



**Discrete POWER & Signal Technologies**

## TIS97



### NPN General Purpose Amplifier

This device is designed for use as general purpose amplifiers and switches requiring collector currents to 300 mA. Sourced from Process 10. See PN100 for characteristics.

#### Absolute Maximum Ratings\*

TA = 25°C unless otherwise noted

Symbol	Parameter	Value	Units
V <sub>CEO</sub>	Collector-Emitter Voltage	40	V
V <sub>CBO</sub>	Collector-Base Voltage	40	V
V <sub>EBO</sub>	Emitter-Base Voltage	6.0	V
I <sub>C</sub>	Collector Current - Continuous	500	mA
T <sub>J</sub> , T <sub>stg</sub>	Operating and Storage Junction Temperature Range	-55 to +150	°C

\*These ratings are limiting values above which the serviceability of any semiconductor device may be impaired.

**NOTES:**

- 1) These ratings are based on a maximum junction temperature of 150 degrees C.
- 2) These are steady state limits. The factory should be consulted on applications involving pulsed or low duty cycle operations.

#### Thermal Characteristics

TA = 25°C unless otherwise noted

Symbol	Characteristic	Max	Units
		TIS97	
P <sub>D</sub>	Total Device Dissipation Derate above 25°C	625	mW
		5.0	mW/°C
R <sub>θJC</sub>	Thermal Resistance, Junction to Case	83.3	°C/W
R <sub>θJA</sub>	Thermal Resistance, Junction to Ambient	200	°C/W



## NPN General Purpose Amplifier

(continued)

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### Electrical Characteristics

TA = 25°C unless otherwise noted

Symbol	Parameter	Test Conditions	Min	Max	Units
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#### OFF CHARACTERISTICS

$V_{(BR)CEO}$	Collector-Emitter Breakdown Voltage*	$I_C = 10 \text{ mA}, I_B = 0$	40		V
$I_{CBO}$	Collector Cutoff Current	$V_{CB} = 40 \text{ V}, I_E = 0$ $V_{CB} = 60 \text{ V}, I_E = 0$		10 10	nA $\mu\text{A}$
$I_{EBO}$	Emitter Cutoff Current	$V_{EB} = 6.0 \text{ V}, I_C = 0$		20	nA

#### ON CHARACTERISTICS\*

$h_{FE}$	DC Current Gain	$V_{CE} = 5.0 \text{ V}, I_C = 100 \mu\text{A}$	250	700	
$V_{BE(on)}$	Base-Emitter On Voltage	$V_{CE} = 5.0 \text{ V}, I_C = 100 \mu\text{A}$	0.45	0.65	V

#### SMALL SIGNAL CHARACTERISTICS

$C_{cb}$	Collector-Base Capacitance	$V_{CB} = 5.0 \text{ V}, f = 1.0 \text{ MHz}$	1.0	4.0	pF
$C_{eb}$	Emitter-Base Capacitance	$V_{EB} = 0.5 \text{ V}, f = 1.0 \text{ MHz}$		16	pF
$h_{fe}$	Small-Signal Current Gain	$I_C = 100 \mu\text{A}, V_{CE} = 5.0 \text{ V},$ $f = 1.0 \text{ kHz}$ $I_C = 10 \text{ mA}, V_{CE} = 5.0 \text{ V},$ $f = 100 \text{ MHz}$	250 2.0	800	
NF	Noise Figure	$V_{CE} = 5.0 \text{ V}, I_C = 30 \mu\text{A},$ $R_g = 10 \text{ k}\Omega, f = 1.0 \text{ kHz},$ $B_W = 100 \text{ Hz}$ $V_{CE} = 5.0 \text{ V}, I_C = 100 \mu\text{A},$ $R_g = 10 \text{ k}\Omega, B_W = 15.7 \text{ kHz}$		2.0 3.0	dB dB

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