

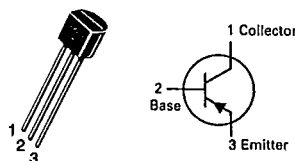
T-29-19

MAXIMUM RATINGS

Rating	Symbol	BC 415	BC 416	Unit
Collector-Emitter Voltage	V_{CE0}	35	45	Vdc
Collector-Base Voltage	V_{CBO}	45	50	Vdc
Emitter-Base Voltage	V_{EBO}	5.0		Vdc
Collector Current - Continuous	I_C	100		mA dc
Total Device Dissipation @ $T_A = 25^\circ\text{C}$ Derate above 25°C	P_D	350	2.8	mW mW/ $^\circ\text{C}$
Total Device Dissipation @ $T_C = 25^\circ\text{C}$ Derate above 25°C	P_D	1.0	8.0	Watt mW/ $^\circ\text{C}$
Operating and Storage Junction Temperature Range	T_J, T_{stg}	-55 to +150		$^\circ\text{C}$

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction to Case	$R_{\theta JC}$	125	$^\circ\text{C/W}$
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	357	$^\circ\text{C/W}$

BC415, B, C
BC416, B, CCASE 29-04, STYLE 17
TO-92 (TO-226AA)

LOW NOISE TRANSISTORS

PNP SILICON

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

Characteristic	Symbol	Min.	Typ.	Max.	Unit
OFF CHARACTERISTICS					
Collector-Emitter Breakdown Voltage ($I_C = 10 \text{ mA dc}, I_B = 0$) BC415 BC416	$V_{(BR)CEO}$	35 45			Vdc
Collector-Base Breakdown Voltage ($I_C = 10 \mu\text{A dc}, I_E = 0$) BC415 BC416	$V_{(BR)CBO}$	45 50			Vdc
Emitter-Base Breakdown Voltage ($I_E = 10 \mu\text{A dc}, I_C = 0$)	$V_{(BR)EBO}$	5			Vdc
Collector Cutoff Current ($V_{CB} = 30 \text{ Vdc}, I_E = 0$) ($V_{CB} = 30 \text{ Vdc}, I_E = 0, T_A = +125^\circ\text{C}$)	I_{CBO}			15 5	nA dc $\mu\text{A dc}$
Emitter Cutoff Current ($V_{EB} = 4 \text{ Vdc}, I_C = 0$)	I_{EBO}			15	nA dc
ON CHARACTERISTICS					
DC Current Gain ($I_C = 10 \mu\text{A dc}, V_{CE} = 5 \text{ Vdc}$) BC415B/BC416B BC415C/BC416C ($I_C = 2 \text{ mA dc}, V_{CE} = 5 \text{ Vdc}$) BC415B/BC416B BC415C/BC416C BC415/BC416	h_{FE}	100 100 180 380 120	150 270 290 500 350	460 800 800	
Collector-Emitter Saturation Voltage ($I_C = 10 \text{ mA dc}, I_B = 0.5 \text{ mA dc}$) ($I_C = 10 \text{ mA dc}, I_B = \text{see note 1}$) ($I_C = 100 \text{ mA dc}, I_B = 5 \text{ mA dc}$, see note 2)	$V_{CE(sat)}$		0.075 0.3 0.25	0.25 0.6	Vdc
Base-Emitter Saturation Voltage ($I_C = 100 \text{ mA dc}, I_B = 5 \text{ mA dc}$)	$V_{BE(sat)}$		1.1		Vdc
Base-Emitter On Voltage ($I_C = 10 \mu\text{A dc}, V_{CE} = 5 \text{ Vdc}$) ($I_C = 100 \mu\text{A dc}, V_{CE} = 5 \text{ Vdc}$) ($I_C = 2 \text{ mA dc}, V_{CE} = 5 \text{ Vdc}$)	$V_{BE(on)}$	0.55	0.52 0.55 0.62	0.75	Vdc
SMALL SIGNAL CHARACTERISTICS					
Current-Gain-Bandwidth Product ($I_C = 10 \text{ mA dc}, V_{CE} = 5 \text{ Vdc}, f = 100 \text{ MHz}$)	f_T		250		MHz
Collector-Base Capacitance ($V_{CE} = 10 \text{ Vdc}, I_E = 0, f = 1 \text{ MHz}$)	C_{cbo}		2.5		pF
Noise Figure ($I_C = 200 \mu\text{A dc}, V_{CE} = 5 \text{ Vdc}, R_S = 2 \text{ K}\Omega$, $f = 30 \text{ Hz} - 15 \text{ KHz}$)	NF		0.5	2.0	dB

Note 1: I_B is value for which $I_C = 11 \text{ mA}$ at $V_{CE} = 1 \text{ V}$ Note 2: Pulse test = $300 \mu\text{s}$ - Duty cycle = 2%