

Transistors

P-N-P silicon low/medium power transistors book 1 parts 1 and 2

Type No.	Outline	Dwg. ref.	V _{CB0}		V _{CEO}		Maximum Ratings		T _j at 25°C	P _{tot} at 25°C	h _{FE}		at I _C	f _T min.	V _{CE(sat)}		at I _C	at I _B	Special Features
			(V)	(V)	(V)	(V)	I _{CM} (mA)	I _{CI(AV)} (mA)			min.	max.			(V)	(V)			
GENERAL PURPOSE																			
BCY70 BCY71 BCY72	TO-18 AT1	AT1	-50	-40	200	200	200	350	100	290*	10	250	-0.25	10	1.0	N < 2dB (BCY71)			
			-45	-45					100	400									
			-30	-25					100	290*									
BFX37	TO-18 AT1	AT1	-60	-60	-	50	200	360	70	300	0.01	40	-0.40	50	5.0	N < 3dB			
BC157 BC158 BC159	SOT-25 Y1	Y1	-50	-45	200	100	125	350	75†	260	2.0	150*	-0.3	10	0.5	N < 4dB at f = 30Hz to 15kHz			
			-30	-30					75†	500									
			-30	-30					125†	500									
BC462 BC464	SOT-25 Y1	Y1	-35	-28	3A	1.5A	175	1 W	50	280	500	200*	-0.5	1A	100	Supplied as complementary pairs with BC463,5			
			-25	-18					95	280									
BC566 BC567 BC568 BC569 BC560	TO-92 BB1	BB1	-80	-65	200	100	150	500	75	250	2.0	150*	-0.3	10	0.5	N < 4dB N < 3dB			
			-60	-45					75	475									
			-30	-30					75	475									
			-30	-30					125	475									
			-60	-45					125	475									
BC327 BC328	TO-92 BB1	BB1	-50	-45	1.0A	500	150	625	100	600	100	100*	-0.7	500	50				
			-30	-25															
BCX35 BCX36 BCX37	SOT-25 Y1	Y1	-80	-80	1.0A	600	150	730	40	75*	150	80	-0.4	150	15				
			-60	-60					80	100*									
			-40	-40					40	75*									
SBFX29 SBFX30	TO-39 AV3	AV3	-60	-60	600	600	200	600	50	125*	10	100	-0.4	150	15	t _s < 50ns at 100mA			
			-65	-65					50	200	10	-	-	-					
BFX87 BFX88	TO-39 AV3	AV3	-50	-50	600	600	200	600	40	125*	10	100	-0.4	150	15				
			-40	-40															
BF423	TO-92 BB5	BB5	-250	-250	100	20	150	830	50	-	25	60	-	-	-	C _{re} < 1.6pF at 0.5MHz			
BSV15 BSV16 BSV17	TO-39 AV3	AV3	-40	-40	-	1.0A	200	800	40	250	100	50	-1.0	500	25				
			-60	-60					40	250									
			-90	-80					40	160									
BFT44 BFT46	TO-39 AV3	AV3	-300	-300	500	500	200	5W ²⁾	50	150	10	70	-5.0	500	100				
			-250	-250								-3.0							
BCY30A BCY31A BCY32A BCY33A BCY34A	TO-5 AS1	AS1	-64	-64	100	50	150	600	10	35	20	7*	-0.55	20	3	V _{EBO} max. = -45V V _{EBO} max. = -45V V _{EBO} max. = -32V V _{EBO} max. = -32V V _{EBO} max. = -32V			
			-64	-64					15	60									
			-64	-64					20	70									
			-32	-32					10	35									
			-32	-32					15	60									
2N4030 2N4031	TO-39 AV3	AV3	-60	-60	-	1.0A	200	800	25	-	500	100	-0.5	500	50				
			-80	-80															
2N4032 2N4033	TO-39 AV3	AV3	-60	-60	-	1.0A	200	800	70	-	500	150	-0.5	500	50				
			-80	-80															

1) T_{case} = 25°C

*Typical t_{hfe}

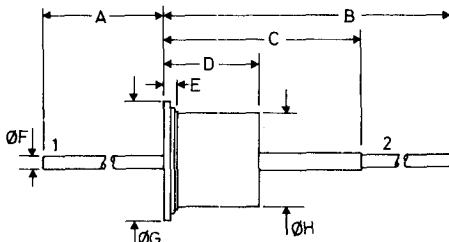
§ Also available to BS9000 (see page 7)

OUTLINES and DIMENSIONS (millimetres)

A

B.S.3934 SO-16

DO-1
DO-2
DO-3

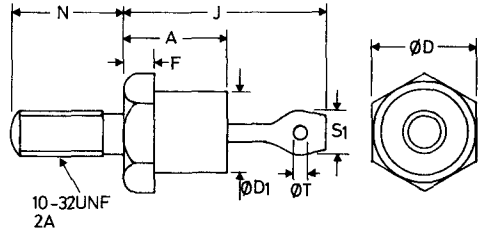


	1	2	A	B	C	D	E	ØF	ØG	ØH
	min.	min.	min.	min.	min.	max.	max.	max.	max.	max.
A1	a	k	35	51	17	7.7	1.6	1.1	9.6	7.1
A2	k	a	35	49	17	8.5	1.9	1.1	9.7	7.1
A3	k	a	35	51	17	7.7	1.6	1.1	9.6	7.1

B

B.S.3934 SO-10

DO-4



A 10.3 max.
ØD 11.1 max.
ØD1 9.3 max.
F 3.2

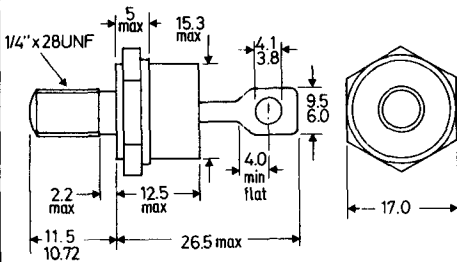
J 20.3 max.
N 11.5 max.
S1 4.8 max.
ØT 1.6 min.

