

# JANHCC2N3019, JANHCCR2N3019 JANKCC2N3019, JANKCCR2N3019

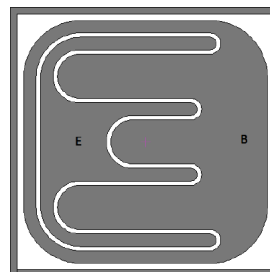


## NPN Low Power Silicon Transistor Die

Rev. V1

### Features

- Qualified to MIL-PRF-19500/391
- Lightweight & Low Power
- Ideal for Space, Military, & Other High Reliability Applications



### Electrical Characteristics ( $T_A = +25^\circ\text{C}$ unless otherwise specified)

Parameter	Test Conditions	Symbol	Units	Min.	Max.
Collector - Emitter Breakdown Voltage	$I_C = 30 \text{ mA}$	$V_{(BR)CEO}$	V dc	80	—
Collector - Base Cutoff Current	$V_{CB} = 140 \text{ V}$	$I_{CBO1}$	$\mu\text{A dc}$	—	10
Emitter - Base Cutoff Current	$V_{EB} = 7 \text{ V}$	$I_{EBO1}$	$\mu\text{A dc}$	—	10
Collector - Emitter Cutoff Current	$V_{CE} = 90 \text{ V}$	$I_{CES1}$	nA dc	—	10
Emitter - Base Cutoff Current	$V_{EB} = 5 \text{ Vdc}$	$I_{EBO2}$	nA dc	—	10
Forward Current Transfer Ratio	$V_{CE} = 10 \text{ V dc}; I_C = 150 \text{ mA dc}$ $V_{CE} = 10 \text{ V dc}; I_C = 0.1 \text{ mA dc}$ $V_{CE} = 10 \text{ V dc}; I_C = 10 \text{ mA dc}$ $V_{CE} = 10 \text{ V dc}; I_C = 500 \text{ mA dc}$ $V_{CE} = 10 \text{ V dc}; I_C = 1 \text{ A dc}$	$h_{FE1}$ $h_{FE2}$ $h_{FE3}$ $h_{FE4}$ $h_{FE5}$	-	100 50 90 50 15	300 300 300
Collector - Emitter Saturation Voltage	$I_C = 150 \text{ mA}; I_B = 15 \text{ mA}$ $I_C = 500 \text{ mA}; I_B = 50 \text{ mA}$	$V_{CE(SAT)1}$ $V_{CE(SAT)2}$	V dc	—	0.2 0.5
Base - Emitter Saturation Voltage	$I_C = 150 \text{ mA}; I_B = 15 \text{ mA}$	$V_{BE(SAT)}$	V dc	—	1.1
Collector - Emitter Cutoff Current	$T_A = +150^\circ\text{C}$ $V_{CE} = 90 \text{ V}$	$I_{CES2}$	$\mu\text{A dc}$	—	5
Forward Current Transfer Ratio	$T_A = -55^\circ\text{C}$ $V_{CE} = 10 \text{ V dc}; I_C = 150 \text{ mA dc}$	$h_{FE6}$		40	

