

2N5151U3 & 2N5153U3

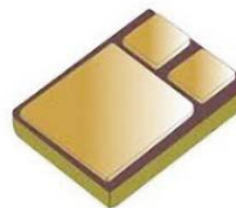


PNP Power Silicon Transistor

Rev. V3

Features

- JANS and JANSR Qualified to MIL-PRF-19500/545
- JEDEC Registered 2N5153
- Lightweight & Low Power
- Ideal for Space, Military, and Other High Reliability Applications
- Surface Mount U3 Package



Electrical Characteristics

Parameter	Test Conditions	Symbol	Units	Min.	Max.
Off Characteristics					
Collector - Emitter Breakdown Voltage	$I_C = -100 \text{ mAdc}$, $I_B = 0$	$V_{(BR)CEO}$	Vdc	-80	—
Emitter - Base Cutoff Current	$V_{EB} = -4.0 \text{ Vdc}$, $I_C = 0$ $V_{EB} = -5.5 \text{ Vdc}$, $I_C = 0$	I_{EBO}	μAdc mAdc	—	-1 -1
Collector - Emitter Cutoff Current	$V_{CE} = -60 \text{ Vdc}$, $V_{BE} = 0$ $V_{CE} = -100 \text{ Vdc}$, $V_{BE} = 0$	I_{CES}	μAdc mAdc	—	-1 -1
Collector - Emitter Cutoff Current	$V_{CE} = -40 \text{ Vdc}$, $I_B = 0$	I_{CEO}	μAdc	—	-50
On Characteristics¹					
Forward Current Transfer Ratio	$I_C = -50 \text{ mAdc}$, $V_{CE} = -5.0 \text{ Vdc}$ 2N5151U3	H_{FE}	-	20	—
	2N5153U3			50	—
	$I_C = -2.5 \text{ Adc}$, $V_{CE} = -5.0 \text{ Vdc}$ 2N5151U3			30	90
	2N5153U3			70	200
Collector - Emitter Saturation Voltage	$I_C = -5.0 \text{ Adc}$, $V_{CE} = -5.0 \text{ Vdc}$ 2N5151U3	$V_{CE(SAT)}$	Vdc	20	—
	2N5153U3			40	—
Collector - Emitter Saturation Voltage	$I_C = -2.5 \text{ Adc}$, $I_B = -250 \text{ mAdc}$ $I_C = -5.0 \text{ Adc}$, $I_B = -500 \text{ mAdc}$	$V_{CE(SAT)}$	Vdc	—	-0.75 -1.50
Emitter - Base Voltage Non-Saturation	$I_C = -2.5 \text{ Adc}$, $V_{CE} = -5.0 \text{ Vdc}$	$V_{BE(ON)}$	Vdc	—	-1.45
Emitter - Base Saturation Voltage	$I_C = -2.5 \text{ Adc}$, $I_B = -250 \text{ mAdc}$ $I_C = -5.0 \text{ Adc}$, $I_B = -500 \text{ mAdc}$	$V_{BE(SAT)}$	Vdc	—	-1.45 -2.20
Dynamic Characteristics					
Magnitude of Common Emitter Small-Signal Short-Circuit Forward Current Transfer Ratio	$I_C = -500 \text{ mAdc}$, $V_{CE} = -5.0 \text{ Vdc}$, $f = 10 \text{ mHz}$ 2N5151U3 2N5153U3	$ H_{FE} $	-	6 7	—
Small-Signal Short-Circuit Forward Current Transfer Ratio	$I_C = -100 \text{ mAdc}$, $V_{CE} = -5.0 \text{ Vdc}$, $f = 1 \text{ kHz}$ 2N5151U3 2N5153U3	H_{FE}	-	20 50	—
Output Capacitance	$V_{CB} = -10 \text{ Vdc}$, $I_E = 0$, $f = 1 \text{ MHz}$	C_{OBO}	pF	—	250

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1. Pulse Test: Pulse Width = 300 μs , Duty Cycle $\leq 2.0\%$.

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PNP Power Silicon Transistor

Rev. V3

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Parameter	Test Conditions	Symbol	Units	Min.	Max.
Switching Characteristics					
Turn-On Time	$I_C = -5 \text{ Adc}$; $I_{B1} = -500 \text{ mAdc}$, $R_L = 6 \Omega$, $I_{B2} = -500 \text{ mAdc}$, $V_{BE(OFF)} = -3.7 \text{ Vdc}$	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 Cycle, $t = 1 \text{ s}$				
Test 1:	$V_{CE} = -5 \text{ Vdc}$, $I_C = -2 \text{ Adc}$				
Test 2:	$V_{CE} = -32 \text{ Vdc}$, $I_C = -310 \text{ mAdc}$				
Test 3:	$V_{CE} = -80 \text{ Vdc}$, $I_C = -12.5 \text{ mAdc}$				

