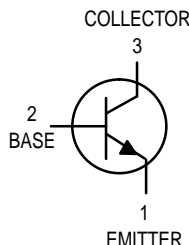
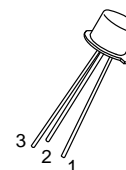


High Voltage Transistors

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	$^\circ\text{C/W}$

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 ($I_C = 20\text{ mAdc}$, $V_{CE} = 20\text{ Vdc}$, $f = 20\text{ MHz}$)	f_t	50	70	200	MHz
Output Capacitance ($I_E = 0$, $V_{CB} = 20\text{ Vdc}$, $f = 1.0\text{ MHz}$)	C_{ob}	—	3.5	—	pF
Input Capacitance ($I_C = 0$, $V_{EB} = 0.5\text{ Vdc}$, $f = 1.0\text{ MHz}$)	C_{ib}	—	45	—	pF
Turn–On Time ($I_{B1} = 10\text{ mAdc}$, $I_C = 50\text{ mAdc}$, $V_{CC} = 100\text{ Vdc}$)	t_{on}	—	100	—	ns
Turn–Off Time ($I_{B2} = 10\text{ mAdc}$, $I_C = 50\text{ mAdc}$, $V_{CC} = 100\text{ Vdc}$)	t_{off}	—	400	—	ns

