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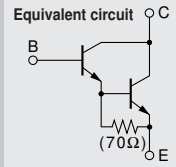
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# Darlington

# 2SD2438



Silicon NPN Triple Diffused Planar Transistor (Complement to type 2SB1587)

Application : Audio, Series Regulator and General Purpose

**Absolute maximum ratings** (Ta=25°C)

| Symbol           | Ratings                  | Unit |
|------------------|--------------------------|------|
| V <sub>CB0</sub> | 160                      | V    |
| V <sub>CE0</sub> | 150                      | V    |
| V <sub>EB0</sub> | 5                        | V    |
| I <sub>C</sub>   | 8                        | A    |
| I <sub>B</sub>   | 1                        | A    |
| P <sub>C</sub>   | 75(T <sub>C</sub> =25°C) | W    |
| T <sub>J</sub>   | 150                      | °C   |
| T <sub>stg</sub> | -55 to +150              | °C   |

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

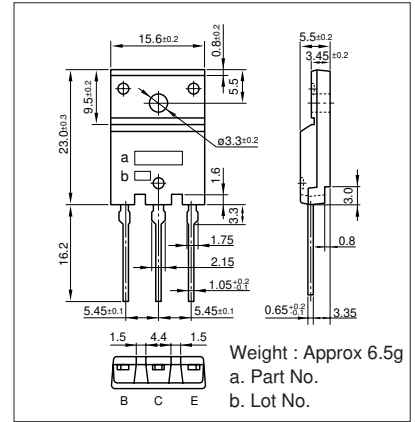
| Symbol               | Conditions                                | Ratings  | Unit |
|----------------------|---|----------|------|
| I <sub>CB0</sub>     | V <sub>CB</sub> =160V                     | 100max   | μA   |
| I <sub>EB0</sub>     | V <sub>EB</sub> =5V                       | 100max   | μA   |
| V <sub>(BR)CEO</sub> | I <sub>C</sub> =30mA                      | 150min   | V    |
| h <sub>FE</sub>      | V <sub>CE</sub> =4V, I <sub>C</sub> =6A   | 5000min* |      |
| V <sub>CE(sat)</sub> | I <sub>C</sub> =6A, I <sub>B</sub> =6mA   | 2.5max   | V    |
| V <sub>BE(sat)</sub> | I <sub>C</sub> =6A, I <sub>B</sub> =6mA   | 3.0max   | V    |
| f <sub>T</sub>       | V <sub>CE</sub> =12V, I <sub>E</sub> =-1A | 80typ    | MHz  |
| C <sub>OB</sub>      | V <sub>CB</sub> =10V, f=1MHz              | 85typ    | pF   |

\*h<sub>FE</sub> Rank  $\bar{O}$ (5000 to 12000), P(6500 to 20000), Y(15000 to 30000)

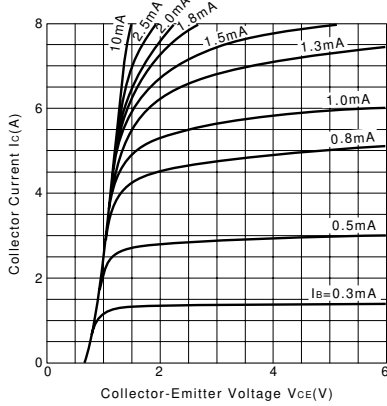
**Typical Switching Characteristics (Common Emitter)**

| V <sub>CC</sub> (V) | R <sub>L</sub> (Ω) | I <sub>C</sub> (A) | V <sub>BB1</sub> (V) | V <sub>BB2</sub> (V) | I <sub>B1</sub> (mA) | I <sub>B2</sub> (mA) | t <sub>on</sub> (μs) | t <sub>stg</sub> (μs) | t <sub>f</sub> (μs) |
|---------------------|--------------------|--------------------|----------------------|----------------------|----------------------|----------------------|----------------------|-----------------------|---------------------|
| 60                  | 10                 | 6                  | 10                   | -2                   | 6                    | -6                   | 0.6typ               | 10.0typ               | 0.9typ              |

