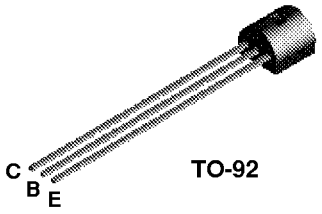
FAIRCHILD SEMICONDUCTOR™

Discrete POWER & Signal Technologies

2N5770



NPN RF Transistor

This device is designed for use as RF amplifiers, oscillators and multipliers with collector currents in the 1.0 mA to 30 mA range. Sourced from Process 43. See PN918 for characteristics.

Absolute Maximum Ratings*

TA = 25°C unless otherwise noted

Symbol	Parameter	Value	Units
V_{CEO}	Collector-Emitter Voltage	15	V
V_{CBO}	Collector-Base Voltage	30	V
V_{EBO}	Emitter-Base Voltage	4.5	V
I_C	Collector Current - Continuous	50	mA
T_J, T_{stg}	Operating and Storage Junction Temperature Range	-55 to +150	°C

*These ratings are limiting values above which the serviceability of any semiconductor device may be impaired.

NOTES:
1) These ratings are based on a maximum junction temperature of 150 degrees C.
2) These are steady state limits. The factory should be consulted on applications involving pulsed or low duty cycle operations.

Thermal Characteristics

TA = 25°C unless otherwise noted

Symbol	Characteristic	Max	Units
		2N5770	
P_D	Total Device Dissipation Derate above 25°C	350 2.8	mW mW/°C
$R_{\theta JC}$	Thermal Resistance, Junction to Case	125	°C/W
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient	357	°C/W

NPN RF Transistor
(continued)

Electrical Characteristics
TA = 25°C unless otherwise noted

Symbol	Parameter	Test Conditions	Min	Max	Units
OFF CHARACTERISTICS					
$V_{(BR)CEO}$	Collector-Emitter Breakdown Voltage*	I_C = 3.0 mA, I_B = 0	15		V
$V_{(BR)CBO}$	Collector-Base Breakdown Voltage	I_C = 1.0 μA, I_E = 0	30		V
$V_{(BR)EBO}$	Emitter-Base Breakdown Voltage	I_E = 10 μA, I_C = 0	4.5		V
I_{CBO}	Collector Cutoff Current	V_{CB} = 15 V, I_E = 0 V_{CB} = 15 V, I_E = 0, T_A = 150 °C		10 1.0	nA μA
I_{EBO}	Emitter Cutoff Current	V_{EB} = 3.0 V, I_C = 0 V_{EB} = 2.0 V, I_C = 0		10 1.0	μA μA
ON CHARACTERISTICS*					
h_{FE}	DC Current Gain	V_{CE} = 1.0 V, I_C = 3.0 mA V_{CE} = 10 V, I_C = 8.0 mA	20 50	 200	
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage	I_C = 10 mA, I_B = 1.0 mA		0.4	V
$V_{BE(sat)}$	Base-Emitter Saturation Voltage	I_C = 10 mA, I_B = 1.0 mA		1.0	V
SMALL SIGNAL CHARACTERISTICS					
NF	Noise Figure	I_C = 1.0 mA, V_{CE} = 8.0 V, f = 60 MHz, Rg = 400 Ω		6.0	dB
C_{cb}	Collector-Base Capacitance	V_{CB} = 10 V, I_E = 0, f = 1.0 MHz	0.7	1.1	pF
C_{ib}	Input Capacitance	V_{EB} = 0.5 V		2.0	pF
h_{fe}	Small-Signal Current Gain	I_C = 8.0 mA, V_{CE} = 10 V, f = 100 MHz I_C = 8.0 mA, V_{CE} = 10 V, f = 1.0 kHz	 9.0 40	 18 240	
$rb'C_C$	Collector-Base Time Constant	I_E = 8.0 mA, V_{CB} = 10 V, f = 79.8 MHz	3.0	20	pS
FUNCTIONAL TEST					
G_{pe}	Amplifier Power Gain	I_C = 6.0 mA, V_{CB} = 12 V, f = 200 MHz	15		dB
P_O	Power Output	V_{CC} = 15 V, I_C = 8.0 mA, f = 500 MHz	30		mW
η	Collector Efficiency		25		%

*Pulse Test: Pulse Width ≤ 300 μs, Duty Cycle ≤ 2.0%

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