

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)} max. | at I _c | at I _B | Special Features |
|--|---------|-----------|---------------------------------|---------------------------------|----------------------|--------------------------|-----------------|------------------|------------------------|--------------------------|-----------------|-------|-------------------|---------------------|---------------------------|-------------------|-------------------|--|
| | | | (V) | (V) | I _{CM} (mA) | I _{CI(AV)} (mA) | min. | max. | | | (mA) | (MHz) | | | | | | |
| GENERAL PURPOSE | | | | | | | | | | | | | | | | | | |
| BCY70 BCY71 BCY72 | TO-18 | AT1 | -50 -45 -30 | -40 -45 -25 | 200 | 200 | 200 | 350 | 100 | 290* | 100 | 290* | 10 | 250 | -0.25 | 10 | 1.0 | N <2dB (BCY71) |
| BFX37 | TO-18 | AT1 | -60 | -60 | - | 50 | 200 | 360 | 70 | 300 | 0.01 | 40 | 10 | 40 | -0.40 | 50 | 5.0 | N <3dB |
| BC157 BC158 BC159 | SOT-25 | Y1 | -50 -30 -30 | -45 -30 -30 | 200 | 100 | 125 | 350 | 75† | 260 | 2.0 | 150* | 10 | 150* | -0.3 | 10 | 0.5 | N <4dB at f = 30Hz to 15kHz |
| BC462 BC464 | SOT-25 | Y1 | -35 -25 | -28 -18 | 3A | 1.5A | 175 | 1 W | 50 | 280 | 500 | 200* | 10 | 200* | -0.5 | 1A | 100 | Supplied as complementary pairs with BC463,5 |
| BC566 BC567 BC568 BC569 BC569 | TO-92 | BB1 | -80 -60 -30 -30 -60 | -65 -45 -30 -30 -45 | 200 | 100 | 150 | 500 | 75 | 250 | 2.0 | 150* | 10 | 150* | -0.3 | 10 | 0.5 | N <4dB N <3dB |
| BC327 BC328 | TO-92 | BB1 | -50 -30 | -45 -25 | 1.0A | 500 | 150 | 625 | 100 | 600 | 100 | 100* | 10 | 100* | -0.7 | 500 | 50 | |
| BCX35 BCX36 BCX37 | SOT-25 | Y1 | -80 -60 -40 | -80 -60 -40 | 1.0A | 600 | 150 | 730 | 40 | 75* | 150 | 80 | 80 | 80 | -0.4 | 150 | 15 | |
| BFX29 BFX30 | TO-39 | AV3 | -60 -65 | -60 -65 | 600 | 600 | 200 | 600 | 50 | 125* | 10 | 100 | 10 | 100 | -0.4 | 150 | 15 | t _s <250ns at 100mA |
| BFX87 BFX88 | TO-39 | AV3 | -50 -40 | -50 -40 | 600 | 600 | 200 | 600 | 40 | 125* | 10 | 100 | 10 | 100 | -0.4 | 150 | 15 | |
| BF423 | TO-92 | BB5 | -250 | -250 | 100 | 20 | 150 | 830 | 50 | - | 25 | 60 | - | - | - | - | - | C _{re} <1.6pF at 0.5MHz |
| BSV15 BSV16 BSV17 | TO-39 | AV3 | -40 -60 -90 | -40 -60 -80 | - | 1.0A | 200 | 800 | 40 | 250 | 100 | 50 | 50 | -1.0 | 500 | 25 | | |
| BFT44 BFT46 | TO-39 | AV3 | -300 -250 | -300 -250 | 500 | 500 | 200 | 5W ²⁾ | 50 | 150 | 10 | 70 | 10 | 70 | -5.0 -3.0 | 500 | 100 | |
| BCY30A BCY31A BCY32A BCY33A BCY34A | TO-5 | AS1 | -64 -64 -64 -32 -32 | -64 -64 -64 -32 -32 | 100 | 50 | 150 | 600 | 10 | 35 | 20 | 7* | 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 |
| 2N4030 2N4031 | TO-39 | AV3 | -60 -80 | -60 -80 | - | 1.0A | 200 | 800 | 25 | - | 500 | 100 | 100 | -0.5 | 500 | 50 | | |
| 2N4032 2N4033 | TO-39 | AV3 | -60 -80 | -60 -80 | - | 1.0A | 200 | 800 | 70 | - | 500 | 150 | 150 | -0.5 | 500 | 50 | | |

1) T_{case} = 25°C

*Typical t_{hfe}

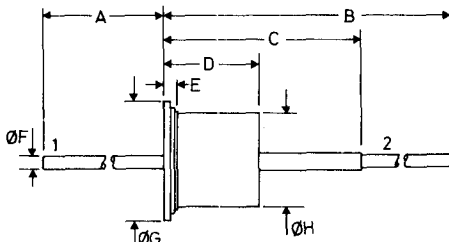
§ Also available to BS9000 (see page 7)

OUTLINES and DIMENSIONS (millimetres)

A

B.S.3934 SO-16

DO-1
DO-2
DO-3

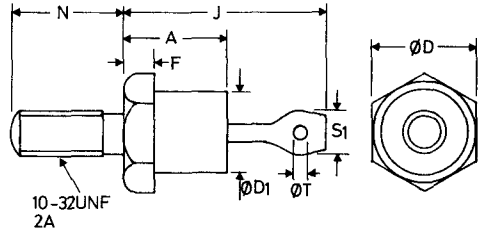


| | 1 | 2 | A | B | C | D | E | ØF | ØG | ØH |
|----|------|------|------|------|------|------|------|------|------|------|
| | min. | max. | min. | max. | min. | max. | min. | max. | min. | max. |
| A1 | a | k | 35 | 51 | 17 | 7.7 | 1.6 | 1.1 | 9.6 | 7.1 |
| A2 | k | a | 35 | 49 | 17 | 8.5 | 1.9 | 1.1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

