

# XN2210

## Silicon NPN epitaxial planer transistor

For switching/digital circuits

### Features

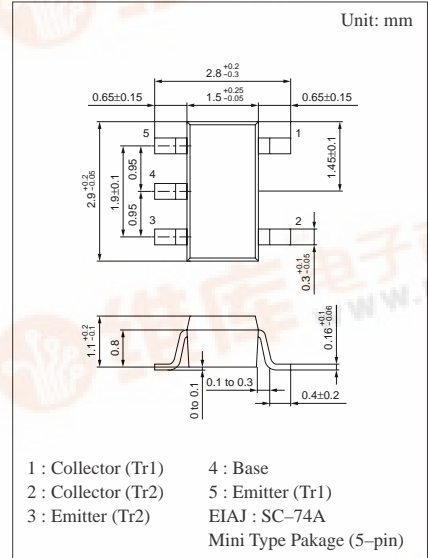
- Two elements incorporated into one package.  
(Base-coupled transistors with built-in resistor)
- Reduction of the mounting area and assembly cost by one half.

### Basic Part Number of Element

- UN1210 × 2 elements

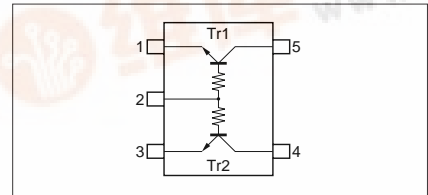
### Absolute Maximum Ratings (Ta=25°C)

|                   | Parameter                    | Symbol    | Rated       | Unit |
|-------------------|------------------------------|-----------|-------------|------|
| Rating of element | Collector to base voltage    | $V_{CBO}$ | 50          | V    |
|                   | Collector to emitter voltage | $V_{CEO}$ | 50          | V    |
|                   | Collector current            | $I_C$     | 100         | mA   |
| Overall           | Total power dissipation      | $P_T$     | 300         | mW   |
|                   | Junction temperature         | $T_j$     | 150         | °C   |
|                   | Storage temperature          | $T_{stg}$ | -55 to +150 | °C   |



Marking Symbol: 9Q

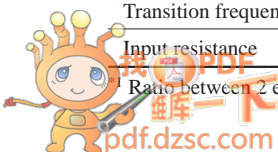
Internal Connection



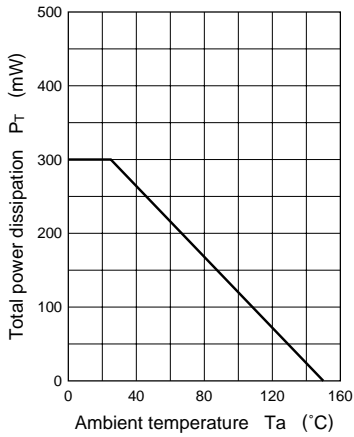
### Electrical Characteristics (Ta=25°C)

| Parameter                               | Symbol                      | Conditions                                | min  | typ  | max  | Unit       |
|---|-----------------------------|---|------|------|------|------------|
| Collector to base voltage               | $V_{CBO}$                   | $I_C = 10\mu A, I_E = 0$                  | 50   |      |      | V          |
| Collector to emitter voltage            | $V_{CEO}$                   | $I_C = 2mA, I_B = 0$                      | 50   |      |      | V          |
| Collector cutoff current                | $I_{CBO}$                   | $V_{CB} = 50V, I_E = 0$                   |      |      | 0.1  | $\mu A$    |
|   | $I_{CEO}$                   | $V_{CE} = 50V, I_B = 0$                   |      |      | 0.5  | $\mu A$    |
| Emitter cutoff current                  | $I_{EBO}$                   | $V_{EB} = 6V, I_C = 0$                    |      |      | 0.01 | mA         |
| Forward current transfer ratio          | $h_{FE}$                    | $V_{CE} = 10V, I_C = 5mA$                 | 160  |      | 460  |            |
| Forward current transfer $h_{FE}$ ratio | $h_{FE} (small/large)^{*1}$ | $V_{CE} = 10V, I_C = 5mA$                 | 0.5  | 0.99 |      |            |
| Collector to emitter saturation voltage | $V_{CE(sat)}$               | $I_C = 10mA, I_B = 0.3mA$                 |      |      | 0.25 | V          |
| Output voltage high level               | $V_{OH}$                    | $V_{CC} = 5V, V_B = 0.5V, R_L = 1k\Omega$ | 4.9  |      |      | V          |
| Output voltage low level                | $V_{OL}$                    | $V_{CC} = 5V, V_B = 2.5V, R_L = 1k\Omega$ |      |      | 0.2  | V          |
| Transition frequency                    | $f_T$                       | $V_{CB} = 10V, I_E = -2mA, f = 200MHz$    |      | 150  |      | MHz        |
| Input resistance                        | $R_1$                       |   | -30% | 47   | +30% | k $\Omega$ |

