

2SA1020 TRANSISTOR (PNP)

FEATURES

Power Amplifier Applications

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

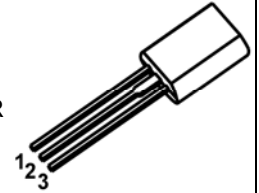
| Symbol | Parameter | Value | Unit |
|------------------|-------------------------------|---------|------|
| V _{CB0} | Collector-Base Voltage | -50 | V |
| V _{CEO} | Collector-Emitter Voltage | -50 | V |
| V _{EBO} | Emitter-Base Voltage | -5 | V |
| I _C | Collector Current –Continuous | -2 | A |
| P _C | Collector Power Dissipation | 900 | mW |
| T _J | Junction Temperature | 150 | °C |
| T _{stg} | Storage Temperature | -55-150 | °C |

TO-92MOD

1. EMITTER

2. COLLECTOR

3. BASE



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

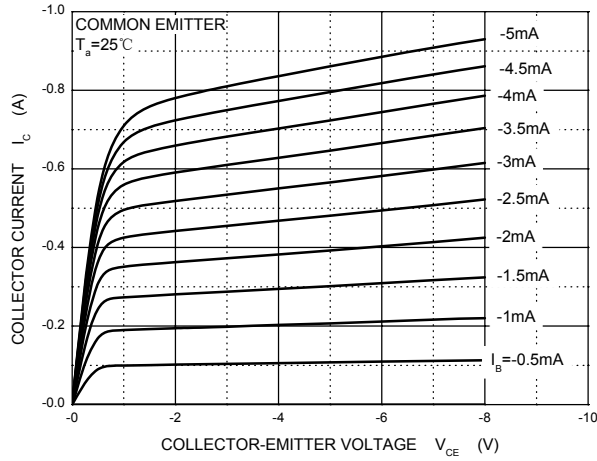
| Parameter | Symbol | Test conditions | Min | Typ | Max | Unit |
|--------------------------------------|----------------------|---|-----|-----|------|------|
| Collector-base breakdown voltage | V _{(BR)CBO} | I _C = -100μA, I _E = 0 | -50 | | | V |
| Collector-emitter breakdown voltage | V _{(BR)CEO} | I _C = -10mA, I _B = 0 | -50 | | | V |
| Emitter-base breakdown voltage | V _{(BR)EBO} | I _E = -100μA, I _C = 0 | -5 | | | V |
| Collector cut-off current | I _{CBO} | V _{CB} = -50V, I _E = 0 | | | -1 | μA |
| Emitter cut-off current | I _{EBO} | V _{EB} = -5V, I _C = 0 | | | -1 | μA |
| DC current gain | h _{FE1} | V _{CE} = -2V, I _C = -0.5A | 70 | | 240 | |
| | h _{FE2} | V _{CE} = -2V, I _C = -1.5A | 40 | | | |
| Collector-emitter saturation voltage | V _{CE(sat)} | I _C = -1A, I _B = -50mA | | | -0.5 | V |
| Base-emitter saturation voltage | V _{BE(sat)} | I _C = -1A, I _B = -50mA | | | -1.2 | V |
| Transition frequency | f _T | V _{CE} = -2V, I _C = -500mA | | 100 | | MHz |
| Collector output capacitance | C _{ob} | V _{CB} = -10V, I _E = 0, f = 1MHz | | 40 | | pF |
| Turn-on time | t _{on} | V _{CC} = -30V, I _{B1} = -I _{B2} = -0.05A, I _C = -1A | | 0.1 | | μs |
| Storage time | t _s | | | 1 | | μs |
| Fall time | t _f | | | 0.1 | | μs |

CLASSIFICATION OF h_{FE1}

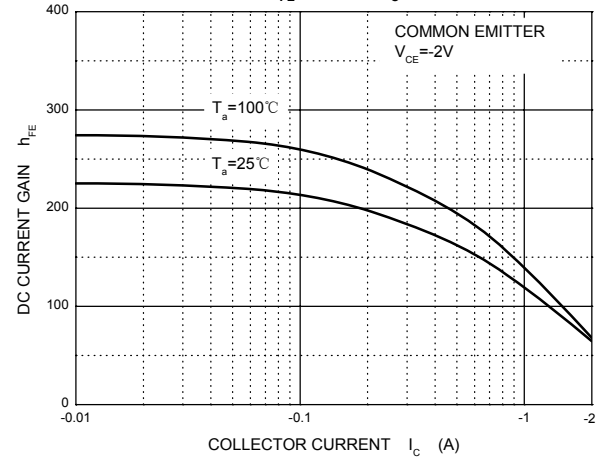
| Rank | O | Y |
|-------|--------|---------|
| Range | 70-140 | 120-240 |

