

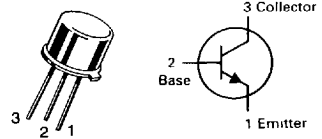
# Boca Semiconductor Corp.

## BSC

<http://www.bocasemi.com>

# 2N3053, A

**CASE 79-04, STYLE 1  
TO-39 (TO-205AD)**



**GENERAL PURPOSE  
TRANSISTORS  
NPN SILICON**

Refer to 2N3019 for graphs.

### MAXIMUM RATINGS

Rating	Symbol	2N3053	2N3053A	Unit
Collector-Emitter Voltage(1)	$V_{CEO}$	40	60	Vdc
Collector-Base Voltage	$V_{CBO}$	60	80	Vdc
Emitter-Base Voltage	$V_{EBO}$	5.0		Vdc
Collector Current — Continuous	$I_C$	700		mAdc
Total Device Dissipation @ $T_C = 25^\circ\text{C}$ Derate above $25^\circ\text{C}$	$P_D$	5.0	28.6	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	$R_{\theta JC}$	35	$^\circ\text{C/W}$

(1) Applicable 0 to 100 mA (Pulsed):

Pulse Width  $\leq 300 \mu\text{sec.}$ , Duty Cycle  $\leq 2.0\%$ .

0 to 700 mA; Pulse Width  $\leq 10 \mu\text{sec.}$ , Duty Cycle  $\leq 2.0\%$ .

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

Characteristic	Symbol	Min	Max	Unit
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#### OFF CHARACTERISTICS

Collector-Emitter Breakdown Voltage ( $I_C = 100 \mu\text{Adc}$ , $I_B = 0$ )	2N3053 2N3053A	$V_{(BR)CEO}$	40 60	— —	Vdc
Collector-Emitter Breakdown Voltage(2) ( $I_C = 100 \text{mAdc}$ , $R_{BE} = 10 \text{ohms}$ )	2N3053 2N3053A	$V_{(BR)CER}$	50 70	— —	Vdc
Collector-Base Breakdown Voltage ( $I_C = 100 \mu\text{Adc}$ , $I_E = 0$ )	2N3053 2N3053A	$V_{(BR)CBO}$	60 80	— —	Vdc
Emitter-Base Breakdown Voltage ( $I_E = 100 \mu\text{Adc}$ , $I_C = 0$ )		$V_{(BR)EBO}$	5.0	—	Vdc
Collector Cutoff Current ( $V_{CE} = 30 \text{Vdc}$ , $V_{EB(\text{off})} = 1.5 \text{Vdc}$ ) ( $V_{CE} = 60 \text{Vdc}$ , $V_{EB(\text{off})} = 1.5 \text{Vdc}$ )	2N3053 2N3053A	$I_{CEX}$	—	0.25	$\mu\text{Adc}$
Emitter Cutoff Current ( $V_{EB} = 4.0 \text{Vdc}$ , $I_C = 0$ )	2N3053	$I_{EBO}$	—	0.25	$\mu\text{Adc}$
Base Cutoff Current ( $V_{CE} = 60 \text{Vdc}$ , $V_{EB(\text{off})} = 1.5 \text{Vdc}$ )	2N3053 2N3053A	$I_{BL}$	—	0.25	$\mu\text{Adc}$

#### ON CHARACTERISTICS(2)

DC Current Gain ( $I_C = 150 \text{mAdc}$ , $V_{CE} = 2.5 \text{Vdc}$ ) ( $I_C = 150 \text{mAdc}$ , $V_{CE} = 10 \text{Vdc}$ )		$h_{FE}$	25 50	— 250	—
Collector-Emitter Saturation Voltage ( $I_C = 150 \text{mAdc}$ , $I_B = 15 \text{mAdc}$ )	2N3053 2N3053A	$V_{CE(\text{sat})}$	— —	1.4 0.3	Vdc
Base-Emitter Saturation Voltage ( $I_C = 150 \text{mAdc}$ , $I_B = 15 \text{mAdc}$ )	2N3053 2N3053A	$V_{BE(\text{sat})}$	— 0.6	1.7 1.0	Vdc
Base-Emitter On Voltage ( $I_C = 150 \text{mAdc}$ , $V_{CE} = 2.5 \text{Vdc}$ )	2N3053 2N3053A	$V_{BE(\text{on})}$	— —	1.7 1.0	Vdc

#### SMALL-SIGNAL CHARACTERISTICS

Current-Gain — Bandwidth Product ( $I_C = 50 \text{mAdc}$ , $V_{CE} = 10 \text{Vdc}$ , $f = 100 \text{MHz}$ )		$f_T$	100	—	MHz
Output Capacitance ( $V_{CB} = 10 \text{Vdc}$ , $I_E = 0$ , $f = 1.0 \text{MHz}$ )		$C_{obo}$	—	15	pF
Input Capacitance ( $V_{EB} = 0.5 \text{Vdc}$ , $I_C = 0$ , $f = 1.0 \text{MHz}$ )		$C_{ibo}$	—	80	pF