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FAIRCHILD
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2N5320/2N5321
2N5322/2N5323

T-33-07
T-33-17

10 Watt NPN-PNP Silicon Power

- $V_{CE(sat)}$ ... **-0.7 V**
- h_{FE} ... **40-250 @ V_{CE} = 4.0 V, I_C = 0.5 A**
- **Complements ... 2N5320, NPN (2N5322, PNP); 2N5321, NPN (2N5322, PNP)**

PACKAGE

2N5320	TO-39
2N5321	TO-39
2N5322	TO-39
2N5323	TO-39

ABSOLUTE MAXIMUM RATINGS (Note 1)

Temperatures

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

Power Dissipation (Notes 2 & 3)

Total Dissipation at 25° C Case Temperature	10 W
Linear Derating Factor	0.057W/° C

Voltages & Currents		**5320**	**5321**
V_{CEO}	Collector to Emitter Voltage	75 V	50 V
V_{CBO}	Collector to Base Voltage	100 V	75 V
V_{EBO}	Emitter to Base Voltage	7.0 V	5.0 V
I_C	Collector Current	2.0 A	2.0 A
I_B	Base Current	1.0 A	1.0 A

Voltages & Currents		**5322**	**5322**
V_{CEO}	Collector to Emitter Voltage	−75 V	−50 V
V_{CBO}	Collector to Base Voltage	−100 V	−75 V
V_{EBO}	Emitter to Base Voltage	−7.0 V	−5.0 V
I_C	Collector Current	2.0 A	2.0 A
I_B	Base Current	1.0 A	1.0 A

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

SYMBOL	CHARACTERISTIC	5320 MIN	5320 MAX	5321 MIN	5321 MAX	UNITS	TEST CONDITIONS
I_{EBO}	Emitter Cutoff Current		0.1			mA	V_{EB} = 7.0 V
					0.1	mA	V_{EB} = 5.0 V

NOTES:
1. These ratings are limiting values above which the serviceability of any individual semiconductor device may be impaired.
2. Pulse conditions: length = 300 μs; duty cycle ≤ 10%
3. Pulse Rep. Frequency = 1 kHz, pulse width = 20 μs.
4. These ratings give a maximum junction temperature of 200° C and junction-to-case thermal resistance of 0.2° C/W (derating factor of 0.057 W/° C.
5. Emitter diode is reversed biased.
6. For product family characteristic curves, refer to Curve Set T314 (2N5320 and 2N5321) and Curve Set T414 (2N5322 and 2N5323).

SYMBOL	CHARACTERISTIC	5320 MIN	5320 MAX	5321 MIN	5321 MAX	UNITS	TEST CONDITIONS
I_{CEX}	Collector Cutoff Current (Note 3)		5.0			mA	V_{CE} = 70 V, V_{BE} = 1.5 V, T_C = 150°C
					5.0	mA	V_{CE} = 45 V, V_{BE} = 1.5 V, T_C = 150°C
			0.1			mA	V_{CE} = 100 V, V_{BE} = 1.5 V
					0.1	mA	V_{CE} = 75 V, V_{BE} = 1.5 V
h_{FE}	DC Current Gain (Note 2)	10 30	130	40	250		I_C = 1.0 A, V_{CE} = 2.0 V I_C = 0.5 A, V_{CE} = 4.0 V
$V_{CEO(sus)}$	Collector to Emitter Sustaining Voltage (Note 2)	75		50		V	I_C = 100 mA, I_B = 0
$V_{CE(sat)}$	Collector to Emitter Saturation Voltage (Note 2)		0.5		0.8	V	I_C = 500 mA, I_B = 50 mA
$V_{BE(ON)}$	Base to Emitter "On" Voltage (Note 2)		1.1		1.4	V	I_C = 500 mA, V_{CE} = 4.0 V
h_{fe}	Small Signal Current Gain	5.0		5.0			I_C = 50 mA, V_{CE} = 4.0 V, f = 10 MHz
t_{on}	Turn On Time (Note 3)		80		80	ns	I_C = 500 mA, I_{B1} = 50 mA
t_{off}	Turn Off Time (Note 3)		800		800	ns	I_C = 500 mA, I_{B1} = 50 mA, I_{B2} = −50 mA

