

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

# RN1130MFV

Unit: mm

Switching Applications

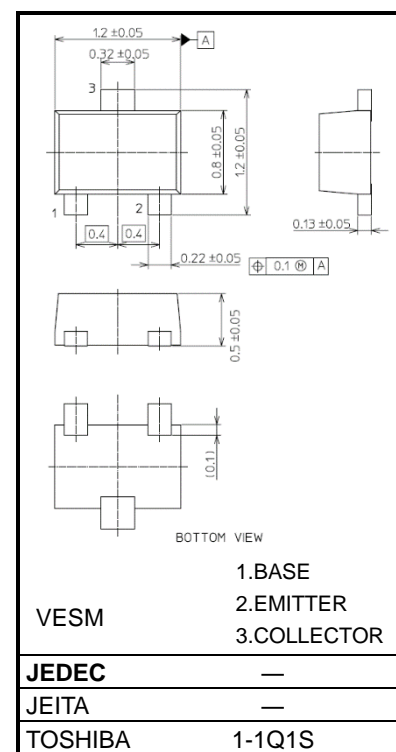
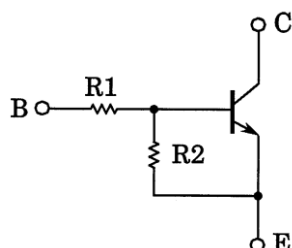
Inverter Circuit Applications

Interface Circuit Applications

Driver Circuit Applications

- Ultra-small package, suited to very high density mounting
- Incorporating 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 RN2130MFV

## Equivalent Circuit



Weight: 1.5 mg (typ.)

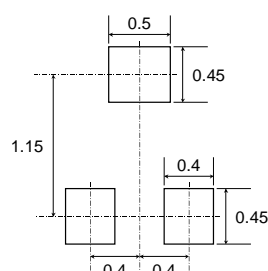
## Absolute Maximum Ratings (Ta = 25°C)

Characterisitic	Symbol	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	$P_C$ (Note1)	150	mW
Junction temperature	$T_j$	150	°C
Storage temperature range	$T_{stg}$	-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).

