JIANGSU CHANGJIANG ELECTRONICS TECHNOLOGY CO.,LTD

# SOT-23 Plastic-Encapsulate Transistors

## 3DK2222A TRANSISTOR ( NPN )

**SOT-23**


1. BASE
2.EMITTER
3.COLLECTOR

**FEATURES**

- **Epitaxial planar die construction**
- **Complementary PNP Type available(MMBT2907ALT1)**

**MARKING: 1P1**

**MAXIMUM RATINGS*** $T_A$=25℃ unless otherwise noted

| Symbol | Parameter | Value | Units |
|---|---|---|---|
| $V_{CBO}$ | Collector-Base Voltage | 75 | V |
| $V_{CEO}$ | Collector-Emitter Voltage | 40 | V |
| $V_{EBO}$ | Emitter-Base Voltage | 6 | V |
| $I_C$ | Collector Current -Continuous | 600 | mA |
| $P_C$ | Collector Dissipation | 300 | mW |
| $T_J$, $T_{stg}$ | Junction and Storage Temperature | -55to+150 | ℃ |

**ELECTRICAL CHARACTERISTICS（Tamb=25℃ unless otherwise specified）**

| Parameter | Symbol | Test conditions | MIN | TYP | MAX | UNIT |
|---|---|---|---|---|---|---|
| **Collector-base breakdown voltage** | $V_{(BR)CBO}$ | $I_C$= 10μA, $I_E$=0 | 75 | | | V |
| **Collector-emitter breakdown voltage** | $V_{(BR)CEO}$ | $I_C$= 10mA, $I_B$=0 | 40 | | | V |
| **Emitter-base breakdown voltage** | $V_{(BR)EBO}$ | $I_E$=10μA, $I_C$=0 | 6 | | | V |
| **Collector cut-off current** | $I_{CBO}$ | $V_{CB}$=70 V , $I_E$=0 | | | 0.1 | μA |
| **Collector cut-off current** | $I_{CEX}$ | $V_{CE}$=60V , $V_{BE(off)}$=3V | | | 0.1 | μA |
| **Emitter cut-off current** | $I_{EBO}$ | $V_{EB}$= 3V , $I_C$=0 | | | 0.1 | μA |
| **DC current gain** | $H_{FE(1)}$ | $V_{CE}$=10V, $I_C$= 150mA | 100 | | 300 | |
| | $H_{FE(2)}$ | $V_{CE}$=10V, $I_C$= 0.1mA | 40 | | | |
| | $H_{FE(3)}$ | $V_{CE}$=10V, $I_C$= 500mA | 42 | | | |
| **Collector-emitter saturation voltage** | $V_{CE}$(sat) | $I_C$=500 mA, $I_B$= 50mA<br>$I_C$=150 mA, $I_B$=15mA | | | 0.6<br>0.3 | V |
| **Base-emitter saturation voltage** | $V_{BE}$(sat) | $I_C$=500 mA, $I_B$= 50mA | | | 1.2 | V |
| **Transition frequency** | $f_T$ | $V_{CE}$=20V, $I_C$= 20mA<br>f=100MHz | 300 | | | MHz |
| **Delay time** | $t_d$ | $V_{CC}$=30V, $V_{BE(off)}$=-0.5V<br>$I_C$=150mA , $I_{B1}$= 15mA | | | 10 | nS |
| **Rise time** | $t_r$ | | | | 25 | nS |
| **Storage time** | $t_S$ | $V_{CC}$=30V, $I_C$=150mA<br>$I_{B1}$=-$I_{B2}$=15mA | | | 225 | nS |
| **Fall time** | $t_f$ | | | | 60 | nS |

