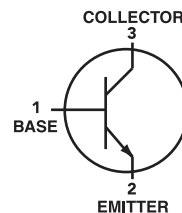


## NPN General Purpose Transistors



### MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Collector-Emitter Voltage	$V_{CEO}$	50	Vdc
Collector-Base Voltage	$V_{CBO}$	60	Vdc
Emitter-Base Voltage	$V_{EBO}$	7.0	Vdc
Collector Current-Continuous	$I_C$	150	mAdc

### THERMAL CHARACTERISTICS

Characteristics	Symbol	Max	Unit
Total Device Dissipation FR-5 Board (1) TA=25 °C	$P_D$	150	mW
Derate above 25 °C		1.2	mW/°C
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	833	°C/W
Junction and Storage, Temperature	$T_J, T_{stg}$	-55 to +150	°C

### DEVICE MARKING

2SC4617Q=BQ, 2SC4617R=BR, 2SC4617S=BS
---------------------------------------

### ELECTRICAL CHARACTERISTICS

Characteristics	Symbol	Min	Max	Unit
-----------------	--------	-----	-----	------

### OFF CHARACTERISTICS

Collector-Emitter Breakdown Voltage ( $I_C=1 \mu\text{Adc}, I_B=0$ )	$V_{(BR)CEO}$	50	-	Vdc
Collector-Base Breakdown Voltage ( $I_C=50 \text{ Adc}, I_E=0$ )	$V_{(BR)CBO}$	60	-	Vdc
Emitter-Base Breakdown Voltage ( $I_E=50 \mu\text{Adc}, I_C=0$ )	$V_{(BR)EBO}$	7.0	-	Vdc
Collector Cutoff Current ( $V_{CE}=50 \text{ Vdc}, I_E=0$ )	$I_{CEO}$	-	0.1	$\mu\text{Adc}$
Collector Cutoff Current ( $V_{CB}=60 \text{ Vdc}, I_E=0$ )	$I_{CBO}$	-	0.1	$\mu\text{Adc}$
Emitter Cutoff Current ( $V_{EB}=7.0 \text{ Vdc}, I_C=0$ )	$I_{EBO}$	-	0.1	$\mu\text{Adc}$

1.FR-5=1.0 x 0.75 x 0.062 in

**ELECTRICAL CHARACTERISTICS** ( $T_A=25^\circ\text{C}$  unless otherwise noted) (Continued)

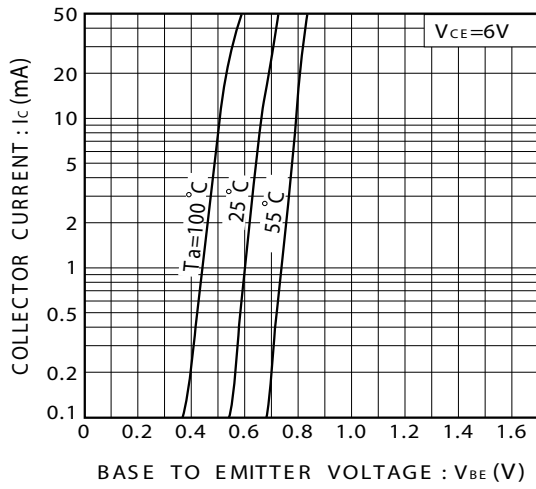
Characteristics	Symbol	Min	Typ	Max	Unit
-----------------	--------	-----	-----	-----	------

**ON CHARACTERISTICS**

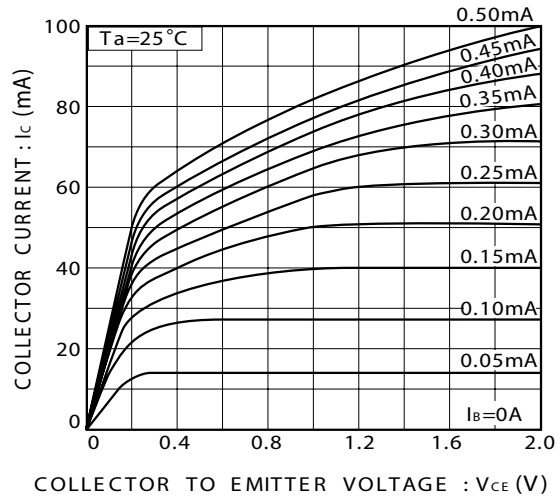
DC Current Gain ( $I_C=1\text{ mA}, V_{CE}=6.0\text{ Vdc}$ )	$h_{FE}$	120	-	560	-
Collector-Emitter Saturation Voltage ( $I_C=50\text{ mA}, I_B=5\text{ mA}$ )	$V_{CE(sat)}$	-	-	0.5	Vdc
Output Capacitance ( $V_{CB}=12\text{ Vdc}, I_E=0\text{ A}, f=1\text{ MHz}$ )	$C_{ob}$	-	2.0	3.5	PF
Current-Gain-Bandwidth Product ( $I_E=2\text{ mA}, V_{CE}=12\text{ Vdc}, f=30\text{ MHz}$ )	$f_T$	-	180	-	MHz

