

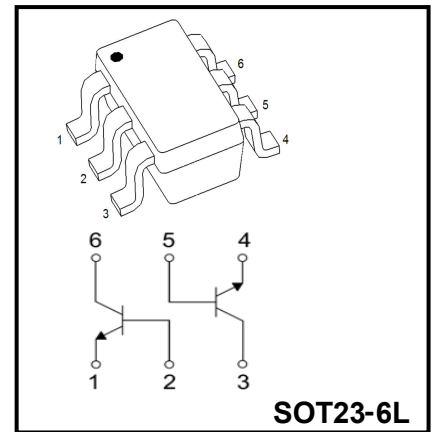
Plastic-Encapsulate Transistors

DUAL TRANSISTOR (NPN+PNP)

FEATURES

- ◆ Complementary Pair
- ◆ One 3904-Type NPN
One 3906-Type PNP
- ◆ Epitaxial Planar Die Construction
- ◆ Ideal for Low Power Amplification and Switching

MAKING: K46



MAXIMUM RATINGS (Ta=25°C unless otherwise noted)

Symbol	Parameter	Value	Units
V _{CBO}	Collector-Base Voltage	60	V
V _{CEO}	Collector-Emitter Voltage	40	V
V _{EBO}	Emitter-Base Voltage	5	V
I _C	Collector Current -Continuous	0.2	A
P _C	Collector Power Dissipation	0.3	W
T _J	Junction Temperature	150	°C
T _{stg}	Storage Temperature	-55-150	°C

NPN 3904 ELECTRICAL CHARACTERISTICS (Ta=25°C unless otherwise specified)

Parameter	Symbol	Test conditions	Min	Max	Unit
Collector-base breakdown voltage	V _{(BR)CBO}	I _C = 10μA, I _E =0	60		V
Collector-emitter breakdown voltage	V _{(BR)CEO}	I _C = 1mA, I _B =0	40		V
Emitter-base breakdown voltage	V _{(BR)EBO}	I _E = 10μA, I _C =0	5		V
Collector cut-off current	I _{CBO}	V _{CB} = 30 V, I _E =0		0.05	μA
Collector cut-off current	I _{CEO}	V _{CE} = 30 V, I _B =0		0.5	μA
Emitter cut-off current	I _{EBO}	V _{EB} = 5V, I _C =0		0.05	μA
DC current gain	h _{FE(1)}	V _{CE} = 1V, I _C = 0.1mA	40		
	h _{FE(2)}	V _{CE} = 1V, I _C = 1mA	70		
	h _{FE(3)}	V _{CE} = 1V, I _C = 10mA	100	300	
	h _{FE(4)}	V _{CE} = 1V, I _C = 50mA	60		
	h _{FE(5)}	V _{CE} = 1V, I _C = 100mA	30		
Collector-emitter saturation voltage	V _{CE(sat)1}	I _C =10 mA, I _B = 1mA		0.2	V
	V _{CE(sat)2}	I _C =50 mA, I _B = 5mA		0.3	V
Base-emitter saturation voltage	V _{BE(sat)1}	I _C = 10 mA, I _B = 1mA	0.65	0.85	V
	V _{BE(sat)2}	I _C = 50 mA, I _B = 5mA		0.95	V
Transition frequency	f _T	V _{CE} =20V, I _C =20mA, f=100MHz	300		MHz
Noise figure	NF	V _{CE} =5V, I _C =0.1mA, f=1KHz, R _g =1KΩ		5	dB
Output capacitance	C _{ob}	V _{CB} =5V, I _E =0, f=1MHz		4	pF
Delay time	t _d	V _{CC} =3V, V _{BE} =0.5V		35	nS
Rise time	t _r	I _C =10mA, I _{B1} =- I _{B2} =1mA		35	nS
Storage time	t _s	V _{CC} =3V, I _C =10mA		200	nS
Fall time	t _f	I _{B1} =-I _{B2} = 1mA		50	nS

MAXIMUM RATINGS(Ta=25°C unless otherwise noted)