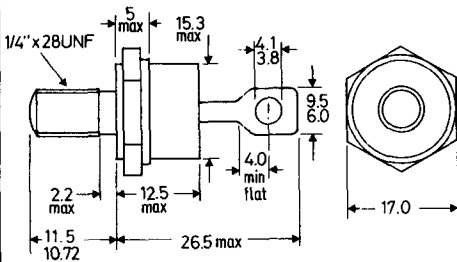
J 20.3 max.
 N 11.5 max.
 S1 4.8 max.
 ØT 1.6 min.

| | Stud | Eyelet |
|----|------|--------|
| B1 | k | a |
| B2 | a | k |

C

B.S.3934 SO-13

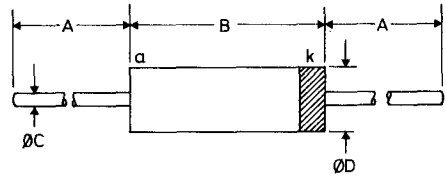
DO-5



| | Stud | Eyelet |
|----|------|--------|
| C1 | k | a |
| C2 | a | k |

D

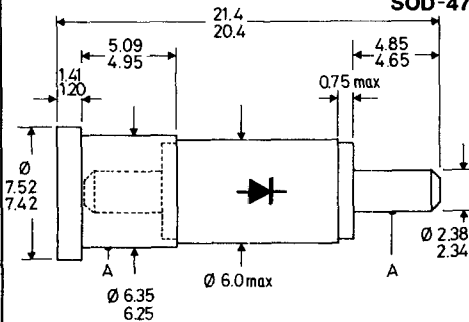
DO-7
DO-14
DO-15



| | | 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

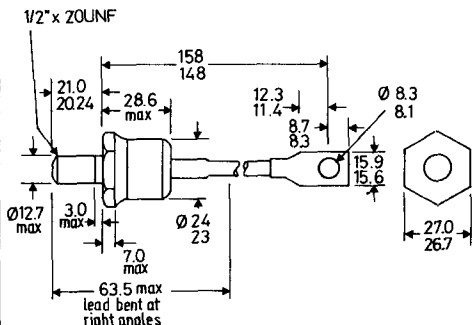
DO-22
SOD-47



A = concentricity tolerance = ± 0.20

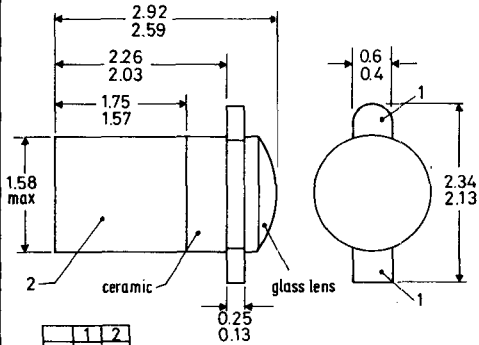
F

DO-30



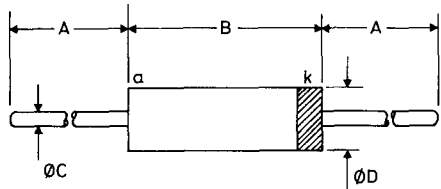
BZW86 Blue sleeve - anode to eyelet
 BZW86R Red sleeve - anode to stud

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.

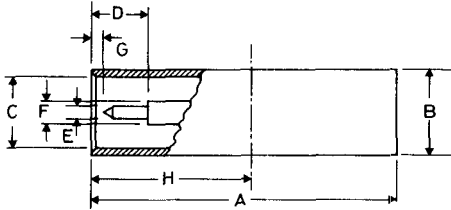
G**DO-31**

| | | |
|----|---|---|
| | 1 | 2 |
| G1 | k | a |
| G2 | e | c |

For LED's the overall length = 3.60/2.97

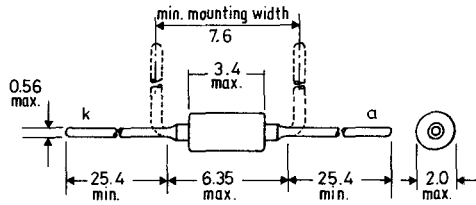
H**DO-35**

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

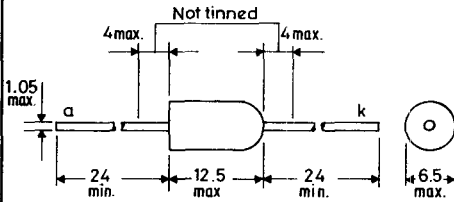
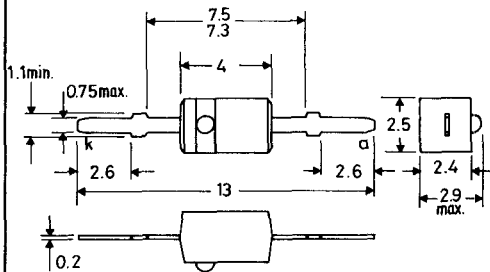
J**DO-37
SOD-49**

