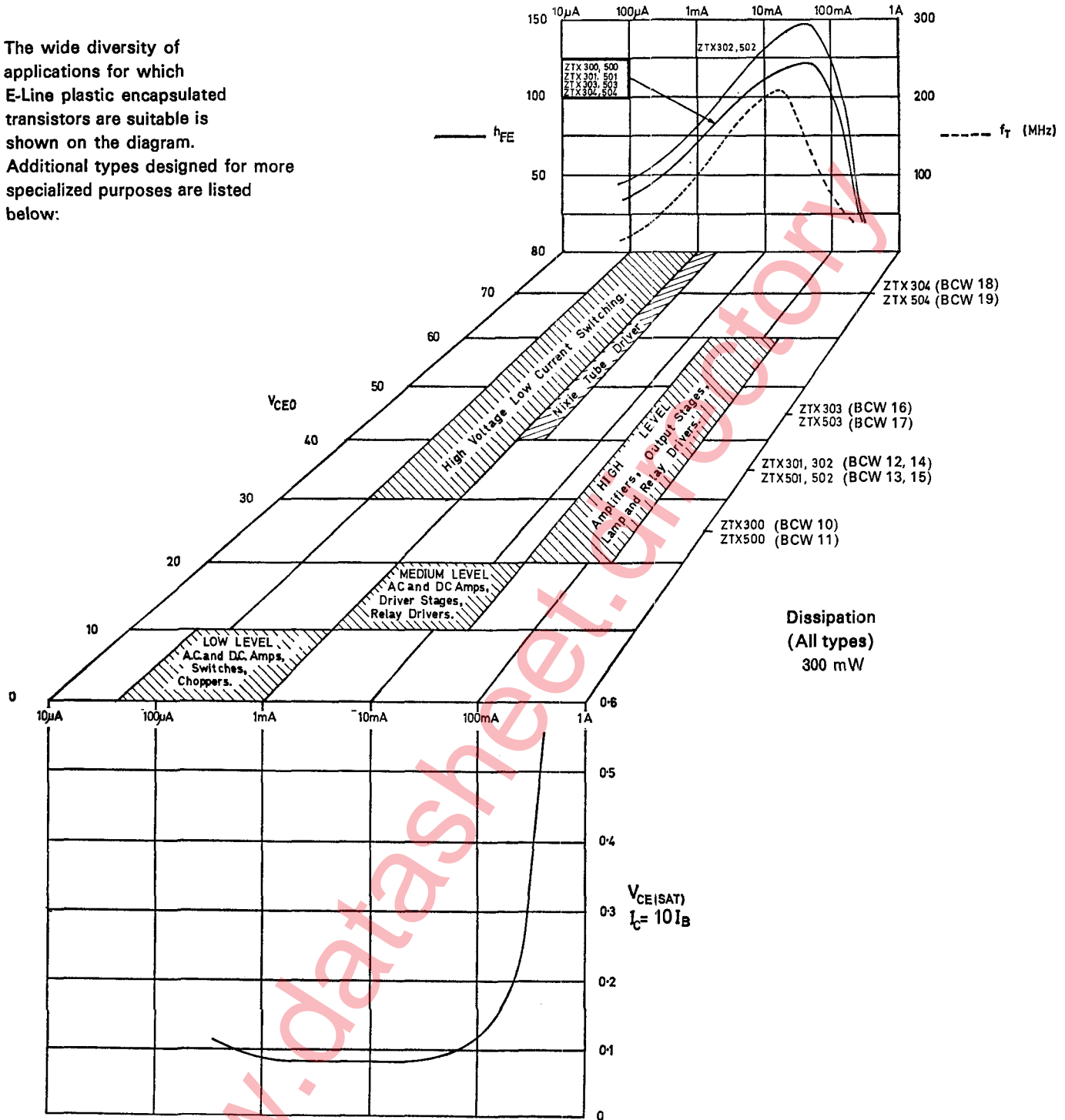


E-Line Transistors Applications Chart

SILICON TRANSISTORS

The wide diversity of applications for which E-Line plastic encapsulated transistors are suitable is shown on the diagram. Additional types designed for more specialized purposes are listed below:



Dissipation
(All types)
300 mW

| Type | Application | Competitive Type | Type | Application | Competitive Type |
|--------------------------------|--|---------------------------------|--------------------------------|----------------------------|-------------------------|
| ZTX330, BCW20 | n-p-n low level, low noise. | 2N3707 | ZTX107 ZTX108 ZTX109 | n-p-n high gain, low noise | BC107 BC108 BC109 |
| ZTX331, BCW22 | n-p-n low level, low noise. | 2N929 | | | |
| ZTX510, BSV33 ZTX511, BCW21 | p-n-p switching p-n-p low level, low noise. | TIS50 2N4058 | ZTX341, BSV28 ZTX342, BSV29 | n-p-n nixie drivers | — |
| ZTX531, BCW23 | p-n-p low level, low noise. | 2N2604 (complement to 2N929) | ZTX350 | Single P-Channel MNOS | — |

SILICON TRANSISTORS

Power (n-p-n)

| Type No. | Maximum Ratings | | | | | Characteristics | | | | | | | Jedec Outline | Outline Drawing | Comments |
|----------|------------------|-----------------------|----------------|-------------------|-------|-----------------|------|-----------------------|---------------------------|-------|------------------------|------------------------|---------------|-----------------|---|
| | V _{CBO} | V _{CEO(sus)} | I _C | Dissipation Watts | | h _{FE} | | | R _(sat) (max.) | | f _T Typical | | | | |
| | | | | Case Temp. 25°C | 100°C | min. | max. | V _{CE} volts | at I _C amps | ohms | | at I _C amps | | | |
| *ZT1479 | 60 | 40 | 1.5 | 5 | 2.9 | 20 | 60 | 4 | 0.2 | 7 | 0.2 | 1.5 | TO-5 | T7A | Medium power types for switching applications |
| *ZT1480 | 100 | 55 | 1.5 | 5 | 2.9 | 20 | 60 | 4 | 0.2 | 7 | 0.2 | 1.5 | TO-5 | T7A | |
| *ZT1481 | 60 | 40 | 1.5 | 5 | 2.9 | 35 | 100 | 4 | 0.2 | 7 | 0.2 | 1.5 | TO-5 | T7A | |
| *ZT1482 | 100 | 55 | 1.5 | 5 | 2.9 | 35 | 100 | 4 | 0.2 | 7 | 0.2 | 1.5 | TO-5 | T7A | |
