

JIS

JAPANESE INDUSTRIAL STANDARD

**Credit Cards with
Magnetic Stripe**

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JAPANESE INDUSTRIAL STANDARD

J I S

Credit Cards with Magnetic Strips

X 6301-1979
(Reaffirmed: 1990)1. Scope

This Japanese Industrial Standard provides specifications for a credit card with a magnetic stripe, hereinafter referred to as the "magnetic card" or simply referred to as the "card" if no special confusions arise.

2. Definitions

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

- (1) credit card A card generally used to identify an individual or a party in a financial transaction and to provide input data for processing of the transaction.
- (2) embossed characters Patterned characters made up of the areas raised by uneven deformations on the surface of a thin plate. Marks and symbols are included.
- (3) character misalignment Misalignment of horizontal embossed character positions.
- (4) front of card The surface of the card which faces an observer when the card is so placed that its embossed characters are read rightly.
- (5) back of card The opposite side of the front of the card.
- (6) top (bottom) edge of card An edge of the card located upwards (downwards) when viewed from an observer who faces the card, where the card is so placed that the embossed characters are read rightly.
- (7) right (left) edge of card An edge on the right-hand (left-hand) side of the card when the card is placed with its top edge upwards in either case where the front or the back of the card is observed vis-a-vis (noted when viewed from back side).
- (8) magnetic stripe The area provided on the card, which accepts and retains magnetic signals.
- (9) magnetic reference card A card which serves as a standard for electromagnetic transducing characteristic of the magnetic stripe.

Applicable Standards:

JIS X 6302-Credit Cards - Magnetic Stripe Encoding

JIS X 9001-Alphanumeric Character Sets for Optical Recognition

JIS K 6745-Rigid Polyvinyl Chloride Plates

- (10) reference peak read-back signal voltage The maximum peak read-back signal voltage obtained from a magnetic reference card written under the specified packing density with the specified rectangular-wave signal for its magnetic stripe.
- (11) reference field The minimum field applied to a magnetic reference card which causes an output signal voltage equal to 80 % of the reference peak read-back signal voltage (see Fig. 6).

3. Classification

The magnetic card is classified into two types - Type I and Type II according to the different location and dimensions of its magnetic stripe (see Figs. 4 and 5).

4. Material, Shape, and Dimensions

4.1 Material The card shall be made by laminating plastic sheets of polyvinyl chloride polymer, polyvinyl chloride and vinyl acetate copolymer, or a material having equal or better performance characteristics, which shall be all suitable for normal embossing.

In addition, the card material shall not contain elements which disturb that the characteristic of magnetic stripe is maintained within the characteristics specified in this standard during normal use of the card. Also, the card material and any material added to the card shall not contaminate the devices which stripe, encode or read the card.

