

JANHCD2N3500, JANHCD2N3501 JANKCD2N3500, JANKCD2N3501

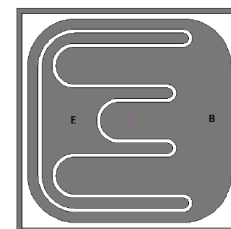


NPN Medium Power Silicon Transistor Die

Rev. V1

Features

- Available in JANHC, JANKC and R versions per MIL-PRF-19500/366
- Rad Hard Assurance Levels M, D, P, L and R
- Ideal for High Voltage Inductive Load Switching Applications



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

Parameter	Test Conditions	Symbol	Units	Min.	Max.
Collector - Emitter Breakdown Voltage	$I_C = 10 \text{ mA dc}$	$V_{(BR)CEO}$	V dc	150	—
Collector - Base Cutoff Current	$V_{CB} = 150 \text{ V}$	I_{CBO1}	$\mu\text{A dc}$	—	10
Collector - Base Cutoff Current	$V_{CB} = 75 \text{ V}$	I_{CBO2}	nA dc	—	50
Emitter - Base Cutoff Current	$V_{EB} = 6.0 \text{ V dc}$	I_{EBO1}	$\mu\text{A dc}$	—	10
Emitter - Base Cutoff Current	$V_{EB} = 4.0 \text{ V dc}$	I_{EBO2}	nA dc	—	25
Collector - Emitter Saturation Voltage	$I_C = 10 \text{ mA dc}; I_B = 1 \text{ mA dc}$	$V_{CE(SAT)1}$	V dc	—	0.2
Collector - Emitter Saturation Voltage	$I_C = 150 \text{ mA dc}; I_B = 15 \text{ mA dc}$	$V_{CE(SAT)2}$	V dc	—	0.4
Base - Emitter Saturation Voltage	$I_C = 10 \text{ mA dc}; I_B = 1 \text{ mA dc}$	$V_{BE(SAT)1}$	V dc	—	0.8
Base - Emitter Saturation Voltage	$I_C = 150 \text{ mA dc}; I_B = 15 \text{ mA dc}$	$V_{BE(SAT)2}$	V dc	—	1.2
Collector - Base Cutoff Current	$T_A = +150^\circ\text{C}$ $V_{CB} = 75 \text{ V dc}$	I_{CBO3}	$\mu\text{A dc}$	—	50
Forward Current Transfer Ratio	$T_A = -55^\circ\text{C}$ $V_{CE} = 10 \text{ V dc}; I_C = 150 \text{ mA dc}$ 2N3500 2N3501	h_{FE7}	-	22 45	

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Parameter	Test Conditions	Symbol	Units	Min.	Max.
Forward Current Transfer Ratio	$V_{CE} = 10\text{ V dc}; I_C = 0.1\text{ mA dc}$ 2N3500 2N3501	h_{FE1}	-	20 35	
Forward Current Transfer Ratio	$V_{CE} = 10\text{ V dc}; I_C = 1.0\text{ mA dc}$ 2N3500 2N3501	h_{FE2}	-	25 50	
Forward Current Transfer Ratio	$V_{CE} = 10\text{ V dc}; I_C = 10\text{ mA dc}$ 2N3500 2N3501	h_{FE3}	-	35 75	
Forward Current Transfer Ratio	$V_{CE} = 10\text{ V dc}; I_C = 150\text{ mA dc}$ 2N3500 2N3501	h_{FE4}	-	40 100	120 300
Forward Current Transfer Ratio	$V_{CE} = 10\text{ V dc}; I_C = 300\text{ mA dc}$ 2N3500 2N3501	h_{FE5}	-	15 20	
Dynamic Characteristics					
Magnitude of Small-Signal Short-Circuit Forward Current Transfer Ratio	$I_C = 20\text{ mA dc}; V_{CE} = 20\text{ V dc}; f = 100\text{ MHz}$	$ h_{fe} $	-	1.5	8
Small-Signal Short-Circuit Forward Current Transfer Ratio	$V_{CE} = 10\text{ V dc}; I_C = 10\text{ mA dc}; f = 1\text{ kHz}$ 2N3500 2N3501	h_{fe}		35 75	300 375
Open Circuit Output Capacitance	$V_{CB} = 10\text{ V dc}; I_E = 0; 100\text{ kHz} \leq f \leq 1\text{ MHz}$ 2N3500, 2N3501	C_{obo}	pF	—	8
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		80
Switching Characteristics					
Turn-On Time	$I_C = 150\text{ mA dc}; I_{B1} = 15\text{ mA dc}; V_{EB} = 5\text{ V dc}$	t_{on}	ns	—	115
Turn-Off Time	$I_C = 150\text{ mA dc}; I_{B1} = I_{B2} = 15\text{ mA dc}$	t_{off}	ns	—	1150

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Absolute Maximum Ratings

Ratings	Symbol	Value
Collector - Emitter Voltage	V_{CEO}	150 V dc
Collector - Base Voltage	V_{CBO}	150 V dc
Emitter - Base Voltage	V_{EBO}	6.0 V dc
Collector Current	I_C	300 mA dc
Operating & Storage Temperature Range	T_{OP}, T_{STG}	-65°C to +200°C

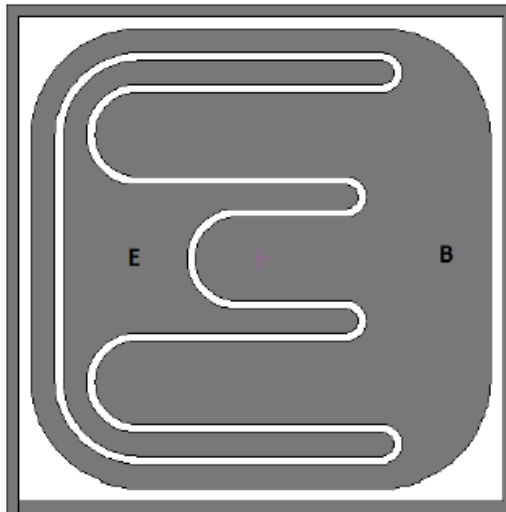
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Outline Drawing (Chip)



NOTES

1. Die Size: .023 x .023 Inch \pm .002 Inch (.584 mm x .584 mm \pm .0508)
2. Die Thickness: .010 Inch + .002 Inch (.254 mm + .508 mm)
3. Top Metal: Aluminum, 16,000 Å Minimum, 20,000 Å Nominal
4. Back Metal: Gold, 4,500 Å Minimum, 5,500 Å Nominal
5. Backside: Collector
6. Bonding pads: Base = .004 x .004 Inch (.100 x .100 mm)
Emitter = .004 x .010 Inch (.100 x .254 mm)

* FIGURE 6. Physical dimensions, JANHCD and JANKCD die.

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