

JANHCD2N5151, JANHCD2N5153 JANKCD2N5151, JANKCD2N5153



PNP Power Silicon Transistor Chips

Rev. V1

Features

- JANS and JANSR Qualified to MIL-PRF-19500/545
- Lightweight & Low Power
- Ideal for Space, Military, and Other High Reliability Applications

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

Parameter	Test Conditions	Symbol	Units	Min.	Max.
Collector - Emitter Breakdown Voltage	$I_C = -100 \text{ mA dc}; I_B = 0$	$V_{(BR)CEO}$	V dc	-80	—
Emitter - Base Cutoff Current	$V_{EB} = -4.0 \text{ V dc}; I_C = 0$	I_{EBO1}	$\mu\text{A dc}$	—	-1.0
	$V_{EB} = -5.5 \text{ V dc}; I_C = 0$	I_{EBO2}	mA dc	—	-1.0
Collector - Emitter Cutoff Current	$V_{CE} = -60 \text{ V dc}; V_{BE} = 0$	I_{CES1}	$\mu\text{A dc}$	—	-1.0
	$V_{CE} = -100 \text{ V dc}; V_{BE} = 0$	I_{CES2}	mA dc	—	-1.0
Collector - Emitter Cutoff Current	$V_{CE} = -40 \text{ V dc}; I_B = 0$	I_{CEO}	$\mu\text{A dc}$	—	-50
Forward Current Transfer Ratio	$V_{CE} = -5.0 \text{ Vdc}; I_C = -50 \text{ mA dc}$ 2N5151	h_{FE}	-	20	—
	$V_{CE} = -5.0 \text{ Vdc}; I_C = -2.5 \text{ A dc}$ 2N5151			50	—
	$V_{CE} = -5.0 \text{ Vdc}; I_C = -5.0 \text{ A dc}$ 2N5153			30 70	90 200
Collector - Emitter Saturation Voltage	$I_C = -2.5 \text{ A dc}; I_B = -250 \text{ mA dc}$	$V_{CE(sat)1}$	V dc	—	-0.75
	$I_C = -5.0 \text{ A dc}; I_B = -500 \text{ mA dc}$	$V_{CE(sat)2}$	V dc	—	-1.50
Base - Emitter Voltage (Non-Saturated)	$V_{CE} = -5.0 \text{ V dc}; I_C = -2.5 \text{ A dc}$	$V_{BE(on)}$	V dc	—	-1.45
Base - Emitter Saturation Voltage	$I_C = -2.5 \text{ A dc}; I_B = -250 \text{ mA dc}$	$V_{BE(sat)1}$	V dc	—	-1.45
	$I_C = -5.0 \text{ A dc}; I_B = -500 \text{ mA dc}$	$V_{BE(sat)2}$	V dc	—	-2.20
Magnitude of Common Emitter Small-Signal Short-Circuit, Forward Current, Transfer Ratio	$V_{CE} = -5.0 \text{ Vdc}; I_C = -500 \text{ mA dc}; f = 10 \text{ MHz}$ 2N5151 2N5153	$ h_{fe} $	-	6 7	—
Common-Emitter, Small-Signal Short-Circuit Forward Current Transfer Ratio	$V_{CE} = -5.0 \text{ V dc}; I_C = -100 \text{ mA dc}; f = 1 \text{ kHz}$ 2N5151 2N5153	h_{fe}	-	20 50	—
Open-Circuit Output Capacitance	$V_{CB} = -10 \text{ V dc}, I_E = 0, f = 1 \text{ MHz}$	C_{obo}	pF	—	250

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

Parameter	Test Conditions	Symbol	Units	Min.	Max.
Collector - Emitter Cutoff Current	$T_C = +150^\circ\text{C}$ $V_{CE} = -60\text{ V dc}; V_{BE} = +2\text{ V dc}$	I_{CEX}	$\mu\text{A dc}$	—	-25
Forward - Current Transfer Ratio	$T_C = -55^\circ\text{C}$ $V_{CE} = -5\text{ V dc}; I_C = -2.5\text{ A dc}$ 2N5151 2N5153	h_{FE4}	-	15 25	

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

Ratings	Symbol	Value
Collector - Emitter Voltage	V_{CEO}	-80 V dc
Collector - Base Voltage	V_{CBO}	-100 V dc
Emitter - Base Voltage	V_{EBO}	-5.5 Vdc
Collector Current	I_C	-2 A dc -10 A dc ⁽³⁾
Reverse Pulse Energy ⁽⁴⁾		15 mj
Operating & Storage Temperature Range	T_J, T_{STG}	-65°C to +200°C

(3) The value applies for $p_w \leq 8.3\text{ ms}$, duty cycle ≤ 1 percent.