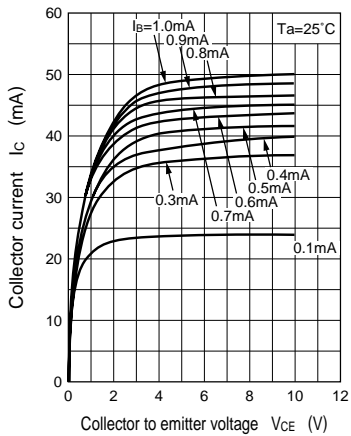
Ratio between 2 elements



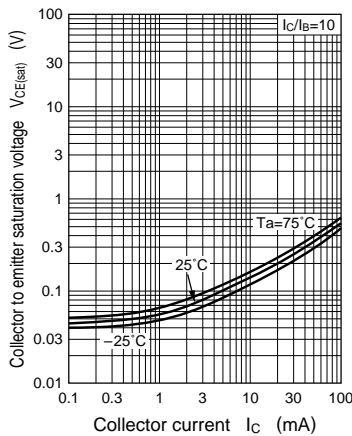
$P_T - T_a$



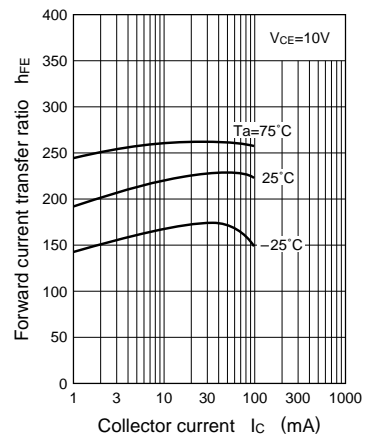
$I_C - V_{CE}$



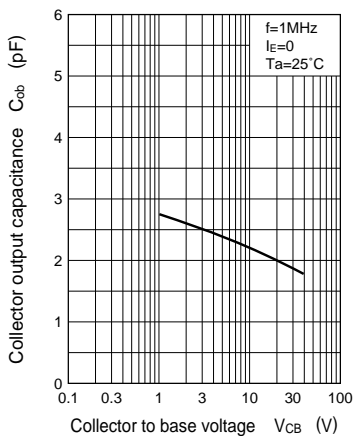
$V_{CE(sat)} - I_C$



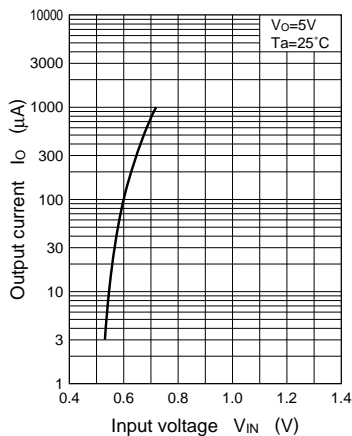
$h_{FE} - I_C$



$C_{ob} - V_{CB}$



$I_O - V_{IN}$



$V_{IN} - I_O$

