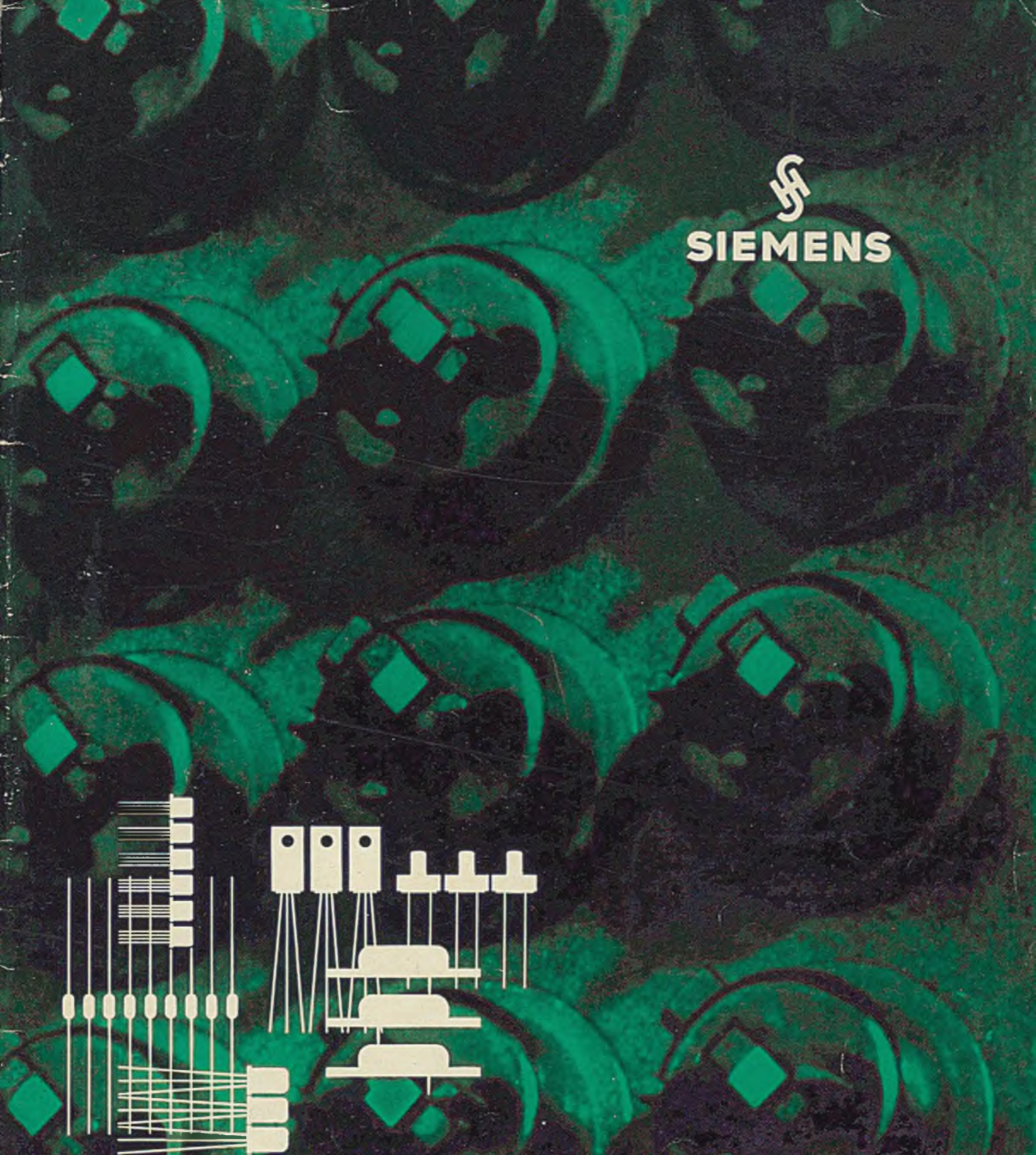


Semiconductors

Edition 1965

Contents

Subminiature, Germanium Point Contact Diodes

Type	$V_R >$ V	(at $V_F = 1$ V) I_F mA	(at $V_R = 10$ V) $I_R <$ µA	Application	Outline No.
AA 113**	60	8 (> 3.5)	12	RF diode	20
AA 116**	20	10 (> 4)	140	RF diode	20
AA 117	90	7 (> 3)	12	General-purpose diode	20
AA 118**	90	9 (> 5)	7	General-purpose diode	20
AA 119**	30	4 (> 2)	20	RF diode	20

Silicon voltage dependent capacity diode

Type	$V_R >$ V	(at $I_F = 40$ mA) V_F V	(at $V_R = 10$ V) I_R µA	(at $V_R = 2$ V $f = 30$ Mc) C_j pF	Outline No.
BA 119	50	≦ 1.1	≦ 100	8 ... 12	20
BA 120	50	≦ 0.9	≦ 50	45 ... 65	20

Silicon Diodes

$R_{th\,amb} \leqq 500$ °C/W betw. junction and stat. ambient air

Type	V_R V	(at $I_F = 100$ mA) V_F V	at V_R I_R µA	Outline No.
BA 103	6	≦ 1.0	≦ 1	24
BA 104	100	≦ 1.1	≦ 1	24
BA 105	300	≦ 1.1	≦ 1	24
BA 108	50	≦ 1.1*	≦ 1	24
▼ BA 127[1]	60	≦ 1.5	≦ 1	20

Compensation and Measuring Thermistors

Type	Dissipation constant G_{thU} mW/°C	Time constant τ_{th} s	Tolerance of TC %	Maximum admissible temperature T °C	Application	Outline No.
K 23	14	50	±7	100	Compensation	38
K 25	30***	20***	±7	75	Comp. meas. control	39
▼ K 26	4	20	±7	100	Compensation	44
K 151	8	30	±7	100	Compensation	40

Table of Types

(Cold-state resistance values R_{20} (ohms) and negative temperature coefficient TC (%/°C)

	K 23		K 25						K 26		K 151											
R 20	1.5	40	10	25	60	150	1 k	6 k	6 k	16 k	4	10	20	40	100	150	250	500	1 k	2 k	5 k	10 k	60 k
TC	3.0	4.1	3.0	3.1	3.3	3.6	4.1	4.6	3.8	4.1	3.0	3.1	3.3	3.5	3.8	4.1	4.2	4.2	4.6	4.6	5.0	5.0	5.4

Tolerance of cold state resistance values is generally ± 20%

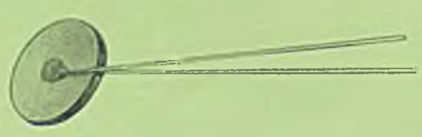
[1] $R_{th\,amb} \leqq 400$° C/W between junction and static ambient air

* at $I_F = 20$ mA

** available in matched pairs also

*** When mounted on metal chassis: G_{thG}

AA 113, AA 116, AA 117, AA 118, AA 119
BA 119, BA 120, BA 127

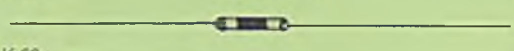


K 23

BA 103, BA 104, BA 105, BA 108

K 25

K 151



K 26

▼ New Type

Transistors Standard Types (for radio, TV a. s. o.)

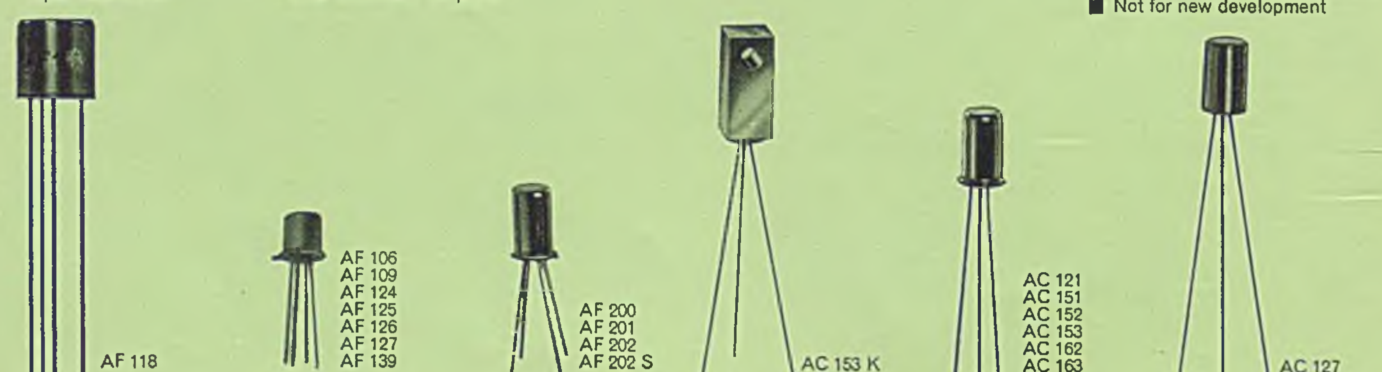
		Type	Application	Maximum Ratings $-V_{CBO}$ V	$-V_{CEO}$ [$-V_{CEV}$] V	$-V_{EBO}$ V	$-I_C$ mA [A]	T_j °C	P_{tot} $T_{case} \leq 45°$C [$T_{amb} \leq 45°$C] mW
Germanium PNP AF Transistors		AC 121[3]	AF driver stages	20	20	10	300	90	900
		AC 127[2]	Push-pull-stages npn/pnp (AC 127/AC 152)	–32	—	–10	–500	90	410
		AC 151	AF-small signal and driver stages	32	24	10	200	90	900
		AC 152[3]	AF driver and power stages of medium output	32	24	10	500	90	900
		AC 153[3]	AF power stages of medium output	32	[32]	10	1000	90	1100
		AC 153 K[3]	AF power stages of medium output	32	[32]	10	1000	90	1100
		AC 162	AF small signal and driver stages	32	24	10	200	90	900
		AC 163	AF small signal and driver stages	32	24	10	200	90	900
Germanium PNP Power Transistors		AD 130[3]	AF power stages	32	30	10	[3]	90	30000
		AD 131[3]	AF power stages	64	45	20	[3]	90	30000
		AD 132	AF power stages and switching	80	60	20	[3]	90	30000
		AD 133	AF power stages and switching	50	32	10	[15]	90	30000
		AD 136	Switching	40	30	10	[10]	90	9000
		AD 148[3]	High quality AF power output stages	32	32	10	[2]	90	11000
		AD 149	Output stages	—	[50]	20	[3.5]	100	27500
		AD 150[3]	High quality AF power output stages	32	30	10	[3.5]	100	27500
	▼	AD 162[3]	Push-pull-stages	32	20	10	[2]	90	6500
	▼	AD 163	Switching applications with high Voltages	100	80	20	[3]	90	30000
Germanium PNP Mesa Transistors		AF 106	HF universal-transistor	25	18	0.3	10	90	[60]
		AF 109	A. G. C. pre stages up to 260 Mc	25	18	0.3	12	90	[60]
	■	AF 118	RF amplifiers for medium power	70	—	0.5	30	75	[120]
		AF 124	for use in radio and TV	32	—	1	10	75	[40]
		AF 125	for use in radio and TV	32	—	1	10	75	[40]
		AF 126	for use in radio and TV	32	—	1	10	75	[40]
		AF 127	for use in radio and TV	32	—	1	10	75	[40]
		AF 139	UHF-stages	20	15	0.3	10	90	[60]
	▼	AF 200	A.G.C.-TV-IF stages	25	—	0.3	10	90	[100]
	▼	AF 201	TV-IF stages	25	—	0.3	10	90	[100]
	▼	AF 202	TV-IF stages	25	—	0.3	30	90	[100]
	▼	AF 202 S	TV-IF stages	32	—	0.3	30	90	[100]

