

# 2SD2396

# Transistor, NPN

## Features

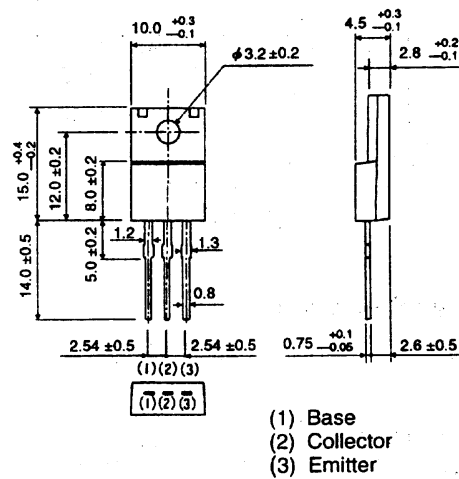
- available in TO-220FN package
- high dc current gain ( $h_{FE}$ ), typically  $h_{FE} = 1000$
- low collector saturation voltage, typically  $V_{CE(sat)} = 0.3$  V at  $I_C/I_B = 2$  A/ 0.05 A
- large collector power dissipation:  $P_C = 30$  W at  $T_C = 25^\circ\text{C}$
- easily insulated from the heat sink as the fin is molded
- 2 mm lower than ROHM'S TO-220FP package which allows higher density mounting
- wide safe operating area (SOA)

## Applications

- low frequency power amplifier

## Dimensions (Units : mm)

2SD2396 (TO-220FN)



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

Parameter	Symbol	Limits	Unit	Conditions
Collector-to-base voltage	$V_{CBO}$	80	V	
Collector-to-emitter voltage	$V_{CEO}$	60	V	
Emitter-to-base voltage	$V_{EBO}$	6	V	
Collector current	$I_C$	3	A	Continuous (dc)
	$I_{CP}$	6	A	Single pulse, $P_W = 100$ ms
Collector dissipation	$P_C$	2	W	
		30	W	$T_C = 25^\circ\text{C}$
Junction temperature	$T_j$	150	$^\circ\text{C}$	
Storage temperature	$T_{stg}$	-55 ~ +150	$^\circ\text{C}$	

2SD2396 Transistor, NPN, 2SD series

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

Parameter	Symbol	Min	Typical	Max	Unit	Conditions
Collector-to-base breakdown voltage	$BV_{CBO}$	80			V	$I_C = 50 \mu\text{A}$
Collector-to-emitter breakdown voltage	$BV_{CEO}$	60			V	$I_C = 1 \text{ mA}$
Emitter-to-base breakdown voltage	$BV_{EBO}$	6			V	$I_E = 50 \mu\text{A}$
Collector cutoff current	$I_{CBO}$			100	$\mu\text{A}$	$V_{CB} = 80 \text{ V}$
Emitter cutoff current	$I_{EBO}$			100	$\mu\text{A}$	$V_{EB} = 6 \text{ V}$
DC current gain	$h_{FE}$	400	1000	2000		$V_{CE} = 4 \text{ V}$ , $I_C = 0.5 \text{ A}$ , single pulse
Collector-to-emitter saturation voltage	$V_{CE(sat)}$		0.3	0.8	V	$I_C/I_B = 2 \text{ A}/0.05 \text{ A}$ , single pulse
Collector-to-base saturation voltage	$V_{BE(sat)}$			1.5	V	$I_C/I_B = 2 \text{ A}/0.05 \text{ A}$ , single pulse
Transition frequency	$f_T$		40		MHz	$V_{CE} = 5 \text{ V}$ , $I_E = -0.2 \text{ A}$ , $f = 10 \text{ MHz}$ , single pulse
Output capacitance	$C_{ob}$		55		pF	$V_{CB} = 10 \text{ V}$ , $I_E = 0 \text{ A}$ , $f = 1 \text{ MHz}$

