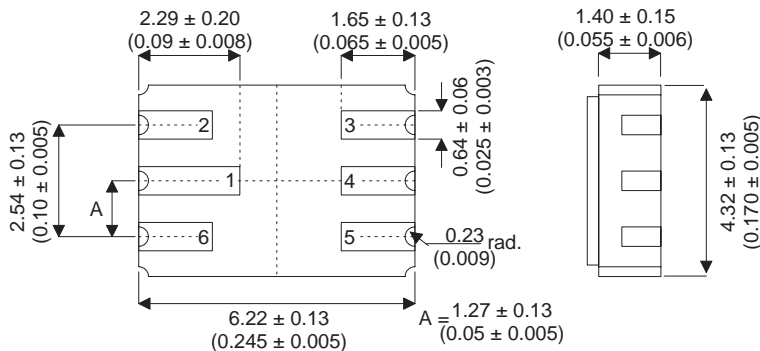


## DUAL BIPOLAR NPN DEVICES IN A HERMETICALLY SEALED LCC2 CERAMIC SURFACE MOUNT PACKAGE FOR HIGH RELIABILITY APPLICATIONS

### MECHANICAL DATA

Dimensions in mm (inches)



**LCC2 (MO-041BB)**

#### PIN OUT

Pin 1 – Collector 1  
Pin 2 – Base 1  
Pin 3 – Base 2

Pin 4 – Collector 2  
Pin 5 – Emitter 2  
Pin 6 – Emitter 1

### FEATURES

- SILICON PLANAR EPITAXIAL NPN TRANSISTOR
- HERMETIC CERAMIC SURFACE MOUNT PACKAGE
- CECC SCREENING OPTIONS
- SPACE QUALITY LEVELS OPTIONS
- JAN LEVEL SCREENING OPTIONS
- HIGH VOLTAGE

All Semelab hermetically sealed products can be processed in accordance with the requirements of BS, CECC and JAN, JANTX, JANTXV and JANS specifications.

### ABSOLUTE MAXIMUM RATINGS

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

		Single Side	Total Device
$V_{CBO}$	Collector-Base Voltage	150V	
$V_{CEO}$	Collector-Emitter Voltage( $I_B=0$ )	150V	
$V_{EBO}$	Emitter-Base Voltage( $I_B=0$ )	6V	
$I_C$	Continuous Collector Current	300mA	
$P_D$	Power Dissipation	300mW	500mW
		$T_{amb} = 25^{\circ}C$	
		Derate above $25^{\circ}C$	
$T_j$	Operating Temperature Range	1.72mW/ $^{\circ}C$	2.86mW/ $^{\circ}C$
$T_{stg}$	Storage Temperature Range	-65 to $200^{\circ}C$	-65 to $200^{\circ}C$
$R_{thJA}$	Thermal Resistance Junction to Ambient		350 $^{\circ}C$

Semelab Plc reserves the right to change test conditions, parameter limits and package dimensions without notice. Information furnished by Semelab is believed to be both accurate and reliable at the time of going to press. However Semelab assumes no responsibility for any errors or omissions discovered in its use. Semelab encourages customers to verify that datasheets are current before placing orders.

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

Parameter		Test Conditions	Min.	Typ.	Max.	Unit
<b>OFF CHARACTERISTICS</b>						
$V_{(BR)CEO}$	Collector-Emitter Breakdown Voltage <sup>1</sup>	$I_C=10mA$ $I_B=0$	150			V
$V_{(BR)CBO}$	Collector-Base Breakdown Voltage	$I_C=10\mu A$ $I_E=0$	150			V
$V_{(BR)EBO}$	Emitter-Base Breakdown Voltage	$I_E=10\mu A$ $I_C=0$	6			V
$I_{CBO}$	Collector Cutoff Current	$V_{CB}=75V$ $I_E=0$ $T_{amb}=150^{\circ}C$			0.05 50	$\mu A$
$I_{EBO}$	Emitter Cutoff Current	$V_{BE(off)}=4V$ $V_{CE}=0$			25	nA
<b>ON CHARACTERISTICS</b>						
$h_{FE}$	DC Current Gain	$I_C=0.1mA$ $V_{CE}=10V$	35			
		$I_C=1mA$ $V_{CE}=10V$	50			
		$I_C=10mA$ $V_{CE}=10V$	75			
		$I_C=150mA$ $V_{CE}=10V$	100		300	
		$I_C=300mA$ $V_{CE}=10V$	20			
$V_{CE(SAT)}$	Collector-Emitter Saturation Voltage <sup>1</sup>	$I_C=10mA$ $I_B=1mA$			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 <sup>1</sup>	$I_C=10mA$ $I_B=1mA$			0.8	V
		$I_C=50mA$ $I_B=5mA$			0.9	
		$I_C=150mA$ $I_B=15mA$			1.2	
<b>SMALL SIGNAL CHARACTERISTICS</b>						
$f_T$	Current Gain-Bandwidth Product (100MHz)	$V_{CE}=20V$ $I_C=20mA$	150			MHz
$C_{obo}$	Output Capacitance (1MHz)	$V_{CB}=10V$ $I_E=0$			8	pF
$C_{ibo}$	Input Capacitance (1MHz)	$V_{EB}=0.5V$ $I_C=0$			80	
$h_{ie}$	Input Impedance (1kHz)	$V_{CE}=10V$ $I_C=10mA$	0.25		1.25	
$h_{fe}$	Small-Signal Current Gain (1kHz)	$V_{CE}=10V$ $I_C=10mA$			375	
$h_{oe}$	Output Admittance (1kHz)	$V_{CE}=10V$ $I_C=10mA$			200	
<b>SWITCHING CHARACTERISTICS</b>						
$t_d$	Delay Time	$I_C=150mA$ $I_B^1=15mA$		20		ns
$t_r$	Rise Time	$V_{CC}=100V$ $V_{EB(off)}=-2V$		35		
$t_s$	Storage Time	$I_C=150mA$ $I_B^1=15mA$		800		
$t_f$	Fall Time	$I_{B1}=I_{B2}=15mA$		80		

1) Pulse Test: Pulse Width < 300 $\mu s$ , Duty Cycle <2%

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