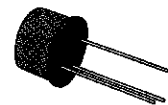


HIGH-SPEED SATURATED SWITCH

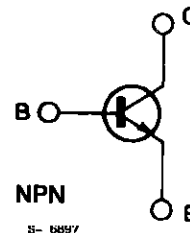
DESCRIPTION

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 μ A to 100 mA.



TO-18

INTERNAL SCHEMATIC DIAGRAM



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 μ 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

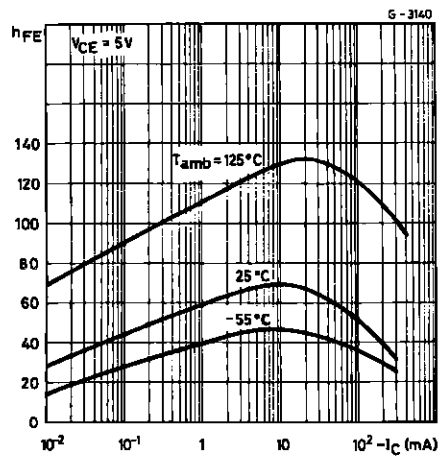
$R_{th j-case}$	Thermal Resistance Junction-case	Max	146	$^{\circ}C/W$
$R_{th j-amb}$	Thermal Resistance Junction-ambient	Max	486	$^{\circ}C/W$

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

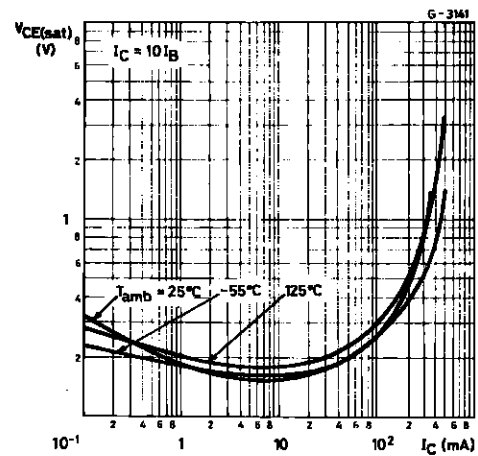
Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
I_{CBO}	Collector Cutoff Current ($I_E = 0$)	$V_{CB} = 20 V$ $T_{amb} = 150^{\circ}C$			30	μA
I_{CES}	Collector Cutoff Current ($V_{BE} = 0$)	$V_{CE} = 20 V$			0.4	μA
$V_{(BR)CBO}$	Collector-base Breakdown Voltage ($I_E = 0$)	$I_C = 10 \mu A$	40			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 μs , duty cycle = 1 %.

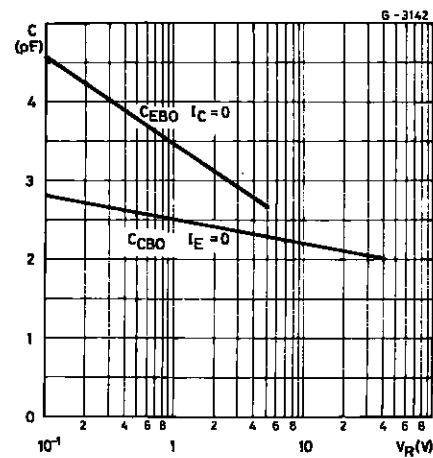
DC Current Gain.



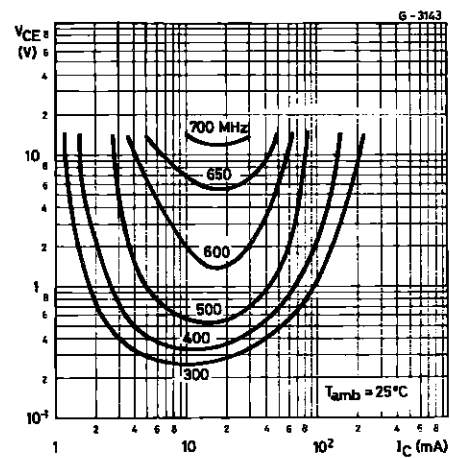
Collector-emitter Saturation Voltage.



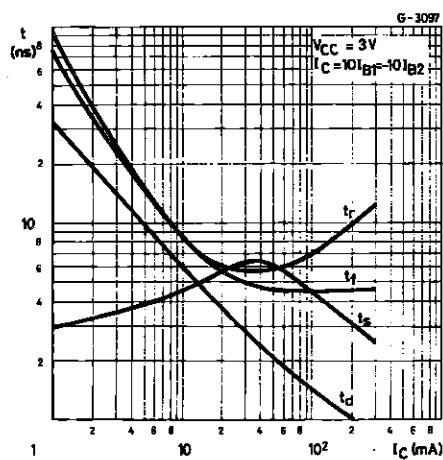
Collector-base and emitter-base capacitances.



