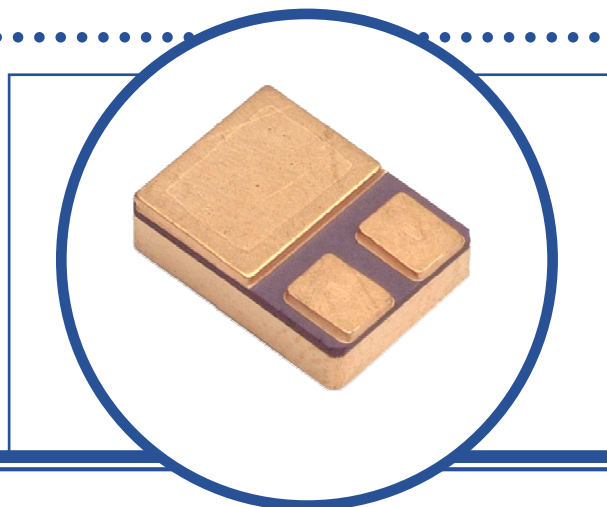


# SILICON EPITAXIAL NPN TRANSISTOR

## 2N5154N1B

- Hermetic Ceramic Surface Mount SMD0.5 Package
- High Reliability and Space Screening Options Available



### ABSOLUTE MAXIMUM RATINGS ( $T_A = 25^\circ\text{C}$ unless otherwise stated)

$V_{CBO}$	Collector – Base Voltage ( $I_E = 0$ )	100V
$V_{CEO}$	Collector – Emitter Voltage ( $I_B = 0$ )	80V
$V_{EBO}$	Emitter – Base Voltage	5.5V
$I_C$	Continuous Collector Current	2A
$I_{CM}$	Peak Collector Current <sup>(1)</sup>	10A
$P_D$	Total Power Dissipation at $T_C = 25^\circ\text{C}$	70W
	Derate Above $25^\circ\text{C}$	400 mW/ $^\circ\text{C}$
$T_J$	Junction Temperature Range	-65 to $+200^\circ\text{C}$
$T_{stg}$	Storage Temperature Range	-65 to $+200^\circ\text{C}$

### THERMAL PROPERTIES

Symbols	Parameters	Min.	Typ.	Max.	Units
$R_{\theta JC}$	Thermal Resistance, Junction To Case ( $T_C = 25^\circ\text{C}$ )			2.5	$^\circ\text{C/W}$

(1) This value applies for  $P_w \leq 8.3\text{ms}$ , duty cycle  $\leq 1\%$ .

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## ELECTRICAL CHARACTERISTICS ( $T_A = 25^\circ\text{C}$ unless otherwise stated)

Symbols	Parameters	Test Conditions	Min.	Typ	Max.	Units
$V_{(BR)CEO}^{(2)}$	Collector-Emitter Breakdown Voltage	$I_C = 10\text{mA}$	80			V
$I_{CES}$	Collector Cut-Off Current	$V_{CE} = 60\text{V}$ $V_{BE} = 0$			1.0	$\mu\text{A}$
		$V_{CE} = 100\text{V}$ $V_{BE} = 0$			1.0	mA
$I_{CEX}$	Collector Cut-Off Current	$V_{CE} = 60\text{V}$ $V_{BE} = -2\text{V}$ $T_C = 150^\circ\text{C}$			25	$\mu\text{A}$
$I_{CEO}$	Collector Cut-Off Current	$V_{CE} = 40\text{V}$ $I_B = 0$			50	
$I_{EBO}$	Emitter Cut-Off Current	$V_{EB} = 4\text{V}$ $I_C = 0$			1.0	mA
		$V_{EB} = 5.5\text{V}$ $I_C = 0$			1.0	
$h_{FE}^{(2)}$	Forward-current transfer ratio	$I_C = 50\text{mA}$ $V_{CE} = 5\text{V}$	50			-
		$I_C = 2.5\text{A}$ $V_{CE} = 5\text{V}$ $T_C = -55^\circ\text{C}$	70		200	
		$I_C = 5\text{A}$ $V_{CE} = 5\text{V}$	40			
$V_{BE}^{(2)}$	Base-Emitter Voltage	$I_C = 2.5\text{A}$ $V_{CE} = 5\text{V}$			1.45	V
$V_{BE(sat)}^{(2)}$	Collector-Emitter Saturation Voltage	$I_C = 2.5\text{A}$ $I_B = 250\text{mA}$			1.45	
		$I_C = 5\text{A}$ $I_B = 500\text{mA}$			2.2	
$V_{CE(sat)}^{(2)}$	Base-Emitter Saturation Voltage	$I_C = 2.5\text{A}$ $I_B = 250\text{mA}$			0.75	
		$I_C = 5\text{A}$ $I_B = 500\text{mA}$			1.5	

