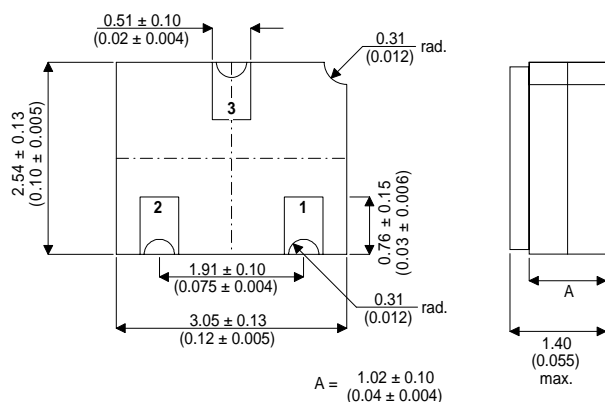


## HIGH SPEED, MEDIUM POWER, NPN SWITCHING TRANSISTOR IN A HERMETICALLY SEALED CERAMIC SURFACE MOUNT PACKAGE FOR HIGH RELIABILITY APPLICATIONS

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



**SOT23 CERAMIC  
(LCC1 PACKAGE)**

**Underside View**

PAD 1 – Base    PAD 2 – Emitter    PAD 3 – Collector

**FEATURES**

- SILICON PLANAR EPITAXIAL NPN TRANSISTOR
- HERMETIC CERAMIC SURFACE MOUNT PACKAGE (SOT23 COMPATIBLE)
- 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** ( $T_{case} = 25^{\circ}C$  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	600mA
$P_D$	Total Device Dissipation	350mW
$P_D$	Derate above 50°C	2.0mW / °C
$R_{ja}$	Thermal Resistance Junction to Ambient	350°C/W
$T_{stg,Tj}$	Storage Temperature, Operating Temp Range	-55 to 200°C

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

Parameter	Test Conditions	Min.	Typ.	Max.	Unit	
$V_{CEO(sus)^*}$ Collector – Emitter Sustaining Voltage	$I_C = 10mA$	40			V	
$V_{(BR)CBO}^*$ Collector – Base Breakdown Voltage	$I_C = 10\mu A$	75			V	
$V_{(BR)EBO}^*$ Emitter – Base Breakdown Voltage	$I_E = 10\mu A$ $I_C = 0$	6			V	
$I_{CEX}^*$ Collector Cut-off Current ( $I_C = 0$ )	$I_B = 0$ $V_{CE} = 60V$			10	nA	
$I_{CBO}^*$ Collector – Base Cut-off Current	$I_E = 0$ $V_{CB} = 60V$			10	nA	
	$T_C = 125^{\circ}C$			10	$\mu A$	
$I_{EBO}^*$ Emitter Cut-off Current ( $I_C = 0$ )	$I_C = 0$ $V_{EB} = 3V$ (off)			10	nA	
$I_{BL}^*$ Base Current	$V_{CE} = 60V$ $V_{EB} = 3V$ (off)			20	nA	
$V_{CE(sat)^*}$ Collector – Emitter Saturation Voltage	$I_C = 150mA$ $I_B = 15mA$			0.3	V	
	$I_C = 500mA$ $I_B = 50mA$			1		
$V_{BE(sat)^*}$ Base – Emitter Saturation Voltage	$I_C = 150mA$ $I_B = 15mA$	0.6		1.2	V	
	$I_C = 500mA$ $I_C = 50mA$			2		
$h_{FE}^*$ DC Current Gain	$T_A = -55^{\circ}C$	$I_C = 0.1mA$ $V_{CE} = 10V$		35	—	
		$I_C = 1mA$ $V_{CE} = 10V$		50		
		$I_C = 10mA$ $V_{CE} = 10V$		75		
		$I_C = 10mA$ $V_{CE} = 10V$		35		
		$I_C = 150mA$ $V_{CE} = 10V$		100		300
		$I_C = 150mA$ $V_{CE} = 1V$		50		
		$I_C = 500mA$ $V_{CE} = 10V$		40		

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

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

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

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

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

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