

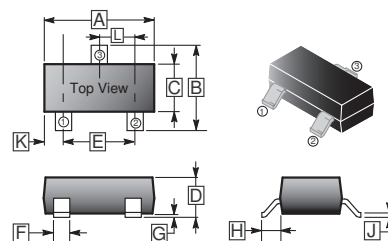
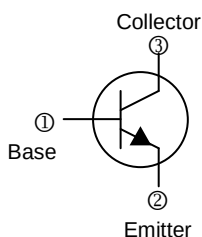
RoHS Compliant Product  
A suffix of "-C" specifies halogen & lead-free

**SOT-323**

## FEATURE

- Ideal for Medium Power Amplification and Switching
- Also Available in Lead Free Version
- Complementary to MMBT5401W

## MARKING: K4N



| REF. | Millimeter |      | REF. | Millimeter |      |
|------|------------|------|------|------------|------|
|      | Min.       | Max. |      | Min.       | Max. |
| A    | 1.80       | 2.20 | G    | 0.100 REF. |      |
| B    | 1.80       | 2.45 | H    | 0.525 REF. |      |
| C    | 1.15       | 1.35 | J    | 0.08       | 0.25 |
| D    | 0.80       | 1.10 | K    | -          | -    |
| E    | 1.20       | 1.40 | L    | 0.650 TYP. |      |
| F    | 0.20       | 0.40 |      |            |      |

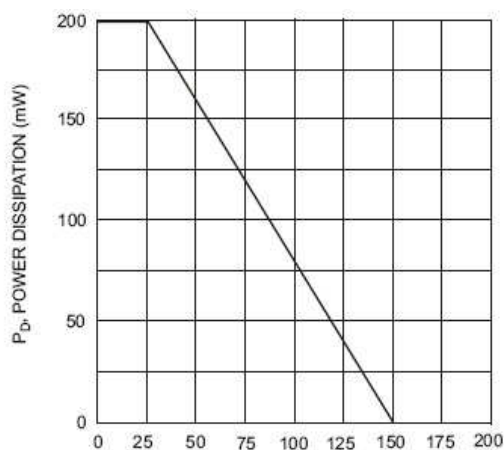
## MAXIMUM RATINGS ( $T_A = 25^\circ\text{C}$ unless otherwise specified)

| PARAMETER                               | SYMBOL          | RATINGS        | UNIT               |
|-----------------------------------------|-----------------|----------------|--------------------|
| Collector to Base Voltage               | $V_{CBO}$       | 180            | V                  |
| Collector to Emitter Voltage            | $V_{CEO}$       | 160            | V                  |
| Emitter to Base Voltage                 | $V_{EBO}$       | 6              | V                  |
| Collector Current-Continuous            | $I_C$           | 200            | mA                 |
| Collector Power Dissipation             | $P_C$           | 200            | mW                 |
| Thermal Resistance, Junction to Ambient | $R_{\theta JA}$ | 625            | $^\circ\text{C/W}$ |
| Operating & Storage Temperature         | $T_J, T_{STG}$  | 150, -55 ~ 150 | $^\circ\text{C}$   |

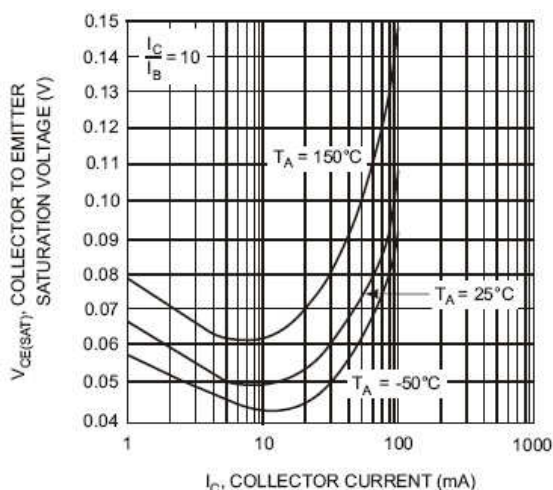
## ELECTRICAL CHARACTERISTICS ( $T_A = 25^\circ\text{C}$ unless otherwise specified)