Characteristics (T_{amb} = 25 °C)

Type	$R_{th\,amb}$ [$R_{th\,case}$] °C/W	f_T Mc	h_{FE} [h_{fe}]	at $-I_C$ mA [A]	$-V_{CE}$ [V_{CB}] V	I_{CBO} I_{CEV}* µA [mA]	at $-V_{CBO}$ V_{CEV}* V	Remarks	Case	Outline No.
AC 121	[≦50]	1.5	30 ... 250[1]	100	0.5	5 (<25)	20	$-V_{CE\,sat}$ = 0.15 (<0.35) V at $-I_C$ = 300 mA; h_{FE} = 20	TO–1	10
AC 127	[≦110]	2.5	105	50	[0]	<14	10	C_{CBO} = 70 pF at V_{CBO} = 5 V; f = 450 kc	TO–1	12
AC 151	[≦50]	1.5	[30 ... 250][1]	2	1	6 (<25)	32	$-V_{CE\,sat}$ = 0.13 (<0.32) V at $-I_C$ = 200 mA; h_{FE} = 20	TO–1	10
AC 152	[≦50]	1.5	30 ... 150[1]	100	0.5	6 (<25)	32	$-V_{CE\,sat}$ = 0.15 (<0.35) V at $-I_C$ = 300 mA; h_{FE} = 20	TO–1	10
AC 153	[≦40]	1.5	50 ... 250[1]	300	[0]	<10	10	$-V_{CE\,sat}$ <0.16(<0.5) V at $-I_C$ = 1 A; h_{FE} = 20	TO–1	8
AC 153 K	—	1.5	50 ... 250[1]	300	[0]	<10	10	$-V_{CE\,sat}$ <0.16(<0.5) V at $-I_C$ = 1 A; h_{FE} = 20	—	9
AC 162	[≦50]	1.7	[80 ... 170]	2	5	6 (<25)	32	NF=4(<10) db at I_C=0.5 mA; V_{CE}=5 V; f=1 kc	TO–1	10
AC 163	[≦50]	2.3	[130 ... 300]	2	5	6 (<25)	32	NF=4(<10) db at I_C=0.5 mA; V_{CE}=5 V; f=1 kc	TO–1	10
AD 130	[≦1.5]	0.35	20 ... 100[1]	[1]	1	[0.15 (<1)]*	32*	$-V_{CE\,sat}$ = 0.5 (<1.0) V at $-I_C$ = 3 A; h_{FE} = 10	TO–3	15
AD 131	[≦1.5]	0.35	20 ... 100[1]	[1]	1	[0.15 (<1)]*	64*	$-V_{CE\,sat}$ = 0.5 (<1.0) V at $-I_C$ = 3 A; h_{FE} = 10	TO–3	15
AD 132	[≦1.5]	0.35	20 ... 100[1]	[1]	1	[0.15 (<1)]*	80*	$-V_{CE\,sat}$ = 0.5 (<1.0) V at $-I_C$ = 3 A; h_{FE} = 10	TO–3	15
AD 133	[≦1.5]	0.30	20 ... 60[1]	[5]	0.5	[<1]*	50*	$-V_{CE\,sat}$ = 0.3 (<0.5) V at $-I_C$ = 15 A; h_{FE} = 10	TO–41	16
AD 136	[≦5]	0.30	20 ... 100[1]	[5]	0.5	[<1]*	40*	$-V_{CE\,sat}$ = 0.22 (<0.45) V at $-I_C$ = 10 A; h_{FE} = 10	TO–8	14
AD 148	[≦4]	0.45	30 ... 100[1]	[1]	1	[0.15 (<1)]*	32*	$-V_{CE\,sat}$ = 0.2 (<0.5) V at $-I_C$ = 2 A; h_{FE} = 10	SOT–9	17
AD 149	[≦2]	0.50	30 ... 100[1]	[1]	1	[0.15 (<3)]*	50*	$-V_{CE\,sat}$ = 0.3 (<0.6) V at $-I_C$ = 3 A; h_{FE} = 10	TO–3	15
AD 150	[≦2]	0.45	30 ... 100[1]	[1]	1	[0.15 (<1)]*	32*	$-V_{CE\,sat}$ = 0.3 (<0.6) V at $-I_C$ = 3 A; h_{FE} = 10	TO–3	15
AD 162	[≦7]	1.5	50 ... 250[1]	[0.5]	1	7 (<40)	20	$-V_{CE\,sat}$ = 0.16 (<0.5) V at $-I_C$ = 1 A; h_{FE} = 20	SOT–9	17
AD 163	[≦1.5]	0.35	12.5 ... 60[1]	[1]	1	[0.15 (<1)]*	100*	$-V_{CE\,sat}$ = 0.5 (<1) V at $-I_C$ = 3 A; h_{FE} = 10	TO–3	15
AF 106	≦750	220	50 (>25)	1	12	0.5 (<10)	12	NF = 5.5 (<7.5) db; G_{pb} = 17.5 (>14) db at f = 200 Mc	TO–18	1
AF 109	≦750	280	100 (>20)	2	10	1 (<10)	12	ΔG_{pb} = 34 db; at I_E = 9 mA	TO–18	1
AF 118	≦250	175	180 (>35)	10	2	1.3 (<6)	6		TO– 7	5
AF 124	≦750	75	140 (>40)	1	6	1.2 (<8)	6		TO–18	3
AF 125	≦750	75	140 (>40)	1	6	1.2 (<8)	6		TO–18	3
AF 126	≦750	75	140 (>40)	1	6	1.2 (<8)	6		TO–18	3
AF 127	≦750	75	140 (>40)	1	6	1.2 (<8)	6		TO–18	3
AF 139	≦750	500	50 (>10)	1.5	12	0.5 (<8)	20	NF = 7.5(<9) db; G_{pb} = 10 (>8.2) db at f = 800 Mc	TO–18	1
AF 200	≦450	—	85 (>30)	3	10	0.5 (<10)	12	ΔG_{pe} = 60 db at f = 35 Mc	TO–18 long	4
AF 201	≦450	—	85 (>20)	3	10	0.5 (<10)	12	G_{pe} = 30 (>28) db at f = 35 Mc	TO–18 long	4
AF 202	≦450	—	85 (>20)	3	10	0.4 (<10)	12	G_{pe} = 31 (>27) db at f = 35 Mc	TO–18 long	4
AF 202 S	≦450	—	85 (>20)	3	10	0.4 (<10)	12	G_{pe} = 31 (>27) db at f = 35 Mc	TO–18 long	4

[1] available in different groups of current gain
[2] npn Transistor
[3] also available in pairs

▼ New type
● Tentative data for samples only
■ Not for new new design



Transistors

Standard Types (for radio, TV a. s. o.)

Mark	Group	Type	Application		V_{CBO} V	V_{CEO} [V_{CER}] V	V_{EBO} V	I_C mA	T_j °C	P_{tot} $T_{amb} \leqq 45°$ C mW
▼●	Silicon NPN Low Power Transistors	BC 107	Low noise amplifier-stages	E, Pl	45	45	5	100	175	260
▼●		BC 108	Low noise amplifier-stages	E, Pl	20	20	5	100	175	260
▼●		BC 121	Low noise amplifier-stages	E, Pl	5	5	5	50	125	90
▼●		BC 122	Low noise amplifier-stages	E, Pl	30	20	5	50	125	90
▼●		BC 123	Low noise amplifier-stages	E, Pl	45	30	5	50	125	90
●		BF 110	Video power stages	Pl	—	[145]	5	40	175	600
▼●		BF 115	For universal HF applications	Pl	32	32	4	30	175	145

Characteristics (T_{amb} = 25° C)

Type	$R_{th\,amb}$ [$R_{th\,case}$] °C/W	f_T Mc	h_{FE} [h_{fe}] I_C/I_B	at I_C mA	V_{CE} V	I_{CBO} I_{CBS}* mA [nA]	at V_{CBO} V	Remarks	Case	Outline No.
BC 107	≦500	>50	100	0.01	0.5	[<10]	10	$V_{CE\,sat} \leqq 0.25$ V at $I_C = 10$ mA; $h_{FE} = 20$	TO–18	2
BC 108	≦500	>50	100	0.01	0.5	[<10]	10	$V_{CE\,sat} \leqq 0.25$ V at $I_C = 10$ mA; $h_{FE} = 20$	TO–18	2
BC 121	≦900	>30	[50 ... 400[2]]	0.25	0.5	[<10]	2	$NF = 3$ (<5) dB at $I_C = 250$ µA; $V_{CE} = 0.5$ V; $f = 1$ kc	—	11
BC 122	≦900	>30	[50 ... 400[2]]	0.25	0.5	[<10]	15	$NF = 3$ (<5) dB at $I_C = 250$ µA; $V_{CE} = 0.5$ V; $f = 1$ kc	—	11
BC 123	≦900	>30	[50 ... 250[2]]	0.25	0.5	[<10]	25	$NF = 3$ (<5) dB at $I_C = 250$ µA; $V_{CE} = 0.5$ V; $f = 1$ kc	—	11
BF 110	≦220	150	>30	10	10	[<100]*	140	$C_{12e} = 1.5$ (<2) pF at $V_{CBO} = 10$ V	TO–5	7
BF 115	≦900	190	[80]	1	10	0.005[3]	10	$NF = 3$ dB at $I_C = 1$ mA; $V_{CB} = 10$ V; $f = 500$ kHz	TO–18	3

E = epitaxial, Pl = Planar

Transistors

Industrial Types

Mark	Group	Type	Application	$-V_{CBO}$ V	$-V_{CEO}$ [V_{CER}] V	$-V_{EBO}$ V	$-I_C$ mA	T_j °C	P_{tot} $T_{case} = 45°$ C mW [W]
	Germanium PNP Low Power Transistors	ACY 23	AF small signal and driver stages	32	30	16	200	90	900
		ACY 32	Low noise AF-pre-stages	32	30	16	200	90	900
		ACY 33[1]	AF power-stages of medium output	32	[32]	10	1000	90	1100
		ASY 26	Switching	30	25	20	200	85	200
		ASY 27	Switching	25	20	20	200	85	200
		ASY 48	Switching	64	45	16	300	90	900
		ASY 70	Switching	32	20	16	300	90	900
	Germanium PNP Power Transistors	ADY 27[1]	AF power-stages	32	30	10	[3.5]	100	[27.5]
		AUY 18	Switching applications with high voltages	64	45	20	[8]	90	[9]
		AUY 19	AF power-stages	64	45	20	[3]	90	[30]
		AUY 20	AF power-stages	80	60	20	[3]	90	[30]
		AUY 21	AF-Power-stages for switching applications	65	45	20	[10]	100	[36]
		AUY 22	AF-Power-stages for switching applications	80	60	20	[8]	100	[36]
		AUY 29[1]	AF-power-stages and switching applications	50	32	10	[15]	100	[36]
▼		AUY 34	Switching applications with high voltages	100	80	20	[3]	90	[30]
		TF 78/30[1]	AF power-stages of medium output	32	24	10	600	75	[2.7]
		TF 78/60[1]	AF power-stages of medium output	64	45	16	600	75	[2.7]