	Stud	Eyelet
B1	k	a
B2	a	k

C

B.S.3934 SO-13

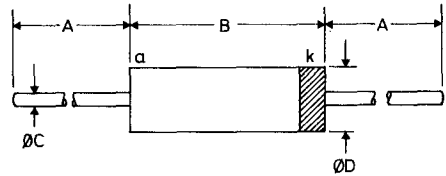
DO-5



	Stud	Eyelet
C1	k	a
C2	a	k

D

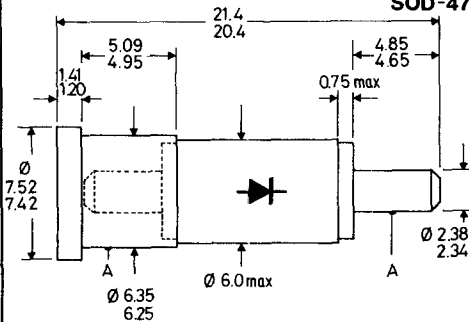
DO-7
DO-14
DO-15



		A	B	ØC	ØD
		min.	max.	nom.	max.
D1	DO-7	25.4	7.6	0.52	2.5
D2	DO-14	25.4	7.6	0.5	3.3
D3	DO-15	25.4	6.4	0.8	3.2

E

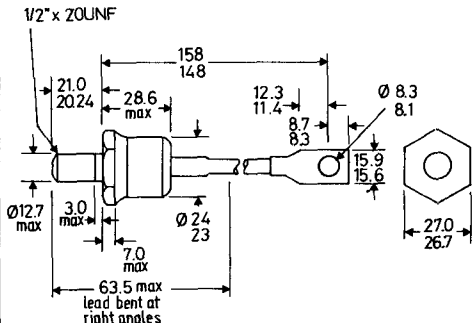
DO-22
SOD-47



A = concentricity tolerance = ± 0.20

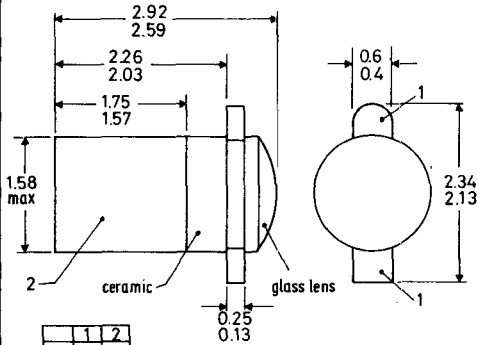
F

DO-30



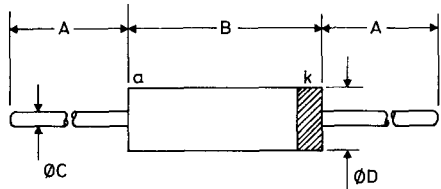
BZW86 Blue sleeve - anode to eyelet
BZW86R Red sleeve - anode to stud

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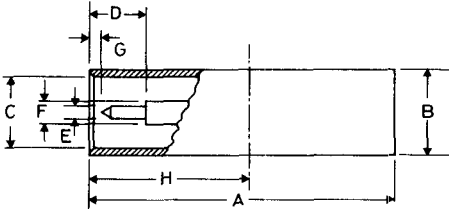
G**DO-31**

	1	2
G1	k	a
G2	e	c

For LED's the overall length = 3.60/2.97

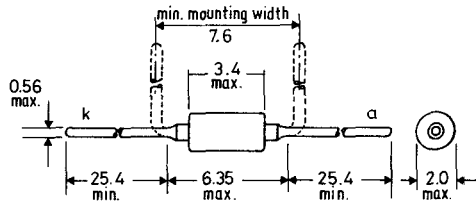
H**DO-35**

A	B	ØC	ØD
min.	max.	max.	max.
25.4	4.25	0.56	1.85

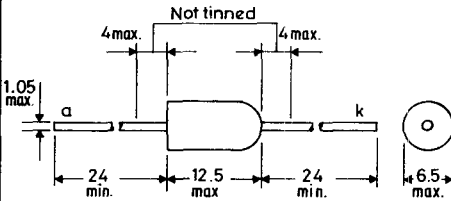
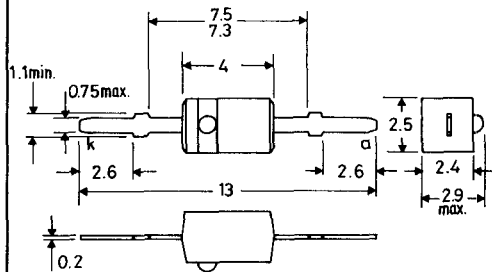
J**DO-37
SOD-49**

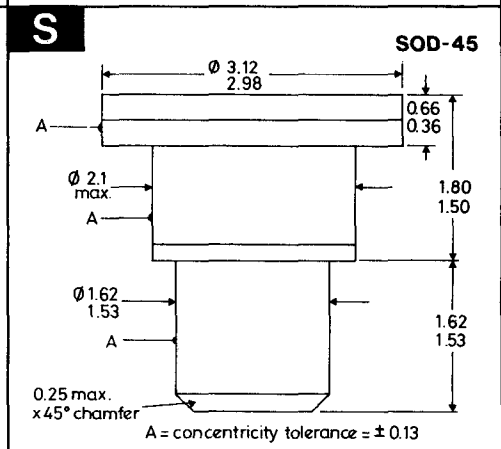
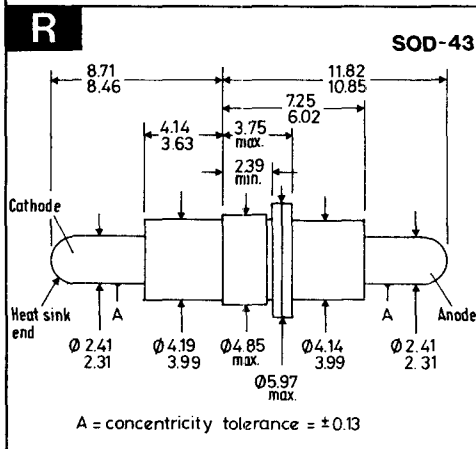
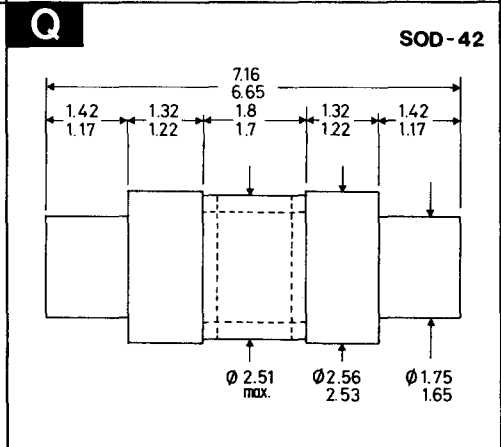
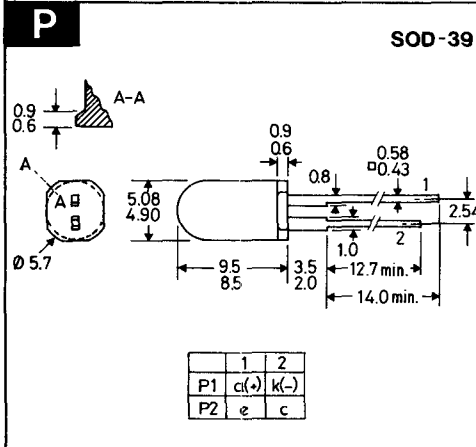
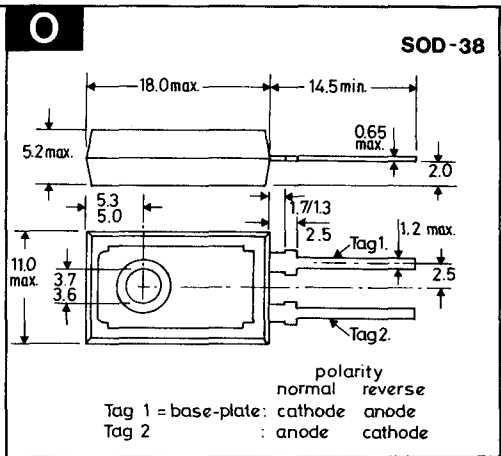
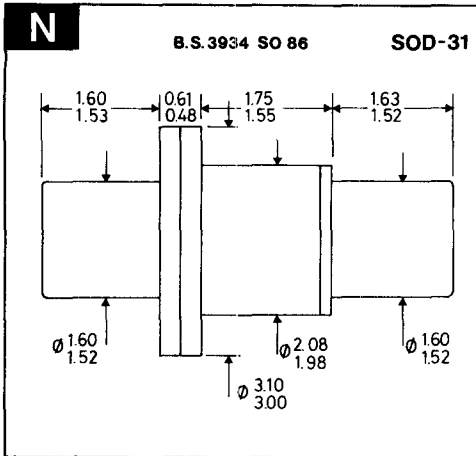
A	19.43/18.67	ØE	0.84/0.79
ØB*	5.59/5.49	ØF	1.57/1.52
ØC	4.80/4.72	G	0.71/0.15
D	3.73 min.	H	10.32 nom.

