

Guide to

Pulse techniques and apparatus —

Part 2: Pulse measurement and analysis, general considerations

UDC [621.373/.376]:621.317:621.35:001.4

NO COPYING WITHOUT BSI PERMISSION EXCEPT AS PERMITTED BY COPYRIGHT LAW

BSI
Documents

AVA

Document Sharing Hub

Committees responsible for this British Standard

The preparation of this British Standard was entrusted by the Electronic Equipment Standards Committee (EEL/-) to Technical Committee EEL/8, upon which the following bodies were represented:

- British Telecommunications plc
- Department of Trade and Industry (National Measurement Accreditation Service)
- Department of Trade and Industry (National Physical Laboratory)
- Electricity Supply Industry in England and Wales
- Electronic Engineering Association
- GAMBICA (BEAMA Ltd.)
- ITV Association
- Independent Broadcasting Authority
- Institution of Electronic and Radio Engineers
- International Association of Broadcasting Manufacturers
- Ministry of Defence
- Telecommunication Engineering and Manufacturing Association

This British Standard, having been prepared under the direction of the Electronic Equipment Standards Committee, was published under the authority of the Board of BSI and comes into effect on 31 July 1989

© BSI 01-2000

First published January 1979
First revision July 1989

The following BSI references relate to the work on this standard:
Committee reference EEL/8
Draft for comment 83/27375 DC

ISBN 0 580 17163 9

Amendments issued since publication

Amd. No.	Date of issue	Comments

Contents

	Page
Committees responsible	Inside front cover
National foreword	ii
1 General	1
1.1 Scope	1
1.2 Object	1
2 Definitions	1
3 Measurement of pulse characteristics	3
4 Pulse waveform analysis	4
5 Analysis of transition waveforms	6
6 Analysis of complex waveforms	6
7 Analysis of time relationships between different waveforms	7
8 Analysis of pulse waveform distortion	7
9 Analysis of jitter and fluctuation	7
Figure 1 — Waveform epoch expansion and contraction	8
Figure 2 — Derived reference pulse waveform	9
Figure 3 — Pulse measurement process	9
Figure 4 — Graphical determination of occurrence density	10
Figure 5 — Determination of pulse amplitude by the integral technique	10
Publications referred to	Inside back cover

National foreword

This Part of BS 5698 has been prepared under the direction of the Electronic Equipment Standards Committee as a revision of BS 5698-2:1979, which is withdrawn. It is identical with IEC 469-2:1987 “*Pulse techniques and apparatus. Part 2: Pulse measurement and analysis, general considerations*”, published by the International Electrotechnical Commission (IEC).

Terminology and conventions. The text of the International Standard has been approved as suitable for publication as a British Standard without deviation. Some terminology and certain conventions are not identical with those used in British Standards; attention is drawn especially to the following.

Cross-references

International Standard	Corresponding British Standard
IEC 469	BS 5698 <i>Guide to pulse techniques and apparatus</i>
IEC 469-1:1987 ^a	Part 1:1989 <i>Pulse terms and definitions</i> (Identical)
ISO 3534:1977 ^a	BS 5532 <i>Statistical terminology</i> Part 1:1978 <i>Glossary of terms relating to probability and general terms relating to statistics</i> (Identical)

^a Undated in the text.

NOTE The following editorial errors have been discovered in the IEC text and have been notified to the IEC.

- In 2.3.1, lines 2 and 3, “pictorial format” should be in italics as this is a defined term. Similar errors appear elsewhere in Clause 2.
- In 3.2, line 1, “error” should be in italics as this is a defined term.
- In 3.3, line 13, “Figure 3” should be “Figure 3”.
- In 3.3.4, in lines 4 and 5, “error” should be in italics as this is a defined term.
- In 6.4, line 4, “envelope” should be “envelope”.

A British Standard does not purport to include all the necessary provisions of a contract. Users of British Standards are responsible for their correct application.

Compliance with a British Standard does not of itself confer immunity from legal obligations.

Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, pages 1 to 10, an inside back cover and a back cover.

This standard has been updated (see copyright date) and may have had amendments incorporated. This will be indicated in the amendment table on the inside front cover.

1 General

1.1 Scope

This standard provides definitions and descriptions of the techniques and procedures for time domain pulse measurements. The definitions and descriptions provided are independent of specific devices, apparatus, instruments or computing devices which may be used in pulse measurements and are necessary for:

- efficient communication of the results of pulse measurements,
- standards for pulse apparatus, and
- standards for apparatus which employs pulse techniques.

1.2 Object

Within its scope, the object of this standard is the definition of terms and the description of techniques and procedures which are applicable:

- to the determination of the characteristics of practical and hypothetical pulses,
- regardless of the applicable limits of error, and
- to a wide range of technologies and disciplines.

2 Definitions

For the definitions of general pulse terms used in this standard reference should be made to IEC Publication 469-1.

When necessary, the references to clauses of IEC Publication 469-1 are given in this standard.

2.1 Pulse measurement terms

The pulse measurement terms defined in this sub-clause are applicable to measurement in general and are not defined in order to draw a distinction between pulse measurement and measurement in general.

For the purpose of this standard, the following definitions shall apply:

2.1.1

pulse measurement

the assignment of a number and a unit of measurement to a characteristic, property or attribute of a pulse wherein the number and unit assigned indicate the magnitude of the characteristic which is associated with the pulse. Typically, this assignment is accomplished by comparison of a transform of the pulse (its pulse waveform) with a scale or reference which is calibrated in the unit of measurement

2.1.2

method of pulse measurement

a method of making a *pulse measurement*¹⁾ comprises:

- the complete specification of the functional characteristics of the devices, apparatus, instruments and auxiliary equipment to be used;
- the essential adjustments required;
- the procedures to be used in making essential adjustments;
- the operations to be performed and their sequence;
- the corrections that will ordinarily need to be made;
- the procedures for making such corrections;
- the conditions under which all operations are to be carried out.

2.1.3

pulse measurement process

a realization of a *method of pulse measurement* in terms of specific devices, apparatus, instruments, auxiliary equipment, conditions, operators and observers

2.1.4

state of statistical control

in a *pulse measurement process*, that state wherein a degree of consistency among repeated measurements of a characteristic, property or attribute is attained

2.1.5

error

the difference between the result of the application of a *pulse measurement process* and the true value of the characteristic, property or attribute being measured

2.1.6

dispersion

the degree of mutual disagreement among the results of independent measurements of a pulse characteristic, property or attribute yielded by repeated applications of a *pulse measurement process*

2.1.7

resolution

the smallest change in the pulse characteristic, property or attribute being measured which can unambiguously be discerned or detected in a *pulse measurement process*

2.2

statistical terms

statistical terms are given in ISO Standard 3534

¹⁾ Terms in italic type are defined in this standard.