

**Type 2N3810**  
**Geometry 0220**  
**Polarity PNP**  
**Qual Level: JAN - JANS**

**Generic Part Number:**  
**2N3810**

**REF: MIL-PRF-19500/336**

**Features:**

[Request Quotation](#)

- Two electrically isolated, matched PNP transistors as one dual unit.
- Housed in [TO-78](#) case.
- Also available in chip form using the [0220](#) chip geometry.
- The Min and Max limits shown are per [MIL-PRF-19500/336](#) which Semicoa meets in all cases.



TO-78

**Maximum Ratings**

$T_C = 25^{\circ}\text{C}$  unless otherwise specified

Rating	Symbol	Rating	Unit
Collector-Emitter voltage	$V_{CEO}$	60	V
Collector-Base Voltage	$V_{CBO}$	60	V
Emitter-Base voltage	$V_{EBO}$	5.0	V
Collector Current, Continuous	$I_C$	50	mA
Power Dissipation, $T_A = 25^{\circ}\text{C}$ , one section	$P_T$	0.5	W
Derate above $25^{\circ}\text{C}$		2.86	mW/ $^{\circ}\text{C}$
Power Dissipation, $T_A = 25^{\circ}\text{C}$ , two sections	$P_T$	0.6	W
Derate above $25^{\circ}\text{C}$		3.43	mW/ $^{\circ}\text{C}$
Operating Junction Temperature	$T_J$	-65 to +200	$^{\circ}\text{C}$
Storage Temperature	$T_{STG}$	-65 to +200	$^{\circ}\text{C}$

### Electrical Characteristics

$T_C = 25^\circ\text{C}$  unless otherwise specified

OFF Characteristics	Symbol	Min	Max	Unit
Collector-Base Breakdown Voltage $I_C = 10\ \mu\text{A}$	$V_{(BR)CBO}$	60	---	V
Collector-Emitter Breakdown Voltage $I_C = 10\ \text{mA}$	$V_{(BR)CEO}$	60	---	V
Emitter-Base Breakdown Voltage $I_C = 10\ \mu\text{A}$	$V_{(BR)EBO}$	5.0	---	V
Collector-Base Cutoff Current $V_{CB} = 50\ \text{V}$	$I_{CBO1}$	---	10	nA
Collector-Base Cutoff Current $V_{CB} = 50\ \text{V}, T_A = +150^\circ\text{C}$	$I_{CBO2}$	---	10	$\mu\text{A}$
Collector-Base Cutoff Current $V_{CE} = 50\ \text{V}, I_C = 1\ \mu\text{A}$	$I_{EBO}$	---	10	nA

ON Characteristics	Symbol	Min	Max	Unit
<b>Forward Current Transfer Ratio</b>				
$I_C = 1\ \mu\text{A}, V_{CE} = 5\ \text{V}$	$h_{FE1}$	75	---	---
$I_C = 10\ \mu\text{A}, V_{CE} = 5\ \text{V}$	$h_{FE2}$	100	---	---
$I_C = 100\ \mu\text{A}, V_{CE} = 5\ \text{V}$	$h_{FE3}$	150	450	---
$I_C = 500\ \mu\text{A}, V_{CE} = 5\ \text{V}$	$h_{FE4}$	150	450	---
$I_C = 1\ \text{mA}, V_{CE} = 5\ \text{V}$	$h_{FE5}$	150	450	---
$I_C = 10\ \text{mA}, V_{CE} = 5\ \text{V}$	$h_{FE6}$	125	---	---
$I_C = 100\ \mu\text{A}, V_{CE} = 5\ \text{V}, T_A = -55^\circ\text{C}$	$h_{FE7}$	60	---	---
<b>Base-Emitter Saturation Voltage</b>				
$I_C = 100\ \mu\text{A}, I_B = 10\ \mu\text{A}$	$V_{BE(sat)1}$	---	0.7	V dc
$I_C = 1\ \text{mA}, I_B = 100\ \mu\text{A}$	$V_{BE(sat)2}$	---	0.8	V dc
$V_{CE} = 5\ \text{V}, I_C = 100\ \mu\text{A}$	$V_{BE(sat)3}$	---	0.7	V dc
<b>Collector-Emitter Saturation Voltage</b>				
$I_C = 100\ \mu\text{A}, I_B = 10\ \mu\text{A}$	$V_{CE(sat)1}$	---	0.2	V dc
$I_C = 1\ \text{mA}, I_B = 100\ \mu\text{A}$	$V_{CE(sat)2}$	---	0.25	V dc

