SEMICOA SEMICONDUCTORS

Data Sheet No. 2N3810

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°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°C, one section	P_T	0.5	W
Derate above 25°C		2.86	mW/°C
Power Dissipation, T_A = 25°C, two sections	P_T	0.6	W
Derate above 25°C		3.43	mW/°C
Operating Junction Temperature	T_J	-65 to +200	°C
Storage Temperature	T_{STG}	-65 to +200	°C

Electrical Characteristics

T_C = 25°C unless otherwise specified

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

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

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