **SM 485**, Advanced High Speed Flexible Mounter (Qty 1)
    5 spindle single overhead gantry; megapixel full vision alignment and centering
    Placement speed 22K Cph (IPC9850)
    Component range: 0402 to 16mm (01005 to .65"), H10mm (.39")
    Placement accuracy: 40 microns/chip, 30 microns/QFP
    Custom component gripper ANC with auto nozzle changer (to place specialty designed components such as custom connectors)
    PCB size Max: 18.11" X 15.74"
    Intelligent-ready electronic feeders.
    Bar code scan assist

Hanwha model **STF-100S** Side Tray Feeder (qty 4)
    20 JEDEC tray capacity. For all tray components such as BGA's, QFP etc.
    Non-stop operation

Solder Paste Printers:

ESE US-2000X (2)
Fully automatic with 3 camera fiducial recognition, under stencil cleaning system and 2D paste verification system.
Board Size: Min. 2" x 2" Max. 21" x 16"

DEK Horizon 03iX (1)
Fully automatic with fiducial recognition, under stencil cleaning system, 25 micron +/- paste on pad verification system.
Board Size: Min. 2" x 2" Max. 20" x 20"

Yamaha YCP10
Fully automatic with fiducial recognition, under stencil auto cleaning system, .025 mm printing accuracy, .010mm repeatability
Board Size: Min. 2" x 2" Max. 20" x 20"

Solder Paste Inspection System
ASC International, SP3D, Mini (1)
Windows XP User Interface, Automatic Height/Width/Length/Area and Volume Calculations, Large, Anti-Static Work Surface, Class II Laser Source, High-Resolution Video Monitor, Solid State Video Camera, PC Control, SVGA Monitor.
1.6 in. maximum object thickness, 36 x 24 in. standard work surface, 16 in throat depth.

SMT Reflow Ovens: (4)
Vitronics Soltec XPM3 1240 with 12 convection heating (top & bottom) zones and EC2 4 cooling zones.
Temperature: Max. 350°C
Board size: Min. 2" Max. 20"

Heller 1913 MK III with 13 convection heating (top & bottom) zones, 3 cooling zones.
Temperature: Max. 300°C
Board Size: Min. 2" Max. 18"

Heller 1809 MKIII with 9 convection heating (top & bottom) zones, 2 cooling zones
Temperature: Max. 300°C
Board size: Min. 2" Max. 18"

Heller 1809 MK III with 9 convection heating (top & bottom) zones, 2 cooling zones.
Temperature: Max. 300°C
Board Size: Min. 2" Max. 18"

Baking Ovens:
Blue M Electric model SPX (1)
(Used to pre-bake PCB and selected components prior to SMT process)

TPS-Blue M, model ESP400 (2)
(Used to cure epoxies, potting compounds and preheat assemblies)

GRIEVE model TBH-500 200sq/ft chamber (1)
(Used to cure epoxies, potting compounds and preheat assemblies)

Yamato model DVS 602 (3)
(Used to cure epoxies, potting compounds, preheat assemblies)

JPW Industries model BT222SUL220V3KW
(to cure PCBs that have a requirement for no contact with silicone products)

QUALITY

AOI Machine (2) *(Automatic Optical Inspection)*
MVP Supra-E (x2) Autoinspector
Quad Color lighting, 2D Image process algorithm
Board size: Min 2" x 2" Max 20" x 20"
Telecentric look down lighting
Large format camera for 01005 Inspection

First Article Inspection System (1)
Cluso A301EH
Board size: Min. 2" x 2" Max. 11" x 17"
Component Height Clearance: 2" above and below with a max of 4" , Smallest Component Size: 01005

VISION
AMScope_model ME1400B/T. 500X mag. Use to verify PWB cross section results.
Mantis scopes (12) 4X & 10X magnification

Luxo 23714RB-31114 Stereo microscopes (10) 2.5X to 45X

QUALITY *(continued)*

XRF (X-ray fluorescence)
FISHERSCOPE Model: X-RAY-XDAL (1)
X-ray fluorescence for measuring a variety of plated materials including Gold, tin, lead, etc.

