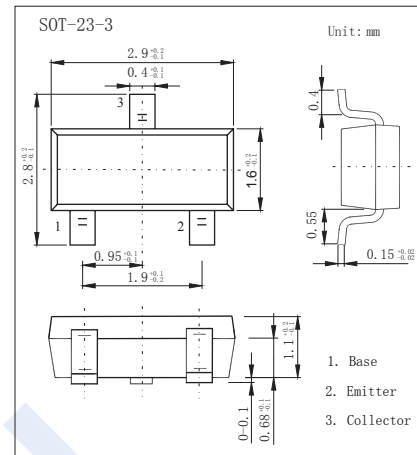


NPN Transistors

2SD1781-HF (2SD1781K-HF)

■ Features

- Very Low $V_{CE(sat)}$.
- High current capacity in compact package.
- Complimentary to 2SB1197-HF (2SB1197K-HF)
- Pb-Free Package May be Available. The G-Suffix Denotes a Pb-Free Lead Finish

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

Parameter	Symbol	Rating	Unit
Collector - Base Voltage	V_{CBO}	40	V
Collector - Emitter Voltage	V_{CEO}	32	
Emitter - Base Voltage	V_{EBO}	5	
Collector Current - Continuous	I_C	800	mA
Collector Current - Pulse (Note.1)	I_{CP}	1.5	A
Collector Power Dissipation	P_C	200	mW
Junction Temperature	T_J	150	$^\circ\text{C}$
Storage Temperature Range	T_{stg}	-55 to 150	

Note.1: Single pulse $P_w=100\text{ms}$

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

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Collector- base breakdown voltage	V_{CBO}	$I_C = 100 \mu\text{A}, I_E = 0$	40			V
Collector- emitter breakdown voltage	V_{CEO}	$I_C = 1 \text{mA}, I_B = 0$	32			
Emitter - base breakdown voltage	V_{EBO}	$I_E = 100 \mu\text{A}, I_C = 0$	5			
Collector-base cut-off current	I_{CBO}	$V_{CB} = 30 \text{V}, I_E = 0$			0.1	μA
Emitter cut-off current	I_{EBO}	$V_{EB} = 4 \text{V}, I_C = 0$			0.1	
Collector-emitter saturation voltage	$V_{CE(sat)}$	$I_C = 500 \text{mA}, I_B = 50 \text{mA}$		0.1	0.4	V
Base - emitter saturation voltage	$V_{BE(sat)}$	$I_C = 500 \text{mA}, I_B = 50 \text{mA}$			1.2	
DC current gain	h_{FE}	$V_{CE} = 3 \text{V}, I_C = 100 \text{mA}$	120		390	
Collector output capacitance	C_{ob}	$V_{CB} = 10 \text{V}, I_E = 0, f = 1 \text{MHz}$		15		pF
Transition frequency	f_T	$V_{CE} = 5 \text{V}, I_E = -50 \text{mA}, f = 100 \text{MHz}$		150		MHz

Note.1: Pulse test : Pulse width $\leq 350 \mu\text{s}$, Duty Cycle $\leq 2\%$.

■ Classification of $h_{fe(1)}$

Type	2SD1781-Q-HF	2SD1781-R-HF
Range	120-270	180-390
Marking	AFQ _F	AFR _F

NPN Transistors

2SD1781-HF (2SD1781K-HF)