SYMBOL	CHARACTERISTIC	5322 MIN	5322 MAX	5323 MIN	5323 MAX	UNITS	TEST CONDITIONS
I_{EBO}	Emitter Cutoff Current		0.1			mA	V_{EB} = −7.0 V
					0.1	mA	V_{EB} = −5.0 V
I_{CEX}	Collector Cutoff Current		5.0			mA	V_{CE} = −70 V, V_{BE} = −1.5 V, T_C = 150°C
					5.0	mA	V_{CE} = −45 V, V_{BE} = −1.5 V, T_C = 150°C
			0.1			mA	V_{CE} = −100 V, V_{BE} = −1.5 V
					0.1	mA	V_{CE} = −75 V, V_{BE} = −1.5 V
h_{FE}	DC Current Gain	10 30	130	40	250		I_C = 1.0 A, V_{CE} = −2.0 V I_C = 500 mA, V_{CE} = −4.0 V
$V_{CEO(sus)}$	Collector to Emitter Sustaining Voltage (Note 2)	−75		−50		V	I_C = −100 mA, I_B = 0
$V_{CE(sat)}$	Collector to Emitter Saturation Voltage (Note 2)		−0.7		−1.20	V	I_C = 50 mA, I_B = 50 mA
$V_{BE(ON)}$	Base to Emitter "On" Voltage (Note 2)		−1.1		−1.4	V	I_C = 500 mA, V_{CE} = −4.0 V
h_{fe}	Small Signal Current Gain	5.0		5.0			I_C = 50 mA, V_{CE} = 4.0 V, f = 10 MHz
t_{on}	Turn On Time (Note 3)		100		100	ns	I_C = 500 mA, I_{B1} = −50 mA
t_{off}	Turn Off Time (Note 3)		1000		1000	ns	I_C = 500 mA, I_{B1} = −50 mA, I_{B2} = 50 mA

FAIRCHILD
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2N5336/2N5338

6 Watt NPN Silicon Power

- P_D ... 6.0 W @ T_C = 25° C
- LV_{CEO} ... 80 V and 100 V (Min)
- $V_{CE(sat)}$ ... 1.2 V (Max) @ 5.0 A

PACKAGE

2N5336	TO-5
2N5338	TO-5

ABSOLUTE MAXIMUM RATINGS (Note 1)

Temperatures

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

Power Dissipation

Total Dissipation at 25° C Case Temperature	6.0 W

Voltages & Currents		**5336**	**5338**
V_{CEO}	Collector to Emitter Voltage	80 V	100 V
V_{CBO}	Collector to Base Voltage	80 V	100 V
V_{EBO}	Emitter to Base Voltage	6.0 V	6.0 V
I_C	Collector Current	5.0 A	5.0 A
I_B	Base Current	1.0 A	1.0 A

ELECTRICAL CHARACTERISTICS (25° C Ambient Temperature unless otherwise noted) (Note 4)

SYMBOL	CHARACTERISTIC	5336 MIN	5336 MAX	5338 MIN	5338 MAX	UNITS	TEST CONDITIONS
I_{EBO}	Emitter Cutoff Current		100		100	μA	V_{EB} = 6.0 V, I_C = 0
I_{CBO}	Collector Cutoff Current		10		10	μA μA	V_{CE} = 80 V, I_E = 0 V_{CE} = 100 V, I_E = 0
I_{CEX}	Collector Cutoff Current		10 1.0		10 1.0	μA mA μA mA	V_{CE} = 75 V, V_{BE} = 1.5 V V_{CE} = 75 V, V_{EB} = 1.5 V, T_C = 150°C V_{CE} = 90 V, V_{BE} = 1.5 V V_{CE} = 90 V, V_{BE} = 1.5 V, T_C = 150°C
h_{FE}	DC Current Gain (Note 2)	30 30 20	120	30 30 20	120		I_C = 500 mA, V_{CE} = 2.0 V I_C = 2.0 A, V_{CE} = 2.0 V I_C = 5.0 A, V_{CE} = 2.0 V

NOTES:
1. These ratings are limiting values above which the serviceability of any individual semiconductor device may be impaired.
2. Pulse conditions: length = 300 μs; duty cycle μ 2%.
3. These ratings give a maximum junction temperature of 200°C and junction-to-case thermal resistance of 33.3°C/W (linear derating factor of 34 mW/°C.
4. For product family characteristic curves, refer to Curve Set T316.