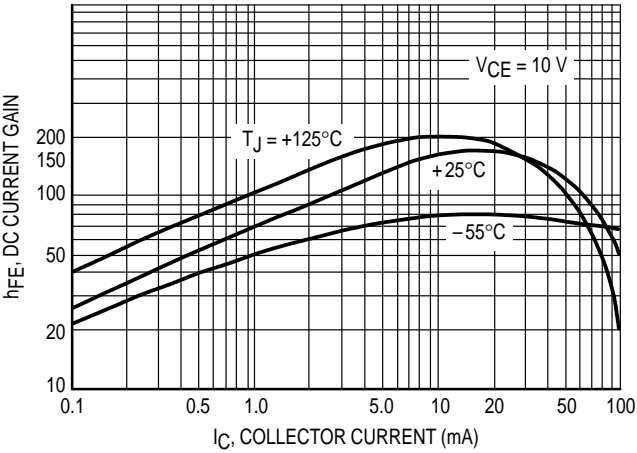


Figure 1. DC Current Gain

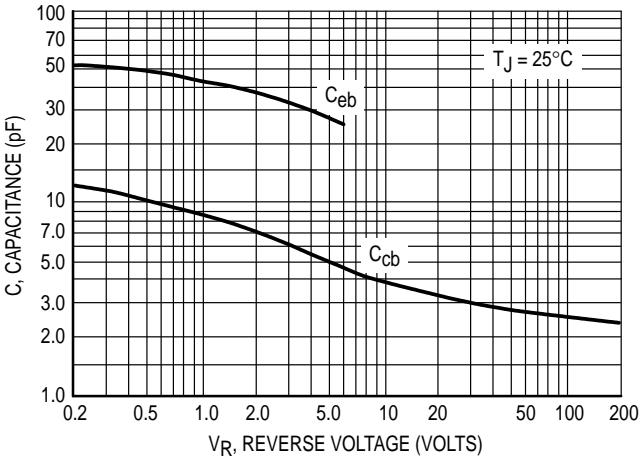


Figure 2. Capacitances

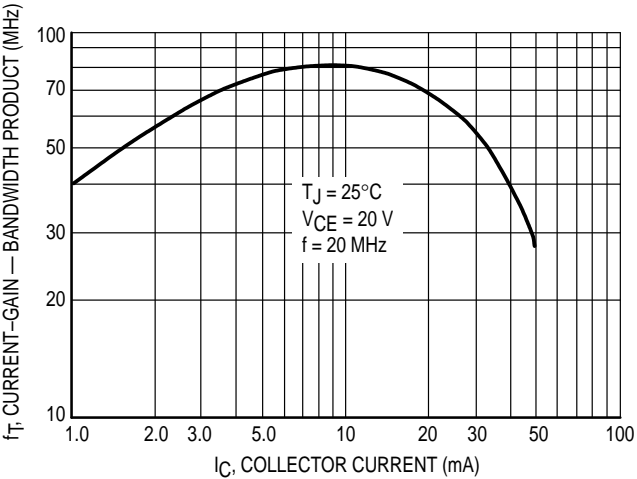


Figure 3. Current–Gain — Bandwidth Product

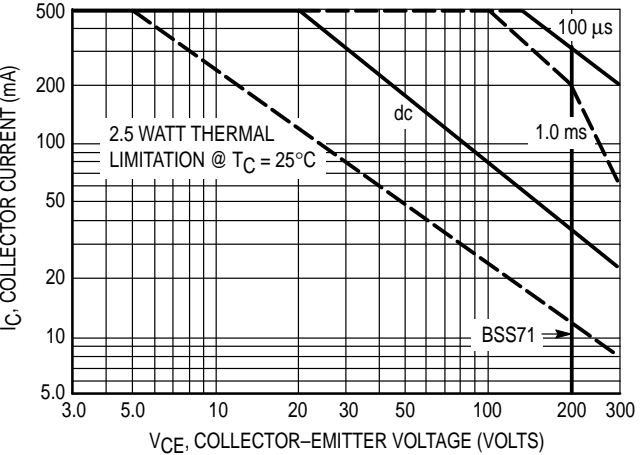


Figure 4. Active–Region Safe Operating Area

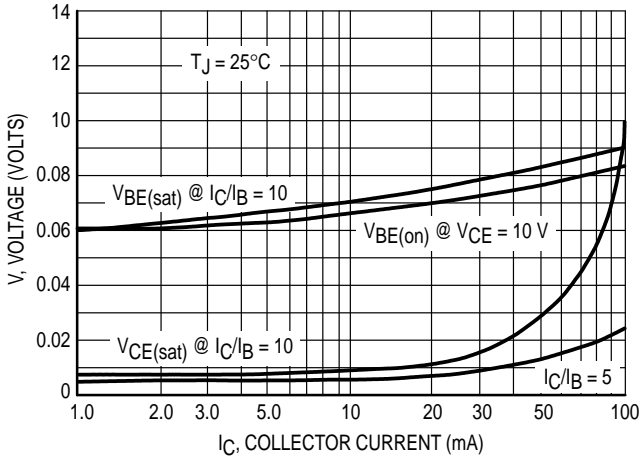


Figure 5. "On" Voltages

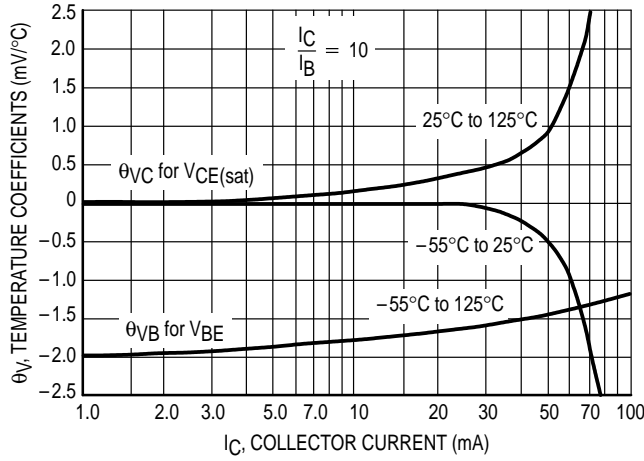


Figure 6. Temperature Coefficients

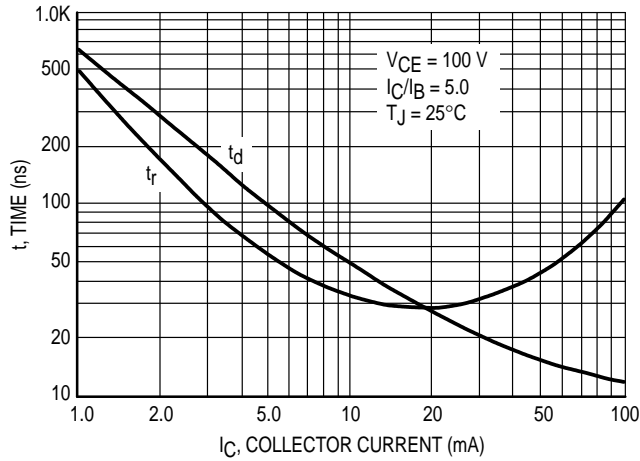


Figure 7. Turn-On Time

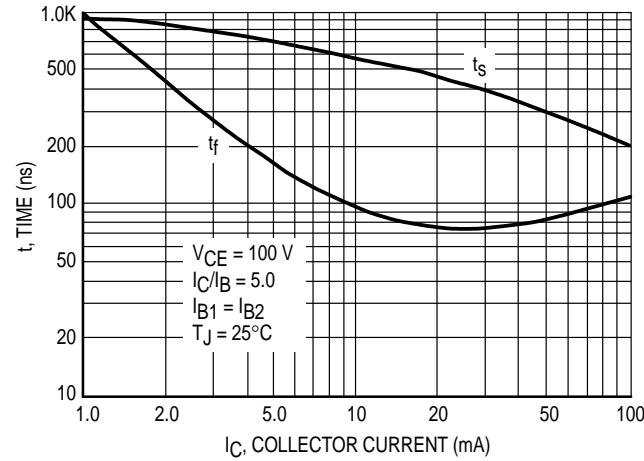


Figure 8. Turn-Off Time

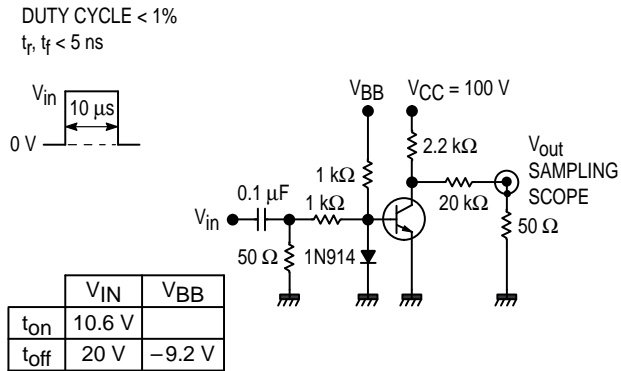
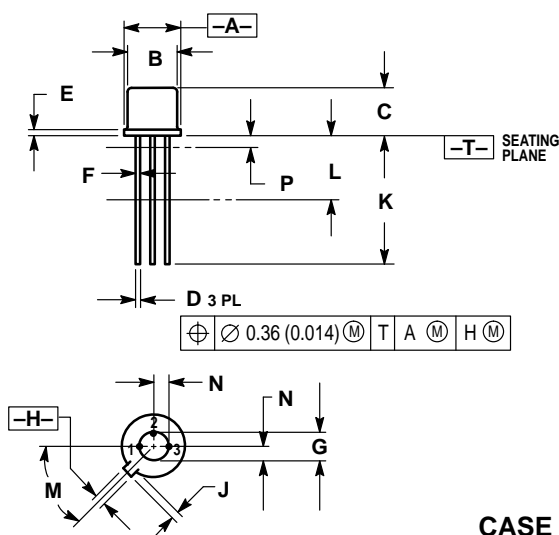


Figure 9. Switching Time Test Circuit

PACKAGE DIMENSIONS




STYLE 1:
PIN 1. EMITTER
2. BASE
3. COLLECTOR

NOTES:

1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. DIMENSION J MEASURED FROM DIMENSION A MAXIMUM.
4. DIMENSION F APPLIES BETWEEN DIMENSION P AND L. DIMENSION D APPLIES BETWEEN DIMENSION L AND K MINIMUM. LEAD DIAMETER IS UNCONTROLLED IN DIMENSION P AND BEYOND DIMENSION K MINIMUM.