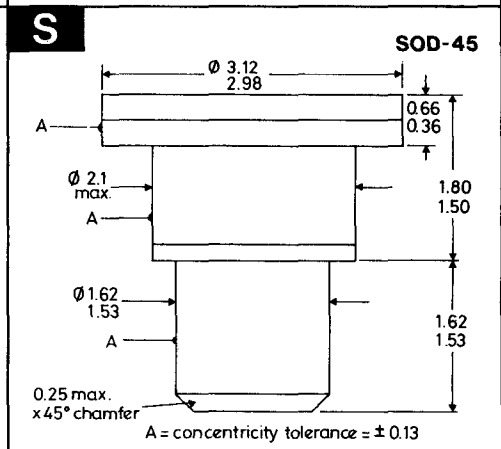
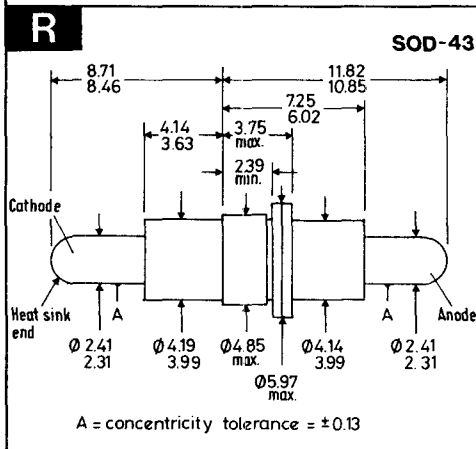
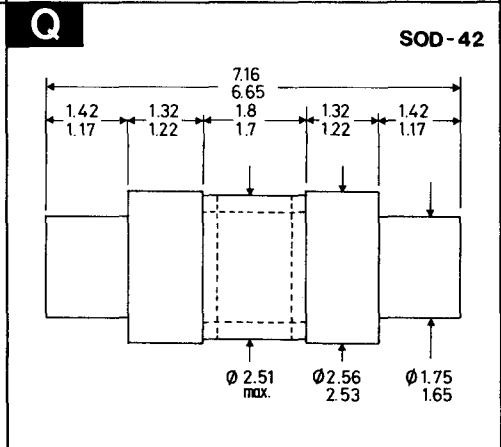
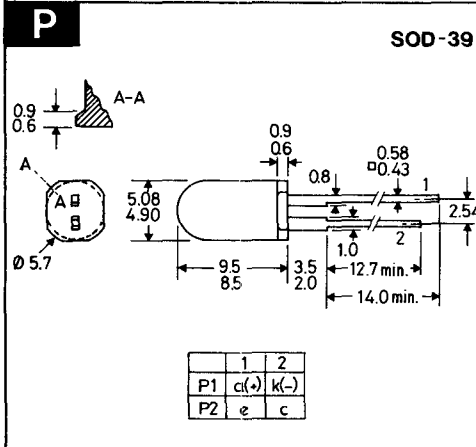
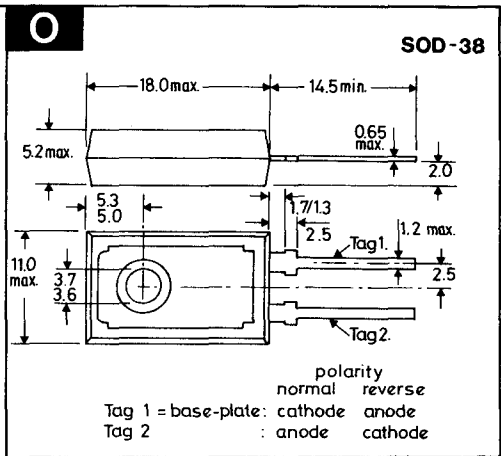
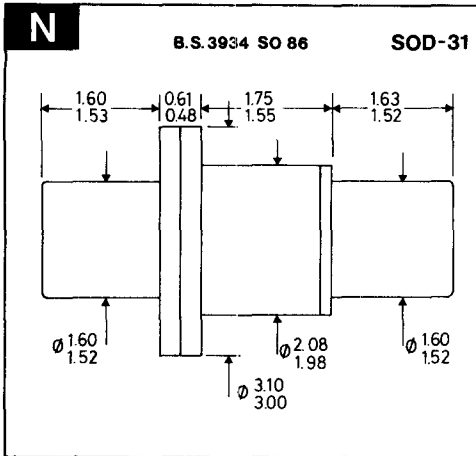
| | |
|---------------|--------------|
| A 19.43/18.67 | ØE 0.84/0.79 |
| ØB* 5.59/5.49 | ØF 1.57/1.52 |
| ØC 4.80/4.72 | G 0.71/0.15 |
| D 3.73 min. | H 10.32 nom. |

*These tolerances apply only over H

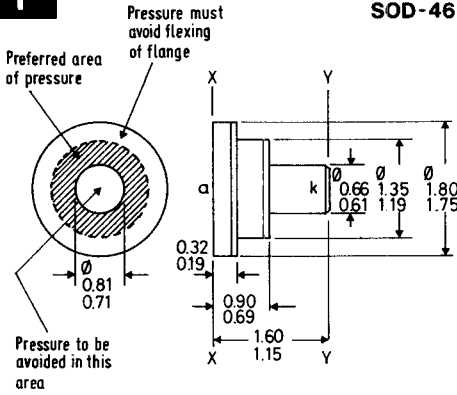
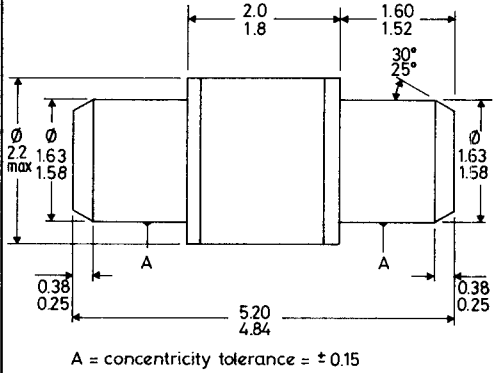
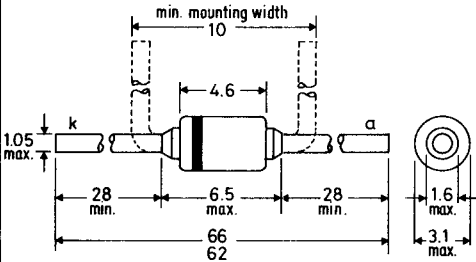
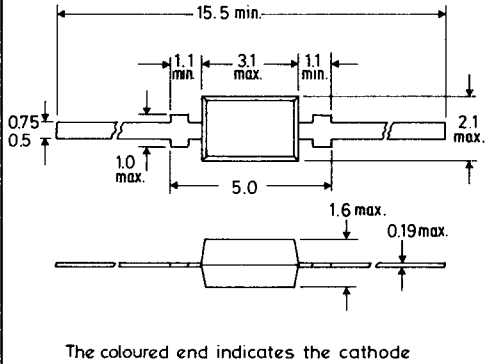
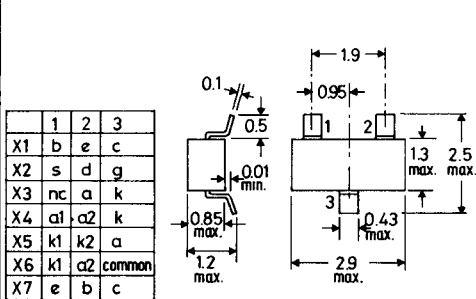
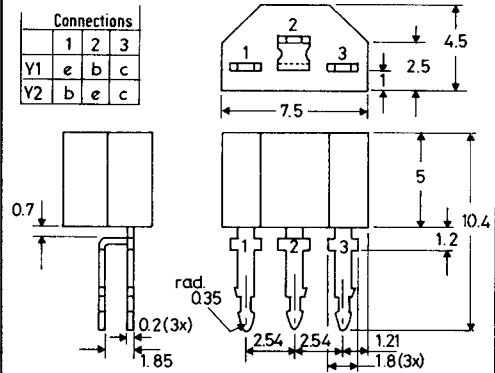
K**SOD-17**