| *ZT1483 | 60 | 40 | 3.0 | 25 | 14 | 20 | 60 | 4 | 0.75 | 2.67 | 0.75 | 1.25 | TO-8 | T10 | |
| *ZT1484 | 100 | 55 | 3.0 | 25 | 14 | 20 | 60 | 4 | 0.75 | 2.67 | 0.75 | 1.25 | TO-8 | T10 | |
| *ZT1485 | 60 | 40 | 3.0 | 25 | 14 | 35 | 100 | 4 | 0.75 | 1.0 | 0.75 | 1.25 | TO-8 | T10 | |
| *ZT1486 | 100 | 55 | 3.0 | 25 | 14 | 35 | 100 | 4 | 0.75 | 1.0 | 0.75 | 1.25 | TO-8 | T10 | |
| *ZT1487 | 60 | 40 | 6.0 | 75 | 43 | 15 | 45 | 4 | 1.5 | 2 | 1.5 | 1.0 | TO-3 | T9C | |
| *ZT1488 | 100 | 55 | 6.0 | 75 | 43 | 15 | 45 | 4 | 1.5 | 2 | 1.5 | 1.0 | TO-3 | T9C | |
| *ZT1489 | 60 | 40 | 6.0 | 75 | 43 | 25 | 75 | 4 | 1.5 | 0.67 | 1.5 | 1.0 | TO-3 | T9C | |
| *ZT1490 | 100 | 55 | 6.0 | 75 | 43 | 25 | 75 | 4 | 1.5 | 0.67 | 1.5 | 1.0 | TO-3 | T9C | |
| *ZT1700 | 60 | 40 | 1.0 | 5 | 2.8 | 20 | 80 | 4 | 0.1 | 10 | 0.1 | 1.2 | TO-5 | T7A | |
| *ZT1701 | 60 | 40 | 2.5 | 25 | 14 | 20 | 80 | 4 | 0.3 | 5 | 0.3 | 1.0 | TO-8 | T10 | |
| *ZT1702 | 60 | 40 | 5.0 | 75 | 43 | 15 | 60 | 4 | 0.8 | 4 | 0.8 | 1.0 | TO-3 | T9C | |
| 2N3055 | 100 | 60 | 15 | 115 | 65 | 20 | 70 | 4 | 4 | 0.28 | 4 | 0.7‡ | TO-3 | T9C | Series/shunt Regulator, Power switching |
| 2N3441 | 160 | 140 | 3 | 25 | 10.6 | 20 | 80 | 4 | 0.5 | 1.0† | 0.5 | 0.65 | TO-66 | T9A | Series/shunt Regulators, |
| 2N3442 | 160 | 140 | 10 | 117 | 67 | 20 | 70 | 4 | 3.0 | 1.0† | 3.0 | 0.8‡ | TO-3 | T9C | Power switching |
| 2N3583 | 250 | 175 | 2.0 | 35 | 20 | 10 | — | 10 | 1.0 | — | — | 10‡ | TO-66 | T9A | High voltage, high |
| 2N3584 | 375 | 250 | 2.0 | 35 | 20 | 25 | 100 | 10 | 1.0 | 0.75† | 1.0 | 10‡ | TO-66 | T9A | speed switching and |
| 2N3585 | 500 | 300 | 2.0 | 35 | 20 | 25 | 100 | 10 | 1.0 | 0.75† | 1.0 | 10‡ | TO-66 | T9A | linear amplification |

