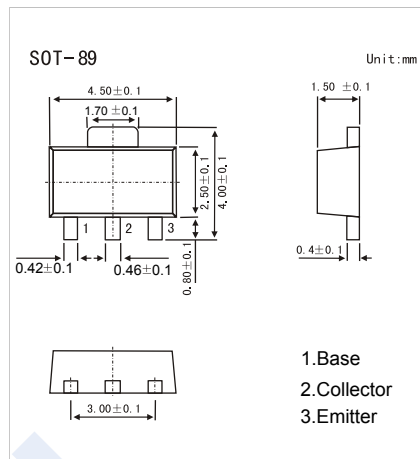


NPN Transistors

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

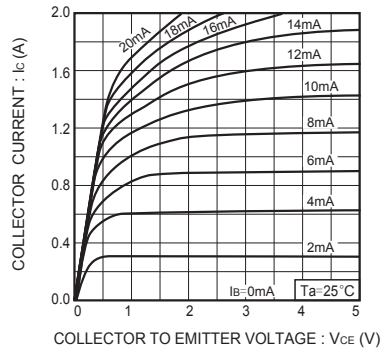


Fig.1 Grounded emitter output characteristics

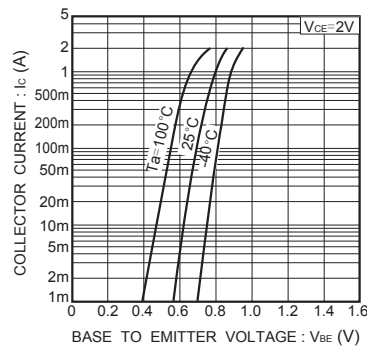


Fig.2 Grounded emitter propagation characteristics

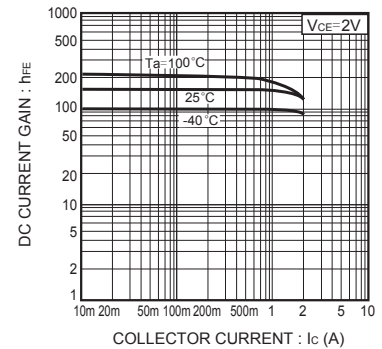


Fig.3 DC current gain vs. collector current (1)

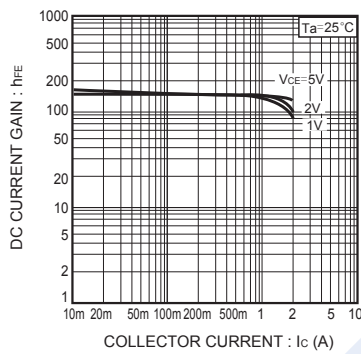


Fig.4 DC current gain vs. collector current (2)

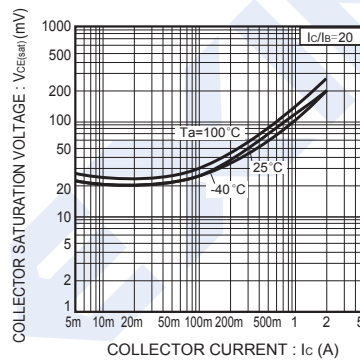


Fig.5 Collector-emitter saturation voltage vs. collector current (1)

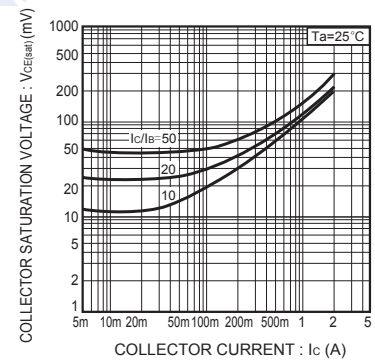


Fig.6 Collector-emitter saturation voltage vs. collector current (2)

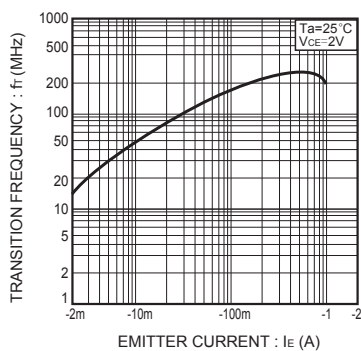


Fig.7 Gain bandwidth product vs. emitter current

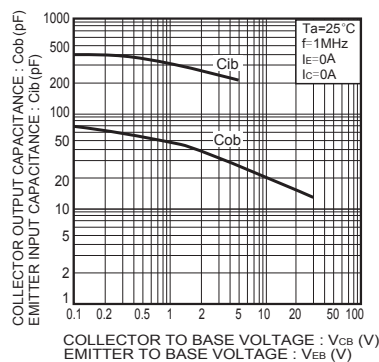


Fig.8 Output capacitance vs. voltage

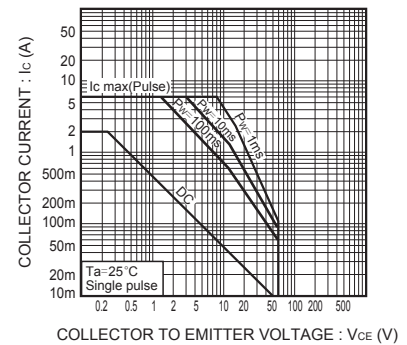


Fig.9 Safe operating area