LINEAR SYSTEMS

LS312
MONOLITHIC DUAL
NPN TRANSISTOR

micross

Linear Systems High Voltage Super-Beta Monolithic Dual NPN

The LS312 is a monolithic pair of NPN transistors mounted in a single TO-78 package. The monolithic dual chip design reduces parasitics and gives better performance while ensuring extremely tight matching.

The hermetically sealed TO-78 is well suited for hi-rel and harsh environment applications.

(See Packaging Information).

- Very high gain
- Tight matching
- Low Output Capacitance

FEATURES	
HIGH GAIN	$h_{FE} \geq 200$ @ 10µA-1mA
TIGHT V_{BE} MATCHING	$\lvert V_{BE1} - V_{BE2} \rvert$ = 0.2mV TYP.
HIGH f_t	250MHz TYP. @ 1mA

ABSOLUTE MAXIMUM RATINGS [1]
@ 25°C (unless otherwise noted)

Maximum Temperatures	
Storage Temperature	-65°C to +200°C
Operating Junction Temperature	-55°C to +150°C
Maximum Power Dissipation	
Continuous Power Dissipation (One side)	250mW
Continuous Power Dissipation (Both sides)	500mW
Linear Derating factor (One side)	2.3mW/°C
Linear Derating factor (Both sides)	4.3mW/°C
Maximum Currents	
Collector Current	10mA

MATCHING CHARACTERISTICS @ 25°C (unless otherwise stated)

SYMBOL	CHARACTERISTIC	MIN	TYP	MAX	UNITS	CONDITIONS
$\lvert V_{BE1} - V_{BE2} \rvert$	Base Emitter Voltage Differential	--	0.2	0.5	mV	I_C = 10µA, V_{CE} = 5V
$\Delta\lvert(V_{BE1} - V_{BE2})\rvert / \Delta T$	Base Emitter Voltage Differential Change with Temperature	--	0.5	2	µV/°C	I_C = 10µA, V_{CE} = 5V T_A = -55°C to +125°C
$\lvert I_{B1} - I_{B2} \rvert$	Base Current Differential	--	--	5	nA	I_C = 10µA, V_{CE} = 5V
$\lvert\Delta (I_{B1} - I_{B2})\rvert$/°C	Base Current Differential Change with Temperature	--	--	0.3	nA/°C	I_C = 10µA, V_{CE} = 5V T_A = -55°C to +125°C
h_{FE1}/h_{FE2}	DC Current Gain Differential	--	5	--	%	I_C = 10µA, V_{CE} = 5V

ELECTRICAL CHARACTERISTICS @ 25°C (unless otherwise noted)

SYMBOL	CHARACTERISTICS	MIN.	TYP.	MAX.	UNITS	CONDITIONS
BV_{CBO}	Collector to Base Voltage	60	--	--	V	I_C = 10µA, I_E = 0
BV_{CEO}	Collector to Emitter Voltage	60	--	--	V	I_C = 10µA, I_B = 0
BV_{EBO}	Emitter-Base Breakdown Voltage	6.2	--	--	V	I_E = 10µA, I_C = 0 [2]
BV_{CCO}	Collector to Collector Voltage	100	--	--	V	I_C = 10µA, I_E = 0
h_{FE}	DC Current Gain	200	--	--		I_C = 10µA, V_{CE} = 5V
		200	--	--		I_C = 100µA, V_{CE} = 5V
		200	--	--		I_C = 1mA, V_{CE} = 5V
V_{CE}(SAT)	Collector Saturation Voltage	--	--	0.25	V	I_C = 1mA, I_B = 0.1mA
I_{EBO}	Emitter Cutoff Current	--	--	0.2	nA	I_E = 0, V_{CB} = 3V
I_{CBO}	Collector Cutoff Current	--	--	0.2	nA	I_E = 0, V_{CB} = 30V
C_{OBO}	Output Capacitance	--	--	2	pF	I_E = 0, V_{CB} = 5V
C_{C1C2}	Collector to Collector Capacitance	--	--	2	pF	V_{CC} = 0V
I_{C1C2}	Collector to Collector Leakage Current	--	--	0.5	nA	V_{CC} = ±45V
f_T	Current Gain Bandwidth Product	200	--	--	MHz	I_C = 1mA, V_{CE} = 5V
NF	Narrow Band Noise Figure	--	--	3	dB	I_C = 100µA, V_{CE} = 5V, BW=200Hz, R_G= 10KΩ, f = 1KHz

Notes:
1. Absolute Maximum ratings are limiting values above which serviceability may be impaired
2. The reverse base-to-emitter voltage must never exceed 6.2 volts; the reverse base-to-emitter current must never exceed 10µA.

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Available Packages:

LS312 in TO-78
LS312 available as bare die

Please contact Micross for full package and die dimensions:

Email: chipcomponents@micross.com
Web: www.micross.com/distribution.aspx

TO-78 (Bottom View)