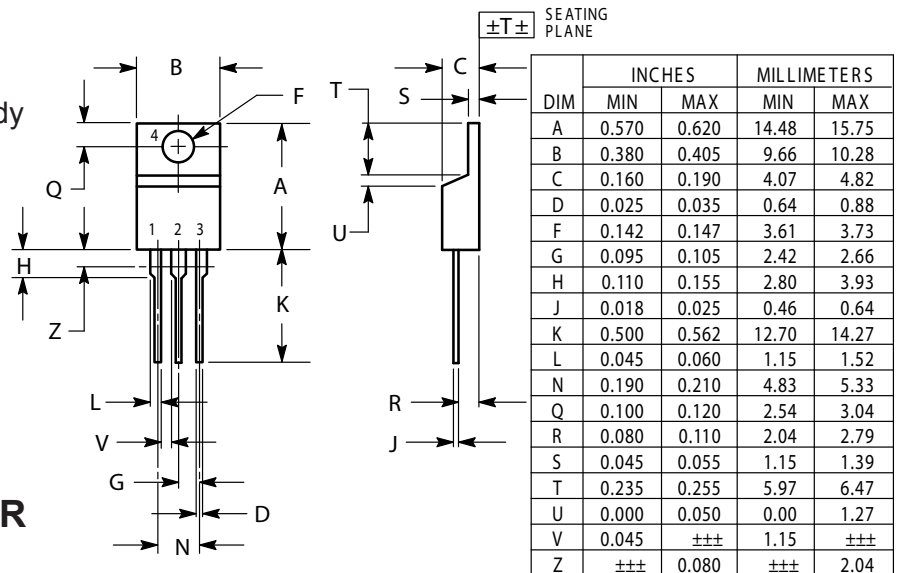


POWER TRANSISTOR E13003

SWITCHING REGULATOR APPLICATION

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

TO-220



NPN SILICON TRANSISTOR

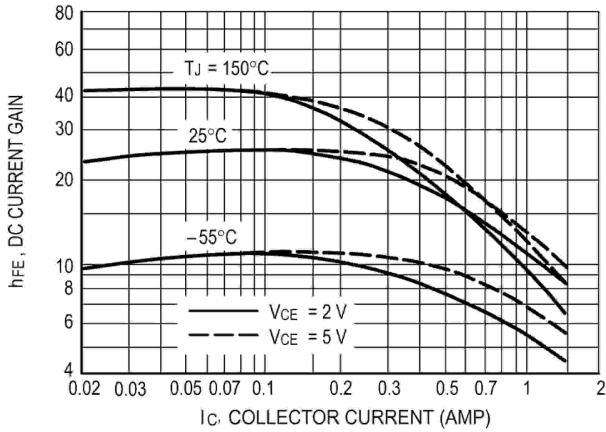
FEATURES $T_c=25^\circ\text{C}$ unless otherwise specified

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

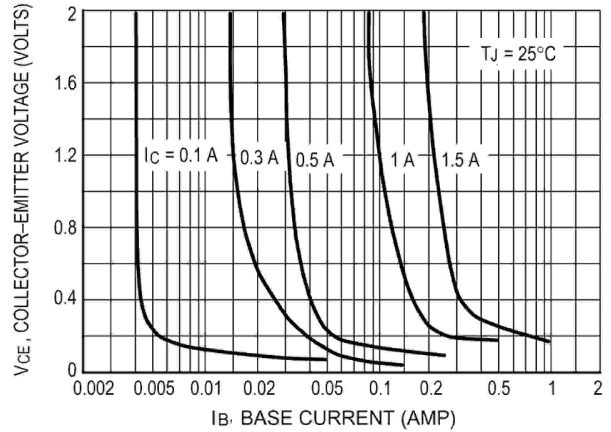
ELECTRICAL CHARACTERISTICS $T_c=25^\circ\text{C}$ unless otherwise specified

