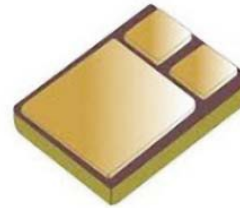


NPN Power Silicon Transistor

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	$I_C = 100 \text{ mA dc}, I_B = 0$	$V_{(BR)CEO}$	Vdc	80	—
Emitter - Base Cutoff Current	$V_{EB} = 4.0 \text{ Vdc}, I_C = 0$	I_{EBO}	$\mu\text{A dc}$ mA dc	—	1.0
	$V_{EB} = 5.5 \text{ Vdc}, I_C = 0$				1.0
Collector - Emitter Cutoff Current	$V_{CE} = 60 \text{ Vdc}, V_{BE} = 0$	I_{CES}	$\mu\text{A dc}$ mA dc	—	1.0
	$V_{CE} = 100 \text{ Vdc}, V_{BE} = 0$				1.0
Collector - Emitter Cutoff Current	$V_{CE} = 40 \text{ Vdc}, I_B = 0$	I_{CEO}	$\mu\text{A dc}$	—	50
On Characteristics¹					
Forward Current Transfer Ratio	$I_C = 50 \text{ mA dc}, V_{CE} = 5.0 \text{ Vdc}$	H_{FE}	-	50	—
	$I_C = 2.5 \text{ A dc}, V_{CE} = 5.0 \text{ Vdc}$			70	200
	$I_C = 5.0 \text{ A dc}, V_{CE} = 5.0 \text{ Vdc}$			40	—
Collector - Emitter Saturation Voltage	$I_C = 2.5 \text{ A dc}, I_B = 250 \text{ mA dc}$	$V_{CE(SAT)}$	Vdc	—	0.75
	$I_C = 5.0 \text{ A dc}, I_B = 500 \text{ mA dc}$				1.50
Emitter - Base Voltage Non-Saturation	$I_C = 2.5 \text{ A dc}, V_{CE} = 5.0 \text{ Vdc}$	$V_{BE(ON)}$	Vdc	—	1.45
Emitter - Base Saturation Voltage	$I_C = 2.5 \text{ A dc}, I_B = 250 \text{ mA dc}$ $I_C = 5.0 \text{ A dc}, I_B = 500 \text{ mA dc}$	$V_{BE(SAT)}$	Vdc	—	1.45 2.20
Dynamic Characteristics					
Magnitude of Common Emitter Small-Signal Short-Circuit Forward Current Transfer Ratio	$I_C = 500 \text{ mA dc}, V_{CE} = 5.0 \text{ Vdc}, f = 10 \text{ MHz}$	$ H_{FE} $	-	7	—
Small-Signal Short-Circuit Forward Current Transfer Ratio	$I_C = 100 \text{ mA dc}, V_{CE} = 5.0 \text{ Vdc}, f = 10 \text{ MHz}$	H_{FE}	-	50	—
Output Capacitance	$V_{CB} = 10 \text{ Vdc}, I_E = 0, f = 1 \text{ MHz}$	C_{OBO}	pF	—	250
Switching Characteristics					
Turn-On Time	$I_C = 5.0 \text{ A dc}; I_{B1} = 500 \text{ mA dc}$	T_{ON}	μs	—	0.5
Turn-Off Time	$R_L = 6 \Omega$	T_{OFF}	μs	—	1.5
Storage Time	$I_{B2} = -500 \text{ mA dc}$	T_S	μs	—	1.4
Fall Time	$V_{BE(OFF)} = 3.7 \text{ Vdc}$	T_f	μs	—	0.5
Safe Operating Area					
DC Tests:	$T_C = +25^\circ\text{C}, 1 \text{ Cycle}, t = 1.0 \text{ s}$				
Test 1:	$V_{CE} = 5.8 \text{ Vdc}, I_C = 2.0 \text{ A dc}$				
Test 2:	$V_{CE} = 32 \text{ Vdc}, I_C = 360 \text{ mA dc}$				
Test 3:	$V_{CE} = 80 \text{ Vdc}, I_C = 14.5 \text{ mA dc}$				

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

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 @ $T_A = 25^\circ\text{C}$ @ $T_C = 25^\circ\text{C}$	P_T	1.16 W 100 W
Operating & Storage Temperature Range	T_{OP}, T_{STG}	-65°C to $+200^\circ\text{C}$

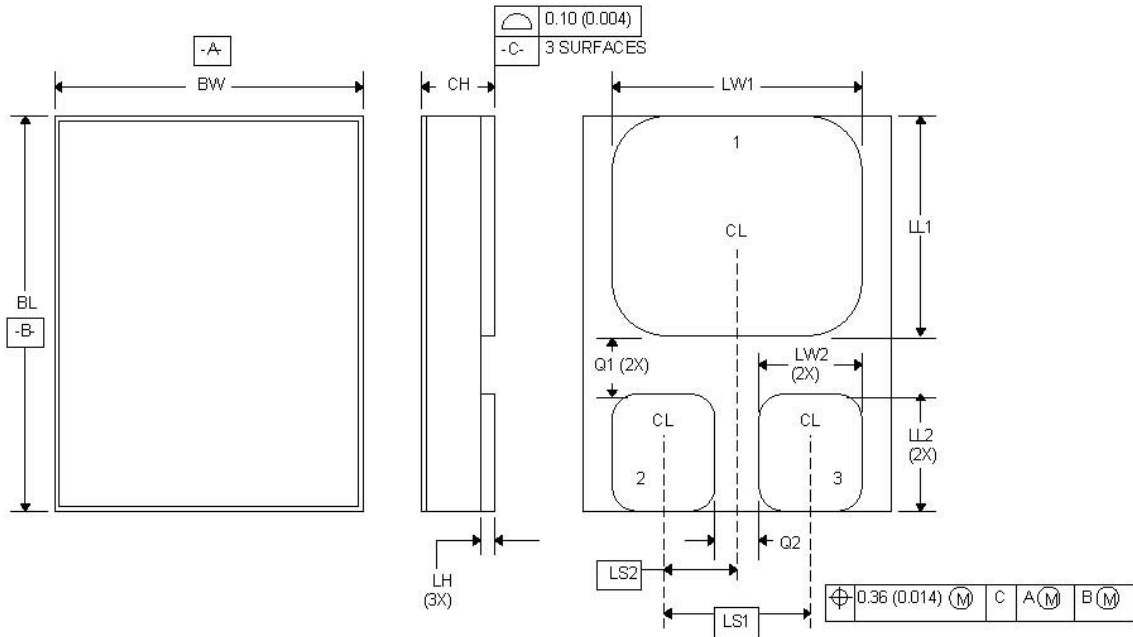
2. Derate linearly 5.7 mW/°C for $T_A > +25^\circ\text{C}$

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

Thermal Characteristics

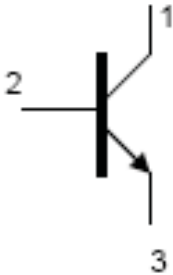
Characteristics	Symbol	Max. Value
Thermal Resistance, Junction to Case	$R_{\theta JC}$	1.75°C/W

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 ϕ x 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	

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