5. DIMENSION E INCLUDES THE TAB THICKNESS. (TAB THICKNESS IS 0.01(0.002) MAXIMUM).

DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	0.209	0.230	5.31	5.84
B	0.178	0.195	4.52	4.95
C	0.170	0.210	4.32	5.33
D	0.016	0.021	0.406	0.533
E	—	0.030	—	0.762
F	0.016	0.019	0.406	0.483
G	0.100 BSC	—	2.54 BSC	—
H	0.036	0.046	0.914	1.17
J	0.028	0.048	0.711	1.22
K	0.500	—	12.70	—
L	0.250	—	6.35	—
M	45° BSC	—	45° BSC	—
N	0.050 BSC	—	1.27 BSC	—
P	—	0.050	—	1.27

**CASE 22-03
(TO-206AA)
ISSUE R**

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How to reach us:

USA/EUROPE/Locations Not Listed: Motorola Literature Distribution;
P.O. Box 5405, Denver, Colorado 80217. 303-675-2140 or 1-800-441-2447

Mfax™: RMFAX0@email.sps.mot.com – TOUCHTONE 602-244-6609
INTERNET: <http://Design-NET.com>

JAPAN: Nippon Motorola Ltd.; Tatsumi-SPD-JLDC, 6F Seibu-Butsuryu-Center,
3-14-2 Tatsumi Koto-Ku, Tokyo 135, Japan. 81-3-3521-8315

ASIA/PACIFIC: Motorola Semiconductors H.K. Ltd.; 8B Tai Ping Industrial Park,
51 Ting Kok Road, Tai Po, N.T., Hong Kong. 852-26629298



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