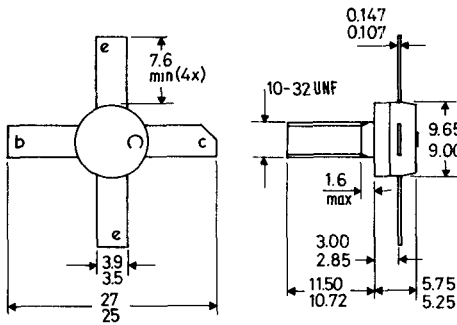
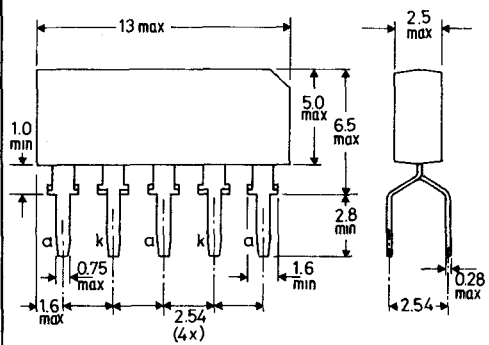
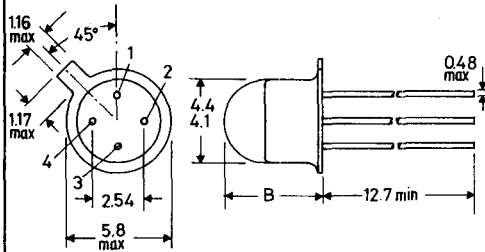
Cathode indicated by the broad band of colour code

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

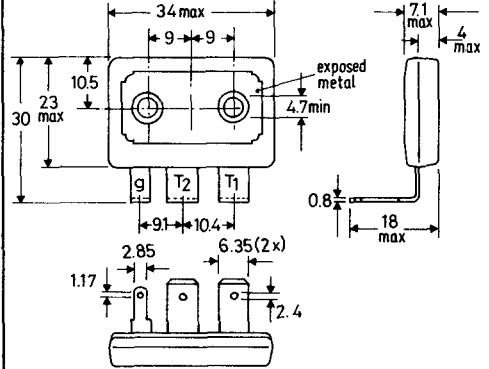
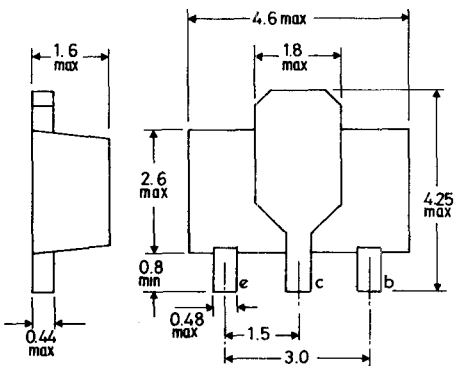
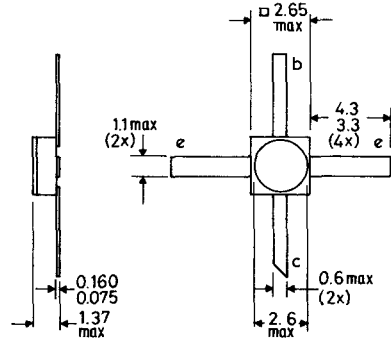


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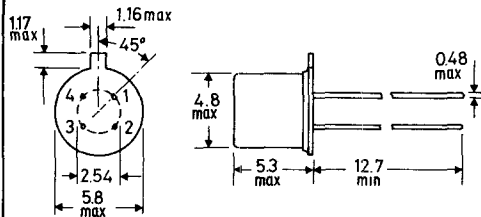
T**SOD-46****U****SOD-50****V****SOD-51****W****SOD-52****X****SOT-23****Y****SOT-25**

