

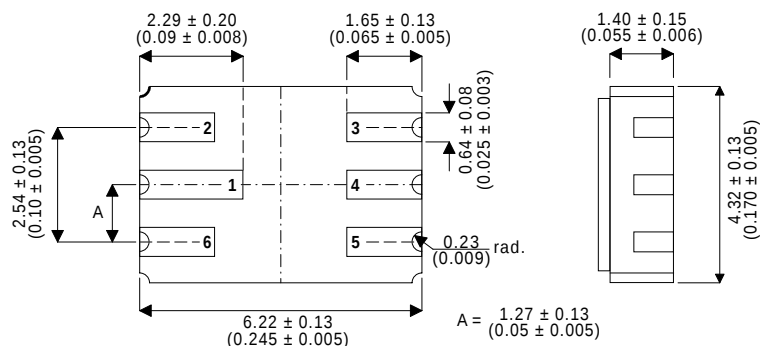
MECHANICAL DATA

Dimensions in mm (inches)

DUAL HIGH GAIN PNP TRANSISTORS IN A HERMETICALLY SEALED CERAMIC SURFACE MOUNT PACKAGE FOR HIGH RELIABILITY APPLICATIONS

FEATURES

- HERMETIC CERAMIC SURFACE MOUNT PACKAGE
- CECC SCREENING OPTIONS
- SPACE QUALITY LEVELS OPTIONS



LCC2 PACKAGE Underside View

- | | |
|---------------------|---------------------|
| PAD 1 – Collector 1 | PAD 4 – Collector 2 |
| PAD 2 – Base 1 | PAD 5 – Emitter 2 |
| PAD 3 – Base 2 | PAD 6 – Emitter 1 |

APPLICATIONS:

Suitable for use in high gain, low noise differential amplifier applications.

ABSOLUTE MAXIMUM RATINGS

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

		EACH SIDE	TOTAL DEVICE
V_{CBO}	Collector – Base Voltage	–60V	
V_{CEO}	Collector – Emitter Voltage ¹	–60V	
V_{EBO}	Emitter – Base Voltage	–5V	
I_C	Collector Current	–50mA	
P_D	Total Device Dissipation	500mW	600mW
	Derate above 25°C	2.9mW / °C	3.4mW / °C
T_{STG}	Storage Temperature Range	–65 to 200°C	

NOTES

1. Base – Emitter Diode Open Circuited.

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

Parameter	Test Conditions ¹	Min.	Typ.	Max.	Unit
INDIVIDUAL TRANSISTOR CHARACTERISTICS					
$V_{(BR)CBO}$ Collector – Base Breakdown Voltage	$I_C = -10\mu\text{A}$ $I_E = 0$	-60			V
$V_{(BR)CEO^*}$ Collector – Emitter Breakdown Voltage	$I_C = -10\text{mA}$ $I_B = 0$	-60			
$V_{(BR)EBO}$ Emitter – Base Breakdown Voltage	$I_E = -10\mu\text{A}$ $I_C = 0$	-5			
I_{CBO} Collector Cut-off Current	$V_{CB} = -50\text{V}$ $I_E = 0$			-10	nA
	$T_A = 150^{\circ}\text{C}$			-10	μA
I_{EBO} Emitter Cut-off Current	$V_{EB} = -4\text{V}$ $I_C = 0$			-20	nA
h_{FE} DC Current Gain	$I_C = -10\mu\text{A}$ $V_{CE} = -5\text{V}$	100			—
	$I_C = -100\mu\text{A}$ $V_{CE} = -5\text{V}$	150		450	
	$T_A = -55^{\circ}\text{C}$	75			
	$I_C = -500\mu\text{A}$ $V_{CE} = -5\text{V}$	150		450	
	$I_C = -1\text{mA}$ $V_{CE} = -5\text{V}$	150		450	
	$I_C = -10\text{mA}$ $V_{CE} = -5\text{V}^*$	125			
V_{BE} Base – Emitter Voltage	$I_C = -100\mu\text{A}$ $V_{CE} = -5\text{V}$			-0.7	V
	$I_B = -10\mu\text{A}$ $I_C = -100\mu\text{A}$			-0.7	
	$I_B = -100\mu\text{A}$ $I_C = -1\text{mA}$			-0.8	
$V_{CE(sat)}$ Collector – Emitter Saturation Voltage	$I_B = -10\mu\text{A}$ $I_C = -100\mu\text{A}$			-0.2	V
	$I_B = -100\mu\text{A}$ $I_C = -1\text{mA}$			-0.25	
h_{ie} Small Signal Common – Emitter Input Impedance	$V_{CE} = -10\text{V}$ $I_C = -1\text{mA}$ $f = 1\text{kHz}$	3		30	$\text{k}\Omega$
h_{fe} Small Signal Common – Emitter Current Gain		150		600	—
h_{re} Small Signal Common – Emitter Reverse Voltage Gain				25×10^{-4}	
h_{oe} Small Signal Common – Emitter Output Admittance		5		60	μmho
$ h_{fe} $ Small Signal Common – Emitter Current Gain	$V_{CE} = -5\text{V}$ $I_C = -500\mu\text{A}$ $f = 30\text{MHz}$	1			—
	$V_{CE} = -5\text{V}$ $I_C = -1\text{mA}$ $f = 100\text{MHz}$	1		5	
C_{obo} Common – Base Open Circuit Output Capacitance	$V_{CB} = -5\text{V}$ $I_E = 0$ $f = 100\text{kHz}$			4	pF
C_{ibo} Common – Base Open Circuit Input Capacitance	$V_{EB} = -0.5\text{V}$ $I_C = 0$ $f = 100\text{kHz}$			8	

