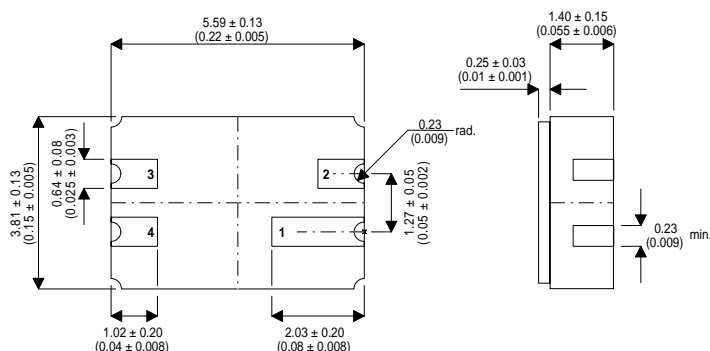


HIGH SPEED, MEDIUM POWER, NPN SWITCHING TRANSISTOR IN A HERMETICALLY SEALED CERAMIC SURFACE MOUNT PACKAGE FOR HIGH RELIABILITY APPLICATIONS

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 SPEED SATURATED SWITCHING

APPLICATIONS:

Hermetically sealed surface mount version of the popular 2N2222A 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	75V
V _{CEO}	Collector – Emitter Voltage (I _B = 0)	40V
V _{EBO}	Emitter – Base Voltage (I _B = 0)	6V
I _C	Collector Current	800mA
P _D	Total Device Dissipation	350mW
P _D	Derate above 50°C	2.0mW / °C
R _{ja}	Thermal Resistance Junction to Ambient	350°C/W
T _{stg}	Storage Temperature	–55 to 200°C

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

Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$V_{\text{CEO(sus)}}^*$ Collector – Emitter Sustaining Voltage	$I_C = 10\text{mA}$	40			V
$V_{(\text{BR})\text{CBO}}^*$ Collector – Base Breakdown Voltage	$I_C = 10\mu\text{A}$	75			V
$V_{(\text{BR})\text{EBO}}^*$ Emitter – Base Breakdown Voltage	$I_E = 10\mu\text{A}$ $I_C = 0$	6			V
I_{CEX}^* Collector Cut-off Current ($I_C = 0$)	$I_B = 0$ $V_{\text{CE}} = 60\text{V}$			10	nA
I_{CBO}^* Collector – Base Cut-off Current	$I_E = 0$ $V_{\text{CB}} = 60\text{V}$			10	nA
	$T_C = 125^{\circ}\text{C}$			10	μA
I_{EBO}^* Emitter Cut-off Current ($I_C = 0$)	$I_C = 0$ $V_{\text{EB}} = 3\text{V (off)}$			10	nA
I_{BL}^* Base Current	$V_{\text{CE}} = 60\text{V}$ $V_{\text{EB}} = 3\text{V (off)}$			20	nA
$V_{\text{CE(sat)}}^*$ Collector – Emitter Saturation Voltage	$I_C = 150\text{mA}$ $I_B = 15\text{mA}$			0.3	V
	$I_C = 500\text{mA}$ $I_B = 50\text{mA}$			1	
$V_{\text{BE(sat)}}^*$ Base – Emitter Saturation Voltage	$I_C = 150\text{mA}$ $I_B = 15\text{mA}$	0.6		1.2	V
	$I_C = 500\text{mA}$ $I_C = 50\text{mA}$			2	
h_{FE}^* DC Current Gain	$I_C = 0.1\text{mA}$ $V_{\text{CE}} = 10\text{V}$	35			—
	$I_C = 1\text{mA}$ $V_{\text{CE}} = 10\text{V}$	50			
	$I_C = 10\text{mA}$ $V_{\text{CE}} = 10\text{V}$	75			
	$I_C = 10\text{mA}$ $V_{\text{CE}} = 10\text{V}$	35			
	$I_C = 150\text{mA}$ $V_{\text{CE}} = 10\text{V}$	100		300	
	$I_C = 150\text{mA}$ $V_{\text{CE}} = 1\text{V}$	50			
	$I_C = 500\text{mA}$ $V_{\text{CE}} = 10\text{V}$	40			

* Pulse test $t_p = 300\mu\text{s}$, $\delta \leq 2\%$

DYNAMIC CHARACTERISTICS ($T_{\text{case}} = 25^{\circ}\text{C}$ unless otherwise stated)

Parameter	Test Conditions	Min.	Typ.	Max.	Unit
f_T Transition Frequency	$I_C = 20\text{mA}$ $V_{\text{CE}} = 20\text{V}$ $f = 100\text{MHz}$	300			MHz
C_{ob} Output Capacitance	$V_{\text{CB}} = 10\text{V}$ $I_E = 0$ $f = 1.0\text{MHz}$			8	pF
C_{ib} Input Capacitance	$V_{\text{BE}} = 0.5\text{V}$ $I_C = 0$ $f = 1.0\text{MHz}$			30	pF
h_{fe} Small Signal Current Gain	$I_C = 1\text{mA}$ $V_{\text{CE}} = 10\text{V}$ $f = 1\text{kHz}$	50		300	
	$I_C = 10\text{mA}$ $V_{\text{CE}} = 10\text{V}$ $f = 1\text{kHz}$	75		375	

SWITCHING CHARACTERISTICS (RESISTIVE LOAD) ($T_{\text{case}} = 25^{\circ}\text{C}$ unless otherwise stated)

Parameter	Test Conditions	Min.	Typ.	Max.	Unit
t_d Delay Time	$V_{\text{CC}} = 30\text{V}$ $V_{\text{BE}} = 0.5\text{V (off)}$			10	ns
t_r Rise Time	$I_{\text{C1}} = 150\text{mA}$ $I_{\text{B1}} = 15\text{mA}$			25	ns
t_s Storage Time	$V_{\text{CC}} = 30\text{V}$ $I_C = 150\text{mA}$			225	ns
t_f Fall Time	$I_{\text{B1}} = I_{\text{B2}} = 15\text{mA}$			60	ns

f_T is defined as the frequency at which h_{FE} extrapolates to unity.