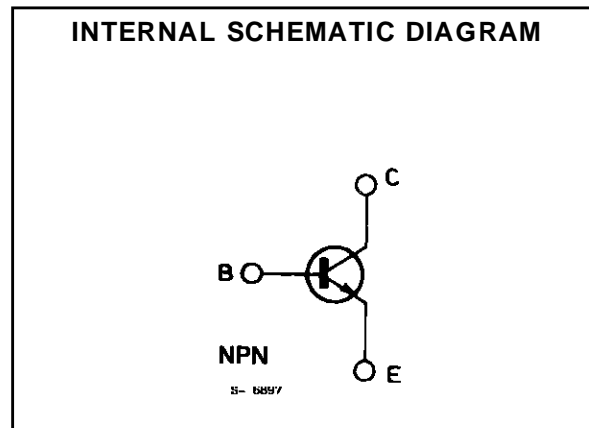
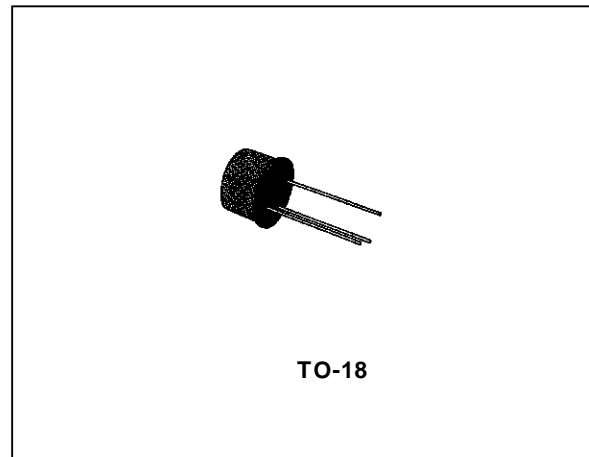


**HIGH-SPEED SATURATED SWITCH**

**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 $T_{amb} \leq 25\text{ }^\circ\text{C}$	0.36	W
	at $T_{case} \leq 25\text{ }^\circ\text{C}$	1.2	W
	at $T_{case} \leq 100\text{ }^\circ\text{C}$	0.68	W
$T_{stg}, T_j$	Storage and Junction Temperature	- 65 to 200	$^\circ\text{C}$

## THERMAL DATA

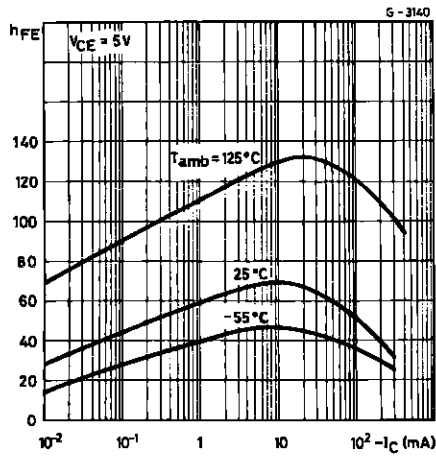
$R_{th\ j-case}$	Thermal Resistance Junction-case	Max	146	$^{\circ}C/W$
$R_{th\ j-amb}$	Thermal Resistance Junction-ambient	Max	486	$^{\circ}C/W$

ELECTRICAL CHARACTERISTICS ( $T_{amb} = 25\ ^{\circ}C$  unless otherwise specified)

