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

RN1130MFV

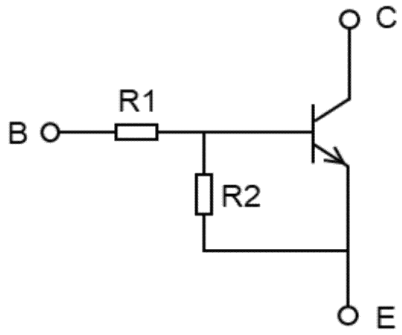
1. Applications

- Switching
- Inverter Circuits
- Interfacing
- Driver Circuits

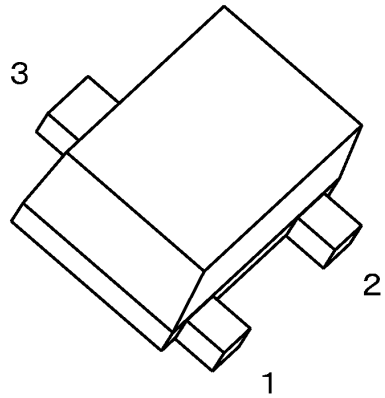
2. Features

(1) Ultra-small package, suited to very high density mounting
(2) The integrated bias resistor reduces the number of external parts required, making it possible to reduce system size and assembly time.
(3) Toshiba offers transistors with a wide range of resistance to accommodate various circuit designs.
(4) Complementary to RN2130MFV

3. Equivalent Circuit



4. Packaging and Pin Assignment



1: Base
2: Emitter
3: Collector

VESM

Start of commercial production
2005-04

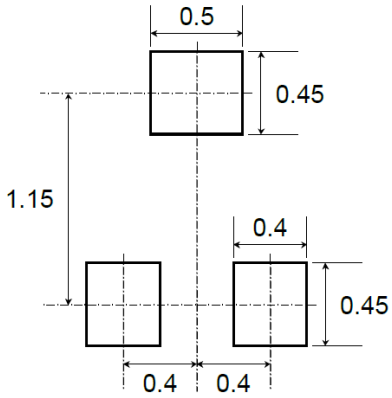
5. Absolute Maximum Ratings (Note) (Unless otherwise specified, T_a = 25 °C)

Characteristics	Symbol	Note	Rating	Unit
Collector-base voltage	V_{CBO}		50	V
Collector-emitter voltage	V_{CEO}		50	V
Emitter-base voltage	V_{EBO}		10	V
Collector current	I_C		100	mA
Collector power dissipation	P_C	(Note 1)	150	mW
Junction temperature	T_j		150	°C
Storage temperature	T_{stg}		-55 to 150	°C

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).

Note 1: Mounted on an FR4 board (25.4 mm × 25.4 mm × 1.6 mm)

6. Land Pattern Dimensions (for reference only)



Unit: mm

7. Electrical Characteristics (Unless otherwise specified, T_a = 25 °C)

Characteristics	Symbol	Test Condition	Min	Typ.	Max	Unit
Collector cut-off current	I_{CBO}	V_{CB} = 50 V, I_E = 0 mA	—	—	100	nA
	I_{CEO}	V_{CE} = 50 V, I_B = 0 mA	—	—	500	
Emitter cut-off current	I_{EBO}	V_{EB} = 10 V, I_C = 0 mA	38	—	72	μA
DC current gain	h_{FE}	V_{CE} = 5 V, I_C = 10 mA	100	—	—	—
Collector-emitter saturation voltage	$V_{CE(sat)}$	I_C = 5 mA, I_B = 0.5 mA	—	0.1	0.3	V
Input voltage (ON)	$V_{I(ON)}$	V_{CE} = 0.2 V, I_C = 5 mA	1.7	—	8.2	V
Input voltage (OFF)	$V_{I(OFF)}$	V_{CE} = 5 V, I_C = 0.1 mA	1.0	—	1.6	V
Collector output capacitance	C_{ob}	V_{CB} = 10 V, I_E = 0 mA, f = 1 MHz	—	0.7	—	pF
Input resistance	R_1	-	70	100	130	kΩ
Resistor ratio	R1/R2	-	0.8	1.0	1.2	—

