

RoHS Compliant Product

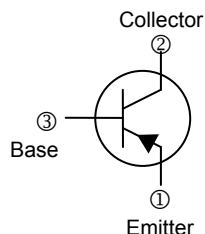
A suffix of "-C" specifies halogen & lead-free

## FEATURES

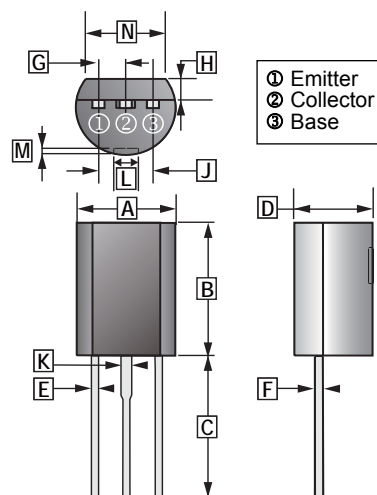
- Power amplifier applications

## CLASSIFICATION OF $h_{FE(1)}$

| Product-Rank | 2SA1020-O | 2SA1020-Y |
|--------------|-----------|-----------|
| Range        | 70-140    | 120-240   |



## TO-92MOD



| REF. | Millimeter |       | REF. | Millimeter |      |
|------|------------|-------|------|------------|------|
|      | Min.       | Max.  |      | Min.       | Max. |
| A    | 5.50       | 6.50  | H    | 1.70       | 2.05 |
| B    | 8.00       | 9.00  | J    | 2.70       | 3.20 |
| C    | 12.70      | 14.50 | K    | 0.85       | 1.15 |
| D    | 4.50       | 5.30  | L    | 1.60 Max   |      |
| E    | 0.35       | 0.65  | M    | 0.00       | 0.40 |
| F    | 0.30       | 0.51  | N    | 4.00 Min   |      |
| G    | 1.50 TYP.  |       |      |            |      |

