

# Transistors

## germanium low/medium power transistors

book 1 parts 1 and 2

Type No.	Outline	Dwg. ref.	Maximum Ratings						h <sub>FE</sub>		f <sub>T</sub>		Special Features
			V <sub>CB0</sub>	V <sub>CE0</sub>	I <sub>CM</sub>	I <sub>C(AV)</sub>	T <sub>j</sub>	P <sub>tot</sub>	min.	max.	at I <sub>C</sub>	typ.	
N-P-N	P-N-P		(V)	(V)	(A)	(A)	(°C)	at 25°C (mW)			(mA)	(MHz)	
<b>GENERAL PURPOSE</b>													
AC127	TO-1	AQ	32	12	0.5	0.5	90	340	50	200	20	2.5	
AC128	TO-1	AQ	-32	-16	2.0	1.0	90	1000	55	175	50	1.5	
AC187	TO-1	AQ	25	15	2.0	1.0	90	1000	100	500	300	1.5	
AC188			-25	-15									
<b>SWITCHING</b>													
2N1303	TO-5	AS	-30	-25	0.3	0.2	85	150	20	—	10	5	Intended for medium current, medium speed computer logic applications
2N1305			-30	-20					40	100	10		
2N1307			-30	-15					60	200	15		
2N1309			-30	-15					80	300	20		

## N-P-N silicon low/medium power transistors

Type No.	Outline	Dwg. ref.	Maximum Ratings						h <sub>FE</sub>		f <sub>T</sub>		V <sub>CE(sat)</sub>		at I <sub>B</sub>		Special Features		
			V <sub>CB0</sub>	V <sub>CE0</sub>	I <sub>CM</sub>	I <sub>C(AV)</sub>	T <sub>j</sub>	P <sub>tot</sub>	min.	max.	at I <sub>C</sub>	min.	max.	I <sub>C</sub>	I <sub>B</sub>	t <sub>on</sub>	t <sub>off</sub>	at I <sub>C</sub>	at I <sub>C</sub>
			(V)	(V)	(A)	(A)	(°C)	at 25°C (mW)			(MHz)	(V)	(mA)	(mA)	(ns)	(ns)	(mA)	(mA)	
<b>GENERAL PURPOSE</b>																			
§BC107	TO-18	AT1	50	45	0.2	0.1	175	300	110	450	2.0	300*	0.25	10	0.5	100	500	10	
§BC108			30	20					110	800						100	500	10	
§BC109			30	20					200	800						N < 4dB at f = 30Hz to 15kHz			
§BC147	SOT-25	Y1	50	45	0.2	0.1	125	350	110	450	2.0	300*	0.25	10	0.5	I <sub>CB0</sub> at 20V < 15nA			
§BC148			30	30					110	800									
§BC149			30	30					200	800						N < 4dB at f = 30Hz to 15kHz			
BC463	SOT-25	Y1	35	28	3	1.5	175	1W	50	280	500	200*	0.5	1A	100	} Supplied as complementary pairs with BC462,464			
BC465			25	18					95	280									
BC548	TO-92	BB1	80	65	0.2	0.1	150	500	110	450	2.0	300*	0.25	10	0.5				
BC547			50	45					110	800									
BC548			30	30					110	800									
BC549			30	30					200	800						N < 4dB at f = 30Hz to 15kHz			
BC550			50	45					200	800						N < 3dB at f = 30Hz to 15kHz			

\* Typical

§ Also available to BS9000 (see page 7)

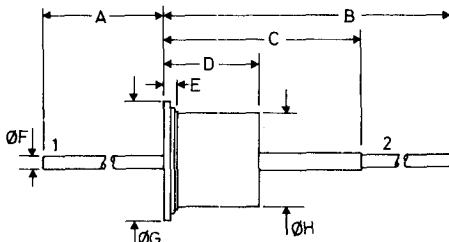
continued

# OUTLINES and DIMENSIONS (millimetres)

**A**

B.S.3934 SO-16

DO-1  
DO-2  
DO-3

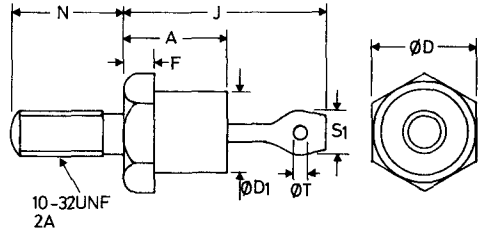


	1	2	A	B	C	D	E	ØF	ØG	ØH
A1	a	k	35	51	17	7.7	1.6	1.1	9.6	7.1
A2	k	a	35	49	17	8.5	1.9	1.1	9.7	7.1
A3	k	a	35	51	17	7.7	1.6	1.1	9.6	7.1

**B**

B.S.3934 SO-10

DO-4



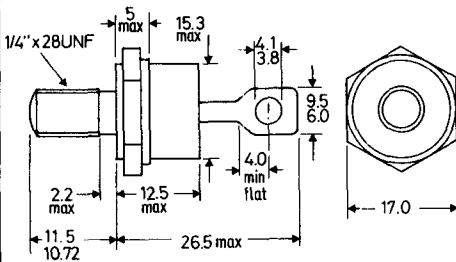
A	10.3 max.	J	20.3 max.
ØD	11.1 max.	N	11.5 max.
ØD1	9.3 max.	S1	4.8 max.
F	3.2	ØT	1.6 min.

