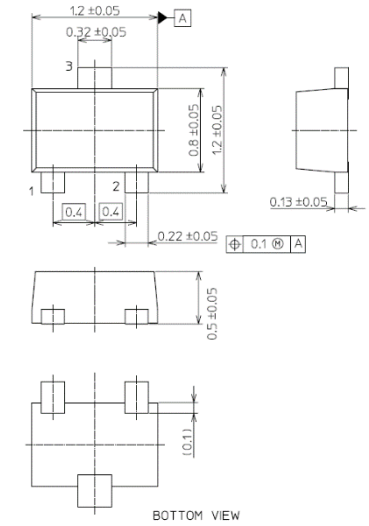
TOSHIBA Transistor Silicon NPN Epitaxial Type (PCT Process) (Bias Resistor built-in Transistor)

# RN1119MFV

Switching Applications
Inverter Circuit Applications
Interface Circuit Applications
Driver Circuit Applications

- Ultra-small package, suited to very high density mounting
- ncorporating a bias resistor into the transistor reduces the number of parts, so enabling the manufacture of ever more compact equipment and lowering assembly cost.
- A wide range of resistor values is available for use in various circuits.
- Complementary to the RN2119MFV

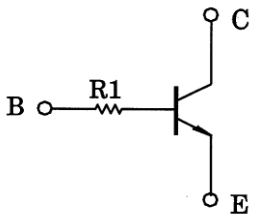
Unit: mm




| | |
|---|---|
| VESM | 1.BASE<br>2.EMITTER<br>3.COLLECTOR |
| **JEDEC** | — |
| JEITA | — |
| TOSHIBA | 1-1Q1S |

Weight: 1.5 mg (typ.)

## Equivalent Circuit

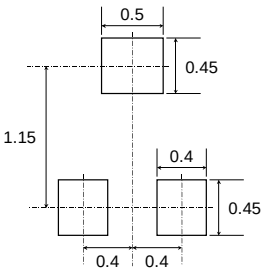



## Absolute Maximum Ratings (Ta = 25°C)

| Characterisstic | Symbol | Rating | Unit |
|---|---|---|---|
| Collector-base voltage | $V_{CBO}$ | 50 | V |
| Collector-emitter voltage | $V_{CEO}$ | 50 | V |
| Emitter-base voltage | $V_{EBO}$ | 5 | V |
| Collector current | $I_C$ | 100 | mA |
| Collector power dissipation | $P_C$ (Note1) | 150 | mW |
| Junction temperature | $T_j$ | 150 | °C |
| Storage temperature range | $T_{stg}$ | −55 to 150 | °C |

Land Pattern Dimensions
(for reference only)

Unit: mm




Note: Using continuously under heavy loads (e.g. the application of high temperature/current/voltage and the significant change in temperature, etc.) may cause this product to decrease in the reliability significantly even if the operating conditions (i.e. operating temperature/current/voltage, etc.) are within the absolute maximum ratings.
Please design the appropriate reliability upon reviewing the Toshiba Semiconductor Reliability Handbook (“Handling Precautions”/“Derating Concept and Methods”) and individual reliability data (i.e. reliability test report and estimated failure rate, etc).

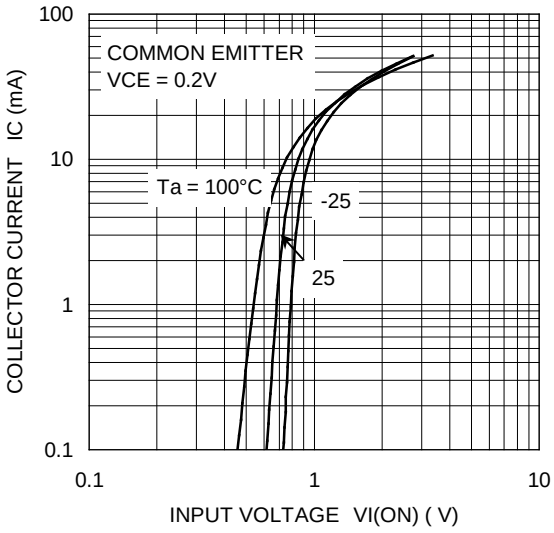
Note1 : Mounted on FR4 board (25.4 mm × 25.4 mm × 1.6 mm)

