



Sockets for Electronic Tubes

1. Scope

This Korean Industrial Standard specifies sockets for small electronic tubes and Braun tubes, hereinafter referred to as the “sockets”, used for electronic apparatus.

2. Type Name

The type name of the sockets shall be designated by the following composition and arrangement.

Example :	M	132	P	Y	(S)
	Classification by base (2.1)	External form (2.2)	Material (2.3)	Grade (2.4)	Supplementary symbol (2.5)
	Form		Performance		

2.1 Classification by Base

The class of the socket shall be designated by a letter symbol as shown in Table 1 according to the class of the class of the base of the adaptable electronic tube [Refer to KS C 7015 (Kinds and Dimensions of Bases, Caps and Gauges for Receiving Tubes)].

Table 1

Classification by base	Class symbol	Basic type name of base of adaptable electronic tube
Miniature(7-pin type)	M	GE 7-1
Miniature(9-pin type)	N	GE 9-1
Octal(8-pin type)	O	Series of GB8
Style X (4-pin type)	X	GA 4-5 A 4-9
Style Y (5-pin type)	Y	GA 5-6 A 5-11
Style Z (6-pin type)	Z	GA 6-7 A 6-12
Style w	W	A7-8
Magnal(11-pin type)	MA	B 11-33 B 11-66
Duodical(12-pin type)	DU	B 12-43
Diheptal(14-pin type)	DH	B 14-38

Related Standards : See page 33



2.2 External Form

The external form of the socket shall be designated by a numerical symbol of 3 figures shown in Table 2 to Table 4, according to the method of mounting to the chassis, existence or non-existence of the shielded base and others.

Table 2. Numerical Symbol in Hundreds

Base plate of socket	Symbol
Molded type	1
Wafer type	2

Table 3. Numerical Symbol in Tens

Mounting board	Shielded base	Mounting to chassis	Symbol
non-existence	non-existence	—	0 ⁽¹⁾
Metallic	non-existence	Above	1
		Below	2
	existence	Above	3
Insulating material	non-existence	Above	4
		Below	5
non-existence	non-existence	Above	6 ⁽²⁾
		Below	7 ⁽²⁾

Notes ⁽¹⁾ The sockets of this class have no mounting metal fittings.

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Table 4. Numerical Symbol in Units

Earth lug	Centre pin	Symbol
non-existence	non-existence	1
	existence	2
existence	non-existence	3
	existence	4



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2.3 Material

The sockets are classified by the class of the insulating materials and shall be designated by letter symbol as shown in Table 5.

Table 5

Material symbol	Insulating material
P	Synthetic resin
Q	Resin with particularly small high frequency loss
C	Porcelain

2.4 Grade

The sockets are classified into Grade Y (mainly used for communication and industry) and Grade Z (mainly used for general) according to performances such as insulating resistance, withstand voltage, weather-proof, etc.

2.5 Supplementary Symbol

It shall be used only when it is required to specify the socket more in detail. Examples are shown in Table 6.

Table 6

Supplementary symbol	Supplementary requirement
S	With shield case
C	Cushion socket
CS	Cushion socket with shield case
PN	With tapped hole in centre pin
HN	With tapped mounting hole

3. Construction and Dimensions

3.1 Construction

Sockets shall be so constructed as not to give undue strain and further so as not to allow insertion of tube pins in the wrong positions. The contact pieces of the socket shall be made of materials having superior characteristics of spring, suitably rust preventive treated and its wiring terminals shall be of easy soldering. The main contact part, when the electronic tube is inserted, shall be preferably located nearer the base than the centre of the pin.

3.2 Form and Dimensions

The dimensions of the main parts of the sockets shall be as shown in Table 7. Supplemental Figs. 1 to 12 show the construction examples of the sockets.

Table 7

Unit : mm

Grade	Class symbol	Form ⁽³⁾	Dimensions							
			Spacing of mounting holes A	Maximum length B	Maximum width C	Diameter of mounting holes D	Diameter of upper part E	Diameter of lower part F	Height of upper part G	Total height H
Y	M	Supplemental Fig.1	22.2 ± 0.2	30 max.	20.5 max.	3.2 ± 0.1	18 max.	18 max.	3 ± 1 ⁽⁴⁾	20 max.
	N	Supplemental Fig.2	28.6 ± 0.2	35.5 max.	24.5 max.	3.2 ± 0.1	19 max.	19 max.	5 ± 1.5	20 max.
	O	Supplemental Fig.3	38 ± 0.2	50 max.	35 max.	3.5 ± 0.1	29 max.	29 max.	5 ± 1.5	26 max.
	X, Y ⁽³⁾ Z, W	Supplemental Fig.4	38 ± 0.2	52 max.	40 max.	3.5 ± 0.1	30 max.	-	-	-
	MA	Supplemental Fig.5	-	45 max.	-	-	-	-	-	30 max.
	DÜ	Supplemental Fig.6	-	50 max.	-	-	-	-	-	22 max.
	DH	Supplemental Fig.7	-	70 max.	-	-	-	-	-	35 max.
Z	M	Supplemental Fig.8	25.4 ± 0.2	33 max.	23 max.	3.2 ± 0.1	-	-	4 max.	15 max.
	N	Supplemental Fig.9	28.6 ± 0.2	35.5 max.	24.5 max.	3.2 ± 0.1	-	-	4 max.	20 max.
	O	Supplemental Fig.10	42 ± 0.2	52 max.	42 max.	3.5 ± 0.1	-	-	5 max.	16 max.
	X, Y, Z, W	Supplemental Fig.11	42 ± 0.2	52 max.	40 max.	3.5 ± 0.1	-	-	-	-
	DÜ	Supplemental Fig.12	-	60 max.	50 max.	-	-	-	-	30 max.



