



2N/PN/MPS/FTSO2369
2N/PN/MPS/FTSO2369A
2N/FTSO5769 7-35-15
NPN High Speed Saturated Switches

- $V_{CE0} \dots 15 \text{ V (Min)}$
- $t_s \dots 13 \text{ ns (Max) @ } 10 \text{ mA}$
- $t_{on} \dots 12 \text{ ns (Max) @ } 10 \text{ mA}$, $t_{off} \dots 18 \text{ ns (Max) @ } 10 \text{ mA}$
- Complements ... 2N4209 (TO18), 2N5771 (TO92)

PACKAGE	
2N2369	TO-18
2N2369A	TO-18
2N5769	TO-92
PN2369	TO-92
PN2369A	TO-92
MPS2369	TO-92
MPS2369A	TO-92
FTSO2369	TO-236AA/AB
FTSO2369A	TO-236AA/AB
FTSO5769	TO-236AA/AB

ABSOLUTE MAXIMUM RATINGS (Note 1)

	MPS/PN2369/A	FTSO2369/69A	2N/FTSO5769
Temperatures			
Storage Temperature	-65° C to 200° C	-55° C to 150° C	
Operating Junction Temperature	200° C	150° C	

	2N2369/A	2N5769	PN/MPS	FTSO
Power Dissipation (Notes 2 & 3)				
Total Dissipation at 25° C Ambient Temperature	0.36 W	0.625 W	0.625 W	0.350 W*
100° C Case Temperature	0.68 W	0.260 W	0.260 W	
25° C Case Temperature	1.2 W	1.0 W	1.0 W	

Voltages & Currents

V_{CE0} Collector to Emitter Voltage (Note 4)	15 V
V_{CBO} Collector to Base Voltage	40 V
V_{CES} Collector to Emitter Voltage	40 V
V_{EBO} Emitter to Base Voltage	4.5 V
I_C Collector Current (Pulse = 10 μ s)	200 mA 500 mA

ELECTRICAL CHARACTERISTICS (25° C Ambient Temperature unless otherwise noted) (Note 6)

SYMBOL	CHARACTERISTIC	2369		2369A 5769		UNITS	TEST CONDITIONS
		MIN	MAX	MIN	MAX		
BV_{CES}	Collector to Emitter Breakdown Voltage	40		40		V	$I_C = 10 \mu\text{A}$, $V_{BE} = 0$
BV_{CBO}	Collector to Base Breakdown Voltage	40		40		V	$I_C = 10 \mu\text{A}$, $V_{BE} = 0$
BV_{EBO}	Emitter to Base Breakdown Voltage	4.5		4.5		V	$I_E = 10 \mu\text{A}$, $I_C = 0$

NOTES:

1. These ratings are limiting values above which the serviceability of any individual semiconductor device may be impaired.
 2. These are steady state limits. The factory should be consulted on applications involving pulsed or low duty cycle operations.
 3. These ratings give a maximum junction temperature of 200° C and junction-to-case thermal resistance of 146° C/W (derating factor of 6.85 mW/° C); junction-to-ambient thermal resistance of 486° C/W (derating factor of 2.06 mW/° C) for 2N2369, 2N2369A, PN2369 and PN2369A. These ratings give a maximum junction temperature of 150° C and junction-to-case thermal resistance of 125° C/W (derating factor of 8.0 mW/° C); junction-to-ambient thermal resistance of 200° C/W (derating factor of 5.0 mW/° C) for MPS2369 and 2N5769; (TO-236) junction-to-ambient thermal resistance of 357° C/W (derating factor of 2.8 mW/° C).
 4. Rating refers to a high current point where collector to emitter voltage is lowest.
 5. Pulse conditions: length = 300 μ s; duty cycle \leq 2%.
 6. For product family characteristic curves, refer to Curve Set T132.
- * Package mounted on 99.5% alumina 8 mm x 8 mm x 0.6 mm.