## DYNAMIC CHARACTERISTICS

$ h_{fe} $	Magnitude of common-emitter, small-signal short-circuit, forward-current transfer ratio	$I_C = 500\text{mA}$ $V_{CE} = 5\text{V}$ $f = 20\text{MHz}$		1.2		-
$h_{fe}$	Small-Signal Current Gain	$I_C = 100\text{mA}$ $V_{CE} = 5\text{V}$ $f = 1.0\text{KHz}$	50			-
$C_{obo}$	Output Capacitance	$V_{CB} = 10\text{V}$ $I_E = 0$ $f = 1.0\text{MHz}$			250	pF
$t_{on}$	Turn-On Time	$V_{CC} = 30\text{V}$ $I_C = 5\text{A}$			0.5	$\mu\text{S}$
$t_s$	Storage Time	$I_{B1} = 500\text{mA}$ $I_{B2} = -I_{B1}$			1.4	
$t_f$	Fall Time	$R_L = 6\Omega$			0.5	
$t_{off}$	Turn-Off Time				1.5	

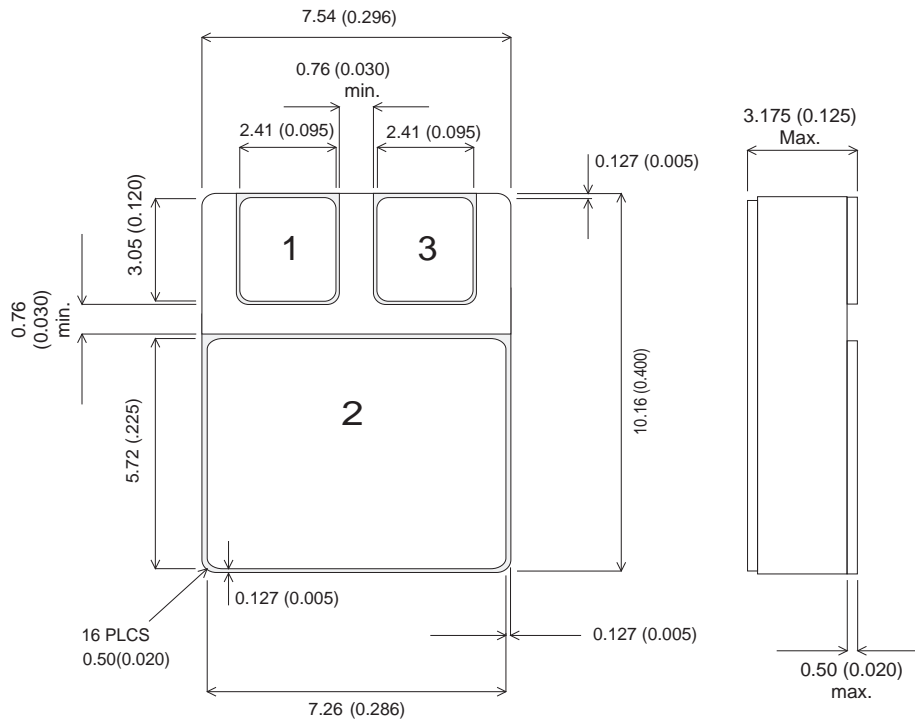
### Notes

(2) Pulse Width  $\leq 300\mu\text{s}$ ,  $\delta \leq 2\%$

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## MECHANICAL DATA

Dimensions in mm (inches)



### SMD0.5 (TO-276AA)

Pad 1 - Base      Pad 2 - Collector      Pad 3 - Emitter