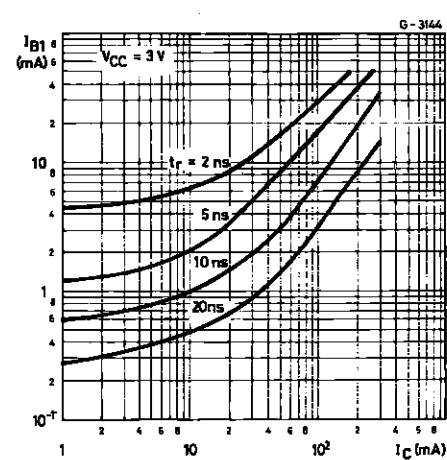
Contours of Constant Transition Frequency.



Switching Characteristics.

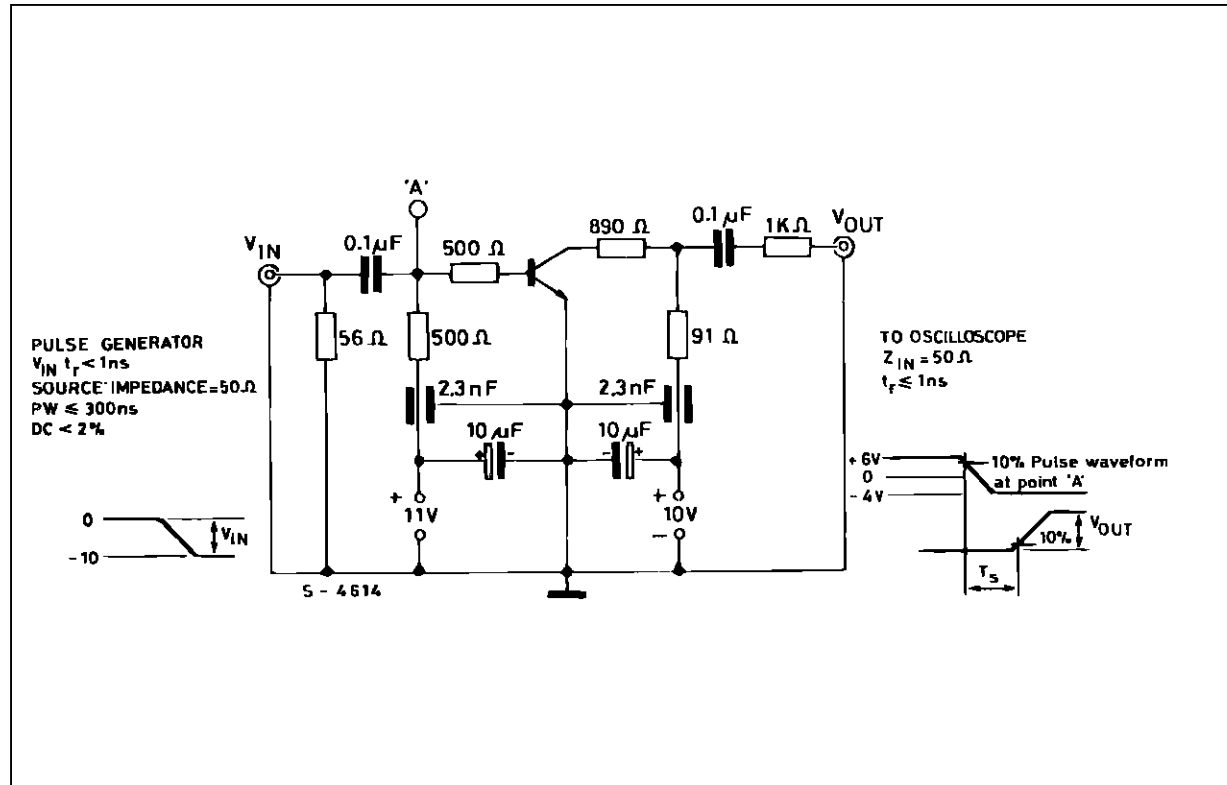


Switching Characteristics.