*These tolerances apply only over H

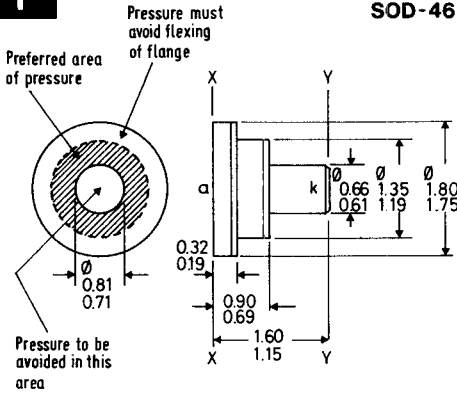
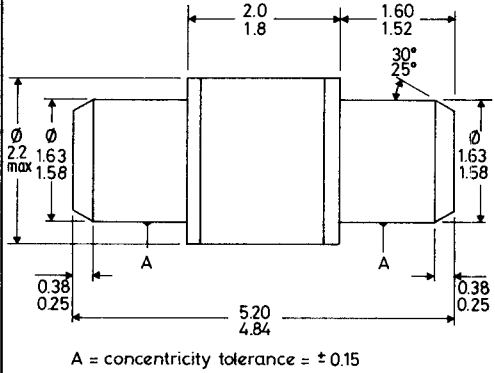
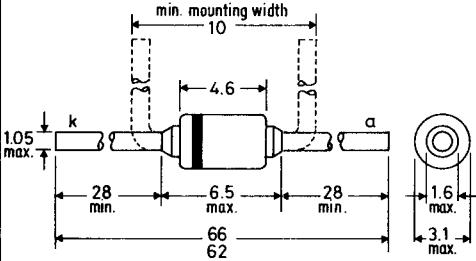
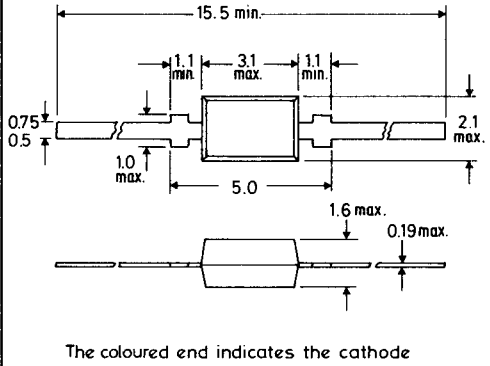
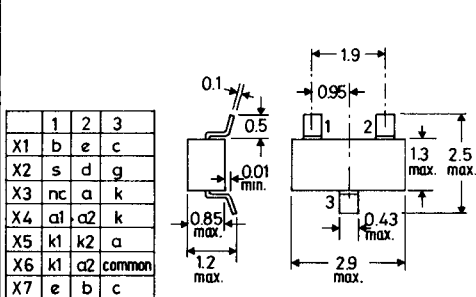
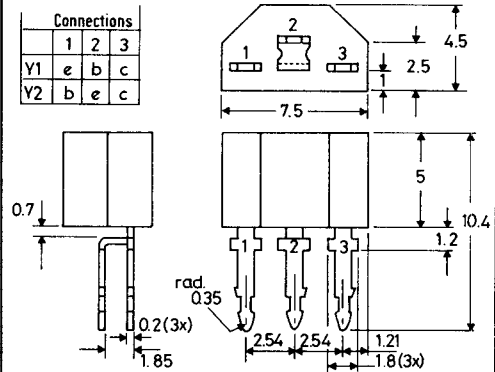
K**SOD-17**

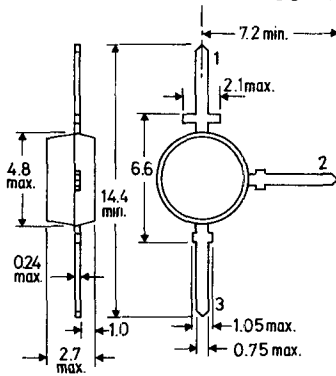
Cathode indicated by the broad band of colour code

L**SOD-18****M****SOD-23**

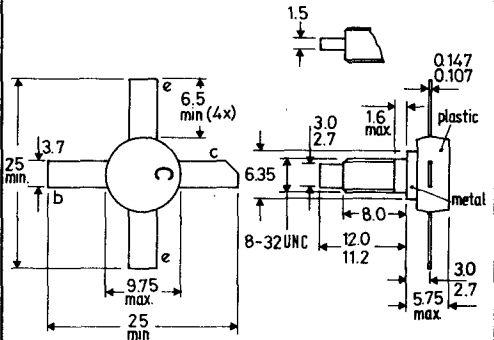
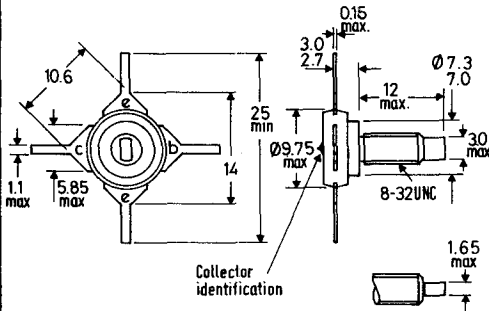
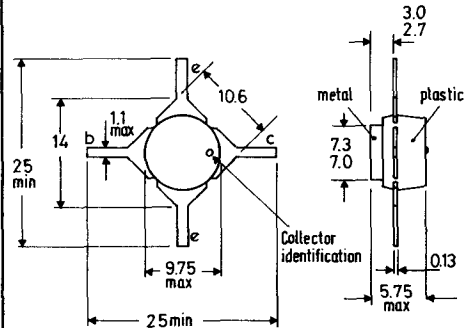
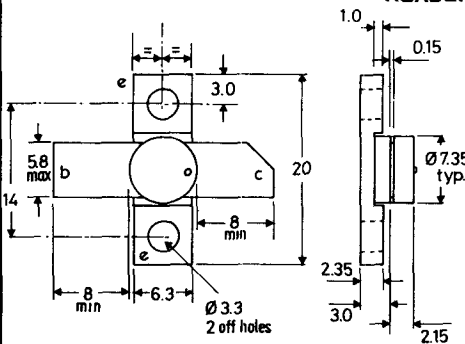
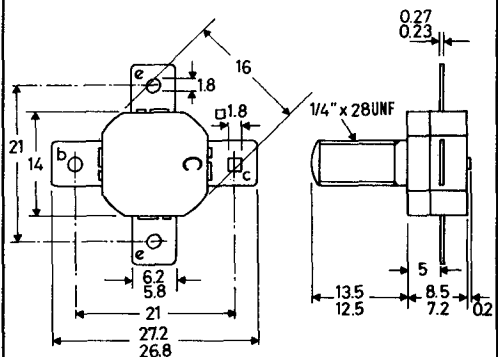