$h_{FE}$  rankings

Item	H	J	K
$h_{FE}$	400 ~ 800	600 ~ 1200	1000 ~ 2000

Electrical characteristic curves

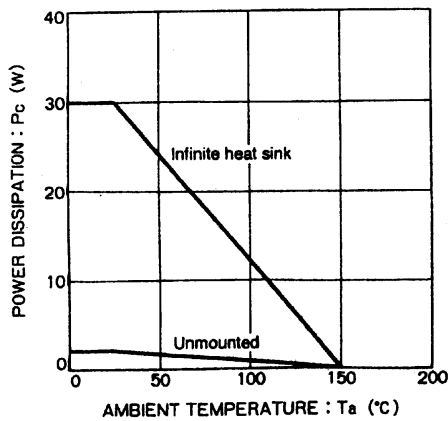


Figure 1

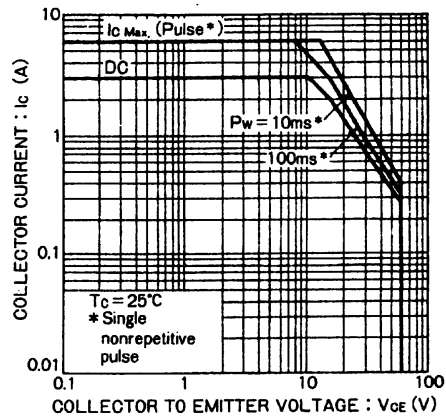


Figure 2

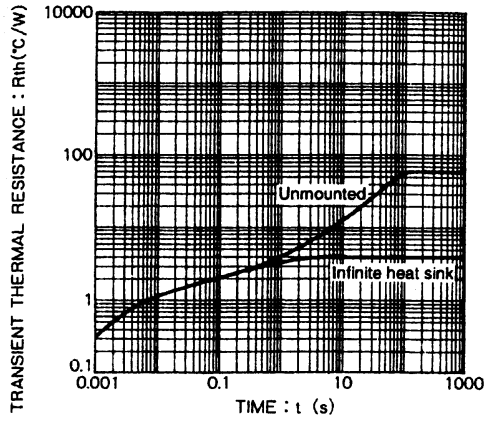


Figure 3

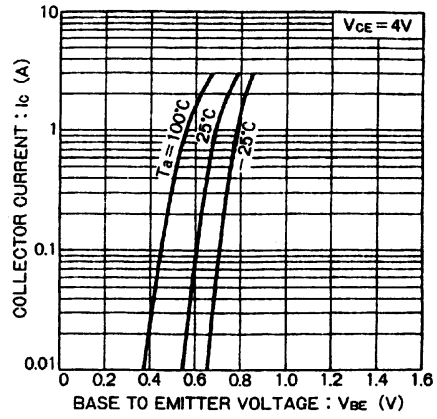


Figure 4

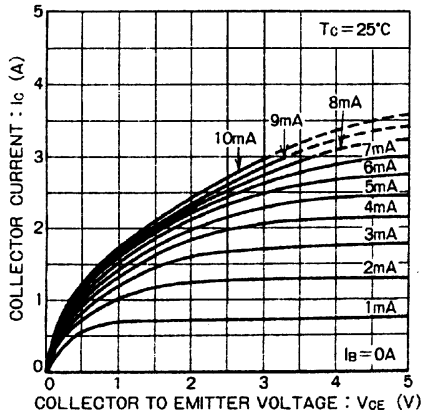


Figure 5

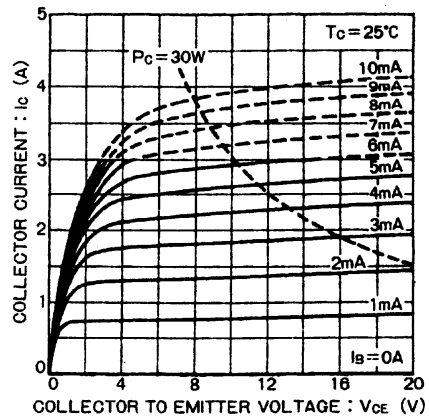


Figure 6

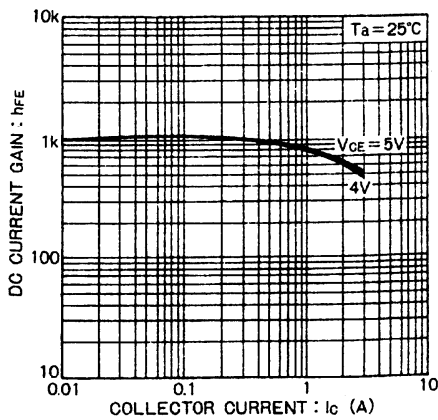


Figure 7

