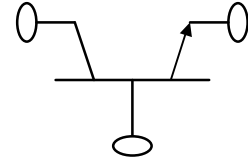


## DIE SPECIFICATION

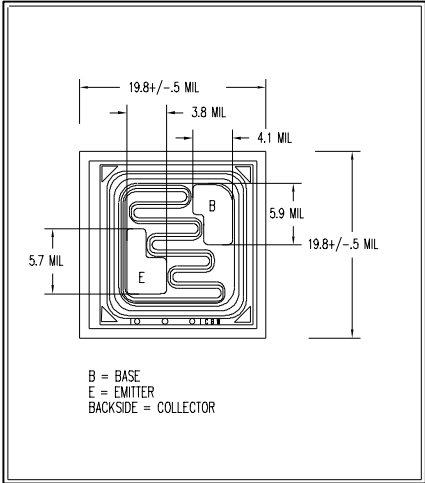
### SWITCHING TRANSISTOR NPN SILICON



#### FEATURES:

- ELECTRICAL PERFORMANCE I.A.W. MIL-PRF-19500/255
- AVAILABLE IN WAFER OR CHIP FORM FOR HYBRID APPLICATIONS
- GENERAL PURPOSE-HIGH SPEED SWITCHING APPLICATIONS
- LOW  $V_{CE(sat)}$ : .3V @  $I_C = 150 \text{ mAdc}$

**PHYSICAL DIMENSIONS**



**Absolute Maximum Ratings:**

| Symbol         | Parameter                                      | Limit       | Unit |
|----------------|--|-------------|------|
| $V_{ce}$       | Collector-Emitter Voltage                      | 50          | Vdc  |
| $V_{cb}$       | Collector-Base Voltage                         | 75          | Vdc  |
| $V_{eb}$       | Emitter-Base Voltage                           | 6.0         | Vdc  |
| $I_c$          | Collector Current- Continuous                  | 800         | mAdc |
| $T_j, T_{stg}$ | Operating Junction & Storage Temperature Range | -65 to +200 | °C   |

**Packaging Options:**  
W: Wafer (100% probed)    U: Wafer (sample probed)  
D: Chip (Waffle Pack)      B: Chip (Vial)  
V: Chip (Waffle Pack, 100% visually inspected)    X: Other

**Processing Options:**  
Standard: Capable of JANTXV applications (No Suffix)  
Suffix C: Commercial  
Suffix S: Capable of S-Level equivalent applications

**Metallization Options:**  
Standard: Al Top / Au Backside (No Dash #)  
Dash 1: Al Top / TiPdAg Backside

**ORDERING INFORMATION:**  
PART #: 2N2222A\_\_ - \_\_  
First Suffix Letter: Packaging Option  
Second Suffix Letter: Processing Option  
Dash #: Metallization Option

## Electrical Characteristics @ $T_j = 25\text{ }^\circ\text{C}$

| Symbol                              | Parameter   | Conditions   | Min | Max | Unit |
|-------------------------------------|---|--|-----|-----|------|
| <b>OFF CHARACTERISTICS</b>          |   |  |     |     |      |
| V(BR)CBO                            | Breakdown Voltage, Collector to Base                      | Bias Cond. D, $I_C=10\mu\text{A}$ dc                                 | 75  |     | Vdc  |
| V(BR)EBO                            | Breakdown Voltage, Emitter to Base                        | Bias Cond. D, $I_E=10\mu\text{A}$ dc                                 | 6   |     | Vdc  |
| V(BR)CEO                            | Breakdown Voltage, Collector to Emitter                   | Bias Cond. D, $I_C=10\text{mA}$ dc, pulsed                           | 50  |     | Vdc  |
| ICES                                | Collector to Emitter Cutoff Current                       | Bias Cond. D, $V_{CE}=50\text{V}$ dc                                 |     | 50  | nAdc |
| ICBO1                               | Collector to Base Cutoff Current                          | Bias Cond. D, $V_{CB}=60\text{V}$ dc                                 |     | 10  | nAdc |
| IEBO                                | Emitter to Base Cutoff Current                            | Bias Cond. D, $V_{EB}=4\text{V}$ dc                                  |     | 10  | nAdc |
| <b>ON CHARACTERISTICS</b>           |   |  |     |     |      |
| hFE1                                | Forward-Current Transfer Ratio                            | $V_{CE}=10\text{V}$ dc, $I_C=0.1\text{mA}$ dc                        | 50  |     |      |
| hFE2                                | Forward-Current Transfer Ratio                            | $V_{CE}=10\text{V}$ dc, $I_C=1.0\text{mA}$ dc                        | 75  | 325 |      |
| hFE3                                | Forward-Current Transfer Ratio                            | $V_{CE}=10\text{V}$ dc, $I_C=10\text{mA}$ dc                         | 100 |     |      |
| hFE4                                | Forward-Current Transfer Ratio                            | $V_{CE}=10\text{V}$ dc, $I_C=150\text{mA}$ dc, pulsed                | 100 | 300 |      |
| hFE5                                | Forward-Current Transfer Ratio                            | $V_{CE}=10\text{V}$ dc, $I_C=500\text{mA}$ dc, pulsed                | 30  |     |      |
| VCE(sat)1                           | Collector to Emitter Saturation Voltage                   | $I_C=150\text{mA}$ dc, $I_B=15\text{mA}$ dc, pulsed                  |     | 0.3 | Vdc  |
| VCE(sat)2                           | Collector to Emitter Saturation Voltage                   | $I_C=500\text{mA}$ dc, $I_B=50\text{mA}$ dc, pulsed                  |     | 1   | Vdc  |
| VBE(sat)1                           | Base to Emitter Saturation Voltage                        | $I_C=150\text{mA}$ dc, $I_B=15\text{mA}$ dc, pulsed                  | 0.6 | 1.2 | Vdc  |
| VBE(sat)2                           | Base to Emitter Saturation Voltage                        | $I_C=500\text{mA}$ dc, $I_B=50\text{mA}$ dc, pulsed                  |     | 2   | Vdc  |
| <b>SMALL SIGNAL CHARACTERISTICS</b> |   |  |     |     |      |
| hfe                                 | Short Circuit Forward Current Xfer Ratio                  | $V_{CE}=10\text{V}$ dc, $I_C=1\text{mA}$ dc, $f=1\text{kHz}$         | 50  |     |      |
| /hfe/                               | Magnitude of Short Circuit Forward Current Transfer Ratio | $V_{CE}=20\text{V}$ dc, $I_C=50\text{mA}$ dc, $f=100\text{MHz}$      | 2.5 |     |      |
| Cobo                                | Output Capacitance  | $V_{CB}=10\text{V}$ dc, $I_E=0$ , $100\text{kHz} < f < 1\text{MHz}$  |     | 8   | pF   |
| Cibo                                | Input Capacitance   | $V_{EB}=2.0\text{V}$ dc, $I_C=0$ , $100\text{kHz} < f < 1\text{MHz}$ |     | 25  | pF   |
| <b>SWITCHING CHARACTERISTICS</b>    |   |  |     |     |      |
| ton                                 | Saturated Turn-on Time                                    | As defined in 19500/255 Figure 8                                     |     | 45  | nS   |
| toff                                | Saturated Turn-off Time                                   | As defined in 19500/255 Figure 9                                     |     | 300 | nS   |