	Stud	Eyelet
B1	k	a
B2	a	k

**C**

B.S.3934 SO-13

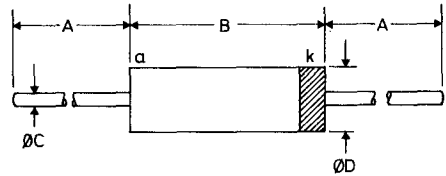
DO-5



	Stud	Eyelet
C1	k	a
C2	a	k

**D**

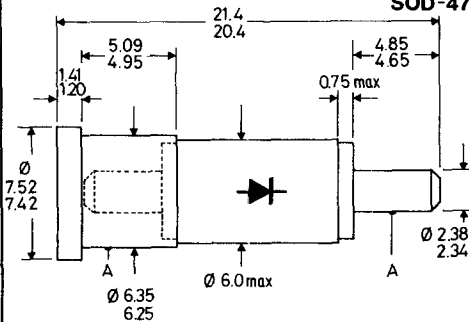
DO-7  
DO-14  
DO-15



		A	B	ØC	ØD
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**

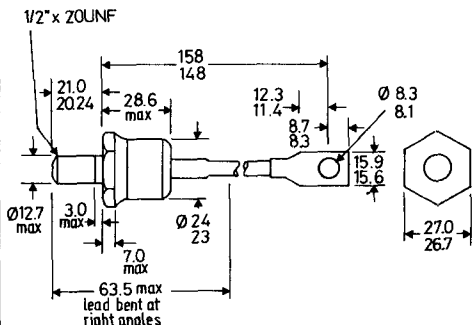
DO-22  
SOD-47



A = concentricity tolerance = ± 0.20

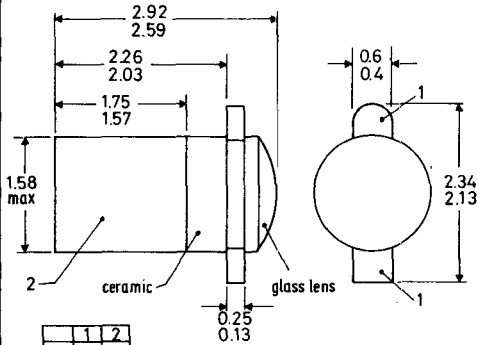
**F**

DO-30



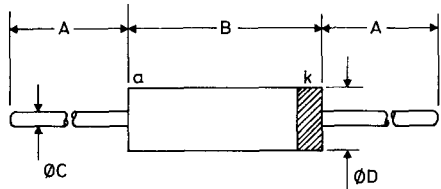
BZW86 Blue sleeve - anode to eyelet  
BZW86R Red sleeve - anode to stud

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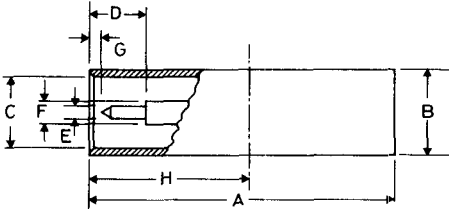
**G****DO-31**

	1	2
G1	k	a
G2	e	c

For LED's the overall length = 3.60/2.97

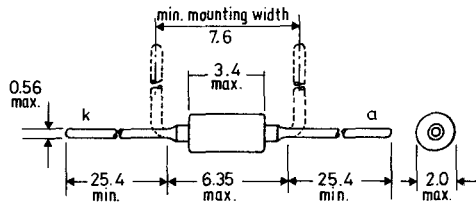
**H****DO-35**

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

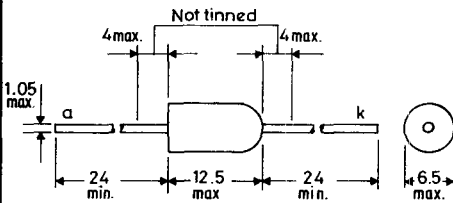
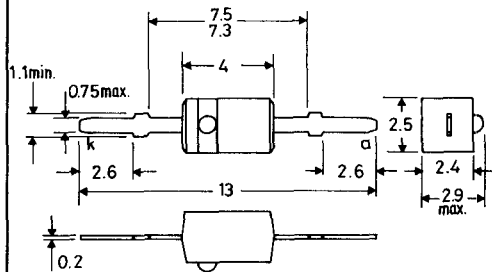
**J****DO-37  
SOD-49**

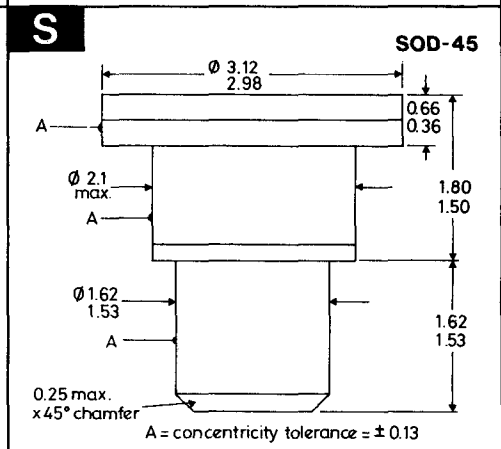
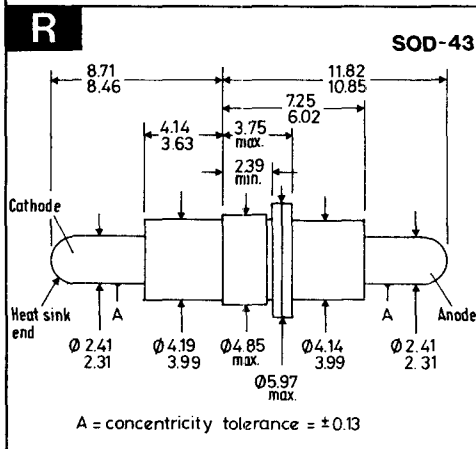
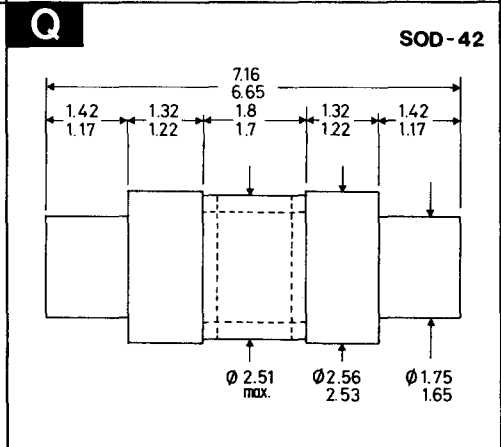
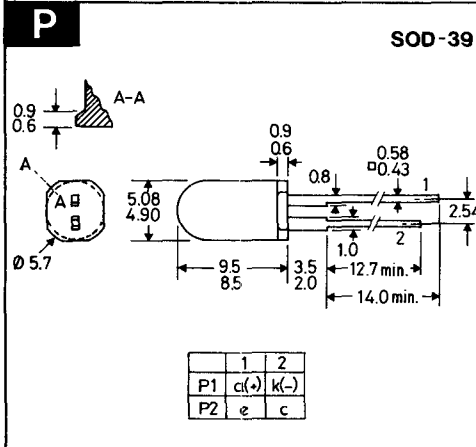
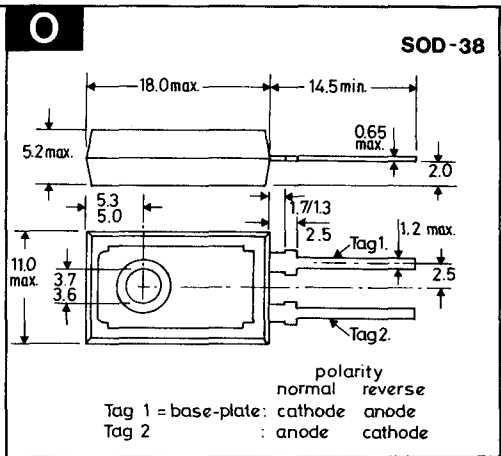
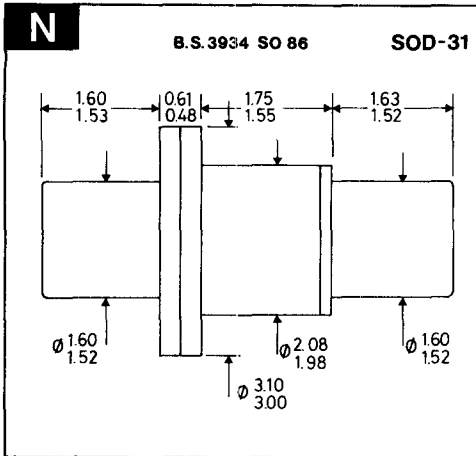
A	19.43/18.67	ØE	0.84/0.79
ØB*	5.59/5.49	ØF	1.57/1.52
ØC	4.80/4.72	G	0.71/0.15
D	3.73 min.	H	10.32 nom.