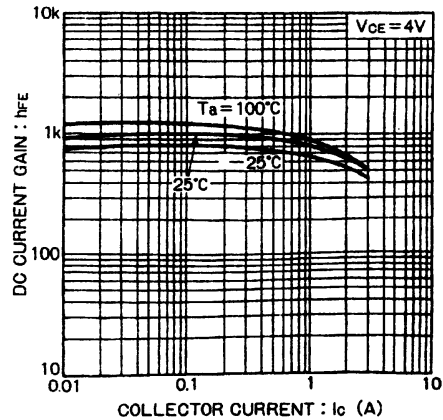


Figure 8

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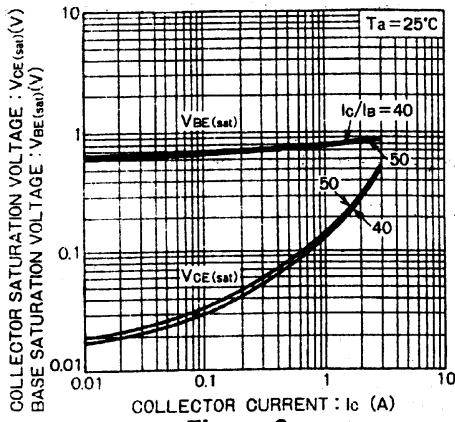


Figure 9

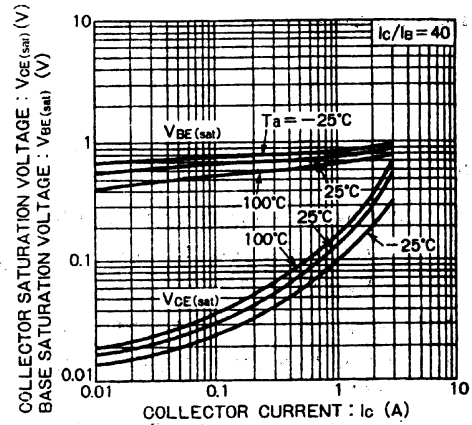


Figure 10

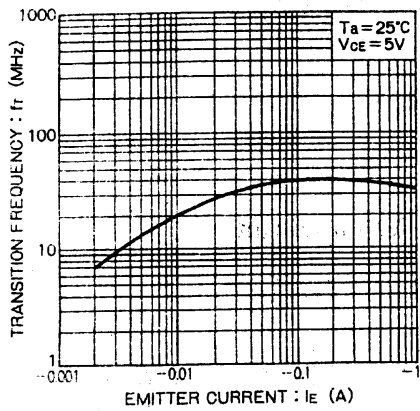


Figure 11

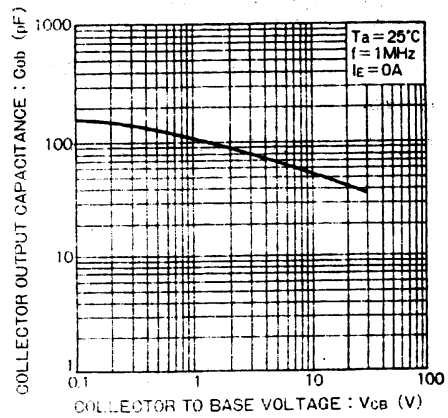


Figure 12

Ordering information

Package	Bulk
Code	
Basic order quantity	500
2SD2396	★
★ = Standard, ☆ = Semi-standard, * = Special order	

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