2N5336/2N5338

T-33-05

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

SYMBOL	CHARACTERISTIC	5336 MIN	5336 MAX	5338 MIN	5338 MAX	UNITS	TEST CONDITIONS
$V_{CEO(sus)}$	Collector to Emitter Sustaining Voltage (Note 2)	80		100		V	I_C = 50 mA, I_B = 0
$V_{CE(sat)}$	Collector to Emitter Saturation Voltage (Pulsed) (Note 2)		0.7 1.2		0.7 1.2	V V	I_C = 2.0 A, I_B = 200 mA I_C = 5.0 A, I_B = 500 mA
$V_{BE(sat)}$	Base Saturation Voltage (Pulsed) (Note 2)		1.2 1.8		1.2 1.8	V V	I_C = 2.0 A, I_B = 200 mA I_C = 5.0 A, I_B = 500 mA
t_d	Turn On Delay Time		100		100	ns	I_C = 2.0 A, V_{CC} = 4.0 V, I_{B1} = 200 mA
t_r	Turn On Rise Time		100		100	ns	I_C = 2.0 A, V_{CC} = 40 V, I_{B1} = 200 mA
t_s	Turn Off Storage Time		2.0		2.0	μs	I_C = 2.0 A, V_{CC} = 40 V, I_{B1} = I_{B2} = 200 mA
t_f	Turn Off Fall Time		200		200	ns	I_C = 2.0 A, V_{CC} = 40 V, I_{B1} = I_{B2} = 200 mA

FAIRCHILD
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2N5415/2N5416

T-33-17

PNP Silicon Power Transistor

- **10 W Dissipation at 25° C Case**
- **1 A (Max) Continuous Collector Current**
- **Up to 350 V V_{CBO} Rating (2N5416)**
- **Complements ... 2N3439, 2N3440**

PACKAGE

2N5415	TO-39
2N5416	TO-39

ABSOLUTE MAXIMUM RATINGS (Note 1)

Temperatures

Storage Temperature	−65° C to 200° C
Operating Junction Temperature	200° C

Power Dissipation (Notes 2 & 3)

Total Dissipation at 25° C Case Temperature	10 W

Voltages & Currents (Note 4)		**5415**	**5416**
V_{CEO}	Collector to Emitter Voltage	−200 V	−300 V
V_{CBO}	Collector to Base Voltage	−200 V	−350 V
V_{EBO}	Emitter to Base Voltage	−4.0 V	−4.0 V
I_C	Collector Current (Continuous)	1.0 A	1.0 A
I_B	Base Current (Continuous)	0.5 A	0.5 A

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

SYMBOL	CHARACTERISTIC	5415 MIN	5415 MAX	5416 MIN	5416 MAX	UNITS	TEST CONDITIONS
I_{EBO}	Emitter Cutoff Current		20			μA	V_{EB} = −4.0 V, I_C = 0
					20	μA	V_{EB} = −6.0 V, I_C = 0
I_{CBO}	Collector Cutoff Current		50			μA	V_{CB} = −175 V, I_E = 0
					50	μA	V_{CB} = −280 V, I_E = 0
I_{CEV}	Collector Cutoff Current		50			μA	V_{CE} = −200 V, V_{BE} = 1.5 V
					50	μA	V_{CE} = −300 V, V_{BE} = 1.5 V
I_{CEO}	Collector Cutoff Current		50			μA	V_{CE} = −150 V, I_B = 0
					50	μA	V_{CE} = −250 V, I_B = 0
h_{FE}	DC Current Gain (Note 5)	30	150	30	120		I_C = 50 mA, V_{CE} = −10 V

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 0.2° C/W (derating factor of 0.057 mW/° C).
4. Rating refers to a high current point where collector to emitter voltage is lowest.
5. Pulse conditions: length = 300 μs; duty cycle = 2%.
6. For product family characteristic curves, refer to Curve Set T443.