■ Typical Characteristics

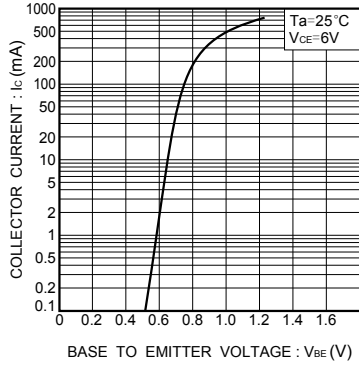


Fig.1 Grounded emitter propagation characteristics

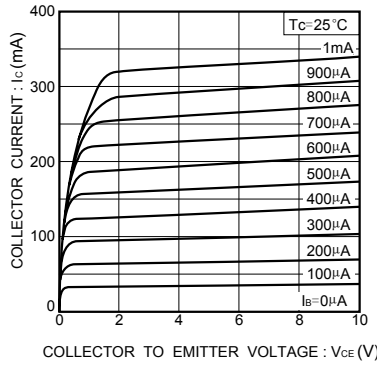


Fig.2 Grounded emitter output characteristics

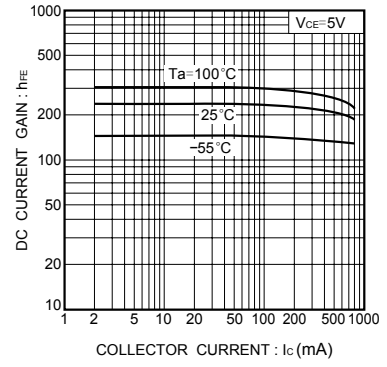


Fig.3 DC current gain vs. collector current

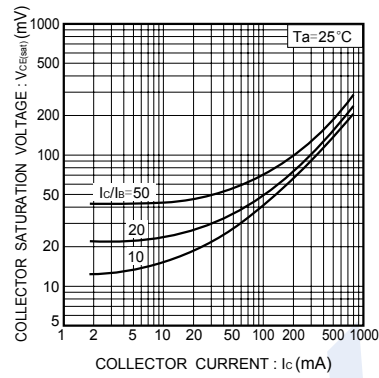


Fig.4 Collector-emitter saturation voltage vs. collector current (I)

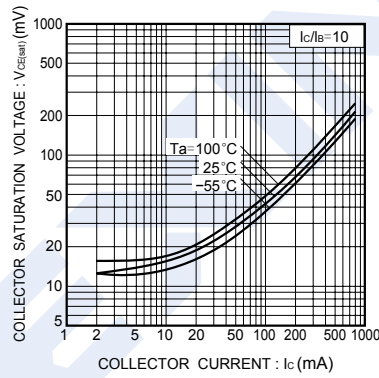


Fig.5 Collector-emitter saturation voltage vs. collector current (II)

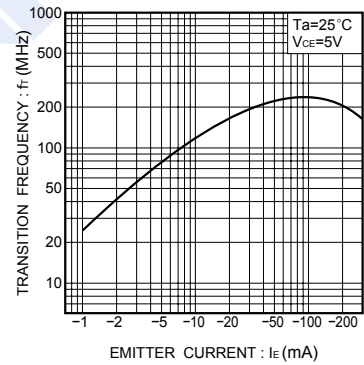


Fig.6 Gain bandwidth product vs. emitter current

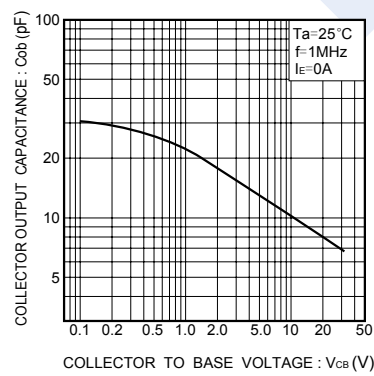


Fig.7 Collector output capacitance vs. collector-base voltage

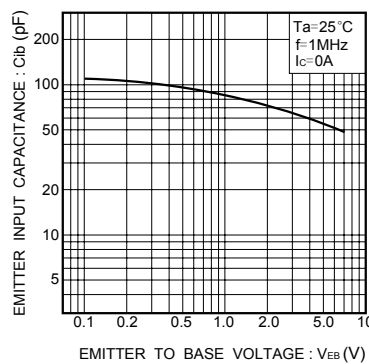


Fig.8 Emitter input capacitance vs. emitter-base voltage