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Notes ⁽³⁾ The forms in Supplemental Figures show examples.

⁽⁴⁾ 3 ± 1 is for the case the socket mounting fittings are attached below the chassis, and 5 ± 1.5 is for the case the fittings are attached above the chassis.

4. Performance

4.1 Mechanical Performance

4.1.1 Strength of Terminal (It shall not be applied to styles X, Y, Z and W)

The wiring terminal of contact piece shall be bent 45 degrees in the same direction by finger and returned to the original position. This operation shall be repeated 3 times, and no breaks nor flaws nor cracks shall develop.

4.1.2 Static Load (It shall not be applied to styles MA, DH and DU)

The socket shall be attached by the normal mounting method to a steel plate of about 3 mm in thickness (Refer to Supplemental Figures), and by means of a cylindrical jig having about the same diameter as the pin circle of the base of the adaptable electronic tube, a static load as shown in Table 8 shall be applied for one minute, respectively on each side. No flaws nor cracks shall be develop in the insulating materials and no loosening in the mounting fittings.



Table 8

Class Symbol	Static load		Insertion force	Withdrawal force	Individual holding force	Withdrawal force after fitting	Withdrawal force after life test
	Grade Y	Grade Z					
M	18.0 {approx.180}	13.5 {approx.130}	4.5 max. {approx.45 max}	1.3 to 4.0 {approx.13 to 40}	0.085 {approx.0.83}	1.25 min. {approx.12.5}	0.9 min. {approx.9 min.}
M	24.0 {approx.240}	18.0 {approx.180}	6.0 max. {approx.60 max}	1.5 to 5.4 {approx.15 to 53}	0.085 {approx.0.83}	1.35 min. {approx.13.5}	0.9 min. {approx.9 min.}
O	36.0 {approx.360}	27.0 {approx.270}	9.0 max. {approx.90 max}	3.0 to 8.0 {approx.30 to 80}	0.057 {approx.0.56}	2.70 min. {approx.27}	2.25 min. {approx.22 min.}
X, Y, Z, W	32.0 {approx.310}	24.0 {approx.240}	8.0 max. {approx.80 max}	2.0 to 7.0 {approx.20 to 70}	-	-	-
MA	-	-	10.0 max. {approx.100max}	-	0.057 {approx.0.56}	3.0 min {approx.30}	-
DU	-	-	11.0 max. {approx.110max}	-	0.057 {approx.0.56}	3.5 min {approx.35}	-
DH	-	-	13.0 max. {approx.130max}	-	0.057 {approx.0.56}	4.0 min {approx.40}	-

Unit:kgf{ N }

Remarks : In this standard, numerals and units shown in paranthesis { } are in accordance with the International System of Units (SI), and are indicated for reference.



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4.1.3 Insertion Force and Withdrawal Force (Withdrawal force shall not be applied to styles MA, DU and DH)

When the insertion and withdrawal gauge of Supplemental Fig. 13 is inserted into or withdrawn from the socket, gently in the axial direction, the insertion force and withdrawal force shall comply with the value of Table 8 respectively.

4.1.4 Individual Holding Force (It shall not be applied to styles X, Y, Z and W.)

In the socket of Grade Y, the fit jig of Supplemental Fig. 14, and in the socket of Grade Z, the insertion and withdrawal gauge of Supplemental Fig. 13 is inserted respectively 10 times (to subtract the number of time previously inserted and withdrawn), and then the gauge of Supplemental Fig. 15 for measuring the individual holding force shall be inserted into each pin hole of the socket, and each contact part metal fitting shall hold the weight of Table 8 (including the gauge's own weight).

4.1.5 Withdrawal Force after Fitting Operation (It shall be applied to Grade Y only, exclusive of Styles X, Y, Z and W.)

In the socket, the fit jig of Supplemental Fig. 14 shall be inserted 10 times (to subtract the number of times previously inserted and withdrawn) and then the withdrawal force shall be measured similarly as in 4.1.3 and shall comply with the value of Table 8.

4.1.6 Withdrawal Force after Life Test (It shall be applied only to Styles M, N and O of Grade Y)

In the socket, the fit jig of Supplemental Fig. 14 shall be inserted 150 times (to subtract the number of times previously inserted and withdrawn), and then the withdrawal force shall be measured similarly as in 4.1.3 and shall comply with the value of Table 8.

