LINEAR SYSTEMS

Linear Integrated Systems

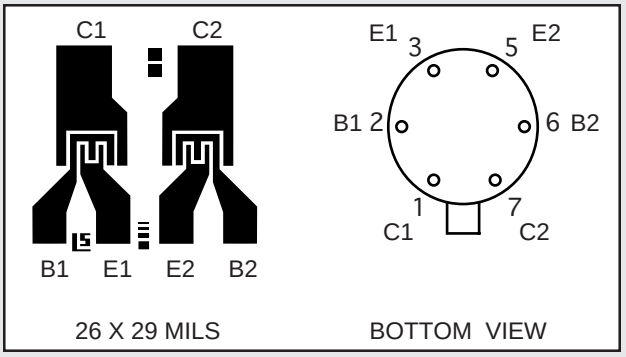
LS301 LS302 LS303

HIGH VOLTAGE SUPER-BETA MONOLITHIC DUAL NPN TRANSISTORS

FEATURES	
VERY HIGH GAIN	$h_{FE} \geq 2000$ @ 1.0µA TYP.
LOW OUTPUT CAPACITANCE	$C_{OBO} \leq 2.0$pF
TIGHT V_{BE} MATCHING	$\lvert V_{BE1}-V_{BE2}\rvert$ = 0.2mV TYP.
HIGH f_T	100MHz

ABSOLUTE MAXIMUM RATINGS NOTE 1 @ 25°C (unless otherwise noted)		
I_C	Collector Current	5mA
Maximum Temperatures		
Storage Temperature		-65° to +200°C
Operating Junction Temperature		+150°C

Maximum Power Dissipation	ONE SIDE	BOTH SIDES
Device Dissipation @ Free Air	250mW	500mW
Linear Derating Factor	2.3mW/°C	4.3mW/°C



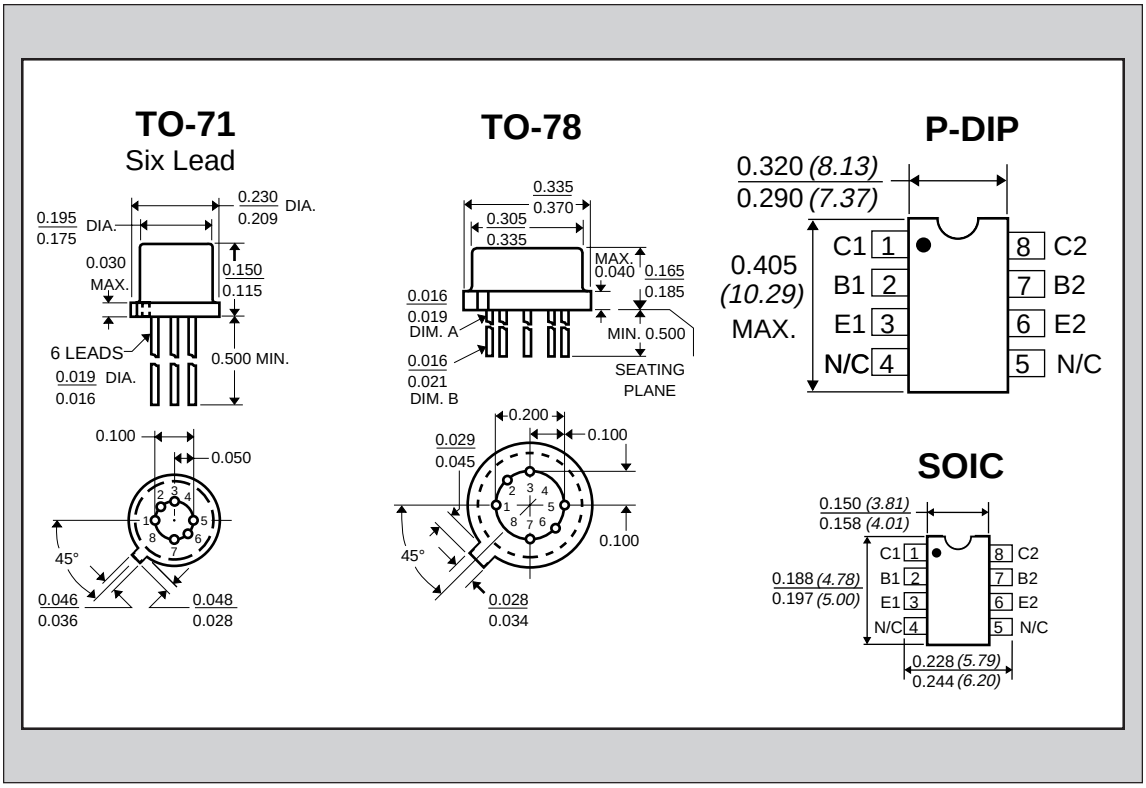
ELECTRICAL CHARACTERISTICS @ 25°C (unless otherwise noted)

