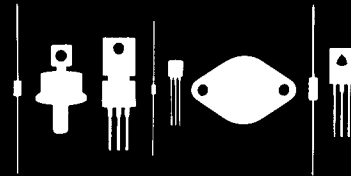


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145 Adams Avenue  
Hauppauge, New York 11788



2N2903

2N2903A

NPN SILICON DUAL TRANSISTOR

JEDEC TO-78 CASE

**DESCRIPTION**

The CENTRAL SEMICONDUCTOR 2N2903, A types are silicon NPN dual transistors manufactured by the epitaxial planar process utilizing 2 individual chips mounted in a hermetically sealed metal case designed for differential amplifier applications.

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

	SYMBOL		UNIT
Collector-Base Voltage	$V_{CB0}$	60	V
Collector-Emitter Voltage	$V_{CE0}$	30	V
Emitter-Base Voltage	$V_{EB0}$	7.0	V
Collector Current	$I_C$	50	mA
Power Dissipation (One Die)	$P_D$	200	mW
Power Dissipation (Both Dice)	$P_D$	300	mW
Power Dissipation (One Die, $T_C=25^\circ\text{C}$ )	$P_D$	600	mW
Power Dissipation (Both Dice, $T_C=25^\circ\text{C}$ )	$P_D$	1200	mW
Operating and Storage Junction Temperature	$T_J, T_{STG}$	-65 TO +200	$^\circ\text{C}$

**ELECTRICAL CHARACTERISTICS** ( $T_A=25^\circ\text{C}$  unless otherwise noted)

SYMBOL	TEST CONDITIONS	MIN	MAX	UNIT
$I_{CB0}$	$V_{CB}=50\text{V}$		0.01	$\mu\text{A}$
$I_{CB0}$	$V_{CB}=50\text{V}, T_A=150^\circ\text{C}$		15	$\mu\text{A}$
$I_{EB0}$	$V_{BE}=5.0\text{V}$		0.01	$\mu\text{A}$
$BV_{CB0}$	$I_C=10\mu\text{A}$	60		V
$BV_{CE0}$	$I_C=10\text{mA}$	30		V
$BV_{EB0}$	$I_E=0.1\mu\text{A}$	7.0		V
$V_{CE(SAT)}$	$I_C=5.0\text{mA}, I_B=0.5\text{mA}$		1.0	V
$V_{BE(SAT)}$	$I_C=5.0\text{mA}, I_B=0.5\text{mA}$		0.9	V
$h_{FE}$	$V_{CE}=5.0\text{V}, I_C=10\mu\text{A}$	60	-	
$h_{FE}$	$V_{CE}=5.0\text{V}, I_C=10\mu\text{A}, T_A=-55^\circ\text{C}$	25	-	
$h_{FE}$	$V_{CE}=5.0\text{V}, I_C=1.0\text{mA}$	125	625	
$h_{FE}$	$V_{CE}=5.0\text{V}, I_C=1.0\text{mA}, T_A=-55^\circ\text{C}$	60	-	
$f_T$	$V_{CE}=10\text{V}, I_C=5.0\text{mA}, f=30\text{MHz}$	60		MHz
$C_{ob}$	$V_{CB}=10\text{V}, I_E=0, f=140\text{kHz}$		8.0	pF
$C_{ib}$	$V_{BE}=0.5\text{V}, I_C=0, f=140\text{kHz}$		10	pF
NF	$V_{CE}=5.0\text{V}, I_C=10\mu\text{A}, R_S=10\text{k}\Omega, f=1.0\text{kHz}$		7.0	dB
$h_{FE1}/h_{FE2}$	$V_{CE}=5.0\text{V}, I_C=1.0\text{mA}$ (2N2903)	0.80	1.0	
$h_{FE1}/h_{FE2}$	$V_{CE}=5.0\text{V}, I_C=1.0\text{mA}$ (2N2903A)	0.90	1.0	
$ V_{BE1}-V_{BE2} $	$V_{CE}=5.0\text{V}, I_C=10\mu\text{A}$ (2N2903)	-	10	mV
$ V_{BE1}-V_{BE2} $	$V_{CE}=5.0\text{V}, I_C=10\mu\text{A}$ (2N2903A)	-	5.0	mV
$\Delta(V_{BE1}-V_{BE2})$				
$\frac{\Delta(V_{BE1}-V_{BE2})}{\Delta T_A}$	$V_{CE}=5.0\text{V}, I_C=10\mu\text{A}, T_A=-55 \text{ TO } +125^\circ\text{C}$ (2N2903)		20	$\mu\text{V}/^\circ\text{C}$
$\frac{\Delta(V_{BE1}-V_{BE2})}{\Delta T_A}$	$V_{CE}=5.0\text{V}, I_C=10\mu\text{A}, T_A=-55 \text{ TO } +125^\circ\text{C}$ (2N2903A)		10	$\mu\text{V}/^\circ\text{C}$