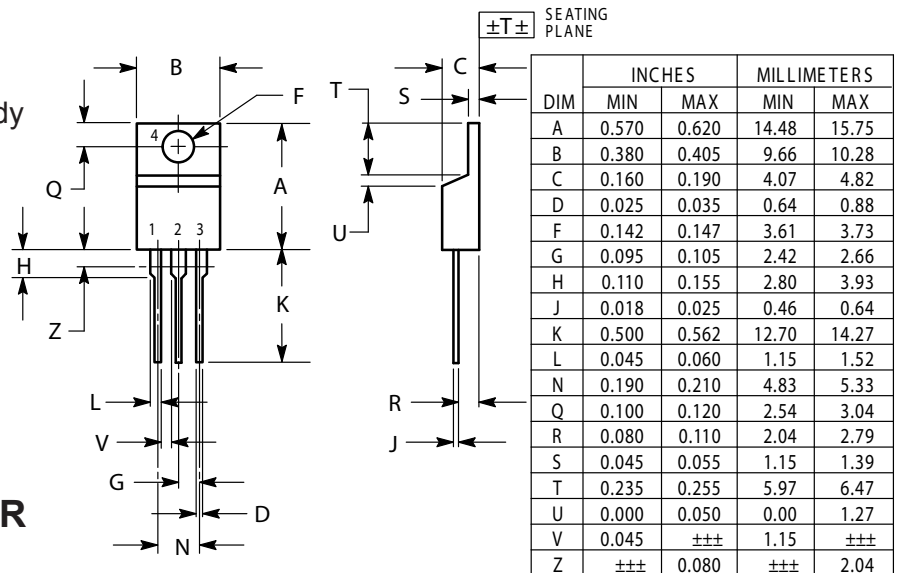


## POWER TRANSISTOR E13003

### SWITCHING REGULATOR APPLICATION

- High speed switching
- Suitable for switching regulator and motor control
- Case : TO-220 molded plastic body

### TO-220



### NPN SILICON TRANSISTOR

### FEATURES $T_c=25^\circ\text{C}$ unless otherwise specified

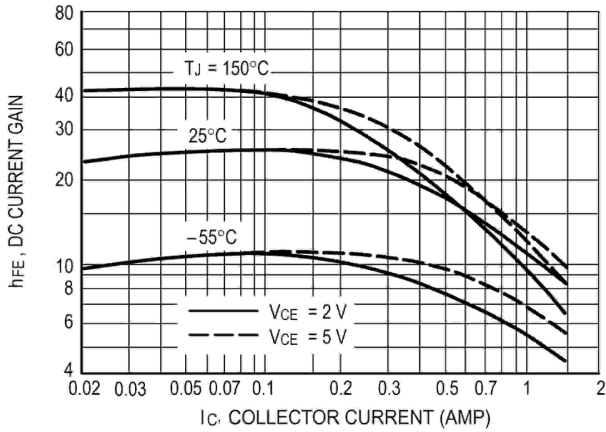
Parameter	Symbol	Value	UNIT
Collector dissipation	$P_c$	20	W
Collector current (DC)	$I_c$	1.5	A
Collector current (Pulse)	$I_{cP}$	3	A
Operating and storage junction temperature range	$T_J, T_{STG}$	-55 °C to +150 °C	°C

### ELECTRICAL CHARACTERISTICS $T_c=25^\circ\text{C}$ unless otherwise specified

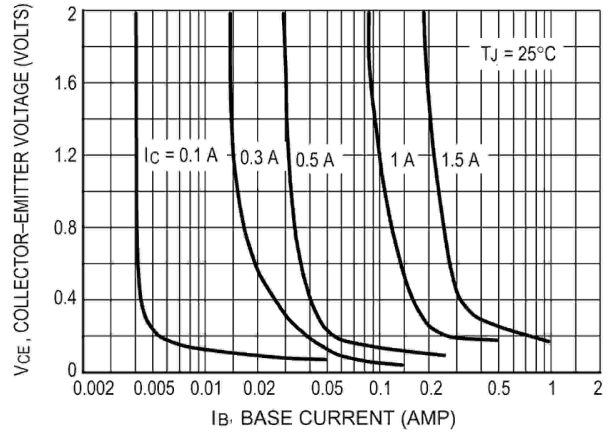
Parameter	Symbol	Test conditions	MIN	MAX	UNIT
Collector-base breakdown voltage	$V_{(BR)CBO}$	$I_c=1\text{mA}, I_E=0$	700		V
Collector-emitter breakdown voltage	$V_{(BR)CEO}$	$I_c=10\text{mA}, I_B=0$	400		V
Emitter-base breakdown voltage	$V_{(BR)EBO}$	$I_E=1\text{mA}, I_c=0$	9		V
Collector cut-off current	$I_{cBO}$	$V_{CB}=700\text{V}, I_E=0$		1	mA
Collector cut-off current	$I_{cEO}$	$V_{CE}=400\text{V}, I_B=0$		500	$\mu\text{A}$
Emitter cut-off current	$I_{EBO}$	$V_{EB}=9\text{V}, I_c=0$		1	mA
DC current gain	$h_{FE(1)}$	$V_{CE}=2\text{V}, I_c=0.5\text{mA}$	8	40	
	$h_{FE(2)}$	$V_{CE}=10\text{V}, I_c=0.5\text{mA}$	5		
Collector-emitter saturation voltage	$V_{CEsat}$	$I_c=1\text{A}, I_B=250\text{mA}$		1	V
Base-emitter saturation voltage	$V_{BEsat}$	$I_c=1\text{A}, I_B=250\text{mA}$		1.2	V
Base-emitter voltage	$V_{BE}$	$I_E=2\text{A}$		3	V
Transition frequency	$f_T$	$V_{CE}=10\text{V}, I_c=100\text{mA}$ $f=1\text{MHz}$	5		MHz
Fall time	$t_f$	$I_c=1\text{A}, I_{B1}=-I_{B2}=0.2\text{mA},$		0.5	$\mu\text{S}$
Storage time	$t_s$	$V_{CC}=100\text{V}$		2.5	$\mu\text{S}$