Characteristics (T_{amb} = 25° C)

Type	$R_{th\,case}$ °C/W	f_T Mc	h_{FE} h_{fe} I_C/I_B	at $-I_C$ mA [A]	$-V_{CE}$ [V_{CB}] V	$-I_{CBO}$ [$-I_{CEV}$] mA	at $-V_{CBO}$ at $-V_{CEV}$ V	Remarks	Case	Outline No.
ACY 23	≦50	1.5	[50 ... 150[2]]	1	5	3 (<10)	10	$-V_{CE\,sat} = 0.11$ (<0.3) V at $I_C = 100$ mA; $h_{FE} = 20$	TO–1	10
ACY 32	≦50	1.5	[50 ... 150[2]]	1	5	3 (<10)	10	$F = 3.5$ (<6) dB at $-I_C = 0.5$ mA; $-V_{CE} = 5$ V; $f = 1$ kc	TO–1	10
ACY 33[1]	≦40	1.5	50 ... 250[2]	300	[0]	<10	10	$-V_{CE\,sat} = 0.16$ (<0.5) V at $I_C = 1$ A; $h_{FE} = 20$	TO–1	8
ASY 26	≦200	>4	30 ... 80	20	[0]	0.003	5	τ <2.2 at $-I_C = 50$ mA; $-V_{CE} = 0.75$ V	TO–5	18
ASY 27	≦200	>6	50 ... 150	20	[0]	0.003	5	τ <2.2 at $-I_C = 50$ mA; $-V_{CE} = 0.75$ V	TO–5	18
ASY 48	≦50	1.2	30 ... 100[2]	100	0.5	[6 (<18)]	64	$-V_{CE\,sat} = 0.15$ (<0.35) V at $-I_C = 300$ mA; $h_{FE} = 20$	TO–1	10
ASY 70	≦50	1.5	30 ... 150[2]	100	0.5	[6 (<18)]	64	$-V_{CE\,sat} = 0.15$ (<0.35) V at $-I_C = 300$ mA; $h_{FE} = 20$	TO–1	10
ADY 27[1]	≦2	0.45	30 ... 100[2]	[1]	1	[0.15 (<5)]	32	$-V_{CE\,sat} = 0.3$ (<0.6) V at $-I_C =$ 3 A; $h_{FE} = 10$	TO–3	15
AUY 18	≦5	0.3	20 ... 60[2]	[5]	0.5	[0.15 (<1)]	64	$-V_{CE\,sat} = 0.25$ (<0.45) V at $-I_C =$ 8 A; $h_{FE} = 10$	TO–8	14
AUY 19	≦1.5	0.35	20 ... 100[2]	[1]	1	[0.15(<0.5)]	64	$-V_{CE\,sat} = 0.6$ (<1.0) V at $-I_C =$ 3 A; $h_{FE} = 10$	TO–3	15
AUY 20	≦1.5	0.35	20 ... 100[2]	[1]	1	[0.15(<0.5)]	80	$-V_{CE\,sat} = 0.6$ (<1.0) V at $-I_C =$ 3 A; $h_{FE} = 10$	TO–3	15
AUY 21	≦1.5	0.30	12.5 ... 60[2]	[5]	0.5	[3 (<10)][4]	65	$-V_{CE\,sat} = 0.22$ (<0.45) V at $-I_C =$ 10 A; $h_{FE} = 10$	TO–41	16
AUY 22	≦1.5	0.30	12.5 ... 40[2]	[5]	0.5	[3 (<10)][4]	80	$-V_{CE\,sat} = 0.18$ (<0.4) V at $-I_C =$ 8 A; $h_{FE} = 10$	TO–41	16
AUY 29[1]	≦1.5	0.30	20 ... 60[2]	[5]	0.5	[3 (<10)][4]	50	$-V_{CE\,sat} = 0.3$ (<0.5) V at $-I_C =$ 15 A; $h_{FE} = 10$	TO–41	16
AUY 34	≦1.5	0.35	12.5 ... 60[2]	[1]	1	[0.15 (<1)]	100	$-V_{CE\,sat} = 0.6$ (<1.0) V at $-I_C =$ 3 A; $h_{FE} = 10$	TO–3	15
TF 78/30[1]	≦15	0.7	30 ... 150[2]	50	0.7	[0.01]	32	$-V_{CE\,sat} = 0.26$ (<0.5) V at $-I_C = 0.5$ A; $h_{FE} = 10$	—	13
TF 78/60[1]	≦15	0.7	30 ... 150[2]	50	0.7	[0.01]	64	$-V_{CE\,sat} = 0.26$ (<0.5) V at $I_C = 0.5$ A; $h_{FE} = 10$	—	13

[1] also available in pairs
[2] available in different groups of current gain
[3] T_j = 175° C
[4] T_G = 90° C


BF 110


BC 107, BC 108


BF 115


BC 121
BC 122
BC 123


ACY 23, ACY 32, ACY 33, ASY 48, ASY 70


ASY 26, ASY 27

▼ New type
● Tentative data for samples only


AUY 21
AUY 22
AUY 29


ADY 27
AUY 19
AUY 20
AUY 34


TF 78/30
TF 78/60


AUY 18

		Type	Application		Maximum Ratings V_{CBO} V	V_{CEO} [V_{CER}] V	V_{EBO} V	I_C mA	T_j °C	P_{tot} [$T_{amb} \leq 45°C$] $T_{case} \leq 45°C$ mW
■	Germanium-PNP-Mesa Transistors	AFY 10	Universal RF applications		—30	—15	—1	—70	90	[560]
		AFY 11	Universal RF applications		—30	—15	—1	—70	90	[560]
		AFY 12	RF stages up to 260 Mc		—25	—18	—0.5	—10	90	60
		AFY 16	RF stages up to 900 Mc		—30	—25	—0.5	—10	90	60
		AFY 18	VHF antennar amplifier		—30	—15	—1	—100	90	[560]
		AFY 34	Universal RF applications up to 1500 Mc		—40	—	—0.3	—20	90	—
▼●		AFY 37	UHF antennar amplifier		—32	—	—0.3	—20	90	[112]
▼		AFY 39	VHF antennar amplifier		—32	—	—0.3	—30	90	100
▼●	Silizium-NPN Transistors	BCY 58	Low noise amplifier-stages	E, Pl	32	32	5	100	175	260
▼●		BCY 59	Low noise amplifier-stages	E, Pl	45	45	5	100	175	260
■		BFY 12	Broadband amplifiers; oscillators; switching	E, Pl	60	40	5	500	200	[2600]
■		BFY 13	Broadband amplifiers; oscillators; switching	E, Pl	80	60	5	350	200	[2600]
■		BFY 14	Broadband amplifiers; oscillators; switching	E, Pl	100	80	5	250	200	[2600]
		BFY 33	Universal applications	Pl	50	30	7	500	200	[2600]
		BFY 34	Universal applications (similar to 2 N 1613)	Pl	75	50	7	500	200	[2600]
●		BFY 45	Nixie driver	Pl	—	[145]	5	30	175	[2100]
		BFY 46	Universal applications (similar to 2 N 1711)	Pl	75	50	7	500	200	[2600]
●		BSY 17	Logic circuits (similar to 2 N 743)	E, Pl	20	12	5	200	200	[1000]
●		BSY 18	Logic circuits (similar to 2 N 744)	E, Pl	20	12	5	200	200	[1000]
●		BSY 34	Switching and core driver	E, Pl	60	40	5	600	200	[2600]
●		BSY 58	Switching and core driver	E, Pl	50	25	5	600	200	[2600]
●		BSY 62	Logic circuits (similar to 2 N 706 A)	E, Pl	25	15	5	200	175	[860]
●		BSY 63	Logic circuits (similar to 2 N 708)	E, Pl	40	15	5	200	200	[1000]
●		BUY 12	Power switching	Me	210	80	5	10000	150	[50 000]
●		BUY 13	Power switching	Me	120	70	5	8000	150	[50 000]

