

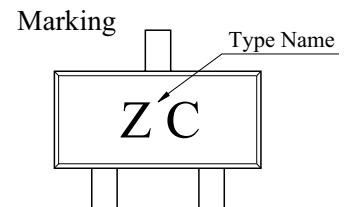
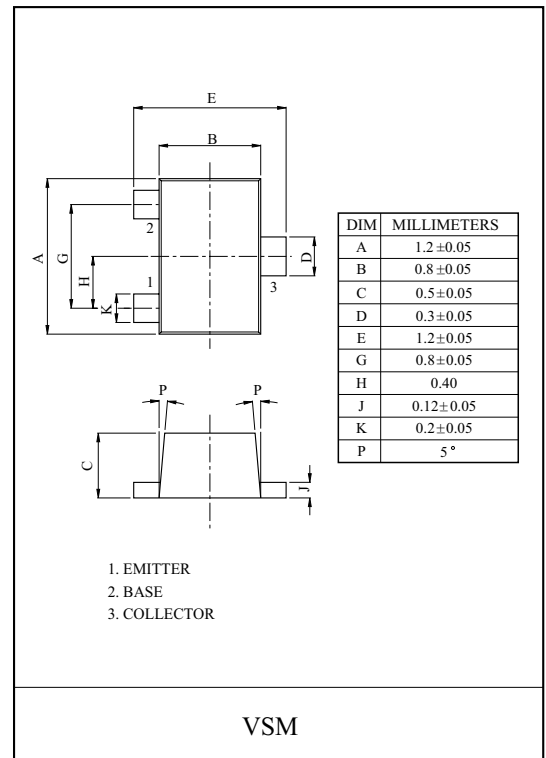
GENERAL PURPOSE APPLICATION.
SWITCHING APPLICATION.

FEATURES

- Low Leakage Current
: $I_{CEX}=50\text{nA}(\text{Max.}), I_{BL}=50\text{nA}(\text{Max.})$
@ $V_{CE}=30\text{V}, V_{EB}=3\text{V}$.
- Excellent DC Current Gain Linearity.
- Low Saturation Voltage
: $V_{CE(\text{sat})}=0.3\text{V}(\text{Max.}) @ I_C=50\text{mA}, I_B=5\text{mA}$.
- Low Collector Output Capacitance
: $C_{ob}=4\text{pF}(\text{Max.}) @ V_{CB}=5\text{V}$.
- Complementary to 2N3906V.

MAXIMUM RATING (Ta=25 °C)

| CHARACTERISTIC | SYMBOL | RATING | UNIT |
|-----------------------------|-----------|-----------|------|
| Collector-Base Voltage | V_{CBO} | 60 | V |
| Collector-Emitter Voltage | V_{CEO} | 40 | V |
| Emitter-Base Voltage | V_{EBO} | 6 | V |
| Collector Current | I_C | 200 | mA |
| Base Current | I_B | 50 | mA |
| Collector Power Dissipation | P_C^* | 100 | mW |
| Junction Temperature | T_j | 150 | °C |
| Storage Temperature Range | T_{stg} | -55 ~ 150 | °C |



