

TO-220-3L Plastic-Encapsulate Transistors

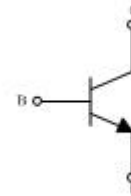
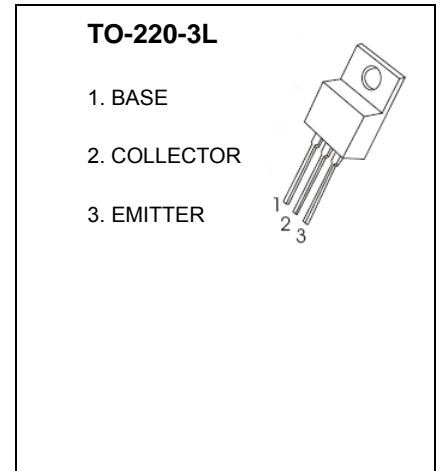
3DD13003 TRANSISTOR (NPN)

FEATURES

- power switching applications

MAXIMUM RATINGS (T_a=25°C unless otherwise noted)

| Symbol | Parameter | Value | Unit |
|------------------|-------------------------------|---------|------|
| V _{CB0} | Collector-Base Voltage | 700 | V |
| V _{CE0} | Collector-Emitter Voltage | 400 | V |
| V _{EB0} | Emitter-Base Voltage | 9 | V |
| I _C | Collector Current -Continuous | 1.5 | A |
| P _C | Collector Power Dissipation | 2 | W |
| T _J | Junction Temperature | 150 | °C |
| T _{stg} | Storage Temperature | -55~150 | °C |



ELECTRICAL CHARACTERISTICS (T_a=25°C unless otherwise specified)

| Parameter | Symbol | Test conditions | Min | Typ | Max | Unit |
|--------------------------------------|----------------------|--|-----|-----|-----|------|
| Collector-base breakdown voltage | V _{(BR)CBO} | I _C =5mA, I _E =0 | 700 | | | V |
| Collector-emitter breakdown voltage | V _{(BR)CEO} | I _C =10mA, I _B =0 | 400 | | | V |
| Emitter-base breakdown voltage | V _{(BR)EBO} | I _E =2mA, I _C =0 | 9 | | | V |
| Collector cut-off current | I _{CBO} | V _{CB} =700V, I _E =0 | | | 1 | mA |
| Collector cut-off current | I _{CEO} | V _{CE} =400V, I _B =0 | | | 0.5 | mA |
| Emitter cut-off current | I _{EBO} | V _{EB} =9V, I _C =0 | | | 1 | mA |
| DC current gain | h _{FE1} | V _{CE} =5V, I _C = 0.5 A | 8 | | 40 | |
| | h _{FE2} | V _{CE} =5V, I _C = 1.5A | 5 | | | |
| Collector-emitter saturation voltage | V _{CE(sat)} | I _C =1A, I _B =0.25A | | | 0.6 | V |
| Base-emitter saturation voltage | V _{BE(sat)} | I _C =1A, I _B =0.25A | | | 1.2 | V |
| Transition frequency | f _T | V _{CE} =10V, I _C =100mA, f =1MHz | 5 | | | MHz |
| Fall time | t _f | I _C =1A, I _{B1} =-I _{B2} =0.2A, V _{CC} =100V | | | 0.5 | μs |
| Storage time | t _s | I _C =250mA (UI9600) | 2 | | 4 | μs |