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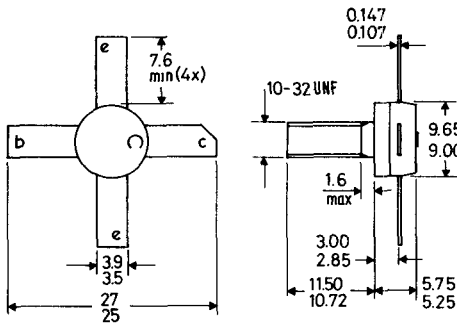
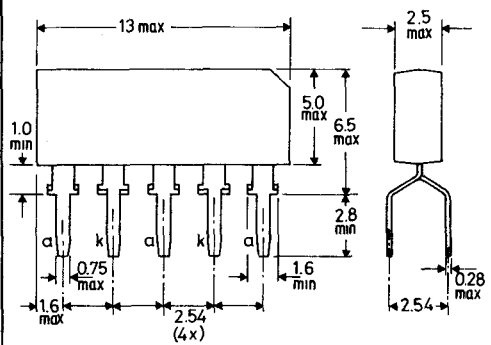
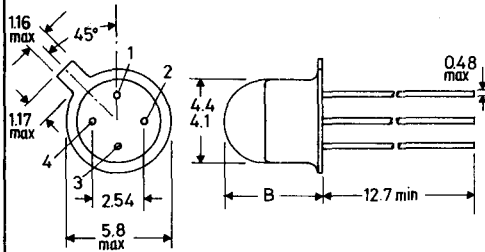
T**SOD-46****U****SOD-50****V****SOD-51****W****SOD-52****X****SOT-23****Y****SOT-25**

Z**SOT-37**

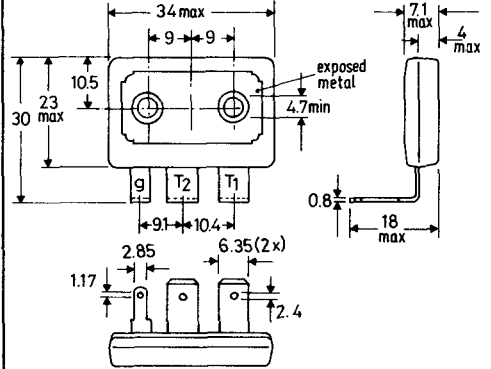
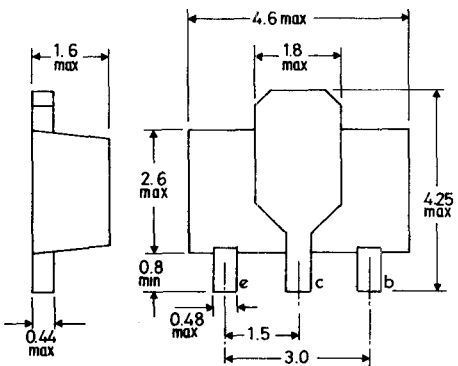
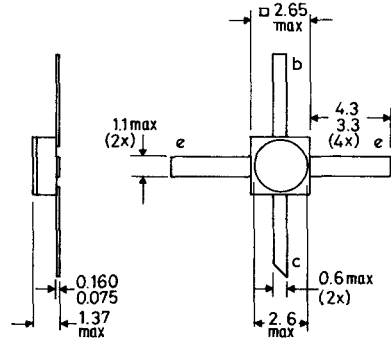
	1	2	3
Z1	c	b	e
Z2	c	e	b

AC**SOT-48/2****AD****SOT-48/3****AE****SOT-48/4****AF****SOT-48
HEADER****AG****SOT-55**

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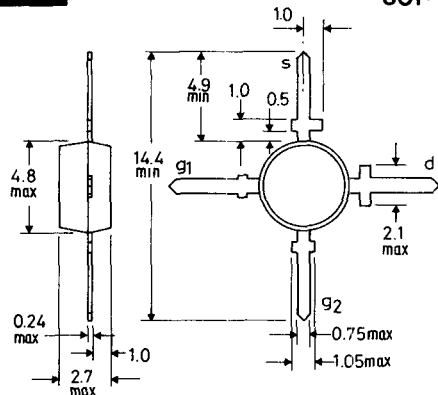
AH**SOT-56****AJ****SOT-60****AK****SOT-70**