3469674 FAIRCHILD SEMICONDUCTOR

84D 27527 D

2N/PN/MPS/FTSO2369
 2N/PN/MPS/FTSO2369A
 2N/FTSO5769

T-35-15

ELECTRICAL CHARACTERISTICS (25° C Ambient Temperature unless otherwise noted) (Note 6)

SYMBOL	CHARACTERISTIC	2369		2369A 5769		UNITS	TEST CONDITIONS
		MIN	MAX	MIN	MAX		
I_{CBO}	Collector Cutoff Current		400 30		400 30	nA μ A	$V_{CB} = 20$ V, $I_E = 0$ $V_{CB} = 20$ V, $I_E = 0$, $T_A = 150^\circ$ C
h_{FE}	DC Pulse Current Gain (Note 5)	40 20	120	40 30 20	120		$I_C = 10$ mA, $V_{CE} = 1.0$ V $I_C = 100$ mA, $V_{CE} = 2.0$ V $I_C = 10$ mA, $V_{CE} = 0.35$ V $I_C = 30$ mA, $V_{CE} = 0.4$ V $I_C = 100$ mA, $V_{CE} = 1.0$ V $I_C = 10$ mA, $V_{CE} = 1.0$ V, $T_A = -55^\circ$ C $I_C = 10$ mA, $V_{CE} = 0.35$ V, $T_A = -55^\circ$ C
$V_{CE(sust)}$	Collector to Emitter Sustaining Voltage (Notes 4 & 5)	15		15		V	$I_C = 10$ mA (pulsed), $I_B = 0$
$V_{CE(sat)}$	Collector to Emitter Saturation Voltage (Note 5)		0.25		0.2 0.25 0.5 0.3	V V V V V	$I_C = 10$ mA, $I_B = 1.0$ mA $I_C = 10$ mA, $I_B = 1.0$ mA $I_C = 30$ mA, $I_B = 3.0$ mA $I_C = 100$ mA, $I_B = 10$ mA $I_C = 10$ mA, $I_B = 10$ mA, $T_A = 125^\circ$ C
$V_{BE(sat)}$	Base to Emitter Saturation Voltage (Note 5)	0.70	0.85	0.70	0.85	V	$I_C = 10$ mA, $I_B = 1.0$ mA
C_{ob}	Output Capacitance		4.0		4.0	pF	$V_{CB} = 5.0$ V, $I_E = 0$, $f = 140$ kHz
h_{fe}	High Frequency Current Gain	5.0		5.0			$I_C = 10$ mA, $V_{CE} = 10$ V, $f = 100$ MHz
τ_s	Charge Storage Time Constant (test circuit no. 3111)		13		13	ns	$I_C = 10$ mA, $I_{B1} = I_{B2} = 10$ mA, $V_{CC} = 10$ V
t_{on}	Turn On Time (test circuit no. 210)		12		12	ns	$I_C = 10$ mA, $I_{B1} = 3.0$ mA, $V_{CC} = 3.0$ V
t_{off}	Turn Off Time (test circuit no. 210)		18		18	ns	$I_C = 10$ mA, $I_{B1} = 3.0$ mA, $I_{B2} = -1.5$ mA, $V_{CC} = 3.0$ V

SYMBOL	CHARACTERISTIC	MPS2369		UNITS	TEST CONDITIONS
		MIN	MAX		
BV_{CES}	Collector to Emitter Breakdown Voltage	40		V	$I_C = 10$ μ A, $V_{BE} = 0$
BV_{CBO}	Collector to Base Breakdown Voltage	40		V	$I_C = 10$ μ A, $V_{BE} = 0$
BV_{EBO}	Emitter to Base Breakdown Voltage	4.5		V	$I_E = 10$ μ A, $I_C = 0$
I_{CBO}	Collector Cutoff Current		400	nA	$V_{CB} = 20$ V, $I_E = 0$, $T_A = 150^\circ$ C
I_{CES}	Collector Cutoff Current		30	μ A	$V_{CB} = 20$ V, $I_E = 0$, $T_A = 125^\circ$ C

