New Jersey Semi-Conductor Products, Inc.

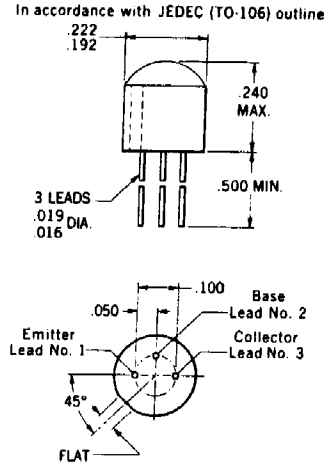
20 STERN AVE.
SPRINGFIELD, NEW JERSEY 07081
U.S.A.

TELEPHONE: (973) 376-2922
(212) 227-6005
FAX: (973) 376-8960

2N5133

- **LOW NOISE - -NF = 1.5 dB (TYP) @ 1.0 kHz**
- **HIGH GAIN - - h_{FE} = 60 (MIN), 220 (TYP) @ 1.0 mA**
  h_{FE} = 50 (TYP) @ 50 μA
- **BREAKDOWN VOLTAGE - - LV_{CEO} = 18 VOLTS (MIN)**

PHYSICAL DIMENSIONS
In accordance with JEDEC (TO-106) outline



NOTES: All dimensions in inches
All leads electrically isolated from case
Package weight is 0.31 gram. Package is electrically non-conductive material

ABSOLUTE MAXIMUM RATINGS (Note 1)

Maximum Temperatures		
Operating Junction Temperature		125°C Maximum
Storage Temperature		−55°C to +125°C
Lead Temperature (Soldering, 10 second time limit)		260°C Maximum
Maximum Power Dissipation		
Total Dissipation at 25°C Case Temperature (Note 2)		0.5 Watt
at 25°C Ambient Temperature (Note 2)		0.2 Watt
Maximum Voltages and Current		
V_{CBO}	Collector to Base Voltage	20 Volts
V_{CEO}	Collector to Emitter Voltage (Note 3)	18 Volts
V_{EBO}	Emitter to Base Voltage	3.0 Volts

ELECTRICAL CHARACTERISTICS (25°C Free Air Temperature unless otherwise noted)

SYMBOL	CHARACTERISTICS	MIN.	TYP.	MAX.	UNITS	TEST CONDITIONS	
h_{FE}	**DC Current Gain**	**60**	**220**	**1000**		**I_C = 1.0 mA**	**V_{CE} = 5.0 V**
h_{FE}	**DC Current Gain**		**50**			**I_C = 50 μA**	**V_{CE} = 10 V**
h_{fe}	High Frequency Current Gain (f = 20 MHz)		1.3			I_C = 50 μA	V_{CE} = 5.0 V
h_{fe}	High Frequency Current Gain (f = 20 MHz)	2.0		20		I_C = 1.0 mA	V_{CE} = 5.0 V
NF	**Narrow Band Noise Figure (f = 1.0 kHz)**		1.5		dB	**I_C = 30 μA**	**V_{CE} = 5.0 V**
						PWR BW = 200 Hz	**R_S = 10 kΩ**
V_{CE}(sat)	Collector Saturation Voltage			0.4	Volts	I_C = 1.0 mA	I_B = 0.1 mA
I_{CBO}	Collector Cutoff Current			50	nA	I_E = 0	V_{CB} = 15 V
I_{CBO}(65°C)	Collector Cutoff Current			5.0	μA	I_E = 0	V_{CB} = 15 V
C_{cb}	Collector-Base Capacitance			5.0	pF	I_E = 0	V_{CB} = 5.0 V
BV_{CBO}	Collector to Base Breakdown Voltage	20			Volts	I_C = 100 μA	I_E = 0
V_{CEO}(sust)	**Collector to Emitter Sustaining Voltage** (Notes 3 and 4)	**18**			**Volts**	**I_C = 3.0 mA**	I_B = 0
BV_{EBO}	Emitter to Base Breakdown Voltage	3.0			Volts	I_E = 10 μA	I_C = 0
V_{BE}(on)	Base to Emitter On Voltage			0.75	Volts	I_C = 100 μA	V_{CE} = 5.0 V
h_{fe}	Small Signal Current Gain (f = 1.0 kHz)	50		1100		I_C = 1.0 mA	V_{CE} = 5.0 V

*Planar is a patented Fairchild process.

NOTES:

(1) These ratings are limiting values above which the serviceability of any individual semiconductor device may be impaired.
(2) These ratings give a maximum junction temperature of 125°C and junction to case thermal resistance of 200°C/Watt (derating factor of 5.0 mW/°C); junction to ambient thermal resistance of 500°C/Watt (derating factor of 2.0 mW/°C).
(3) Rating refers to a high-current point where collector to emitter voltage is lowest. For more information send for Fairchild Publication APP-4/2.
(4) Pulse Conditions: length = 300 μs; duty cycle = 1%.