	1	2	3	4	B max
AK1	a	—	k	—	5.08
AK2	e	b	c	—	4.5
AK3	Vp	IP	GND	OP	5.08

AL**SOT-80****AM****SOT-89****AN****SOT-100**

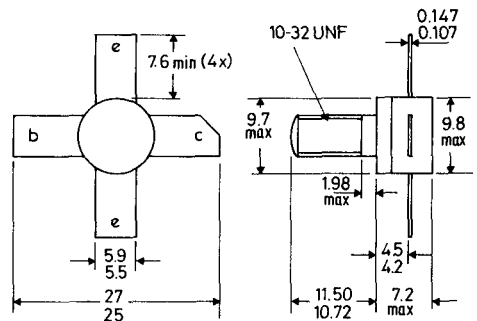
AO

SOT-103



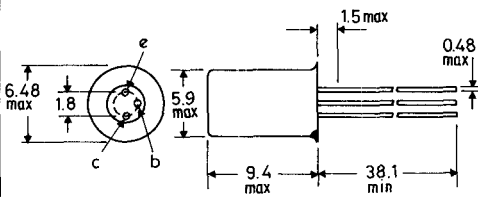
AP

SOT-105



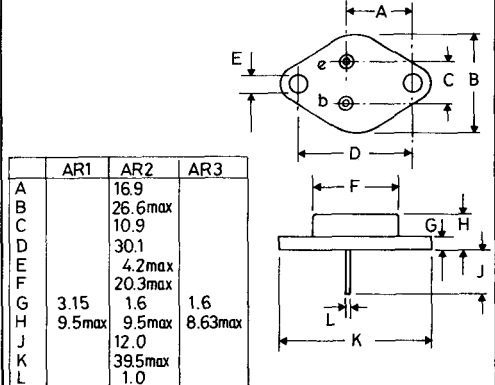
AQ

B.S.3934 SO-21/SB3-10 TO-1



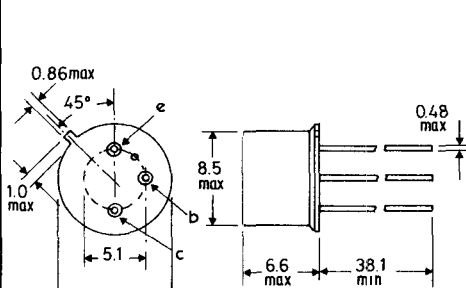
AR

B.S.3934 SO-5B/SB2-2 TO-3



AS

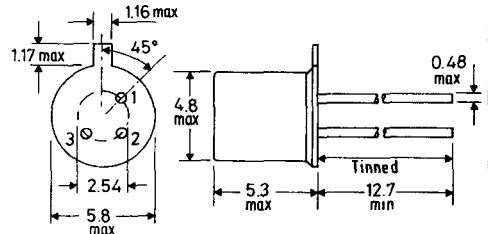
B.S.3934 SO-3/SB3-3B TO-5



AS1: collector connected to case
AS2: base connected to case

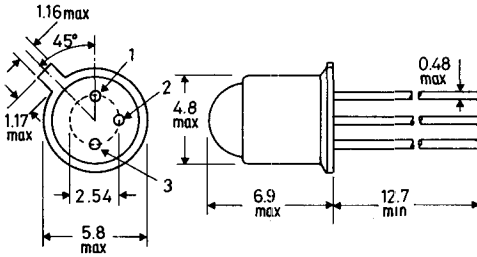
AT

B.S.3934 SO-12A/SB3-6A TO-18

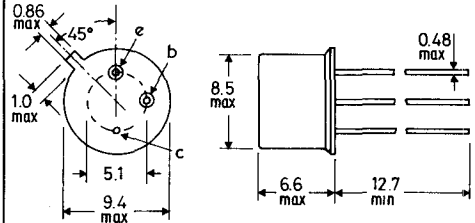


	1	2	3
AT1	e	b	c + env.
AT2	s	d	g + env.
AT3	d	g	s + env.
AT4	k	-	a
AT5	a	-	k
AT6	k	-	a

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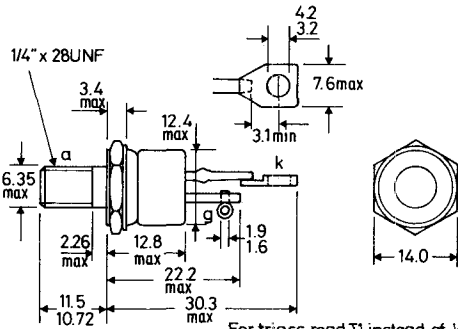
AU**TO-18**
(with lens)

	1	2	3
AU1	a	a	k
AU2	e	b	c+case
AU3	k	-	a

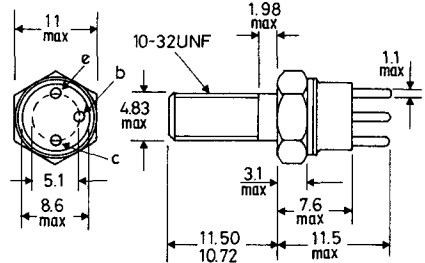
AV**B.S.3934 SO-3/SB3-3A TO-39**

AV1: b+case
 AV2: case isolated
 AV3: c+case
 AV4: e.cathode
 b.gate
 c.anode+case

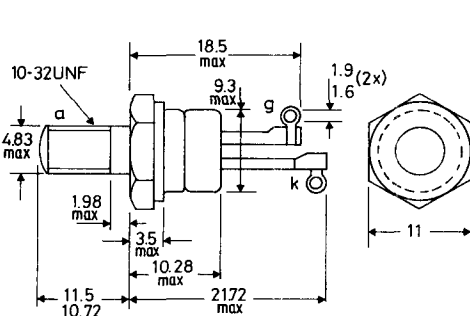
AV5: e.b. cell connections
 c. metal case
 AV6: red spot indicates
 +ve connection

AW**B.S.3932 SO-36 TO-48**

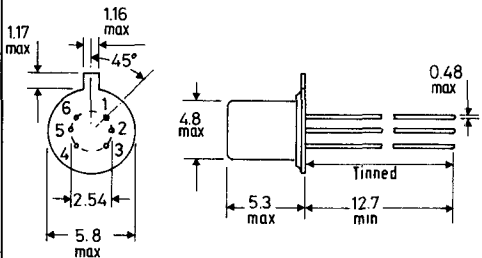
For triacs read T1 instead of k
 T2 instead of a

AX**TO-60**

Emitter connected to envelope

AY**B.S.3934 SO-35A TO-64**

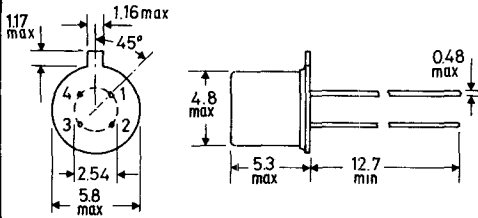
For triacs read T1 instead of k
 T2 instead of a

AZ**TO-71**

Pin	1	2	3	4	5	6
AZ1	e1	e2	c2	b2	b1	c1
AZ2	s1	d1	g1	s2	d2	g2

BA

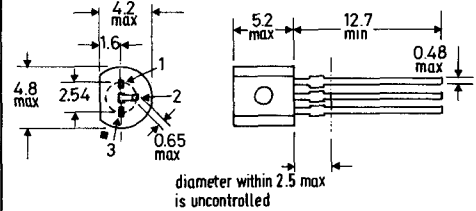
B.S.3934 SO-12A/SB4-3 TO-72



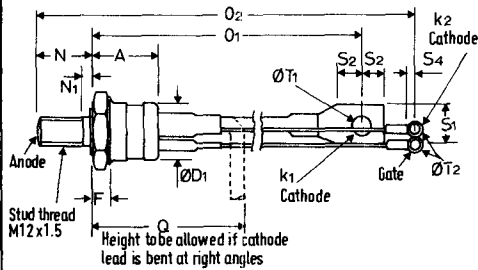
	1	2	3	4
BA1	b	e	c	s+envelope
BA2	e	b	c	s+envelope
BA3	s	d	g	screen+envelope
BA4	d	g	g	s+b+envelope
BA5	d	s	g	b+envelope
BA6	k	gk	ga	a

