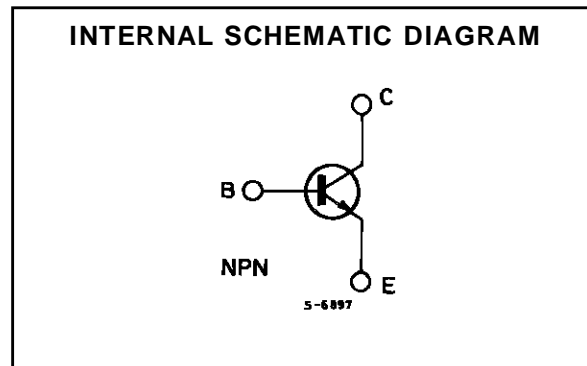
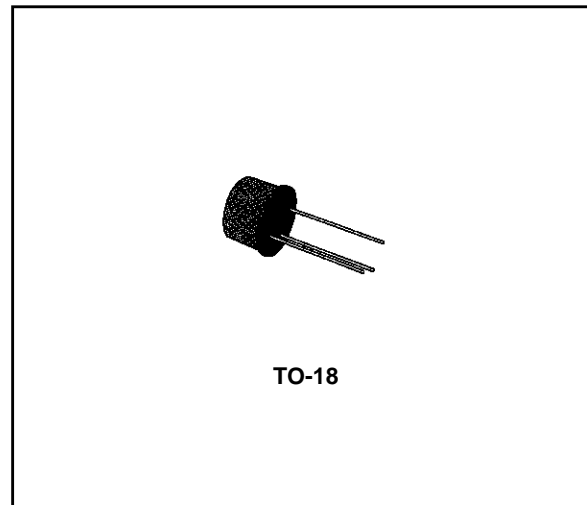


HIGH SPEED SATURATED SWITCHES

DESCRIPTION

The 2N3014 is a silicon planar epitaxial NPN transistor in Jedec TO-18 metal case intended for high speed low saturation switching application up to 300 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 ($I_B = 0$)	20	V
V_{EBO}	Emitter-base Voltage ($I_C = 0$)	5	V
I_C	Collector Current	200	mA
I_C	Collector Peak Current ($t < 10 \mu s$)	500	mA
P_{tot}	Total Dissipation at $T_{amb} < 25 \text{ }^\circ\text{C}$	360	mW
	at $T_{case} < 25 \text{ }^\circ\text{C}$	1200	mW
	at $T_{case} < 100 \text{ }^\circ\text{C}$	680	mW
T_{stg}	Storage Temperature	- 55 to 200	$^\circ\text{C}$
T_j	Maximum Operating Junction Temperature	200	$^\circ\text{C}$

THERMAL DATA

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

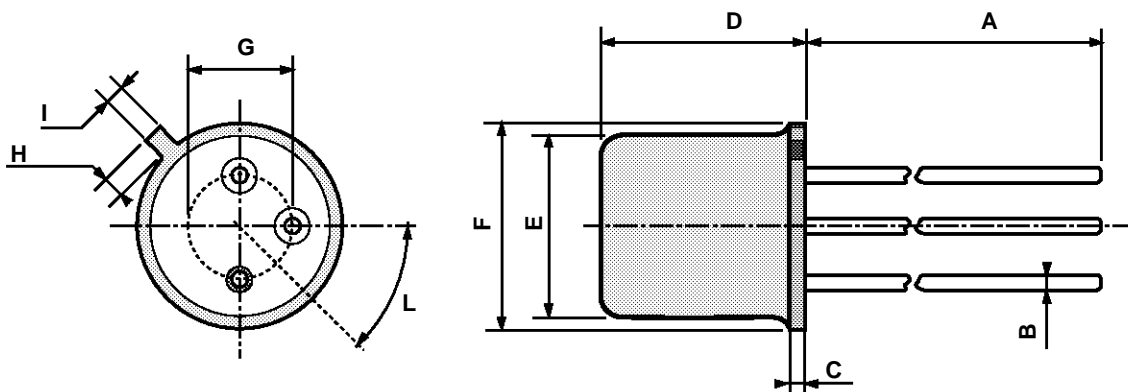
ELECTRICAL CHARACTERISTICS ($T_{amb} = 25\ ^{\circ}C$ unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
I_{CES}	Collector Cutoff Current ($V_{BE} = 0$)	$V_{CE} = 20\ V$ $V_{CE} = 20\ V$ $T_{amb} = 125\ ^{\circ}C$			300 40	nA μA
$V_{(BR)CBO}$	Collector-base Breakdown Voltage	$I_C = 100\ \mu A$ $I_E = 0$	40			V
$V_{(BR)CEO}^*$	Collector-emitter Breakdown Voltage	$I_C = 10\ A$ $I_B = 0$	20			V
$V_{(BR)EBO}$	Emitter-base Breakdown Voltage	$I_E = 100\ \mu A$ $I_C = 0$	5			V
h_{FE}^*	DC Current Gain	$V_{CE} = 0.4\ V$ $I_C = 10\ mA$ $V_{CE} = 0.4\ V$ $I_C = 30\ mA$ $V_{CE} = 1\ V$ $I_C = 100\ mA$ $V_{CE} = 0.4\ V$ $I_C = 30\ mA$ $T_{amb} = -55\ ^{\circ}C$	25 30 25 12		120	
$V_{CE(sat)}^*$	Collector-emitter Saturation Voltage	$I_C = 10\ mA$ $I_B = 1\ mA$ $I_C = 30\ mA$ $I_B = 3\ mA$ $I_C = 100\ mA$ $I_B = 10\ mA$ $I_C = 30\ mA$ $I_B = 3\ mA$ $T_{amb} = 125\ ^{\circ}C$			0.18 0.18 0.35 0.25	V V V V
$V_{BE(sat)}^*$	Base-emitter Saturation Voltage	$I_C = 10\ mA$ $I_B = 1\ mA$ $I_C = 30\ mA$ $I_B = 3\ mA$ $I_C = 100\ mA$ $I_B = 10\ mA$	0.70 0.75		0.80 0.95 1.20	V V V
f_T	Transition Frequency	$V_{CE} = 10\ V$ $I_C = 30\ mA$ $f = 100\ MHz$	350			MHz
C_{CBO}	Collector-base Capacitance	$V_{CB} = 5\ V$; $I_E = 0$ $f = 1\ MHz$			5	pF
C_{EBO}	Emitter-base Capacitance	$V_{EB} = 0.5\ V$; $I_C = 0$ $f = 1\ MHz$			8	pF
t_{on}	Turn-on Time	$V_{CC} = 2\ V$ $I_C = 30\ mA$ $I_{B1} = 3\ mA$			16	ns
t_{off}	Turn-off Time	$V_{CC} = 2\ V$ $I_C = 30\ mA$ $I_{B1} = -I_{B2} = 3\ mA$			25	ns
t_s	Storage Time	$V_{CC} = 10\ V$ $I_C = 10\ mA$ $I_{B1} = -I_{B2} = 10\ mA$			18	ns

* Pulsed : pulse duration = 300 μs , duty cycle = 1.5 %.

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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