

TECHNICAL REPORT



**Wearable electronic devices and technologies –
Part 250-1: Electronic textile – Snap fastener connectors between e-textiles and
detachable electronic devices**



THIS PUBLICATION IS COPYRIGHT PROTECTED

Copyright © 2021 IEC, Geneva, Switzerland

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from either IEC or IEC's member National Committee in the country of the requester. If you have any questions about IEC copyright or have an enquiry about obtaining additional rights to this publication, please contact the address below or your local IEC member National Committee for further information.

IEC Central Office
3, rue de Varembe
CH-1211 Geneva 20
Switzerland

Tel.: +41 22 919 02 11
info@iec.ch
www.iec.ch

About the IEC

The International Electrotechnical Commission (IEC) is the leading global organization that prepares and publishes International Standards for all electrical, electronic and related technologies.

About IEC publications

The technical content of IEC publications is kept under constant review by the IEC. Please make sure that you have the latest edition, a corrigendum or an amendment might have been published.

IEC publications search - webstore.iec.ch/advsearchform

The advanced search enables to find IEC publications by a variety of criteria (reference number, text, technical committee, ...). It also gives information on projects, replaced and withdrawn publications.

IEC Just Published - webstore.iec.ch/justpublished

Stay up to date on all new IEC publications. Just Published details all new publications released. Available online and once a month by email.

IEC Customer Service Centre - webstore.iec.ch/csc

If you wish to give us your feedback on this publication or need further assistance, please contact the Customer Service Centre: sales@iec.ch.

IEC online collection - oc.iec.ch

Discover our powerful search engine and read freely all the publications previews. With a subscription you will always have access to up to date content tailored to your needs.

Electropedia - www.electropedia.org

The world's leading online dictionary on electrotechnology, containing more than 22 000 terminological entries in English and French, with equivalent terms in 18 additional languages. Also known as the International Electrotechnical Vocabulary (IEV) online.

Document preview generated by EVS

TECHNICAL REPORT



**Wearable electronic devices and technologies –
Part 250-1: Electronic textile – Snap fastener connectors between e-textiles and
detachable electronic devices**

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

ICS 59.080.80

ISBN 978-2-8322-9891-6

Warning! Make sure that you obtained this publication from an authorized distributor.

CONTENTS

FOREWORD.....	3
INTRODUCTION.....	5
1 Scope.....	6
2 Normative references	6
3 Terms and definitions	6
4 Classification of devices by connector type	6
4.1 General.....	6
4.2 Devices having two electrodes and using sockets of snap fasteners to connect with the e-textile	7
4.2.1 Size of the stud on the e-textile	7
4.2.2 Distance between electrodes on the e-textile	7
4.3 Devices with two electrodes using snap fastener studs to connect	9
4.3.1 Size of the stud on the device	9
4.3.2 Distance between the electrodes on the device	9
4.4 Devices using snap fasteners to connect the e-textile, but having more than two electrodes	9
5 Summary	11
5.1 Overview.....	11
5.2 Standardization needs	11
Figure 1 – a pair of typical snap fastener stud and socket	7
Table 1 – Examples of devices using sockets as connector	8
Table 2 – Examples of devices using two studs as connectors	9
Table 3 – Examples of devices having many electrodes.....	10

Document is a preview generated by EVS

INTERNATIONAL ELECTROTECHNICAL COMMISSION

WEARABLE ELECTRONIC DEVICES AND TECHNOLOGIES –**Part 250-1: Electronic textile – Snap fastener connectors
between e-textiles and detachable electronic devices**

