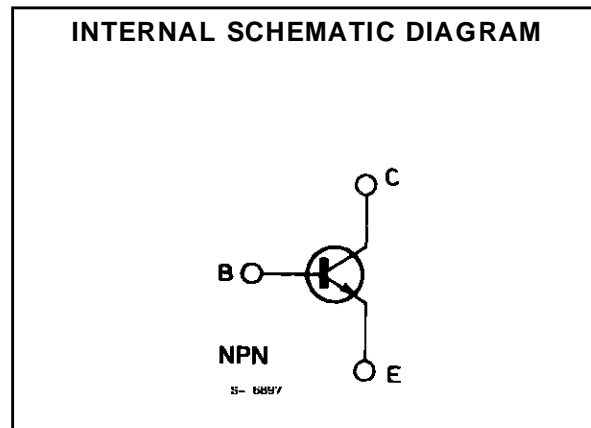
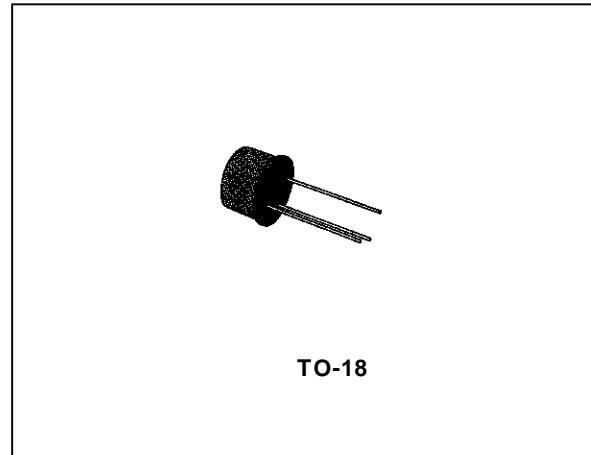


**HIGH-SPEED SATURATED SWITCH**

**DESCRIPTION**

The 2N2369A is a silicon planar epitaxial NPN transistor in Jedec TO-18 metal case. It is designed specifically for high-speed saturated switching applications at current levels from 100  $\mu$ A to 100 mA.



**ABSOLUTE MAXIMUM RATINGS**

Symbol	Parameter	Value	Unit
$V_{CBO}$	Collector-base Voltage ( $I_E = 0$ )	40	V
$V_{CES}$	Collector-emitter Voltage ( $V_{BE} = 0$ )	40	V
$V_{CEO}$	Collector-emitter Voltage ( $I_B = 0$ )	15	V
$V_{EBO}$	Emitter-base Voltage ( $I_C = 0$ )	4.5	V
$I_C$	Collector Current	0.2	A
$I_{CM}$	Collector Current (10 $\mu$ s pulse)	0.5	A
$P_{tot}$	Total Power Dissipation at $T_{amb} \leq 25^\circ\text{C}$	0.36	W
	at $T_{case} \leq 25^\circ\text{C}$	1.2	W
	at $T_{case} \leq 100^\circ\text{C}$	0.68	W
$T_{stg}, T_j$	Storage and Junction Temperature	- 65 to 200	$^\circ\text{C}$

**THERMAL DATA**

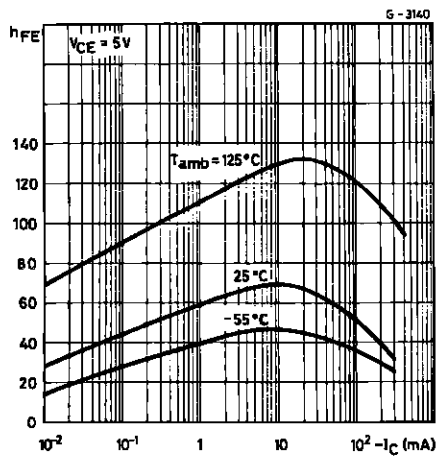
$R_{th\ j-case}$	Thermal Resistance Junction-case	Max	146	°C/W
$R_{th\ j-amb}$	Thermal Resistance Junction-ambient	Max	486	°C/W