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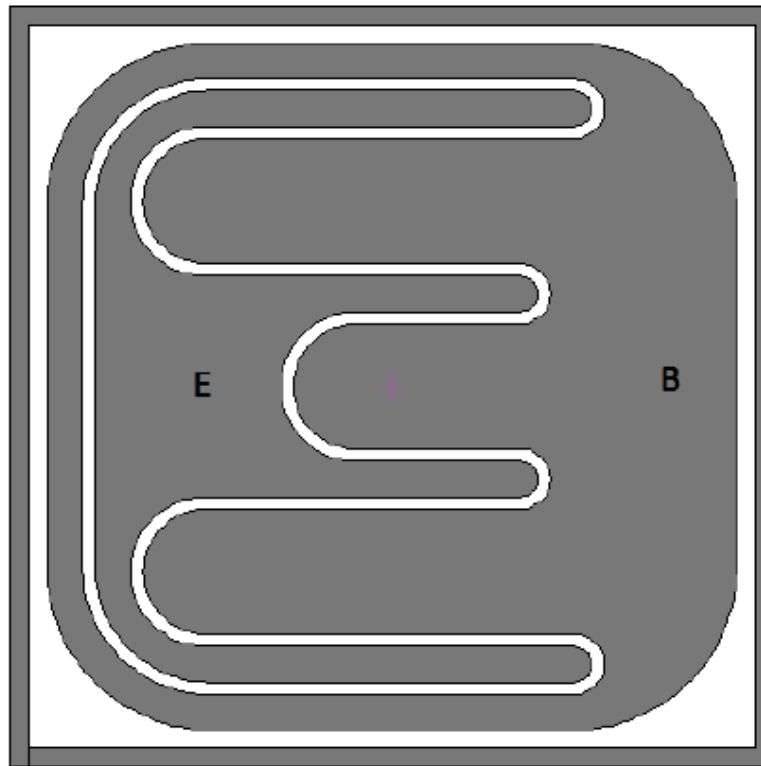
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Parameter	Test Conditions	Symbol	Units	Min.	Max.
<b>Dynamic Characteristics</b>					
Small-Signal Short-Circuit Forward -Current Transfer Ratio	$V_{CE} = 5 \text{ V dc}; I_C = 1 \text{ mA dc}; f = 1 \text{ kHz}$	$h_{FE}$		80	400
Magnitude of Small-Signal Short-Circuit Forward Current Transfer Ratio	$V_{CE} = 10 \text{ V dc}; I_C = 50 \text{ mA dc}; f = 20 \text{ MHz}$	$ h_{FE} $		5	20
Input Capacitance (Output Open Circuited)	$V_{EB} = 0.5 \text{ V dc}; I_C = 0; 100 \text{ kHz} \leq f \leq 1 \text{ MHz}$	$C_{ibo}$	pF	—	60
Open Circuit Output Capacitance	$V_{CB} = 10 \text{ V dc}; I_E = 0; 100 \text{ kHz} \leq f \leq 1 \text{ MHz}$	$C_{obo}$	pF	—	12
Noise Figure	$V_{CE} = 10 \text{ V dc}; I_C = 100 \mu\text{A dc}; R_g = 1 \text{ k}\Omega;$ power bandwidth = 200 Hz $f = 1 \text{ kHz}$	NF	dB	—	4
Pulse Response	See Figure 21 of MIL-PRF-19500/391	$t_{on}+t_{off}$	ns		30

### Absolute Maximum Ratings ( $T_A = +25^\circ\text{C}$ unless otherwise specified)

Ratings	Symbol	Value
Collector - Emitter Voltage	$V_{CEO}$	80 V dc
Collector - Base Voltage	$V_{CBO}$	140 V dc
Emitter - Base Voltage	$V_{EBO}$	7 V dc
Collector Current	$I_C$	1 A dc
Operating & Storage Temperature Range	$T_J, T_{STG}$	$-65^\circ\text{C}$ to $+200^\circ\text{C}$

Outline Drawing (Die)



Physical characteristics (C-version):

1. Die size: .023 x .023 inch  $\pm$ .002 inch (0.584 X 0.584  $\pm$ 0.051 millimeter).
2. Die thickness: .010 inch  $\pm$ .002 inch (0.254  $\pm$ 0.508 millimeter).
3. Base pad: B = .004 inch x .010 inch (0.102 X 0.254 millimeter).
4. Emitter pad: E = .0039 inch x .0039 inch (0.992 X 0.099 millimeter).
5. Collector pad: Backside.
6. Top metal: Aluminum 16,000Å minimum, 20,000Å nominal.
7. Backside metal: Gold: 5,000Å  $\pm$ 500Å.

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