FOREWORD

- 1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as "IEC Publication(s)"). Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
- 2) The formal decisions or agreements of IEC on technical matters express, as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested IEC National Committees.
- 3) IEC Publications have the form of recommendations for international use and are accepted by IEC National Committees in that sense. While all reasonable efforts are made to ensure that the technical content of IEC Publications is accurate, IEC cannot be held responsible for the way in which they are used or for any misinterpretation by any end user.
- 4) In order to promote international uniformity, IEC National Committees undertake to apply IEC Publications transparently to the maximum extent possible in their national and regional publications. Any divergence between any IEC Publication and the corresponding national or regional publication shall be clearly indicated in the latter.
- 5) IEC itself does not provide any attestation of conformity. Independent certification bodies provide conformity assessment services and, in some areas, access to IEC marks of conformity. IEC is not responsible for any services carried out by independent certification bodies.
- 6) All users should ensure that they have the latest edition of this publication.
- 7) No liability shall attach to IEC or its directors, employees, servants or agents including individual experts and members of its technical committees and IEC National Committees for any personal injury, property damage or other damage of any nature whatsoever, whether direct or indirect, or for costs (including legal fees) and expenses arising out of the publication, use of, or reliance upon, this IEC Publication or any other IEC Publications.
- 8) Attention is drawn to the Normative references cited in this publication. Use of the referenced publications is indispensable for the correct application of this publication.
- 9) Attention is drawn to the possibility that some of the elements of this IEC Publication may be the subject of patent rights. IEC shall not be held responsible for identifying any or all such patent rights.

IEC TR 63203-250-1 has been prepared by IEC technical committee 124: Wearable electronic devices and technologies. It is a Technical Report.

The text of this Technical Report is based on the following documents:

Draft	Report on voting
124/119/DTR	124/143/RVDTR

Full information on the voting for its approval can be found in the report on voting indicated in the above table.

The language used for the development of this Technical Report is English.

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at www.iec.ch/members_experts/refdocs. The main document types developed by IEC are described in greater detail at www.iec.ch/standardsdev/publications.

A list of all parts in the IEC 63203 series, published under the general title *Wearable electronic devices and technologies*, can be found on the IEC website.

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under webstore.iec.ch in the data related to the specific document. At this date, the document will be

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

IMPORTANT – The "colour inside" logo on the cover page of this document indicates that it contains colours which are considered to be useful for the correct understanding of its contents. Users should therefore print this document using a colour printer.

INTRODUCTION

E-textiles are suitable for measuring biological signals such as electrocardiograms, electromyograms and respiratory rates in everyday life without discomfort. The e-textile is interwoven or coated with an electric material for sensing the body surface potential in order to measure biological signals. To measure these biological signals, a detachable electronic device is connected to measure the body surface potential from the e-textile.

However, there is no established standard on the method for connecting the detachable electronic device to the e-textile. In view of the above circumstances and in order to standardize connection interface issues, it is necessary to investigate the connector types between e-textile and the detachable electronic device.

To date, conductive snap fasteners have been the most commonly applied as connectors for e-textiles.

This document reviews conductive snap fastener connectors and gives some guidance for future standardization work as regards connectors for e-textiles.

WEARABLE ELECTRONIC DEVICES AND TECHNOLOGIES –

Part 250-1: Electronic textile – Snap fastener connectors between e-textiles and detachable electronic devices

1 Scope

This document reviews the use cases of conductive snap fasteners applied as electrical connectors for e-textile products available on the market and provides guidance on future standardization works.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

There are no normative references in this document.

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- ISO Online browsing platform: available at <http://www.iso.org/obp>
- IEC Electropedia: available at <http://www.electropedia.org/>

3.1

snap fastener

device for attaching one material to another consisting of matching male (stud) and female (socket) parts, each of which is attached to a separate material so that the parts can be joined by an appropriate force and separated by a sufficient perpendicular tensile force

3.2

stud

male functional part of a snap fastener which engages with, or snaps into, the mouth of the socket to form a closure of two parts of the item, or garment on which the fastener is used

3.3

socket

female functional part of the fastener which engages with the stud part of the fastener to form the closure of two parts of the item on which the fastener is used

4 Classification of devices by connector type

4.1 General

Snap fasteners may be used for connecting detachable electronic devices to e-textile products.