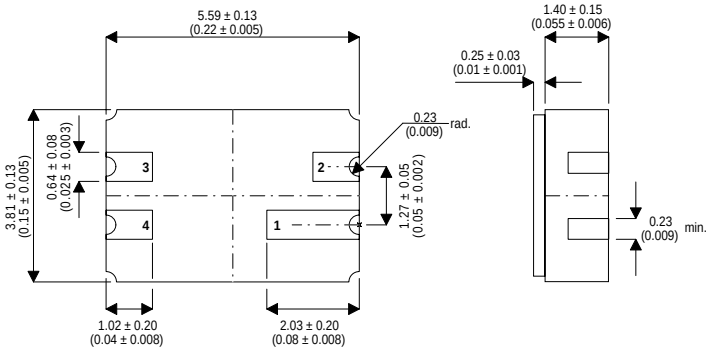
2N3501CSM4

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°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 °C	500mW
P_D	Derate above 25°C	2.85mW / °C
T_{stg}	Storage Temperature	–65 to 200°C
R_{ja}	Thermal Resistance Junction to Ambient	350°C/W

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SEME LAB

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ELECTRICAL CHARACTERISTICS (T_A = 25°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			50	
			T_A = 150°C				
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 = 100MH$_Z$	150			MH$_Z$
C_{obo}	Output Capacitance	V_{CB} = 10V	I_E = 0 f = 1MH$_Z$			8	pF
C_{ibo}	Input Capacitance	V_{EB} = 0.5V	I_C = 0 f = 1MH$_Z$			80	
h_{ie}	Input Impedance	V_{CE} = 10V	I_C = 10mA f = 1KH$_Z$	0.25		1.25	Ω
h_{re}	Voltage Feedback Ratio	V_{CE} = 10V	I_C = 10mA f = 1KH$_Z$			4	x10^{-4}
h_{fe}	Small-Signal Current Gain	V_{CE} = 10V	I_C = 10mA f = 1KH$_Z$			375	—
h_{oe}	Output Admittance	V_{CE} = 10V	I_C = 10mA f = 1KH$_Z$			200	Ω

ELECTRICAL CHARACTERISTICS Continued (T_A = 25°C unless otherwise stated)

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

1) Pulse test : Pulse Width < 300µs ,Duty Cycle < 2%

2) f_t is defined as the frequency at which $|h_{fe}|.f_{test}$