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

## Land Pattern Dimensions (for reference only)



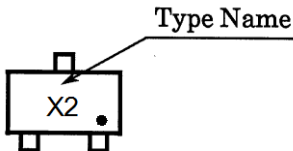
unit: mm

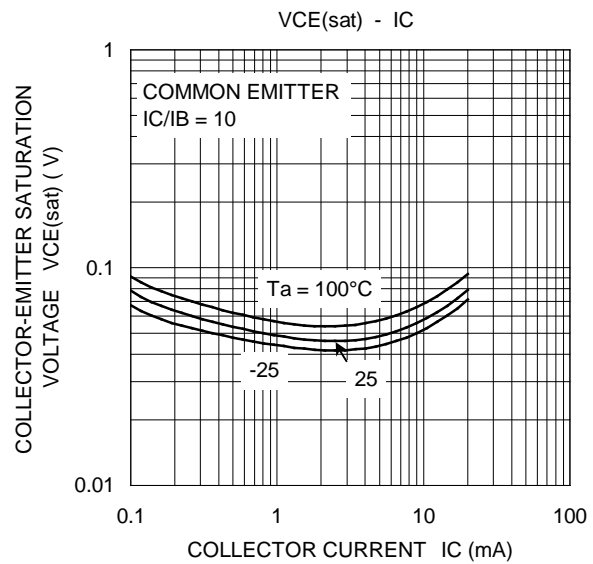
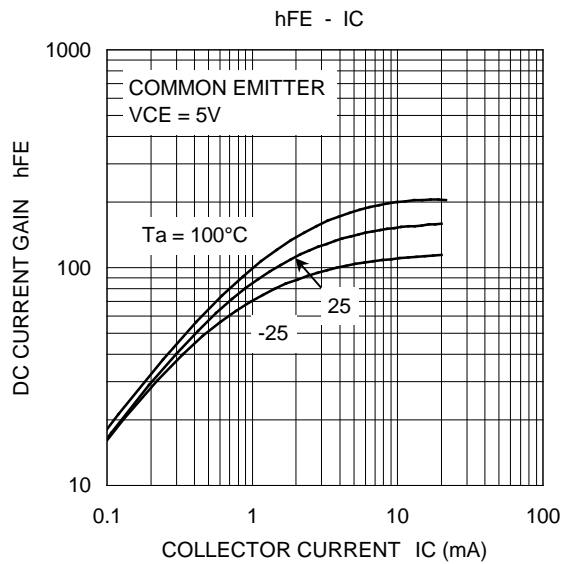
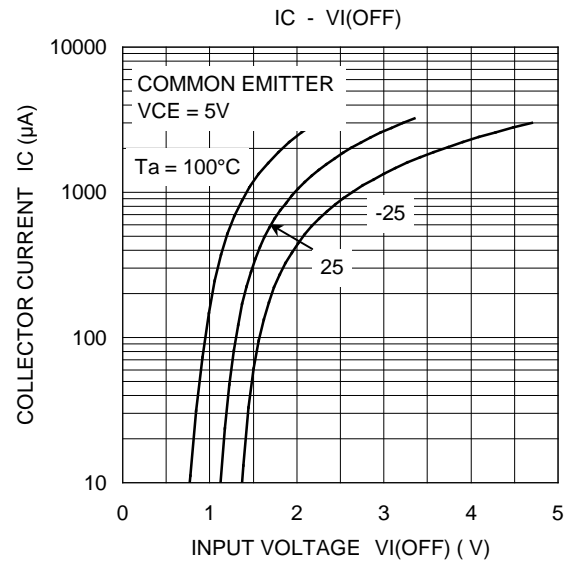
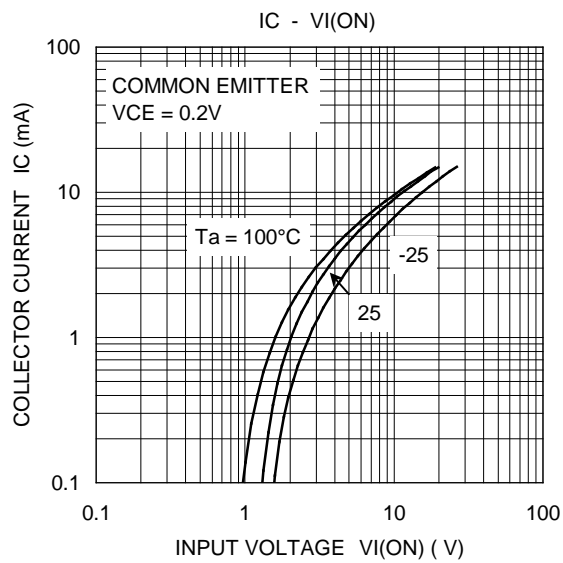
Start of commercial production  
2005-04

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

Characteristic	Symbol	Test Condition	Min	Typ.	Max	Unit
Collector cut-off current	ICBO	V <sub>CB</sub> = 50 V, I <sub>E</sub> = 0 A	—	—	100	nA
	ICEO	V <sub>CE</sub> = 50V, I <sub>B</sub> = 0 A	—	—	500	nA
Emitter cut-off current	IEBO	V <sub>EB</sub> = 10 V, I <sub>C</sub> = 0 A	38	—	72	μA
DC current gain	hFE	V <sub>CE</sub> = 5 V, I <sub>C</sub> = 10 mA	100	—	—	—
Collector-emitter saturation voltage	V <sub>CE (sat)</sub>	I <sub>C</sub> = 5 mA, I <sub>B</sub> = 0.5 mA	—	0.1	0.3	V
Input voltage(ON)	V <sub>I(ON)</sub>	V <sub>CE</sub> = 0.2 V, I <sub>C</sub> = 5 mA	1.7	—	8.2	V
Input voltage(OFF)	V <sub>I(OFF)</sub>	V <sub>CE</sub> = 5 V, I <sub>C</sub> = 0.1 mA	1.0	—	1.6	V
Transition Frequency	f <sub>T</sub>	V <sub>CE</sub> = 10 V, I <sub>C</sub> = 5 mA		250		MHz
Collector output capacitance	C <sub>ob</sub>	V <sub>CB</sub> = 10 V, I <sub>E</sub> = 0 A, f = 1 MHz	—	0.7	—	pF
Input resistance	R <sub>I</sub>	—	70	100	130	kΩ
Resistance ratio	R <sub>1</sub> /R <sub>2</sub>	—	0.8	1.0	1.2	—

### Marking

Type Name	Marking
RN1130MFV	



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