


**SOT - 23**


1. BASE
2. EMITTER
3. COLLECTOR

## FMMT491 TRANSISTOR (NPN)

### FEATURES

Low equivalent on-resistance

Marking :491

MAXIMUM RATINGS( $T_a=25^{\circ}\text{C}$  unless otherwise noted)

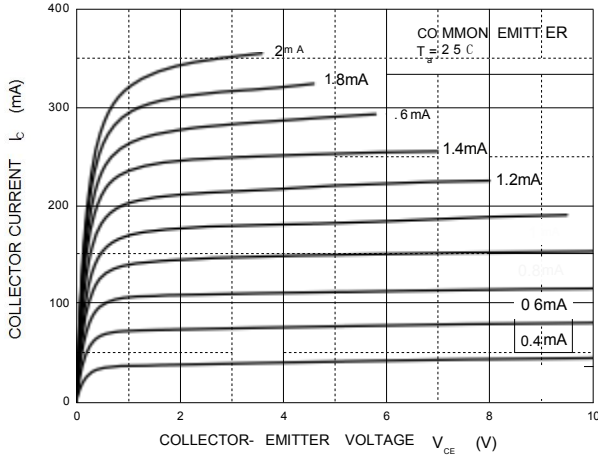
| Symbol    | Parameter                     | Value   | Unit               |
|-----------|-------------------------------|---------|--------------------|
| $V_{CB0}$ | Collector-Base Voltage        | 80      | V                  |
| $V_{CE0}$ | Collector-Emitter Voltage     | 60      | V                  |
| $V_{EB0}$ | Emitter-Base Voltage          | 5       | V                  |
| $I_c$     | Collector Current -Continuous | 1       | A                  |
| $P_c$     | Collector Power Dissipation   | 250     | mW                 |
| $T_j$     | Junction Temperature          | 150     | $^{\circ}\text{C}$ |
| $T_{stg}$ | Storage Temperature           | -55-150 | $^{\circ}\text{C}$ |

### ELECTRICAL CHARACTERISTICS ( $T_a=25^{\circ}\text{C}$ unless otherwise specified)

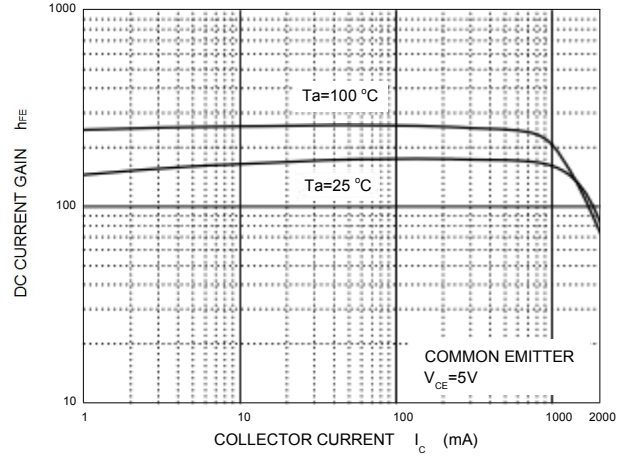
| Parameter                            | Symbol           | Test conditions                                       | Min | Typ | Max  | Unit |
|--------------------------------------|------------------|---|-----|-----|------|------|
| Collector-base breakdown voltage     | $V_{(BR)CB0}$    | $I_c=100\text{pA}, I_E=0$                             | 80  |     |      | V    |
| Collector-emitter breakdown voltage  | $V_{(BR)CE0}^1$  | $I_c=10\text{mA}, I_B=0$                              | 60  |     |      | V    |
| Emitter-base breakdown voltage       | $V_{(BR)EB0}$    | $I_E=100\text{pA}, I_c=0$                             | 5   |     |      | V    |
| Collector cut-off current            | $I_{CB0}$        | $V_{CB}=60\text{V}, I_E=0$                            |     |     | 0.1  | PA   |
| Emitter cut-off current              | $I_{EB0}$        | $V_{EB}=4\text{V}, I_c=0$                             |     |     | 0.1  | PA   |
| DC current gain                      | $h_{FE(1)}$      | $V_{CE}=5\text{V}, I_c=1\text{mA}$                    | 100 |     |      |      |
|                                      | $h_{FE(2)}^1$    | $V_{CE}=5\text{V}, I_c=500\text{mA}$                  | 100 |     | 300  |      |
|                                      | $h_{FE(3)}^1$    | $V_{CE}=5\text{V}, I_c=1\text{A}$                     | 80  |     |      |      |
|                                      | $h_{FE(4)}^1$    | $V_{CE}=5\text{V}, I_c=2\text{A}$                     | 30  |     |      |      |
| Collector-emitter saturation voltage | $V_{CE(sat)1}^1$ | $I_c=500\text{mA}, I_B=50\text{mA}$                   |     |     | 0.25 | V    |
|                                      | $V_{CE(sat)2}^1$ | $I_c=1\text{A}, I_B=100\text{mA}$                     |     |     | 0.5  | V    |
| Base-emitter saturation voltage      | $V_{BE(sat)}^1$  | $I_c=1\text{A}, I_B=100\text{mA}$                     |     |     | 1.1  | V    |
| Base-emitter voltage                 | $V_{BE}^1$       | $V_{CE}=5\text{V}, I_c=1\text{A}$                     |     |     | 1    | V    |
| Transition frequency                 | $f_T$            | $V_{CE}=10\text{V}, I_c=50\text{mA}, f=100\text{MHz}$ | 150 |     |      | MHz  |
| Collector output capacitance         | $C_{ob}$         | $V_{CB}=10\text{V}, f=1\text{MHz}$                    |     |     | 10   | pF   |

<sup>1</sup>Measured under pulsed conditions, Pulse width=300  $\mu\text{s}$ , Duty cycle $\leq$ 2%.

