LINEAR SYSTEMS

LS301
MONOLITHIC DUAL
NPN TRANSISTOR

micross

Linear Systems High Voltage Super-Beta Monolithic Dual NPN

The LS301 is a monolithic pair of high voltage Super-Beta NPN transistors mounted in a single SOIC package. The monolithic dual chip design reduces parasitics and gives better performance while ensuring extremely tight matching.

The 8 Pin SOIC provides ease of manufacturing, and the symmetrical pinout prevents improper orientation.

(See Packaging Information).

LS301 Features:

- Very high gain
- Tight matching
- Low Output Capacitance

FEATURES	
HIGH GAIN	$h_{FE} \geq 2000$ @ 1µA TYP.
LOW OUTPUT CAPACITANCE	$C_{OBO} \leq 2.0$pF
TIGHT V_{BE} MATCHING	$\lvert V_{BE1} - V_{BE2} \rvert = 0.2$mV TYP.
HIGH f_t	100MHz

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	5mA

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	1	mV	$I_C = 10\mu A$, $V_{CE} = 5V$
$\Delta\lvert(V_{BE1} - V_{BE2})\rvert / \Delta T$	Base Emitter Voltage Differential Change with Temperature	--	1	5	µV/°C	$I_C = 10\mu A$, $V_{CE} = 5V$ $T_A = -55°C$ to $+125°C$
$\lvert I_{B1} - I_{B2} \rvert$	Base Current Differential	--	0.5	1	nA	$I_C = 10\mu A$, $V_{CE} = 5V$
h_{FE1}/h_{FE2}	DC Current Gain Differential	--	5	--	%	$I_C = 10\mu A$, $V_{CE} = 5V$

ELECTRICAL CHARACTERISTICS @ 25°C (unless otherwise noted)

SYMBOL	CHARACTERISTICS	MIN.	TYP.	MAX.	UNITS	CONDITIONS
BV_{CBO}	Collector to Base Voltage	18	--	--	V	$I_C = 10\mu A$, $I_E = 0$
BV_{CEO}	Collector to Emitter Voltage	18	--	--	V	$I_C = 10\mu A$, $I_B = 0$
BV_{EBO}	Emitter-Base Breakdown Voltage	6.2	--	--	V	$I_E = 10\mu A$, $I_C = 0$ [2]
BV_{CCO}	Collector to Collector Voltage	100	--	--	V	$I_C = 10\mu A$, $I_E = 0$
h_{FE}	DC Current Gain	--	2000	--		$I_C = 1\mu A$, $V_{CE} = 5V$
		2000	--	--		$I_C = 10\mu A$, $V_{CE} = 5V$
		--	2000	--		$I_C = 500\mu A$, $V_{CE} = 5V$
$V_{CE}(SAT)$	Collector Saturation Voltage	--	--	0.5	V	$I_C = 1mA$, $I_B = 0.1mA$
I_{EBO}	Emitter Cutoff Current	--	--	0.2	pA	$I_C = 0$, $V_{EB} = 3V$
I_{CBO}	Collector Cutoff Current	--	--	100	pA	$I_E = 0$, $V_{CB} = 10V$
C_{OBO}	Output Capacitance	--	--	2	pF	$I_E = 0$, $V_{EB} = 1V$
C_{C1C2}	Collector to Collector Capacitance	--	--	2	pF	$V_{CC} = 0V$
I_{C1C2}	Collector to Collector Leakage Current	--	--	0.5	nA	$V_{CC} = \pm 80V$
f_T	Current Gain Bandwidth Product	100	--	--	MHz	$I_C = 200\mu A$, $V_{CE} = 5V$
NF	Narrow Band Noise Figure	--	--	3	dB	$I_C = 10\mu A$, $V_{CE} = 3V$, BW=200Hz, $R_G = 10K\Omega$, 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:

LS301 in SOIC
LS301 available as bare die

Please contact Micross for full package and die dimensions:

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

SOIC (Top View)