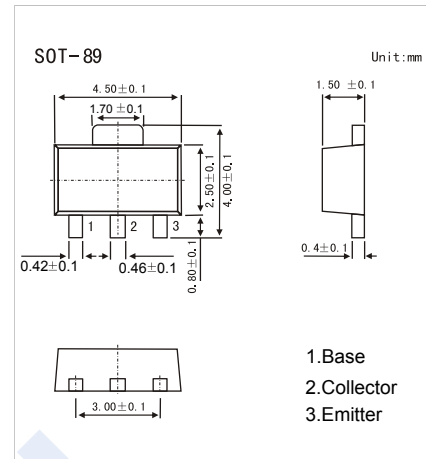


## NPN Transistors

### 2SD2391

#### ■ Features

- Low saturation voltage
- Collector-emitter voltage =60V
- $P_c = 2W$  (on 40X40X0.7mm ceramic board).
- Complements the 2SB1561.



#### ■ Absolute Maximum Ratings $T_a = 25^\circ\text{C}$

Parameter	Symbol	Rating	Unit
Collector - Base Voltage	$V_{CB0}$	60	V
Collector - Emitter Voltage	$V_{CE0}$	60	
Emitter - Base Voltage	$V_{EB0}$	6	
Collector Current - Continuous	$I_C$	2	A
Collector Current - Pulse (Note.1)	$I_{CP}$	6	
Collector Power Dissipation (Note.2)	$P_C$	0.5	W
		2	
Junction Temperature	$T_J$	150	$^\circ\text{C}$
Storage Temperature Range	$T_{stg}$	-55 to 150	

#### ■ Electrical Characteristics $T_a = 25^\circ\text{C}$

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Collector- base breakdown voltage	$V_{CB0}$	$I_C = 100 \mu\text{A}, I_E = 0$	60			V
Collector- emitter breakdown voltage	$V_{CE0}$	$I_C = 1 \text{ mA}, I_B = 0$	60			
Emitter - base breakdown voltage	$V_{EB0}$	$I_E = 100 \mu\text{A}, I_C = 0$	6			
Collector-base cut-off current	$I_{CBO}$	$V_{CB} = 50 \text{ V}, I_E = 0$			100	nA
Emitter cut-off current	$I_{EBO}$	$V_{EB} = 5 \text{ V}, I_C = 0$			100	
Collector-emitter saturation voltage	$V_{CE(sat)}$	$I_C = 1 \text{ A}, I_B = 50 \text{ mA}$			0.35	V
Base - emitter saturation voltage	$V_{BE(sat)}$	$I_C = 1 \text{ A}, I_B = 50 \text{ mA}$			1.2	
DC current gain	$h_{FE(1)}$	$V_{CE} = 2 \text{ V}, I_C = 500 \text{ mA}$	82		390	
	$h_{FE(2)}$	$V_{CE} = 2 \text{ V}, I_C = 1.5 \text{ A}$	45			
Collector output capacitance	$C_{ob}$	$V_{CB} = 10 \text{ V}, I_E = 0, f = 1 \text{ MHz}$		21		pF
Transition frequency	$f_T$	$V_{CE} = 2 \text{ V}, I_E = -500 \text{ mA}, f = 100 \text{ MHz}$		210		MHz

#### ■ Classification of $h_{FE(1)}$

Type	2SD2391-P	2SD2391-Q	2SD2391-R
Range	82-180	120-270	180-390
Marking	DTP*	DTQ*	DTR*