**ELECTRICAL CHARACTERISTICS** ( $T_{amb} = 25\text{ °C}$  unless otherwise specified)

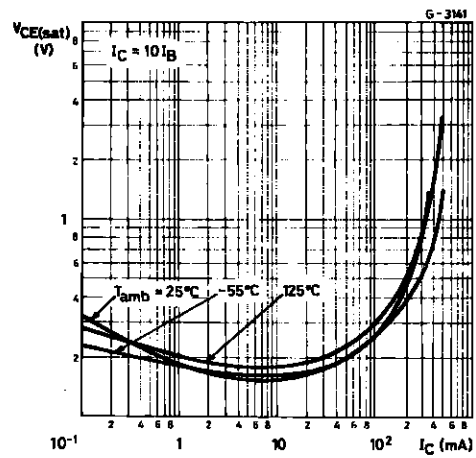
Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$I_{CBO}$	Collector Cutoff Current ( $I_E = 0$ )	$V_{CB} = 20\text{ V}$ $T_{amb} = 150\text{ °C}$			30	$\mu\text{A}$
$I_{CES}$	Collector Cutoff Current ( $V_{BE} = 0$ )	$V_{CE} = 20\text{ V}$			0.4	$\mu\text{A}$
$V_{(BR)CBO}$	Collector-base Breakdown Voltage ( $I_E = 0$ )	$I_C = 10\ \mu\text{A}$	40			V
$V_{(BR)CES}$	Collector-emitter Breakdown Voltage ( $V_{BE} = 0$ )	$I_C = 10\ \mu\text{A}$	40			V
$V_{(BR)CEO}^*$	Collector-emitter Breakdown Voltage ( $I_B = 0$ )	$I_C = 10\text{ mA}$	15			V
$V_{(BR)EBO}$	Emitter-base Breakdown Voltage ( $I_C = 0$ )	$I_E = 10\ \mu\text{A}$	4.5			V
$V_{CE(sat)}^*$	Collector-emitter Saturation Voltage	$I_C = 10\text{ mA}$ $I_B = 1\text{ mA}$ $I_C = 30\text{ mA}$ $I_B = 3\text{ mA}$ $I_C = 100\text{ mA}$ $I_B = 10\text{ mA}$ $I_C = 10\text{ mA}$ $I_B = 1\text{ mA}$ $T_{amb} = 125\text{ °C}$		0.14 0.17 0.28 0.19	0.2 0.25 0.5 0.3	V V V V
$V_{BE(sat)}^*$	Base-emitter Saturation Voltage	$I_C = 10\text{ mA}$ $I_B = 1\text{ mA}$ $I_B = 30\text{ mA}$ $I_B = 3\text{ mA}$ $I_C = 100\text{ mA}$ $I_B = 10\text{ mA}$ $I_C = 10\text{ mA}$ $I_B = 1\text{ mA}$ $T_{amb} = -55\text{ to }125\text{ °C}$	0.7 0.59	0.8 0.9 1.1	0.85 1.15 1.6 1.02	V V V V
$h_{FE}^*$	DC Current Gain	$I_C = 10\text{ mA}$ $V_{CE} = 0.35\text{ V}$ $I_C = 10\text{ mA}$ $V_{CE} = 1\text{ V}$ $I_C = 30\text{ mA}$ $V_{CE} = 0.4\text{ V}$ $I_C = 100\text{ mA}$ $V_{CE} = 1\text{ V}$	40 40 30 20	63 66 71	120 120	
$h_{FE}^*$	DC Current Gain	$I_C = 10\text{ mA}$ $V_{CE} = 0.35\text{ V}$ $T_{amb} = -55\text{ °C}$	20	50		
$f_T$	Transition Frequency	$I_C = 10\text{ mA}$ $V_{CE} = 10\text{ V}$ $f = 100\text{ MHz}$	500	675		MHz
$C_{CBO}$	Collector-base Capacitance	$I_E = 0$ $V_{CB} = 5\text{ V}$ $f = 1\text{ MHz}$		2.3	4	pF
$t_s^{**}$	Storage Time	$I_C = 10\text{ mA}$ $V_{CC} = 10\text{ V}$ $I_{B1} = -I_{B2} = 10\text{ mA}$		6	13	ns
$t_{on}^{**}$	Turn-on Time	$I_C = 10\text{ mA}$ $V_{CC} = 3\text{ V}$ $I_{B1} = 3\text{ mA}$		9	12	ns
$t_{off}^{**}$	Turn-off Time	$I_C = 10\text{ mA}$ $V_{CC} = 3\text{ V}$ $I_{B1} = 3\text{ mA}$ $I_{B2} = -1.5\text{ mA}$		13	18	ns