BBTO-92
variant

Pin	1	2	3
BB1	e	b	c
BB2	b	e	c
BB3	d	s	g
BB4	g	a	k
BB5	b	c	e

**BC**

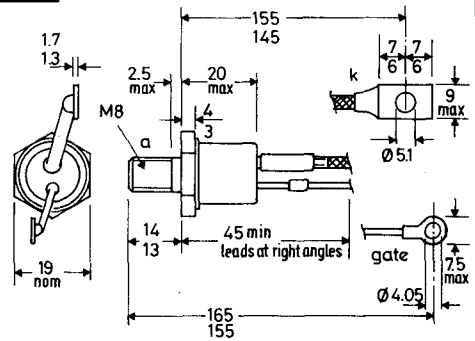
B.S.3934 SO-30C TO-94



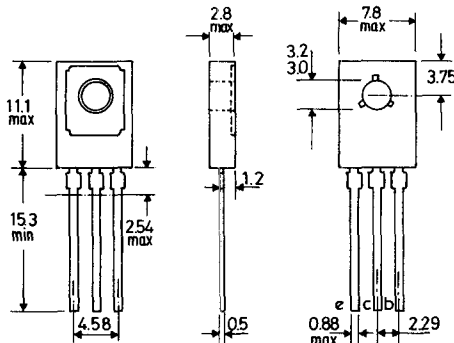
A	28.5max	O1	158 max	S4	3.8 min
ØD1	24.1max	O2	190max	ØT1	8.3max
F	8.9max	Q	63.5max	ØT2	4.2max
N	21.0max	S1	16.5max		
N1	3.0max	S2	9.6min		

BD

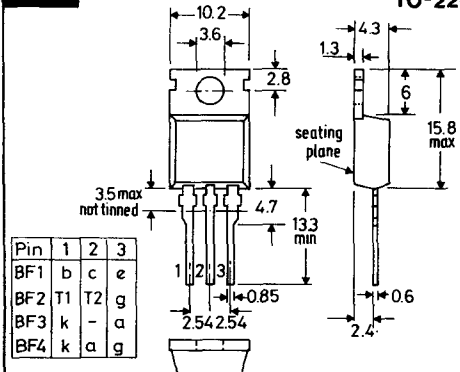
TO-103

For triacs read T1 instead of k
T2 instead of a**BE**

TO-126

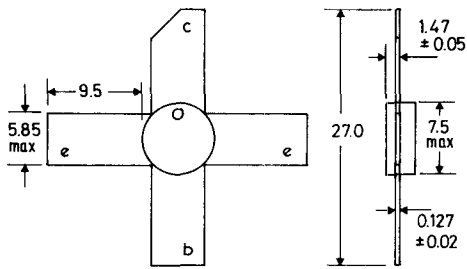
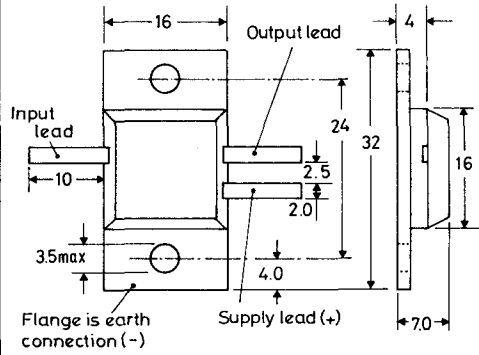
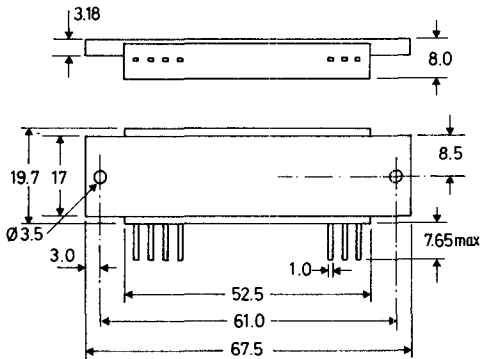
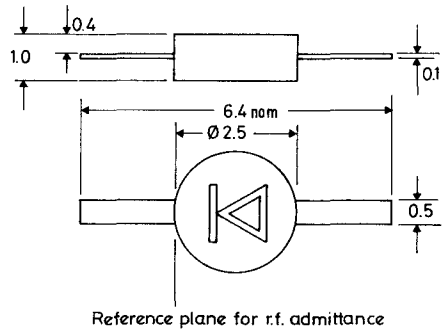
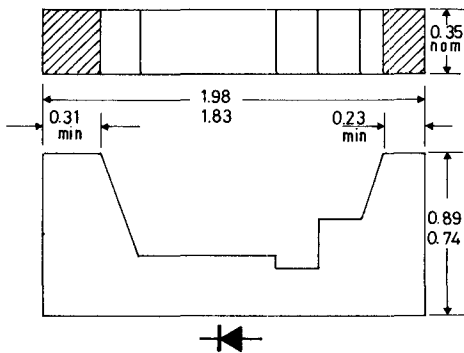
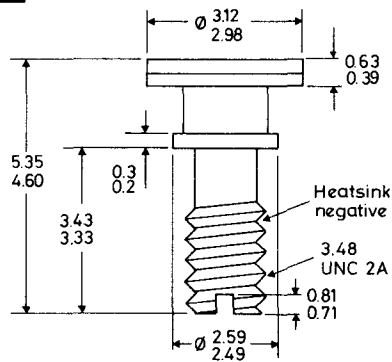
**BF**

TO-220



Pin	1	2	3
BF1	b	c	e
BF2	T1	T2	g
BF3	k	-	a
BF4	k	a	g

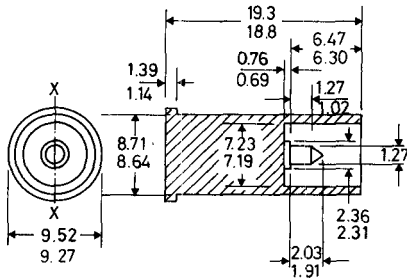
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BG**BH****BJ****BK****BL****BM**

BN

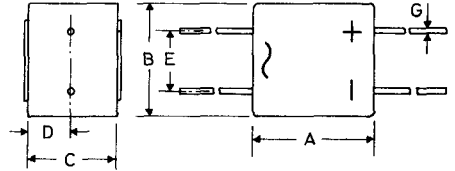
B.S.3934

SO-26

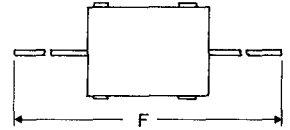


(All dimensions max.)

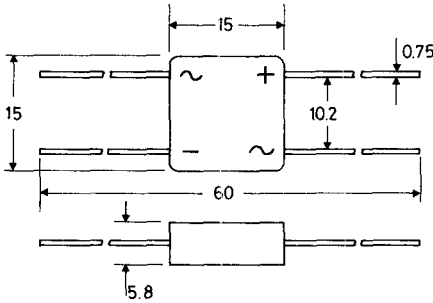
BO



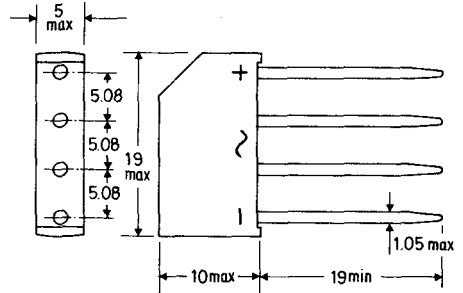
	BO1	BO2	BO3
A	12	20	12
B	10	19	10
C	8	15	8
D	4	7.5	4
E	5	10	5
F	58	60	48
G	0.75	1.0	1.1