Start of commercial production
2005-09

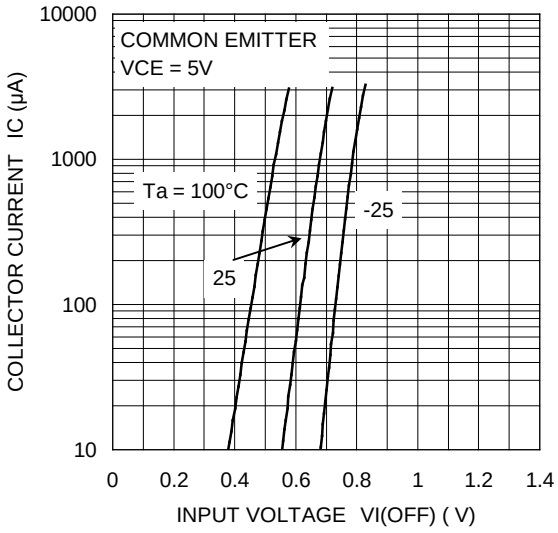
## Electrical Characteristics (Ta = 25°C)

| Characteristic | Symbol | Test Circuit | Test Condition | Min | Typ. | Max | Unit |
|---|---|---|---|---|---|---|---|
| Collector cut-off current | $I_{CBO}$ | — | $V_{CB}$ = 50 V, $I_E$ = 0 A | — | — | 100 | nA |
| Emitter cut-off current | $I_{EBO}$ | — | $V_{EB}$ = 5 V, $I_C$ = 0 A | — | — | 100 | nA |
| DC current gain | $h_{FE}$ | — | $V_{CE}$ = 5 V, $I_C$ = 1 mA | 120 | — | 700 | — |
| Collector-emitter saturation voltage | $V_{CE\ (sat)}$ | — | $I_C$ = 5 mA, $I_B$ = 0.5 mA | — | 0.1 | 0.3 | V |
| Collector output capacitance | $C_{ob}$ | — | $V_{CB}$ = 10 V, $I_E$ = 0 A, f = 1 MHz | — | 0.7 | — | pF |
| Input resistor | R1 | — | — | 0.7 | 1.0 | 1.3 | kΩ |

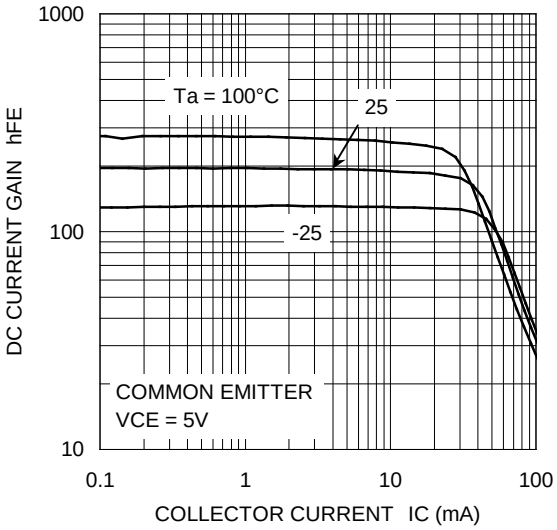
IC - VI(ON)



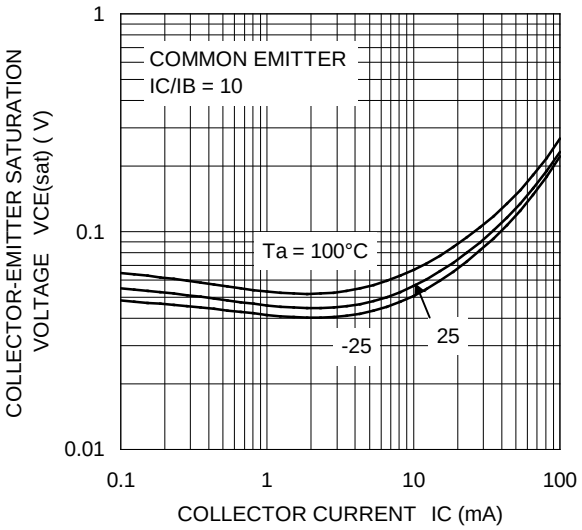

IC - VI(OFF)



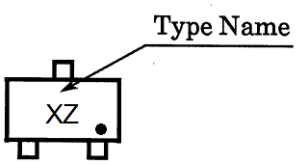

hFE - IC




VCE(sat) - IC



## Marking

| Type Name | Marking |
|---|---|
| RN1119MFV |  |

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