SYMBOL	CHARACTERISTICS	LS301	LS302	LS303		UNITS	CONDITIONS	
BV_{CBO}	Collector to Base Voltage	18	35	10	MIN.	V	I_C = 10µA	I_E = 0
BV_{CEO}	Collector to Emitter Voltage	18	35	10	MIN.	V	I_C = 10µA	I_B = 0
BV_{EBO}	Emitter-Base Breakdown Voltage	6.2	6.2	6.2	MIN.	V	I_E = 10µA	I_C = 0 NOTE 2
BV_{CCO}	Collector to Collector Voltage	100	100	100	MIN.	V	I_C = 10µA	I_E = 0
h_{FE}	DC Current Gain	2000	1000	2000	TYP.		I_C = 1µA	V_{CE} = 5V
h_{FE}	DC Current Gain	2000	1000	2000	MIN.		I_C = 10µA	V_{CE} = 5V
h_{FE}	DC Current Gain	2000	1000	2000	TYP.		I_C = 500µA	V_{CE} = 5V
V_{CE}(SAT)	Collector Saturation Voltage	0.5	0.5	0.5	MAX.	V	I_C = 1mA	I_B = 0.1mA
I_{CBO}	Collector Cutoff Current	100	100	100	MAX.	pA	I_E = 0	V_{CB} = NOTE 3
I_{EBO}	Emitter Cutoff Current	0.2	0.2	0.2	MAX.	pA	I_E = 0	V_{EB} = 3V
C_{OBO}	Output Capacitance	2	2	2	MAX.	pF	I_E = 0	V_{CB} = 1V
C_{C1C2}	Collector to Collector Capacitance	2	2	2	MAX.	pF	V_{CC} = 0	
I_{C1C2}	Collector to Collector Leakage Current	0.5	0.5	0.5	MAX.	nA	V_{CC} = NOTE 4	
f_T	Current Gain Bandwidth Product	100	100	100	MIN.	MHz	I_C = 200µA	V_{CE} = 5V
NF	Narrow Band Noise Figure	3	3	3	MAX.	dB	I_C = 10µA BW = 200Hz f = 1KHz	V_{CE} = 3V R_G = 10 KΩ

Linear Integrated Systems 4042 Clipper Court, Fremont, CA 94538 • TEL: (510) 490-9160 • FAX: (510) 353-0261

MATCHING CHARACTERISTICS

SYMBOL	CHARACTERISTICS	LS301	LS302	LS303		UNITS	CONDITIONS
$\|V_{BE1}-V_{BE2}\|$	Base Emitter Voltage Differential	0.2	0.2	0.2	TYP.	mV	I_C = 10 µA V_{CE} = 5V
		1	1	1	MAX.	mV	
$\Delta\|(V_{BE1}-V_{BE2})\|/°C$	Base Emitter Voltage Differential	1	1	1	TYP.	µV/°C	I_C = 10 µA V_{CE} = 5V
	Change with Temperature	5	5	5	MAX.	µV/°C	T = -55°C to +125°C
$\|I_{B1}- I_{B2}\|$	Base Current Differential	0.5	1	0.5	TYP.	nA	I_C = 10µA V_{CE} = 1V
		1	5	1.5	MAX.	nA	I_C = 10µA V_{CE} = 5V
h_{FE1}/h_{FE2}	DC Current Gain Differential	5	5	5	TYP.	%	I_C = 10µA V_{CE} = 5V



NOTES:

1. These ratings are limiting values above which the serviceability of any semiconductor 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 10 µAmps.
3. For LS301 & LS302: V_{CB}= 10V; for LS303: V_{CB} = 5V.
4. For LS301 & LS302: V_{CC}= ±80V; for LS303: V_{CC} = ±20V.