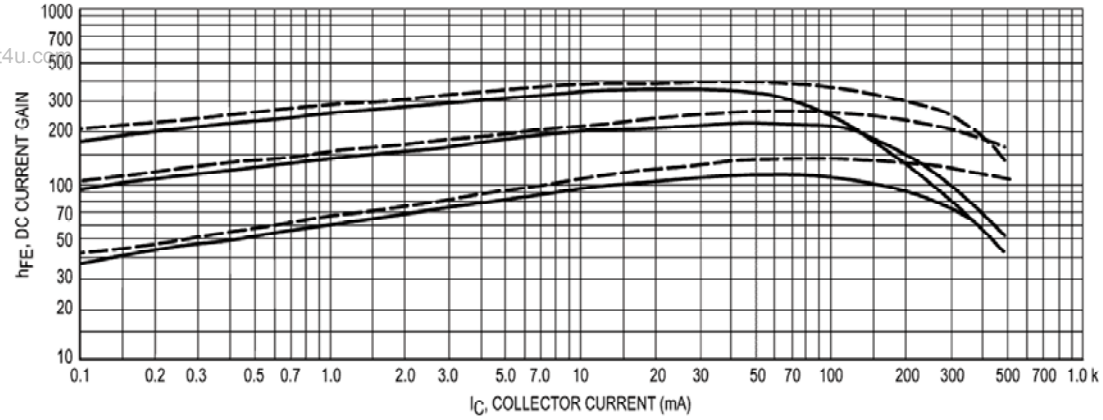


**Figure 3. DC Current Gain**

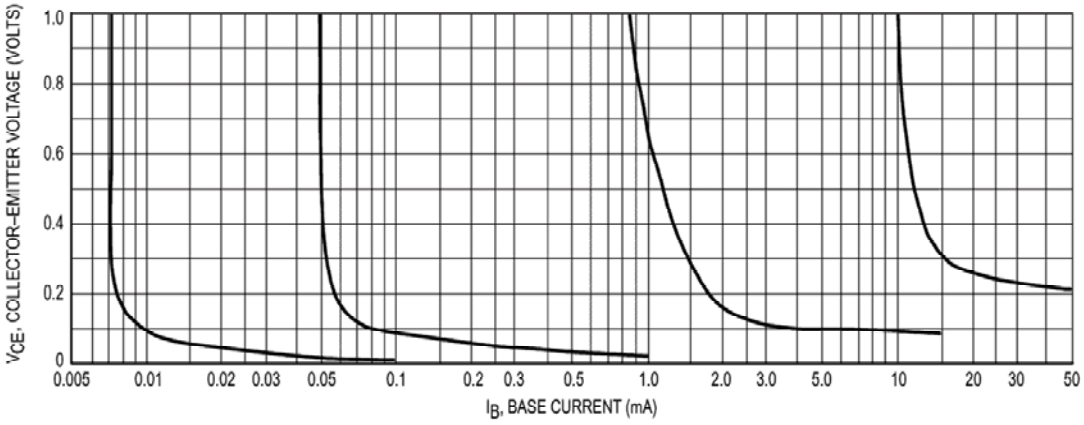


**Figure 4. Collector Saturation Region**

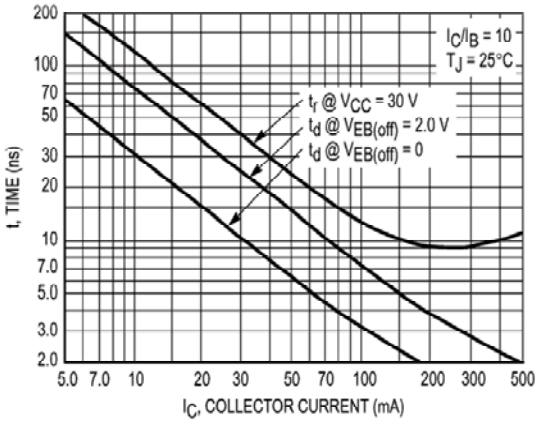


**Figure 5. Turn–On Time**

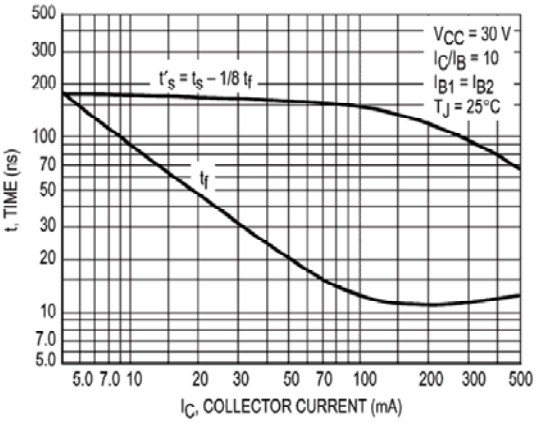


**Figure 6. Turn–Off Time**

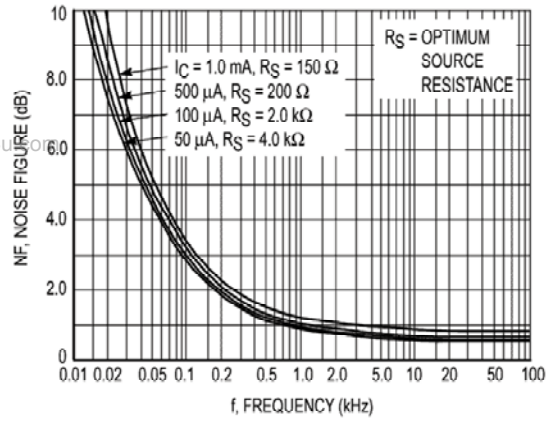


**Figure 7. Frequency Effects**

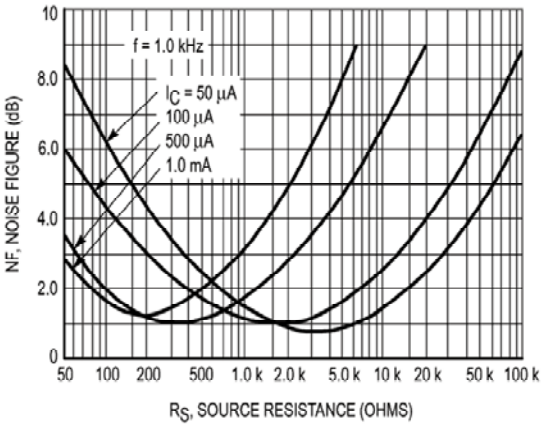


