

# 2SD2033A

# Transistor, NPN

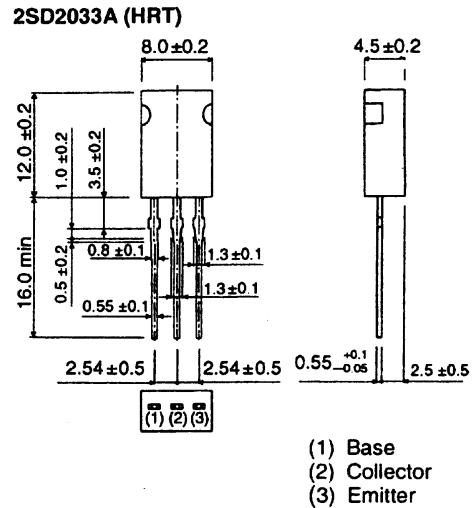
## Features

- available in HRT package
- high breakdown voltage:  
 $BV_{CEO} = 160\text{ V}$
- high transition frequency ( $f_T$ ) and low output capacitance ( $C_{ob}$ )
- wide safe operating area (SOA)

## Applications

- low frequency power amplifier

## Dimensions (Units : mm)



## Absolute maximum ratings ( $T_a = 25^\circ\text{C}$ )

Parameter	Symbol	Limits	Unit	Conditions
Collector-to-base voltage	$V_{CBO}$	160	V	
Collector-to-emitter voltage	$V_{CEO}$	160	V	
Emitter-to-base voltage	$V_{EBO}$	5	V	
Collector current	$I_C$	1.5	A	Continuous (dc)
		3	A	Single pulse, $P_W = 100\text{ ms}$
Collector dissipation	$P_C$	1.8	W	
Junction temperature	$T_j$	150	$^\circ\text{C}$	
Storage temperature	$T_{stg}$	-55 ~ +150	$^\circ\text{C}$	

**ROHM**

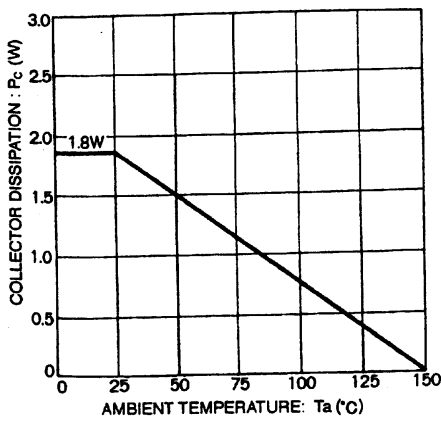
**Electrical characteristics (unless otherwise noted,  $T_a = 25^\circ\text{C}$ )**

Parameter	Symbol	Min	Typical	Max	Unit	Conditions
Collector-to-base breakdown voltage	$BV_{CBO}$	160			V	$I_C = 50 \mu\text{A}$
Collector-to-emitter breakdown voltage	$BV_{CEO}$	160			V	$I_C = 1 \text{ mA}$
Emitter-to-base breakdown voltage	$BV_{EBO}$	5			V	$I_E = 50 \mu\text{A}$
Collector cutoff current	$I_{CBO}$			1.0	$\mu\text{A}$	$V_{CB} = 120 \text{ V}$
Emitter cutoff current	$I_{EBO}$			1.0	$\mu\text{A}$	$V_{EB} = 4 \text{ V}$
DC current gain	$h_{FE}$	60		200		$V_{CE} = 5 \text{ V}, I_C = 0.1 \text{ A}$
Collector-to-emitter saturation voltage	$V_{CE(sat)}$			2.0	V	$I_C/I_B = 1 \text{ A}/0.1 \text{ A}$ , single pulse
Base-to-emitter saturation voltage	$V_{BE(sat)}$			1.5	V	$I_C/I_B = 1 \text{ A}/0.1 \text{ A}$ , single pulse
Transition frequency	$f_T$		80		MHz	$V_{CE} = 5 \text{ V}, I_E = -0.1 \text{ A}, f = 30 \text{ MHz}$
Output capacitance	$C_{ob}$		20		pF	$V_{CB} = 10 \text{ V}, I_E = 0 \text{ A}, f = 1 \text{ MHz}$

