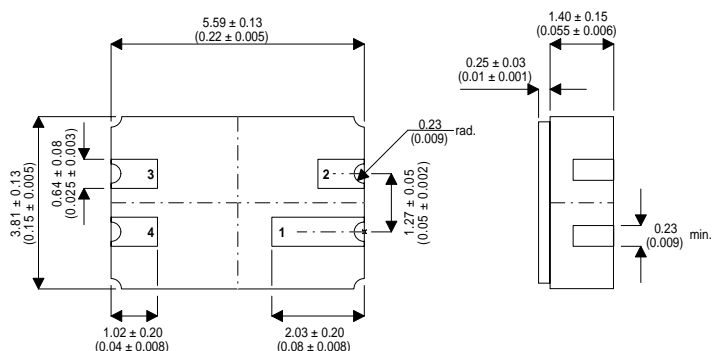


**HIGH VOLTAGE, MEDIUM POWER, NPN  
TRANSISTOR IN A  
HERMETICALLY SEALED  
CERAMIC SURFACE MOUNT PACKAGE  
FOR HIGH RELIABILITY APPLICATIONS**

**MECHANICAL DATA**  
Dimensions in mm (inches)



**LCC3 PACKAGE**  
**Underside View**

PAD 1 – Collector      PAD 3 – Emitter  
PAD 2 – N/C          PAD 4 – Base

**FEATURES**

- SILICON PLANAR EPITAXIAL NPN TRANSISTOR
- HERMETIC CERAMIC SURFACE MOUNT PACKAGE
- CECC SCREENING OPTIONS
- SPACE QUALITY LEVELS OPTIONS
- HIGH VOLTAGE

**APPLICATIONS:**

Hermetically sealed surface mount version of the popular 2N3501 for high reliability / space applications requiring small size and low weight devices.

**ABSOLUTE MAXIMUM RATINGS** ( $T_{case} = 25^{\circ}C$  unless otherwise stated)

$V_{CBO}$	Collector – Base Voltage	150V
$V_{CEO}$	Collector – Emitter Voltage ( $I_B = 0$ )	150V
$V_{EBO}$	Emitter – Base Voltage ( $I_B = 0$ )	6V
$I_C$	Collector Current	300mA
$P_D$	Total Device Dissipation $T_A = 25^{\circ}C$	500mW
$P_D$	Derate above $25^{\circ}C$	2.85mW / $^{\circ}C$
$T_{stg}$	Storage Temperature	-65 to $200^{\circ}C$
$R_{ja}$	Thermal Resistance Junction to Ambient	350 $^{\circ}C/W$

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

Parameter	Test Conditions	Min.	Typ.	Max.	Unit
<b>OFF CHARACTERISTICS</b>					
$V_{(BR)CEO}$	Collector-Emitter Breakdown Voltage <sup>1</sup>	$I_C = 10\text{mA}$ $I_B = 0$	150		V
$V_{(BR)CBO}$	Collector-Base Breakdown Voltage	$I_C = 10\mu\text{A}$ $I_E = 0$	150		
$V_{(BR)EBO}$	Emitter-Base Breakdown Voltage	$I_E = 10\mu\text{A}$ $I_C = 0$	6		
$I_{CBO}$	Collector Cutoff Current	$V_{CB} = 75\text{V}$ $I_E = 0$		0.05	$\mu\text{A}$
		$V_{CB} = 75\text{V}$ $I_E = 0$ $T_A = 150^\circ\text{C}$		50	
$I_{EBO}$	Emitter Cutoff Current	$V_{EB(off)} = 4\text{V}$ $I_C = 0$			nA
<b>ON CHARACTERISTICS</b>					
$h_{FE}$	DC Current Gain	$I_C = 0.1\text{mA}$ $V_{CE} = 10\text{V}$	35		—
		$I_C = 1\text{mA}$ $V_{CE} = 10\text{V}$	50		
		$I_C = 10\text{mA}$ $V_{CE} = 10\text{V}^1$	75		
		$I_C = 150\text{mA}$ $V_{CE} = 10\text{V}^1$	100	300	
		$I_C = 300\text{mA}$ $V_{CE} = 10\text{V}^1$	20		
$V_{CE(SAT)}$	Collector-Emitter Saturation Voltage <sup>1</sup>	$I_C = 10\text{mA}$ $I_B = 1\text{mA}$		0.2	V
		$I_C = 50\text{mA}$ $I_B = 5\text{mA}$		0.25	
		$I_C = 150\text{mA}$ $I_B = 15\text{mA}$		0.4	
$V_{BE(SAT)}$	Base-Emitter Saturation Voltage <sup>1</sup>	$I_C = 10\text{mA}$ $I_B = 1\text{mA}$		0.8	V
		$I_C = 50\text{mA}$ $I_B = 5\text{mA}$		0.9	
		$I_C = 150\text{mA}$ $I_B = 15\text{mA}$		1.2	
<b>SMALL SIGNAL CHARACTERISTICS</b>					
$f_T$	Current-Gain-Bandwidth Product <sup>2</sup>	$V_{CE} = 20\text{V}$ $I_C = 20\text{mA}$ $f = 100\text{MHz}$	150		MHz
$C_{obo}$	Output Capacitance	$V_{CB} = 10\text{V}$ $I_E = 0$ $f = 1\text{MHz}$		8	pF
$C_{ibo}$	Input Capacitance	$V_{EB} = 0.5\text{V}$ $I_C = 0$ $f = 1\text{MHz}$		80	
$h_{ie}$	Input Impedance	$V_{CE} = 10\text{V}$ $I_C = 10\text{mA}$ $f = 1\text{kHz}$	0.25	1.25	$\Omega$
$h_{re}$	Voltage Feedback Ratio	$V_{CE} = 10\text{V}$ $I_C = 10\text{mA}$ $f = 1\text{kHz}$		4	$\times 10^{-4}$
$h_{fe}$	Small-Signal Current Gain	$V_{CE} = 10\text{V}$ $I_C = 10\text{mA}$ $f = 1\text{kHz}$		375	—
$h_{oe}$	Output Admittance	$V_{CE} = 10\text{V}$ $I_C = 10\text{mA}$ $f = 1\text{kHz}$		200	$\Omega$

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

Parameter	Test Conditions	Min.	Typ.	Max.	Unit	
<b>SWITCHING CHARACTERISTICS</b>						
$t_d$	Delay Time	$I_C = 150\text{mA}$ $V_{CC} = 100\text{V}$	$I_{B1} = 15\text{mA}$ $V_{EB(off)} = -2\text{V}$		20	ns
$t_r$	Rise Time	$I_C = 150\text{mA}$ $V_{CC} = 100\text{V}$	$I_{B1} = 15\text{mA}$ $V_{EB(off)} = -2\text{V}$		35	
$t_s$	Storage Time	$I_C = 150\text{mA}$ $I_{B1} = I_{B2} = 15\text{mA}$	$V_{CC} = 100\text{V}$		800	
$t_f$	Fall Time	$I_C = 150\text{mA}$ $I_{B1} = I_{B2} = 15\text{mA}$	$V_{CC} = 100\text{V}$		80	

- 1) Pulse test : Pulse Width <  $300\mu\text{s}$  ,Duty Cycle < 2%
- 2)  $f_t$  is defined as the frequency at which  $|h_{fe}|.f_{\text{test}}$