†V_{CE(sat)} ‡f_T at I_C=200mA *Also available as 2N1479 etc.

Planar General Purpose—Small Signal (n-p-n)

| Type No. | Maximum Ratings | | | | | Characteristics | | | | | | | Jedec Outline | Outline Drawing | Comments |
|----------------|---|------------------|------------------|---------------------|---------------------|-----------------|----------------------|------------|--|------|-----------------------|---------------------|---------------|---------------------------------|---|
| | V _{CBO} | V _{CEO} | V _{EB0} | I _C (pk) | P _{tot} mW | | V _{CE(sat)} | | h _{FE} I _C =10mA V _{CE} =6V | | I _{CBO} max. | f _T min. | | | |
| | | | | | amb. temp. | 25°C | 100°C | Max. volts | at I _C mA | min. | | | | | |
| BCY42 | 40 | 25 | 5 | 200 | 300 | — | 0.25 | 10 | 45 | 90 | 0.025 | 100 | TO-18 | T2A | Low leakage current, low saturation voltage |
| BCY43 | 40 | 25 | 5 | 200 | 300 | — | 0.25 | 10 | 75 | 150 | 0.025 | 100 | TO-18 | T2A | |
| ZT20 | 20 | 20 | 6 | 50 | 350 | 140 | 0.5 | 10 | 18 | 42 | 0.5 | 70 | TO-5 | T7A | For amplifier and switching applications |
| ZT21 | 20 | 20 | 6 | 50 | 350 | 140 | 0.5 | 10 | 38 | 82 | 0.5 | 70 | TO-5 | T7A | |
| ZT22 | 45 | 45 | 6 | 50 | 350 | 140 | 1.0 | 10 | 18 | 42 | 0.5 | 70 | TO-5 | T7A | |
| ZT23 | 45 | 45 | 6 | 50 | 350 | 140 | 1.0 | 10 | 38 | 82 | 0.5 | 70 | TO-5 | T7A | |
| ZT24 | 45 | 45 | 6 | 50 | 350 | 140 | 1.0 | 10 | 78 | 160 | 0.5 | 70 | TO-5 | T7A | |
| ZT40 | 20 | 20 | 6 | 50 | 300 | 120 | 0.5 | 10 | 18 | 42 | 0.5 | 70 | TO-18 | T2B | |
| ZT41 | 20 | 20 | 6 | 50 | 300 | 120 | 0.5 | 10 | 38 | 82 | 0.5 | 70 | TO-18 | T2B | |
| ZT42 | 45 | 45 | 6 | 50 | 300 | 120 | 1.0 | 10 | 18 | 42 | 0.5 | 70 | TO-18 | T2B | |
| ZT43 | 45 | 45 | 6 | 50 | 300 | 120 | 1.0 | 10 | 38 | 82 | 0.5 | 70 | TO-18 | T2B | |
| ZT44 | 45 | 45 | 6 | 50 | 300 | 120 | 1.0 | 10 | 78 | 160 | 0.5 | 70 | TO-18 | T2B | |
| ZT80 | 25 | 25 | 4 | 500 | 300 | 120 | 0.2 | 10 | 38 | 162 | 0.5 | 150 | TO-18 | T2B | Low leakage current, low saturation voltage |
| ZT81 | 45 | 35 | 4 | 500 | 300 | 120 | 0.2 | 10 | 38 | 162 | 0.5 | 150 | TO-18 | T2B | |
| ZT82 | 45 | 35 | 4 | 500 | 300 | 120 | 0.2 | 10 | 75 | 250 | 0.5 | 150 | TO-18 | T2B | |
| ZT83 | 60 | 45 | 5 | 500 | 300 | 170 | 0.2 | 50 | 38 | 85 | 0.05 | 150 | TO-18 | T2B | |
| ZT84 | 60 | 45 | 5 | 500 | 300 | 170 | 0.2 | 50 | 75 | 170 | 0.05 | 150 | TO-18 | T2B | |
| ZT86 | 100 | 80 | 5 | 500 | 300 | 170 | 0.2 | 50 | 38 | 85 | 0.05 | 150 | TO-18 | T2B | |
| ZT87 | 25 | 25 | 4 | 500 | 300 | 120 | 0.2 | 10 | 75 | 250 | 0.5 | 150 | TO-18 | T2B | |
| ZT88 | 100 | 80 | 5 | 500 | 300 | 170 | 0.2 | 50 | 75 | 170 | 0.05 | 150 | TO-18 | T2B | |
| ZT89 | 70 | 70 | 5 | 500 | 300 | 170 | 0.2 | 50 | 75 | 250 | 0.5 | 150 | TO-18 | T2B | |
| ZT110 to ZT119 | SO-12C (TO-46) versions of ZT80 to ZT89 | | | | | | | | | | | TO-46 | T1B | Low level, low noise amplifiers | |
| 2N929 | 45 | 45 | 5 | 30 | 300 | 150 | 1.0 | 10 | 40* | 120* | 0.01 | 30 | TO-18 | | T2A |
| 2N930 | 45 | 45 | 5 | 30 | 300 | 150 | 1.0 | 10 | 100* | 300* | 0.01 | 30 | TO-18 | | T2A |
| 2N2484 | 60 | 60 | 6 | 50 | 360 | — | 0.35 | 1.0 | 100* | 500* | 0.01 | 60 | TO-18 | | T2A |