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**

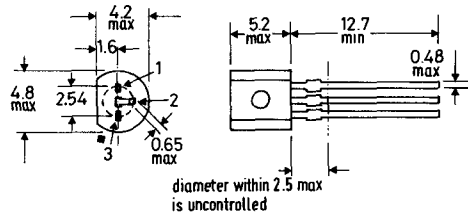
BA B.S.3934 SO-12A/SB4-3 TO-72



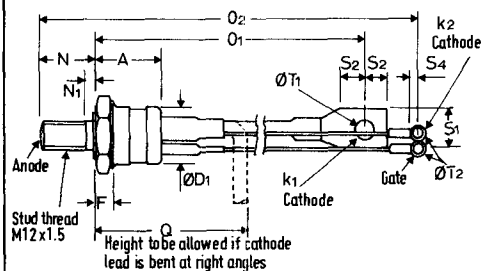
| | 1 | 2 | 3 | 4 |
|-----|---|----|----|-----------------|
| BA1 | b | e | c | s+envelope |
| BA2 | e | b | c | s+envelope |
| BA3 | s | d | g | screen+envelope |
| BA4 | d | g | g | s+b+envelope |
| BA5 | d | s | g | b+envelope |
| BA6 | k | gk | ga | a |

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 |

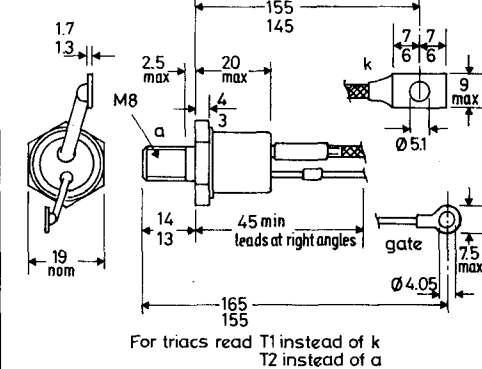


BC B.S.3934 SO-30C TO-94



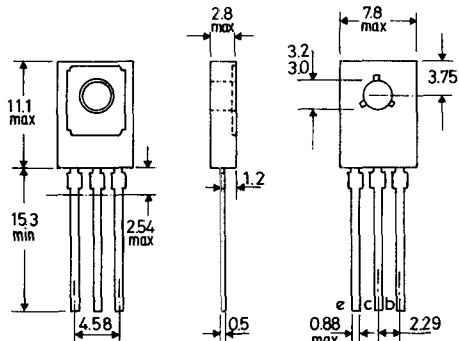
| | | | | | |
|-----|---------|----|---------|-----|---------|
| A | 28.5max | O1 | 158 max | S4 | 3.8 min |
| ØD1 | 24.1max | O2 | 190max | ØT1 | 8.3max |
| F | 8.9max | Q | 63.5max | ØT2 | 4.2max |
| N | 21.0max | S1 | 16.5max | | |
| N1 | 3.0max | S2 | 9.6min | | |

BD TO-103

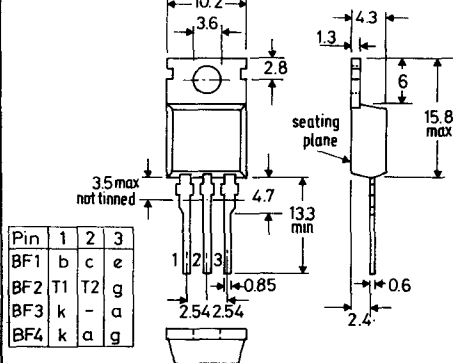


For triacs read T1 instead of k
T2 instead of a

BE TO-126



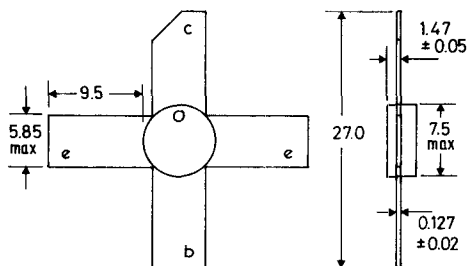
BF TO-220



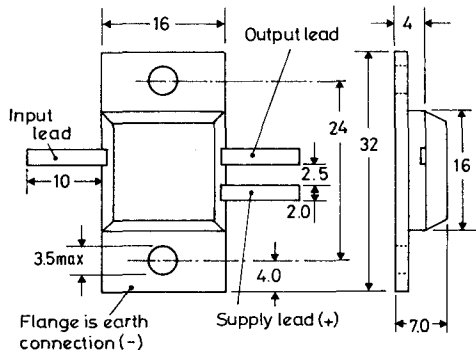
| Pin | 1 | 2 | 3 |
|-----|----|----|---|
| BF1 | b | c | e |
| BF2 | T1 | T2 | g |
| BF3 | k | - | a |
| BF4 | k | a | g |

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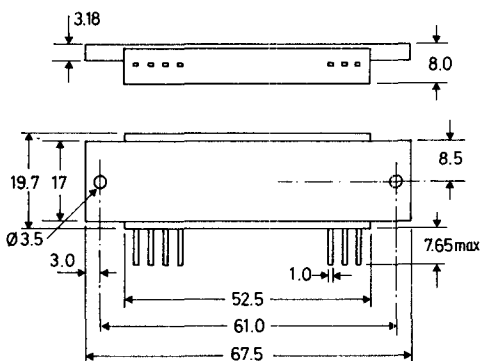
BG