Typical Characteristics

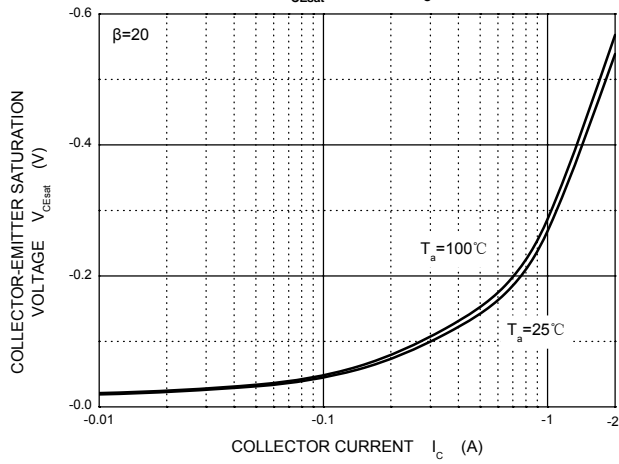
Static Characteristic



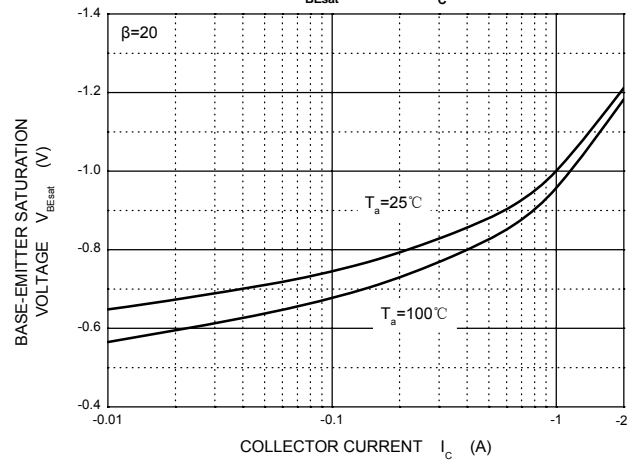
h_{FE} — I_c



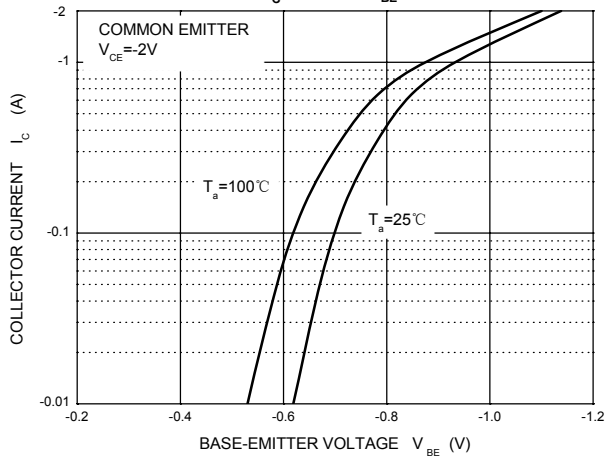
V_{CEsat} — I_c



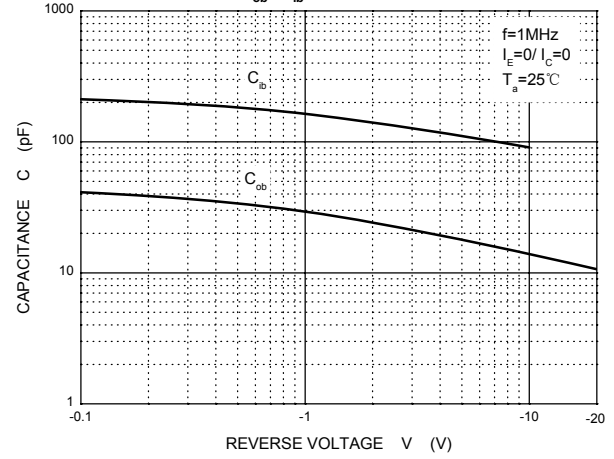
V_{BEsat} — I_c



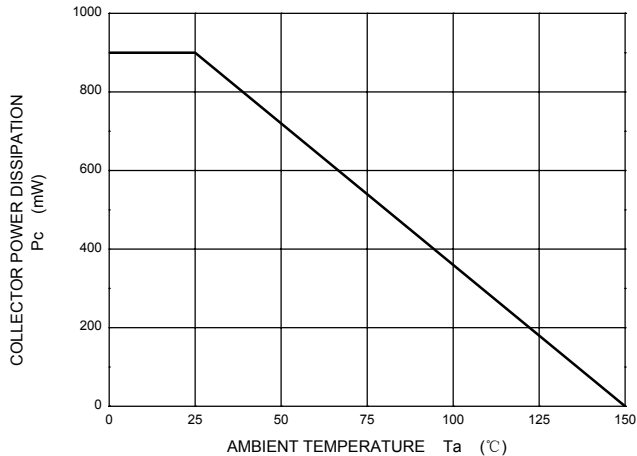
I_c — V_{BE}



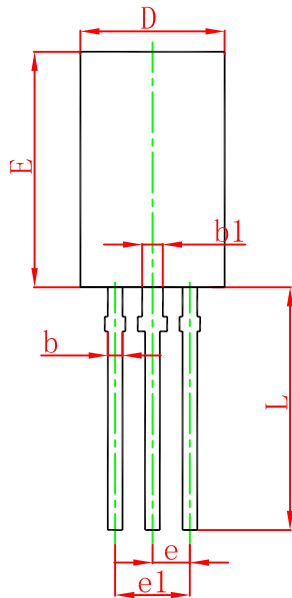
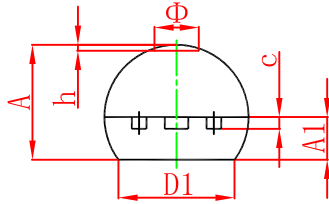
C_{ob}/C_{ib} — V_{CB}/V_{EB}



P_c — T_a

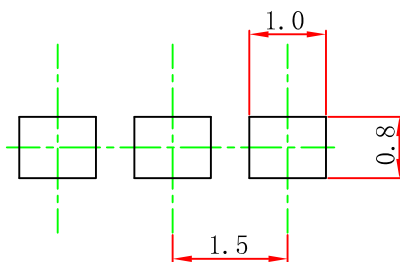


TO-92MOD Package Outline Dimensions



| Symbol | Dimensions In Millimeters | | Dimensions In Inches | |
|--------|---------------------------|--------|----------------------|-------|
| | Min. | Max. | Min. | Max. |
| A | 4.800 | 5.000 | 0.189 | 0.197 |
| A1 | 1.730 | 2.030 | 0.068 | 0.080 |
| b | 0.440 | 0.600 | 0.017 | 0.024 |
| b1 | 0.940 | 1.100 | 0.037 | 0.043 |
| c | 0.350 | 0.450 | 0.014 | 0.018 |
| D | 5.900 | 6.100 | 0.232 | 0.240 |
| D1 | 4.000 | | 0.157 | |
| E | 8.500 | 8.700 | 0.335 | 0.343 |
| e | 1.500 TYP. | | 0.059 TYP. | |
| e1 | 2.900 | 3.100 | 0.114 | 0.122 |
| L | 13.800 | 14.200 | 0.543 | 0.559 |
| Φ | | 1.600 | | 0.063 |
| h | 0.000 | 0.380 | 0.000 | 0.015 |