*I_C=10μA V_{CE}=5V

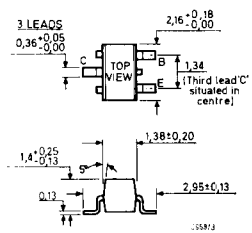
MICRO-E CHARACTERISTICS AT 25°C

| MEDIUM CURRENT GENERAL PURPOSE TRANSISTORS | | n-p-n | | | | | | p-n-p | | | | | | Units |
|--|-------------------------------------|--------|------|-------|------|-------|------|--------|------|-------|------|-------|------|---------|
| | | BFS38A | | BFS38 | | BFS39 | | BFS40A | | BFS40 | | BFS41 | | |
| Parameter | Test Conditions | Min. | Max. | Min. | Max. | Min. | Max. | Min. | Max. | Min. | Max. | Min. | Max. | |
| V_{CB0} | Rated Max. | — | 25 | — | 45 | — | 60 | — | 25 | — | 45 | — | 45 | V |
| $V_{CE0(sus)}$ | $I_C=5mA, I_B=0$ | 25 | — | 35 | — | 45 | — | 25 | — | 35 | — | 45 | — | V |
| V_{EBO} | Rated Max. | — | 5 | — | 5 | — | 5 | — | 5 | — | 5 | — | 5 | V |
| I_{CB0} | $V_{CB}=V_{CB0}$ Rated Max, $I_E=0$ | — | 0.5 | — | 0.5 | — | 0.5 | — | 0.5 | — | 0.5 | — | 0.5 | μA |
| I_{EBO} | $V_{EBO}=5V, I_C=0$ | — | 0.5 | — | 0.5 | — | 0.5 | — | — | — | — | — | — | μA |
| | $V_{EBO}=4V, I_C=0$ | — | — | — | — | — | — | — | 0.5 | — | 0.05 | — | 0.05 | μA |
| h_{FE} | $I_C=100\mu A, V_{CE}=6V$ | — | — | 20 | — | — | — | — | — | 20 | — | — | — | |
| h_{FE} | $I_C=10mA, V_{CE}=6V$ | 50 | 300 | 100 | 300 | 40 | 120 | 50 | 300 | 100 | 300 | 40 | 120 | |
| h_{FE} | $I_C=50mA, V_{CE}=6V$ | — | — | 50 | — | — | — | — | — | 50 | — | — | — | |
| $V_{CE(sat)}$ | $I_C=50mA, I_B=5mA$ | — | — | — | 0.25 | — | 0.25 | — | — | — | 0.25 | — | 0.25 | V |
| | $I_C=10mA, I_B=1mA$ | — | 0.35 | — | — | — | — | — | 0.35 | — | — | — | — | V |
| $V_{BE(sat)}$ | $I_C=50mA, I_B=5mA$ | — | — | — | 1.0 | — | 1.0 | — | — | — | 1.0 | — | 1.0 | V |
| | $I_C=10mA, I_B=1mA$ | — | 1.0 | — | — | — | — | — | 1.0 | — | — | — | — | V |
| f_T | $I_C=10mA, V_{CE}=6V, f=100MHz$ | 150 | — | 150 | — | 150 | — | 150 | — | 150 | — | 150 | — | MHz |
| C_{ob} | $V_{CB}=6V, I_E=0$ | — | 5 | — | 5 | — | 5 | — | 5 | — | 5 | — | 5 | pF |

DEVICE TYPES and nearest metal can equivalents

| | n-p-n | | p-n-p | |
|-------------------------|---------------------------|---------------------------|--------------------------|-------------------------|
| LOW LEVEL AMPLIFICATION | BFS36 BFS36A | 2N930 2N929 | BFS37 BFS37A | 2N2605 2N2604 |
| MEDIUM CURRENT | BFS38A BFS38 BFS39 | ZT80 ZT82 ZT83 | BFS40A BFS40 BFS41 | ZT180 ZT182 ZT183 |
| MEDIUM POWER | BFS42 BFS43 | 2N2221 2N2222A | BFS44 BFS45 | 2N2906 2N2907A |
| HIGH-SPEED SWITCHES | BSV35A BSV35 BSV36 | 2N708 2N2369 2N2475 | BSV37 | 2N2894 |
| V.H.F. AMPLIFIERS | BFS46 BFS46A | 2N918 | | |
| HIGH-SPEED DIODES | BAW63 BAW63A BAW63B | 1N914 | | |

PACKAGE PHYSICAL DATA



B — Base C — Collector E — Emitter
Dimensions in millimetres

Actual size

HIGH SPEED SWITCHING DIODES

Pin Connections