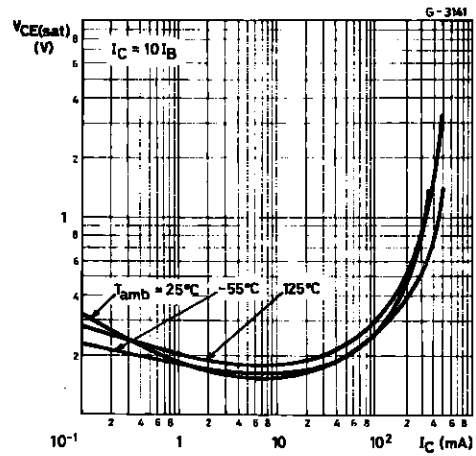
Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$I_{CBO}$	Collector Cutoff Current ( $I_E = 0$ )	$V_{CB} = 20\ V$ $T_{amb} = 150\ ^{\circ}C$			30	$\mu A$
$I_{CES}$	Collector Cutoff Current ( $V_{BE} = 0$ )	$V_{CE} = 20\ V$			0.4	$\mu A$
$V_{(BR)CBO}$	Collector-base Breakdown Voltage ( $I_E = 0$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

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

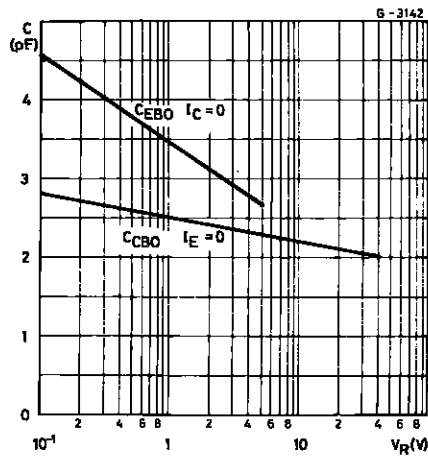
DC Current Gain.



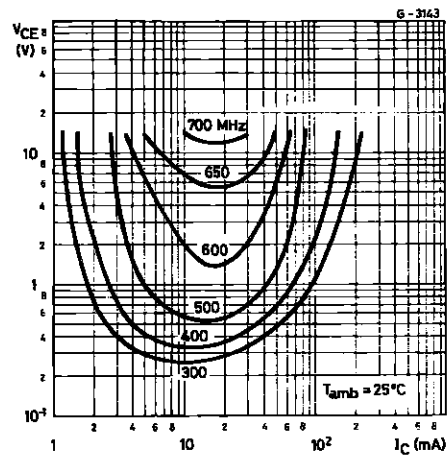
Collector-emitter Saturation Voltage.



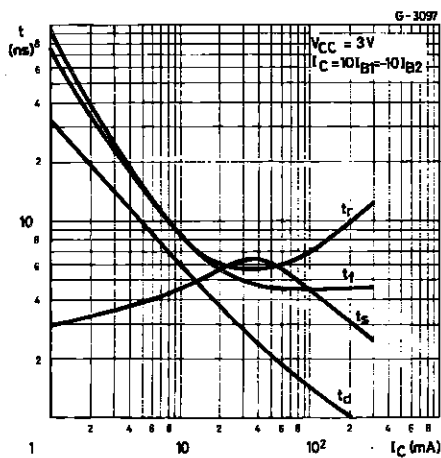
Collector-base and emitter-base capacitances.



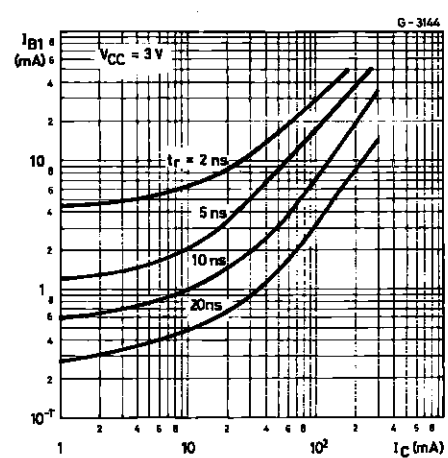
Contours of Constant Transition Frequency.



Switching Characteristics.