E = epitaxial, Pl = planar, Me = mesa

¹) Available in different groups of current gain

Type	Characteristics (T_{amb} = 25° C) $R_{th\,amb}$ [$R_{th\,case}$] °C/W	f_T [f_{max}] Mc	h_{FE} [h_{fe}] I_C/I_B	at I_C mA	V_{CE} V	I_{CBO} µA [nA]	at V_{CBO} V	Remarks	Case	Outline No.
AFY 10	≦265	250	[60 (> 25)]	—10	—10	—0.8 (< 18)	—15	$G_{pb\,opt}$ = 14 ... 17 db at f = 100 Mc; I_C = 10 mA	TO–5	6
AFY 11	≦265	350	[60 (> 25)]	—10	—10	—0.8 (< 18)	—15	$G_{pb\,opt}$ = 16 ... 20 db at f = 100 Mc; I_C = 10 mA	TO–5	6
AFY 12	≦750	230	[65 (> 30)]	—1	—12	—0.4 (< 3)	12	NF = 5 (< 7) db at f = 200 Mc	TO–18	1
AFY 16	≦750	500	60 (> 10)	—2	—12	—0.7 (< 3)	—20	NF = 7 (< 8) db at f = 800 Mc	TO–18	1
AFY 18	≦265	600	[40 ... 600¹)]	—10	—10	—0.2 (< 10)	—15	NF = 4 db at f = 70 Mc; I_C = 10 mA	TO–5	6
AFY 34	[≦157]	[3500]	> 10	—2	—12	—	—	G_{pb} = 15 (> 12) db at f = 800 Mc; —I_C = 4,5 mA	coaxial	19
AFY 37	[≦400]	600	40 (> 10)	—2	—12	—0.4 (< 10)	—20	G_{pb} = 12 (> 10) db at f = 800 Mc; —I_C = 4 mA	TO–18	1
AFY 39	≦450	500	85 (> 20)	—3	—10	—0.2 (< 10)	—12	G_{pe} = 17.5 (> 16) db at f = 200 Mc	TO–18 lg	4
BCY 58	≦500	> 50	100	0.01	0.5	[< 10]	10	$V_{CE\,sat} \leq$ 0.25 V at I_C = 10 mA; h_{FE} = 20	TO–18	2
BCY 59	≦500	> 50	100	0.01	0.5	[< 10]	10	$V_{CE\,sat} \leq$ 0.25 V at I_C = 10 mA; h_{FE} = 20	TO–18	2
BFY 12	≦220	> 180	20 ... 300¹)	100	10	[0.2 (< 20)]	50	$V_{CE\,sat} \leq$ 0.5 V at I_C = 200 mA; h_{FE} = 10	TO–5	7
BFY 13	≦220	> 180	20 ... 300¹)	100	10	[0.3 (< 20)]	65	$V_{CE\,sat} \leq$ 0.7 V at I_C = 200 mA; h_{FE} = 10	TO–5	7
BFY 14	≦220	> 180	20 ... 300¹)	100	10	[4 (< 20)]	80	$V_{CE\,sat} \leq$ 1 V at I_C = 200 mA; h_{FE} = 10	TO–5	7
BFY 33	≦220	80	> 40	150	10	[0.8 (< 20)]	40	C_{CBO} = 18 (< 25) pf at V_{CBO} = 10 V	TO–5	7
BFY 34	≦220	80 (> 60)	40 ... 120	150	10	[0.3 (< 10)]	60	C_{CBO} = 18 (< 25) pf at V_{CBO} = 10 V	TO–5	7
BFY 45	≦220	150	> 30	10	10	—	—	C_{CBO} = 2.5 (< 3.5) pf at V_{CBO} = 10 V	TO–5	7
BFY 46	≦220	100 (> 70)	100 ... 300	150	10	[0.3 (< 10)]	60	C_{CBO} = 18 (< 25) pf at V_{CBO} = 10 V	TO–5	7
BSY 17	≦500	> 300	20 ... 60	10	0.35	[0.3 (< 25)]	20	τ_s < 14 ns at $I_C = I_{B_1} = I_{B_2}$ = 10 mA; R_L = 1 kΩ	TO–18	2
BSY 18	≦500	> 300	40 ... 120	10	0.35	[0.3 (< 25)]	20	τ_s < 18 ns at $I_C = I_{B_1} = I_{B_2}$ = 10 mA; R_L = 1 kΩ	TO–18	2
BSY 34	≦220	400 (> 250)	42 (> 25)	100	1	[< 70]	50	t_{on} = 30 (< 50) ns at I_C = 500 mA	TO–5	7
BSY 58	≦220	400 (> 250)	42 (> 17)	100	1	[< 120]	50	t_{on} = 35 (< 65) ns at I_C = 500 mA	TO–5	7
BSY 62	≦500	> 200	20 ... 60	10	1	[< 500]	15	τ_s < 25 ns at $I_C = I_{B_1} = I_{B_2}$ = 10 mA; R_L = 1 kΩ	TO–18	2
BSY 63	≦500	> 300	30 ... 120	10	1	[0.3 (< 25)]	20	τ_s < 25 ns at $I_C = I_{B_1} = I_{B_2}$ = 10 mA; R_L = 1 kΩ	TO–18	2
BUY 12	[≦1.5]	11 (> 5)	21 (> 10)	8000	1.7	200	150	t_r = 0.5 (< 1) µs at I_C = 10 A; h_{FE} = 10; V_{CE} = 40 V	TO–41	16
BUY 13	[≦1.5]	11 (> 5)	25 (> 11)	6000	1.7	200	80	t_r = 0.5 (< 1) µs at I_C = 8 A; h_{FE} = 10; V_{CE} = 40 V	TO–41	16

▼ New type
● Tentative data for samples only
■ Not for new development


AFY 39


AFY 12 AFY 16 AFY 37


AFY 10 AFY 11 AFY 18


AFY 34


BUY 12 BUY 13


BCY 58 BCY 59 BSY 17 BSY 18 BSY 62 BSY 63


BFY 12 BFY 13 BFY 14 BFY 33 BFY 34 BFY 45 BFY 46 BSY 34 BSY 58

Subminiature, Germanium Point Contact Diode

$R_{th\,amb} \leq 400°$ C/W

Type	Reverse voltage $V_R >$ V	Forward current at $V_F = 1$ V I_F mA	Reverse current at $V_R = 10$ V $I_R <$ µA	Application	Outline No.
AAY 27	25	50 (> 18)	30	rectifier circuits, video and switching	20

Gold-bonded Germanium Diodes

$R_{th\,amb} \leq 500°$ C/W

Type	Reverse voltage	Forward voltage		Reverse current at $V_R = 10$ V	Application	Outline
		at $I_F = 0.1$ mA	at $I_F = 200$ mA			
	V_R > V	V_F V		I_R µA		No.
AAY 14	100	≦ 0.25	1.1	≦ 6	Low conductance General-purpose diode	21
AAY 15	30	≦ 0.28	0.75*	≦ 3.5	Switching diode	21

* at $I_F = 190$ mA

Subminiature, General-purpose Silicon Diodes

$R_{th\,amb} \leq 400°$ C/W

Type	Reverse voltage V_R V	Forward voltage at $I_F = 100$ mA V_F V	Reverse current at V_R I_R µA	Application	Outline No.
BAY 44	50	≦ 1.1	< 0.2	General-purpose diode	20
BAY 45	150	≦ 1.1	< 0.2	General-purpose diode	20
BAY 46	300	≦ 1.1	< 0.2	General-purpose diode	20

Subminiature, Silicon Planar-Epitaxial-Switching-Diodes

$R_{th\,amb} \leq 400°$ C/W

Type	Reverse voltage V_R V	Forward voltage at $I_F = 200$ mA V_F V	Reverse current I_R nA	Capacitance at $V_R = 0$ C pF	Reverse recovery time t_{rr}* nsec	Outline No.
BAY 41	40	< 1	< 50 at $U_R = 20$ V	< 5	< 15	20
BAY 42	60	< 1	< 50 at $U_R = 30$ V	< 5	< 15	20
BAY 43	80	< 1	< 50 at $U_R = 40$ V	< 5	< 15	20

* Switching time measured when switching from $I_F = 200$ mA to $I_R = 200$ mA with sampling oscillograph to 10% of I_R

AAY 14
AAY 15

AAY 27
BAY 41
BAY 42
BAY 43
BAY 44
BAY 45
BAY 46

Germanium Tunnel Diodes

Type	Peak point current I_1 mA			Peak to valley ratio I_1/I_2		Negative resistance $-R_n$ Ω			Series resistance R_s Ω		Valley point capacitance C_{min} pF		Switching time[1] t ns		Outline No.
	min.	typ.	max.	min.	typ.	min.	typ.	max.	typ.	max.	typ.	max.	typ.	max.	
■ TU 4	1.3	1.6	2.3	4	7	30	60	110	1.5	2.5	10	30	—	—	22
■ TU 5	0.8	1.3	1.6	4	7	60	90	150	2.0	3.0	5	20	—	—	22
TU 10/1	0.9	1.0	1.1	4	7	80	110	140	2.0	3.0	2	5	3	4	22
TU 10/2	0.7	—	1.3	4	7	—	110	—	2.0	3.0	2	5	—	—	22
TU 11/1	1.8	2.0	2.2	4	7	50	80	110	1.5	2.5	5	10	2	3	22
TU 11/2	1.4	—	2.6	4	7	—	80	—	1.5	2.5	5	10	—	—	22
TU 12/1	4.5	5.0	5.5	4	7	—	30	50	1.0	2.0	8	15	1	2	23
TU 12/2	3.5	—	6.5	4	7	—	30	—	1.0	2.0	8	15	—	—	
TU 13/1	9.0	10.0	11.0	4	7	—	15	30	1.0	2.0	15	30	1	2	23
TU 13/2	8.0	—	12.0	4	7	—	15	—	1.0	2.0	15	30	—	—	
TU 14/1	18.0	20.0	22.0	4	7	—	10	20	1.0	2.0	30	60	1	2	23
TU 14/2	16.0	—	24.0	4	7	—	10	—	1.0	2.0	30	60	—	—	

[1] Measured with test-oscilloscope for tunnel diode «Tektronix»

Backward Diode

Type	Reverse voltage at $I_R = 300\,\mu A$ V_R mV	Forward voltage at $I_F = 3$ mA V_F mV	Capacitance C pF	Peak current i_{FM} mA	Outline No.
TU 1 B	420 ... 520	80 ... 120	1 ... 3	5	23

■ not for new development

TU 4, TU 5
TU 10, TU 11

TU 1 B
TU 12 ... TU 14

Silicon Zener Diodes

$R_{th\,amb} \leq 500$ °C/W between junction and static ambient air
$R_{th\,case} \leq 250$ °C/W between junction and case

Type	Zener range V_Z and r_Z values at measuring current $I_Z = 5$ mA			Forward range at $I_F = 100$ mA	Reverse current at $V_R = 1$ V	TC of V_Z	Outline
	V_Z V	V_Z range	r_Z max. ohms	V_F V	I_R nA	10^{-4}/°C	No.
BZY 83/C 4 V 7	4.7	4.4 ... 5.0	90	≦ 1.0	100 < 500	— 5 ... + 1	24
BZY 83/C 5 V 1	5.1	4.8 ... 5.4	75	≦ 1.0	100 < 500	— 5 ... + 3	24
BZY 83/C 5 V 6	5.6	5.2 ... 6.0	60	≦ 1.0	100 < 500	— 4 ... + 4	24
BZY 83/C 6 V 2	6.2	5.8 ... 6.6	40	≦ 1.0	100 < 500	— 4 ... + 6	24
BZY 83/C 6 V 8	6.8	6.4 ... 7.2	8	≦ 1.0	10 < 100	— 2 ... + 7	24
BZY 83/C 7 V 5	7.5	7.0 ... 7.9	6	≦ 1.0	10 < 100	+ 2 ... + 7	24
BZY 83/C 8 V 2	8.2	7.7 ... 8.7	7	≦ 1.0	10 < 100	+ 3 ... + 7	24
BZY 83/C 9 V 1	9.1	8.5 ... 9.6	10	≦ 1.0	10 < 100	+ 4 ... + 8	24
BZY 83/C 10	10	9.4 ... 10.6	15	≦ 1.0	10 < 100	+ 5 ... + 8	24
BZY 83/C 11	11	10.4 ... 11.6	20	≦ 1.0	10 < 100	+ 5 ... + 8	24
BZY 83/C 12	12	11.4 ... 12.8	30	≦ 1.0	10 < 100	+ 6 ... + 9	24
BZY 83/C 13 V 5	13.5	12.6 ... 14	30	≦ 1.0	10 < 100	+ 7 ... + 9	24
BZY 83/C 15	15	13.8 ... 15.5	55	≦ 1.0	10 < 100	+ 7 ... + 9	24
BZY 83/C 16 V 5	16.5	15.3 ... 17	75	≦ 1.0	10 < 100	+ 8 ... + 9.5	24
BZY 83/C 18	18	16.8 ... 19	110	≦ 1.0	10 < 100	+ 8 ... + 9.5	24
BZY 83/C 20	20	18.8 ... 21	150	≦ 1.0	10 < 100	+ 8 ... +10	24
BZY 83/C 22	22	20.8 ... 23	170	≦ 1.0	10 < 100	+ 8 ... +10	24
BZY 83/C 24 V 5	24.5	22.8 ... 25.6	200	≦ 1.0	10 < 100	+ 8 ... +10	24
BZY 83/D 1*	0.7	0.62 ... 0.78	8	—	—	—25 ... —35	24
BZY 83/D 4 V 7	4.7	4.1 ... 5.2	90	≦ 1.0	< 500	— 6 ... + 3	24
BZY 83/D 5 V 6	5.6	5.0 ... 6.3	75	≦ 1.0	100 (< 500)	— 5 ... + 6	24
BZY 83/D 6 V 8	6.8	6.0 ... 7.5	15	≦ 1.0	100 (< 500)	— 4 ... + 7	24
BZY 83/D 8 V 2	8.2	7.3 ... 9.2	10	≦ 1.0	10 (< 100)	+ 2 ... + 8	24
BZY 83/D 10	10	8.8 ... 11.0	15	≦ 1.0	10 (< 100)	+ 4 ... + 8	24
BZY 83/D 12	12	10.7 ... 13.4	30	≦ 1.0	10 (< 100)	+ 5 ... + 9	24
BZY 83/D 15	15	13 ... 16.5	55	≦ 1.0	10 (< 100)	+ 7 ... + 9.5	24
BZY 83/D 18	18	16 ... 20.0	100	≦ 1.0	10 (< 100)	+ 8 ... +10	24
BZY 83/D 22	22	19.6 ... 24.4	200	≦ 1.0	10 (< 100)	+ 8 ... +10	24