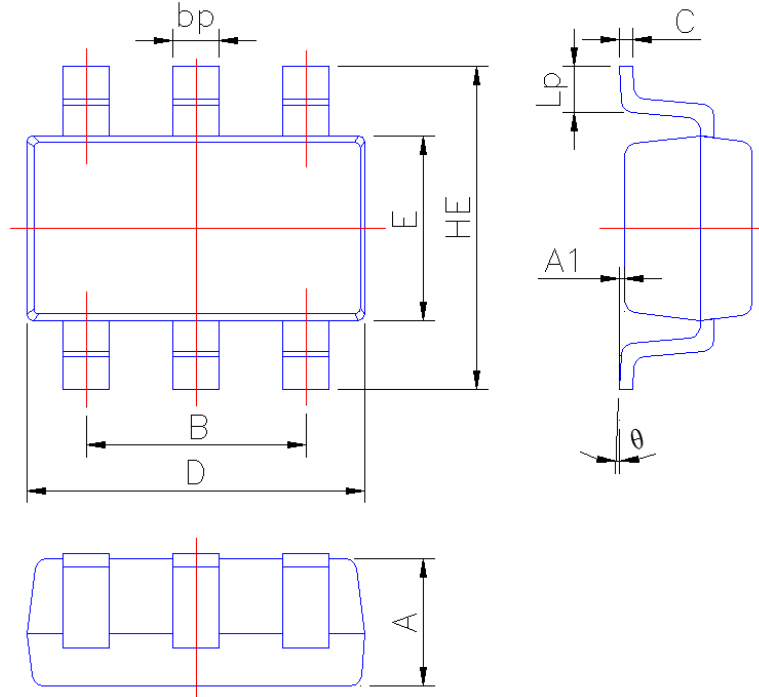
Symbol	Parameter	Value	Units
V _{CBO}	Collector-Base Voltage	-40	V
V _{CEO}	Collector-Emitter Voltage	-40	V
V _{EBO}	Emitter-Base Voltage	-5	V
I _C	Collector Current -Continuous	-0.2	A
P _C	Collector Power Dissipation	0.2	W
T _J	Junction Temperature	150	°C
T _{stg}	Storage Temperature	-55-150	°C

PNP 3906 ELECTRICAL CHARACTERISTICS (Ta=25°C unless otherwise specified)

Parameter	Symbol	Test conditions	Min	Typ	Max	Unit
Collector-base breakdown voltage	V _{(BR)CBO}	I _C =-10μA, I _E =0	-40			V
Collector-emitter breakdown voltage	V _{(BR)CEO}	I _C =-1mA, I _B =0	-40			V
Emitter-base breakdown voltage	V _{(BR)EBO}	I _E =-10μA, I _C =0	-5			V
Collector cut-off current	I _{CBO}	V _{CB} =-30V, I _E =0			-0.05	μA
Emitter cut-off current	I _{EBO}	V _{EB} =-5V, I _C =0			-0.05	μA
DC current gain	h _{FE(1)}	V _{CE} =-1V, I _C =-0.1mA	60			
	h _{FE(2)}	V _{CE} =-1V, I _C =-1mA	80			
	h _{FE(3)}	V _{CE} =-1V, I _C =-10mA	100		300	
	h _{FE(4)}	V _{CE} =-1V, I _C =-50mA	60			
	h _{FE(5)}	V _{CE} =-1V, I _C =-100mA	30			
Collector-emitter saturation voltage	V _{CE(sat)1}	I _C =-10mA, I _B =-1mA			-0.25	V
	V _{CE(sat)2}	I _C =-50mA, I _B =-5mA			-0.4	V
Base-emitter saturation voltage	V _{BE(sat)1}	I _C =-10mA, I _B =-1mA	-0.65		-0.85	V
	V _{BE(sat)2}	I _C =-50mA, I _B =-5mA			-0.95	V
Transition frequency	f _T	V _{CE} =-20V, I _C =-10mA, f=100MHz	250			MHz
Collector output capacitance	C _{ob}	V _{CB} =-5V, I _E =0, f=1MHz			4.5	pF
Noise figure	NF	V _{CE} =-5V, I _C =-0.1mA, f=1KHz, R _g =1KΩ			4	dB
Delay time	t _d	V _{CC} =-3V, V _{BE} =-0.5V			35	nS
Rise time	t _r	I _C =-10mA, I _{B1} =-I _{B2} =-1mA			35	nS
Storage time	t _s	V _{CC} =-3V, I _C =-10mA			225	nS
Fall time	t _f	I _{B1} =-I _{B2} =-1mA			75	nS

Package Outline

SOT23-6L



Symbol	Dimension in Millimeters	
	Min	Max
A	1.05	1.20
A1	0.010	0.100
B	1.80	2.00
bp	0.35	0.50
C	0.12	0.20
D	2.80	3.00
E	1.50	1.70
HE	2.60	3.00
Lp	0.25	0.55
θ	2°	6°

Summary of Packing Options

Package	Packing Description	Packing Quantity	Industry Standard
SOT23-6L	Tape/Reel,7"reel	3000	EIA-481-1

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