\* Pulsed : pulse duration = 300  $\mu\text{s}$ , duty cycle = 1 %.

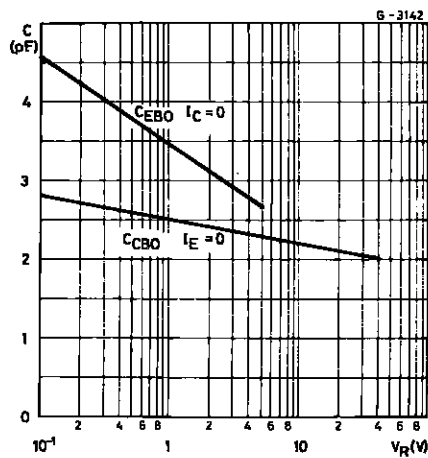
DC Current Gain.



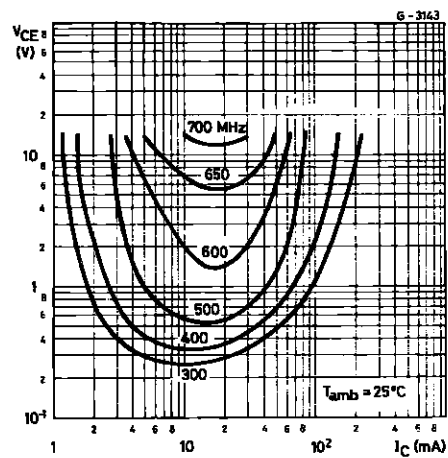
Collector-emitter Saturation Voltage.



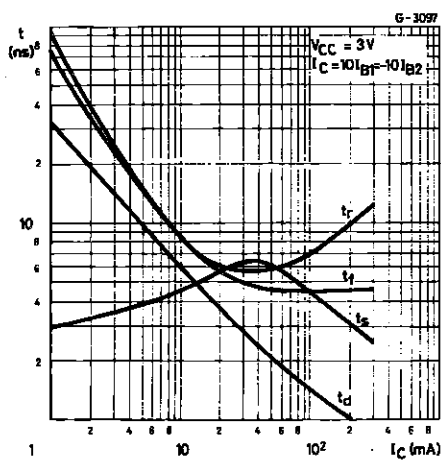
Collector-base and emitter-base capacitances.



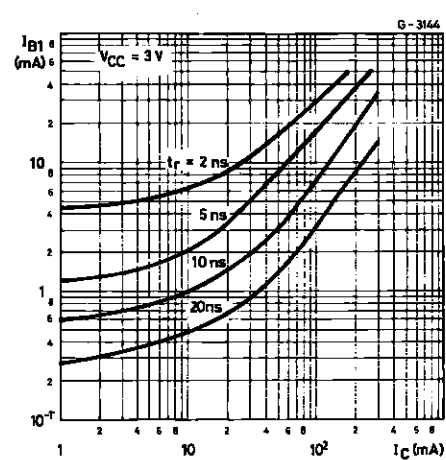
Contours of Constant Transition Frequency.



Switching Characteristics.