\*These tolerances apply only over H

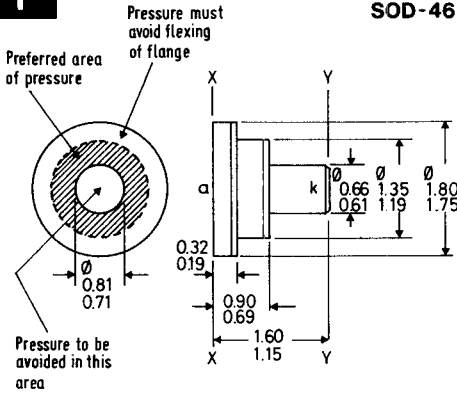
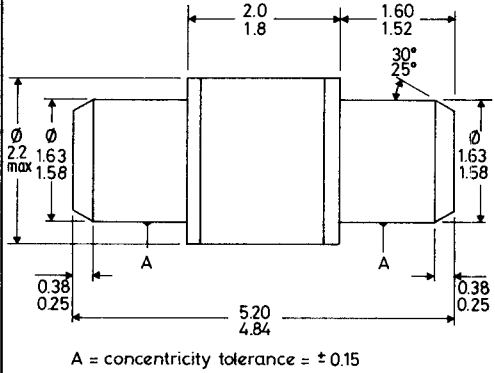
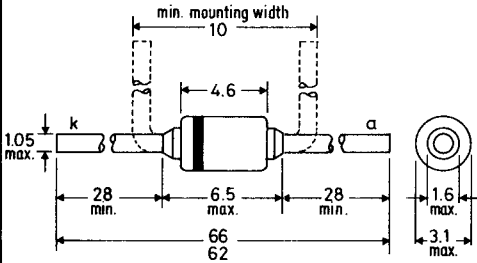
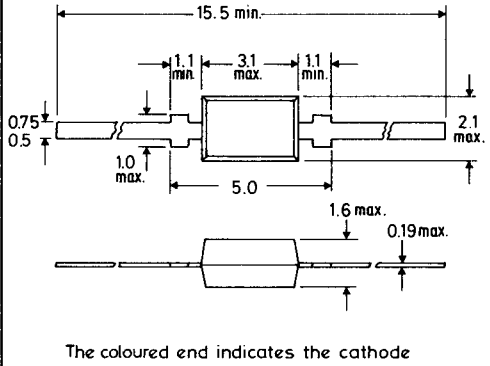
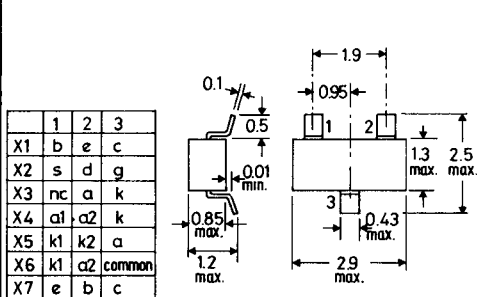
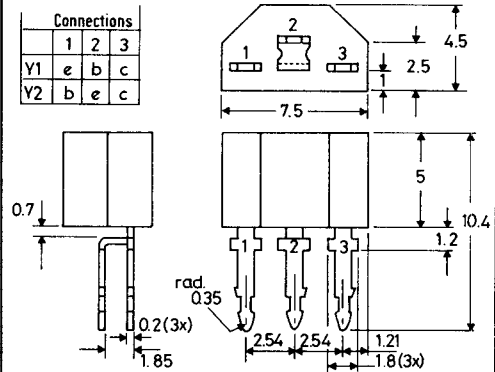
**K****SOD-17**

Cathode indicated by the broad band of colour code

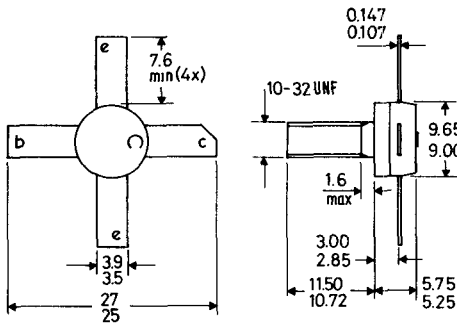
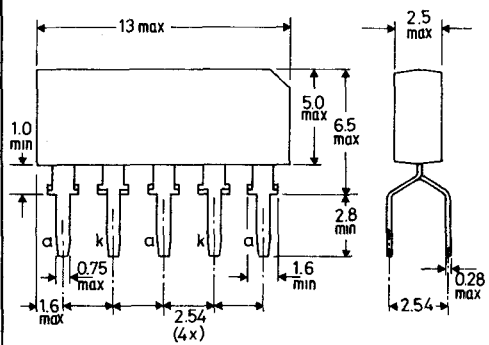
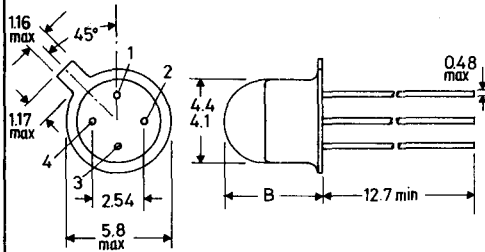
**L****SOD-18****M****SOD-23**