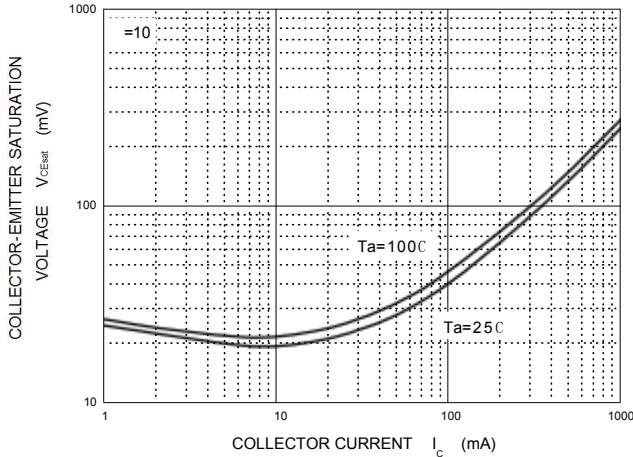
**Static Characteristic**



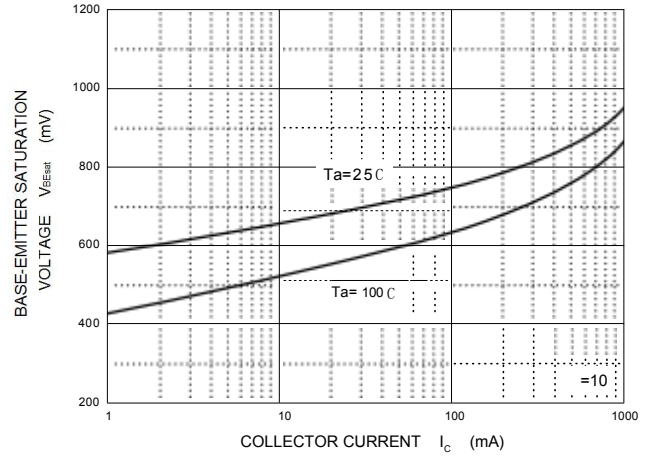
$h_{FE} - I_c$



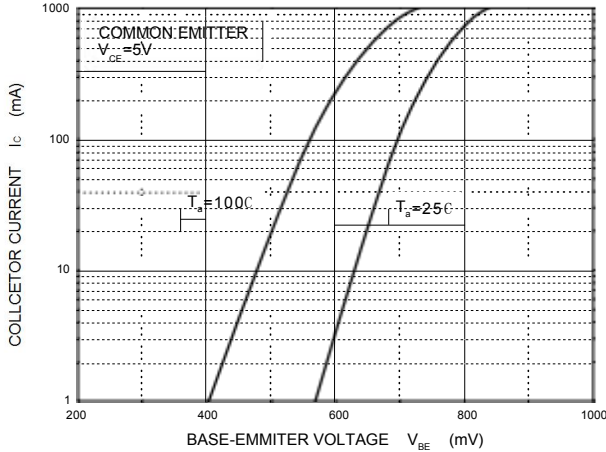
$V_{CEsat} - I_c$



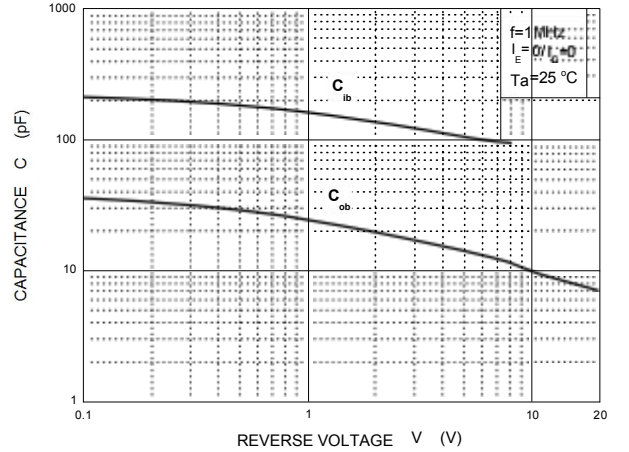
$V_{BEsat} - I_c$



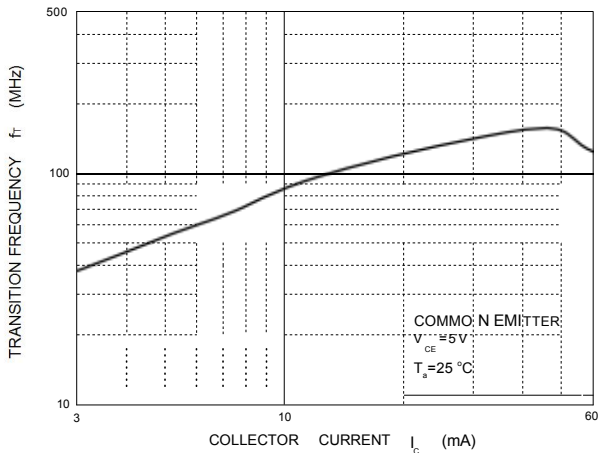
$I_c - V_{BE}$



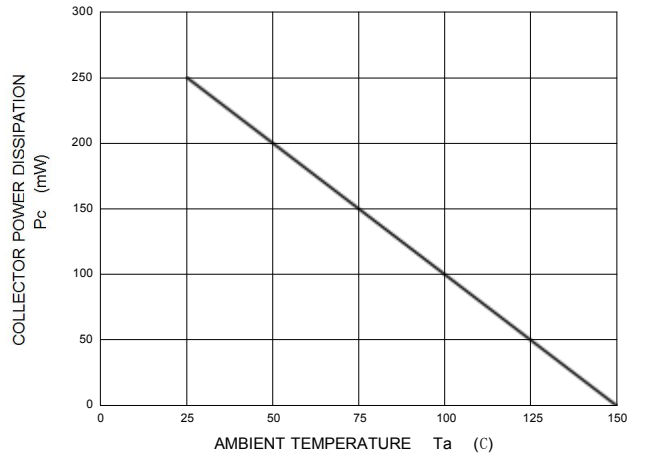
$C_{ob}/C_{ib} - V_{CB}/V_{EB}$



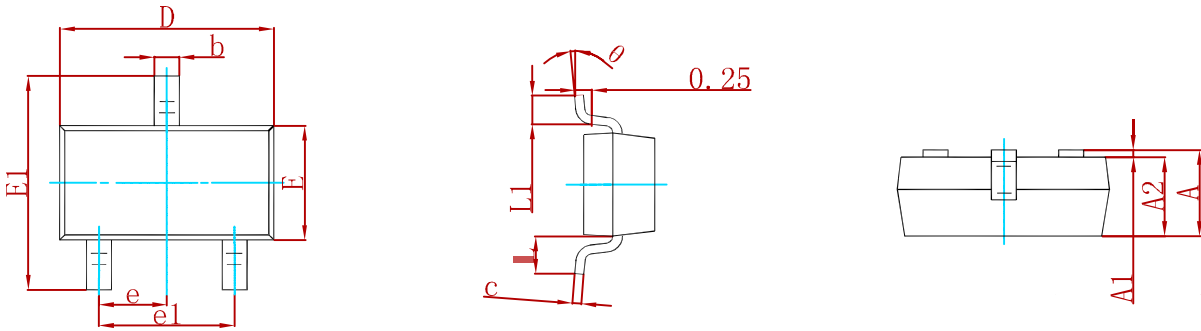
$f_T - I_c$



$P_c - T_a$

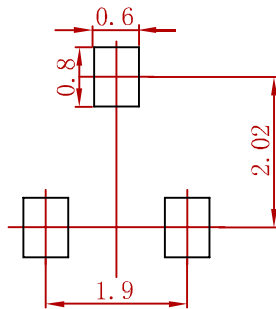


**PACKAGE MECHANICAL DATA**



| Symbol | Dimensions In Millimeters |       | Dimensions In Inches |       |
|--------|---------------------------|-------|----------------------|-------|
|        | Min                       | Max   | Min                  | Max   |
| A      | 0.900                     | 1.150 | 0.035                | 0.045 |
| A1     | 0.000                     | 0.100 | 0.000                | 0.004 |
| A2     | 0.900                     | 1.050 | 0.035                | 0.041 |
| b      | 0.300                     | 0.500 | 0.012                | 0.020 |
| c      | 0.080                     | 0.150 | 0.003                | 0.006 |
| D      | 2.800                     | 3.000 | 0.110                | 0.118 |
| E      | 1.200                     | 1.400 | 0.047                | 0.055 |
| E1     | 2.250                     | 2.550 | 0.089                | 0.100 |
| e      | 0.950 TYP                 |       | 0.037 TYP            |       |
| e1     | 1.800                     | 2.000 | 0.071                | 0.079 |
| L      | 0.550 REF                 |       | 0.022 REF            |       |
| L1     | 0.300                     | 0.500 | 0.012                | 0.020 |
| θ      | 0°                        | 8°    | 0°                   | 8°    |

**Suggested Pad Layout**



- Note:
1. Controlling dimension: in millimeters.
  2. General tolerance: ± 0.05mm.
  3. The pad layout is for reference purposes only.

**REEL SPECIFICATION**

| P/N     | PKG    | QTY  |
|---------|--------|------|
| FMMT491 | SOT-23 | 3000 |

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