8. Marking

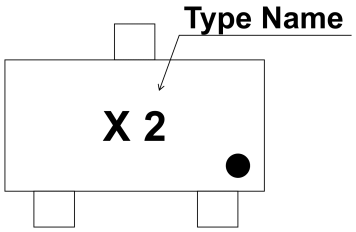


Fig. 8.1 Marking RN1130MFV

9. Characteristics Curves (Note)

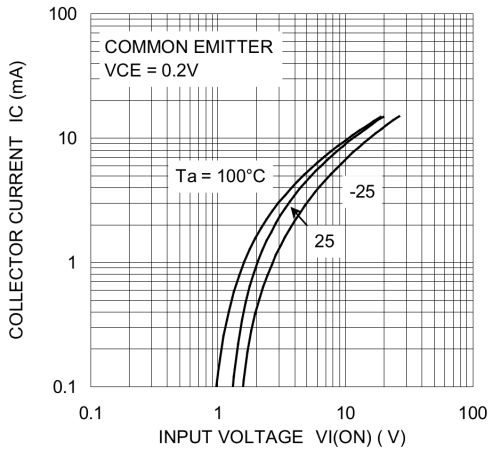


Fig. 9.1 I_C-$V_{I(ON)}$

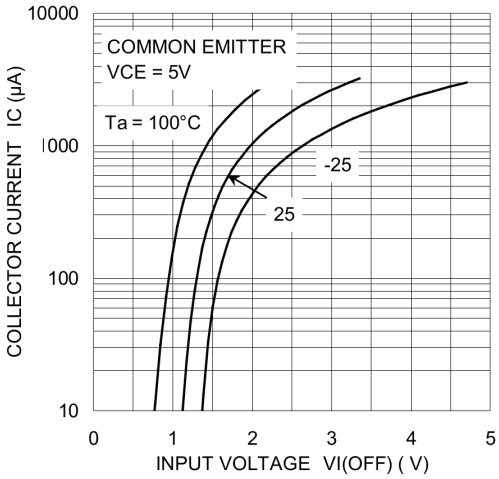


Fig. 9.2 I_C-$V_{I(OFF)}$

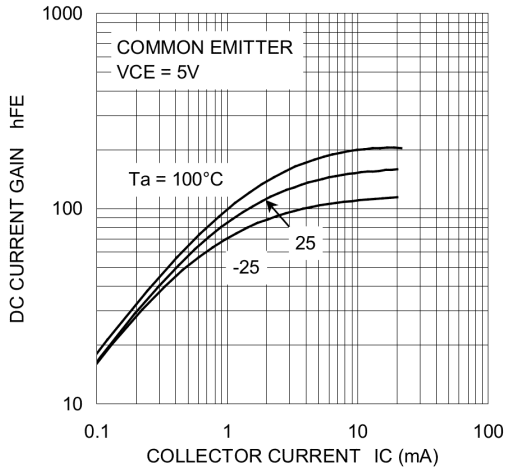


Fig. 9.3 h_{FE}-I_C

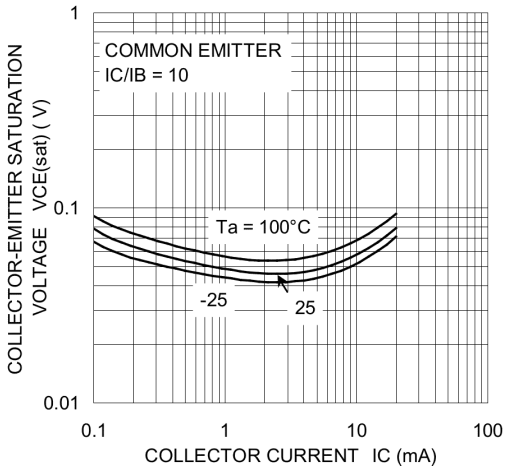
