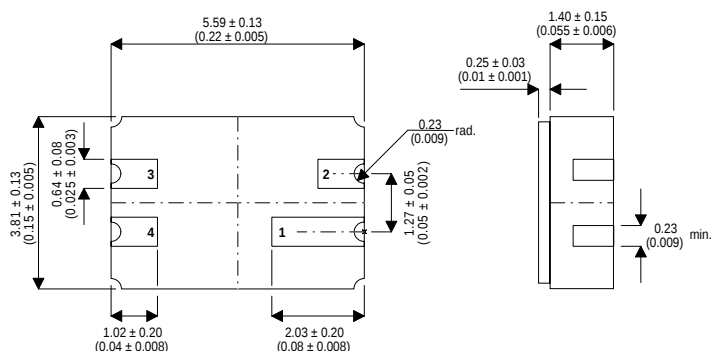


2N3501CSM4

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 = 10mA	I _B = 0	150			V
V _{(BR)CBO}	Collector-Base Breakdown Voltage	I _C = 10μA	I _E = 0	150			
V _{(BR)EBO}	Emitter-Base Breakdown Voltage	I _E = 10μA	I _C = 0	6			
I _{CBO}	Collector Cutoff Current	V _{CB} = 75V	I _E = 0			0.05	μA
		V _{CB} = 75V	I _E = 0 T _A = 150°C			50	
I _{EBO}	Emitter Cutoff Current	V _{EB(off)} = 4V	I _C = 0				nA
ON CHARACTERISTICS							
h _{FE}	DC Current Gain	I _C = 0.1mA	V _{CE} = 10V	35			—
		I _C = 1mA	V _{CE} = 10V	50			
		I _C = 10mA	V _{CE} = 10V ¹	75			
		I _C = 150mA	V _{CE} = 10V ¹	100		300	
		I _C = 300mA	V _{CE} = 10V ¹	20			
V _{CE(SAT)}	Collector-Emitter Saturation Voltage ¹	I _C = 10mA	I _B = 1mA			0.2	V
		I _C = 50mA	I _B = 5mA			0.25	
		I _C = 150mA	I _B = 15mA			0.4	
V _{BE(SAT)}	Base-Emitter Saturation Voltage ¹	I _C = 10mA	I _B = 1mA			0.8	V
		I _C = 50mA	I _B = 5mA			0.9	
		I _C = 150mA	I _B = 15mA			1.2	
SMALL SIGNAL CHARACTERISTICS							
f _T	Current-Gain–Bandwidth Product ²	V _{CE} = 20V	I _C = 20mA f = 100MHz	150			MHz
C _{obo}	Output Capacitance	V _{CB} = 10V	I _E = 0 f = 1MHz			8	pF
C _{ibo}	Input Capacitance	V _{EB} = 0.5V	I _C = 0 f = 1MHz			80	
h _{ie}	Input Impedance	V _{CE} = 10V	I _C = 10mA f = 1KHz	0.25		1.25	Ω
h _{re}	Voltage Feedback Ratio	V _{CE} = 10V	I _C = 10mA f = 1KHz			4	x10 ⁻⁴
h _{fe}	Small-Signal Current Gain	V _{CE} = 10V	I _C = 10mA f = 1KHz			375	—
h _{oe}	Output Admittance	V _{CE} = 10V	I _C = 10mA f = 1KHz			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	$I_C = 150\text{mA}$ $I_{B1} = 15\text{mA}$ $V_{CC} = 100\text{V}$ $V_{EB(\text{off})} = -2\text{V}$		20		ns
t_r Rise Time	$I_C = 150\text{mA}$ $I_{B1} = 15\text{mA}$ $V_{CC} = 100\text{V}$ $V_{EB(\text{off})} = -2\text{V}$		35		
t_s Storage Time	$I_C = 150\text{mA}$ $V_{CC} = 100\text{V}$ $I_{B1} = I_{B2} = 15\text{mA}$		800		
t_f Fall Time	$I_C = 150\text{mA}$ $V_{CC} = 100\text{V}$ $I_{B1} = I_{B2} = 15\text{mA}$		80		

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

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