3469674 FAIRCHILD SEMICONDUCTOR

84D 27529 D

FAIRCHILD

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2N2405

T-29-23

NPN Low Power Audio Frequency
Transistor**ABSOLUTE MAXIMUM RATINGS** (Note 1)**PACKAGE**

2N2405

TO-39

TemperaturesStorage Temperature -65°C to 200°C
Operating Junction Temperature 175°C**Power Dissipation** (Notes 2 & 3)Total Dissipation at
25°C Ambient Temperature 1.0 W
25°C Case Temperature 5.0 W**Voltages & Currents**V_{CEO} Collector to Emitter Voltage 90 V
(Note 4)
V_{CBO} Collector to Base Voltage 140 V
V_{EBO} Emitter to Base Voltage 7.0 V
I_C Collector Current 1.0 A**ELECTRICAL CHARACTERISTICS** (25°C Ambient Temperature unless otherwise noted) (Note 6)

SYMBOL	CHARACTERISTIC	MIN	MAX	UNITS	TEST CONDITIONS
BV _{CER}	Collector to Emitter Breakdown Voltage	140		V	I _C = 100 mA, R _{BE} = 10 Ω
BV _{CBO}	Collector to Base Breakdown Voltage	120		V	I _C = 100 μA, I _E = 0
BV _{EBO}	Emitter to Base Breakdown Voltage	7.0		V	I _E = 100 μA, I _C = 0
I _{EBO}	Emitter Cutoff Current		10	nA	V _{EB} = 5.0 V
I _{CBO}	Collector Cutoff Current		10 10	nA μA	V _{CB} = 90 V V _{CB} = 90 V, I _E = 0, T _A = 150°C
LV _{CEO}	Collector to Emitter Sustain Voltage	90 90		V V	I _C = 30 mA I _C = 100 mA
h _{FE}	DC Pulse Current Gain (Note 5)	60	200		I _C = 150 mA, V _{CE} = 10 V
h _{FE}	DC Current Gain (Note 5)	35			I _C = 10 mA, V _{CE} = 10 V

NOTES:

- These ratings are limiting values above which the serviceability of any individual semiconductor device may be impaired.
- These are steady state limits. The factory should be consulted on applications involving pulsed or low duty cycle operations.
- These ratings give a maximum junction temperature of 175°C and junction-to-case thermal resistance of 30°C/W (derating factor of 3.33 mW/°C); junction-to-ambient thermal resistance of 150°C/W (derating factor of 6.6 mW/°C).
- Rating refers to a high current point where collector to emitter voltage is lowest.
- Pulse conditions: length = 300 μs; duty cycle = 1.8%.
- For product family characteristic curves, refer to Curve Set T149.

ELECTRICAL CHARACTERISTICS (25°C Ambient Temperature unless otherwise noted) (Note 6)

SYMBOL	CHARACTERISTIC	MIN	MAX	UNITS	TEST CONDITIONS
$V_{CE(sat)}$	Collector to Emitter Saturation Voltage		0.5	V	$I_C = 150 \text{ mA}$, $I_B = 15 \text{ mA}$
$V_{BE(sat)}$	Base to Emitter Saturation Voltage		1.1	V	$I_C = 150 \text{ mA}$, $I_B = 15 \text{ mA}$
C_{ob}	Output Capacitance		15	pF	$V_{CB} = 10 \text{ V}$, $I_E = 0$, $f = 1.0 \text{ MHz}$
C_{ib}	Input Capacitance		80	pF	$V_{EB} = 0.5 \text{ V}$, $I_C = 0$
h_{fe}	Current Gain	50	275		$I_C = 5.0 \text{ mA}$, $V_{CE} = 5.0 \text{ V}$, $f = 1.0 \text{ kHz}$
h_{ib}	Input Resistance	4	8	Ω	$I_C = 5.0 \text{ mA}$, $V_{CE} = 10 \text{ V}$, $f = 1.0 \text{ kHz}$
h_{ob}	Output Conductance		0.5	μmhos	$I_C = 5.0 \text{ mA}$, $V_{CB} = 10 \text{ V}$, $f = 1.0 \text{ kHz}$
h_{rb}	Voltage Feedback Ratio		3	$\times 10^{-4}$	$I_C = 5.0 \text{ mA}$, $V_{CB} = 10 \text{ V}$, $f = 1.0 \text{ kHz}$