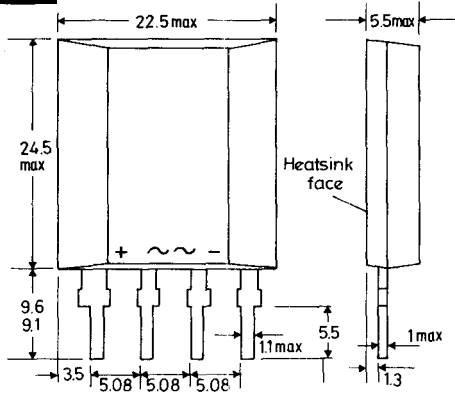
BP



BQ

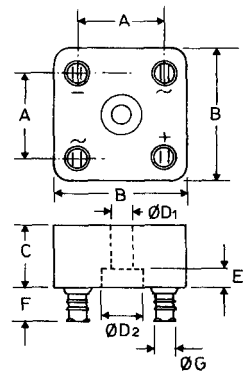


BR



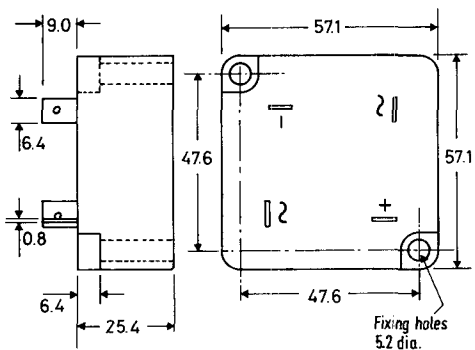
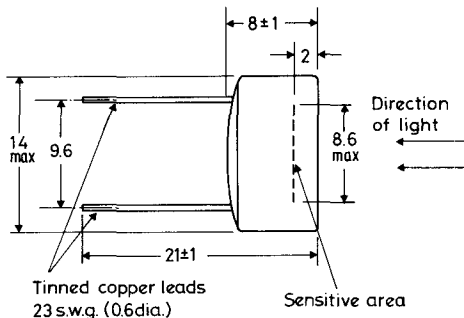
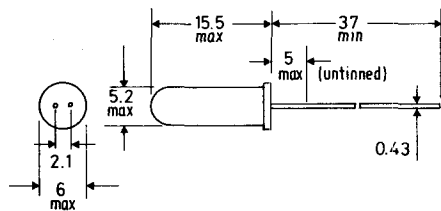
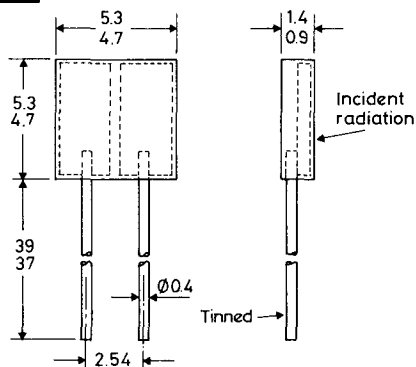
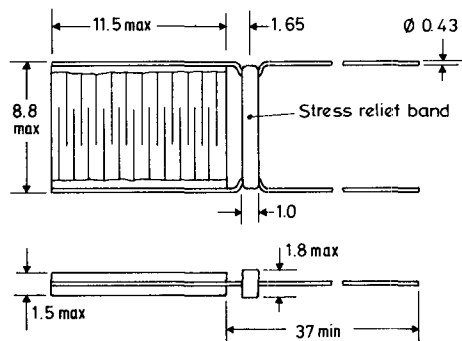
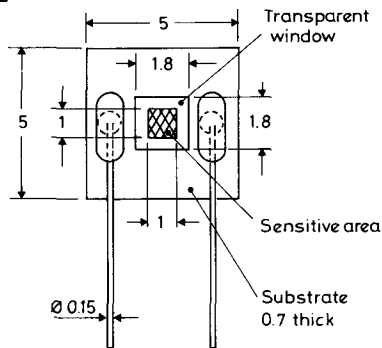
BS

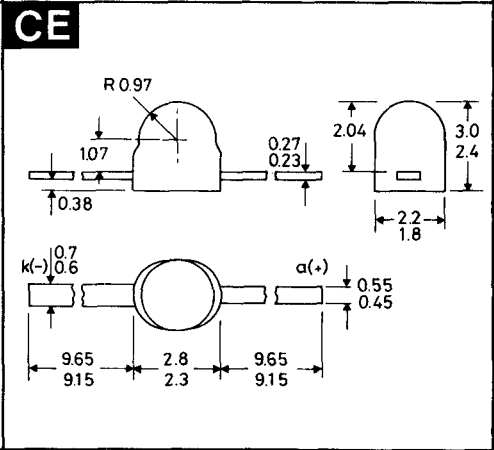
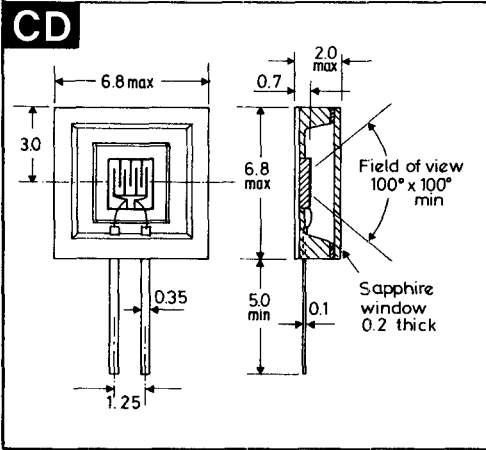
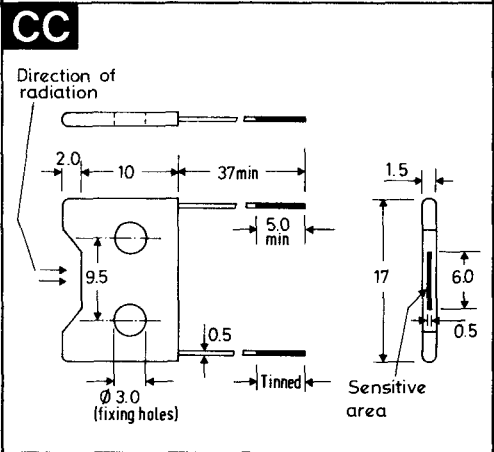
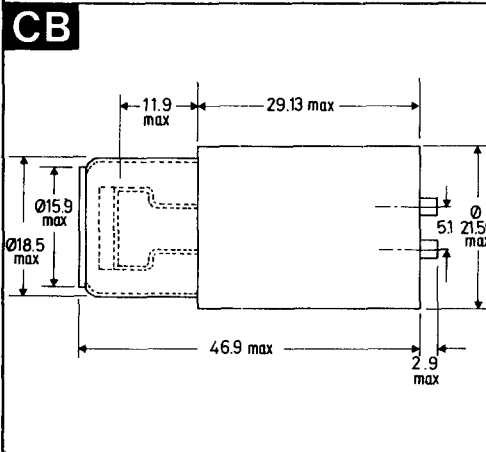
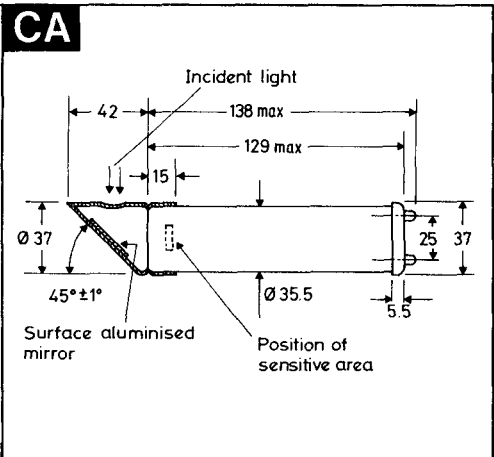
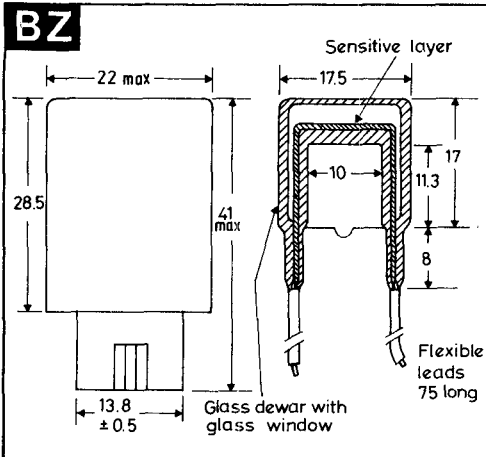
B.S.3934 SO-67