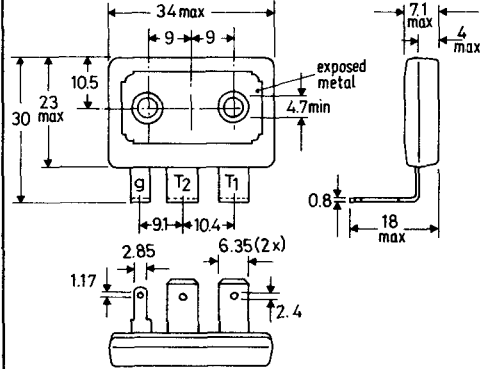
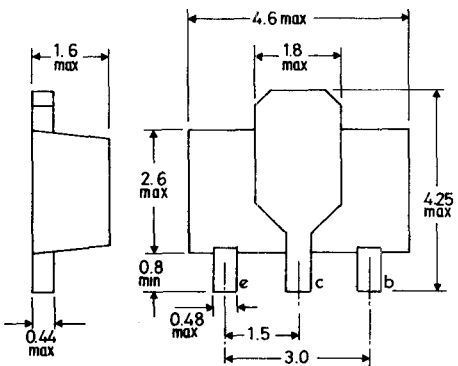
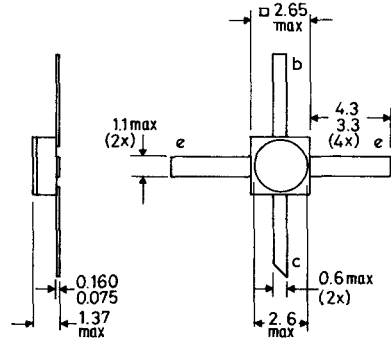
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**T****SOD-46****U****SOD-50****V****SOD-51****W****SOD-52****X****SOT-23****Y****SOT-25**



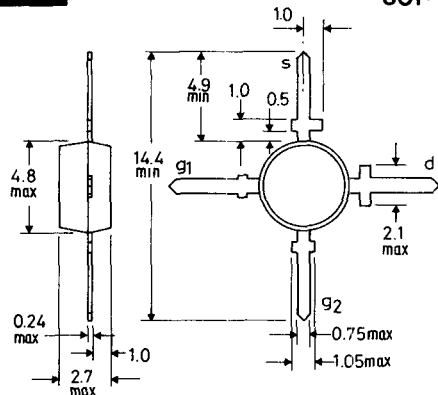
**AH****SOT-56****AJ****SOT-60****AK****SOT-70**

	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**

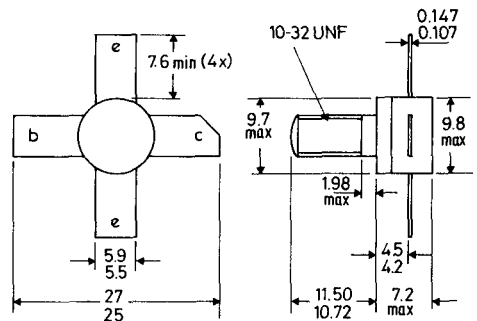
# AO

SOT-103



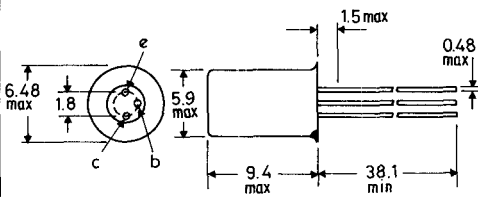
# AP

SOT-105



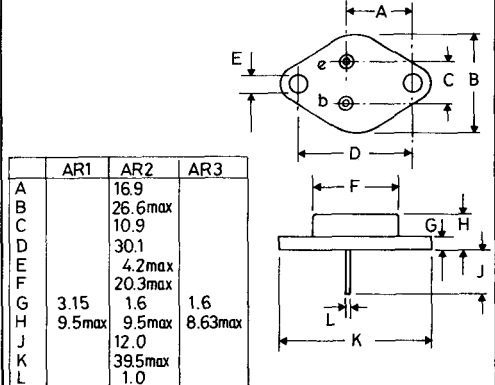
# AQ

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



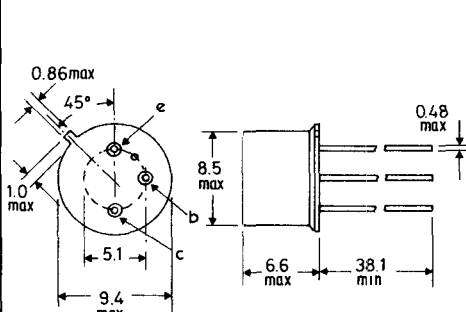
# AR

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



# AS

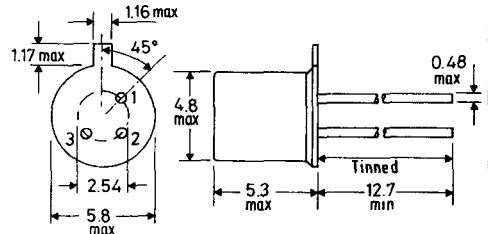
B.S.3934 SO-3/SB3-3B TO-5



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

# AT

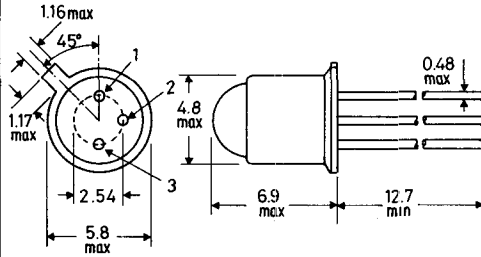
B.S.3934 SO-12A/SB3-6A TO-18



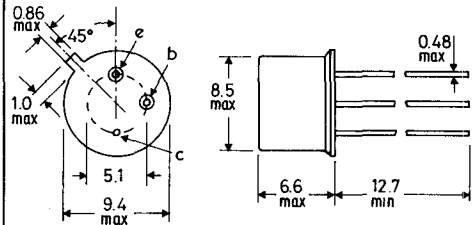
	1	2	3
AT1	e	b	c + env.
AT2	s	d	g + env.
AT3	d	g	s + env.
AT4	k	-	a
AT5	a	-	k
AT6	k	-	a

