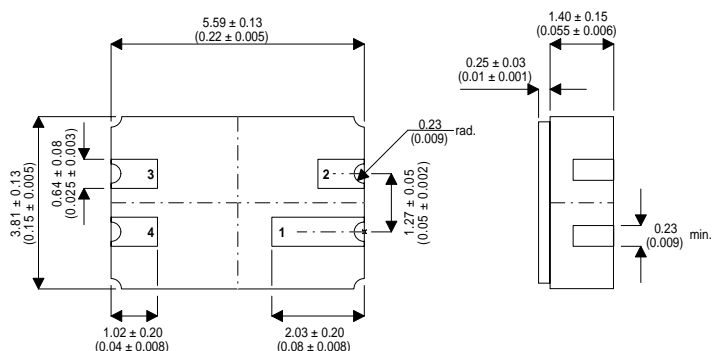


**HIGH VOLTAGE, MEDIUM POWER, NPN
TRANSISTOR IN A
HERMETICALLY SEALED
CERAMIC SURFACE MOUNT PACKAGE
FOR HIGH RELIABILITY APPLICATIONS**

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	
OFF CHARACTERISTICS						
$V_{(BR)CEO}$	Collector-Emitter Breakdown Voltage ¹	$I_C = 10\text{mA}$	$I_B = 0$	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	μA
		$V_{CB} = 75\text{V}$	$I_E = 0$		50	
		$T_A = 150^\circ\text{C}$				
I_{EBO}	Emitter Cutoff Current	$V_{EB(off)} = 4\text{V}$	$I_C = 0$			nA
ON CHARACTERISTICS						
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 ¹	$I_C = 10\text{mA}$	$I_B = 1\text{mA}$		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 ¹	$I_C = 10\text{mA}$	$I_B = 1\text{mA}$		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	
SMALL SIGNAL CHARACTERISTICS						
f_T	Current-Gain-Bandwidth Product ²	$V_{CE} = 20\text{V}$	$I_C = 20\text{mA}$ $f = 100\text{MHz}$	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	Ω
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	Ω

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

Parameter	Test Conditions	Min.	Typ.	Max.	Unit	
SWITCHING CHARACTERISTICS						
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 $|h_{fe}|.f_{\text{test}}$