

PN3563



NPN RF Amplifier

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	2.0	V
Ic	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
		PN3563	1
P _D	Total Device Dissipation	350	mW
	Derate above 25°C	2.8	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 Amplifier (continued)

Symbol	Parameter	Test Conditions	Min	Max	Units
OFF CHA	RACTERISTICS				
$V_{\text{CEO(sus)}}$	Collector-Emitter Sustaining Voltage*	$I_C = 3.0 \text{ mA}, I_B = 0$	15		V
$V_{(BR)CBO}$	Collector-Base Breakdown Voltage	$I_C = 100 \mu A, I_E = 0$	30		V
$V_{(BR)EBO}$	Emitter-Base Breakdown Voltage	$I_E = 10 \mu A, I_C = 0$	2.0		V
I _{CBO}	Collector Cutoff Current	$V_{CB} = 15 \text{ V}, I_E = 0$ $V_{CB} = 15 \text{ V}, T_A = 150^{\circ}\text{C}$		0.05 5.0	μA nA
ON CHAR	RACTERISTICS*				
h _{FE}	DC Current Gain	$I_C = 8.0 \text{ mA}, V_{CE} = 10 \text{ V}$	20	200	
	IGNAL CHARACTERISTICS	0 / 32			NAL I-
SMALL S		$I_C = 8.0 \text{ mA}, V_{CE} = 10 \text{ V}$ $I_C = 8.0 \text{ mA}, V_{CE} = 10 \text{ V},$ $f = 100 \text{ MHz}$	600	1500	MHz
SMALL S	IGNAL CHARACTERISTICS	$I_{C} = 8.0 \text{ mA}, V_{CE} = 10 \text{ V},$			MHz pF pF
SMALL S f _T C _{obo}	IGNAL CHARACTERISTICS Current Gain - Bandwidth Product	$I_{C} = 8.0 \text{ mA}, V_{CE} = 10 \text{ V},$ f = 100 MHz $V_{CB} = 10 \text{ V}, I_{E} = 0, f = 1.0 \text{ MHz}$		1500	pF
SMALL S f _T C _{obo}	IGNAL CHARACTERISTICS Current Gain - Bandwidth Product Output Capacitance	$I_{C} = 8.0 \text{ mA}, V_{CE} = 10 \text{ V},$ f = 100 MHz $V_{CB} = 10 \text{ V}, I_{E} = 0, f = 1.0 \text{ MHz}$ $V_{CB} = 0, I_{E} = 0, f = 1.0 \text{ MHz}$		1500 1.7 3.0	pF pF
	IGNAL CHARACTERISTICS Current Gain - Bandwidth Product Output Capacitance Input Capacitance	$\begin{split} I_{C} &= 8.0 \text{ mA}, \ V_{CE} = 10 \ \text{V}, \\ f &= 100 \text{ MHz} \\ V_{CB} &= 10 \ \text{V}, \ I_{E} = 0, \ f = 1.0 \ \text{MHz} \\ V_{CB} &= 0, \ I_{E} = 0, \ f = 1.0 \ \text{MHz} \\ V_{BE} &= 0.5 \ \text{V}, \ I_{C} = 0, \ f = 140 \ \text{MHz} \\ I_{C} &= 8.0 \ \text{mA}, \ V_{CE} = 10 \ \text{V}, \end{split}$	600	1500 1.7 3.0 2.0	pF pF
SMALL S f _T C _{obo} C _{ibo} h _{fe} rb'C _C	IGNAL CHARACTERISTICS Current Gain - Bandwidth Product Output Capacitance Input Capacitance Small-Signal Current Gain	$\begin{split} I_C &= 8.0 \text{ mA}, \ V_{CE} = 10 \ \text{V}, \\ f &= 100 \text{ MHz} \\ V_{CB} &= 10 \ \text{V}, \ I_E = 0, \ f = 1.0 \ \text{MHz} \\ V_{CB} &= 0, \ I_E = 0, \ f = 1.0 \ \text{MHz} \\ V_{BE} &= 0.5 \ \text{V}, \ I_C = 0, \ f = 140 \ \text{MHz} \\ I_C &= 8.0 \ \text{mA}, \ V_{CE} = 10 \ \text{V}, \\ f &= 1.0 \ \text{kHz} \\ I_C &= 8.0 \ \text{mA}, \ V_{CE} = 10 \ \text{V}, \end{split}$	600	1500 1.7 3.0 2.0 250	pF pF pF

^{*}Pulse Test: Pulse Width \leq 300 μ s, Duty Cycle \leq 2.0%