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84D 27531 D

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2N2484/FTSO2484**PN2484****2N3117/FTSO3117**

T-29-23

NPN Low Level Low Noise Amplifiers

- V_{CE0} ... 60 V (Min)
- h_{FE} ... 100-500 (2N/PN/FTSO2484), 250-500 (2N/FTSO3117) @ 10 μ A
- NF ... 3.0 dB (Max) (2N/PN/FTSO2484), 1.0 dB (Max) (2N/FTSO3117) @ 1.0 kHz, 2.0 dB (Max) (2N/PN/FTSO2484), 1.0 dB (Max) (2N/FTSO3117) @ 10 kHz

PACKAGE

2N2484	TO-18
2N3117	TO-18
PN2484	TO-92
FTSO2484	TO-236AA/AB
FTSO3117	TO-236AA/AB

ABSOLUTE MAXIMUM RATINGS (Note 1)

Temperatures	2N3117	PN/FTSO	2N2484
Storage Temperature	-65° C to 200° C	-55° C to 150° C	-65° C to 300° C
Operating Junction Temperature	200° C	150° C	200° C

Power Dissipation (Notes 2 & 3)

	2N	PN
Total Dissipation at 25° C Ambient Temperature	0.36 mW	0.625 W
25° C Case Temperature	1.2 W	1.0 W
Total Dissipation at 25° C Ambient Temperature	FTSO 0.350 W*	

Voltages & Currents

V_{CE0} Collector to Emitter Voltage (Note 4)	60 V
V_{CBO} Collector to Base Voltage	60 V
V_{EBO} Emitter to Base Voltage	6.0 V
I_C Collector Current	50 mA

ELECTRICAL CHARACTERISTICS (25° C Ambient Temperature unless otherwise noted) (Note 6)

SYMBOL	CHARACTERISTIC	2484		3117		UNITS	TEST CONDITIONS
		MIN	MAX	MIN	MAX		
BV_{CBO}	Collector to Base Breakdown Voltage	60		60		V	$I_C = 10 \mu A, I_E = 0$
BV_{EBO}	Emitter to Base Breakdown Voltage	6.0		6.0		V	$I_E = 10 \mu A, I_C = 0$
I_{CE0}	Collector to Emitter Cutoff Current		2.0			nA	$V_{CE} = 5.0 V, I_B = 0$
I_{EBO}	Emitter Cutoff Current		10		10	nA	$V_{EB} = 5.0 V, I_C = 0$
I_{CBO}	Collector Cutoff Current		10		10	nA	$V_{CB} = 45 V, I_E = 0$
			10		10	μA	$V_{CB} = 45 V, I_E = 0, T_A = 150^\circ C$

NOTES:

- These ratings are limiting values above which the serviceability of any individual semiconductor device may be impaired.
- These are steady state limits. The factory should be consulted on applications involving pulsed or low duty cycle operations.
- These ratings give a maximum junction temperature of 200° C and junction-to-case thermal resistance of 147° C/W (derating factor of 6.85 mW/° C); junction-to-ambient thermal resistance of 485° C/W (derating factor of 2.06 mW/° C) for 2N2484 and 2N3117. These ratings give a maximum junction temperature of 150° C and (TO-92) junction-to-case thermal resistance of 125° C/W (derating factor of 8.0 mW/° C); junction-to-ambient thermal resistance of 200° C/W (derating factor of 5.0 mW/° C); (TO-236) junction-to-ambient thermal resistance of 357° C/W (derating factor of 2.8 mW/° C).
- Rating refers to a high current point where collector to emitter voltage is lowest.
- Pulse conditions: length = 300 μ s; duty cycle = 1%.
- For product family characteristic curves, refer to Curve Set T107.
- * Package mounted on 99.5% alumina 8 mm x 8 mm x 0.6 mm.

