Monolithic Dual PNP General Purpose Amplifier

calogic CORPORATION

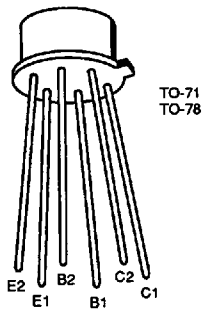
T-27-27

IT136 – IT139

FEATURES

- High Gain at Low Current
- Low Output Capacitance
- Tight I_B Match
- Tight V_{BE} Tracking
- Dielectrically Isolated Matched Pairs for Differential Amplifiers

PIN CONFIGURATION



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ABSOLUTE MAXIMUM RATINGS

(T_A = 25°C unless otherwise specified)

Collector-Base Voltage (Note 1)
- IT136, IT137 ..... 60V
- IT138 ..... 55V
- IT139 ..... 45V

Collector-Emitter Voltage (Note 1)
- IT136, IT137 ..... 60V
- IT138 ..... 55V
- IT139 ..... 45V

Emitter Base Voltage (Notes 1 and 2) 7V
Collector Current (Note 1) 100mA
Collector-Collector Voltage 70V
Storage Temperature Range ..... -65°C to +175°C
Operating Temperature Range ..... -55°C to +175°C
Lead Temperature (Soldering, 10sec) ..... +300°C

	TO-71		TO-78	
	One Side	Both Sides	One Side	Both Sides
Power Dissipation	200mW	400mW	250mW	500mW
Derate above 25°C	1.3mW/°C	2.7mW/°C	1.7mW/°C	3.3mW/°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

Part	Package	Temperature Range
IT136	Hermetic TO-78	-55°C to +175°C
IT136/71	Hermetic TO-71	-55°C to +175°C
XIT136	Sorted Chips in Carriers	-55°C to +175°C
IT137	Hermetic TO-78	-55°C to +175°C
IT137/71	Hermetic TO-71	-55°C to +175°C
XIT137	Sorted Chips in Carriers	-55°C to +175°C
IT138	Hermetic TO-78	-55°C to +175°C
IT138/71	Hermetic TO-71	-55°C to +175°C
XIT138	Sorted Chips in Carriers	-55°C to +175°C
IT139	Hermetic TO-78	-55°C to +175°C
IT139/71	Hermetic TO-71	-55°C to +175°C
XIT139	Sorted Chips in Carriers	-55°C to +175°C

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ELECTRICAL CHARACTERISTICS (T_A = 25°C unless otherwise specified)

SYMBOL	PARAMETER	IT136		IT137		IT138		IT139		UNITS	TEST CONDITIONS
		MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX		
h_{FE}	DC Current Gain	150		150		100		70			I_C = 10µA, V_{CE} = 5V
		150	800	150	800	100	800	70	800		I_C = 1.0mA, V_{CE} = 5V
		125		125		80		50			I_C = 10mA, V_{CE} = 5V
		65		60		40		25			I_C = 50mA, V_{CE} = 5V
		75		75		60		40			I_C = 1mA, V_{CE} = 5V, T_A = 55°C
$V_{BE(on)}$	Emitter-Base On Voltage		.9		.9		.9		.9	V	I_C = 10mA, V_{CE} = 5V
			1.0		1.0		1.0		1.0		I_C = 50mA, V_{CE} = 5V
$V_{CE(sat)}$	Collector Saturation Voltage		.3		.3		.3		.3		I_C = 1mA, I_B = .1mA
			.6		.6		.6		.6		I_C = 10mA, I_B = 1mA
I_{CBO}	Collector Cutoff Current		0.1		0.1		0.1		0.1*	nA	I_E = 0, V_{CB} = 45V, V_{CD} = 30V* (IT139), T_A = +150°C
			0.1		0.1		0.1		0.1*	µA	
I_{EBO}	Emitter Cutoff Current		0.1		0.1		0.1		0.1	nA	I_C = 0, V_{EB} = 5V
C_{obo}	Output Capacitance (Note 3)		3		3		3		3	pF	I_E = 0, V_{CB} = 20V, f = 1MHz
$BV_{C_1C_2}$	Collector to Collector Breakdown Current	±100		±100		±100		±100		V	I_C = ±1µA
$V_{CEO(sust)}$	Collector to Emitter Sustaining Voltage	60		60		55		45			I_C = 1mA, I_B = 0
BV_{CBO}	Collector Base Breakdown Voltage	60		60		55		45			I_C = 10µA, I_E = 0
BV_{EBO}	Emitter Base Breakdown Voltage	7		7		7		7			I_E = 10µA, I_C = 0
$\lvert V_{BE_1} - V_{BE_2} \rvert$	Base Emitter Voltage Differential		1		2		3		5	mV	I_C = 1mA, V_{CE} = 5V
$\frac{\Delta(\lvert V_{BE_1} - V_{BE_2} \rvert)}{\Delta T}$	Base Emitter Voltage Differential Change with Temperature (Note 3)		3		5		10		20	µV/°C	I_C = 1mA, V_{CE} = 5V T_A = -55°C to +125°C
$\lvert I_{B_1} - I_{B_2} \rvert$	Base Current Differential		2.5		5		10		20	nA	I_C = 10µA, V_{CE} = 5V
			.25		.5		1.0		2.0	µA	I_C = 1mA, V_{CE} = 5V

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 10µA.
3. For design reference only, not 100% tested.