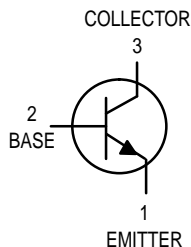
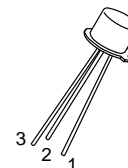


High Voltage Transistors

NPN Silicon



BSS71



CASE 22-03, STYLE 1
TO-18 (TO-206AA)

MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Collector–Emitter Voltage	V_{CEO}	200	Vdc
Collector–Base Voltage	V_{CBO}	200	Vdc
Emitter–Base Voltage	V_{EBO}	6.0	Vdc
Collector Current — Continuous	I_C	0.5	Adc
Total Device Dissipation @ $T_A = 25^\circ\text{C}$ Derate above 25°C	P_D	0.5 2.86	Watts mW/ $^\circ\text{C}$
Total Device Dissipation @ $T_C = 25^\circ\text{C}$ Derate above 25°C	P_D	2.5 14.3	Watts mW/ $^\circ\text{C}$
Operating and Storage Junction Temperature Range	T_J, T_{stg}	-65 to +200	$^\circ\text{C}$

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction to Case	$R_{\theta JC}$	70	$^\circ\text{C}/\text{W}$

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

Characteristic	Symbol	Min	Typ	Max	Unit
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OFF CHARACTERISTICS

Collector–Emitter Breakdown Voltage ($I_C = 10 \text{ mAdc}, I_B = 0$) ⁽¹⁾	$V_{(BR)CEO}$	200	—	—	Vdc
Collector–Base Breakdown Voltage ($I_C = 100 \text{ }\mu\text{Adc}, I_E = 0$)	$V_{(BR)CBO}$	200	—	—	Vdc
Emitter–Base Breakdown Voltage ($I_E = 100 \text{ }\mu\text{Adc}, I_C = 0$)	$V_{(BR)EBO}$	6.0	—	—	Vdc
Collector Cutoff Current ($V_{CB} = 150 \text{ Vdc}, I_E = 0$)	I_{CBO}	—	—	50	nAdc
Collector–Emitter Cutoff Current ($V_{CE} = 150 \text{ Vdc}, I_B = 0$)	I_{CEO}	—	—	500	nAdc
Emitter Cutoff Current ($V_{EB} = 5.0 \text{ Vdc}, I_C = 0$)	I_{EBO}	—	—	50	nAdc

ON CHARACTERISTICS

DC Current Gain ($I_C = 0.1 \text{ mAdc}, V_{CE} = 1.0 \text{ Vdc}$) ($I_C = 1.0 \text{ mAdc}, V_{CE} = 10 \text{ Vdc}$) ($I_C = 10 \text{ mAdc}, V_{CE} = 10 \text{ Vdc}$) ⁽¹⁾ ($I_C = 30 \text{ mAdc}, V_{CE} = 10 \text{ Vdc}$) ⁽¹⁾	h_{FE}	20 30 50 40	40 45 120 140	— — — 250	—
Collector–Emitter Saturation Voltage ⁽¹⁾ ($I_C = 10 \text{ mAdc}, I_B = 1.0 \text{ mAdc}$) ($I_C = 30 \text{ mAdc}, I_B = 3.0 \text{ mAdc}$) ($I_C = 50 \text{ mAdc}, I_B = 5.0 \text{ mAdc}$)	$V_{CE(sat)}$	— — —	0.15 0.25 0.35	0.3 0.4 0.5	Vdc
Base–Emitter Saturation Voltage ⁽¹⁾ ($I_C = 10 \text{ mAdc}, I_B = 1.0 \text{ mAdc}$) ($I_C = 30 \text{ mAdc}, I_B = 3.0 \text{ mAdc}$) ($I_C = 50 \text{ mAdc}, I_B = 5.0 \text{ mAdc}$)	$V_{BE(sat)}$	— — —	0.7 0.8 0.85	0.8 0.9 1.0	Vdc