3469674 FAIRCHILD SEMICONDUCTOR

84D 27532 D ■

2N2484/FTSO2484
 PN2484
 2N3117/FTSO3117

T-29-23

ELECTRICAL CHARACTERISTICS (25° C Ambient Temperature unless otherwise noted) (Note 6)

SYMBOL	CHARACTERISTIC	2484		3117		UNITS	TEST CONDITIONS
		MIN	MAX	MIN	MAX		
h_{FE}	DC Current Gain (Note 5)	250 200 175 100 30 20	800 500	400 300 250 100 50	 500		$I_C = 10 \text{ mA}, V_{CE} = 5.0 \text{ V}$ $I_C = 1.0 \text{ mA}, V_{CE} = 5.0 \text{ V}$ $I_C = 500 \mu\text{A}, V_{CE} = 5.0 \text{ V}$ $I_C = 100 \mu\text{A}, V_{CE} = 5.0 \text{ V}$ $I_C = 10 \mu\text{A}, V_{CE} = 5.0 \text{ V}$ $I_C = 1.0 \mu\text{A}, V_{CE} = 5.0 \text{ V}$ $I_C = 10 \mu\text{A}, V_{CE} = 5.0 \text{ V},$ $T_A = -55^\circ\text{C}$
$V_{CEO(sus)}$	Collector to Emitter Sustaining Voltage (Notes 4 & 5)	60		60		V	$I_C = 10 \text{ mA (pulsed)}, I_B = 0$

SYMBOL	CHARACTERISTIC	2484		3117		UNITS	TEST CONDITIONS
		MIN	MAX	MIN	MAX		
$V_{CE(sat)}$	Collector to Emitter Saturation Voltage (Note 5)		0.35		0.35	V	$I_C = 1.0 \text{ mA}, I_B = 0.1 \text{ mA}$
$V_{BE(ON)}$	Base to Emitter "On" Voltage	0.5	0.7		0.7	V	$I_C = 100 \mu\text{A}, V_{CE} = 5.0 \text{ V}$
C_{ob}	Output Capacitance		6.0		4.5	pF	$V_{CB} = 5.0 \text{ V}, I_E = 0, f = 140 \text{ kHz}$
C_{ib}	Input Capacitance		6.0		6.0	pF	$V_{BE} = 0.5 \text{ V}, I_C = 0, f = 140 \text{ kHz}$
h_{fe}	High Frequency Current Gain	2.0 3.0 150	 900	2.0 400	 900		$I_C = 0.5 \text{ mA}, V_{CE} = 5.0 \text{ V},$ $f = 30 \text{ MHz}$ $I_C = 50 \mu\text{A}, V_{CE} = 5.0 \text{ V},$ $f = 5.0 \text{ MHz}$ $I_C = 1.0 \text{ mA}, V_{CE} = 5.0 \text{ V},$ $f = 1.0 \text{ kHz}$
h_{ie}	Input Resistance	3.5	24	10	24	k Ω	$I_C = 1.0 \text{ mA}, V_{CE} = 5.0 \text{ V},$ $f = 1.0 \text{ kHz}$
h_{oe}	Output Conductance		40		40	μmhos	$I_C = 1.0 \text{ mA}, V_{CE} = 5.0 \text{ V},$ $f = 1.0 \text{ kHz}$
h_{re}	Reverse Voltage Feedback Ratio		800		800	$\times 10^{-6}$	$I_C = 1.0 \text{ mA}, V_{CE} = 5.0 \text{ V},$ $f = 1.0 \text{ kHz}$
NF	Wide Band Noise Figure		3.0			dB	$I_C = 10 \mu\text{A}, V_{CE} = 5.0 \text{ V},$ $R_S = 10 \text{ k}\Omega$, Power Bandwidth of 15.7 kHz with 3.0 dB pts at 10 Hz and 10 kHz

