



Edited by:

Mohd Arif Anuar Mohd Salleh,
Azman Jalar,
Mohd Sharizal Abdul Aziz,
Mohd Izrul Izwan Ramli.

ISSN 2364-3293

ISSN 2364-3307 (electronic)

Topics in Mining, Metallurgy and Materials Engineering

ISBN 978-3-030-93440-8

ISBN 978-3-030-93441-5 (eBook)

<https://doi.org/10.1007/978-3-030-93441-5>

© The Editor(s) (if applicable) and The Author(s), under exclusive license to Springer Nature Switzerland AG 2022

This work is subject to copyright. All rights are solely and exclusively licensed by the Publisher, whether the whole or part of the material is concerned, specifically the rights of translation, reprinting, reuse of illustrations, recitation, broadcasting, reproduction on microfilms or in any other physical way, and transmission or information storage and retrieval, electronic adaptation, computer software, or by similar or dissimilar methodology now known or hereafter developed.

The use of general descriptive names, registered names, trademarks, service marks, etc. in this publication does not imply, even in the absence of a specific statement, that such names are exempt from the relevant protective laws and regulations and therefore free for general use.

The publisher, the authors and the editors are safe to assume that the advice and information in this book are believed to be true and accurate at the date of publication. Neither the publisher nor the authors or the editors give a warranty, expressed or implied, with respect to the material contained herein or for any errors or omissions that may have been made. The publisher remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.

This Springer imprint is published by the registered company Springer Nature Switzerland AG
The registered company address is: Gewerbestrasse 11, 6330 Cham, Switzerland

Properties of Sn0.7Cu Solder Alloys Bearing Fe and Bi	133
Mohd Faizul Mohd Sabri, Mohd Faiz Mohd Salleh, Syed Hassan Abbas Jaffery, and Mohammad Hossein Mahdaviifard	
Processing and Performances	
The Effect of Isothermal Ageing Treatment on Different PCB Surface Finishes: Simulation and Experimental	171
F. Muhamad Razizy, N. Zhen Zhang, M. S. Hashim, O. Saliza Azlina, and O. Shahrul Azmir	
Flux Modification for Wettability and Reliability Improvement in Solder Joints	195
N. Ismail, A. Jalar, M. A. Bakar, and A. Atiqah	
Advancement of Printed Circuit Board (PCB) Surface Finishes in Controlling the Intermetallic Compound (IMC) Growth in Solder Joints	217
A. Atiqah, A. Jalar, M. A. Bakar, and N. Ismail	
Significance of Intermetallic Compound (IMC) Layer to the Reliability of a Solder Joint, Methods of IMC Layer Thickness Measurements	239
M. A. Bakar, A. Jalar, A. Atiqah, and N. Ismail	
The Effect of Laser Soldering onto Intermetallic Compound Formation, Growth	265
Siti Rabiattull Aisha Idris, Nabila Tamar Jaya, and Muhammad Asyraf Abdullah	
Reliability Analysis on the Flexible Printed Circuit Board After Reflow Soldering	283
Muhammad Iqbal Ahmad, Mohd Sharizal Abdul Aziz, and C. Y. Khor	
Solder Paste's Rheology Data for Stencil Printing Numerical Investigations	299
M. S. Rusdi, M. Z. Abdullah, Mohd Sharizal Abdul Aziz, S. A. H. A. Seman, and M. H. Hassan	
Tin Whiskers Growth in Electronic Assemblies	311
M. S. Chang, Mohd Arif Anuar Mohd Salleh, D. S. C. Halin, and N. Z. Mohd Mokhtar	

The effect of laser soldering onto intermetallic compound formation, Growth

Siti Rabiatussalamah Aisha Idris , Nabila Tamar Jaya , Muhammad Asyraf Abdullah
Faculty of Mechanical and Automotive Engineering Technology, Universiti Malaysia Pahang, 26600,
Pekan, Pahang, Malaysia

ABSTRACT

Recently, the laser soldering method has been introduced among electronic manufacturers because of its superior properties such as non-contact and localised heating, quick rise and drop in temperature, and ease of automation compared to reflow soldering. This paper discusses the effect of laser soldering parameters on intermetallic compound formation and growth between lead-free solder alloy and copper substrate. The analysis was conducted for the type of laser used for heat-sensitive components and characteristics of the laser soldering process, which could promote or inhibit excessive growth of intermetallic compound formation.

KEYWORD

Lead-free solder alloy; Laser soldering; Intermetallic compound