* Diode BZY 83/D 1 has small tolerances and operates in direct sence.
Inverse characteristic without guarantee.

BZY 83/C
BZY 83/D

Silicon Zener Diodes

$R_{th\,amb}$ < 400 °C/W between junction and static ambient air

Type	Zener range V_Z and r_Z values at measuring current I_Z = 5 mA			Forward range at I_F = 100 mA	Reverse current at V_R = 1 V	TC of V_Z	Outline
	V_Z V	V_Z range	$r_{Z\,max}$ ohms	V_F V	I_R nA	10^{-4}/°C	No.
▼ BZY 85/C 4 V 7	4.7	4.4 ... 5.0	70	≦ 1.0	< 500	— 5 ... + 1	20
▼ BZY 85/C 5 V 1	5.1	4.8 ... 5.4	60	≦ 1.0	< 500	— 5 ... + 3	20
▼ BZY 85/C 5 V 6	5.6	5.2 ... 6.0	40	≦ 1.0	< 500	— 4 ... + 4	20
▼ BZY 85/C 6 V 2	6.2	5.8 ... 6.6	10	≦ 1.0	< 100	— 4 ... + 6	20
▼ BZY 85/C 6 V 8	6.8	6.4 ... 7.2	8	≦ 1.0	< 100	— 2 ... + 7	20
▼ BZY 85/C 7 V 5	7.5	7.0 ... 7.9	7	≦ 1.0	< 100	+ 2 ... + 7	20
▼ BZY 85/C 8 V 2	8.2	7.7 ... 8.7	7	≦ 1.0	< 100	+ 3 ... + 7	20
▼ BZY 85/C 9 V 1	9.1	8.5 ... 9.6	10	≦ 1.0	< 100	+ 4 ... + 8	20
▼ BZY 85/C 10	10	9.4 ... 10.6	15	≦ 1.0	< 100	+ 5 ... + 8	20
▼ BZY 85/C 11	11	10.4 ... 11.6	20	≦ 1.0	< 100	+ 5 ... + 8	20
▼ BZY 85/C 12	12	11.4 ... 12.8	20	≦ 1.0	< 100	+ 6 ... + 9	20
▼ BZY 85/C 13 V 5	13.5	12.6 ... 14	26	≦ 1.0	< 100	+ 7 ... + 9	20
▼ BZY 85/C 15	15	13.8 ... 15.5	30	≦ 1.0	< 100	+ 7 ... + 9	20
▼ BZY 85/C 16 V 5	16.5	15.3 ... 17	40	≦ 1.0	< 100	+ 8 ... + 9.5	20
● ▼ BZY 85/C 18	18	16.8 ... 19	55	≦ 1.0	< 100	+ 8 ... + 9.5	20
● ▼ BZY 85/C 20	20	18.8 ... 21	55	≦ 1.0	< 100	+ 8 ... +10	20
● ▼ BZY 85/C 22	22	20.8 ... 23	55	≦ 1.0	< 100	+ 8 ... +10	20
● ▼ BZY 85/C 24 V 5	24.5	22.8 ... 25.6	80	≦ 1.0	< 100	+ 8 ... +10	20
▼ BZY 85/D 1*	0.7	0.62 ... 0.78	8	—	—	—25 ... —35	20
BZY 85/D 4 V 7	4.7	4.1 ... 5.2	—	≦ 1.0	< 500	— 6 ... + 3	20
▼ BZY 85/D 5 V 6	5.6	5.0 ... 6.3	75	≦ 1.0	< 100	— 5 ... + 6	20
▼ BZY 85/D 6 V 8	6.8	6.0 ... 7.5	15	≦ 1.0	< 100	— 4 ... + 7	20
▼ BZY 85/D 8 V 2	8.2	7.3 ... 9.2	10	≦ 1.0	< 100	+ 2 ... + 8	20
▼ BZY 85/D 10	10	8.8 ... 11.0	15	≦ 1.0	< 100	+ 4 ... + 8	20
▼ BZY 85/D 12	12	10.7 ... 13.4	30	≦ 1.0	< 100	+ 5 ... + 9	20
▼ BZY 85/D 15	15	13 ... 16.5	55	≦ 1.0	< 100	+ 7 ... + 9.5	20
● ▼ BZY 85/D 18	18	16 ... 20.0	55	≦ 1.0	< 100	+ 8 ... +10	20
● ▼ BZY 85/D 22	22	19.6 ... 24.4	55	≦ 1.0	< 100	+ 8 ... +10	20

* Diode BZY 85/D1 has small tolerances and operate in direct sence.
Inverse characteristic without guarantee.

BZY 85/C
BZY 85/D

▼ New type
● Tentative data for samples only

Germanium Photo Diodes

Type	Maximum operating voltage U V	Sensitivity E nA/lux	Dark current at maximum operating voltage T_U = 25 °C I_d ≦ µA	Maximum dissipation at 20 °C P_{tot} mW	Maximum admissible case temperature T_G °C	Outline No.
TP 50/0	100	40 (> 25)	4.5	50	50	25
TP 50/I	100	50 (> 45)	4.5	50	50	25
TP 50/II	100	65 (> 55)	4.5	50	50	25
TP 51/0	30	40 (> 25)	6.5	50	50	25
TP 51/I	30	50 (> 45)	6.5	50	50	25
TP 51/II	30	65 (> 53)	6.5	50	50	25
■ APY 10/I	50	60	5	40	50	26
■ APY 10/II	50	100	5	40	50	26
■ APY 11/I	25	60	8	40	50	26
■ APY 11/II	25	100	8	40	50	26

Silicon Photovoltaic Cells

Type	Open circuit voltage at 100 lux U_L ≧ V	Open circuit voltage at 10.000 lux U_L ≧ V	Sensitivity E nA/lux	Maximum admissible case temperature T_G max °C	Color temperature °K	Outline No.	Max. reverse voltage
TP 60	0.10	0.44	1000	75	2400	28	
TP 61	0.10	0.44	1000	100	2400	29	
BPY 11	0.2	0.3[1]	40	150	2400	27	
BP 100	0.15	0.23[1]	35	150	2400	27	
BPY 43[2]	0.13	0.27[1]	15	100	2850	26	$R = 2$ V
BPY 44[3]	0.20	0.33[1]	20	100	2850	26	$R = 5$ V
BPY 45	0.10	0.45	1000	100	2850	30	

[1] at B = 1.000 lux

[2] with reverse characteristics. Guaranteed value: $U_R = 1$ V, $I_R \leq 5\,\mu$A, $T_U = 25$ °C

[3] with reverse characteristics. Guaranteed value: $U_R = 2$ V, $I_R \leq 1\,\mu$A, $T_U = 25$ °C

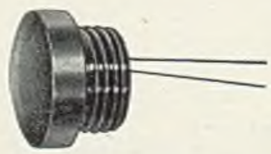
■ not for new development

BPY 43
BPY 44

BPY 11
BP 100

TP 61

TP 60



BPY 45

TP 50
TP 51

APY 10
APY 11

Compensation and Measuring Thermistors

Type	Thermal conduction constant $G_{th\,U}$ mW/°C	Time constant τ_{th} s	Tolerance of TC %	Maximum admissible temperature T °C	Application	Outline No.
K 11	8	30	±5	120	Compensation	31
K 13	60*	50*	±5	120	Comp. measured automatic control	32
K 15	8	30	±5	150	Compensation	33
K 17	0.8	3	±5	250	Temp. meas.	34
K 18	4	60	±5	200	Temp. meas.	35
K 19	0.14	0.4	±5	200	Temp. measured automatic control	36
K 22	1	30	±7	200	Comp. measured automatic control	37
K 252	30*	20*	±5	120	Comp. measured automatic control	39

Table of Types

Cold-state resistance values R_{20} (ohms) and negative temperature coefficients TC (%/°C)

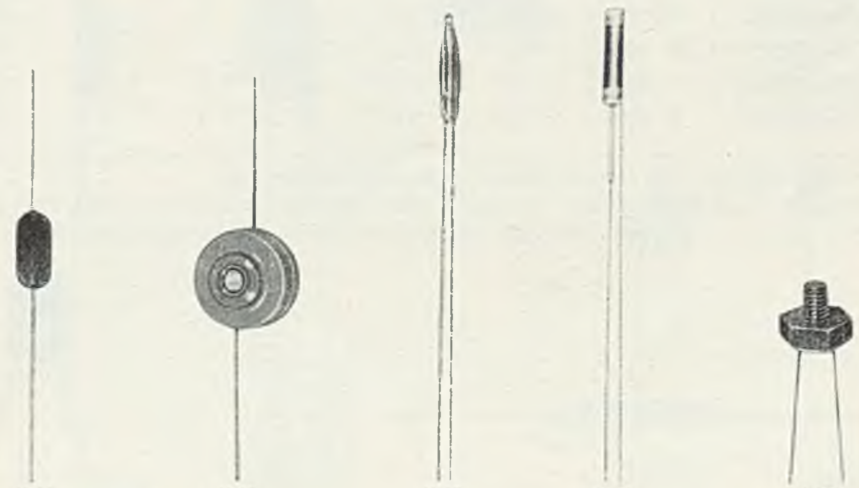
	K 11													
R_{20}	10	20	50	100	200	500	1 k	2 k	5 k	10 k	20 k	50 k	100 k	500 k
TC	3.0	3.0	3.5	3.5	3.5	3.5	3.8	3.8	3.8	3.8	3.8	3.8	5.0	5.3

Tolerance of cold-state resistance values R_{20} is generally ± 20% (and ± 10%). Closer tolerances available on request.