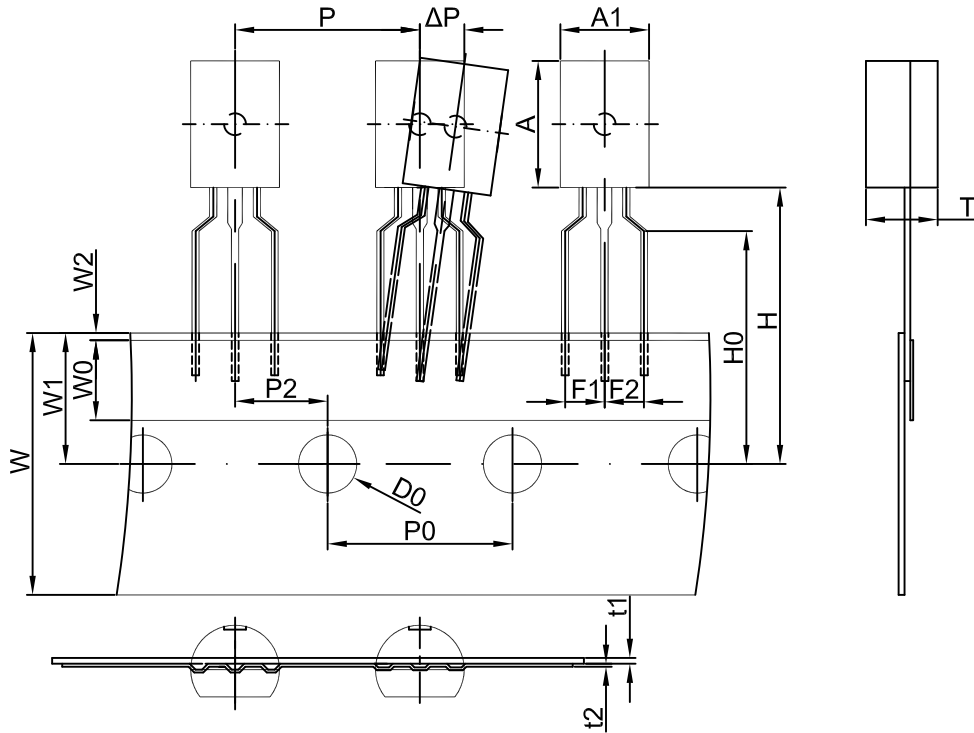
TO-92MOD Suggested Pad Layout



Note:

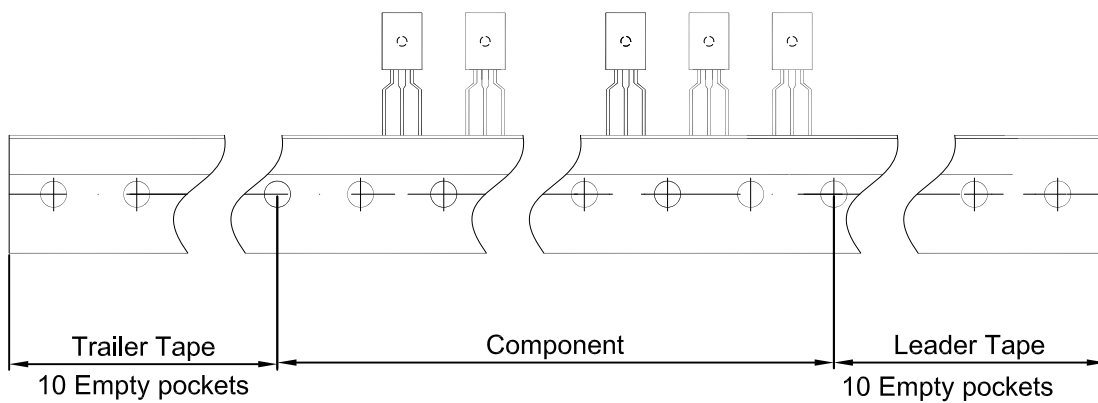
1. Controlling dimension: in millimeters.
2. General tolerance: ± 0.05 mm.
3. The pad layout is for reference purposes only.

TO-92MOD PACKAGE TAPEING DIMENSION



Dimensions are in millimeter

| A1 | A | T | P | P0 | P2 | F1 | F2 | W |
|-----|-----|-----|------|------|------|-----|-----|------|
| 6.0 | 8.6 | 4.9 | 12.7 | 12.7 | 6.35 | 2.5 | 2.5 | 18.0 |
| W0 | W1 | W2 | H | H0 | D0 | t1 | t2 | ΔP |
| 6.0 | 9.0 | 1.0 | 19.0 | 16.0 | 4.0 | 0.4 | 0.2 | 0 |



| Package | Box | Box Size(mm) | Carton | Carton Size(mm) |
|----------|----------|--------------|------------|-----------------|
| TO-92MOD | 2000 pcs | 333×245×43 | 20,000 pcs | 573×404×266 |