

## 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 <sub>CEO</sub>	Collector-Emitter Voltage	15	V
V <sub>CBO</sub>	Collector-Base Voltage	30	V
V <sub>EBO</sub>	Emitter-Base Voltage	4.5	V
I <sub>C</sub>	Collector Current - Continuous	50	mA
T <sub>J</sub> , T <sub>stg</sub>	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 <sub>D</sub>	Total Device Dissipation Derate above 25°C	350	mW
		2.8	mW/°C
R <sub>θJC</sub>	Thermal Resistance, Junction to Case	125	°C/W
R <sub>θJA</sub>	Thermal Resistance, Junction to Ambient	357	°C/W

# NPN RF Transistor

(continued)

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## Electrical Characteristics

TA = 25°C unless otherwise noted

Symbol	Parameter	Test Conditions	Min	Max	Units
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### OFF CHARACTERISTICS

$V_{(BR)CEO}$	Collector-Emitter Breakdown Voltage*	$I_C = 3.0 \text{ mA}, I_B = 0$	15		V
$V_{(BR)CBO}$	Collector-Base Breakdown Voltage	$I_C = 1.0 \text{ } \mu\text{A}, I_E = 0$	30		V
$V_{(BR)EBO}$	Emitter-Base Breakdown Voltage	$I_E = 10 \text{ } \mu\text{A}, I_C = 0$	4.5		V
$I_{CBO}$	Collector Cutoff Current	$V_{CB} = 15 \text{ V}, I_E = 0$ $V_{CB} = 15 \text{ V}, I_E = 0, T_A = 150 \text{ }^\circ\text{C}$		10 1.0	nA $\mu\text{A}$
$I_{EBO}$	Emitter Cutoff Current	$V_{EB} = 3.0 \text{ V}, I_C = 0$ $V_{EB} = 2.0 \text{ V}, I_C = 0$		10 1.0	$\mu\text{A}$ $\mu\text{A}$

### ON CHARACTERISTICS\*

$h_{FE}$	DC Current Gain	$V_{CE} = 1.0 \text{ V}, I_C = 3.0 \text{ mA}$ $V_{CE} = 10 \text{ V}, I_C = 8.0 \text{ mA}$	20 50	200	
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage	$I_C = 10 \text{ mA}, I_B = 1.0 \text{ mA}$		0.4	V
$V_{BE(sat)}$	Base-Emitter Saturation Voltage	$I_C = 10 \text{ mA}, I_B = 1.0 \text{ mA}$		1.0	V

### SMALL SIGNAL CHARACTERISTICS

NF	Noise Figure	$I_C = 1.0 \text{ mA}, V_{CE} = 8.0 \text{ V},$ $f = 60 \text{ MHz}, R_g = 400 \text{ } \Omega$		6.0	dB
$C_{cb}$	Collector-Base Capacitance	$V_{CB} = 10 \text{ V}, I_E = 0, f = 1.0 \text{ MHz}$	0.7	1.1	pF
$C_{ib}$	Input Capacitance	$V_{EB} = 0.5 \text{ V}$		2.0	pF
$h_{fe}$	Small-Signal Current Gain	$I_C = 8.0 \text{ mA}, V_{CE} = 10 \text{ V},$ $f = 100 \text{ MHz}$ $I_C = 8.0 \text{ mA}, V_{CE} = 10 \text{ V},$ $f = 1.0 \text{ kHz}$	9.0 40	18 240	
$\tau_b \cdot C_C$	Collector-Base Time Constant	$I_E = 8.0 \text{ mA}, V_{CB} = 10 \text{ V},$ $f = 79.8 \text{ MHz}$	3.0	20	pS

### FUNCTIONAL TEST

$G_{pe}$	Amplifier Power Gain	$I_C = 6.0 \text{ mA}, V_{CB} = 12 \text{ V},$ $f = 200 \text{ MHz}$	15		dB
$P_O$	Power Output	$V_{CC} = 15 \text{ V}, I_C = 8.0 \text{ mA},$	30		mW
$\eta$	Collector Efficiency	$f = 500 \text{ MHz}$	25		%

\*Pulse Test: Pulse Width  $\leq 300 \text{ } \mu\text{s}$ , Duty Cycle  $\leq 2.0\%$