	K 13				K 15						K 17			
R_{20}	50	200	2 k	50 k	4	50	150	500	2 k	5 k	2.5 k	4 k	10 k	100 k
TC	3.5	4.1	4.6	5.4	3.0	3.5	4.1	4.2	4.6	5.0	4.0	4.0	4.0	4.6

	K 18		K 19	K 22				K 252		
R_{20}	8 k	100 k	12 k	1 k	10 k	40 k	250 k	1 k	6 k	40 k
TC	4.0	4.6	4.0	4.1	4.6	5.0	5.3	4.1	4.6	5.0

* when mounted on metal chassis: $G_{th\,G}$



K 11 K 13 K 17 K 18 K 252

Starting Thermistors

Type	Rated voltage U_N V	Rated current I_N mA	Cold-state resistance R_{20} kΩ	Thermal capacity C_{th} mWs/°C	Thermal dissipation constant G_{thU} mW/°C	Minimum admissible resistance R_{min} ohms	Voltage maximum U_1 V	Outline No.
A 32–1/600	1	600	0.06	350 env.	4	1.5	1.8	41
A 32–2/300	2	300	0.5	350 env.	4	6	4	41
A 34–2/30	2	30	5	0.5	0.4	40	4	42
A 34–4/20	4	20	15	0.5	0.4	150	8	42
A 34–5/15	5	15	40	0.5	0.4	300	13	42
A 34–6/40	6	40	6	10	1.5	120	9	42
A 34–7/10	7	10	100	0.5	0.4	500	18	42
A 34–10/25	10	25	40	7	1.2	350	21	42
A 34–14/30	14	30	40	32	2.3	400	28	42
A 37–10/80	10	80	10	240	4	120	20	43
A 37–20/40	20	40	100	240	4	500	60	43

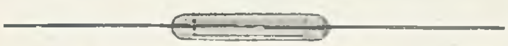
Automatic Control Thermistors

Type	Voltage maximum U_1 V	Current at U_1 I_1 mA	Rated current I_N mA	Cold-state resistance R_{20} k-ohms	Thermal conduction constant G_{thU} mW/°C	Minimum admissible resistance R_{min} ohms	Outline No.
R 51–4/1/20	4	1	20	10	0.2	90	42
R 51–8/0.5/10	8	0.5	10	40	0.2	360	42

Indirectly heated bead Thermistors

Type	Cold-state resistance R_{20} ohms	Hot-state resistance R_w ohms	Heater resistance R_{Hz} mA	Heater current at R_w I_{Hz} mA	Time constant τ_{th}	Insulation resistance between heater and thermistor R_{Is} ohms	Capacitance betw. heater and thermistor $C_{Hz.\,HL}$ pF	Minimum admissible resistance R_{min} ohms	Outline No.
F 74–35/15*	$5 \cdot 10^3$	50	400	≦ 25	15	$> 10^8$	approx. 2	40	45
F 74–51/25x	$1 \cdot 10^5$	500	400	≦ 25	15	$> 10^8$	approx. 2	350	45
F 75–34/14u*	$4 \cdot 10^3$	$5 \cdot 10^1$	100**	≦ 27	3	$> 10^8$	approx. 2	35	45
F 75–41/21u*	$1 \cdot 10^4$	$1 \cdot 10^2$	100**	≦ 30***	3	$> 10^8$	approx. 2	80	45
F 75–46/23u*	$6 \cdot 10^4$	$3 \cdot 10^2$	100**	≦ 30***	3	$> 10^8$	approx. 2	250	45
F 75–54/32u*	$4 \cdot 10^5$	$2 \cdot 10^3$	100**	≦ 30***	3	$> 10^8$	approx. 2	1500	45

* Replaces former type F 73 with different arrangement of filaments.
** Available with 400-ohm heater on request. Such types are marked by the letter "x", e. g. F 75—54/32x.
*** In the case of 400-ohm heaters, the heater current for R_w is reduced to ≦ 15 mA.



A 34— 2/30
A 34— 4/20
A 35— 5/15
A 34— 6/40
A 34— 7/10
A 34—10/25
A 34—14/30
R 51—4/1/20
R 51—8/0.5/10

F 74—35/15
F 74—51/25
F 75—34/14
F 75—41/21
F 75—46/23
F 75—54/32

A 37 — 10/80
A 37 — 20/40

Thermistors with positive temperature coefficient

Type	Rated temperature T_N °C	Initial resistance R_A* Ω	Final resistance R_E kΩ	Final temperature T_E °C	Maximum admissible Voltage V_{max} V	Color dot
P 310–C11	30	70	> 70	120	30	blue
P 330–C11	50	60	> 60	140	30	lilac
P 350–C11	70	35	> 35	160	30	orange
P 390–C11	110	60	> 60	180	30	green
P 450–C11	170	80	> 80	270	30	grey
P 310–C12	30	60	> 60	120	50	blue
P 330–C12	55	55	> 55	140	50	lilac
P 350–C12	70	40	> 40	160	50	orange
P 390–C12	110	55	> 55	180	50	green
P 330–C13	50	25	> 25	140	60	lilac
P 350–C13	70	15	> 15	160	60	orange
P 390–C13	110	25	> 25	180	60	green
P 350–C14	70	3	> 3	160	10	orange
P 390–C14	110	5	> 5	180	10	green
P 350–C15	70	12	> 12	160	80	orange
P 390–C15	110	22	> 22	180	80	green
P 390–C16	110	1000	> 1000	180	300	green
P 330–D1	50	70	> 70	140	10	lilac
P 350–D1	70	40	> 40	160	10	orange
P 390–D1	110	70	> 70	180	10	green
▼ P 350–E1**	70	200	> 200	140	20	orange
▼ P 390–E1**	110	200	> 200	160	20	green
▼ P 430–E1**	150	200	> 200	180	20	brown

* Tolerance of R_A = –50% . . . +100%

** D0-7, glass

▼ new type

P 310–C 11
P 330–C 11
P 350–C 11
P 390–C 11
P 450–C 11

P 310–C 12
P 330–C 12
P 350–C 12
P 390–C 12

P 330–C 13
P 350–C 13
P 390–C 13

P 350–C 14
P 390–C 14

P 350–C 15
P 390–C 15

P 390–C 16

P 330–D 1
P 350–D 1
P 390–D 1

P 350–E 1
P 390–E 1
P 430–E 1

Hall-effect Field Probes

Type	Rated control field current i_{1n} mA	Rated control field B_n kG	Open-circuit Hall voltage at rated values V_{20n} mV	Open-circuit sensitivity ref. to B_n K_0 V/AkG	Resistive termination for linear matching $R_{3\,lin}$ Ω	Probe Dimensions: Thickness d mm	Length l mm	Width b mm	Outline No.
FA 22 e	150	10	≧ 95	≧ 0.063	approx. 4	0.8	100	3	46
FA 24	400	10	≧ 300	≧ 0.075	approx. 6	1.0	19	9	47
EA 218	100	10	≧ 85	≧ 0.085	approx. 6	0.5	7	3.2	48
SBV 525	100	10	> 97	> 0.097	approx. 20	0.3	20	2	—
JC 24	450	10	> 360	> 0.08	approx. 8	1.6	24	14	—
TC 21	150	10	> 84	> 0.056	approx. 3.5	2.0	12	6	—
TC 21-d	2 × 100	—	—	> 0.1*	—	2.5	20	8	—

* referred to $B \rightarrow 0$

Hall-effect Probes for High-precision Field Measurements

Type	Rated control field current i_{1n} mA	Rated control field B_n kG	Open-circuit Hall voltage at rated values V_{20n} mV	Open-circuit sensitivity ref. to B_n K_0 V/AkG	Resistive termination for linear matching $R_{3\,lin}$ Ω	Thickness d mm	Length l mm	Width b mm	Outline No.
FC 32	100	10	≧ 130	≧ 0.13	approx. 13	1.5	12	6	—
FC 33	100	10	≧ 145	≧ 0.145	approx. 25	1.5	15	8	—
FC 34	200	10	≧ 290	≧ 0.145	approx. 50	1.5	22	12	—

Axial Field Probes

Type	Rated control field current i_{1n} mA	Rated control field B_n kG	Open-circuit Hall voltage at rated values V_{20n} mV	Open-circuit sensitivity ref. to B_n K_0 V/AkG	Application	Outline No.
SBV 552	100	10	≧ 40	≧ 0.04	Application: Meas. of axial fields in bores	—
RHY 10	100	10	> 70	≧ 0.07	Application: Meas. of axial fields in bores	49
RHY 11	150	10	> 105	≧ 0.07	Application: Meas. of axial fields in bores	50

Signal Probes

Type	Rated control current I_{1n} mA	Rated control field B_n kG	Open-circuit Hall-voltage at rated values V_{20n} V	Open-circuit sensitivity ref. to $B \rightarrow 0$ K_{0a} V/AkG	Application	Outline No.
■ SV 120*	20...30...40	10	1.3 ... 0.9 ... 0.6	≧ 6.5 ... 3.2 ... 1.6	High sensitivity signal probes	51
SV 130*	40...50...80	10	2.0 ... 1.3 ... 1.0	≧ 6.5 ... 1.3 ... 1.6	High sensitivity signal probes	52
SV 210	60	10	≧ 3.00	≧ 0.6	High sensitivity signal probes	53
■ SV 220	100	10	≧ 0.65	≧ 0.65	High sensitivity signal probes	51
SV 230	100	10	≧ 0.65	≧ 0.65	High sensitivity signal probes	—

* Three sensitivity groups can be supplied

FA 24

RHY 11

SV 130
SV 230

SBV 525

■ not for new development

Magnetogram Probes and Ferrite Hall-effect Devices for Contactless Signaling

Type	Rated control current I_{1n} mA	Rated control field B_n kG	Open-circuit Hall-voltage at rated value V_{20n} mV	Application	Outline No.
SBV 535	50	[1]	approx. 0.4	Magnetic tape probe with recording winding	—
SBV 536	50	[2]	> 0.3	Magnetic tape probe	—
■ SBV 539	50	[3]	> 150	Probe for contactless program scanning	—
■ SBV 540	50	[4]	> 120	Probe for contactless signaling	—
■ SBV 541	50	[3]	> 150	Ferrite Hall-effect device for magnetic-control circuits	—
■ RHY 12[5]	5 ... 20	[3]	> 80	Ferrite Hall-effect device for magnetic-control circuits	—
■ RHY 13[5]	8 ... 30	[3]	> 80	Ferrite Hall-effect device for contactless signaling	—