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

SYMBOL	CHARACTERISTIC	5415 MIN	5415 MAX	5416 MIN	5416 MAX	UNITS	TEST CONDITIONS
$V_{CEO(sus)}$	Collector to Emitter Sustaining Voltage (Note 5)	−200		−300		V	I_C = 50 mA, I_B = 0
$V_{CER(sus)}$	Collector to Emitter Sustaining Voltage (Note 5)			−350		V	I_C = 50 mA, R_{BE} = 50 Ω
$V_{CE(sat)}$	Collector to Emitter Saturation Voltage (Note 5)		−2.5		−2.0	V	I_C = 50 mA, I_B = 5.0 mA
$V_{BE(ON)}$	Base to Emitter "On" Voltage		−1.5		−1.5	V	I_C = 50 mA, V_{CE} = −10 V
C_{ob}	Output Capacitance		15		15	pF	V_{CB} = −10 V, I_E = 0 f = 1.0 MHz
C_{ib}	Input Capacitance		75		75	pF	V_{EB} = −5.0 V, I_C = 0 f = 1.0 MHz
$\|h_{fe}\|$	Magnitude of Common Emitter Small Signal Current Gain	3.0		3.0			I_C = 10 mA, V_{CE} = −10 V, f = 5.0 MHz
h_{fe}	Small Signal Current Gain	25		25			I_C = 5.0 mA, V_{CE} = −10 V, f = 1.0 kHz
$R_e(h_{ie})$	Real Part of Common Emitter Small Signal Short-Circuit Impedance		300		300	Ω	I_C = 5.0 mA, V_{CE} = −10 V, f = 1.0 MHz
$I_{s/b}$	Second Breakdown Collector Current	100		100		mA	V_{CE} = −100 V, t = 1.0 s (non repetitive)

FAIRCHILD
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2N5550/FTSO5550 T-29-23
2N5551/MPS5551
FTSO5551

NPN Small Signal High Voltage General Purpose Amplifiers

- V_{CEO} ... **160 V (Min) (MPS/FTSO5551)**
- h_{FE} ... **80-250 @ 10 mA (MPS/FTSO5551)**
- $V_{CE(sat)}$ ... **0.2 V (max) @ 50 mA (MPS/FTSO5551)**
- **Complements ... 2N5400, 2N5401**

PACKAGE

2N5550	TO-92
2N5551	TO-92
MPS5551	TO-92
FTSO5550	TO-236AA/AB
FTSO5551	TO-236AA/AB

ABSOLUTE MAXIMUM RATINGS (Note 1)

Temperatures

Storage Temperature	-55° C to 150° C
Operating Junction Temperature	150° C

Power Dissipation (Notes 2 & 3)

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

Voltages & Currents		**5550**	**5551**
V_{CEO}	Collector to Emitter Voltage (Note 4)	140 V	160 V
V_{CBO}	Collector to Base Voltage	160 V	180 V
V_{EBO}	Emitter to Base Voltage	6.0 V	6.0 V
I_C	Collector Current	600 mA	600 mA

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

SYMBOL	CHARACTERISTIC	5550 MIN	5550 MAX	5551 MIN	5551 MAX	UNITS	TEST CONDITIONS
BV_{CEO}	Collector to Emitter Breakdown Voltage	140		160		V	I_C = 1.0 mA, I_B = 0
BV_{CBO}	Collector to Base Breakdown Voltage	160		180		V	I_C = 100 μA, I_E = 0
BV_{EBO}	Emitter to Base Breakdown Voltage	6.0		6.0		V	I_E = 10 μA, I_C = 0
I_{EBO}	Emitter Cutoff Current		50		50	nA	V_{EB} = 4.0 V, I_C = 0
I_{CBO}	Collector Cutoff Current		100			nA	V_{CB} = 100 V, I_E = 0
					50	nA	V_{CB} = 120 V, I_E = 0
			100			μA	V_{CB} = 100 V, I_E = 0, T_A = 100° C
					50	μA	V_{CB} = 120 V, I_E = 0, T_A = 100° C

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 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).
4. Rating refers to a high current point where collector to emitter voltage is lowest.
5. Pulse conditions: length = 300 μs; duty cycle = 1%.
6. For product family characteristic curves, refer to Curve Set T147.

* Package mounted on 99.5% alumina 8 mm x 8 mm x 0.6 mm.