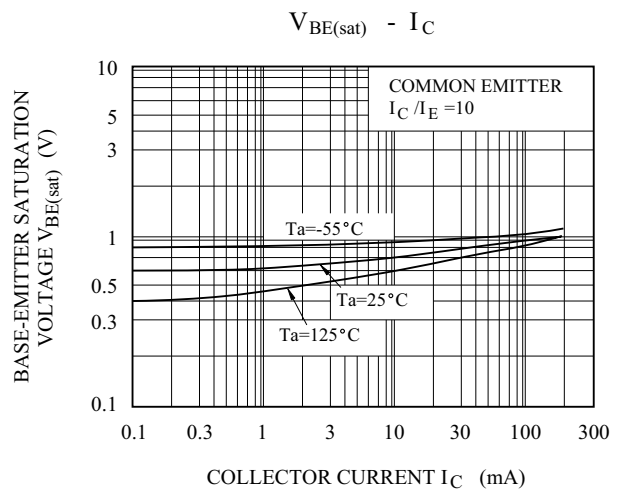
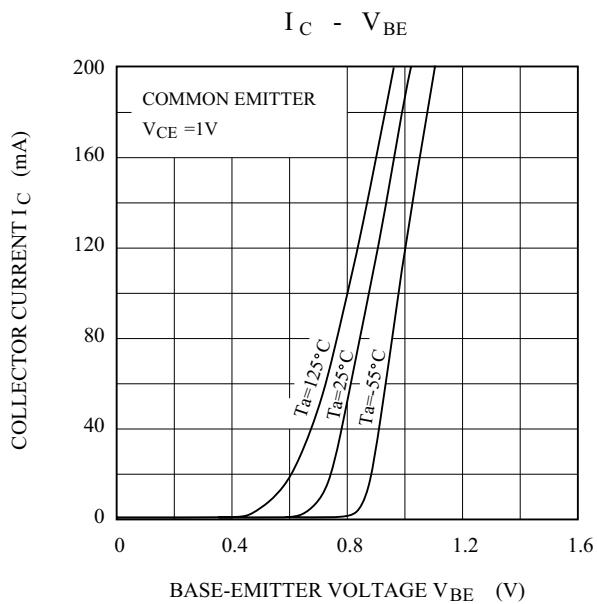
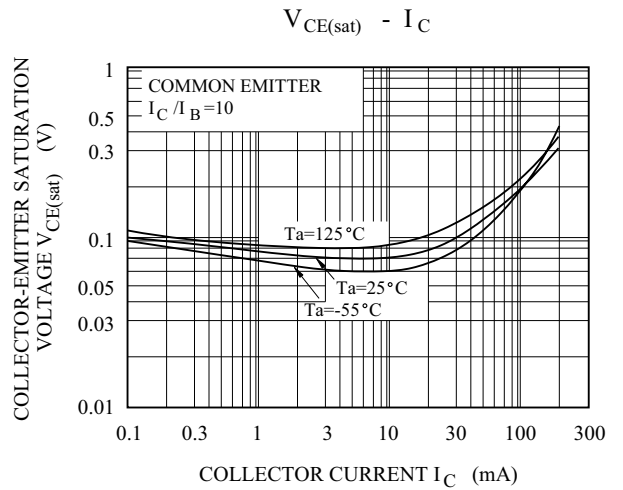
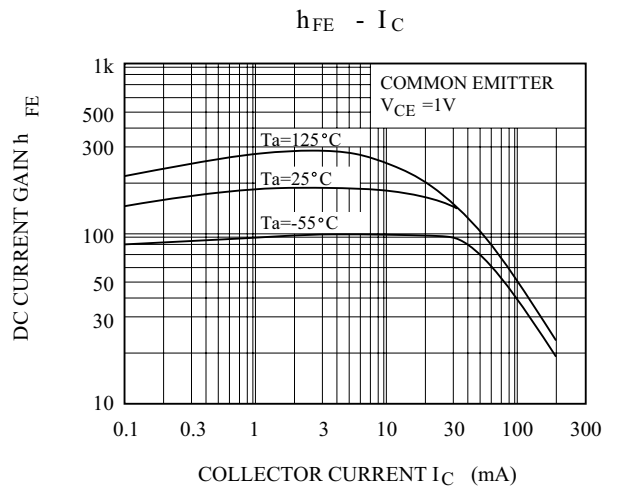
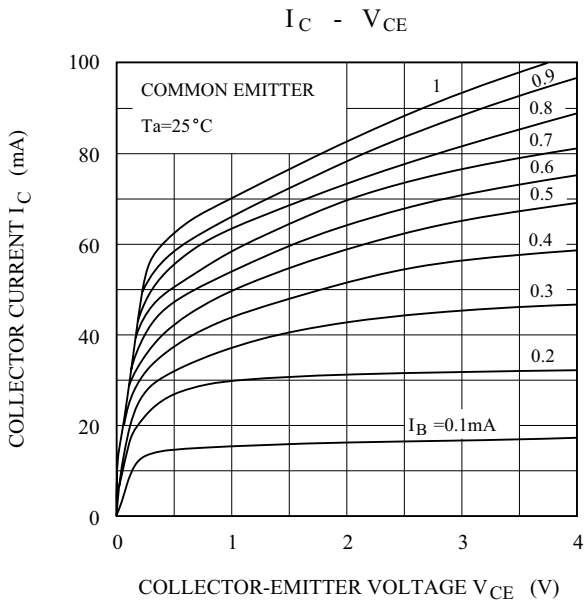
2N3904V