2N2484/FTSO2484

PN2484

2N3117/FTSO3117

T-29-23

Electrical Characteristics (25°C Ambient Temperature unless otherwise noted)

Symbol	Characteristic	Min.	Max.	Units	Test Conditions
NF	Narrow Band Noise Figure	3.0		dB	$I_C = 10 \mu A, V_{CE} = 5.0 V,$ $f = 1.0 kHz, R_S = 10 k\Omega$ Power Bandwidth of 200 Hz
		2.0		dB	$I_C = 10 \mu A, V_{CE} = 5.0 V,$ $f = 10 kHz, R_S = 10 k\Omega,$ Power Bandwidth of 2.0 kHz
		10		dB	$I_C = 10 \mu A, V_{CE} = 5.0 V,$ $f = 100 Hz, R_S = 10 k\Omega,$ Power Bandwidth of 20 Hz
			1.0	dB	$I_C = 5.0 \mu A, V_{CE} = 5.0 V,$ $f = 1.0 kHz, R_S = 50 k\Omega,$ Power Bandwidth of 200 Hz
			1.0	dB	$I_C = 5.0 \mu A, V_{CE} = 5.0 V,$ $f = 10 kHz, R_S = 50 k\Omega,$ Power Bandwidth of 1.0 kHz
			4.0	dB	$I_C = 30 \mu A, V_{CE} = 5.0 V,$ $f = 100 kHz, R_S = 10 k\Omega,$ Power Bandwidth of 20 Hz
			1.5	dB	$I_C = 30 \mu A, V_{CE} = 5.0 V,$ $f = 10 Hz, R_S = 10 k\Omega,$ Power Bandwidth of 2.0 Hz

3469674 FAIRCHILD SEMICONDUCTOR

84D 27534 D'

FAIRCHILD

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2N2586

7-29-23

NPN Low Level Low Noise Type

ABSOLUTE MAXIMUM RATINGS (Note 1)

PACKAGE
2N2586

TO-18

Temperatures

Storage Temperature -65° C to 200° C
Operating Junction Temperature 175° C

Power Dissipation (Notes 2 & 3)

Total Dissipation at
25° C Ambient Temperature 0.4 W
25° C Case Temperature 1.8 W

Voltages & Currents

V_{CEO} Collector to Emitter Voltage 45 V
(Note 4)
V_{CBO} Collector to Base Voltage 60 V
V_{EBO} Emitter to Base Voltage 6.0 V
I_C Collector Current 30 mA

ELECTRICAL CHARACTERISTICS (25° C Ambient Temperature unless otherwise noted) (Note 6)

SYMBOL	CHARACTERISTIC	MIN	MAX	UNITS	TEST CONDITIONS
BV _{CBO}	Collector to Base Breakdown Voltage	60		V	I _C = 10 μA, I _E = 0
BV _{EBO}	Emitter to Base Breakdown Voltage	6.0		V	I _E = 10 μA, I _C = 0
I _{CEO}	Collector to Emitter Cutoff Current		2.0	nA	V _{CE} = 5.0 V, I _B = 0
I _{CES}	Collector to Emitter Cutoff Current		2.0 10	nA μA	V _{CE} = 45 V, V _{BE} = 0 V _{CE} = 45 V, V _{BE} = 0, T _A = 170° C
I _{CBO}	Collector Cutoff Current		2.0	nA	V _{CB} = 45 V, I _E = 0
I _{EBO}	Emitter Cutoff Current		2.0	nA	V _{EB} = 5.0 V, I _C = 0
h _{FE}	DC Pulse Current Gain (Note 5)		600		I _C = 10 mA, V _{CE} = 5.0 V
h _{FE}	DC Current Gain	150 120 80 40	360		I _C = 500 μA, V _{CE} = 5.0 V I _C = 10 μA, V _{CE} = 5.0 V I _C = 1.0 μA, V _{CE} = 5.0 V I _C = 10 μA, V _{CE} = 5.0 V, T _A = 55° C