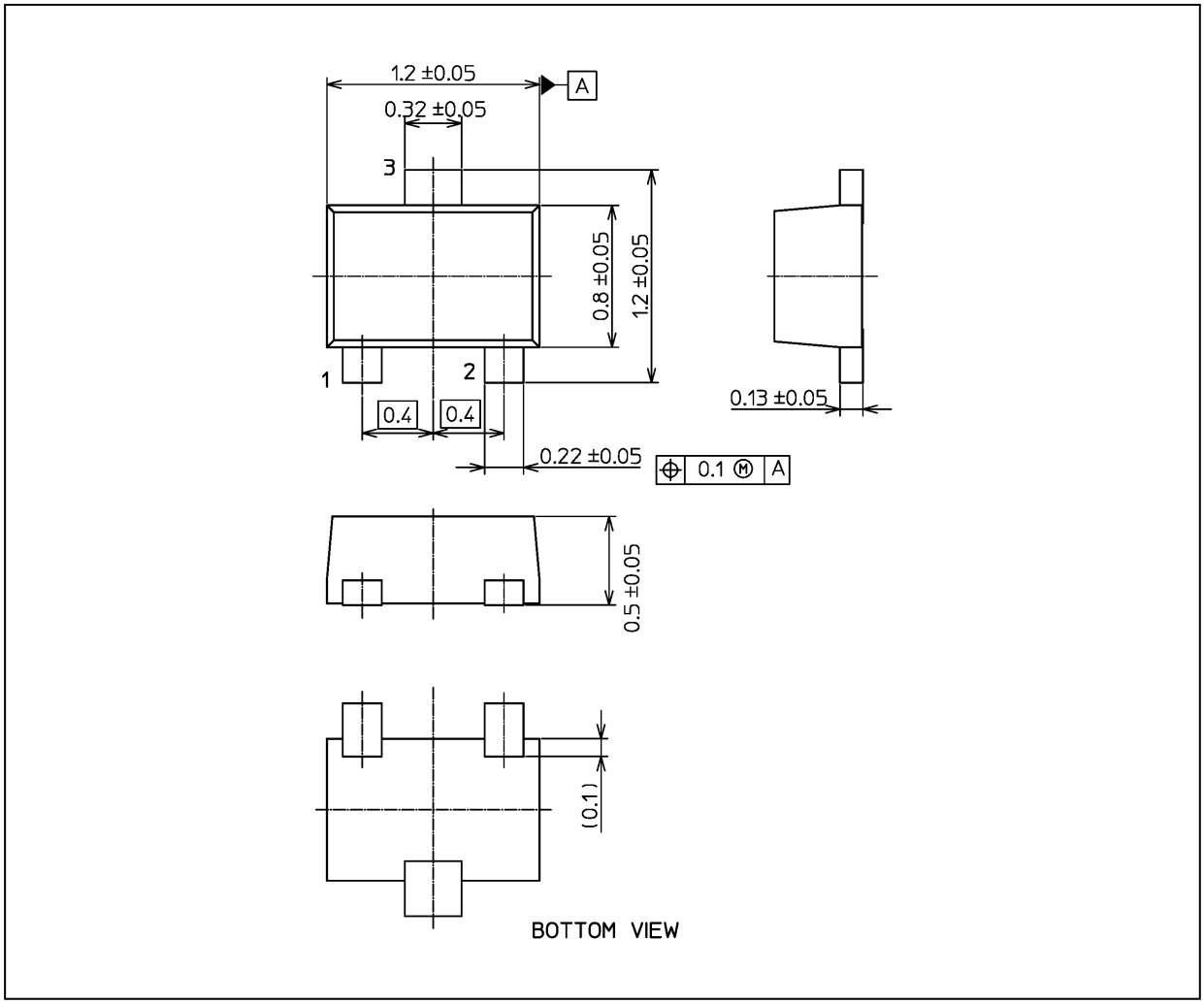


Fig. 9.4 $V_{CE(sat)}$-I_C

Note: The above characteristics curves are presented for reference only and not guaranteed by production test, unless otherwise noted.

Package Dimensions

Unit: mm



Weight: 1.5 mg (typ.)

Package Name(s)
TOSHIBA: 1-1Q1S
Nickname: VESM

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