WAVE-Through Hole Assembly

Selective Solder Machine
ACE KISS 103 (1)
Board Size: Min. 2” x 2” Max. 24” x 18”
Heated N2
Lead and Lead-Free (exchangeable solder pots)
Top and bottom side preheaters
De-Bridging N2 Jet
Utilizes Water soluble and No clean fluxes
Fiducial correction system
Board warp compensation system

Leaded Wave Solder Machine
Electrovert VectraES (1)
Servo Spray fluxer
3 zone top & bottom preheaters (6’ overall length) -Calrod type
Receipt-Driven air atmosphere wave technology
Recipe-driven solder pot height adjustment
Wet finger cleaning system
Finger type: titanium rigid VVL
Board thickness: 1.6mm
18” process width
Soldering atmosphere: Air
Nozzle type: Titanium ultra-fill with rotary chip

Lead Free Wave Solder Machine
Electrovert VectraES (1)
Servo Spray fluxer
3 zone top & bottom preheaters (6’ overall length) -Calrod type
Receipt-Driven air atmosphere wave technology
Recipe-driven solder pot height adjustment
Wet finger cleaning system
Finger type: titanium rigid VVL
Board thickness: 1.6mm
18” process width
Soldering atmosphere: Air
Nozzle type: Titanium ultra-fill with rotary chip

Nitrogen Generator
On-Site Model N-50 (1)
Built in oxygen analyzer
Produces up to 226 SCFH at a purity of 99.99%
120 gallon storage capacity

Solder Fountain (used for dip solder, pre tin, etc.)

Lead Solder

Hakko 485 (3) with automatic solder flow controller
Component size: 9.9mm x 9.9mm to 89mm x 10mm
Standard solder: 63Sn/37Pb

Lead Free Solder

Hakko 485 (2) with automatic solder flow controller
Component size: 9.9mm x 9.9mm to 89mm x 10mm
Standard solder: SAC 305

Lead forming:

General Product Devices Model: CF8, Component former**,**
Hepco Inc, Model T3700-2 Lead trimmer

PCBA CLEANING

Electrovert Aquastrom 100 Cleaning System (qty.1)
Dionized Water Cleaning System
30” wide adjustable incline conveyer
Pre-wash: (2) upper and (2) lower spray bars with V-Jet nozzles
Recirculating wash: with 10hp pump (4) upper and (4) lower spray bars with V-Jet nozzles
Final rinse: (2) upper and (2) lower spray bars with V-Jet nozzles
Dryer module: Dual dryer system 10hp dryers with electro air knives
Digital flow meter: Prewash & Final Rinse
Sub-pump upgrade
Internal drip tray

Aqua Kleen System model Typhoon T-8 In-line Chemistry Cleaner (1), Low discharge in-line cleaner used to clean assemblies manufactured with RMA flux. Utilizes Techspray SMT 200 as standard saponifier

Ionic Tester

Aqueous technologies: model G3-24 ZERO-ION (1) 24” X 24” test cell.

BGA

X-Ray

PHOENIX PCBA Analyzer
160KV Open Tube design
2-D with Rotating Stage

BGA Rework Station

Airvac DRS25 BGA/SMD rework station high efficiency 16” X 16” preheated (5000 watts), programmable board heating system. Rework Capability: Lead & Lead Free capable BGA, Micro BGA smallest size in the market to 43^2mm or 1.7^2” Board Size: Min. 2” x 2” Max. 18” x 24”

BGA Re-ball

APT can perform reballing in house utilizing pre-form ball grid templates, on large qty’s APT may opt to outsource re-balling based on volume. Re-balling to a minimum of .015” with a pitch of 0.4 mm

TEST

ICT In-Circuit Test Systems
HP 3070 Series V (1)
Capability: Currently testing up to 1728 nodes. Up to a maximum of 2592 nodes
HP 3070 Series III (2)
Capability: Currently testing up to 2304 nodes.

Teradyne Z1820 (1)
Capability: Currently testing up to 1060 nodes.
DeltaScan with FrameScan
Teradyne Spectrum 8800 series. (1)
Capability: Currently testing up to 2400 nodes.

GenRad 2286e (1)
Capability: Currently testing up to 3840 nodes.