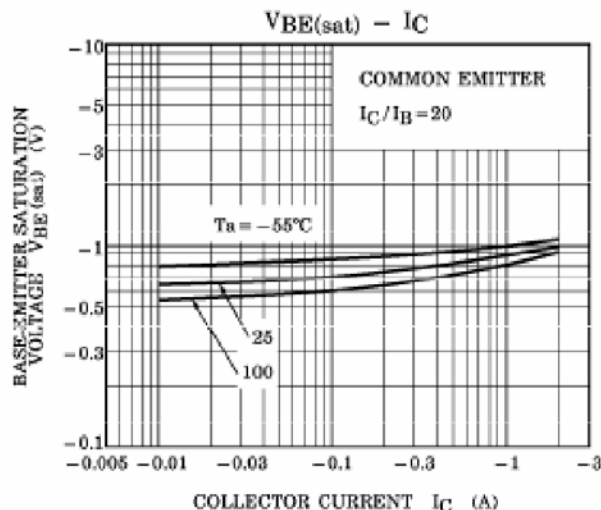
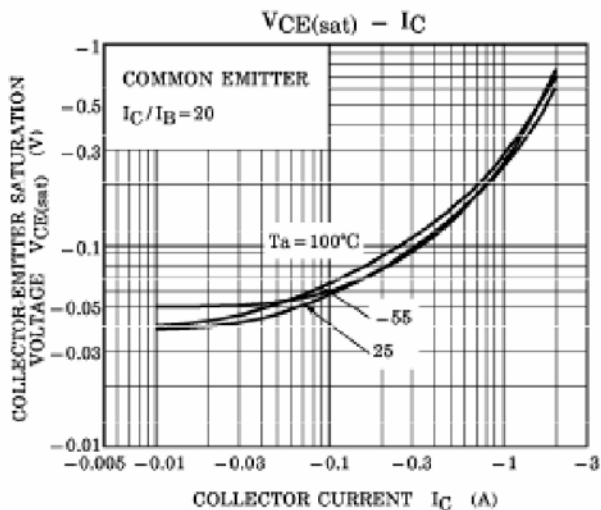
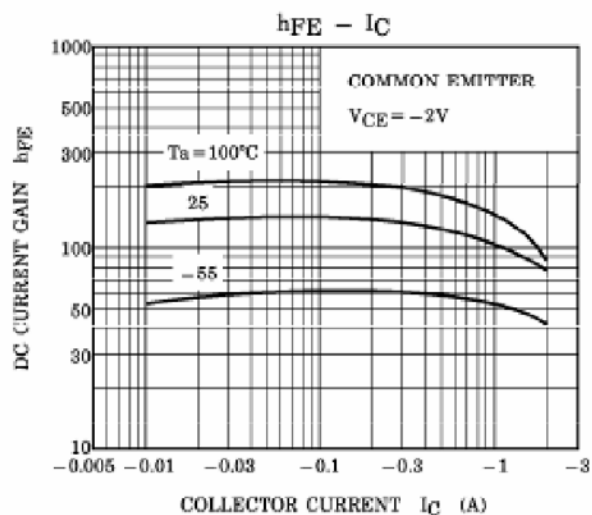
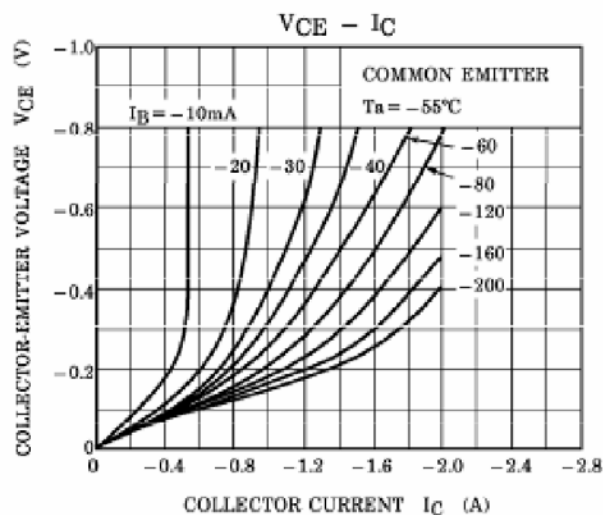
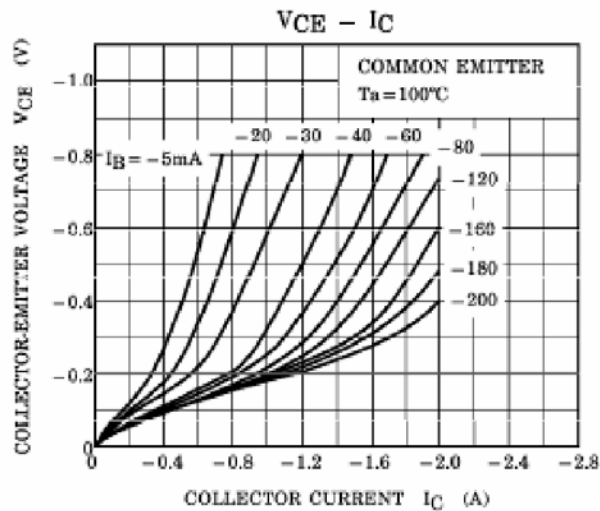
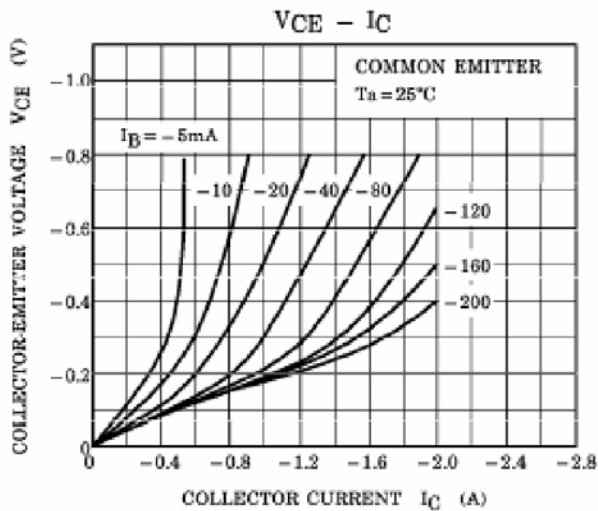
## ABSOLUTE MAXIMUM RATINGS ( $T_A = 25^\circ\text{C}$ unless otherwise specified)