# NPN Transistors 2SD2391

## Typical Characteristics

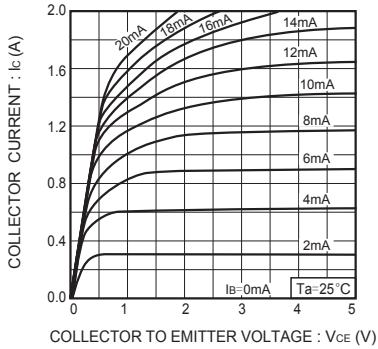


Fig.1 Grounded emitter output characteristics

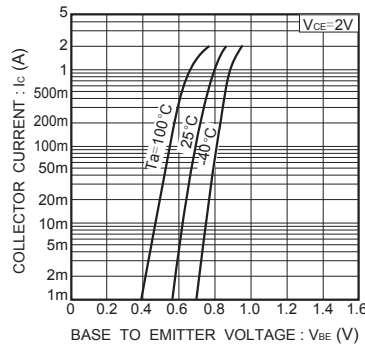


Fig.2 Grounded emitter propagation characteristics

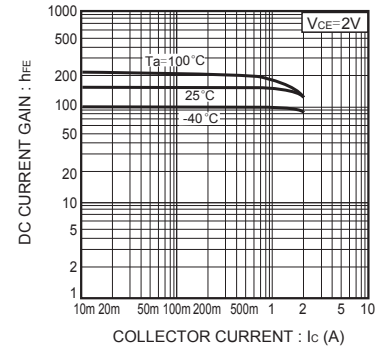


Fig.3 DC current gain vs. collector current ( 1 )

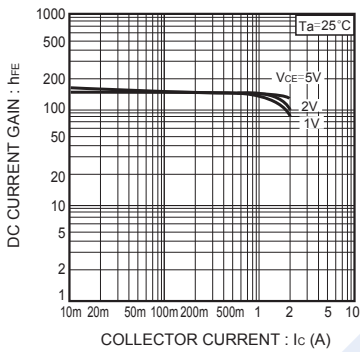


Fig.4 DC current gain vs. collector current ( 2 )

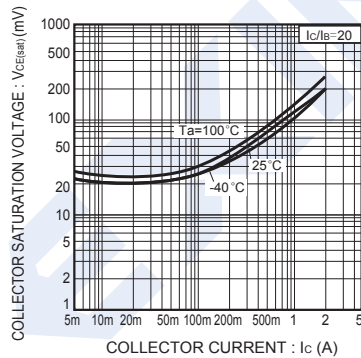


Fig.5 Collector-emitter saturation voltage vs. collector current ( 1 )

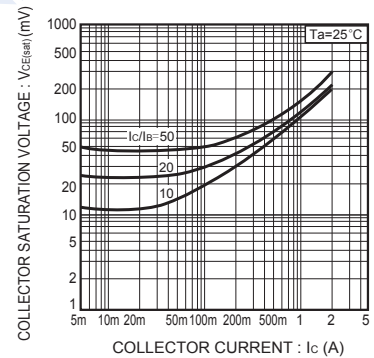


Fig.6 Collector-emitter saturation voltage vs. collector current ( 2 )

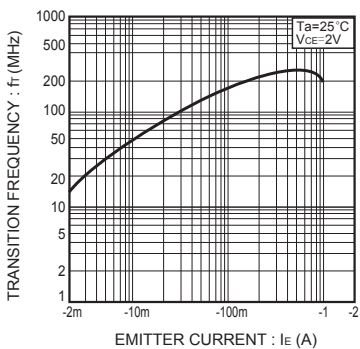


Fig.7 Gain bandwidth product vs. emitter current

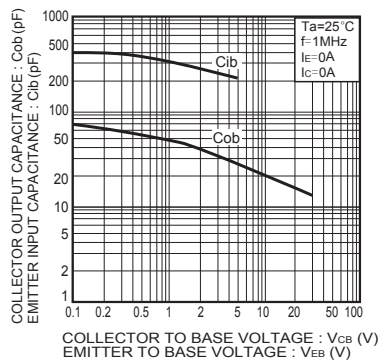


Fig.8 Output capacitance vs. voltage

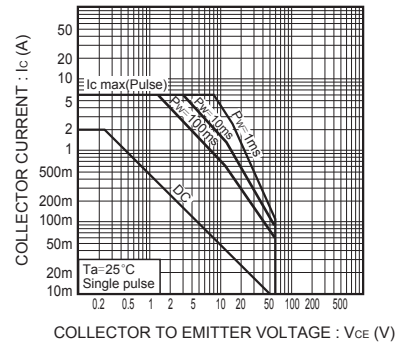


Fig.9 Safe operating area