

MAXIMUM RATINGS

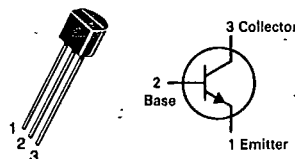
Rating	Symbol	BC650 Series	BC651 Series	Unit
Collector-Emitter Voltage	V_{CEO}	30	45	Vdc
Collector-Base Voltage	V_{CBO}	30	45	Vdc
Emitter-Base Voltage	V_{EBO}	6.0		Vdc
Collector Current — Continuous	I_C	200		mA dc
Total Device Dissipation @ $T_A = 25^\circ\text{C}$ Derate above 25°C	P_D	625	5.0	mW mW/°C
Total Device Dissipation @ $T_C = 25^\circ\text{C}$ Derate above 25°C	P_D	1.5	12	Watt mW/°C
Operating and Storage Junction Temperature Range	T_J, T_{stg}	-55 to +150		°C

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction to Case	$R_{\theta JC}$	83.3	°C/W
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	200	°C/W

T-29-21
BC650, C, CS, S
BC651, C, CS, S

CASE 29-04, STYLE 1
 TO-92 (TO-226AA)



**LOW NOISE AUDIO
 TRANSISTORS**

NPN SILICON

Refer to MPSA18 for graphs.

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

Characteristic	Symbol	Min	Max	Unit
OFF CHARACTERISTICS				
Collector-Emitter Breakdown Voltage ($I_C = 1.0\text{ mA dc}, I_B = 0$)	$V_{(BR)CEO}$	30 45	—	Vdc
Collector-Base Breakdown Voltage ($I_C = 0.1\text{ mA dc}, I_E = 0$)	$V_{(BR)CBO}$	30 45	—	Vdc
Collector Cutoff Current ($V_{CB} = 30\text{ Vdc}, I_E = 0$)	I_{CBO}	—	0.015	μA
Collector-Emitter Leakage Current ($V_{CE} = 60\text{ V}$)	I_{CES}	—	0.025	μA
Emitter Cutoff Current ($V_{EB} = 6.0\text{ Vdc}, I_C = 0$)	I_{EBO}	—	0.015	μA
ON CHARACTERISTICS				
DC Current Gain ($I_C = 2.0\text{ mA dc}, V_{CE} = 5.0\text{ Vdc}$)	h_{FE}	380 380	1400 820	—
Collector-Emitter Saturation Voltage ($I_C = 10\text{ mA dc}, I_B = 0.5\text{ mA dc}$) ($I_C = 100\text{ mA dc}, I_B = 5.0\text{ mA dc}$)	$V_{CE(sat)}$	— —	0.2 0.6	Vdc
Base-Emitter On Voltage ($I_C = 2.0\text{ mA dc}, V_{CE} = 5.0\text{ Vdc}$)	$V_{BE(on)}$	0.55	0.7	Vdc
SMALL-SIGNAL CHARACTERISTICS				
Small-Signal Current Gain ($I_C = 2.0\text{ mA dc}, V_{CE} = 5.0\text{ Vdc}, f = 1.0\text{ kHz}$)	h_{fe}	380	1600	—
Output Capacitance ($V_{CB} = 10\text{ Vdc}, I_E = 0, f = 1.0\text{ MHz}$)	C_{ob}	—	3.0	pF
Input Capacitance ($V_{EB} = 0.5\text{ Vdc}, I_C = 0, f = 1.0\text{ MHz}$)	C_{ib}	—	8.0	pF
Current-Gain Bandwidth Product ($I_C = 1.0\text{ mA dc}, V_{CE} = 5.0\text{ V}, f = 100\text{ MHz}$)	f_T	100	700	MHz
Noise Figure ($V_{CE} = 5.0\text{ V}, I_C = 0.2\text{ mA}, R_S = 2.0\text{ k}\Omega, f = 1.0\text{ kHz}, T_A = 25^\circ\text{C}$) BC650, C, BC651, C BC650S, CS, BC651S, CS	NF	— —	2.8 2.0	dB