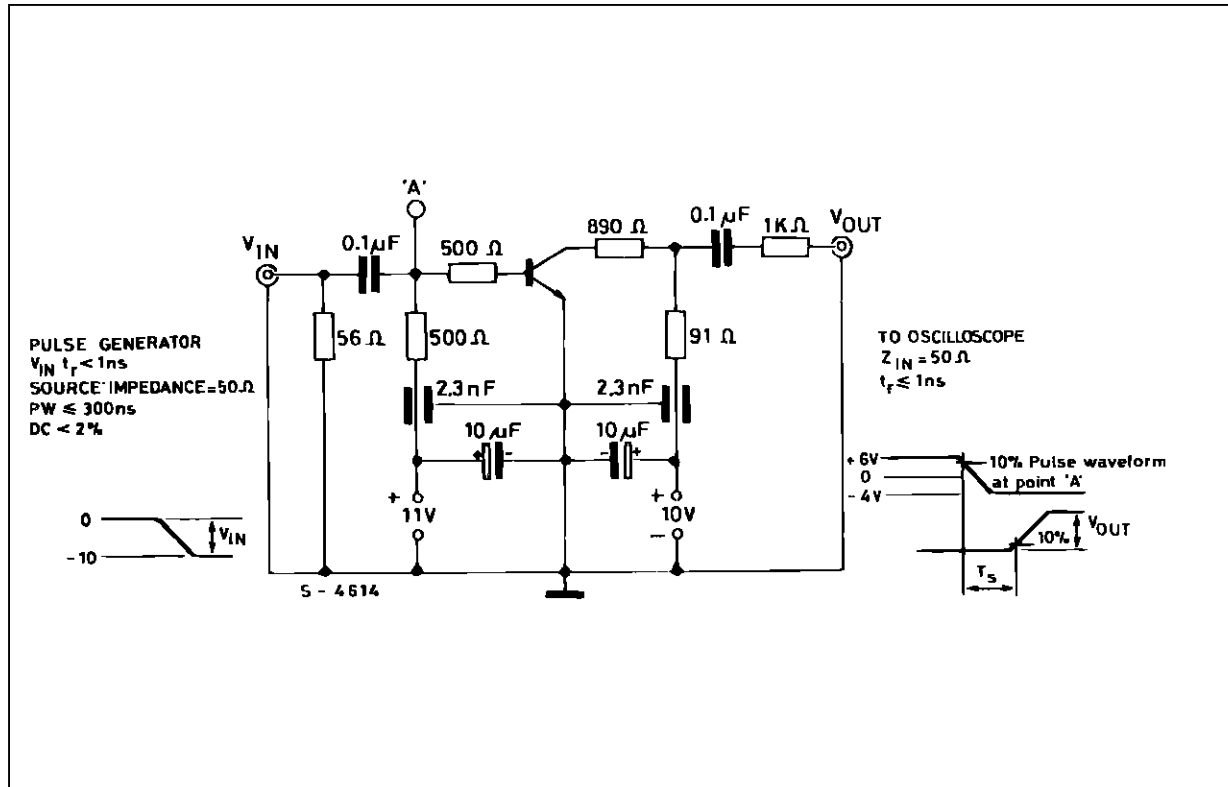


Switching Characteristics.

