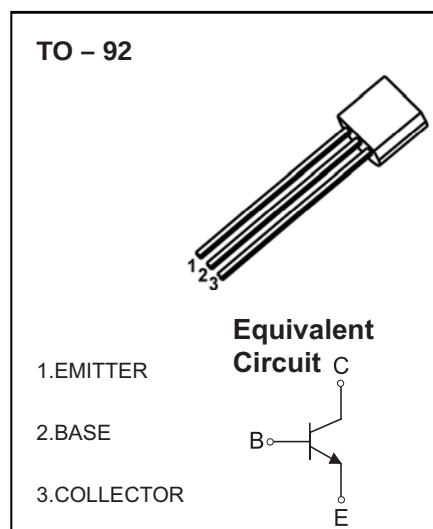


TO-92 Plastic-Encapsulate Transistors

S9018G331 TRANSISTOR (NPN)

FEATURES

- High Current Gain Bandwidth Product



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

Symbol	Parameter	Value	Unit
V_{CBO}	Collector-Base Voltage	25	V
V_{CEO}	Collector-Emitter Voltage	18	V
V_{EBO}	Emitter-Base Voltage	4	V
I_C	Collector Current -Continuous	0.05	A
P_D	Collector Power Dissipation	400	mW
$R_{\theta JA}$	Thermal Resistance from Junction to Ambient	312.5	$^{\circ}\text{C} / \text{W}$
T_J, T_{stg}	Operation Junction and Storage Temperature Range	-55~+150	$^{\circ}\text{C}$

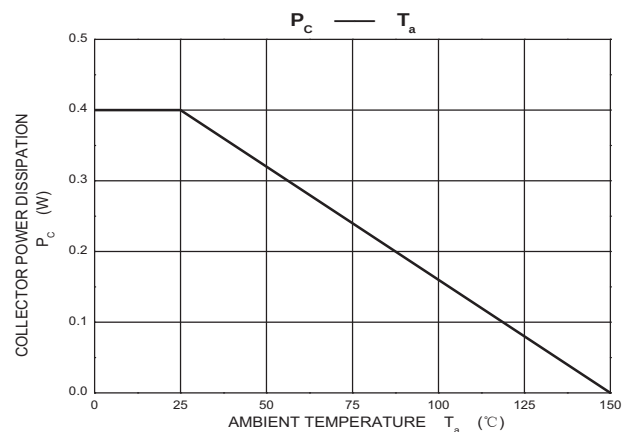
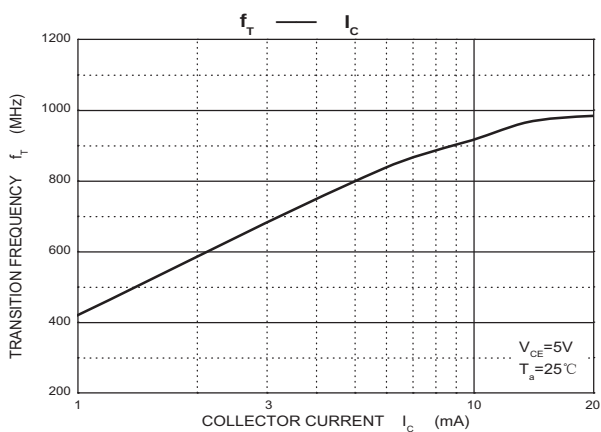
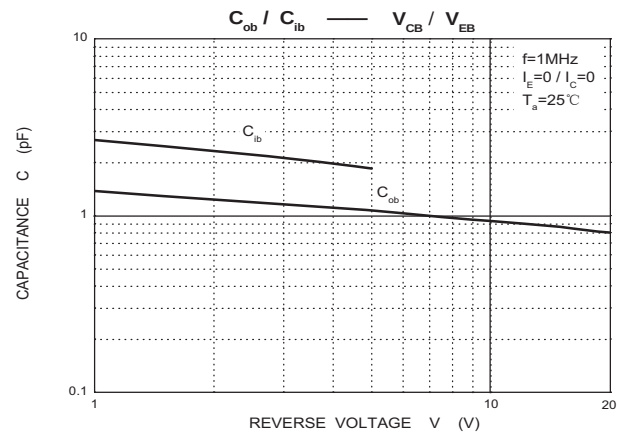
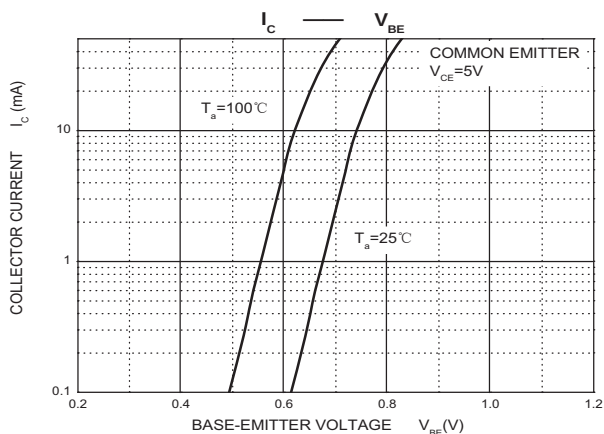
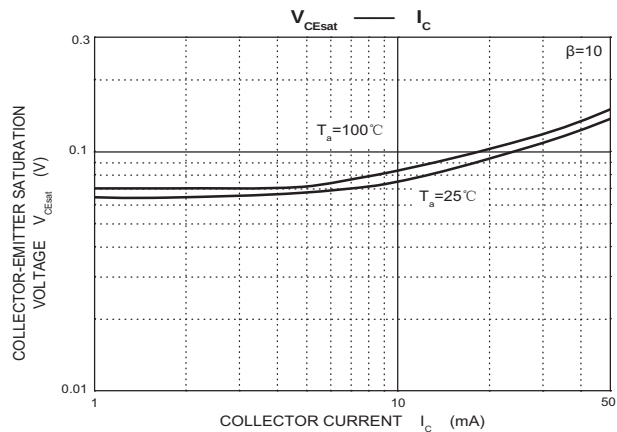
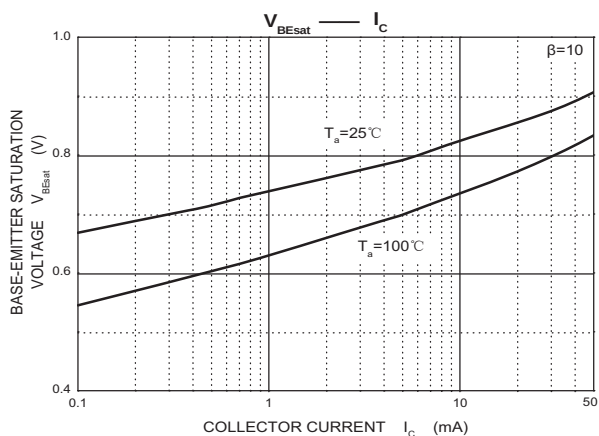
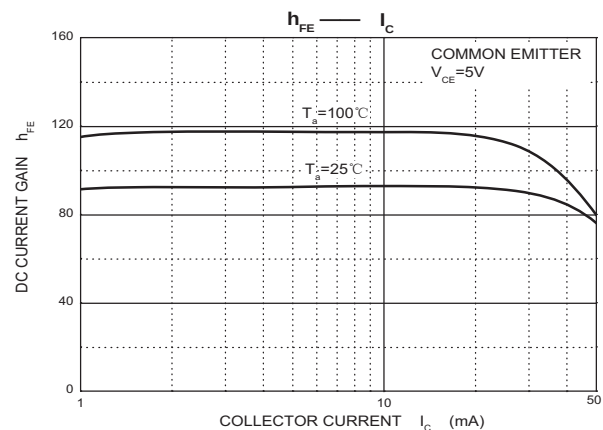
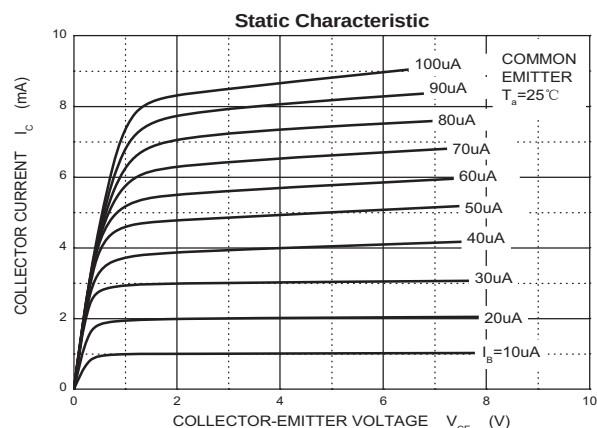
ELECTRICAL CHARACTERISTICS $T_a = 25^{\circ}\text{C}$ unless otherwise specified

Symbol	Parameter	Test conditions	Min	Typ	Max	Unit
$V_{(BR)CBO}$	Collector-base breakdown voltage	$I_C=100\mu\text{A}, I_E=0$	25			V
$V_{(BR)CEO}$	Collector-emitter breakdown voltage	$I_C=0.1\text{mA}, I_B=0$	18			V
$V_{(BR)EBO}$	Emitter-base breakdown voltage	$I_E=100\mu\text{A}, I_C=0$	4			V
I_{CBO}	Collector cut-off current	$V_{CB}=20\text{V}, I_E=0$			0.1	nA
I_{CEO}	Collector cut-off current	$V_{CE}=15\text{V}, I_B=0$			0.1	μA
I_{EBO}	Emitter cut-off current	$V_{EB}=3\text{V}, I_C=0$			0.1	μA
h_{FE}	DC current gain	$V_{CE}=5\text{V}, I_C=1\text{mA}$	28		270	
$V_{CE(sat)}$	Collector-emitter saturation voltage	$I_C=10\text{mA}, I_B=1\text{mA}$			0.5	V
$V_{BE(sat)}$	Base-emitter saturation voltage	$I_C=10\text{mA}, I_B=1\text{mA}$			1.42	V
f_T	Transition frequency	$V_{CE}=5\text{V}, I_C=50\text{mA}, f=400\text{MHz}$		800		MHz

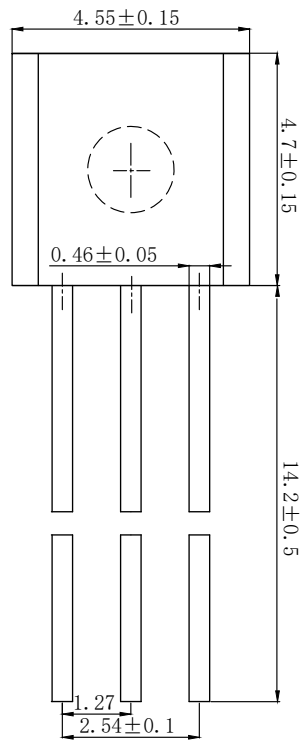
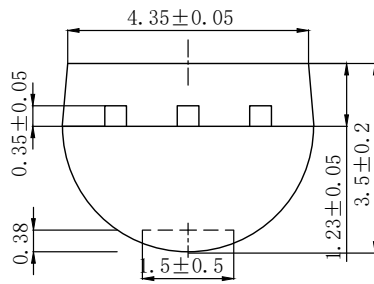
CLASSIFICATION OF h_{FE}

RANK	D	E	F	G	H	I	J
RANGE	28-45	39-60	54-80	72-108	97-146	132-198	180-270

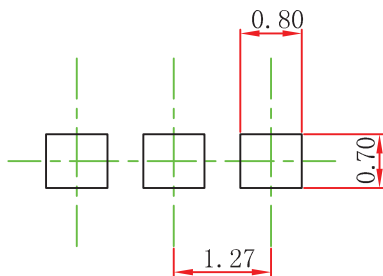
Typical Characteristics



TO-92 Package Outline Dimensions

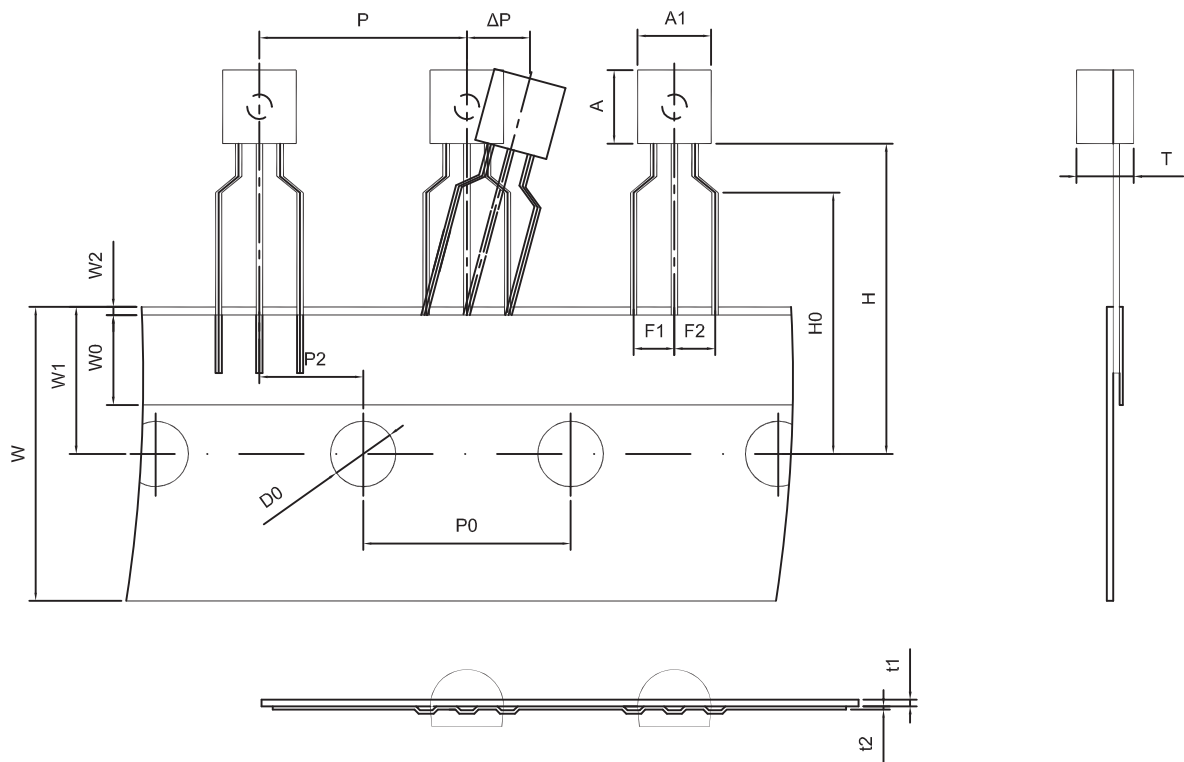


TO-92 Suggested Pad Layout



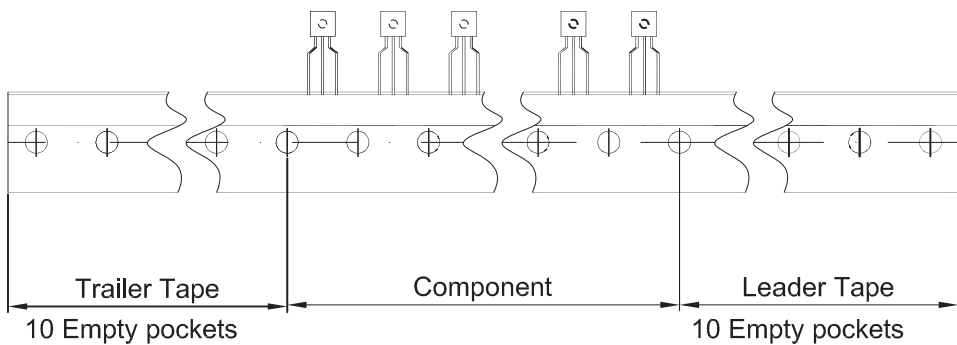
- Note:
- 1. Controlling dimension: in millimeters.
 - 2. General tolerance: $\pm 0.05\text{mm}$.
 - 3. The pad layout is for reference purposes only.

TO-92 Tape and Reel



Dimiensions are in millimeter

A1	A	T	P	P0	P2	F1	F2	W
4.5	4.5	3.5	12.7	12.7	6.35	2.5	2.5	18.0
W0	W1	W2	H	H0	D0	t1	t2	ΔP
6.0	9.0	1.0 MAX.	19.0	16.0	4.0	0.4	0.2	0



Package	Box	Box Size(mm)	Carton	Carton Size(mm)
TO-92	2000 pcs	333×162×43	20,000 pcs	350×340×250