

TO-92 Plastic-Encapsulate Transistors

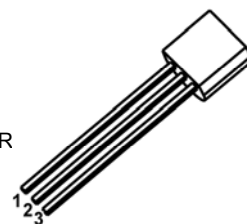
2SD1513 TRANSISTOR (NPN)

FEATURES

- Low Collector Saturation
- High DC Current Gain
- Complementary to The 2SB1068 PNP Transistor

TO - 92

1. EMITTER
2. COLLECTOR
3. BASE



MAXIMUM RATINGS ($T_a=25^{\circ}\text{C}$ unless otherwise noted)

Symbol	Parameter	Value	Unit
V_{CBO}	Collector-Base Voltage	20	V
V_{CEO}	Collector-Emitter Voltage	16	V
V_{EBO}	Emitter-Base Voltage	6	V
I_C	Collector Current	2	A
P_C	Collector Power Dissipation	625	mW
$R_{\theta JA}$	Thermal Resistance From Junction To Ambient	200	$^{\circ}\text{C/W}$
T_j	Junction Temperature	150	$^{\circ}\text{C}$
T_{stg}	Storage Temperature	-55~+150	$^{\circ}\text{C}$

ELECTRICAL CHARACTERISTICS ($T_a=25^{\circ}\text{C}$ unless otherwise specified)

Parameter	Symbol	Test conditions	Min	Typ	Max	Unit
Collector-base breakdown voltage	$V_{(BR)CBO}$	$I_C=0.1\text{mA}, I_E=0$	20			V
Collector-emitter breakdown voltage	$V_{(BR)CEO}$	$I_C=1\text{mA}, I_B=0$	16			V
Emitter-base breakdown voltage	$V_{(BR)EBO}$	$I_E=0.1\text{mA}, I_C=0$	6			V
Collector cut-off current	I_{CBO}	$V_{CB}=16\text{V}, I_E=0$			0.1	μA
Emitter cut-off current	I_{EBO}	$V_{EB}=6\text{V}, I_C=0$			0.1	μA
DC current gain	$h_{FE(1)}$	$V_{CE}=2\text{V}, I_C=100\text{mA}$	135		650	
	$h_{FE(2)}$	$V_{CE}=2\text{V}, I_C=1.5\text{A}$	100			
Collector-emitter saturation voltage	$V_{CE(sat)(1)}$	$I_C=1\text{A}, I_B=10\text{mA}$			0.4	V
	$V_{CE(sat)(2)}$	$I_C=1.5\text{A}, I_B=20\text{mA}$			0.5	V
	$V_{CE(sat)(3)}$	$I_C=1.5\text{A}, I_B=75\text{mA}$			0.5	V
Base-emitter saturation voltage	$V_{BE(sat)}$	$I_C=1.5\text{mA}, I_B=75\text{mA}$			1.2	V
Base-emitter voltage	V_{BE}	$V_{CE}=6\text{V}, I_C=5\text{mA}$	0.55		0.65	V
Collector output capacitance	C_{ob}	$V_{CB}=10\text{V}, I_E=0, f=1\text{MHz}$		28		pF
Transition frequency	f_T	$V_{CE}=10\text{V}, I_C=50\text{mA}$	100			MHz

CLASSIFICATION OF $h_{FE(1)}$

RANK	L	K	U
RANGE	135-270	200-400	300-650