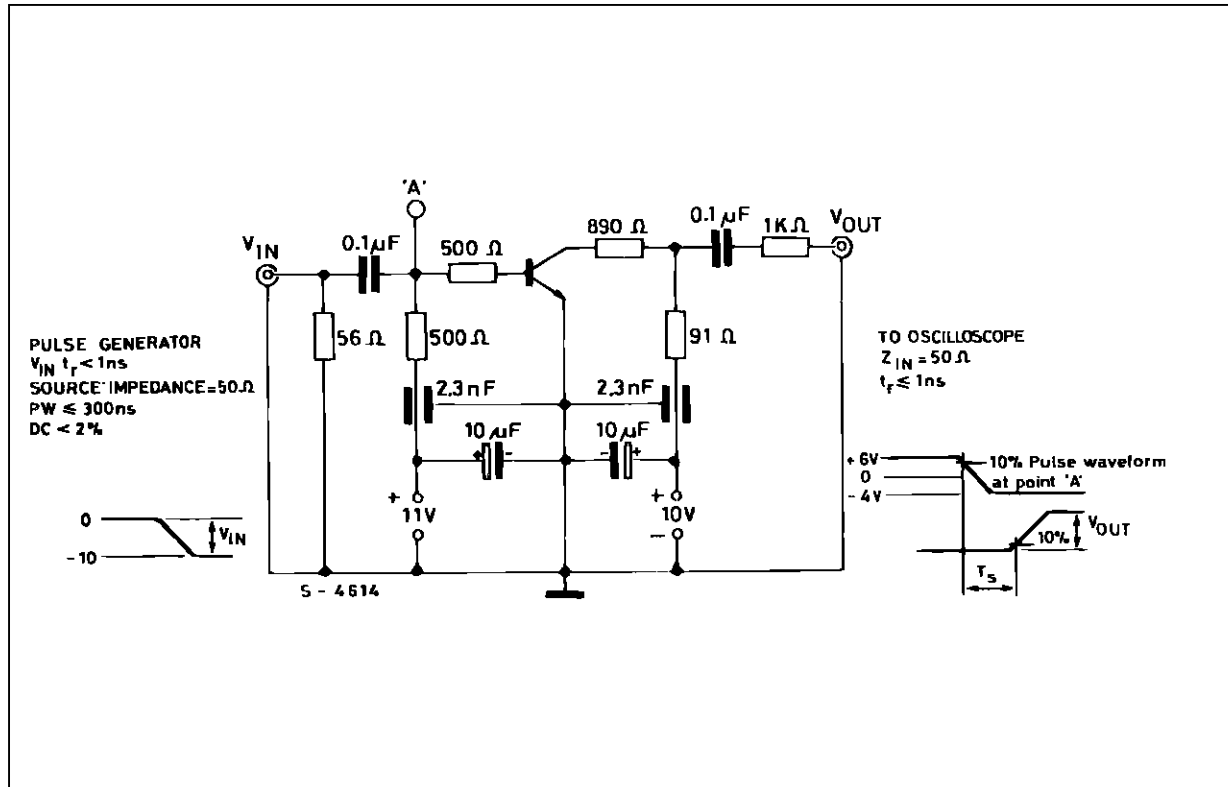


Switching Characteristics.