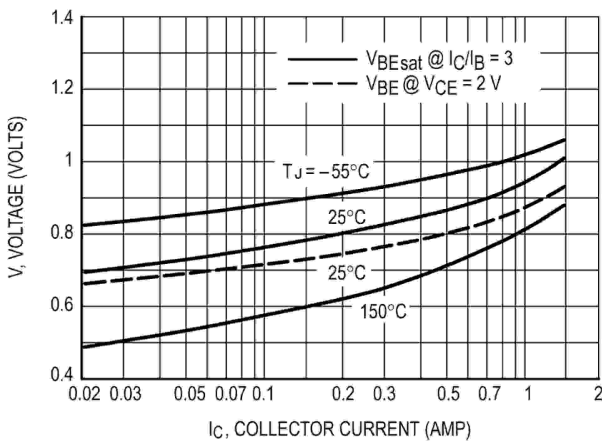
## RATINGS AND CHARACTERISTIC CURVES E13003



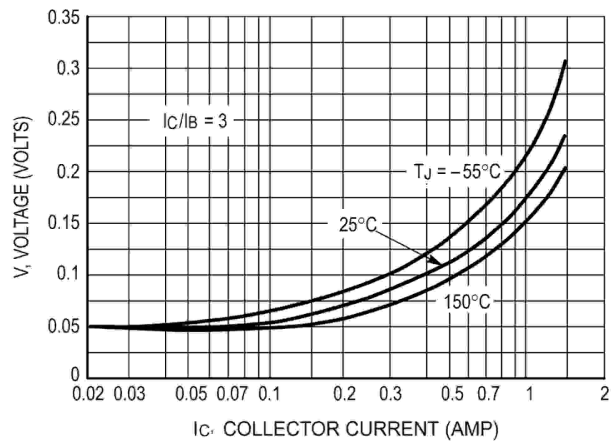
DC Current Gain



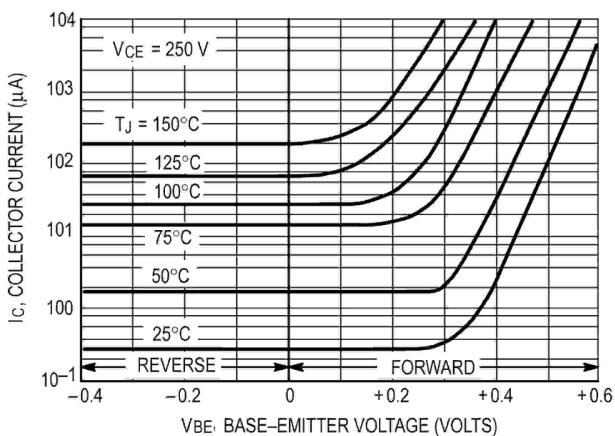
Collector Saturation Region



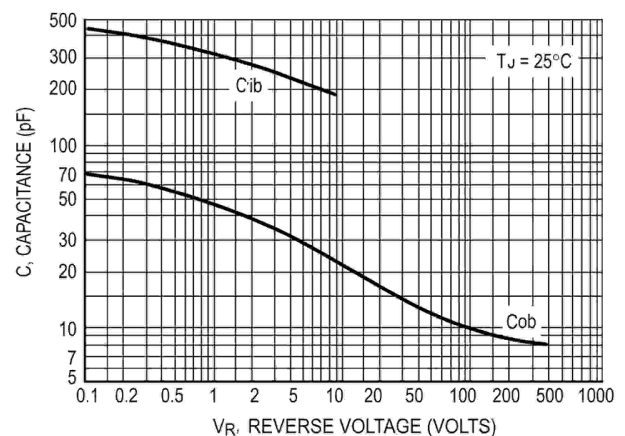
Base-Emitter Voltage



Collector-Emitter Saturation Region



Collector Cutoff Region



Capacitance