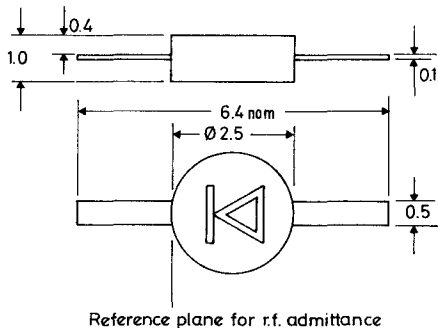
BH



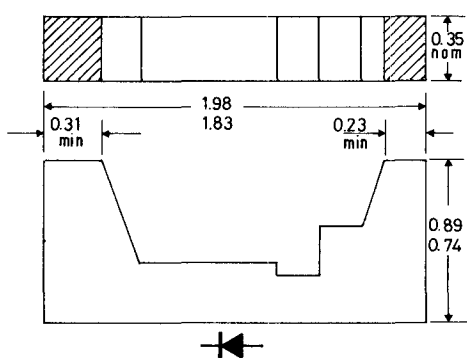
BJ



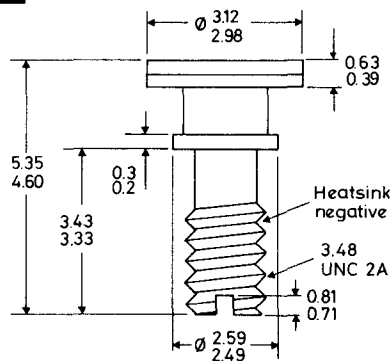
BK



BL



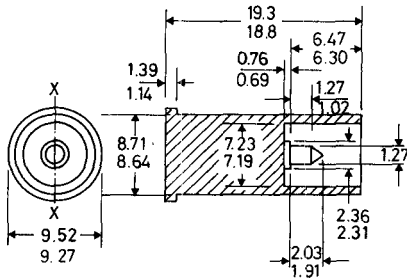
BM



BN

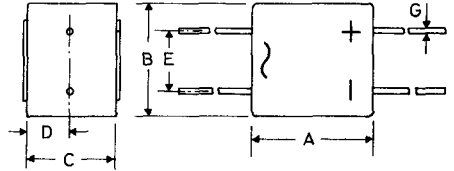
B.S.3934

SO-26

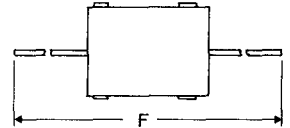


(All dimensions max.)

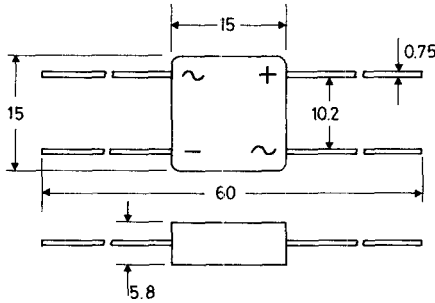
BO



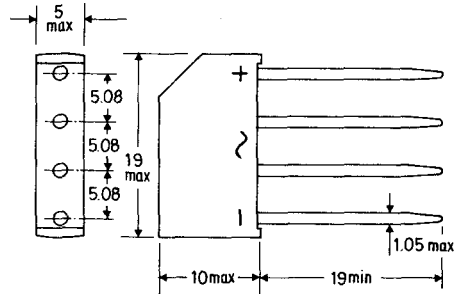
| | BO1 | BO2 | BO3 |
|---|------|-----|-----|
| A | 12 | 20 | 12 |
| B | 10 | 19 | 10 |
| C | 8 | 15 | 8 |
| D | 4 | 7.5 | 4 |
| E | 5 | 10 | 5 |
| F | 58 | 60 | 48 |
| G | 0.75 | 1.0 | 1.1 |