ELECTRICAL CHARACTERISTICS (Ta=25 °C)

| CHARACTERISTIC | | SYMBOL | TEST CONDITION | MIN. | TYP. | MAX. | UNIT | |
|--|--------------|----------------|----------------------------------|---|------|------|------------------|-----|
| Collector Cut-off Current | | I_{CEX} | $V_{CE}=30V, V_{EB}=3V$ | - | - | 50 | nA | |
| Base Cut-off Current | | I_{BL} | $V_{CE}=30V, V_{EB}=3V$ | - | - | 50 | nA | |
| Collector-Base Breakdown Voltage | | $V_{(BR)CBO}$ | $I_C=10\mu A, I_E=0$ | 60 | - | - | V | |
| Collector-Emitter Breakdown Voltage * | | $V_{(BR)CEO}$ | $I_C=1mA, I_B=0$ | 40 | - | - | V | |
| Emitter-Base Breakdown Voltage | | $V_{(BR)EBO}$ | $I_E=10\mu A, I_C=0$ | 6.0 | - | - | V | |
| DC Current Gain | * | $h_{FE}(1)$ | $V_{CE}=1V, I_C=0.1mA$ | 40 | - | - | | |
| | | $h_{FE}(2)$ | $V_{CE}=1V, I_C=1mA$ | 70 | - | - | | |
| | | $h_{FE}(3)$ | $V_{CE}=1V, I_C=10mA$ | 100 | - | 300 | | |
| | | $h_{FE}(4)$ | $V_{CE}=1V, I_C=50mA$ | 60 | - | - | | |
| | | $h_{FE}(5)$ | $V_{CE}=1V, I_C=100mA$ | 30 | - | - | | |
| Collector-Emitter Saturation Voltage * | * | $V_{CE(sat)1}$ | $I_C=10mA, I_B=1mA$ | - | - | 0.2 | V | |
| | | $V_{CE(sat)2}$ | $I_C=50mA, I_B=5mA$ | - | - | 0.3 | | |
| Base-Emitter Saturation Voltage * | * | $V_{BE(sat)1}$ | $I_C=10mA, I_B=1mA$ | 0.65 | - | 0.85 | V | |
| | | $V_{BE(sat)2}$ | $I_C=50mA, I_B=5mA$ | - | - | 0.95 | | |
| Transition Frequency | | f_T | $V_{CE}=20V, I_C=10mA, f=100MHz$ | 300 | - | - | MHz | |
| Collector Output Capacitance | | C_{ob} | $V_{CB}=5V, I_E=0, f=1MHz$ | - | - | 4.0 | pF | |
| Input Capacitance | | C_{ib} | $V_{BE}=0.5V, I_C=0, f=1MHz$ | - | - | 8.0 | pF | |
| Input Impedance | | h_{ie} | $V_{CE}=10V, I_C=1mA, f=1kHz$ | 1.0 | - | 10 | $k\Omega$ | |
| Voltage Feedback Ratio | | h_{re} | | 0.5 | - | 8.0 | $\times 10^{-4}$ | |
| Small-Signal Current Gain | | h_{fe} | | 100 | - | 400 | | |
| Collector Output Admittance | | h_{oe} | | 1.0 | - | 40 | μS | |
| Noise Figure | | NF | | $V_{CE}=5V, I_C=0.1mA, R_g=1k\Omega, f=10Hz \sim 15.7kHz$ | - | - | 5.0 | dB |
| Switching Time | Delay Time | t_d | | - | - | 35 | nS | |
| | Rise Time | t_r | | - | - | 35 | | |
| | Storage Time | t_{stg} | | | - | - | | 200 |
| | Fall Time | t_f | | | - | - | | 50 |

* Pulse Test : Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 2\%$.

2N3904V



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