ISO/IEC 23634:2022-04 (E)

Information technology - Automatic identification and data capture techniques - JAB Code polychrome bar code symbology specification

Contents

Page

Foreword v

Introduction vi

1 Scope 1

2 Normative references 1

3 Terms, definitions, abbreviated terms and symbols 1
3.1 Terms and definitions 1
3.2 Abbreviated terms 2
3.3 Mathematical symbols 3
3.4 Mathematical and logical operations 3

4 Symbol description 4
4.1 Basic characteristics 4
4.2 Summary of additional features 5
4.3 Symbol structure 5
4.3.1 Square primary symbol 5
4.3.2 Rectangle primary symbol 5
4.3.3 Square secondary symbol 5
4.3.4 Rectangle secondary symbol 5
4.3.5 Symbol side size 7
4.3.6 Module dimension 9
4.3.7 Finder pattern 9
4.3.8 Alignment pattern 10
4.3.9 Colour palette 13
4.3.10 Metadata 13
4.3.11 Encoded data 14
4.4 Metadata structure 14
4.4.1 Metadata of a primary symbol 14
4.4.2 Metadata of a secondary symbol 16
4.4.3 Metadata error correction encoding 18
4.4.4 Reserved modules for metadata and colour palette 18
4.5 Symbol Cascading 20
4.5.1 Symbol docking rules 20
4.5.2 Symbol decoding order 20

5 Symbol generation 24
5.1 Encoding procedure overview 24
5.2 Data analysis 25
5.3 Encoding modes 25
5.3.1 Encoding modes and character set 25
5.3.2 Uppercase mode 26
5.3.3 Lowercase mode 27
5.3.4 Numeric mode 28
5.3.5 Punctuation mode 28
5.3.6 Mixed mode 28
5.3.7 Alphanumeric mode 28
5.3.8 Byte mode 29
5.3.9 Extended Channel Interpretation (ECI) mode 29

5.3.10 FNC1 mode 29
5.4 Error correction 29
5.4.1 Error correction levels 29
5.4.2 Error correction parameters 30
5.4.3 Padding Bits 30
5.4.4 Generating the error correction stream 31
5.5 Data interleaving 31

5.6 Metadata module reservation 31
5.7 Data module encoding and placement 32
5.8 Data masking 33
5.8.1 Data masking rules 33
5.8.2 Data mask patterns 33
5.8.3 Evaluation of data masking results 34
5.9 Metadata generation and module placement 34

6 Reference decode algorithm 35
6.1 Decoding procedure overview 35
6.2 Pre-processing image and classifying colours 35
6.3 Locating finder patterns 36
6.4 Locating alignment patterns 41
6.5 Establishing sampling grid and sampling symbol 44
6.6 Decoding metadata and constructing colour palettes 45
6.7 Decoding the data stream 47
6.8 Locating and decoding secondary symbols 48

7 Transmitted Data 49
7.1 General principles 49
7.2 Protocol for FNC1 49
7.3 Protocol for ECIs 49
7.4 Symbology identifier 49

8 JAB-Code symbol quality 50
8.1 Symbol quality evaluation 50
8.2 JAB-Code verification parameter according to ISO/IEC 15415 50
8.2.1 Decode 50
8.2.2 Unused Error Correction 50
8.2.3 Grid non-uniformity 51
8.2.4 Fixed Pattern Damage 51
8.2.5 Symbol contrast, modulation and reflectance margin 53
8.3 JAB-Code colour verification 54
8.3.1 Colour Palette Accuracy 54
8.3.2 Colour Variation in Data Modules 54

Annex A (informative) User guidelines 56

Annex B (informative) Error detection and correction 58

Annex C (normative) Error correction matrix generation for metadata 61

Annex D (informative) JAB Code symbol encoding example 62

Annex E (informative) Optimization of bit stream length 64

Annex F (informative) Interleaving algorithm 66

Annex G (informative) Guidelines for module colour selection and colour palette construction 67

Annex H (normative) Symbology identifier 71

Bibliography 72