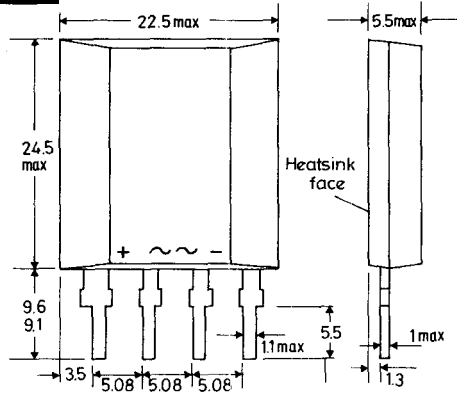
BP



BQ

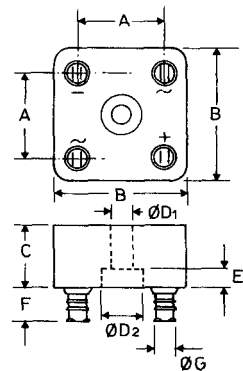


BR



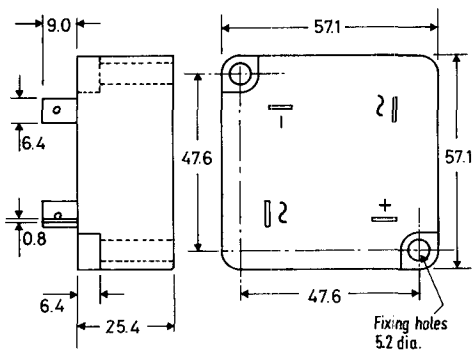
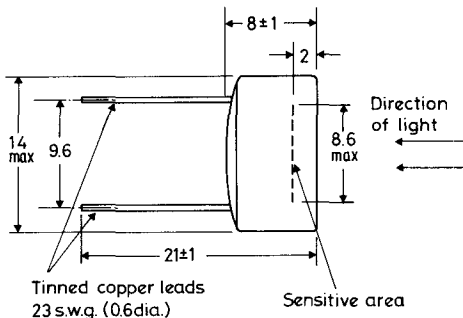
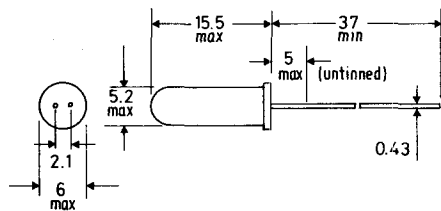
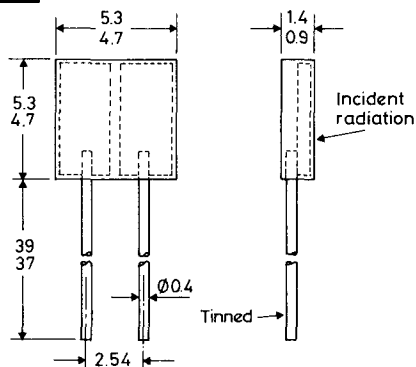
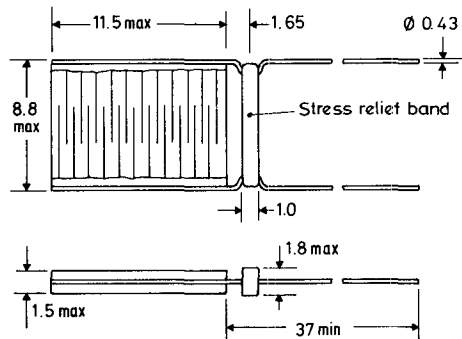
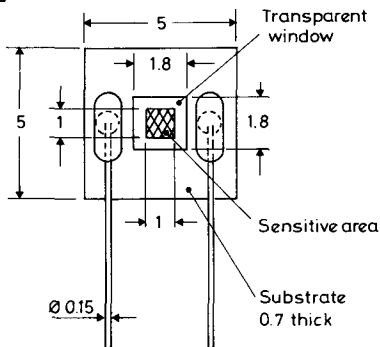
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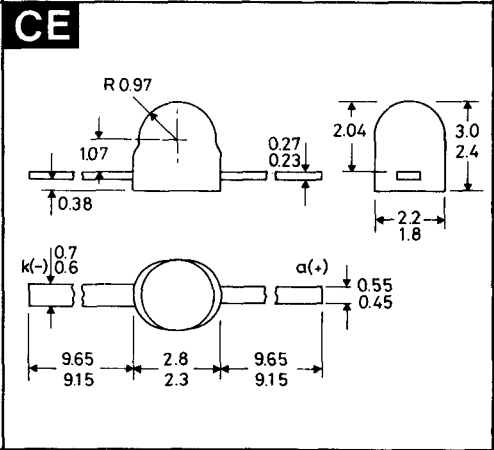
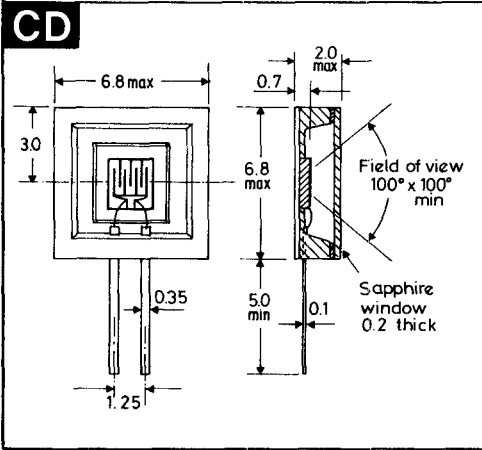
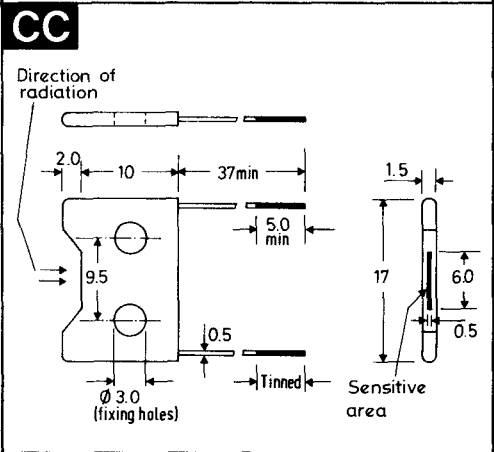
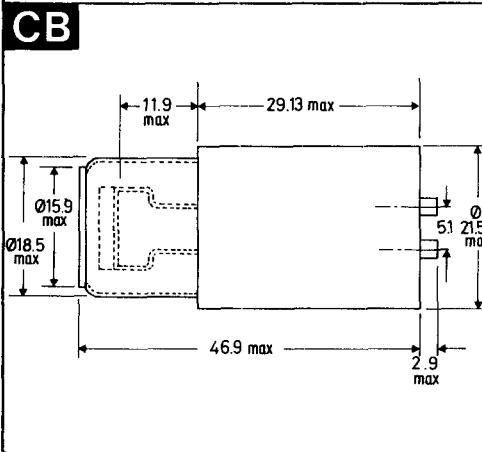
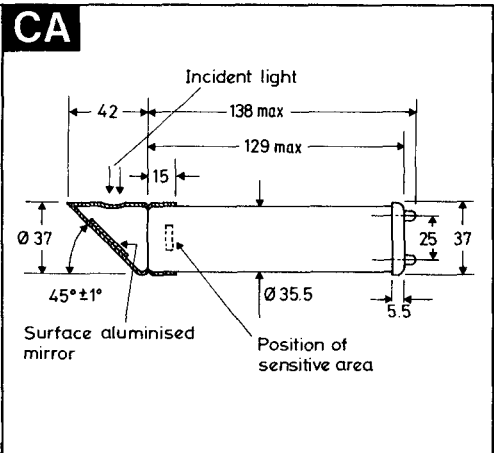
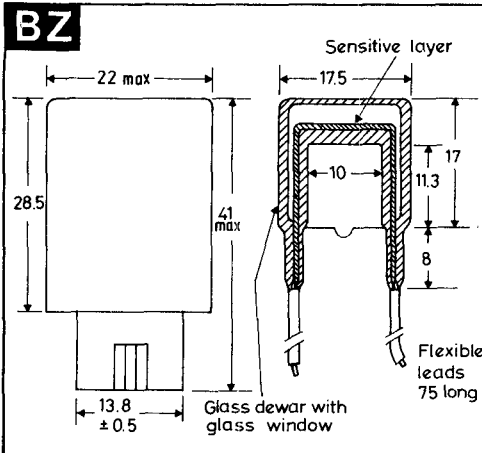
B.S.3934 SO-67



| | 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 |

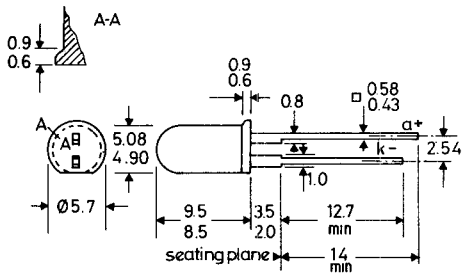
These drawings give limited information for quick reference purposes. For equipment design more complete information should be obtained from individual data sheets in the Technical Handbook or from standard B.S. or JEDEC outline drawings.