1. Pulse Test: Pulse Width $\leq 300 \text{ }\mu\text{s}$, Duty Cycle $\leq 2.0\%$.

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

Characteristic	Symbol	Min	Typ	Max	Unit
DYNAMIC CHARACTERISTICS					
Current-Gain — Bandwidth Product ($I_C = 20\text{ mA dc}$, $V_{CE} = 20\text{ V dc}$, $f = 20\text{ MHz}$)	f_t	50	70	200	MHz
Output Capacitance ($I_E = 0$, $V_{CB} = 20\text{ V dc}$, $f = 1.0\text{ MHz}$)	C_{ob}	—	3.5	—	pF
Input Capacitance ($I_C = 0$, $V_{EB} = 0.5\text{ V dc}$, $f = 1.0\text{ MHz}$)	C_{ib}	—	45	—	pF
Turn-On Time ($I_{B1} = 10\text{ mA dc}$, $I_C = 50\text{ mA dc}$, $V_{CC} = 100\text{ V dc}$)	t_{on}	—	100	—	ns
Turn-Off Time ($I_{B2} = 10\text{ mA dc}$, $I_C = 50\text{ mA dc}$, $V_{CC} = 100\text{ V dc}$)	t_{off}	—	400	—	ns

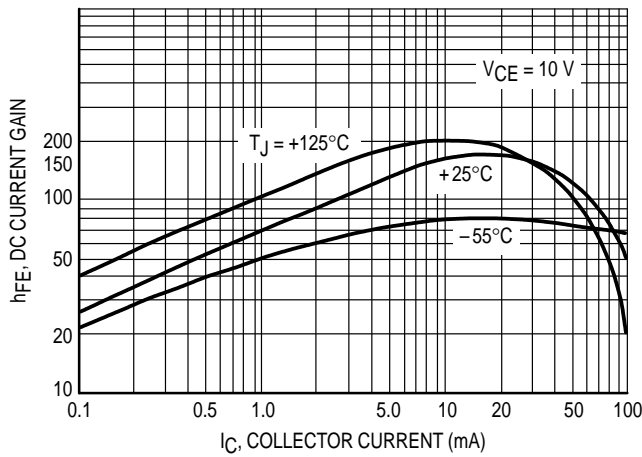


Figure 1. DC Current Gain

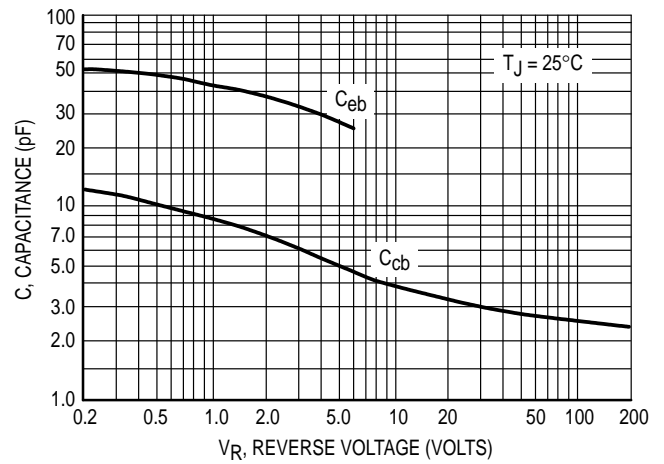


Figure 2. Capacitances

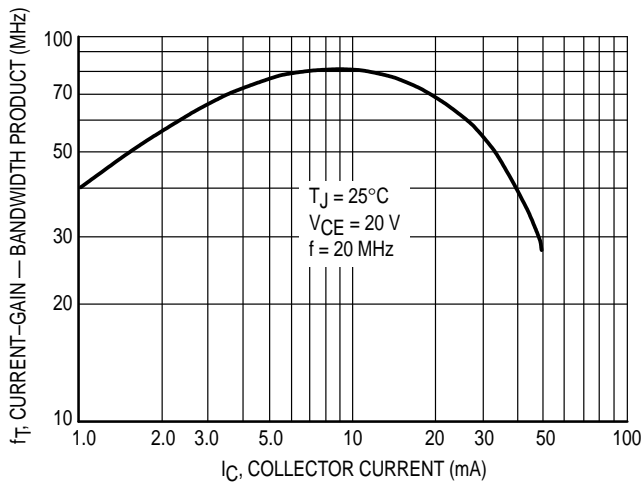


Figure 3. Current-Gain — Bandwidth Product

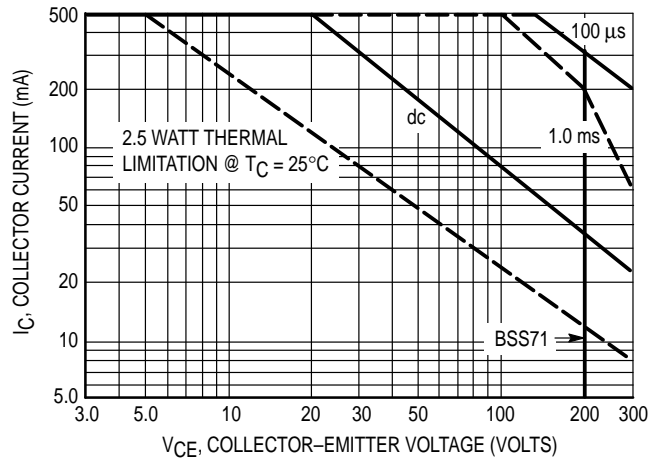


