

# IT120, IT122

## Dual NPN

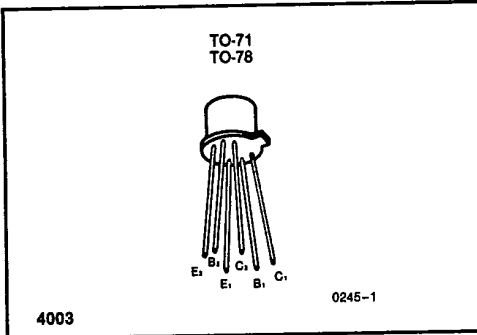
### General Purpose Amplifier



#### FEATURES

- High  $h_{FE}$  at Low Current
- Low Output Capacitance
- Good Matching
- Tight  $V_{BE}$  Tracking

#### PIN CONFIGURATION



#### ABSOLUTE MAXIMUM RATINGS

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

Collector-Base Voltage (Note 1)	45V
Collector-Emitter Voltage (Note 1)	45V
Emitter Base Voltage (Notes 1 and 2)	7V
Collector Current (Note 1)	50mA
Collector-Collector Voltage	60V
Storage Temperature Range	$-65^\circ\text{C}$ to $+200^\circ\text{C}$
Operating Temperature Range	$-55^\circ\text{C}$ to $+150^\circ\text{C}$
Lead Temperature (Soldering, 10sec)	$+300^\circ\text{C}$

	TO-78		TO-71	
	One Side	Both Sides	One Side	Both Sides
Power Dissipation	250mW	500mW	200mW	400mW
Derate Above $25^\circ\text{C}$	1.7mW/ $^\circ\text{C}$	3.3mW/ $^\circ\text{C}$	1.3mW/ $^\circ\text{C}$	2.7mW/ $^\circ\text{C}$

**NOTE:** Stresses above those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only and functional operation of the device at these or any other conditions above those indicated in the operational sections of the specifications is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

#### ORDERING INFORMATION

TO-78	TO-71
IT120	IT120-TO71
IT121	IT121-TO71
IT122	IT122-TO71

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

Symbol	Parameter	Test Conditions	IT120A		IT120		IT121		IT122		Units
			Min	Max	Min	Max	Min	Max	Min	Max	
$h_{FE}$	DC Current Gain	$I_C = 10\mu\text{A}, V_{CE} = 5.0\text{V}$	200		200		80		80		
		$I_C = 1.0\text{mA}, V_{CE} = 5.0\text{V}$	225		225		100		100		
		$I_C = 10\mu\text{A}, V_{CE} = 5.0\text{V}$ $T_A = -55^\circ\text{C}$	75		75		30		30		
$V_{BE(ON)}$	Emitter-Base On Voltage		0.7		0.7		0.7		0.7		V
$V_{CE(SAT)}$	Collector Saturation Voltage	$I_C = 0.5\text{mA}, I_B = 0.05\text{mA}$	0.5		0.5		0.5		0.5		
$I_{CBO}$	Collector Cutoff Current	$I_E = 0, V_{CB} = 45\text{V}$	1.0		1.0		1.0		1.0		nA
		$T_A = +150^\circ\text{C}$	10		10		10		10		$\mu\text{A}$
$I_{EBO}$	Emitter Cutoff Current	$I_C = 0, V_{EB} = 5.0\text{V}$	1.0		1.0		1.0		1.0		nA
$C_{obo}$	Output Capacitance	$I_E = 0, V_{CB} = 5.0\text{V}$ $f = 1\text{MHz}$	2.0		2.0		2.0		2.0		pF
$C_{ie}$	Emitter Transition Capacitance	$I_C = 0, V_{EB} = 0.5\text{V}$ (Note 3)	2.5		2.5		2.5		2.5		
$C_{C1,C2}$	Collector to Collector Capacitance	$V_{CC} = 0$	4.0		4.0		4.0		4.0		

INTERASIL'S SOLE AND EXCLUSIVE WARRANTY OBLIGATION WITH RESPECT TO THIS PRODUCT SHALL BE THAT STATED IN THE WARRANTY ARTICLE OF THE CONDITION OF SALE. THE WARRANTY SHALL BE EXCLUSIVE AND SHALL BE IN LIEU OF ALL OTHER WARRANTIES, EXPRESS, IMPLIED OR STATUTORY, INCLUDING THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR USE.

NOTE: All typical values have been characterized but are not tested.

# IT120, IT122



IT120, IT122

T-29-27

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

Symbol	Parameter	Test Conditions	IT120A		IT120		IT121		IT122		Units
			Min	Max	Min	Max	Min	Max	Min	Max	
$I_{C1, C2}$	Collector to Collector Leakage Current	$V_{CC} = \pm 60\text{V}$ (Note 3)		10		10		10		10	nA
$V_{CEO(\text{SUST})}$	Collector to Emitter Sustaining Voltage	$I_C = 1.0\text{mA}$ , $I_B = 0$	45		45		45		45		V
GBW	Current Gain Bandwidth Product (Note 3)	$I_C = 10\mu\text{A}$ , $V_{CE} = 5\text{V}$	10		10		7		7		MHz
		$I_C = 1\text{mA}$ , $V_{CE} = 5\text{V}$	220		220		180		180		
$ V_{BE1} - V_{BE2} $	Base Emitter Voltage Differential	$I_C = 10\mu\text{A}$ , $V_{CE} = 5.0\text{V}$		1		2		3		5	mV
$ I_{B1} - I_{B2} $	Base Current Differential				2.5		5		25		25
$\frac{\Delta(V_{BE1} - V_{BE2})}{\Delta T}$	Base-Emitter Voltage Differential Change with Temperature	(Note 3) $T_A = -55^\circ\text{C}$ to $+125^\circ\text{C}$ $I_C = 10\mu\text{A}$ , $V_{CE} = 5.0\text{V}$		3		5		10		20	$\mu\text{V}/^\circ\text{C}$

NOTES: 1. Per transistor.

2. The reverse base-to-emitter voltage must never exceed 7.0 volts and the reverse base-to-emitter current must never exceed  $10\mu\text{A}$ .

3. For design reference only, not 100% tested.