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	μA
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	μS
Storage time	t_s	$V_{CC}=100\text{V}$		2.5	μS

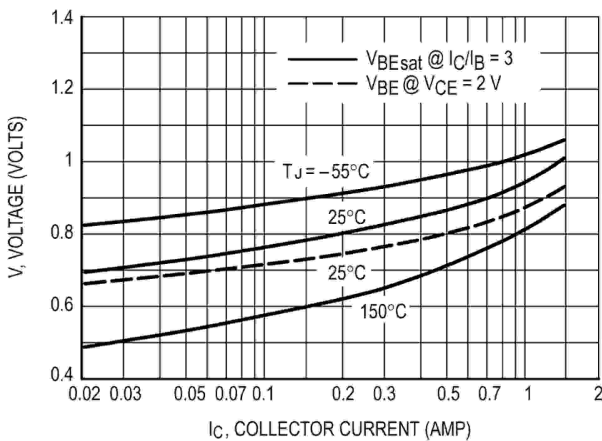
RATINGS AND CHARACTERISTIC CURVES E13003



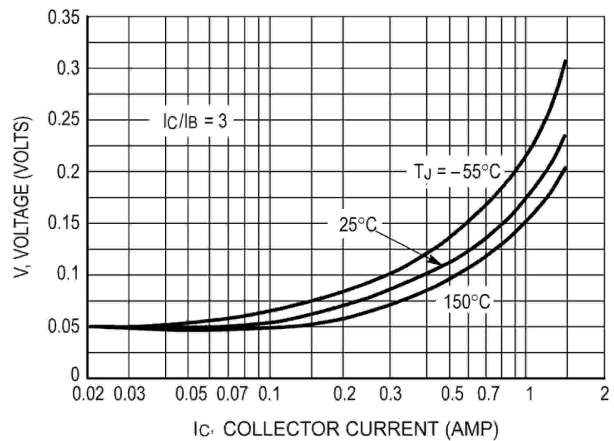
DC Current Gain



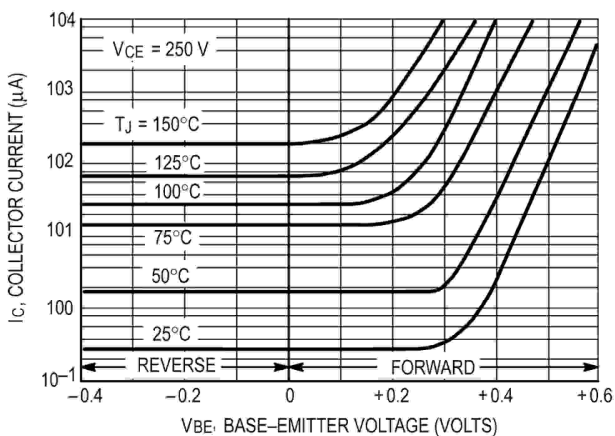
Collector Saturation Region



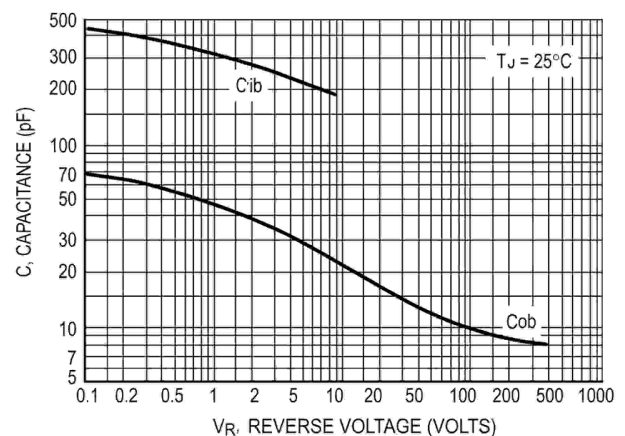
Base-Emitter Voltage



Collector-Emitter Saturation Region



Collector Cutoff Region



Capacitance