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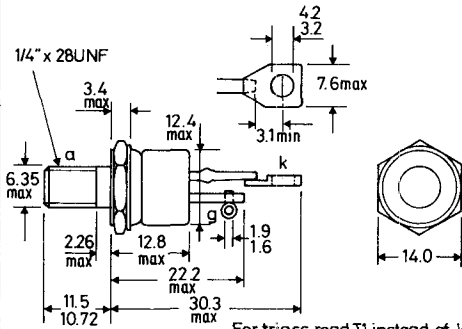
**AU****TO-18**  
(with lens)

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

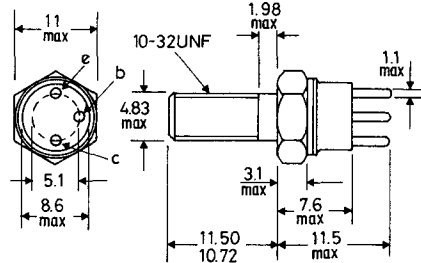
**AV****B.S.3934 SO-3/SB3-3A TO-39**

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

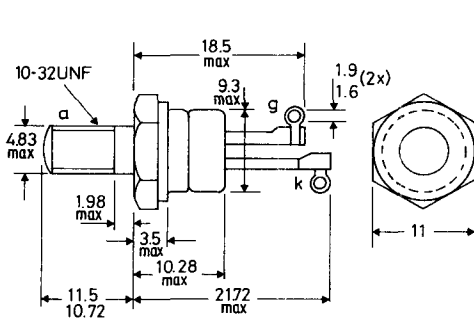
AV5: e.b. cell connections  
 c. metal case  
 AV6: red spot indicates  
       +ve connection

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

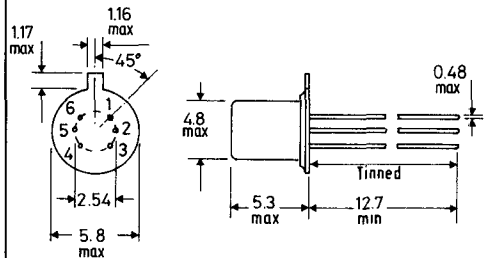
For triacs read T1 instead of k  
 T2 instead of a

**AX****TO-60**

Emitter connected to envelope

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

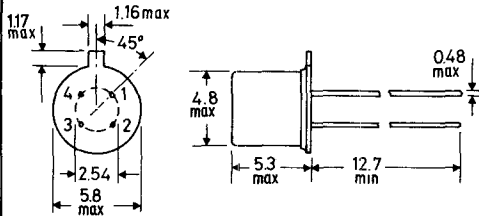
For triacs read T1 instead of k  
 T2 instead of a

**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**

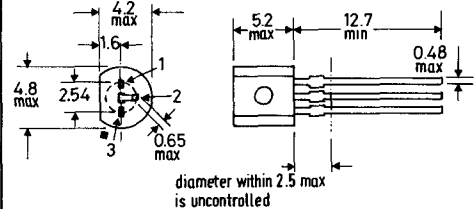
B.S.3934 SO-12A/SB4-3 TO-72



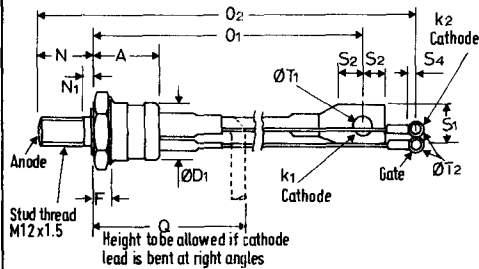
	1	2	3	4
BA1	b	e	c	s+envelope
BA2	e	b	c	s+envelope
BA3	s	d	g	screen+envelope
BA4	d	g	g	s+b+envelope
BA5	d	s	g	b+envelope
BA6	k	gk	ga	a

**BB**TO-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**

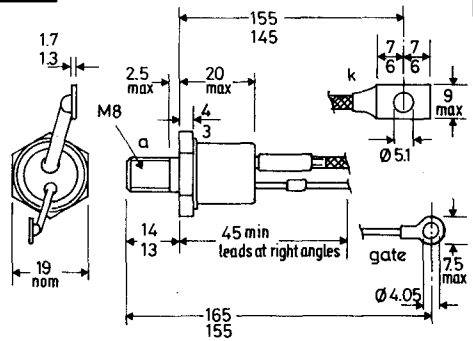
B.S.3934 SO-30C TO-94



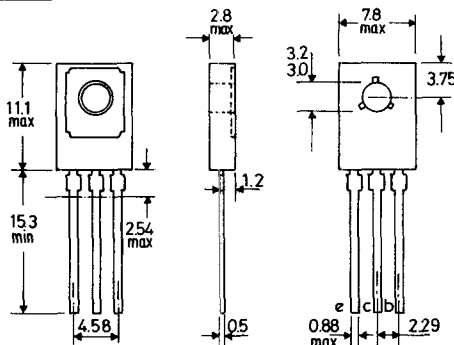
A	28.5max	O1	158 max	S4	3.8 min
ØD1	24.1max	O2	190max	ØT1	8.3max
F	8.9max	Q	63.5max	ØT2	4.2max
N	21.0max	S1	16.5max		
N1	3.0max	S2	9.6min		