Figure 4. Active-Region Safe Operating Area

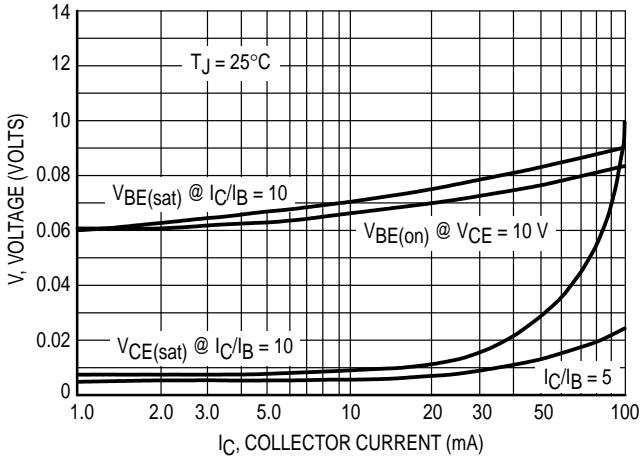


Figure 5. "On" Voltages

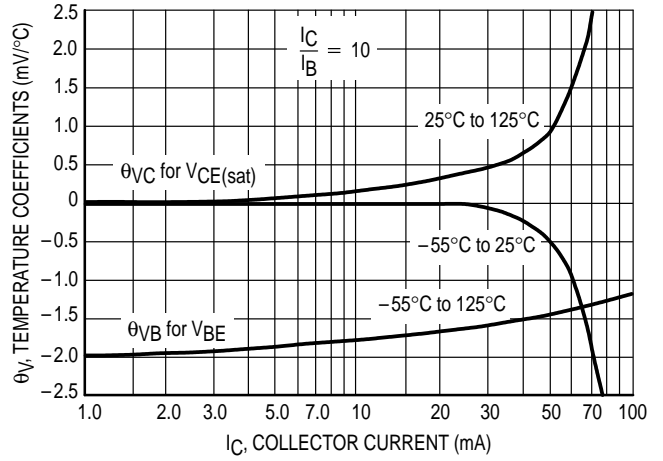


Figure 6. Temperature Coefficients

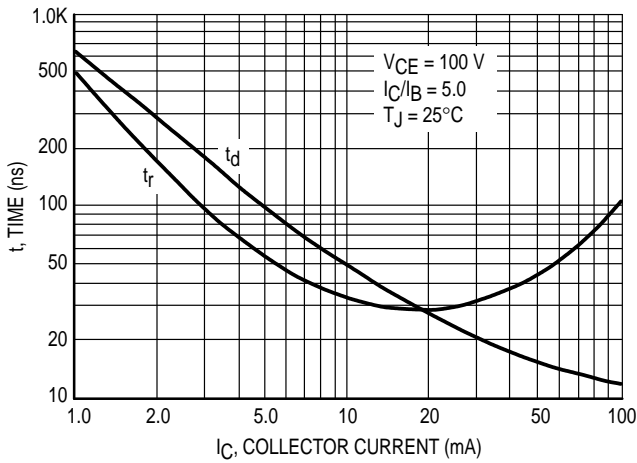


Figure 7. Turn-On Time

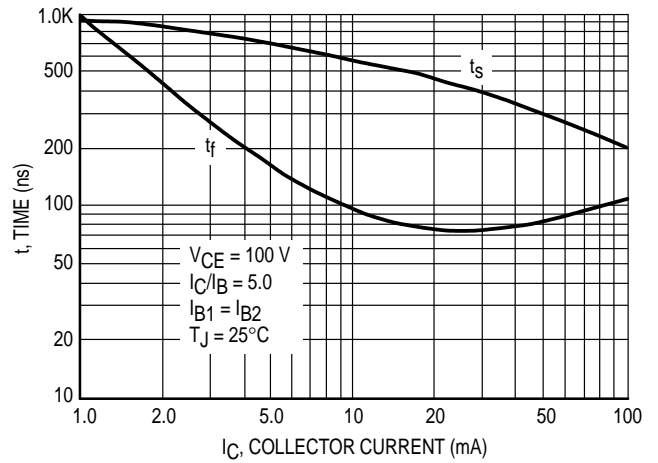


Figure 8. Turn-Off Time

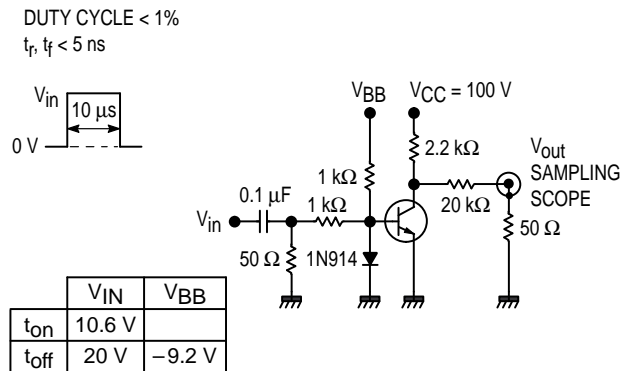
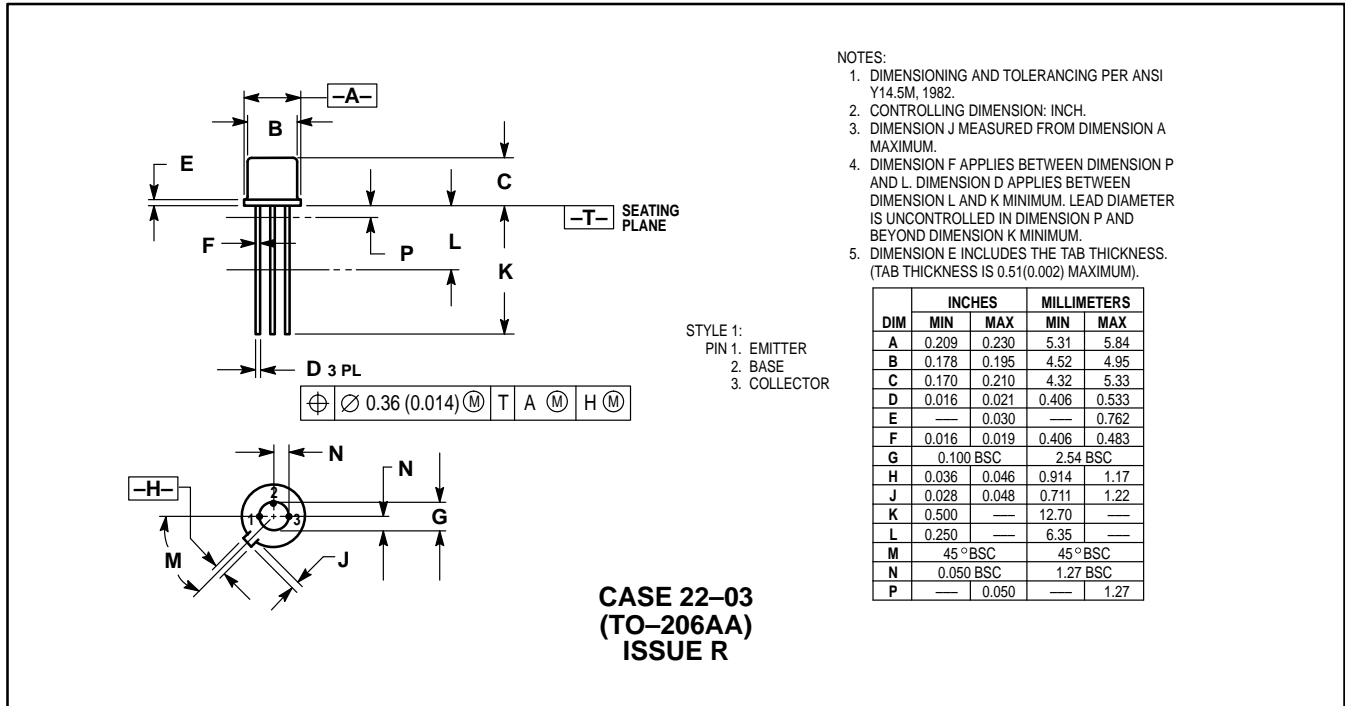


Figure 9. Switching Time Test Circuit

PACKAGE DIMENSIONS



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