| Parameter                      | Symbol         | Ratings      | Unit             |
|--------------------------------|----------------|--------------|------------------|
| Collector to Base Voltage      | $V_{CBO}$      | -50          | V                |
| Collector to Emitter Voltage   | $V_{CEO}$      | -50          | V                |
| Emitter to Base Voltage        | $V_{EBO}$      | -5           | V                |
| Collector Current - Continuous | $I_C$          | -2           | A                |
| Collector Power Dissipation    | $P_C$          | 900          | mW               |
| Junction, Storage Temperature  | $T_J, T_{STG}$ | 150, -55~150 | $^\circ\text{C}$ |

## ELECTRICAL CHARACTERISTICS ( $T_A = 25^\circ\text{C}$ unless otherwise specified)

| Parameter                               | Symbol        | Min. | Typ. | Max. | Unit          | Test Conditions  |
|---|---------------|------|------|------|---------------|--|
| Collector to Base Breakdown Voltage     | $V_{(BR)CBO}$ | -50  | -    | -    | V             | $I_C = -100\mu\text{A}, I_E = 0\text{A}$   |
| Collector to Emitter Breakdown Voltage  | $V_{(BR)CEO}$ | -50  | -    | -    | V             | $I_C = -10\text{mA}, I_B = 0\text{A}$  |
| Emitter to Base Breakdown Voltage       | $V_{(BR)EBO}$ | -5   | -    | -    | V             | $I_E = -100\mu\text{A}, I_C = 0\text{A}$   |
| Collector Cut-Off Current               | $I_{CBO}$     | -    | -    | -1   | $\mu\text{A}$ | $V_{CB} = -50\text{V}, I_E = 0\text{A}$  |
| Emitter Cut-Off Current                 | $I_{EBO}$     | -    | -    | -1   | $\mu\text{A}$ | $V_{EB} = -5\text{V}, I_C = 0\text{A}$   |
| DC Current Gain                         | $h_{FE(1)}$   | 70   | -    | 240  |               | $V_{CE} = -2\text{V}, I_C = -0.5\text{A}$  |
|   | $h_{FE(2)}$   | 40   | -    | -    |               | $V_{CE} = -2\text{V}, I_C = -1.5\text{A}$  |
| Collector to Emitter Saturation Voltage | $V_{CE(sat)}$ | -    | -    | -0.5 | V             | $I_C = -1\text{A}, I_B = -50\text{mA}$   |
| Base to Emitter Saturation Voltage      | $V_{BE(sat)}$ | -    | -    | -1.2 | V             | $I_C = -1\text{A}, I_B = -50\text{mA}$   |
| Transition Frequency                    | $f_T$         | -    | 100  | -    | MHz           | $V_{CE} = -2\text{V}, I_C = -500\text{mA}$   |
| Collector Output Capacitance            | $C_{ob}$      | -    | 40   | -    | pF            | $V_{CB} = -10\text{V}, I_E = 0\text{A}, f = 1\text{MHz}$                           |
| Turn-on Time                            | $T_{on}$      | -    | 0.1  | -    | $\mu\text{s}$ | $V_{CC} = -30\text{V}$<br>$I_{B1} = -I_{B2} = -0.05\text{A}$<br>$I_C = -1\text{A}$ |
| Storage Time                            | $T_s$         | -    | 1    | -    |               |  |
| Fall Time                               | $T_f$         | -    | 0.1  | -    |               |  |

**CHARACTERISTIC CURVES**



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