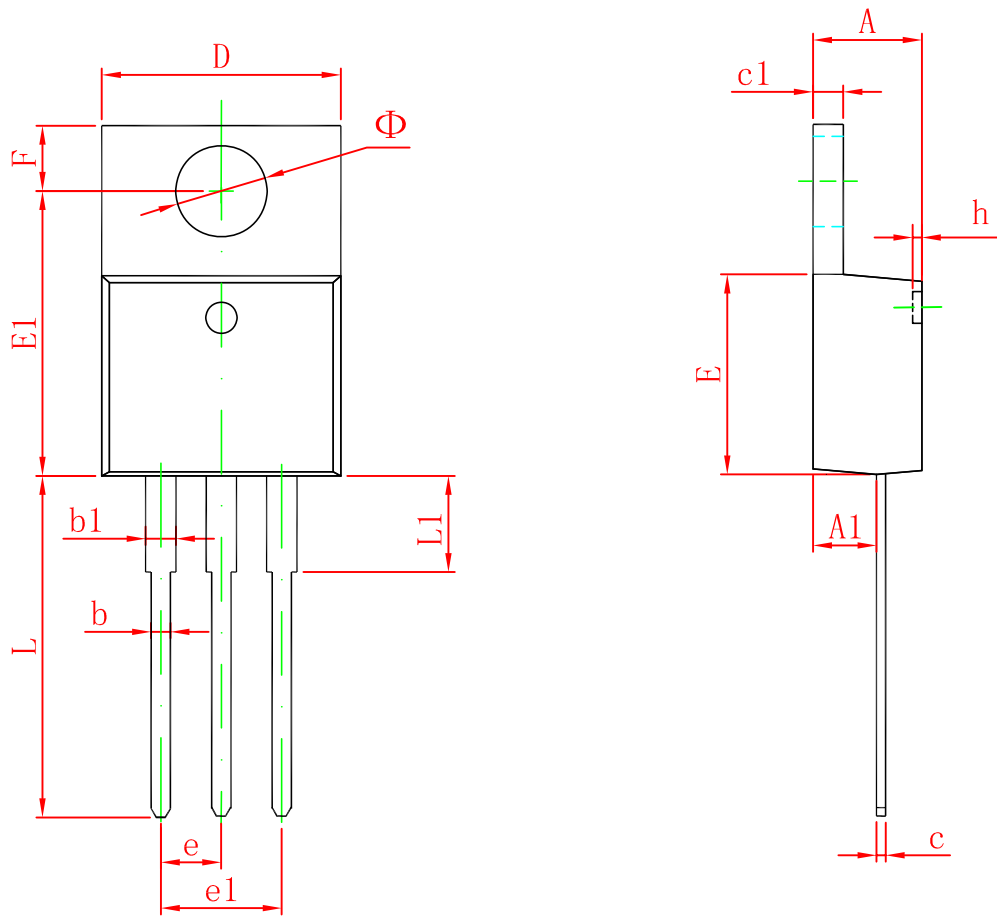
CLASSIFICATION OF h_{FE1}

| Range | 8-10 | 10-15 | 15-20 | 20-25 | 25-30 | 30-35 | 35-40 |
|-------|------|-------|-------|-------|-------|-------|-------|
| | | | | | | | |

CLASSIFICATION OF t_s

| Rank | A1 | A2 | B1 | B2 |
|-------|------------|------------|------------|------------|
| Range | 2-2.5 (μs) | 2.5-3 (μs) | 3-3.5 (μs) | 3.5-4 (μs) |

TO-220-3L Package Outline Dimensions



| Symbol | Dimensions In Millimeters | | Dimensions In Inches | |
|--------|---------------------------|--------|----------------------|-------|
| | Min | Max | Min | Max |
| A | 4.470 | 4.670 | 0.176 | 0.184 |
| A1 | 2.520 | 2.820 | 0.099 | 0.111 |
| b | 0.710 | 0.910 | 0.028 | 0.036 |
| b1 | 1.170 | 1.370 | 0.046 | 0.054 |
| c | 0.310 | 0.530 | 0.012 | 0.021 |
| c1 | 1.170 | 1.370 | 0.046 | 0.054 |
| D | 10.010 | 10.310 | 0.394 | 0.406 |
| E | 8.500 | 8.900 | 0.335 | 0.350 |
| E1 | 12.060 | 12.460 | 0.475 | 0.491 |
| e | 2.540 TYP | | 0.100 TYP | |
| e1 | 4.980 | 5.180 | 0.196 | 0.204 |
| F | 2.590 | 2.890 | 0.102 | 0.114 |
| h | 0.000 | 0.300 | 0.000 | 0.012 |
| L | 13.400 | 13.800 | 0.528 | 0.543 |
| L1 | 3.560 | 3.960 | 0.140 | 0.156 |
| Φ | 3.735 | 3.935 | 0.147 | 0.155 |