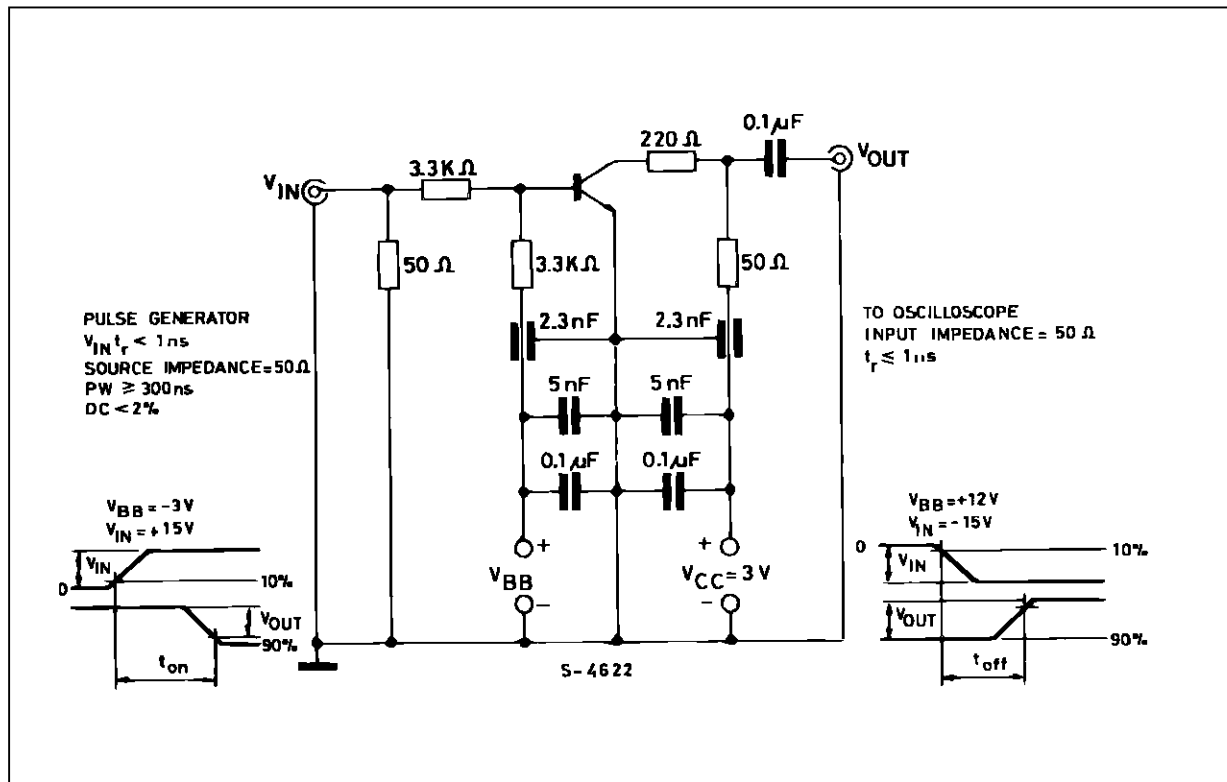


2N2369A

Test Circuit for t_s

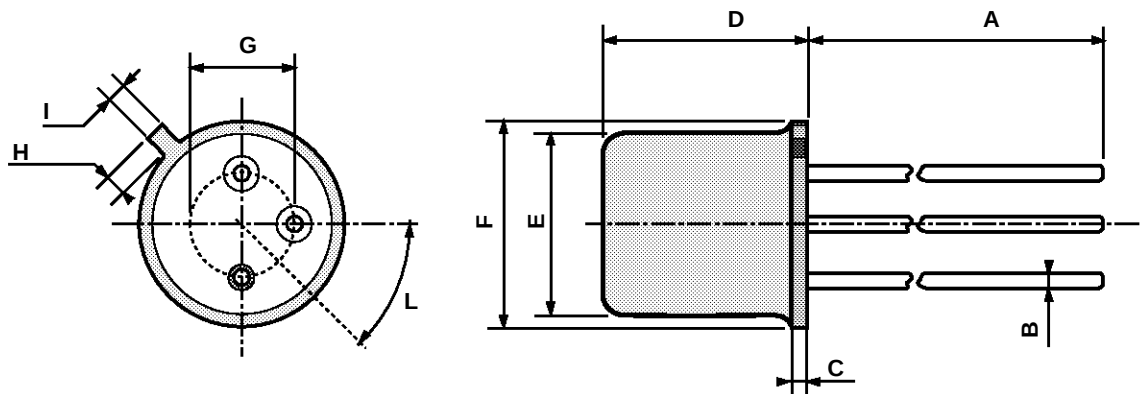


Test Circuit for t_{on} , t_{off}



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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