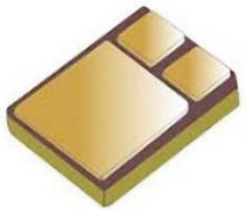
2N5153U3

NPN Power Silicon Transistor

Rev. V1

Features

- JANS and JANSR Qualified to MIL-PRF-19500/544
- 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 mAdc, I_B = 0	$V_{(BR)CEO}$	Vdc	80	—
Emitter - Base Cutoff Current	V_{EB} = 4.0 Vdc, I_C = 0 V_{EB} = 5.5 Vdc, I_C = 0	I_{EBO}	µAdc mAdc	— —	1.0 1.0
Collector - Emitter Cutoff Current	V_{CE} = 60 Vdc, V_{BE} = 0 V_{CE} = 100 Vdc, V_{BE} = 0	I_{CES}	µAdc mAdc	— —	1.0 1.0
Collector - Emitter Cutoff Current	V_{CE} = 40 Vdc, I_B = 0	I_{CEO}	µAdc	—	50
On Characteristics[1]					
Forward Current Transfer Ratio	I_C = 50 mAdc, V_{CE} = 5.0 Vdc I_C = 2.5 Adc, V_{CE} = 5.0 Vdc I_C = 5.0 Adc, V_{CE} = 5.0 Vdc	H_{FE}	-	50 70 40	— 200 —
Collector - Emitter Saturation Voltage	I_C = 2.5 Adc, I_B = 250 mAdc I_C = 5.0 Adc, I_B = 500 mAdc	$V_{CE(SAT)}$	Vdc	—	0.75 1.50
Emitter - Base Voltage Non-Saturation	I_C = 2.5 Adc, V_{CE}= 5.0 Vdc	$V_{BE(ON)}$	Vdc	—	1.45
Emitter - Base Saturation Voltage	I_C = 2.5 Adc, I_B = 250 mAdc I_C = 5.0 Adc, I_B = 500 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 mAdc, V_{CE} = 5.0 Vdc, f = 10 mHz	$\lvert H_{FE} \rvert$	-	7	—
Small-Signal Short-Circuit Forward Current Transfer Ratio	I_C = 100 mAdc, V_{CE} = 5.0 Vdc, f = 10 mHz	H_{FE}	-	50	—
Output Capacitance	V_{CB} = 10 Vdc, I_E = 0, f = 1 MHz	C_{OBO}	pF	—	250
Switching Characteristics					
Turn-On Time	I_C = 5.0 Adc; I_{B1} = 500 mAdc	T_{ON}	µs	—	0.5
Turn-Off Time	R_L = 6 Ω	T_{OFF}	µs	—	1.5
Storage Time	I_{B2} = -500 mAdc	T_S	µs	—	1.4
Fall Time	$V_{BE(OFF)}$ = 3.7 Vdc	T_f	µs	—	0.5
Safe Operating Area					
DC Tests: Test 1: Test 2: Test 3:	T_C = +25°C, I Cycle, t = 1.0 s V_{CE} = 5.8 Vdc, I_C = 2.0 Adc V_{CE} = 32 Vdc, I_C = 360 mAdc V_{CE} = 80 Vdc, I_C = 14.5 mAdc				

1. Pulse Test: Pulse Width = 300 µs, Duty Cycle ≤2.0%.

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
Total Power Dissipation @ T_A = 25°C @ T_C = 25°C	P_T	1.16 W 100 W
Operating & Storage Temperature Range	T_{OP}, T_{STG}	-65°C to +200°C

2. Derate linearly 5.7 mW/°C for T_A > +25°C
3. Derate linearly 571 mW/°C for T_A > +25°C

Thermal Characteristics

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

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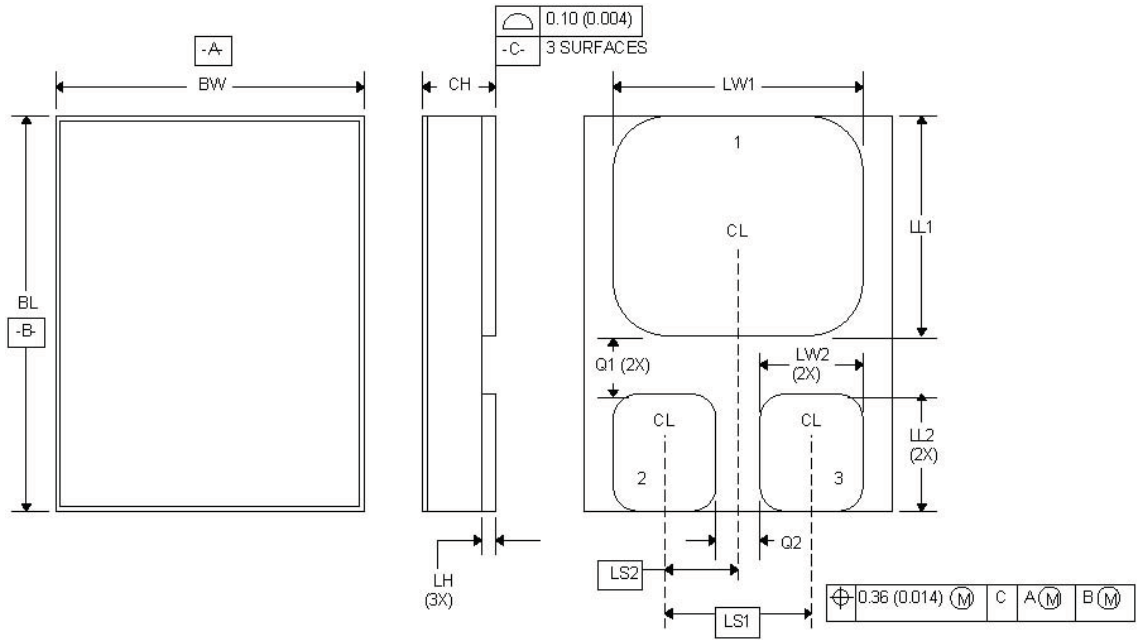
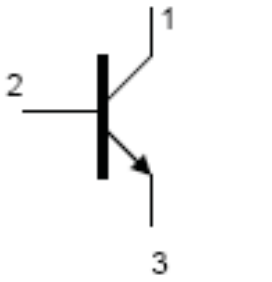
Outline Drawing (U3)



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.

SCHEMATIC



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	