4.2 Shapes and Dimensions

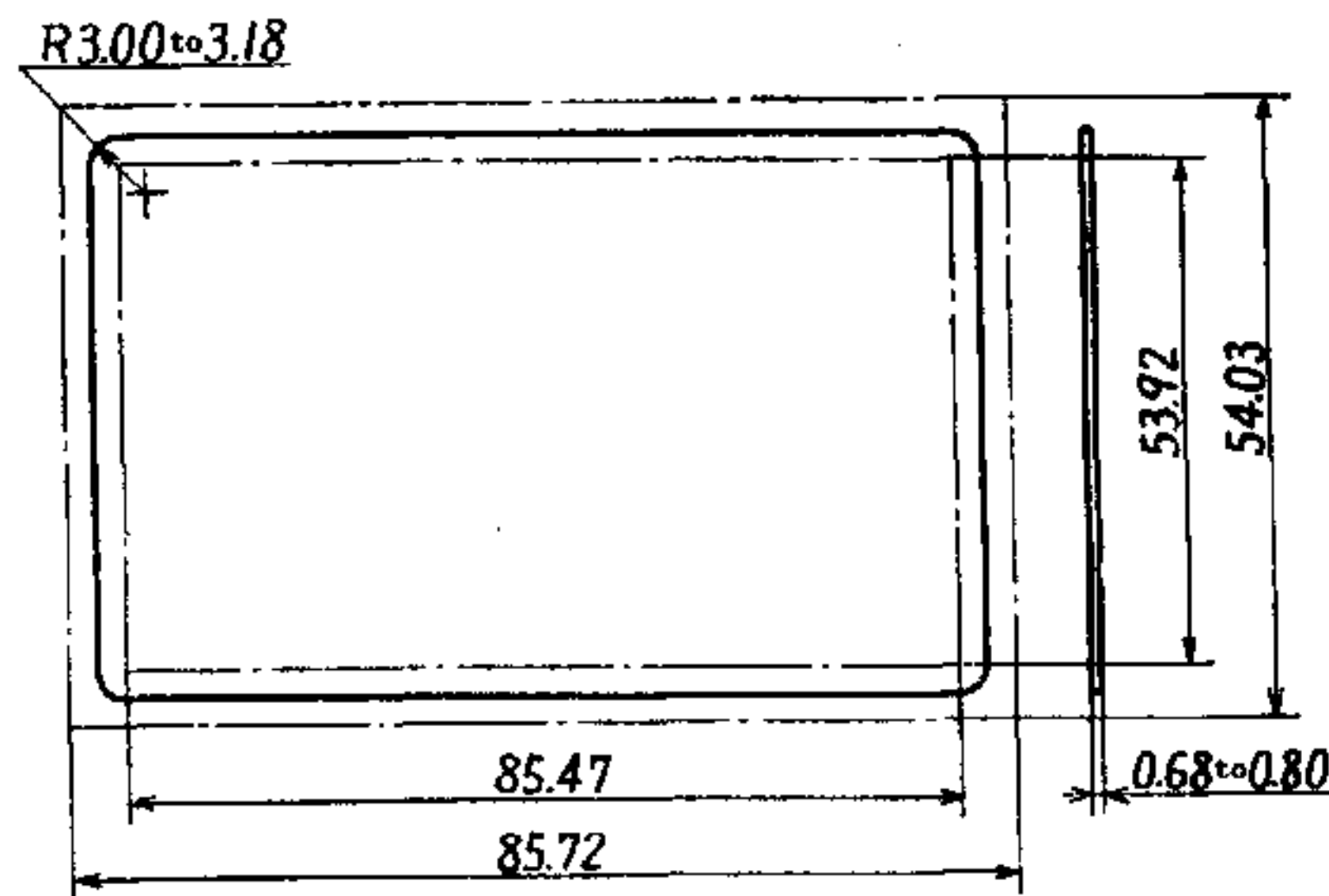
4.2.1 Outline Dimensions All points on the edges of the card in the finished state shall fall between two concentric, similarly aligned, rectangles which are dimensioned as given below. However, the corners where the long sides intersect the short sides shall conform to the dimensions specified in 4.2.3 (see Fig. 1).

Dimensions of the outer rectangle: long side: 85.72 mm
short side: 54.03 mm

Dimensions of the inner rectangle: long side: 85.47 mm
short side: 53.92 mm

Fig. 1. Size of Card

Unit: mm



4.2.2 Card Thickness The thickness of the unembossed card shall be 0.80 mm maximum and 0.68 mm minimum.

4.2.3 Finishing of Four Corners The four corners where long sides intersect short sides shall be rounded with a maximum radius of 3.18 mm and a minimum of 3.00 mm (see Fig. 1).

4.2.4 Finishing of Card Edges Edge burrs shall not exceed 0.08 mm above the card surface.

4.2.5 Card Warpage Card warpage shall be measured with the card in normal use. The measurement of warpage shall be carried out on a flat surface in the direction that the raised areas of the embossed characters of card does not contact the flat face. When the card lies with its front side up on a flat surface, the minimum distance from the flat surface to any non-embossed portion of the front side of an embossed card shall not be greater than 2 mm. For proper evaluation of a card, however, the previous inspection of the embosser shall be necessary using a card to satisfy this standard.

4.2.6 Surface Distortions Any surface distortions, irregularities or raised areas which may interfere mechanically with a recording head or play-back head shall not be within 6.35 mm from either the right-hand or the left-hand edge and either the top or the bottom edge of the magnetic stripe. There shall be no raised areas that exceed 0.05 mm on the front surface within 24 mm from the bottom edge of the card of Type II. There shall be no raised areas that exceed 0.5 mm on the entire front surface of the card. There shall be no raised areas within 2.41 mm from the top and bottom edges of the front of the card, nor on the entire back surface of the card, that exceed 0.25 mm.

