

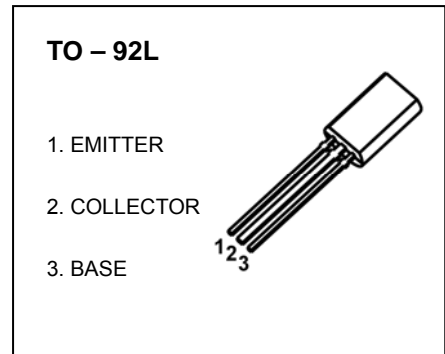
## TO-92L Plastic-Encapsulate Transistors

### 2SB649/2SB649A TRANSISTOR (PNP)

#### FEATURES

- High Collector Current
- High Collector-Emitter Breakdown Voltage
- Low Saturation Voltage

#### MAXIMUM RATINGS (T<sub>a</sub>=25°C unless otherwise noted)



Symbol	Parameter	Value	Unit
V <sub>CB0</sub>	Collector-Base Voltage	-180	V
V <sub>CEO</sub>	Collector-Emitter Voltage	2SB649	-120
		2SB649A	-160
V <sub>EBO</sub>	Emitter-Base Voltage	-5	V
I <sub>C</sub>	Collector Current	-1.5	A
P <sub>C</sub>	Collector Power Dissipation	900	mW
R <sub>θJA</sub>	Thermal Resistance From Junction To Ambient	139	°C/W
T <sub>j</sub>	Junction Temperature	150	°C
T <sub>stg</sub>	Storage Temperature	-55~+150	°C

#### ELECTRICAL CHARACTERISTICS (T<sub>a</sub>=25°C unless otherwise specified)

Parameter	Symbol	Test conditions	Min	Typ	Max	Unit
Collector-base breakdown voltage	V <sub>(BR)CBO</sub>	I <sub>C</sub> =-1mA, I <sub>E</sub> =0	-180			V
Collector-emitter breakdown voltage	V <sub>(BR)CEO</sub>	I <sub>C</sub> =-10mA, I <sub>B</sub> =0	2SB649	-120		V
			2SB649A	-160		
Emitter-base breakdown voltage	V <sub>(BR)EBO</sub>	I <sub>E</sub> =-1mA, I <sub>C</sub> =0	-5			V
Collector cut-off current	I <sub>CBO</sub>	V <sub>CB</sub> =-160V, I <sub>E</sub> =0			-10	μA
Emitter cut-off current	I <sub>EBO</sub>	V <sub>EB</sub> =-4V, I <sub>C</sub> =0			-10	μA
DC current gain	h <sub>FE(1)</sub>	V <sub>CE</sub> =-5V, I <sub>C</sub> =-150mA	2SB649	60	320	
			2SB649A	60	200	
	h <sub>FE(2)</sub> *	V <sub>CE</sub> =-5V, I <sub>C</sub> =-500mA	30			
Collector-emitter saturation voltage	V <sub>CE(sat)</sub>	I <sub>C</sub> =-500mA, I <sub>B</sub> =-50mA			-1	V
Base-emitter voltage	V <sub>BE</sub>	V <sub>CE</sub> =-5V, I <sub>C</sub> =-150mA			-1.5	V
Collector output capacitance	C <sub>ob</sub>	V <sub>CB</sub> =-10V, I <sub>E</sub> =0, f=1MHZ		27		pF
Transition frequency	f <sub>T</sub>	V <sub>CE</sub> =-5V, I <sub>C</sub> =-150mA		140		MHZ

\*Pulse test

#### CLASSIFICATION OF h<sub>FE(1)</sub>

TYPE	2SB649		
	2SB649A		
RANK	B	C	D
RANGE	60-120	100-200	160-320