2N5550/FTSO5550
2N5551/MPS5551 T-29.23
FTSO5551

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

SYMBOL	CHARACTERISTIC	5550 MIN	5550 MAX	5551 MIN	5551 MAX	UNITS	TEST CONDITIONS
h_{FE}	DC Pulse Current Gain (Note 5)	60 60 20	250	80 80 30	250		I_C = 1.0 mA, V_{CE} = 5.0 V I_C = 10 mA, V_{CE} = 5.0 V I_C = 50 mA, V_{CE} = 5.0 V
$V_{CE(sat)}$	Collector to Emitter Saturation Voltage (Note 5)		0.15 0.25		0.15 0.25	V V	I_C = 10 mA, I_B = 1.0 mA I_C = 50 mA, I_B = 5.0 mA
$V_{BE(sat)}$	Base to Emitter Saturation Voltage (Note 5)		1.0 1.2		1.0 1.0	V V	I_C = 10 mA, I_B = 1.0 mA I_C = 50 mA, I_B = 5.0 mA
C_{ob}	Output Capacitance		6.0		6.0	pF	V_{CB} = 10 V, I_E = 0, f = 1.0 MHz
C_{ib}	Input Capacitance (2N/FTSO5550) (MPS/FTSO5551) (2N5551)		30		 30 20	 pF pF	 V_{BE} = 0.5 V, I_C = 0, f = 1.0 MHz V_{BE} = 0.5 V, I_C = 0, f = 1.0 MHz
h_{fe}	Small Signal Current Gain	50	200	50	200		I_C = 1.0 mA, V_{CE} = −10 V, f = 1.0 kHz
f_T	Current Gain Bandwidth Product	100	300	100	300	MHz	I_C = 10 mA, V_{CE} = 10 V, f = 100 MHz
NF	Noise Figure		10		8.0	dB	I_C = 250 μA, V_{CE} = 5.0 V, f = 10 Hz to 15.7 kHz, R_S = 1.0 kΩ

FAIRCHILD
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2N5679/2N5680
2N5681/2N5682

T-33-07
T-33-17

1.0 Amp 10 Watt NPN-PNP Complementary Power

- **f_T ... 30 MHz @ I_C = 100 mA**
- **$V_{CE(sat)}$ ... 0.6 V @ I_C = 0.25 A**
- **Complements ... 2N5679, PNP (2N5681, NPN); 2N5680, PNP (2N5682, NPN)**

PACKAGE

2N5679	TO-39
2N5680	TO-39
2N5681	TO-39
2N5682	TO-39

ABSOLUTE MAXIMUM RATINGS (Note 1)

Temperatures

Storage Temperature	−65° C to 200° C
Operating Junction Temperature	200° C

Power Dissipation (Notes 2 & 3)

Continuous Dissipation at 25° C Ambient Temperature	1.0 W
Continuous Dissipation at 25° C Case Temperature	10 W

Voltages & Currents (Note 4)		**5679**	**5680**
V_{CEO}	Collector to Emitter Voltage	−100 V	−120 V
V_{CBO}	Collector to Base Voltage	−100 V	−120 V
V_{EBO}	Emitter to Base Voltage	−4.0 V	−4.0 V
I_C	Collector Current	1.0 A	1.0 A
I_B	Base Current	0.5 A	0.5 A

Voltages & Currents (Note 4)		**5681**	**5682**
V_{CEO}	Collector to Emitter Voltage	100 V	120 V
V_{CBO}	Collector to Base Voltage	100 V	120 V
V_{EBO}	Emitter to Base Voltage	4.0 V	4.0 V
I_C	Collector Current	1.0 A	1.0 A
I_B	Base Current	0.5 A	0.5 A

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

SYMBOL	CHARACTERISTIC	5679 MIN	5679 MAX	5680 MIN	5680 MAX	UNITS	TEST CONDITIONS
I_{EBO}	Emitter Cutoff Current		1.0		1.0	μA	V_{EB} = −4.0 V, I_C = 0
I_{CBO}	Collector Cutoff Current		1.0			μA	V_{CB} = −100 V, I_E = 0
					1.0	μA	V_{CB} = −120 V, I_E = 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 0 2° C/W (derating factor of 0.057 mW/° C); junction-to-ambient thermal resistance of 0 02° C/W (derating factor of 0 0057 mW/° C).
4. Rating refers to a high current point where collector to emitter voltage is lowest.
5. Pulse conditions: length = 300 μs; duty cycle = 2%.
6. For product family characteristic curves, refer to Curve Set T415 (2N5679 and 2N5680) and Curve Set T315 (2N5681 and 2N5782)