**BD**

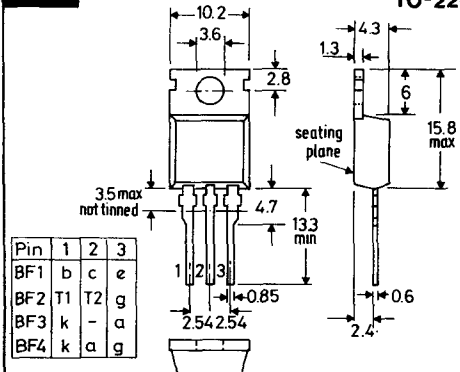
TO-103

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

TO-126

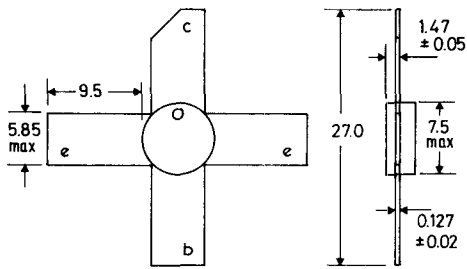
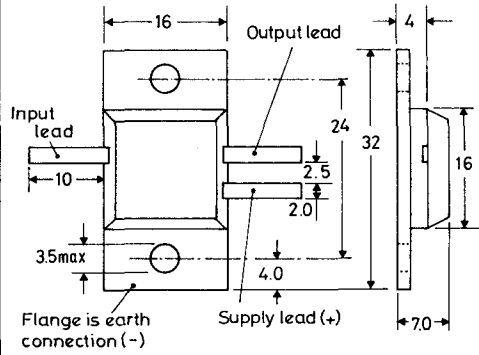
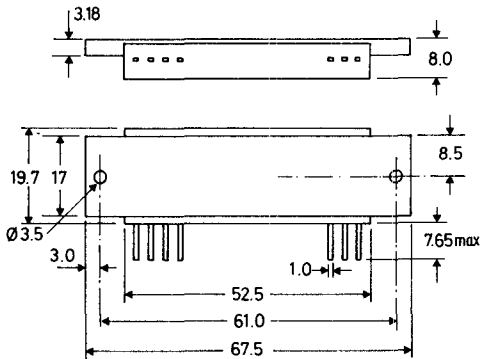
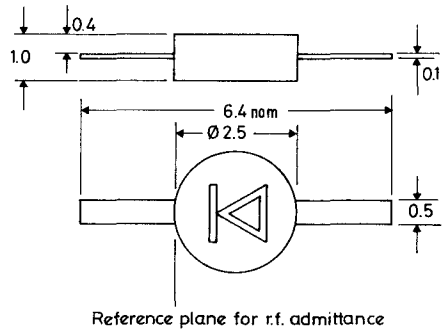
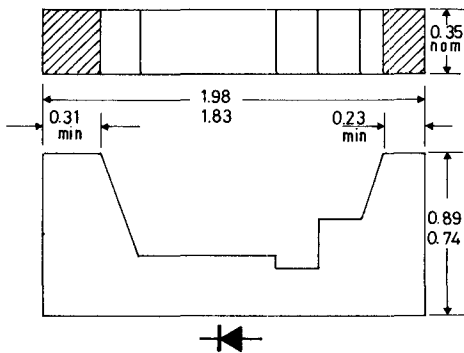
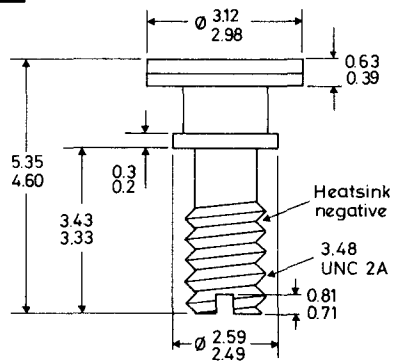
**BF**

TO-220



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

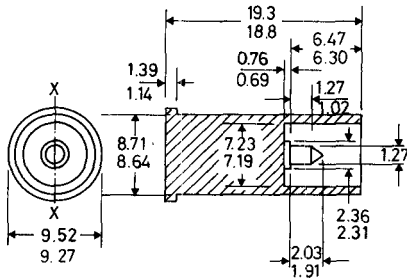
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**BG****BH****BJ****BK****BL****BM**

# BN

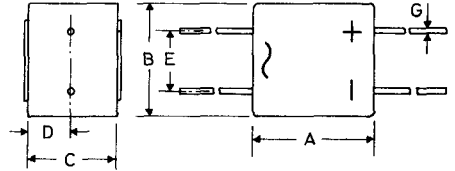
B.S.3934

SO-26

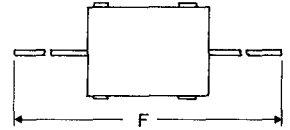


(All dimensions max.)

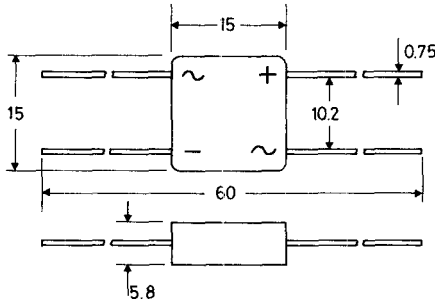
# BO



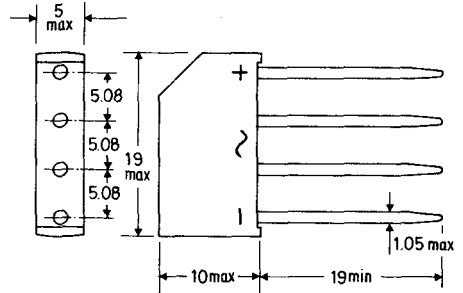
	BO1	BO2	BO3
A	12	20	12
B	10	19	10
C	8	15	8
D	4	7.5	4
E	5	10	5
F	58	60	48
G	0.75	1.0	1.1