NOTES:

- These ratings are limiting values above which the serviceability of any individual semiconductor device may be impaired.
- These are steady state limits. The factory should be consulted on applications involving pulsed or low duty cycle operations.
- These ratings give a maximum junction temperature of 175° C and junction-to-case thermal resistance of 250° C/W (derating factor of 4.0 mW/° C); junction-to-ambient thermal resistance of 500° C/W (derating factor of 2.0 mW/° C).
- Rating refers to a high current point where collector to emitter voltage is lowest.
- Pulse conditions: length = 300 μs; duty cycle ≤ 2%.
- For product family characteristic curves, refer to Curve Set T107.

3469674 FAIRCHILD SEMICONDUCTOR

84D 27535 D*

2N2586

T-29-23

ELECTRICAL CHARACTERISTICS (25° C Ambient Temperature unless otherwise noted) (Note 6)

SYMBOL	CHARACTERISTIC	MIN	MAX	UNITS	TEST CONDITIONS
$V_{CE(sus)}$	Collector to Emitter Sustaining Voltage (Notes 4 & 5)	45		V	$I_C = 10 \text{ mA}$, $I_B = 0$
$V_{CE(sat)}$	Collector to Emitter Saturation Voltage		0.5	V	$I_C = 10 \text{ mA}$, $I_B = 0.5 \text{ mA}$
V_{BE}	Base to Emitter Voltage	0.7	0.9	V	$I_C = 10 \text{ mA}$, $I_B = 0.5 \text{ mA}$
C_{obo}	Common Base Open Circuit Output Capacitance		7.0	pF	$V_{CB} = 5.0 \text{ V}$, $I_E = 0$, $f = 1.0 \text{ MHz}$
h_{fe}	High Frequency Current Gain	1.5			$I_C = 500 \mu\text{A}$, $V_{CE} = 5.0 \text{ V}$, $f = 30 \text{ MHz}$
h_{fe}	Small Signal Current Gain	150	600		$I_C = 1.0 \text{ mA}$, $V_{CE} = 5.0 \text{ V}$, $f = 1.0 \text{ kHz}$
h_{ie}	Input Resistance	4.5	18	k Ω	$I_C = 1.0 \text{ mA}$, $V_{CE} = 5.0 \text{ V}$, $f = 1.0 \text{ kHz}$
h_{oe}	Output Admittance		100	μmhos	$I_C = 1.0 \text{ mA}$, $V_{CE} = 5.0 \text{ V}$, $f = 1.0 \text{ kHz}$
NF	Spot Noise Figure		2.0	dB	$I_C = 1.0 \mu\text{A}$, $V_{CE} = 5.0 \text{ V}$, $R_G = 1.0 \text{ M}\Omega$, $f = 10 \text{ kHz}$
			2.0	dB	$I_C = 10 \mu\text{A}$, $V_{CE} = 5.0 \text{ V}$, $R_G = 10 \text{ k}\Omega$, $f = 10 \text{ kHz}$
			3.0	dB	$I_C = 10 \mu\text{A}$, $V_{CE} = 5.0 \text{ V}$, $R_G = 10 \text{ k}\Omega$, $f = 1.0 \text{ kHz}$
			3.5	dB	$I_C = 1.0 \mu\text{A}$, $V_{CE} = 5.0 \text{ V}$, $R_G = 1 \text{ M}\Omega$, $f = 1.0 \text{ kHz}$