4.2 Electrical Performance

4.2.1 Contact Resistance

A contact resistance measuring jig with the same dimensions as the insertion and withdrawal gauge of Supplemental Fig. 13, while the contact part of the pins are made of material having small resistance, shall be inserted and withdrawn 5 times (to subtract the number of times previously inserted and withdrawn), and then a current of 1 A shall be passed from a source of DC 2.5 V or less between the pin of jig and contact piece of the socket, and the contact resistance measured at the respective contact piece shall not exceed 10 MΩ each.

4.2.2 Insulation Resistance

The socket shall be mounted to a metal plate by the normal mounting method (refer to Supplemental Figures) and the insulation resistance between each terminal and the metal plate and that between adjacent terminals each other shall be measured by the voltmeter-ammeter method with DC 500 V. The insulation resistance shall be not less than 10000 MΩ for Grade Y socket and not less than 1000 MΩ for Grade Z socket respectively. In case of sockets not required to be mounted, insulation resistance between terminals only shall be measured, and in case of sockets with an earth lug or centre pin, measurements shall be made with the lug or pin connected to the metal plate.



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4.2.3 Withstand Voltage

The socket shall be mounted to a metal plate by the normal mounting method, and AC voltage of 60 Hz given in Table 9 shall be applied for one minute between each terminal and the metal plate and between adjacent terminals each other, and no fault shall develop.

In this case, the voltage shall be raised up to the highest voltage at the rate of 400 to 600 V per second. In case of sockets not required to be mounted, only withstand voltage between terminals shall be measured, and in case of sockets with an earth lug or centre pin, measurement shall be made with the lug or pin connected to the metal plate.

Table 9

		Unit: V	
Class symbol	Grade	Y	Z
M, N	2000	2000	700
O			1000
X, Y, Z, W,			
MA, DU, DH			

4.3 Weather-Proof Property

4.3.1 Rapid Change of Temperature (It shall be applied only to Grade Y with porcelain base plate.)

The socket shall be immersed alternately in cold water below 4°C and hot water above 94°C respectively for 10 minutes.

Transferring from the cold water to hot water or from hot to cold shall be carried out as quickly as possible.

This operation shall be repeated 20 times and the socket shall be returned to ordinary temperature. No visible flaws nor cracks shall develop in the insulating material and no loosening in mounting metal fittings.

4.3.2 Heat Resistance (It shall be applied only to Grade Y.)

The socket shall be kept in a thermostatic oven at $125 \pm 3^\circ\text{C}$ for 16 hours and returned to room temperature.

No visible deformation nor flaws nor cracks shall develop in the insulating material and no loosening in the mounting metal fittings.

4.3.3 Moisture Resistance

The socket shall be kept in a thermohygrostatic vessel at temperature $40 \pm 2^\circ\text{C}$, relative humidity 90 to 95% for 96 hours or more. After taken out, the specimen shall have water drops removed and let stand at ordinary temperature and humidity for 30 minutes.

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Then the insulation resistance shall be measured by the method of 4.2.2 and it shall be not less than 1000 MΩ for Grade Y socket and not less than 100 MΩ for Grade Z socket and further, the specimen shall comply with 4.2.3.

5. Test**5.1 Standard Test Condition**

The standard test condition for the socket shall be class 1 (temperature $20 \pm 1^{\circ}\text{C}$, relative humidity $65 \pm 2\%$) specified in KS A 0006 (Standard Atmospheric Conditions for Testing).

In case, however, doubt is not entertained in judgement, tests may be conducted within the range of ordinary temperature and humidity (temperature 5 to 35°C , relative humidity 45 to 85%) specified in the above standard.

5.2 Classification of Tests

The tests on the sockets are classified into the following two.

(1) General test

(2) Special test

5.2.1 General Test

The general test is a test conducted for acceptance, and the test items shall comply with Table 10. The grouping of the test specimens and sequence of the test shall comply, as a rule, with Table 10. Which one to choose, the total test or sampling test for each item, shall be determined by agreement between the parties concerned.



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Table 10

Group	Sequence of test	Test item	Article(s) to apply	Applicable to	Difference in requirements between Grade Y and Grade Z
1	1	Construction, form and dimensions	3.1 and 3.2	All	None
	2	Insertion force and withdrawal force	4.1.3	All except withdrawal force for styles MA, DU and DH	None
	3	Insulation resistance	4.2.2	All	Specified values differ
	4	Withstand voltage	4.2.3	All	Specified values differ
2	1	Contact resistance	4.2.1	All except styles X, Y, Z and W	None
	2	Individual holding force ⁽⁵⁾	4.1.4	All except styles X, Y, Z and W	Test methods differ
	3	Withdrawal force after fitting operation ⁽⁵⁾	4.1.5	All except styles X, Y, Z, W and Grade Z	-
	4	Strength of terminal ⁽⁵⁾	4.1.1	All except styles X, Y, Z and W	None

Note ⁽⁵⁾ These tests are regarded as destructive tests. The individual holding force test on Grade Z sockets, however, is not a destructive test.

5.2.2 Special Test

The special test is a test to be conducted upon the special request of the purchaser, and the test items shall comply with Table 11.

Further, samples for group 2 and group 3 shall be taken from those which have passed the test items of group 1 and the other matters shall be determined by agreement between the parties concerned.