IPC-9850A

Surface Mount Placement Equipment Characterization

Developed by the SMT Component Placement Equipment Subcommittee (5-41) of the Assembly Equipment Committee (5-40) of IPC

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Users of this publication are encouraged to participate in the development of future revisions.

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1 INTRODUCTION

1.1 Scope This standard establishes the procedures to characterize the capability of surface mount assembly equipment in specification documents, as well as in documentation used to verify a specific machine's placement capability and conformance to the specification while maintaining placement accuracy to placement throughput relationship.

1.2 Purpose IPC-9850 has been developed to standardize the parameters, measurement procedures, and the methodologies used for the specification, evaluation, and continuing verification of assembly equipment throughput and accuracy characterization parameters. These standardized tools **shall** be used to develop and report the information called out in this standard.

1.3 Background Historically, placement equipment machine suppliers have selected their own parameters and methodologies to present the specification of their machines' throughput and accuracy capabilities. The many representations of the information have made the comparisons between placement machines very difficult.

This standard simplifies the evaluation process by coupling placement throughput and placement accuracy because they are dependent on each other. This standard also specifies the methodologies by which these parameters are measured. The methodologies specified herein are consistent and verifiable, thus providing common ground methodologies between users and machine suppliers. The test boards used in this standard are for metrology reasons less complex than real-life boards so individual users will experience different levels of derate depending on their products. It is recommended for evaluation purposes that the user treats the IPC-9850 throughput rating as an initial comparison knowing that further evaluation based on actual product would be advised.

The throughput and accuracy evaluation methods of this standard specify that measurements will be made by placement of standardized components into sticky media on clear glass panels. Experience shows that surface mount equipment must perform well on sticky media before it can perform well in production. Furthermore, improved process capability on sticky tape usually translates into enhanced process capability in production. Although this method does not provide all information to perfectly predict production accuracy, this methodology was selected in order to remove as much of the variation as possible between facilities, products, process, and operators.

1.3.1 Future Considerations A number of issues including but not limited to the following items were deferred to a future revision to this standard. Users are encouraged to provide additional recommendations and support material using the Standard Improvement Form at the end of this standard:

- Placement density metric.
- Update chip component criteria (component size, C, R, shape/physical attributes) as component manufacturing technology and use changes. For instance 0402 [01005] size components may be added in the future.
- Develop the means to correlate the use and test results of more challenging test devices.
- Removing the old IPC-9850 chip board CB-A from the standard on next revision.

1.4 Implementation

1.4.1 Characterization Limitations This standard is comprised of a set of parameters that are the lowest common denominator for surface mount placement equipment. It should be recognized that additional metrics may be of value in some instances. The collection of parameters selected for this standard comprise the best subset for use as a core set of requirements to be included with an equipment supplier's general specification. This core set may change in future revisions as technology dictates. In addition, since there are many possible combinations of hardware and software features that are unique to individual machine types, this standard cannot address every one of them. Such features and options affect the overall capabilities of specific equipment model and it is left to the user to understand their implications. Additionally, it is incumbent upon the user to understand the restrictions and leeway provided for each parameter in this standard so the proper performance conclusions are reached.