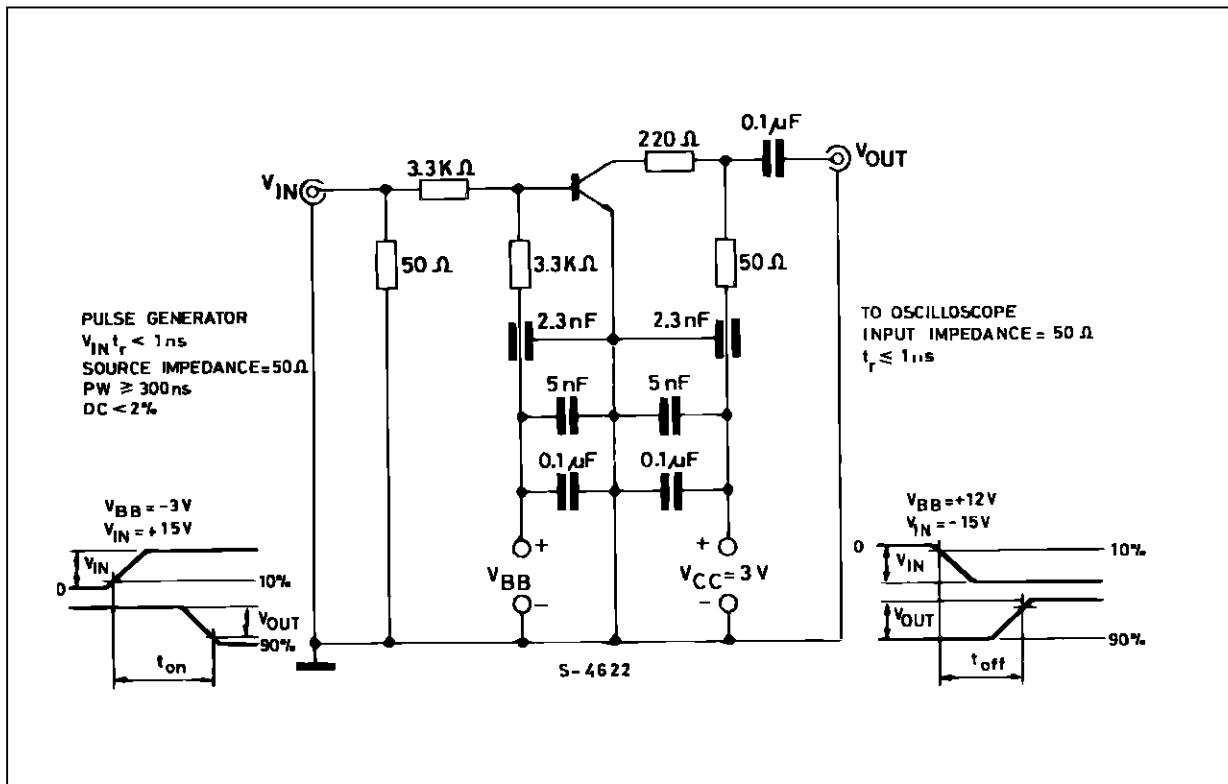


# 2N2369A

Test Circuit for  $t_s$

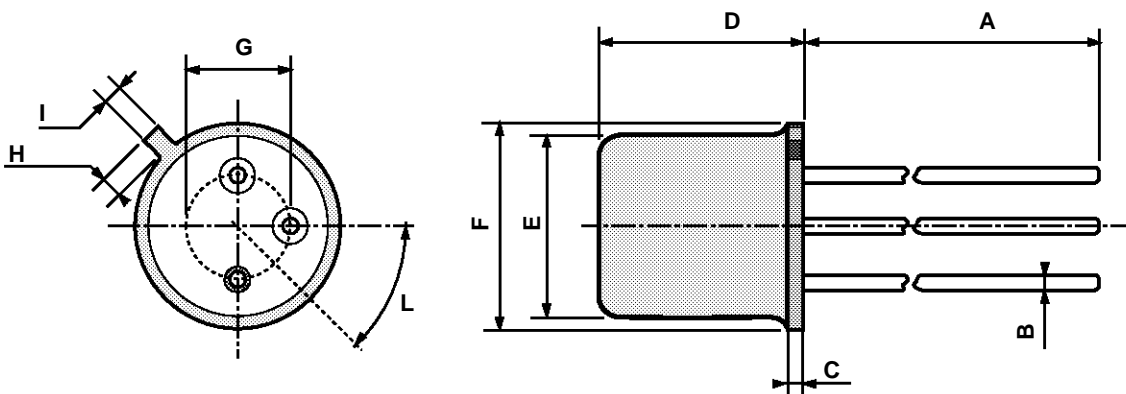


Test Circuit for  $t_{on}$ ,  $t_{off}$



## TO-18 MECHANICAL DATA

DIM.	mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A		12.7			0.500	
B			0.49			0.019
D			5.3			0.208
E			4.9			0.193
F			5.8			0.228
G	2.54			0.100		
H			1.2			0.047
I			1.16			0.045
L	45°			45°		



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