(4) This rating is based on the capability of the transistors to operate safely in the unclamped inductive load energy test circuit, see subgroup 5 of the group A inspection table and figure 13 of MIL-PRF-19500/545.

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

Parameter	Test Conditions	Symbol	Units	Min.	Max.
Switching Characteristics					
Turn-On Time	$I_C = -5 \text{ A dc}; I_{B1} = -500 \text{ mA dc}, R_L = 6 \Omega,$ $I_{B2} = -500 \text{ mA dc}, V_{BE(off)} = -3.7 \text{ Vdc}$	t_{on}	μs	—	0.5
Turn-Off Time		t_{off}	μs	—	1.5
Storage Time		t_s	μs	—	1.4
Fall Time		t_f	μs	—	0.5

Safe Operating Area

DC Tests:	$T_C = +25^\circ\text{C}, 1 \text{ Cycle}, t_p = 1 \text{ s}$
Test 1:	$V_{CE} = -5.8 \text{ V dc}; I_C = -2 \text{ A dc}$
Test 2:	$V_{CE} = -32 \text{ Vdc}; I_C = -360 \text{ mA dc}$
Test 3:	$V_{CE} = -80 \text{ Vdc}; I_C = -14.5 \text{ mA dc}$

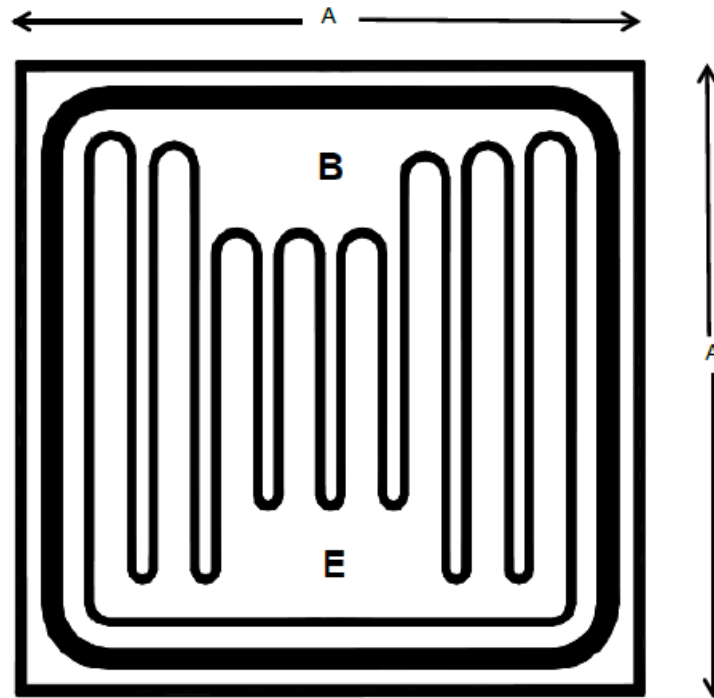
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Outline Drawing (Chip)



Backside: Collector

LTR	Dimensions			
	Inches		Millimeters	
	Min	Max	Min	Max
A	.118	.122	3.0	3.1

NOTES:

1. Dimensions are in inches.
2. Millimeters are given for general information only.
3. Unless otherwise specified, tolerance is ± 0.005 (0.13 mm).
4. The physical characteristics of the die are:
 Thickness: .0135 inch (0.34 mm) nominal, tolerance is ± 0.0015 inch (0.04 mm).
 Top metal: Aluminum, 54,000 Å minimum, 60,000 Å nominal.
 Back metal: Gold 6,400 Å minimum, 8,000 Å nominal.
 Back side: Collector.
 Bonding pad: B = .038 x .022 inch (0.97 x 0.56 mm)
 E = .042 x .020 inch (1.07 mm x 0.51 mm)

*

FIGURE 5. JANHC and JANKC (D-version) die dimensions.

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