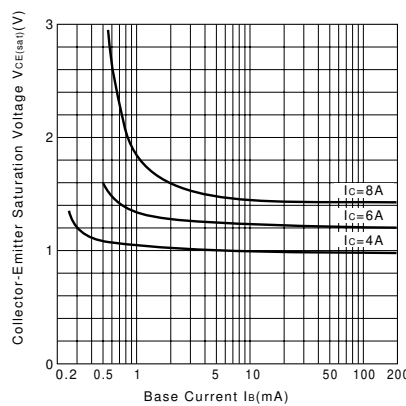
**External Dimensions FM100(TO3PF)**



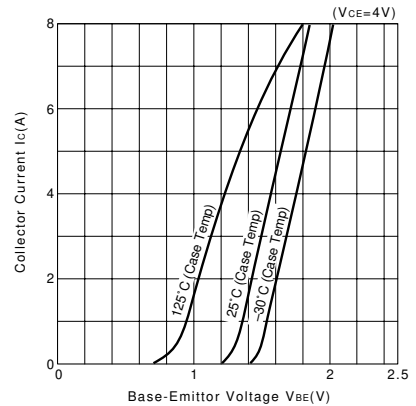
**I<sub>C</sub>-V<sub>CE</sub> Characteristics (Typical)**



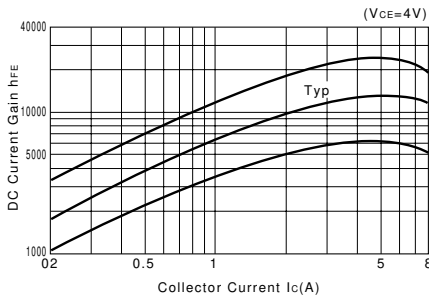
**V<sub>CE(sat)</sub>-I<sub>B</sub> Characteristics (Typical)**



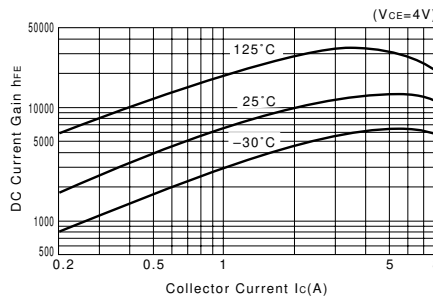
**I<sub>C</sub>-V<sub>BE</sub> Temperature Characteristics (Typical)**



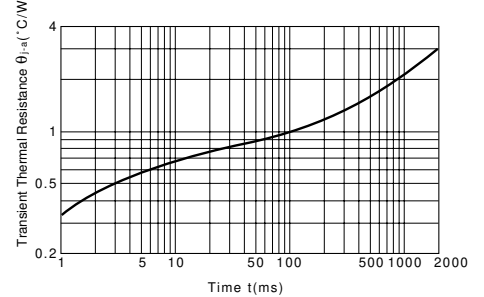
**h<sub>FE</sub>-I<sub>C</sub> Characteristics (Typical)**



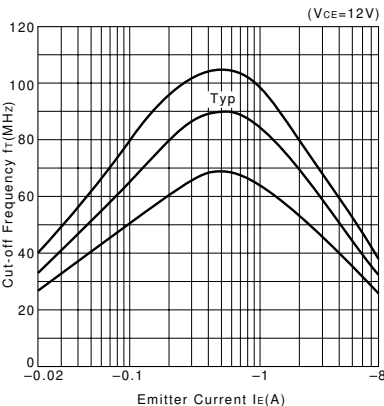
**h<sub>FE</sub>-I<sub>C</sub> Temperature Characteristics (Typical)**



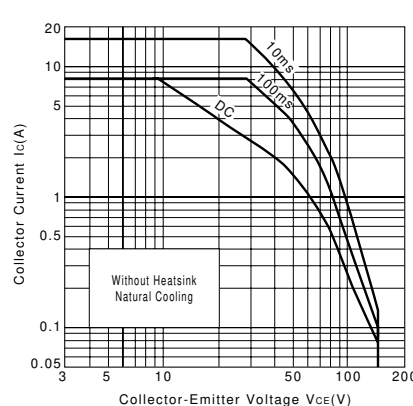
**θ<sub>j-a</sub>-t Characteristics**



**f<sub>T</sub>-I<sub>E</sub> Characteristics (Typical)**



**Safe Operating Area (Single Pulse)**



**P<sub>C</sub>-T<sub>a</sub> Derating**