	BS1	BS2
	typ.	max.
A	23	21
B	35	34.6
C	17	15.2
ØD1	5	5.05
ØD2	11	11
E	5	3.7
F	9	9
ØG	4.8	4.8

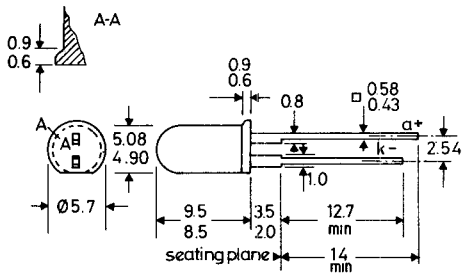
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BT**BU****BV****BW****BX****BY**

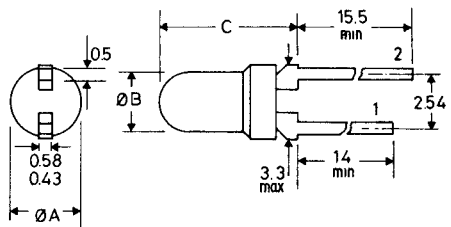


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CF

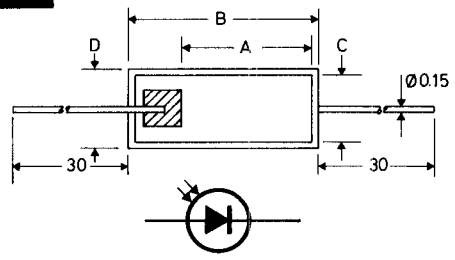


CG



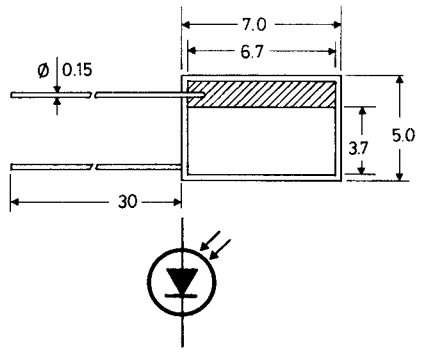
	1	2	$\varnothing A$	$\varnothing B$	C
CG1	k(-)	a(+)	3.0-3.17	2.4-2.6	5.8-6.3
CG2	a(+)	k(-)	3.0-3.17	2.4-2.6	5.8-6.3
CG3	k(-)	a(+)	3.3 max	2.65-3.17	4.8-6.3

CH

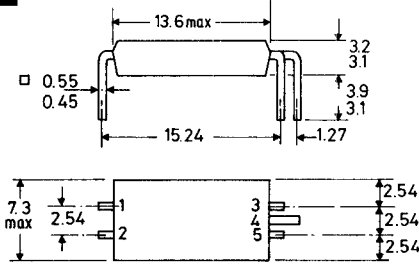


	CH1	CH2
A	2.2	3.5
B	3.35	4.55
C	0.95	1.85
D	1.25	2.15

CJ

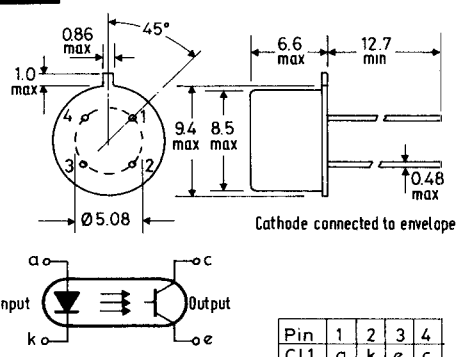


CK



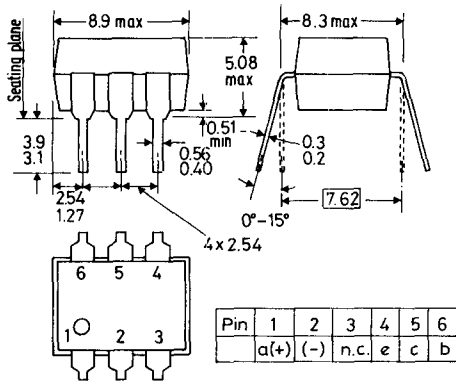
Pin	1	2	3	4	5
CK1	a	k	b	c	e
CK2	k	a	e	omitted	c

CL

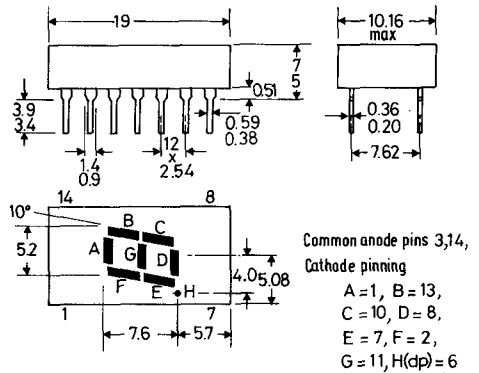


Pin	1	2	3	4
CL1	a	k	e	c
CL2	e	c	a	k

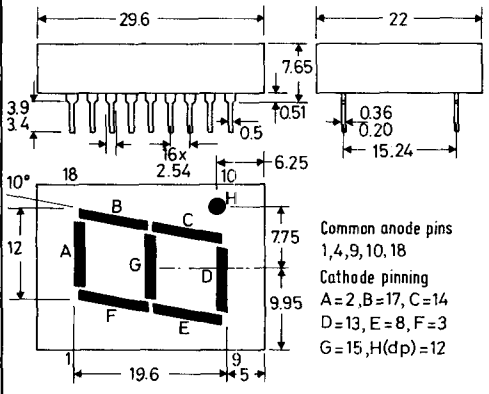
CM



CN



CO



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