Small Signal Characteristics	Symbol	Min	Max	Unit
Forward Current Transfer Ratio (Gain Ratio) $V_{CE} = 5 \text{ V}, I_C = 100 \mu\text{A}$	$h_{FE3-1} / h_{FE3-2}$	0.9	1.0	---
Base Emitter Voltage, Nonsaturated Absolute Value of Differential, $ V_{BE1} - V_{BE2} _1$ $V_{CE} = 5 \text{ V}, I_C = 10 \mu\text{A}$ $V_{CE} = 5 \text{ V}, I_C = 100 \mu\text{A}$ $V_{CE} = 5 \text{ V}, I_C = 10 \text{ mA}$		---	5.0 3.0 5.0	mV mV mV
Magnitude of Small-Signal, Short Circuit Forward Current Transfer Ratio $V_{CE} = 5 \text{ V}, I_C = 500 \mu\text{A}, f = 30 \text{ MHz}$ $V_{CE} = 5 \text{ V}, I_C = 1 \text{ mA}, f = 100 \text{ MHz}$	$ h_{FE} _1$ $ h_{FE} _2$	1.0 1.0	--- 5.0	--- ---
Small-Signal, Short Circuit Forward Current Transfer Ratio $V_{CE} = 10 \text{ V}, I_C = 1.0 \text{ mA}, f = 1 \text{ kHz}$	$h_{FE}$	150	600	---
Small-Signal, Short Circuit Input Impedance $V_{CE} = 10 \text{ V}, I_C = 1 \text{ mA}, f = 1 \text{ kHz}$	$h_{ie}$	3.0	30	kohm
Small-Signal, Open Circuit Output Admittance $V_{CE} = 10 \text{ V}, I_C = 1 \text{ mA}, f = 1 \text{ kHz}$	$h_{oe}$	5.0	60	$\mu\text{ohm}$
Small-Signal, Open Circuit Reverse Voltage Transfer Ratio $V_{CE} = 10 \text{ V}, I_C = 1 \text{ mA}, f = 1 \text{ kHz}$	$h_{re}$	---	$25 \times 10^{-4}$	---
Noise Figure $V_{CE} = 10 \text{ V}, I_C = 100 \mu\text{A}, R = 3 \text{ k}\Omega, f = 100 \text{ Hz}$ $V_{CE} = 10 \text{ V}, I_C = 100 \mu\text{A}, R = 3 \text{ k}\Omega, f = 1 \text{ kHz}$ $V_{CE} = 10 \text{ V}, I_C = 100 \mu\text{A}, R = 3 \text{ k}\Omega, f = 10 \text{ kHz}$ $V_{CE} = 10 \text{ V}, I_C = 100 \mu\text{A}, R = 3 \text{ k}\Omega,$ noise bandwidth 10 Hz to 15.7 kHz	F1 F2 F3 F4	--- --- --- ---	7.0 3.0 2.5 3.5	dB dB dB dB
Open Circuit, Output Capacitance $V_{CB} = 5 \text{ V}, I_E = 0, 100 \text{ kHz} < f < 1 \text{ MHz}$	$C_{OBO}$	---	5.0	pF
Input Capacitance, Output Short Circuited $V_{EB} = 0.5 \text{ V}, I_C = 0, 100 \text{ kHz} < f < 1 \text{ MHz}$	$C_{IBO}$	---	8.0	pF