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

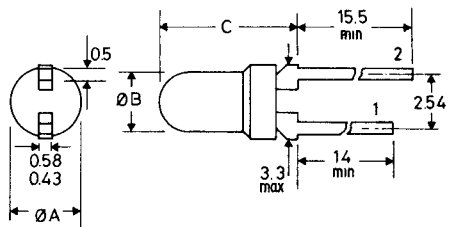


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CF

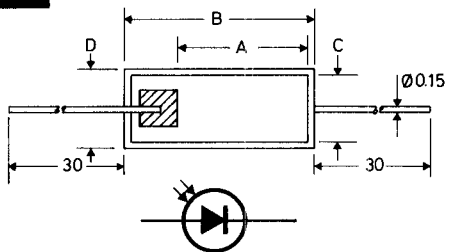


CG



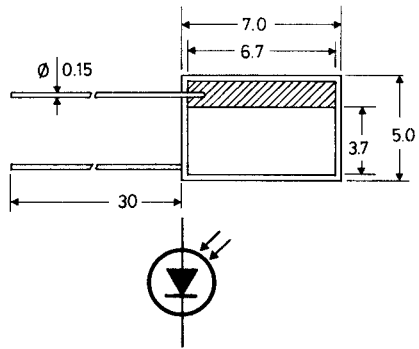
| | 1 | 2 | $\varnothing A$ | $\varnothing B$ | C |
|-----|-------|-------|-----------------|-----------------|---------|
| CG1 | k^- | a^+ | 3.0-3.17 | 2.4-2.6 | 5.8-6.3 |
| CG2 | a^+ | k^- | 3.0-3.17 | 2.4-2.6 | 5.8-6.3 |
| CG3 | k^- | a^+ | 3.3 max | 2.65-3.17 | 4.8-6.3 |

CH

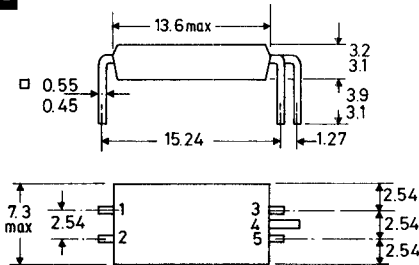


| | CH1 | CH2 |
|---|------|------|
| A | 2.2 | 3.5 |
| B | 3.35 | 4.55 |
| C | 0.95 | 1.85 |
| D | 1.25 | 2.15 |

CJ

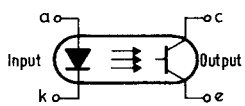
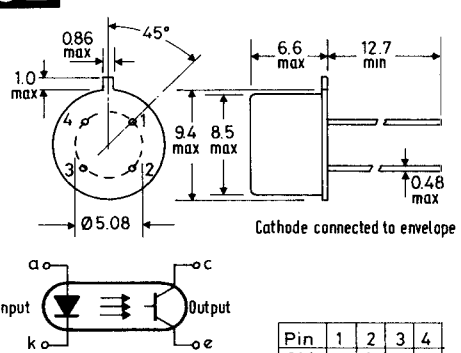


CK



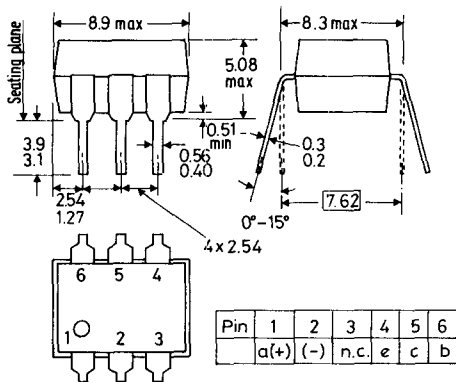
| Pin | 1 | 2 | 3 | 4 | 5 |
|-----|---|---|---|---------|---|
| CK1 | a | k | b | c | e |
| CK2 | k | a | e | omitted | c |

CL

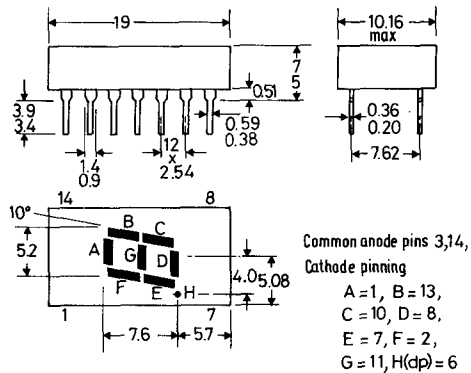


| Pin | 1 | 2 | 3 | 4 |
|-----|---|---|---|---|
| CL1 | a | k | e | c |
| CL2 | e | c | a | k |

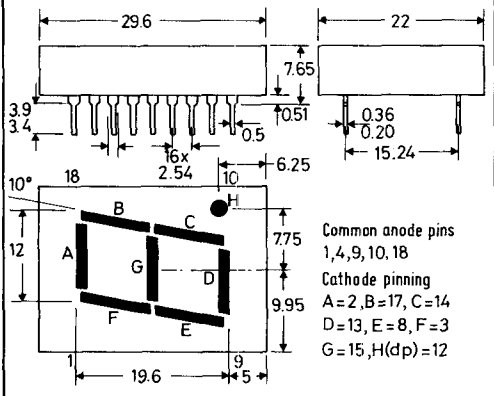
CM



CN



CO



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