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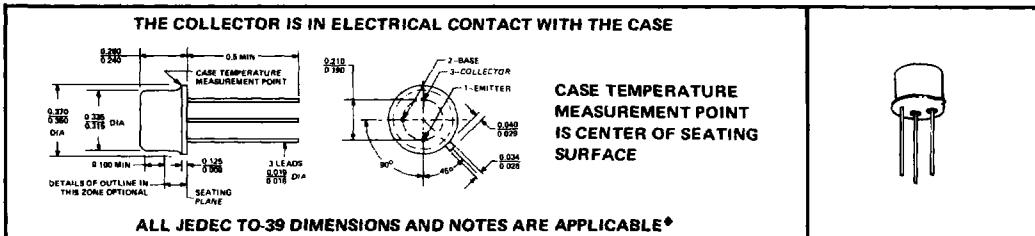
**TYPE 2N3053
N-P-N SILICON TRANSISTOR**

BULLETIN NO. DL-S 7311957, MARCH 1973

FOR HIGH-CURRENT, HIGH-DISSIPATION, GENERAL PURPOSE APPLICATIONS

- **High Current Capability . . . 700 mA**
 - **High Dissipation Capability . . . 10 W**
 - **f_T . . . 100 MHz Min**

mechanical data



ALL JEDEC TO-39 DIMENSIONS AND NOTES ARE APPLICABLE*

absolute maximum ratings at 25°C case temperature (unless otherwise noted)

Collector-Base Voltage	60 V*
Collector-Emitter Voltage (See Note 1)	40 V*
Collector-Emitter Voltage (See Note 2)	50 V
Emitter-Base Voltage	5 V*
Continuous Collector Current	700 mA*
Continuous Device Dissipation at (or below) 25°C Free-Air Temperature (See Note 3)	1 W
Continuous Device Dissipation at (or below) 25°C Case Temperature (See Note 4)	<div style="display: flex; align-items: center; gap: 10px;"> { 10 W† 5 W* </div>
Storage Temperature Range	-65°C to 200°C*
Lead Temperature 1/16 Inch from Case for 10 Seconds	<div style="display: flex; align-items: center; gap: 10px;"> { 300°C† 235°C* </div>

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*electrical characteristics at 25°C free-air temperature

PARAMETER		TEST CONDITIONS		MIN	MAX	UNIT
$V_{(BR)CBO}$	Collector-Base Breakdown Voltage	$I_C = 100 \mu A$, $I_E = 0$		60		V
$V_{(BR)CEO}$	Collector-Emitter Breakdown Voltage	$I_C = 100 \mu A$, $I_B = 0$		40		V
$V_{(BR)CER}$	Collector-Emitter Breakdown Voltage	$I_C = 100 \text{ mA}$, $R_{BE} = 10 \Omega$, See Note 5		50		V
$V_{(BR)EBO}$	Emitter-Base Breakdown Voltage	$I_E = 100 \mu A$, $I_C = 0$		5		V
I_{CEV}	Collector Cutoff Current	$V_{CE} = 30 \text{ V}$, $V_{BE} = -1.5 \text{ V}$		250		mA
I_{EBO}	Emitter Cutoff Current	$V_{EB} = 4 \text{ V}$, $I_C = 0$		250		mA
h_{FE}	Static Forward Current Transfer Ratio	$V_{CE} = 2.5 \text{ V}$, $I_C = 150 \text{ mA}$	See Note 5	25		
		$V_{CE} = 10 \text{ V}$, $I_C = 150 \text{ mA}$		50	250	
V_{BE}	Base-Emitter Voltage	$V_{CE} = 2.5 \text{ V}$, $I_C = 150 \text{ mA}$	See Note 5		1.7	
		$I_B = 15 \text{ mA}$, $I_C = 150 \text{ mA}$			1.7	V
$V_{CE(\text{sat})}$	Collector-Emitter Saturation Voltage	$I_B = 15 \text{ mA}$, $I_C = 150 \text{ mA}$, See Note 5			1.4	V
$ h_{fe} $	Small-Signal Common-Emitter Forward Current Transfer Ratio	$V_{CE} = 10 \text{ V}$, $I_C = 50 \text{ mA}$, $f = 20 \text{ MHz}$		5		
C_{cbo}	Common-Base Open-Circuit Output Capacitance	$V_{CB} = 10 \text{ V}$, $I_E = 0$, $f = 140 \text{ kHz}$		15		pF
$C_{i\text{cbo}}$	Common-Base Open-Circuit Input Capacitance	$V_{EB} = 0.5 \text{ V}$, $I_C = 0$, $f = 140 \text{ kHz}$		80		pF

NOTES:

1. This value applies between 0 and 700 mA collector current when the base-emitter diode is open-circuited. The instantaneous product of collector-emitter voltage and collector current must not exceed 5 W for longer than 300 μ s at a 2% duty cycle.
2. This value applies when the base-emitter resistance $R_{BE} \leq 10 \Omega$.
3. Derate linearly to 200°C free-air temperature at the rate of 5.71 mW/ $^{\circ}$ C.
4. Derate the 10-watt rating linearly to 200°C case temperature at the rate of 57.1 mW/ $^{\circ}$ C. Derate the 5-watt (JEDEC registered) rating linearly to 200°C case temperature at the rate of 28.6 mW/ $^{\circ}$ C.
5. These parameters must be measured using pulse techniques. $t_{w} = 300 \mu$ s, duty cycle $\leq 2\%$.

◆ The JEDEC registered outline for this device is TO-5. TO-39 falls within TO-5 with the exception of lead length.

JEDEC registered data. This data sheet contains all applicable registered data in effect at the time of publication.

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