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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 μ A
- **BREAKDOWN VOLTAGE** - - $V_{CEO} = 18$ VOLTS (MIN)

ABSOLUTE MAXIMUM RATINGS (Note 1)

Maximum Temperatures

- Operating Junction Temperature
- Storage Temperature
- Lead Temperature (Soldering, 10 second time limit)

125°C Maximum
 -55°C to +125°C
 260°C Maximum

Maximum Power Dissipation

- Total Dissipation at 25°C Case Temperature (Note 2)
- at 25°C Ambient Temperature (Note 2)

0.5 Watt
 0.2 Watt

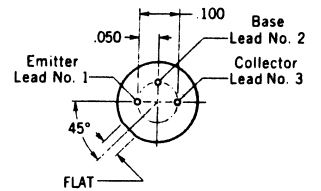
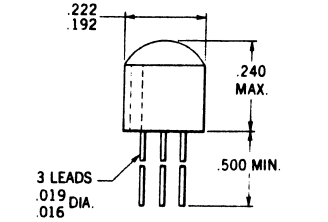
Maximum Voltages and Current

- V_{CBO} Collector to Base Voltage
- V_{CEO} Collector to Emitter Voltage (Note 3)
- V_{EBO} Emitter to Base Voltage

20 Volts
 18 Volts
 3.0 Volts

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

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			$I_C = 50$ μ A $V_{CE} = 10$ V
h_{fe}	High Frequency Current Gain (f = 20 MHz)		1.3			$I_C = 50$ μ A $V_{CE} = 5.0$ 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	$I_C = 30$ μ A $V_{CE} = 5.0$ V PWR BW = 200 Hz $R_S = 10$ k Ω
$V_{CE(sat)}$	Collector Saturation Voltage			0.4	Volts	$I_C = 1.0$ mA $I_B = 0.1$ mA
I_{CBO}	Collector Cutoff Current			50	nA	$I_E = 0$ $V_{CE} = 15$ V
$I_{CBO(65^\circ C)}$	Collector Cutoff Current			5.0	μ A	$I_E = 0$ $V_{CB} = 15$ 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	$I_C = 100$ μ A $I_E = 0$
$V_{CEO(sust)}$	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	$I_E = 10$ μ A $I_C = 0$
$V_{BE(on)}$	Base to Emitter On Voltage			0.75	Volts	$I_C = 100$ μ A $V_{CE} = 5.0$ 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:

- These ratings are limiting values above which the serviceability of any individual semiconductor device may be impaired.
- 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).
- Rating refers to a high-current point where collector to emitter voltage is lowest. For more information send for Fairchild Publication APP-4/2.
- Pulse conditions: length = 300 μ s; duty cycle = 1%.