| CHARACTERISTIC                       | SYMBOL        | MIN | MAX  | UNIT | TEST CONDITION                                                           |
|--------------------------------------|---------------|-----|------|------|--------------------------------------------------------------------------|
| Collector-Base Breakdown Voltage     | $V_{(BR)CBO}$ | 180 |      | V    | $I_C=100\mu\text{A}, I_E=0$                                              |
| Collector-Emitter Breakdown Voltage  | $V_{(BR)CEO}$ | 160 |      | V    | $I_C = 1\text{mA}, I_B = 0$                                              |
| Emitter-Base Breakdown Voltage       | $V_{(BR)EBO}$ | 6   |      | V    | $I_E=10\mu\text{A}, I_C=0$                                               |
| Collector Cutoff Current             | $I_{CBO}$     |     | 50   | nA   | $V_{CB}=120\text{V}, I_E=0$                                              |
| Emitter Cutoff Current               | $I_{EBO}$     |     | 50   | nA   | $V_{EB}=4\text{V}, I_C=0$                                                |
| DC Current Gain                      | $h_{FE1}$     | 80  |      |      | $V_{CE}=5\text{V}, I_C=1\text{mA}$                                       |
|                                      | $h_{FE2}$     | 80  | 250  |      | $V_{CE}=5\text{V}, I_C=10\text{mA}$                                      |
|                                      | $h_{FE3}$     | 30  |      |      | $V_{CE}=5\text{V}, I_C=50\text{mA}$                                      |
| Collector-Emitter Saturation Voltage | $V_{CE(sat)}$ |     | 0.15 | V    | $I_C=10\text{mA}, I_B=1\text{mA}$                                        |
|                                      | $V_{CE(sat)}$ |     | 0.2  | V    | $I_C=50\text{mA}, I_B=5\text{mA}$                                        |
| Base-Emitter Voltage                 | $V_{BE(sat)}$ |     | 1    | V    | $I_C=10\text{mA}, I_B=1\text{mA}$                                        |
|                                      | $V_{BE(sat)}$ |     | 1    | V    | $I_C=50\text{mA}, I_B=5\text{mA}$                                        |
| Transition Frequency                 | $f_T$         | 100 | 300  | MHz  | $V_{CE}=10\text{V}, I_C=10\text{mA}, f=100\text{MHz}$                    |
| Collector Output Capacitance         | $C_{ob}$      |     | 6    | pF   | $V_{CB}=10\text{V}, I_E=0, f=1\text{MHz}$                                |
| Noise Figure                         | NF            |     | 8    | dB   | $V_{CE}=5\text{V}, I_C=0.2\text{mA}, f=1\text{kHz}, R_S=1\text{k}\Omega$ |

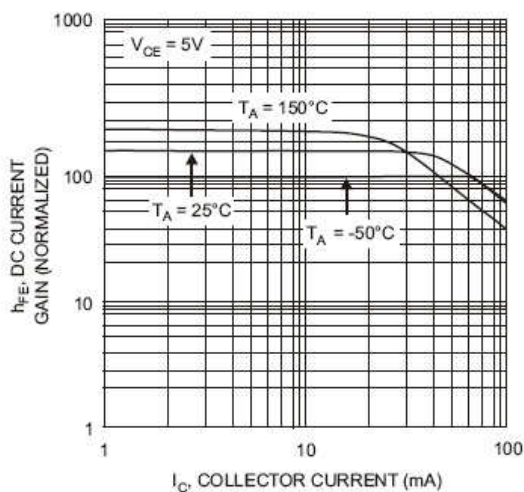
## CHARACTERISTIC CURVES



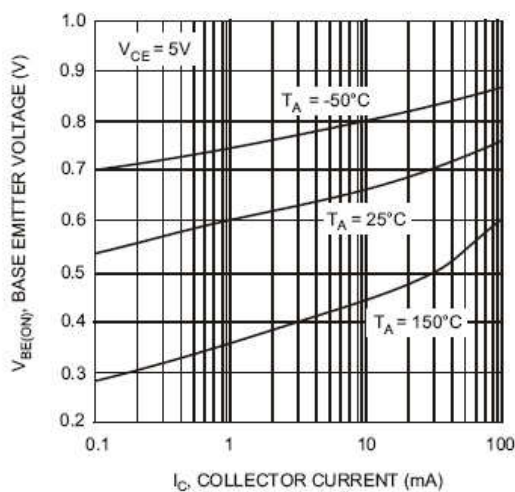
$T_A$ , AMBIENT TEMPERATURE (°C)  
Fig. 1, Max Power Dissipation vs Ambient Temperature



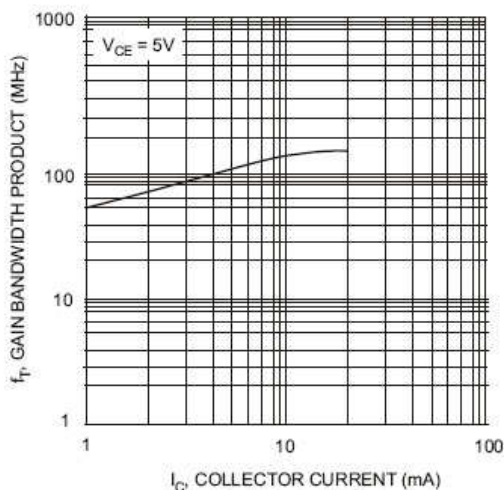
$I_C$ , COLLECTOR CURRENT (mA)  
Fig. 2, Collector Emitter Saturation Voltage vs. Collector Current



$I_C$ , COLLECTOR CURRENT (mA)  
Fig. 3, DC Current Gain vs Collector Current



$I_C$ , COLLECTOR CURRENT (mA)  
Fig. 4, Base Emitter Voltage vs. Collector Current



$I_C$ , COLLECTOR CURRENT (mA)  
Fig. 5, Gain Bandwidth Product vs. Collector Current