2N5679/2N5680
2N5681/2N5682 T-33-17

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

SYMBOL	CHARACTERISTIC	5679 MIN	5679 MAX	5680 MIN	5680 MAX	UNITS	TEST CONDITIONS
I_{CEO}	Collector Cutoff Current		10			μA	V_{CB} = −70 V, I_B = 0
					10	μA	V_{CB} = −80 V, I_B = 0
I_{CEX}	Collector Reverse Current (Note 3)		1.0			mA	V_{CE} = −100 V, V_{BE} = −1.5 V, T_C = 150°C
					1.0	mA	V_{CE} = −120 V, V_{BE} = −1.5 V, T_C = 150°C
			1.0			μA	V_{CE} = −100 V, V_{BE} = −1.5 V
					1.0	μA	V_{CE} = −120 V, V_{BE} = −1.5 V
h_{FE}	DC Current Gain (Note 5)	5.0		5.0			I_C = 1.0 A, V_{CE} = −2.0 V
		40	150	40	150		I_C = 250 mA, V_{CE} = −2.0 V
$V_{CEO(sus)}$	Collector to Emitter Sustaining Voltage (Note 5)	−100		−120		V	I_C = 10 mA, I_B = 0
$V_{CE(sat)}$	Collector to Emitter Saturation Voltage (Note 5)		−2.0		−2.0	V	I_C = 1.0 mA, I_B = 200 mA
			−1.0		−1.0	V	I_C = 500 mA, I_B = 50 mA
			−0.6		−0.6	V	I_C = 250 mA, I_B = 25 mA
$V_{BE(ON)}$	Base to Emitter "On" Voltage (Note 5)		−1.0		−1.0	V	I_C = 250 mA, V_{CE} = −2.0 V
C_{ob}	Common Base Output Capacitance		50		50	pF	V_{CB} = −20 mA, I_E = 0 f = 1.0 MHz
h_{fe}	High Frequency Current Gain	3.0		3.0			I_C = 100 mA, V_{CE} = −10 V, f = 10 MHz
h_{fe}	Small Signal Current Gain	40		40			I_C = 200 mA, V_{CE} = −1.5 V, f = 1.0 kHz

2N5679/2N5680
2N5681/2N5682

T-33-17

SYMBOL	CHARACTERISTIC	5681 MIN	5681 MAX	5682 MIN	5682 MAX	UNITS	TEST CONDITIONS
I_{EBO}	Emitter Cutoff Current		1.0		1.0	μA	V_{EB} = 4.0 V, I_C = 0
I_{CBO}	Collector Cutoff Current		1.0			μA	V_{CB} = 100 V, I_E = 0
					1.0	μA	V_{CB} = 120 V, I_E = 0
I_{CEO}	Collector Cutoff Current		10			μA	V_{CB} = 70 V, I_B = 0
					10	μA	V_{CB} = 80 V, I_B = 0
I_{CEX}	Collector Cutoff Current		1.0			mA	V_{CE} = 100 V, V_{BE} = 1.5 V, T_C = 150°C
					1.0	mA	V_{CE} = 120 V, V_{BE} = −1.5 V, T_C = 150°C
			1.0			μA	V_{CE} = −100 V, V_{BE} = 1.5 V
					1.0	μA	V_{CE} = −120 V, V_{BE} = 1.5 V
h_{FE}	DC Current Gain (Note 5)	5.0		5.0			I_C = 1.0 A, V_{CE} = 2.0 V
		40	150	40	150		I_C = 250 mA, V_{CE} = 2.0 V
$V_{CEO(sus)}$	Collector to Emitter Sustaining Voltage (Note 5)	100		120		V	I_C = 10 mA, I_B = 0
$V_{CE(sat)}$	Collector to Emitter Saturation Voltage (Note 5)		2.0		2.0	V	I_C = 1.0 mA, I_B = 200 mA
			1.0		1.0	V	I_C = 500 mA, I_B = 50 mA
			0.6		0.6	V	I_C = 250 mA, I_B = 25 mA
$V_{BE(ON)}$	Base to Emitter "On" Voltage (Note 2)		1.0		1.0	V	I_C = 250 mA, V_{CE} = 2.0 V
C_{ob}	Output Capacitance		50		50	pF	V_{CB} = 20 mA, I_E = 0 f = 1.0 MHz
h_{fe}	High Frequency Current Gain	3.0		3.0			I_C = 100 mA, V_{CE} = 10 V, f = 10 MHz
h_{fe}	Small Signal Current Gain	40		40			I_C = 200 mA, V_{CE} = 1.5 V, f = 1.0 kHz