Absolute Maximum Ratings^{2,3}

Ratings	Symbol	Value
Collector - Emitter Voltage	V_{CEO}	-80 Vdc
Collector - Base Voltage	V_{CBO}	-100 Vdc
Emitter - Base Voltage	V_{EBO}	-5.5 Vdc
Collector Current	I_C	-2 Adc -10 Adc ⁴
Total Power Dissipation @ $T_A = 25^\circ\text{C}$ @ $T_C = 25^\circ\text{C}$	P_T	1.16 W 100 W
Operating & Storage Temperature Range	T_J , T_{STG}	-65°C to +200°C

2. Derate linearly 5.7 mW/°C for $T_A > +25^\circ\text{C}$.

3. Derate linearly 571 mW/°C for $T_A > +25^\circ\text{C}$.

4. This value applies for $PW \leq 8.3 \text{ ms}$, duty cycle $\leq 1\%$.

Thermal Characteristics

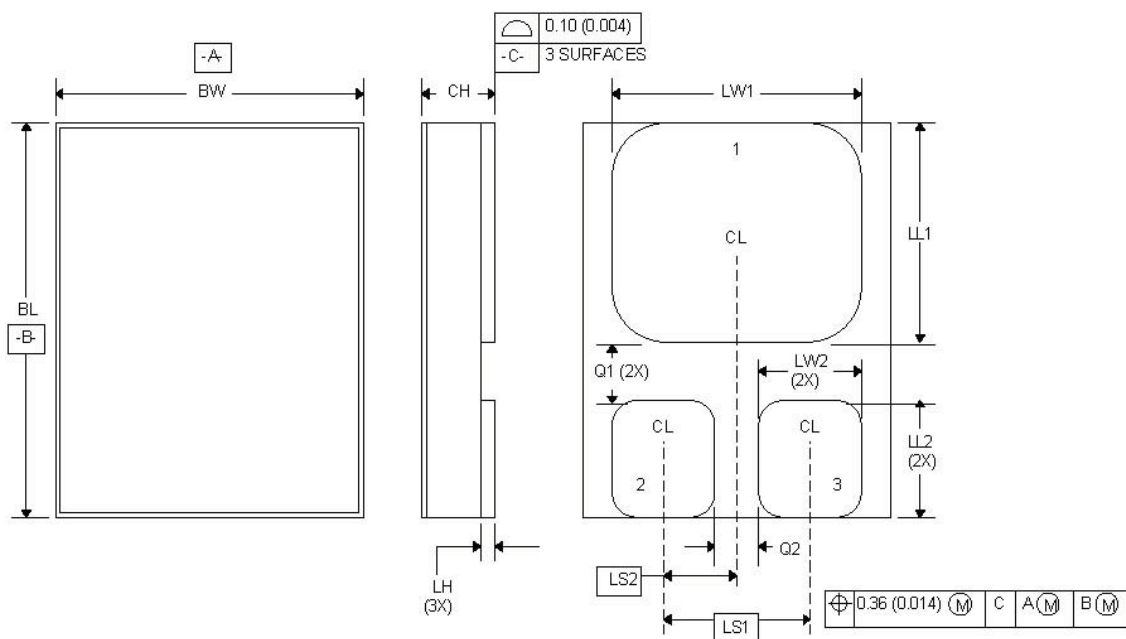
Characteristics	Symbol	Max. Value
Thermal Resistance, Junction to Case	$R_{\theta JC}$	1.75°C/W

2N5151U3 & 2N5153U3

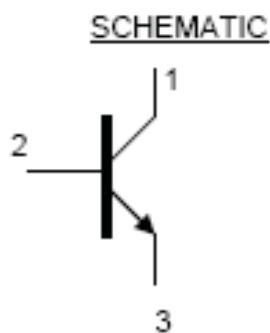
PNP Power Silicon Transistor

Rev. V3

Outline Drawing (U3)



1. Dimensions are in inches.
2. Millimeters are given for general information only.
3. In accordance with ASME Y14.5M, diameters are equivalent to ϕx symbology.
4. Terminal 1 - collector, terminal 2 - base, terminal 3 - emitter.



Ltr	Dimensions			
	Inches		Millimeters	
	Min.	Max.	Min.	Max.
BL	0.395	0.405	10.03	10.29
BW	0.291	0.301	7.40	7.65
CH	0.1085	0.1205	2.76	3.06
LH	0.010	0.020	0.25	0.51
LW ₁	0.281	0.291	7.14	7.39
LW ₂	0.090	0.100	2.29	2.54
LL ₁	0.220	0.230	5.59	5.84
LL ₂	0.115	0.125	2.92	3.18
LS ₁	0.150 BSC		3.81 BSC	
LS ₂	0.075 BSC		1.91 BSC	
Q ₁	0.030		0.762	
Q ₂	0.030		0.762	

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Rev. V3

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