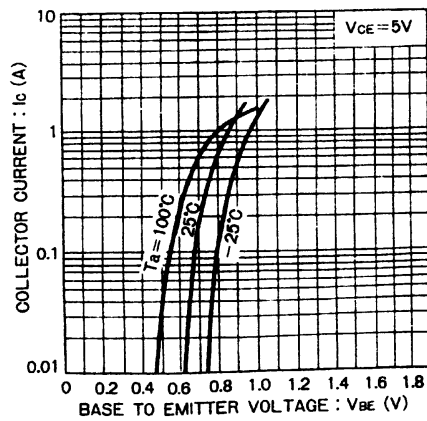
**$h_{FE}$  rankings**

Item	D	E
$h_{FE}$	60 - 120	100 - 200

**Electrical characteristic curves**



**Figure 1**



**Figure 2**

2SD2033A Transistor, NPN 2SD series

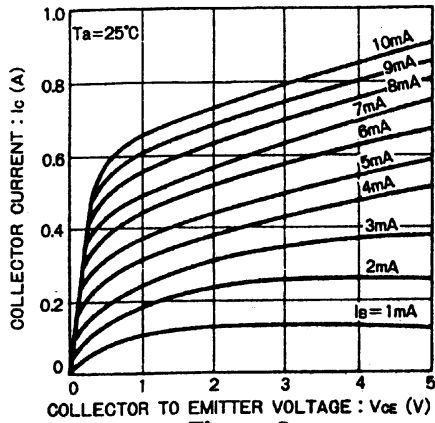


Figure 3

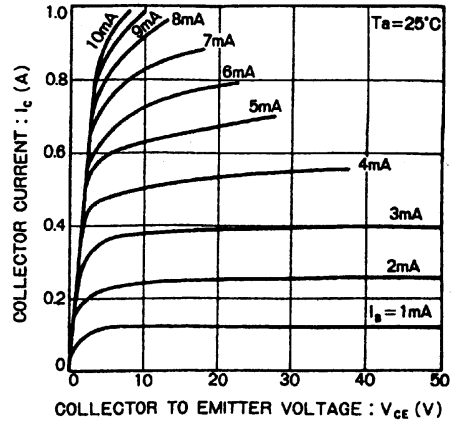


Figure 4

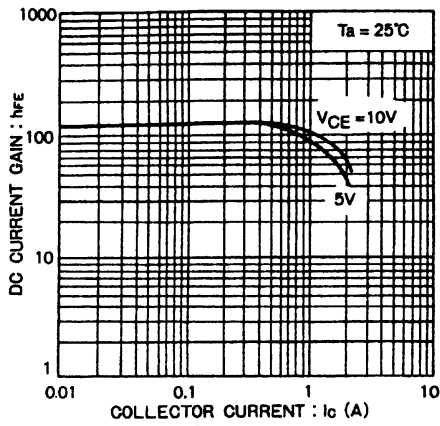


Figure 5

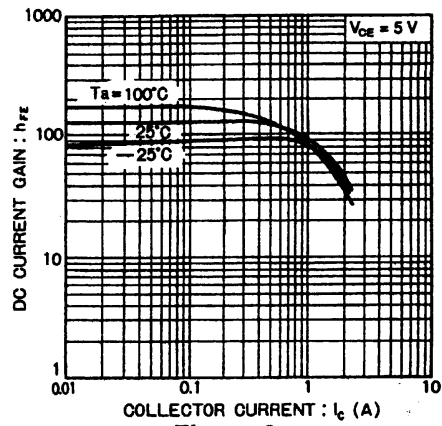


Figure 6

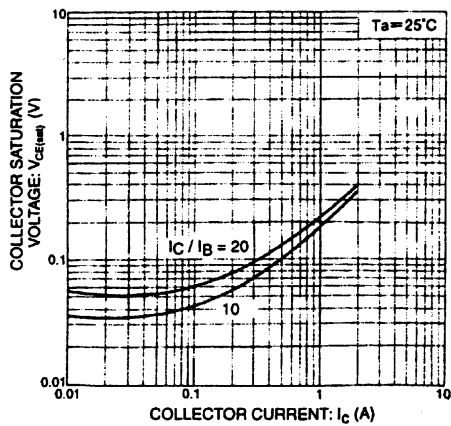


Figure 7

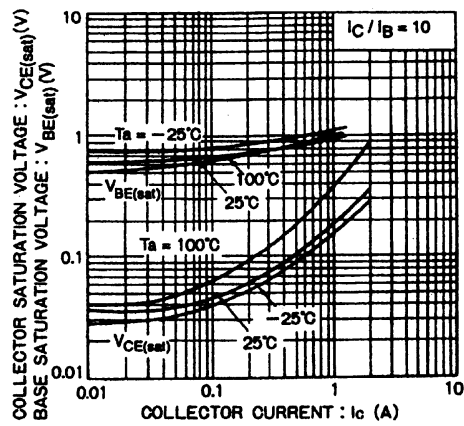
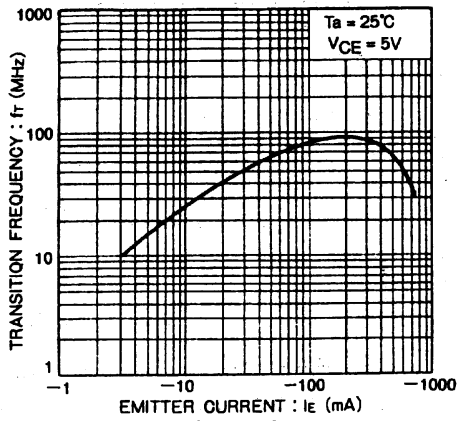
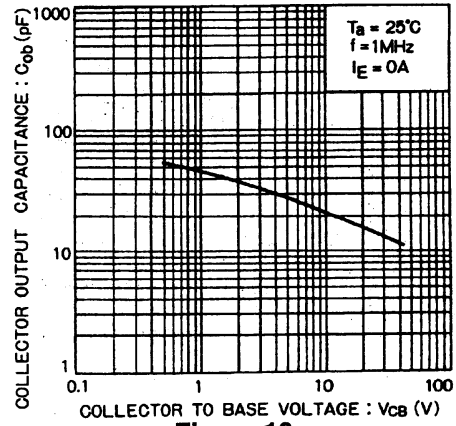


Figure 8



**Figure 9**



**Figure 10**

**Ordering information**

Package	Tape
Code	T114
Basic order quantity	1 000
2SD2033A	★
★ = Standard, ☆ = Semi-standard, * = Special order	

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