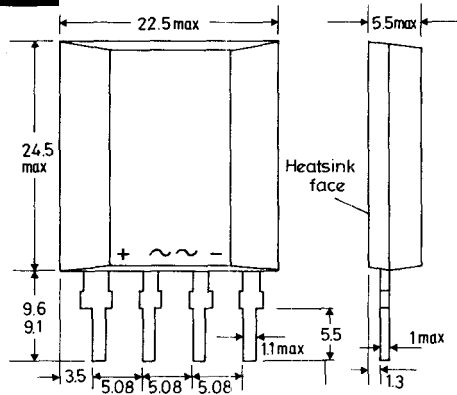
# BP



# BQ

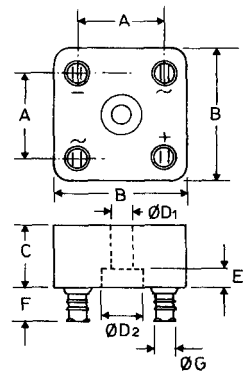


# BR



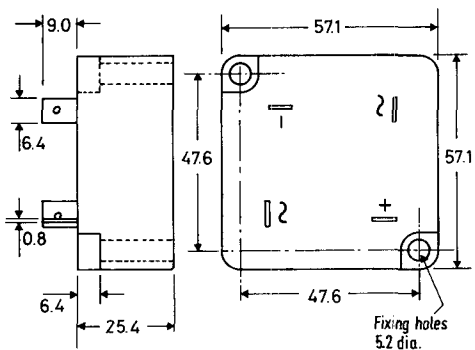
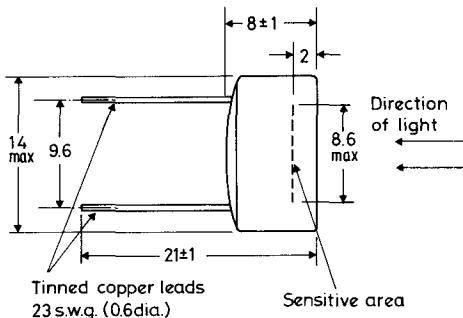
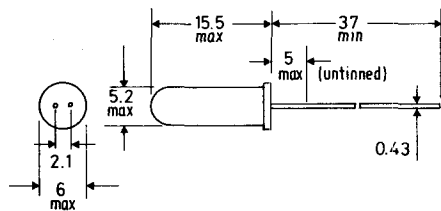
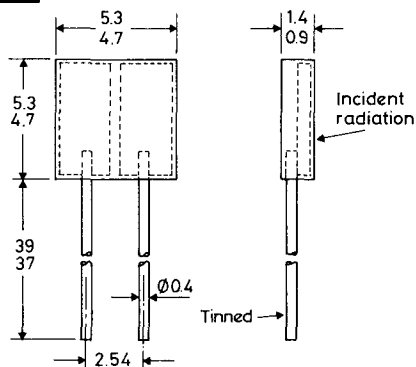
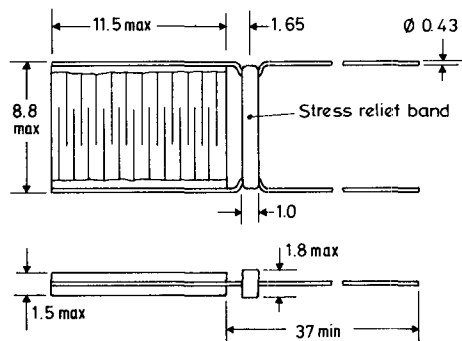
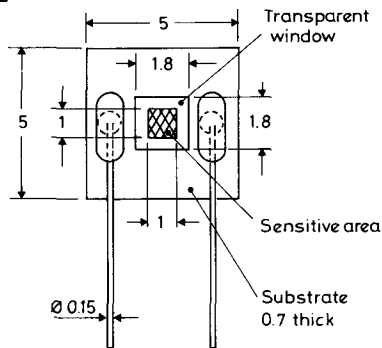
# BS

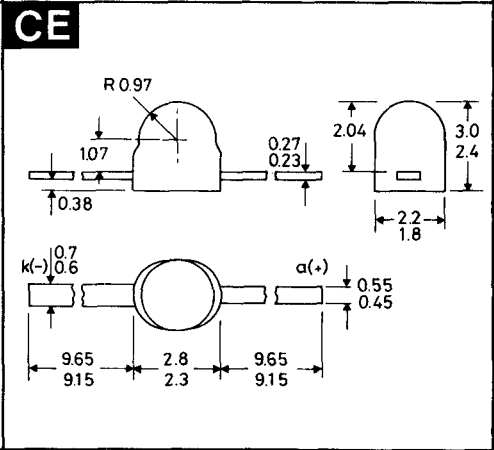
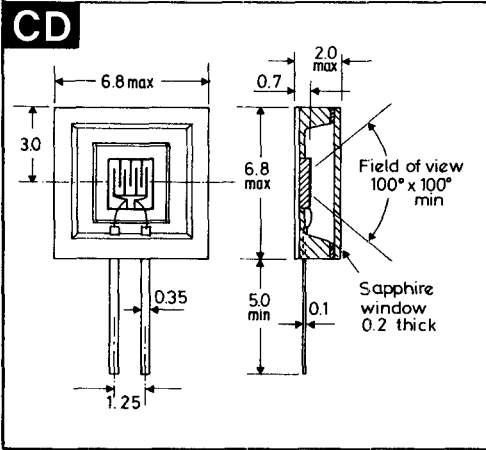
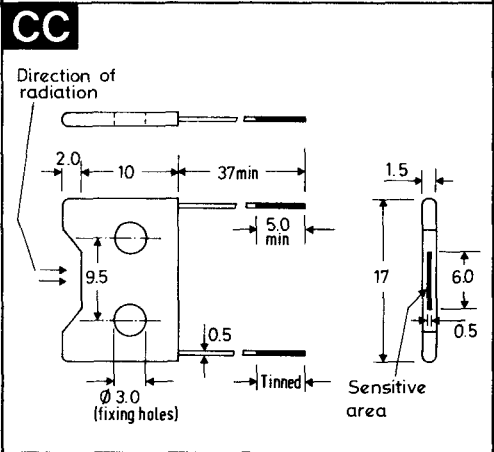
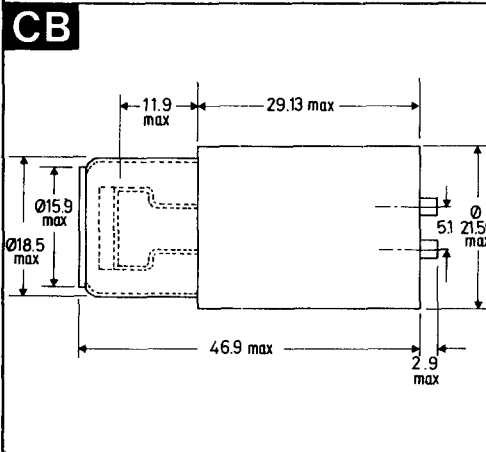
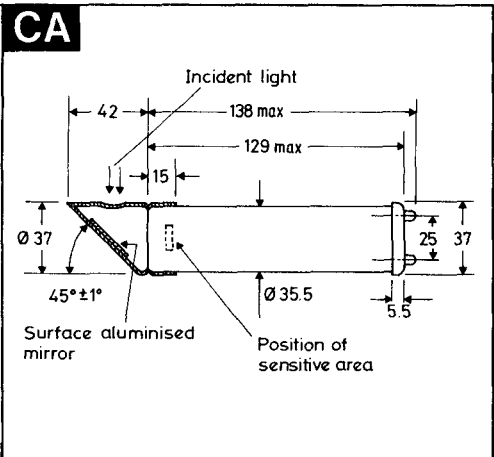
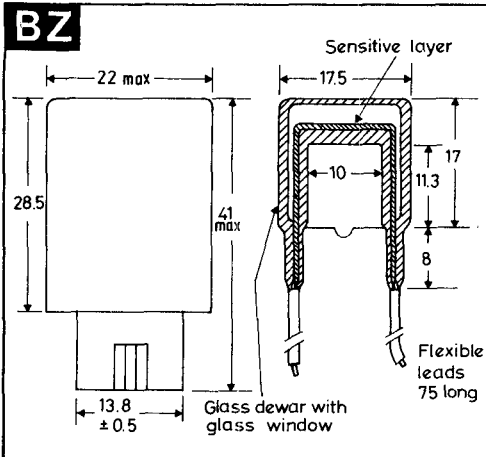
B.S.3934 SO-67