**CLASSIFICATION OF  $h_{FE}$**

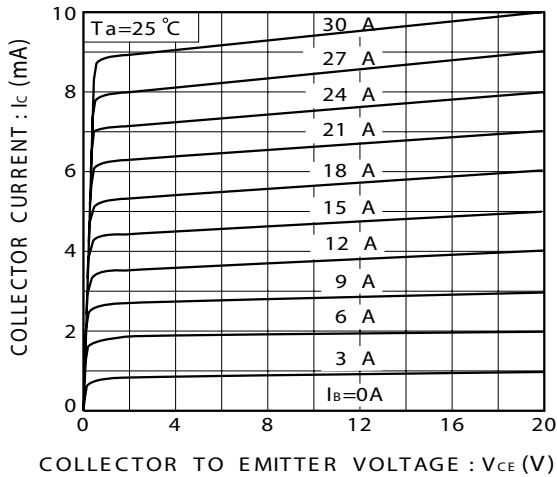
Item	Q	R	S
Range	120-270	180-390	270-560
Marking	BQ	BR	BS



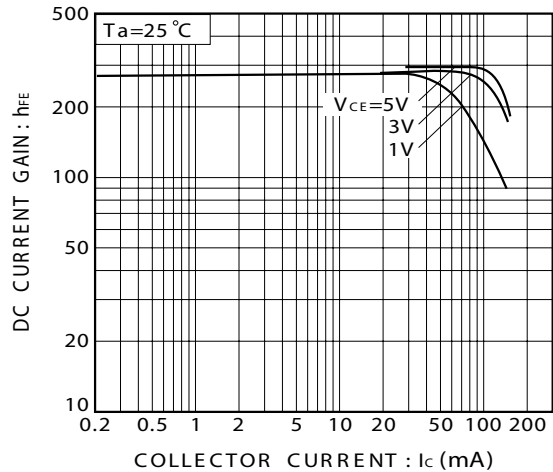
**FIG.1** Grounded emitter propagation characteristics



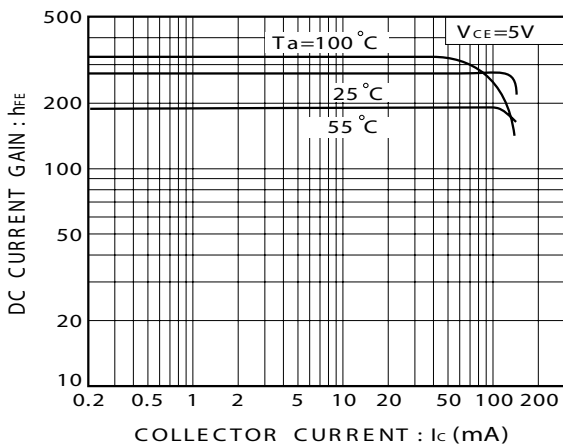
**FIG.2** Grounded emitter output characteristics ( I )



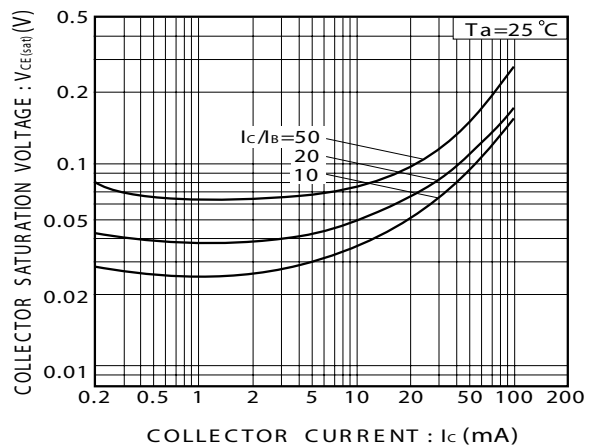
**FIG.3** Grounded emitter output characteristics ( II )



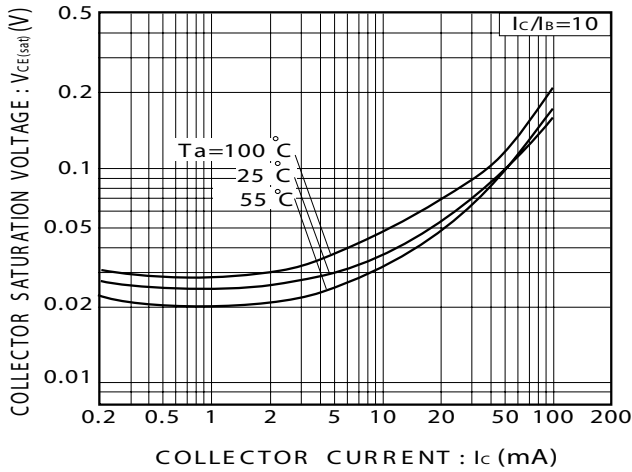
**FIG.4** DC current gain vs. collector current ( I )