Hall Multiplier Probes and Hall Modulators

Type	Rated control current I_{n1} mA	Control field energization $I_A \cdot N$ AW	Open-circuit Hall-voltage at rated values V_{20n} mV	Resistive termination for linear matching $R_{3\,11n}$ Ω	Application	Outline No.
MB 23	800	20*	≧ 80*	approx. 20	Hall multiplier probe, and for measuring small bunched magnetic fields	—
MB 26	400	70*	≧ 160	approx. 12	Hall multiplier probe	—
MB 26 EI 38/MU	400	70*	≧ 160	approx. 12	Hall multiplier	—
RMY 10	500	70*	≧ 200	5	Hall multiplier, ferrite potcore design	54
SBV 514	300	10	≧ 55	—	Inverter for control systems	—
RMY 11	25	3.5	≧ 150	—	μV-modulator	55

* when installed in EI 38 MU

[1] When scanning a recording: 50 c/s; 19,55 cm/s tape speed and a magnetic short circuit flux of 6 mM/mm

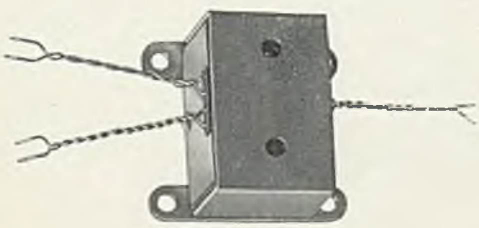
[2] When scanning a recording: 1 Kc, track width 1,5 mm; 38.1 cm/s tape speed, tape flux 50 mM

[3] At a web flux of 20 maxwells

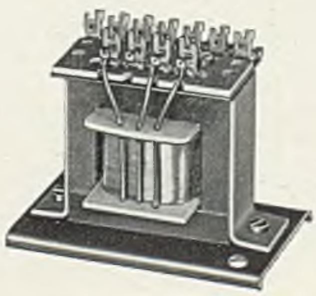
[4] At a probe flux of 20 maxwells

[5] These types are subdivied into 3 groups

■ not for new development



RMY 11



MB 26 EI 38/MU

RMY 10

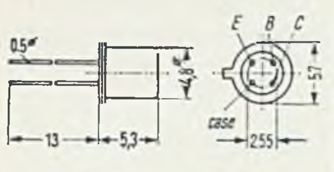
A new Magnetic-Flux Dependent Resistor (MDR) has been developed at the Siemens-Schuckert-Werke Research Laboratories in Erlangen. New technological processes made it possible to achieve unusually large resistance changes of these ohmic semiconductor resistors by application of a controlling magnetic field. For magnetic inductions up to 3 kG a square-law characteristic and for higher flux densities a linear characteristic has been observed. Particularly the linear region shows a negative temperature dependence of the resistance value. The flux dependence is effective up to the microwave range.

Tentative characteristics

Type	Basic resistance at $T_{amb} = 22°$ C	Resistance at $T_{amb} = 22°$ C normalized to R_0		Temperature coefficient at $T_{amb} = 22°$ C and induction B			Outline
		± 3 kG	± 10 kG	0 kG	± 3 kG	± 10 kG	
	R_0 (Ω)	R_B/R_0		T_C (% /° C)			
• M 15 M 10	10 ± 10%	1.6—1.9	6—8	—0.16	—0.4	—0.55	56
• M 20 T 50	50 ± 10%	1.8—2.1	7—9	+0.06	—0.05	—0.09	59
• M 20 P 50	50 ± 10%	2.3—2.7	9—12	0	—0.15	—0.18	59
• M 28 D 500	500 ± 10%	3.0—3.2	13—18	—1.8	—2.7	—2.9	57
• M 17 L 100	100 ± 10%	1.9	7—10	—0.12	—0.35	—0.5	60
• M 32 L 10	10 ± 10%	1.9	7—10	—0.12	—0.35	—0.5	58

• Tentative datas for samples only

Outline Drawings



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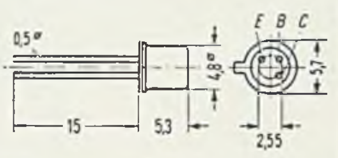

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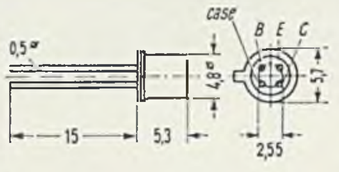

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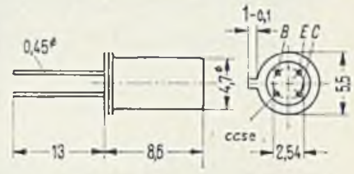

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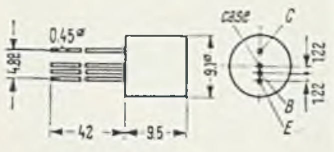

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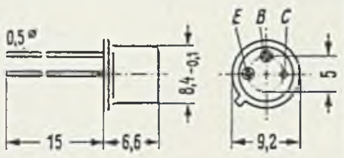

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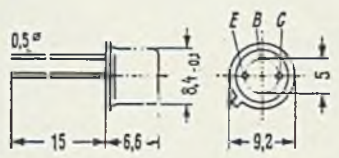

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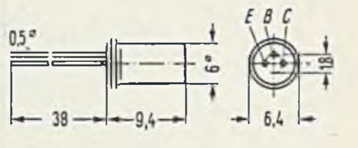

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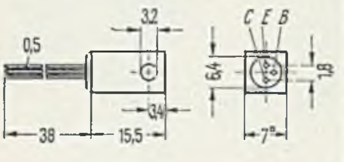

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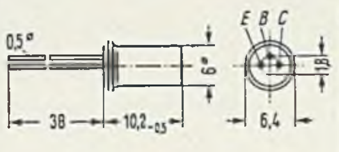

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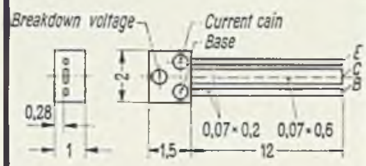

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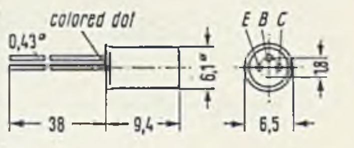

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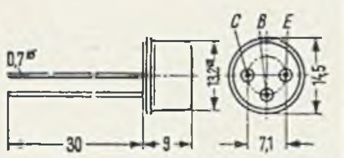

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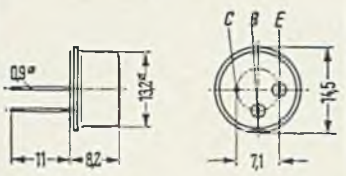

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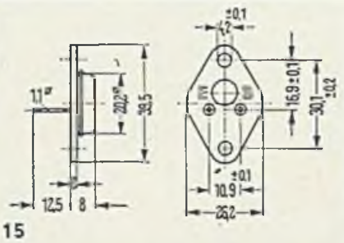

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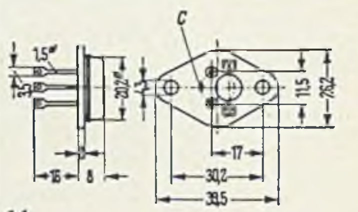

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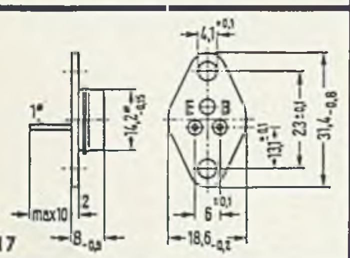

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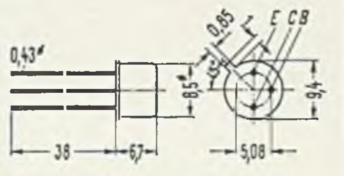

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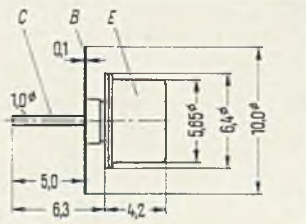

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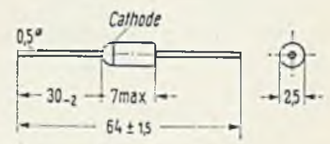

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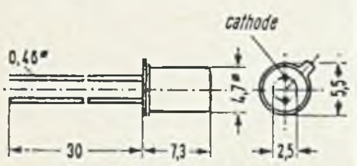

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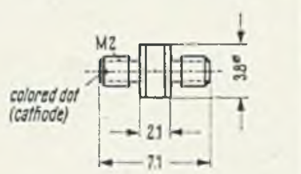

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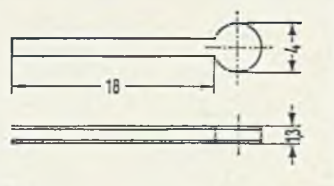

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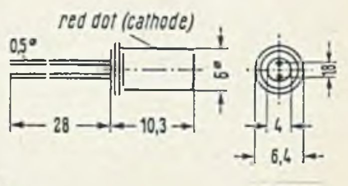

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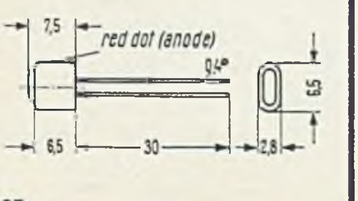

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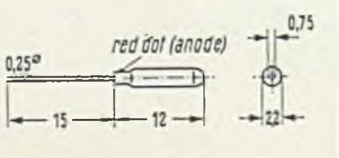

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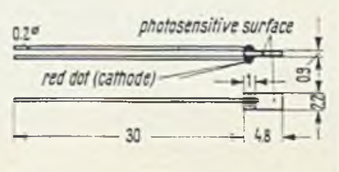

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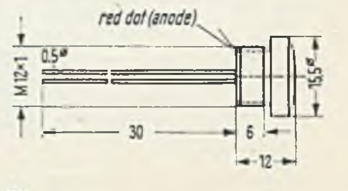

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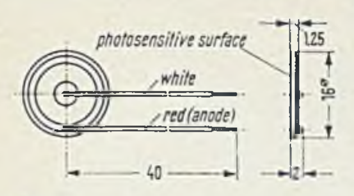

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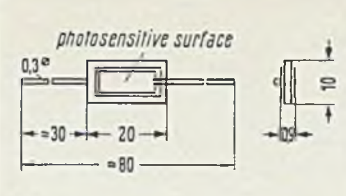

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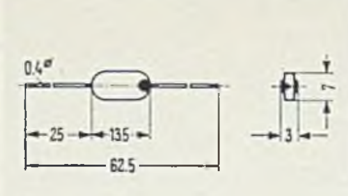

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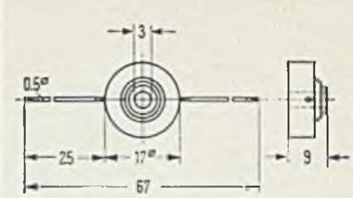

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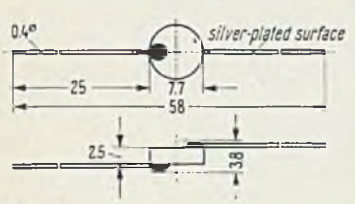

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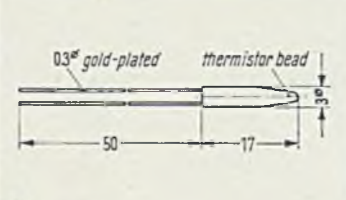