5. Physical Characteristics

The card shall satisfy the following specifications.

The testing method, however, shall conform to JIS K 6745 in every case where applicable testing methods are specified.

- (1) Tensile Strength Tensile strength of the card shall be not less than 47.1 N/mm^2 .
 - (2) Impact Strength The card shall be free from any defects such as flaws, cracks, when a steel ball of 500 g drops from a height of 30 cm onto the card which is laid on a horizontal hard plate.
 - (3) Softening Temperature The softening temperature of the card shall be not less than 52°C .
 - (4) Lamination Property The card shall be free from any splits between the laminations when it is immersed in liquid paraffin at a temperature of 150°C for a duration of 5 min.
 - (5) Thermal Stability The card surface shall present no change when the card is immersed in hot water at a temperature of 60°C for a duration of 5 min.
 - (6) Flammability The card shall be flame resistant and self-extinguishing in still air.
 - (7) Temperature Stability When the card is placed in the circumstance of temperature of -10°C and $+45^\circ\text{C}$ each for 30 min, then left under the room temperature for 2 h, the card dimensions shall show no change of greater than $\pm 0.2 \%$.
 - (8) Resistance to Chemicals No delamination of the magnetic tape shall occur after 24 h immersion in any of the following water solutions:
 - (a) 5 % sodium chloride
 - (b) 1 % sodium carbonate
 - (c) 5 % acetic acid
- And there shall be no change of magnetic properties when the card is immersed, washed in water and dried afterwards.
- (9) Adhesion There shall be no adhesion between the cards when they are kept in the circumstance of temperature of 40°C with relative humidity of 90 %, under pressure of 4.9 kPa, for a duration of 48 h.
 - (10) Humidity The card shall show no change on its appearance when it is kept in the circumstance of temperature of 40°C with relative humidity of 90 %, for a duration of 48 h.
 - (11) Light Transmittance Light transmittance of the card shall be greater than 2.0 on its entire area, when measured by a densitometer having a No. 106 Wratten filter.
 - (12) Toxicity The card shall present no toxic hazards in the course of normal use.
 - (13) Durability Durability of the card shall be based on a mutual agreement between the card issuer and the card manufacturer.

6. Location and Dimensions of Embossed Characters6.1 Type I

6.1.1 Location of Embossed Characters Two areas (Area 1 and Area 2) are assigned to the card for the embossing of characters as shown in Fig. 2 and the specifications shall be as follows:

(1) Location of Embossed Characters in Area 1

- (a) Distance from the centre line of Area 1 to the bottom edge of the card:

$$A = 21.42 \pm 0.12 \text{ mm}$$

- (b) Distance from the centre line of the first (left side) character position to the left edge of the card:

$$B = 10.18 \pm 0.25 \text{ mm}$$

- (c) Nominal character spacing:

$$3.63 \text{ mm}$$

- (d) Minimum character spacing:

$$3.48 \text{ mm}$$

- (e) Tolerance on distance (
- D
-) between the centre lines of the first and the last character in the area :

$$\pm 0.08 \text{ mm, where } D = 65.34 \text{ mm (nominal maximum)}$$

- (f) Maximum height of the embossed characters, encompassing the centre line skew and character misalignment:

$$E = 4.32 \text{ mm}$$

- (g) Profile embossed height over the card surface:

$$F = 0.48 \begin{smallmatrix} 0 \\ -0.05 \end{smallmatrix} \text{ mm}$$

(2) Location of Embossed Characters in Area 2

- (a) The area for embossing of characters shall be within the rectangle surrounded by the four lines specified below and the details are as follows:

- (i) Distance from the left-hand edge of the card:

$$G = 6.13 \text{ mm}$$

$$H = 75.29 \text{ mm}$$

(ii) Distance from the bottom edge of the card:

$$I = 2.41 \text{ mm}$$

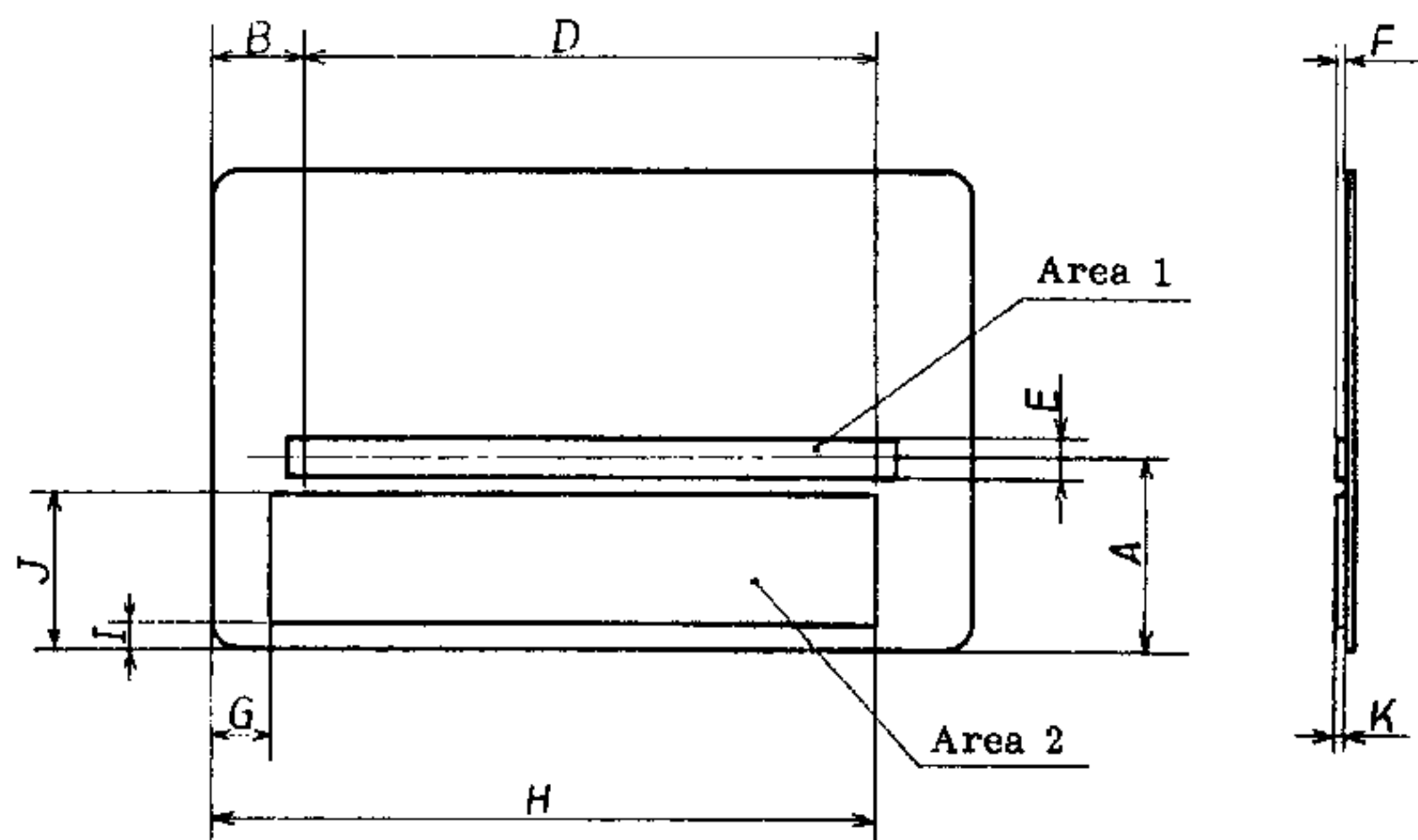
$$J = 17.88 \text{ mm}$$

(b) Profile embossed height over the card surface:

$$K = 0.48 \begin{smallmatrix} 0 \\ -0.071 \end{smallmatrix} \text{ mm}$$

Fig. 2. Embossing Areas for Type I Card

Unit: mm



6.1.2 Shape and Dimensions of Embossed Characters Shape and dimensions of the characters embossed on the card shall be as follows:

- (1) Shape and Dimensions of Embossed Characters in Area 1 Area 1 shall be embossed so as to produce the image of characters from either one of the three sets, i.e. the OCR-A size IV and OCR-B size IV founts specified in JIS X 9001, and the 7 B fount given in Reference Figs. 1 to 10.
- (2) Shape and Dimensions of Embossed Characters in Area 2 Shape of the characters embossed in Area 2 is not specified, and the relevant dimensions shall conform to either of the two specifications indicated below: