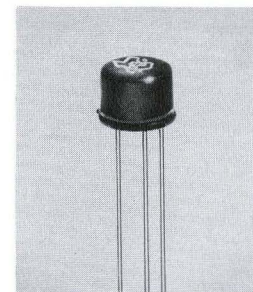


PNP ALLOY JUNCTION GERMANIUM TRANSISTOR



TYPE 320  
BULLETIN NO. DL-S 942  
AUGUST, 1958

**High Frequency Alloy Junction Transistor**  
**Specifically Designed for Computer and Switching Applications**  
**Close parameter control and the JETEC TO-5 package assure device reliability and stable characteristics**



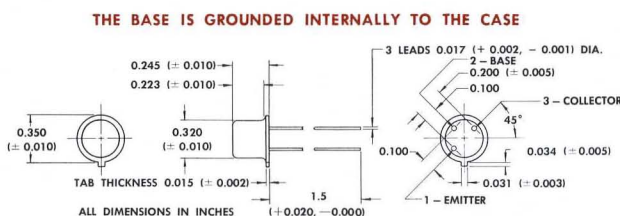
ACTUAL SIZE

**qualification testing**

To assure maximum reliability, stability, and long life, all units are heat cycled from  $-55^{\circ}\text{C}$  and room humidity to  $+75^{\circ}\text{C}$  and 95% relative humidity for four complete cycles over an eight-hour period. All transistors are thoroughly tested for rigid adherence to specified design characteristics.

**mechanical data**

Welded case with glass-to-metal hermetic seal between case and leads. Unit weight is 1 gram.



**absolute maximum ratings at 25°C case temperature** [except where advanced temperatures are indicated]

$BV_{CBO}$	Collector to Base	-30 V
$BV_{EBO}$	Emitter to Base	-15 V
$BV_{CEO}$	Collector to Emitter ( $I_C = -0.6$ mA)	-15 V
$I_C$	Collector Current	250 mA
	Total Dissipation (Derate 2.5 mW/°C for advanced temperatures)	150 mW
$T_j$	Collector Junction Temperature	+85° C
$T_A$	Storage Range	-55° C to +85° C

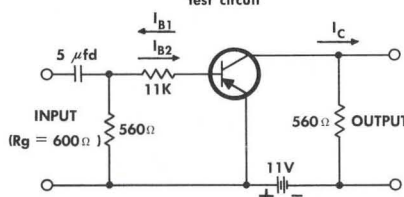
**design characteristics at 25°C**

			min	design center	max	unit
$I_{CBO}$	Collector Reverse Current	$I_E = 0$ $I_C = 0$	—	2	6	$\mu\text{A}$
$I_{EBO}$	Emitter Reverse Current		—	2	6	$\mu\text{A}$
$BV_{CES}$	Collector to Emitter Voltage	$I_C = -0.4$ mA	20	30	—	V
$h_{FE}$	Forward Current Transfer Ratio	$I_C = -20$ mA	50	100	200	—
$f_{\alpha b}$	Current Transfer Ratio Cutoff Frequency	$I_C = -1$ mA	5	8	—	mc
$V_{CE(SAT)}$	Saturation Voltage	$I_C = -20$ mA	—	0.11	0.2	V
$V_{BE}$	Input Voltage	$I_C = -20$ mA	—	0.33	—	V
$C_{ob}$	Output Capacitance	$I_C = -1$ mA	—	13	—	$\mu\text{mfd}$
$h_{ib}$	Input Impedance*	$I_C = -1$ mA	—	34	—	Ohm
$h_{rb}$	Reverse Voltage Transfer Ratio*	$I_C = -1$ mA	—	9	—	$\times 10^{-4}$
$h_{ob}$	Output Admittance*	$I_C = -1$ mA	—	0.3	—	$\mu\text{mho}$

\* Measured at 270 cps.

**typical switching characteristics**

$T_{ON}$	Turn On Time ( $T_d + T_r$ )	0.8 $\mu\text{sec}$
$T_s$	Storage Time	0.6 $\mu\text{sec}$
$T_f$	Fall Time	0.5 $\mu\text{sec}$



**test currents**

$I_{B1}$	= -1.0 mA
$I_{B2}$	= 1.0 mA
$I_C$	= -20 mA