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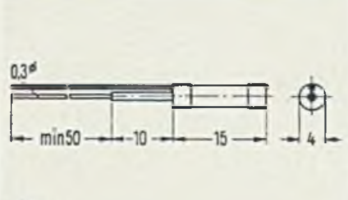

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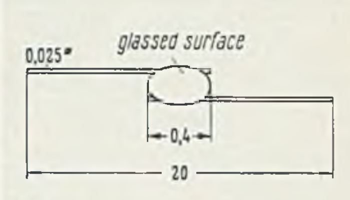

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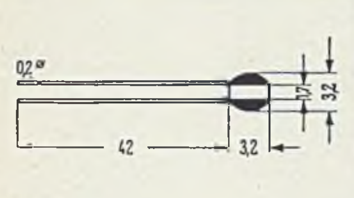

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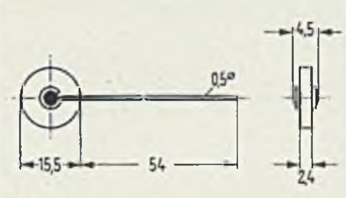

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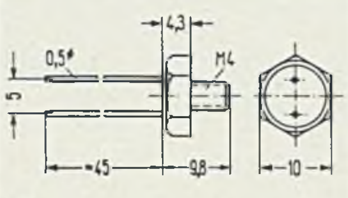

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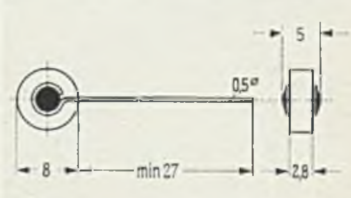

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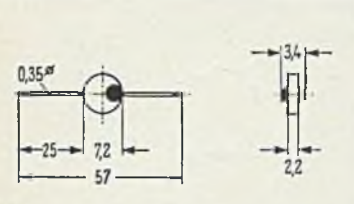

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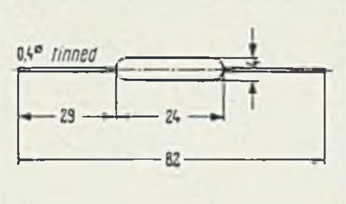

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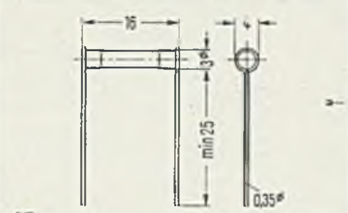

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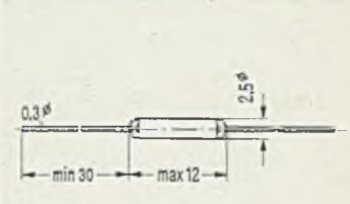

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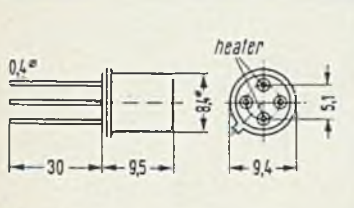

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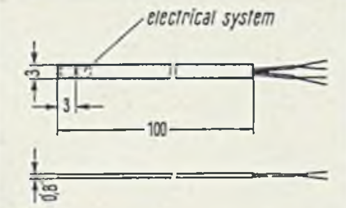

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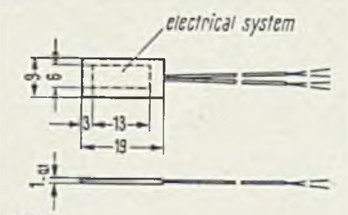

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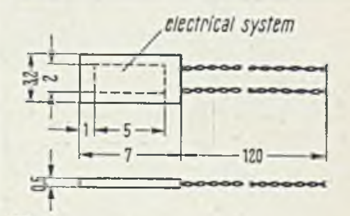

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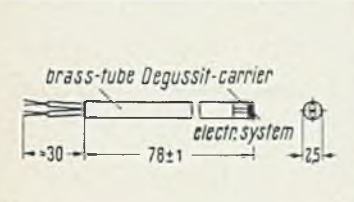

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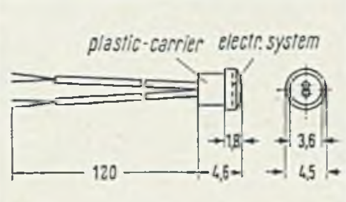

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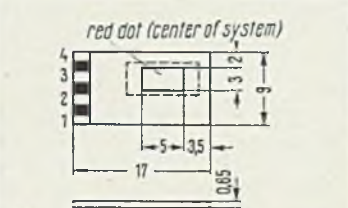

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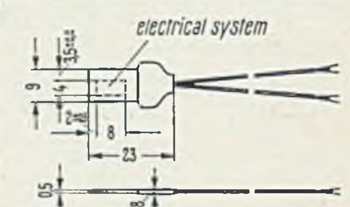

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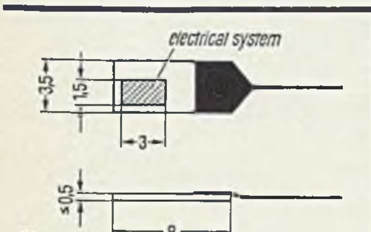

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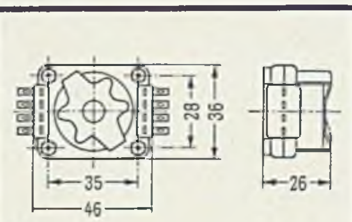

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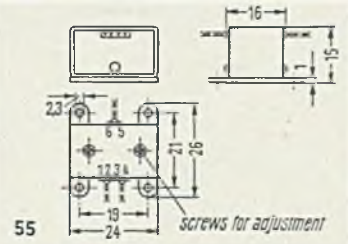

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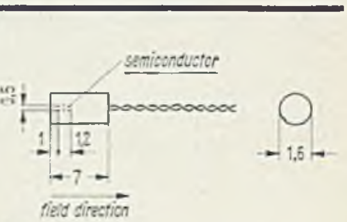

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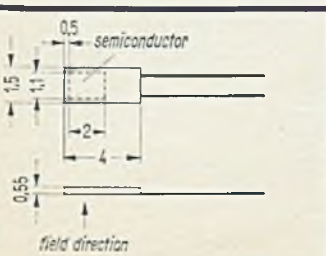

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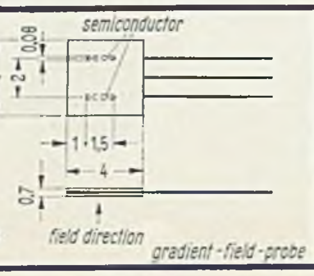

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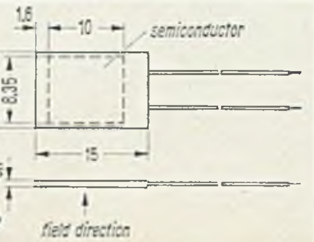

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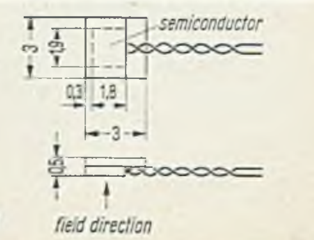

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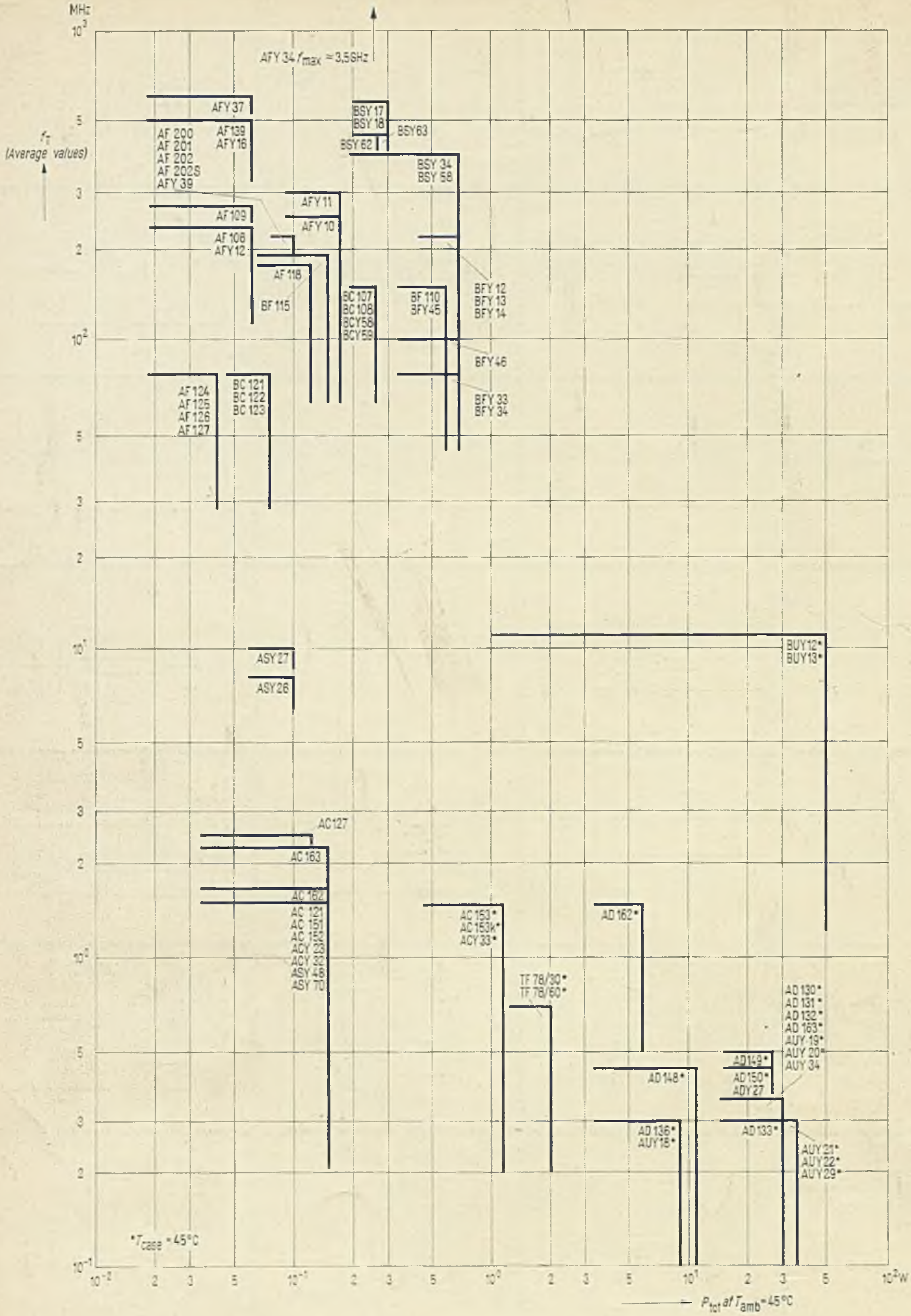

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