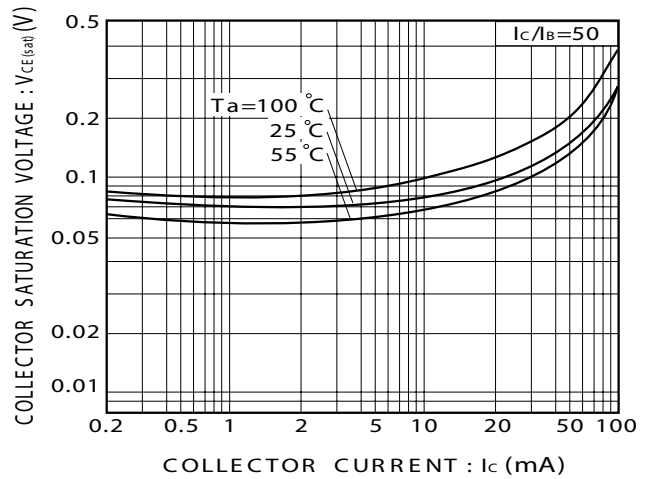
**FIG.5** DC current gain vs. collector current ( II )



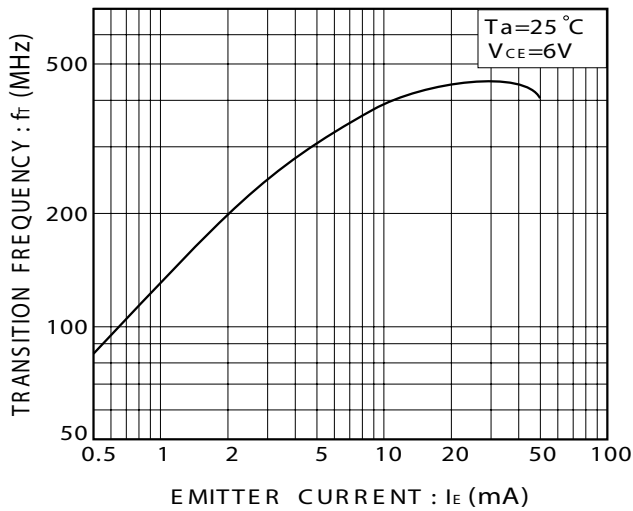
**FIG.6** Collector-emitter saturation voltage vs. collector current



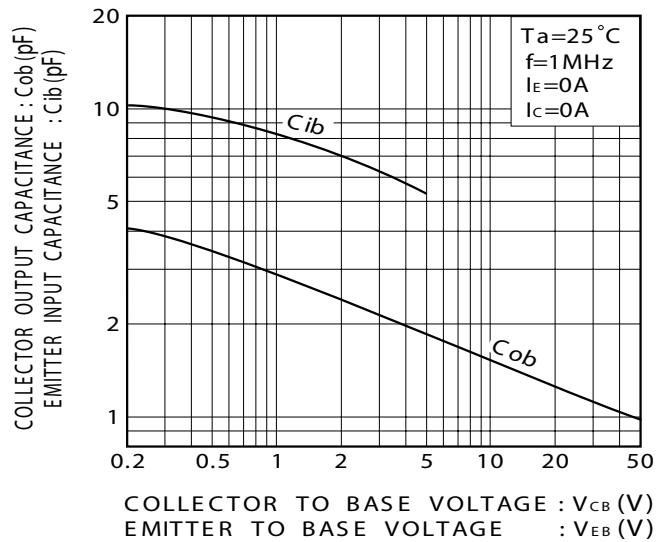
**FIG.7 Collector-emitter saturation voltage vs. collector current (I)**



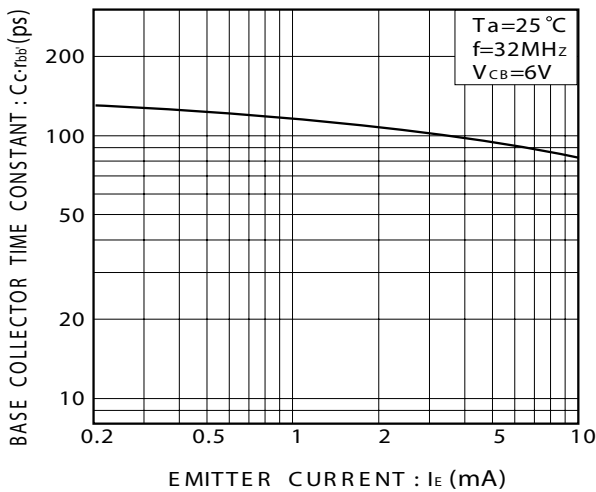
**FIG.8 Collector-emitter saturation voltage vs. collector current (I)**



**FIG.9 Gain bandwidth product vs. emitter current**



**FIG.10 Collector output capacitance vs. collector-base voltage  
Emitter input capacitance vs. emitter-base voltage**



**FIG.11 Base-collector time constant vs. emitter current**

**2SC4617**



**SC-89 Outline Demensions**

Unit:mm