**Figure 8. Source Resistance Effects**

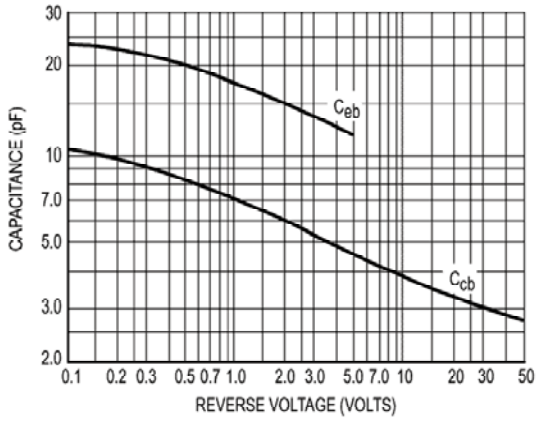


**Figure 9. Capacitances**

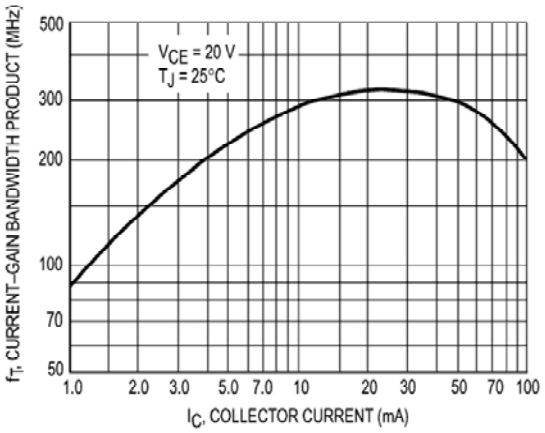


**Figure 10. Current–Gain Bandwidth Product**

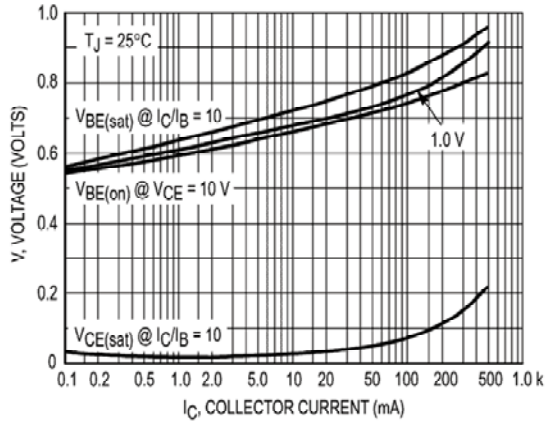


**Figure 11. "On" Voltages**

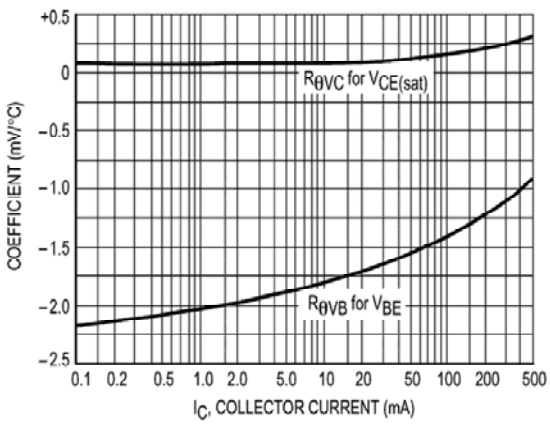


**Figure 12. Temperature Coefficients**