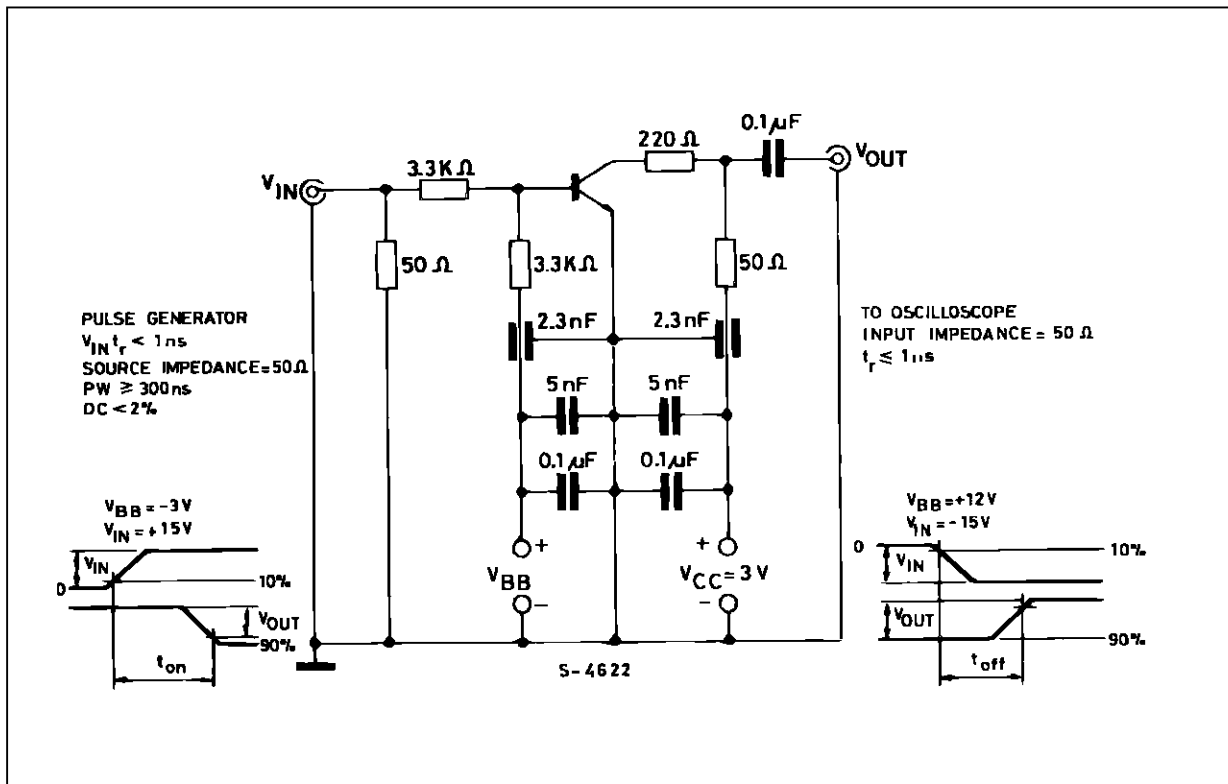


# 2N2369A

Test Circuit for  $t_s$

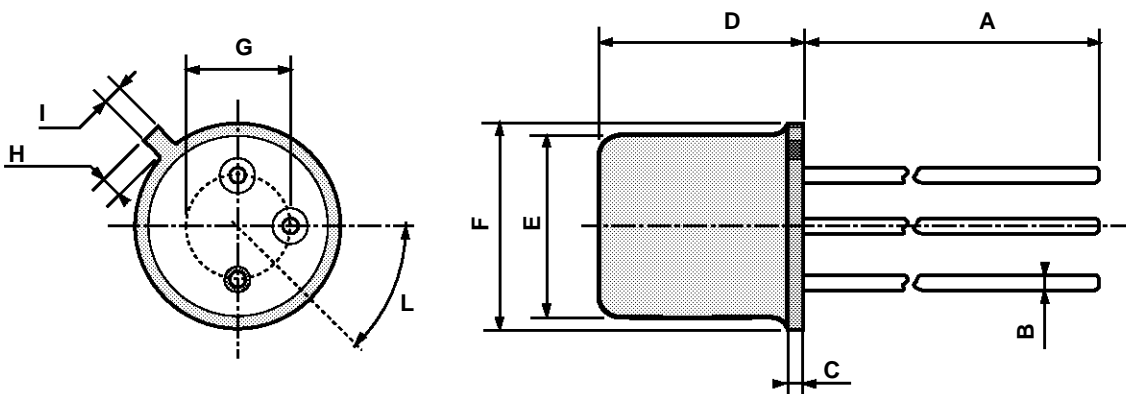


Test Circuit for  $t_{on}$ ,  $t_{off}$



## 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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