Flying Probe Test System
Acculogic 980Dx
Full Function Double Sided System, Closed Loop AccuFast™ Drive System with 1 micron minimum step size, +/-10 micron positioning repeatability, Configurable with up-to 22 Closed Loop Flying Probes, Programmable probe angle +6º to -6º degrees, Extensive electrical Test capabilities including Analog, Digital, Mixed signal and Boundary Scan as well as advanced Optical and Thermal inspection, Power-on and advance function testing (up-to GHz range), Up-to 128 non-Mux test channels through fixed nails, Latent open detection, Support for largest boards up-to 41″x 25.5″ (1050 x 640mm)

Temperature Cycle Testing

Thermotron S-16 (1)
Internal Volume (Cubic Ft): 16c/ft
Temperature High Limit: 350°F, (177°C)
Temperature Low Limit: -100°F, (-73.3°C)
Method of Cooling: Cascade Mechanical Refrigeration with N2 assist.

SD-302 Mechanical Refrigeration Chamber
Internal Volume 2 Cubic ft.
Temperature High Limit: 350F, (177°C)
Temperature Low Limit: -85F, (-65°C)

Vacuum Oven
Bemco- AF+300-8SBemco- AF+300-8S
Internal Volume 16cft
Temperature High Limit: 240°F, (115°C)
Temperature Low Limit: -ambient
Vacuum: 1 x 10-4 Torr.

IC Programming

Chip Master 7000, 7100, and 6100/XP (2), XPRO-3000, PBM 1410-84
Program Capability: PLCC-24, 32, 44, QFP-44 and SO-16

Miscellaneous Test Equipment

Tonehom multilayer shorts locator Model 950 (1)
Cable Scan Test Mate Model EXP (1)
Oscilloscope: Tektronix TDS 3053 500MHZ DPO (1)
BK Precision 889 Bench LCR/ESR Meter (1)
Variable DC power supplies from 1VDC to 250VDC.
Various DMM (standard test equipment)
Lecroy Waverunner 604 ZI (1)

MATERIAL CONTROL

MRP/ERP

MANEX XRP Anticipatory Data Analytics ERP System designed for small – medium electronic contract manufactures

X-RAY Component Counter

Optical Control Model OC-SCAN-CCX (1)
SMD X-Ray Scanner with intuitive usability
Automatic component recognition – Automated parameter setting and counting of unknown components
Intelligent database
Direct interface with MANEX MRP/ERP Database.

MISCELLANEOUS

De-paneling Equipment

SAYAKA SAM-CT56NJ (SEIKA)
High-speed automatic router with CCD camera and state of the art image-processing software
Routing area: 19.5" x 23.5"
Max PCB thickness: 0.236"
Repeatability: +/- 0.0004"

FKN SYSTEK Model: 01-01000R
Semi-Automatic router.
Manual feed
Max PCB thickness: 0.155"

VDP3-IM manual de-paneling machine (3)
Board Size: Min. 2" Max. 18"

DJZ-NIR-1 pneumatic nibbler (1)
Board Size: Min. 2" Max. 18"

Press-Fit Connector Installation

5 Ton Manual Press (1)
3 Ton Manual Press (2)
1 Ton precision press (1)
½ Ton Manual Press (2)
AMP 2216056-1 CBP-5T 5 ton electronic press (1)
Customized tooling provided to ensure proper engagement

Component Baking Oven

Yamato model DVS-602 (1)
Use to recondition MSD devices per J-STD-033

Vacuum Sealer with Optional Nitrogen Infusion

Super Mighty Mutt (2)
Bag size min 2" max 18" at 26 hg vacuum

De-Humidity Cabinet (Dry Box)

Mc Dry model DXU-1001
- Compliant to ESD-IEC61340-5-1
- Can maintain RH level of 1%RH

Freezer (for pre-mixed frozen materials)
SO-LOW Model CH45-5 freezer (1), (-45°)

SO-LOW Model U40-13 freezer (1)

Pre-Heater (PCBA Rework Preparation)

HAKKO model FR1012 (5)

Dispensing

Loctite Dispensing Controllers (2) 98021 with digital timer control of duration from .01 to 30 seconds. Vacuum pull back feature.

Oki Precision Dispensers DX-250 (4) with digital timer control of duration from .02 to 60 seconds. Vacuum pull back feature.

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