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(JWES)

**Test methods for lead-free solders —  
Part 1: Methods for measuring of melting  
temperature ranges**

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In the event of any doubts arising as to the contents,  
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## Foreword

This translation has been made based on the original Japanese Industrial Standard revised by the Minister of Economy, Trade and Industry, through deliberations at the Japanese Industrial Standards Committee as the result of proposal for revision of The Japan Welding Engineering Society (JWES) with the draft being attached, based on the provision of Article 12 Clause 1 of the Industrial Standardization Law applicable to the case of revision by the provision of Article 14.

Consequently **JIS Z 3198-1:2003** is replaced with this Standard.

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**JIS Z 3198** series consists of the following 7 parts under the general title “*Test methods for lead-free solders*”:

*Part 1: Methods for measuring of melting temperature ranges*

*Part 2: Methods for testing of mechanical characteristics-tensile test*

*Part 3: Methods for spread test*

*Part 4: Methods for solderability test by a wetting balance method and a contact angle method*

*Part 5: Methods for tensile tests and shear tests on solder joints*

*Part 6: Methods for 45° pull test of solder joints on QFP lead*

*Part 7: Methods for shear strength of solder joints on chip components*

# Test methods for lead-free solders — Part 1: Methods for measuring of melting temperature ranges

## Introduction

This Japanese Industrial Standard has been prepared based on the first edition of IEC 61189-11 published in 2013 with some modifications of the technical contents, intended to reflect the results obtained from the project entrusted by New Energy and Industrial Technology Development Organization concerning “the Standardization of items including test methods required for solder connection corresponding to the decrease in environmental load” carried out in 2000 and 2001.

The portions with continuous sidelines or dotted underlines are the matters in which the contents of the corresponding International Standard have been modified. A list of modifications with the explanations is given in Annex JA.

## 1 Scope

This Standard specifies the methods for measuring of melting temperature ranges of lead-free solders (hereafter referred to as “solder alloys”) that are mainly used for wiring of electric, electrical and communication equipment, and for other apparatus, as well as connecting components.

NOTE: The International Standard corresponding to this Standard and the symbol of degree of correspondence are as follows.

IEC 61189-11 : 2013 *Test methods for electrical materials, printed boards and other interconnection structures and assemblies — Part 11 : Measurement of melting temperature or melting temperature ranges of solder alloys* (MOD)

In addition, symbols which denote the degree of correspondence in the contents between the relevant International Standard and JIS are IDT (identical), MOD (modified), and NEQ (not equivalent) according to ISO/IEC Guide 21-1.

## 2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this Standard. The most recent editions of the standards (including amendments) indicated below shall be applied.

JIS C 1602	<i>Thermocouples</i>
JIS C 1605	<i>Mineral insulated thermocouples</i>
JIS K 7121	<i>Testing methods for transition temperatures of plastics</i>
JIS R 1301	<i>Porcelain crucibles for chemical analysis</i>