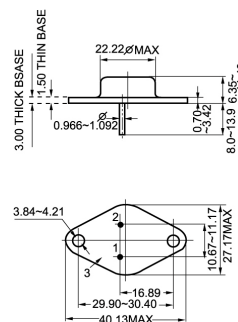


**MJ10023****Silicon NPN Power Darlington Transistor****GENERAL DESCRIPTION**

Darlington transistor are designed for use as general purpose amplifiers, switching and motor control applications.



TO-3

**QUICK REFERENCE DATA**

| SYMBOL      | PARAMETER                             | CONDITIONS                                | TYP | MAX | UNIT    |
|-------------|---------------------------------------|-------------------------------------------|-----|-----|---------|
| $V_{CESM}$  | Collector-emitter voltage peak value  | $V_{BE} = 0V$                             | -   | 600 | V       |
| $V_{CEO}$   | Collector-emitter voltage (open base) |                                           | -   | 400 | V       |
| $I_C$       | Collector current (DC)                |                                           | -   | 40  | A       |
| $I_{CM}$    | Collector current peak value          |                                           | -   | 80  | A       |
| $P_{tot}$   | Total power dissipation               | $T_{mb} \leq 25^\circ C$                  | -   | 250 | W       |
| $V_{CEsat}$ | Collector-emitter saturation voltage  | $I_C = 20A; I_B = 1.2A$                   | -   | 6.0 | V       |
| $I_{csat}$  | Collector saturation current          | $f = 16KHz$                               | -   | -   | A       |
| $V_F$       | Diode forward voltage                 | $I_F = 20A$                               | -   | 5   | V       |
| $t_f$       | Fall time                             | $I_C = 20A, I_{B1} = 1.2A, V_{CC} = 250V$ | -   | 1.0 | $\mu s$ |

**LIMITING VALUES**

| SYMBOL     | PARAMETER                             | CONDITIONS               | MIN | MAX | UNIT       |
|------------|---------------------------------------|--------------------------|-----|-----|------------|
| $V_{CESM}$ | Collector-emitter voltage peak value  | $V_{BE} = 0V$            | -   | 600 | V          |
| $V_{CEO}$  | Collector-emitter voltage (open base) |                          | -   | 400 | V          |
| $I_C$      | Collector current (DC)                |                          | -   | 40  | A          |
| $I_{CM}$   | Collector current peak value          |                          | -   | 80  | A          |
| $I_B$      | Base current (DC)                     |                          | -   | 20  | A          |
| $I_{BM}$   | Base current peak value               |                          | -   | 40  | A          |
| $P_{tot}$  | Total power dissipation               | $T_{mb} \leq 25^\circ C$ | -   | 250 | W          |
| $T_{sta}$  | Storage temperature                   |                          | -55 | 150 | $^\circ C$ |
| $T_j$      | Junction temperature                  |                          | -   | 150 | $^\circ C$ |

**ELECTRICAL CHARACTERISTICS**

| SYMBOL        | PARAMETER                                     | CONDITIONS                                                   | TYP | MAX | UNIT    |
|---------------|-----------------------------------------------|--------------------------------------------------------------|-----|-----|---------|
| $I_{CE}$      | Collector cut-off current                     | $V_{BE} = 0V; V_{CE} = V_{CEmax}$                            | -   | 2.0 | mA      |
| $I_{CES}$     |                                               | $V_{BE} = 0V; V_{CE} = V_{CEmax}$                            | -   | 5.0 | mA      |
| $V_{CEOsust}$ | Collector-emitter sustaining voltage          | $T_j = 125^\circ C$<br>$I_B = 0A; I_C = 100mA$<br>$L = 25mH$ | -   |     | V       |
| $V_{CEsat}$   | Collector-emitter saturation voltages         | $I_C = 20A; I_B = 1.2A$                                      | -   | 6   | V       |
| $V_{BEsat}$   | Base-emitter saturation voltage               | $I_C = 20A; I_B = 1.2A$                                      | -   | 3.5 | V       |
| $h_{FE}$      | DC current gain                               | $I_C = 10A; V_{CE} = 5V$                                     | 300 |     |         |
| $V_F$         | Diode forward voltage                         | $I_F = 20A$                                                  | 2.5 | 5.0 | V       |
| $f_T$         | Transition frequency at $f = 5MHz$            |                                                              |     | -   | MHz     |
| $C_c$         | Collector capacitance at $f = 1MHz$           | $V_{CB} = 10V$                                               |     | 600 | pF      |
| $t_s$         | Switching times(16KHz line deflecton circuit) | $I_C = 20A, I_{B1} = 1.2A, V_{CC} = 250V$                    | 1.0 | 3.0 | $\mu s$ |
| $t_f$         | Turn-off storage time    Turn-off fall time   | $I_C = 20A, I_{B1} = 1.2A, V_{CC} = 250V$                    | 0.3 | 1.0 | $\mu s$ |