

1.Descriptions

Silicon NPN transistor in a TO-92 Plastic Package

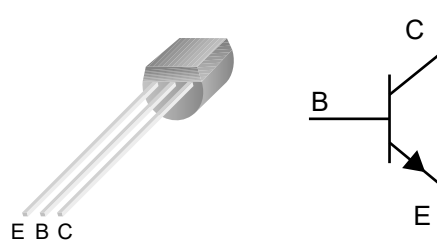
2.Features

- Low current, Low voltage
- General purpose amplifier

3.Pinning Information

Pin	Symbol	Description
1	C	Collector
2	B	Base
3	E	Emitter

TO-92



4.Absolute Maximum Ratings $T_A = 25^{\circ}\text{C}$

Parameter	Symbol	Rating	Units
Collector to Base Voltage	V_{CBO}	60	V
Collector to Emitter Voltage	V_{CEO}	40	V
Emitter to Base Voltage	V_{EBO}	6	V
Collector Current - Continuous	I_C	200	mA
Collector Power Dissipation	P_C	625	mW
Junction Temperature	T_J	150	$^{\circ}\text{C}$
Storage Temperature Range	T_{STG}	-55 to 150	$^{\circ}\text{C}$



5. Electrical Characteristic ($T_A=25^{\circ}\text{C}$)

Parameter	Symbol	Conditions	Min	Typ	Max	Units
Collector to Base Breakdown Voltage	V_{CBO}	$I_C=10\mu\text{A}$, $I_E=0$	60			V
Collector to Emitter Breakdown Voltage	V_{CEO}	$I_C=1\text{mA}$, $I_B=0$	40			V
Emitter to Base Breakdown Voltage	V_{EBO}	$I_E=10\mu\text{A}$, $I_C=0$	6			V
Collector Cut-Off Current	I_{CBO}	$V_{CB}=50\text{V}$, $I_E=0$			0.1	μA
Emitter Cut-Off Current	I_{EBO}	$V_{EB}=5\text{V}$, $I_C=0$			0.1	μA
DC Current Gain	$h_{FE(1)}$	$V_{CE}=1.0\text{V}$, $I_C=10\text{mA}$	100		300	
	$h_{FE(2)}$	$V_{CE}=1.0\text{V}$, $I_C=100\text{mA}$	30			
Collector to Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C=50\text{mA}$, $I_B=5.0\text{mA}$			0.3	V
Base to Emitter Saturation Voltage	$V_{BE(sat)}$	$I_C=50\text{mA}$, $I_B=5.0\text{mA}$			0.95	V
Current Gain Bandwidth Product	f_T	$I_C=10\text{mA}$, $V_{CE}=20\text{V}$, $f=100\text{MHz}$	300			MHz
Output Capacitance	C_{ob}	$I_E=0$, $V_{CB}=5.0\text{V}$, $f=1\text{MHz}$			4	pF
Turn On Time	T_{on}	$V_{CC}=3\text{V}$, $V_{BE}=0.5\text{V}$, $I_C=10\text{mA}$, $I_{B1}=1\text{mA}$			0.07	μs
Turn Off Time	T_{off}	$V_{CC}=3\text{V}$, $I_C=10\text{mA}$, $I_{B1}=-I_{B2}=1\text{mA}$			0.25	μs



6. Typical Characteristics

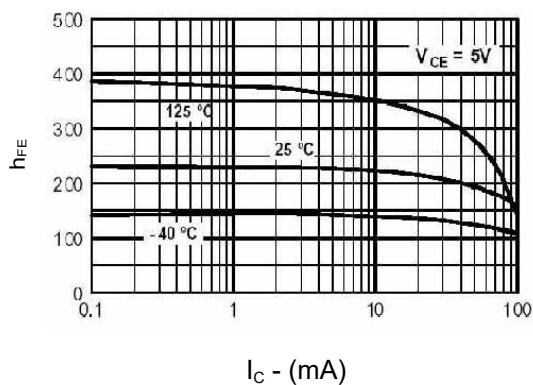
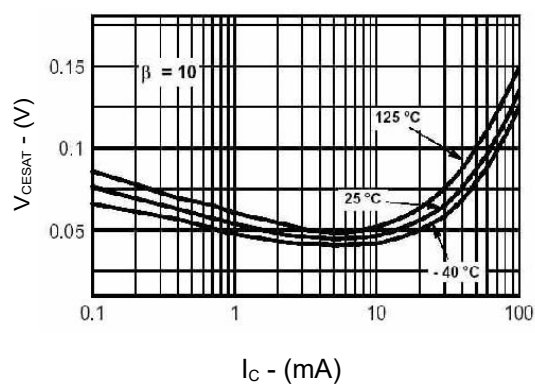
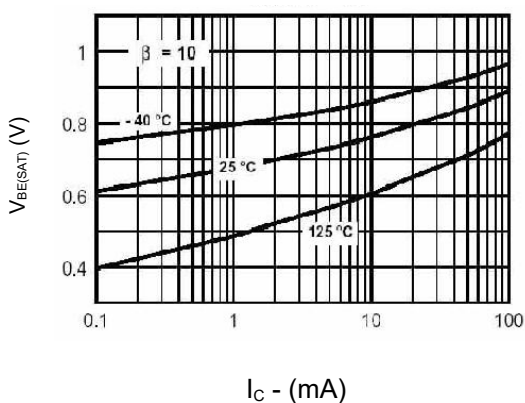
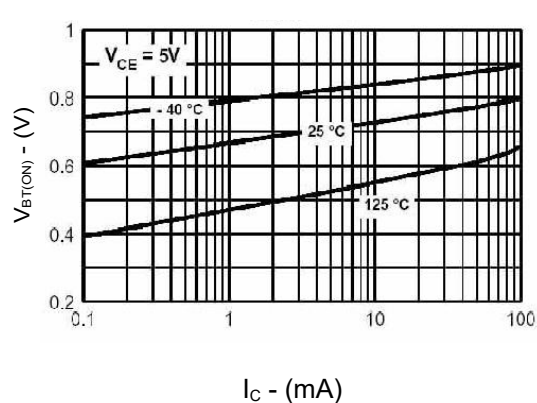
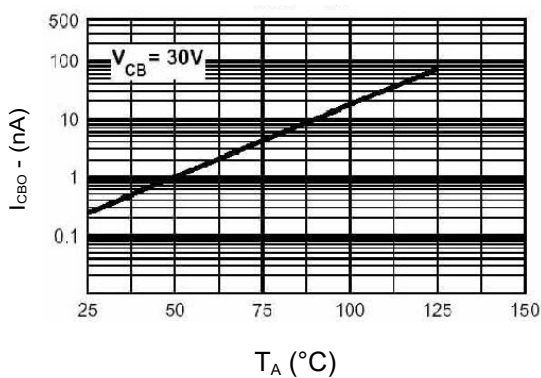
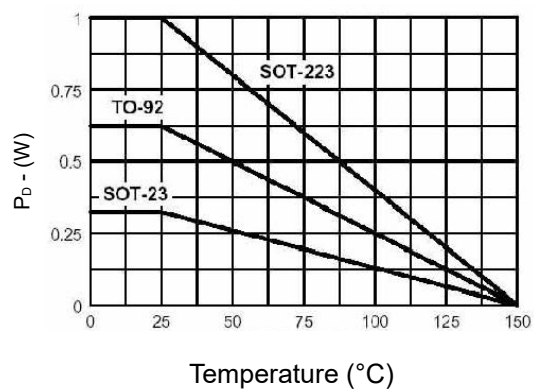
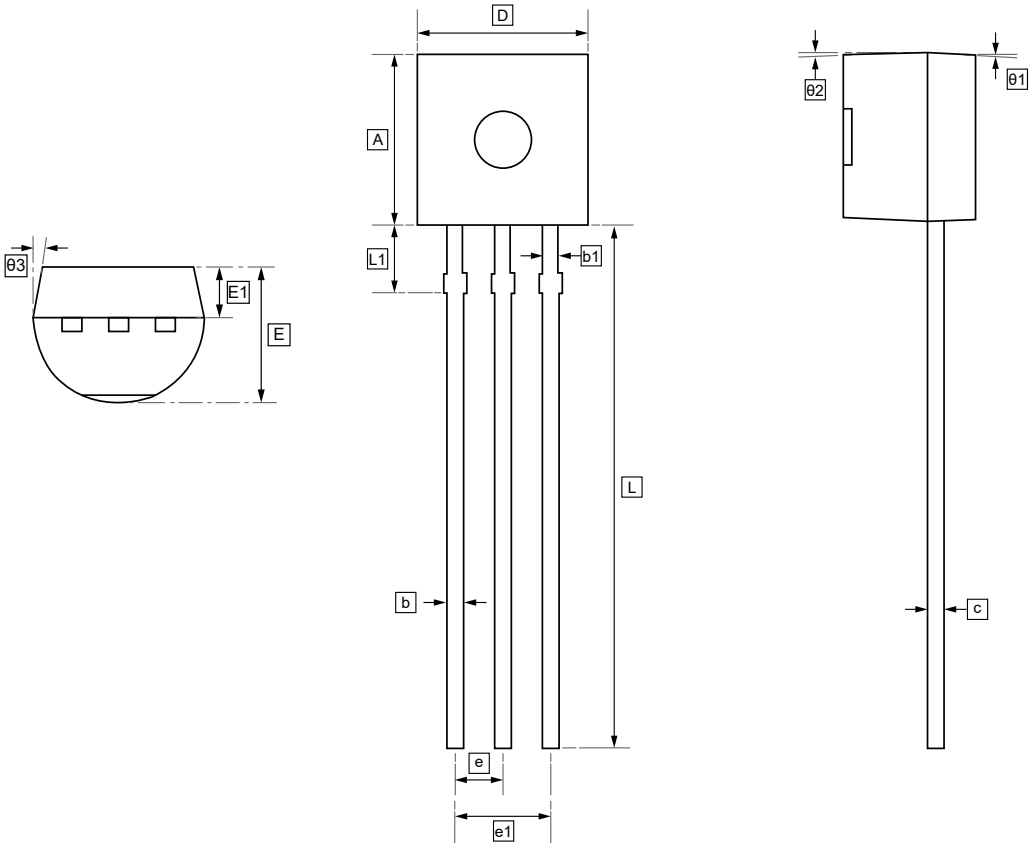
Figure 1: $h_{FE} - I_C$ Figure 2: $V_{CESAT} - I_C$ Figure 3: $V_{BE(SAT)} - I_C$ Figure 4: $V_{BE(ON)} - I_C$ Figure 5: $I_{CBO} - T_A$ 

Figure 6: Temperature



7.TO-92 Package Outline Dimensions



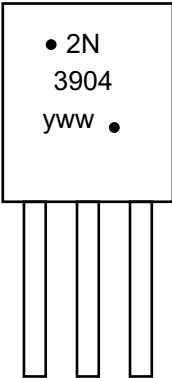
DIMENSIONS (mm are the original dimensions)

Symbol	A	b	b1	c	D	E	E1	e	e1	L	L1	θ1
Min	4.5	0.38	0.46	0.36	4.5	3.45	1.2	1.27	2.54	13.5	1.96	2°
Max	4.7	0.56		0.51	4.7	3.75	1.4			15.3		

Symbol	θ2	θ3
Min	2°	5°
Max		



8.Ordering Information



yww: Batch Code

Order Code	Package	Base QTY	Delivery Mode
UMW 2N3904	TO-92	5000	Bulk Bag



9.Disclaimer

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