	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

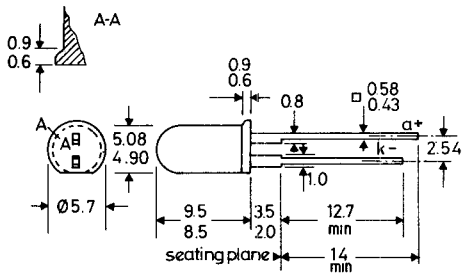
These drawings give limited information for quick reference purposes. For equipment design more complete information should be obtained from individual data sheets in the Technical Handbook or from standard B.S. or JEDEC outline drawings.

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

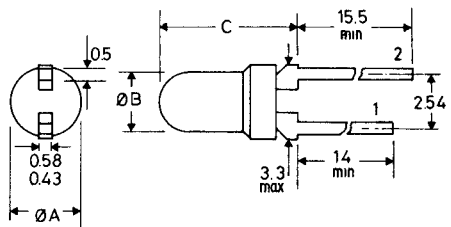


These drawings give limited information for quick reference purposes. For equipment design more complete information should be obtained from individual data sheets in the Technical Handbook or from standard B.S. or JEDEC outline drawings.

# CF

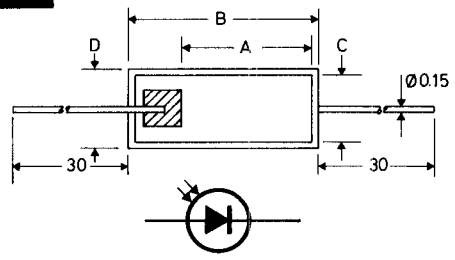


# CG



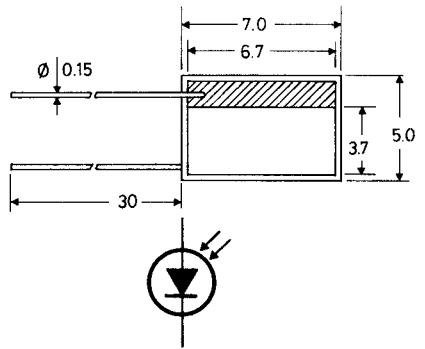
	1	2	$\varnothing A$	$\varnothing B$	C
CG1	$k^-$	$a^+$	3.0-3.17	2.4-2.6	5.8-6.3
CG2	$a^+$	$k^-$	3.0-3.17	2.4-2.6	5.8-6.3
CG3	$k^-$	$a^+$	3.3 max	2.65-3.17	4.8-6.3

# CH

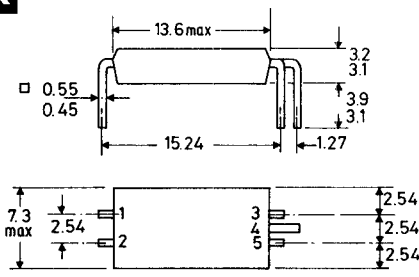


	CH1	CH2
A	2.2	3.5
B	3.35	4.55
C	0.95	1.85
D	1.25	2.15

# CJ

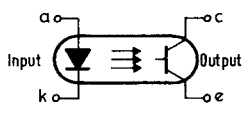
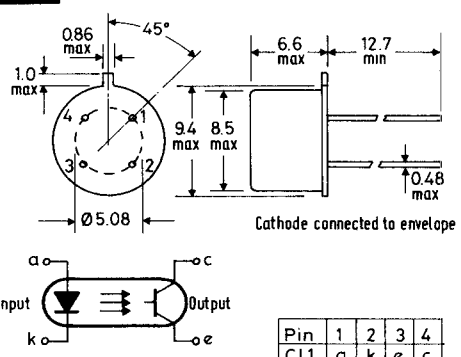


# CK



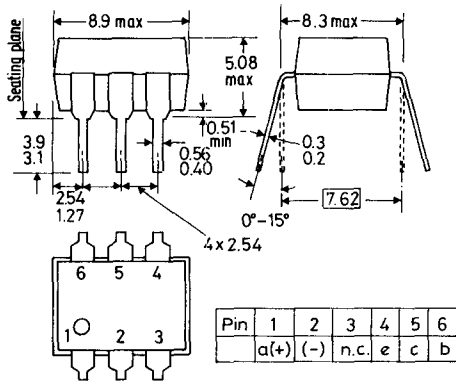
Pin	1	2	3	4	5
CK1	a	k	b	c	e
CK2	k	a	e	omitted	c

# CL

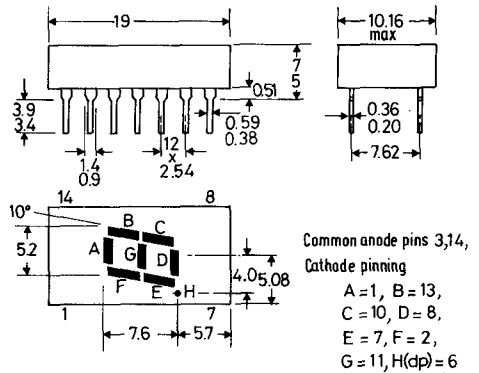


Pin	1	2	3	4
CL1	a	k	e	c
CL2	e	c	a	k

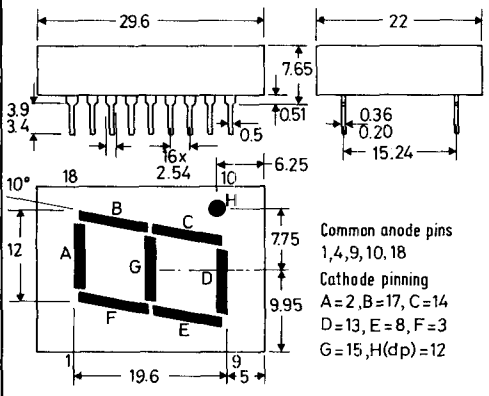
# CM



# CN



# CO



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