NOTES

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

1) Terminals not under test are open circuited under all test conditions.

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

Parameter		Test Conditions		Min.	Typ.	Max.	Unit
TRANSISTOR MATCHING CHARACTERISTICS							
h_{FE1}	Static Forward Current Gain	$V_{CE} = -5V$	$I_C = -100\mu A$	0.9		1	—
h_{FE2}	Balance Ratio	See Note 2.					
$ V_{BE1} - V_{BE2} $	Base – Emitter Voltage Differential	$V_{CE} = -5V$	$I_C = -10\mu A$ to $-10mA$			5	mV
		$V_{CE} = -5V$		$I_C = -100\mu A$			
$ \Delta(V_{BE1} - V_{BE2})\Delta T_A $	Base – Emitter Voltage Differential	$V_{CE} = -5V$	$I_C = -100\mu A$			0.8	mV
		$T_{A1} = 25^{\circ}C$	$T_{A2} = -55^{\circ}C$				
		$V_{CE} = -5V$	$I_C = -100\mu A$			1	
		$T_{A1} = 25^{\circ}C$	$T_{A2} = 125^{\circ}C$				

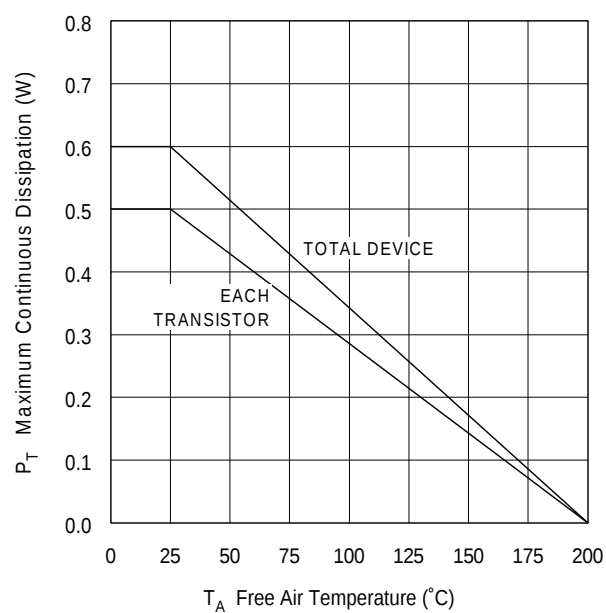
OPERATING CHARACTERISTICS ($T_{amb} = 25^{\circ}\text{C}$ unless otherwise stated)

Parameter		Test Conditions ¹	Min.	Typ.	Max.	Unit
INDIVIDUAL TRANSISTOR CHARACTERISTICS						
F	Spot Noise Figure	V _{CE} = −10V I _C = −100μA R _G = 3kΩ f = 100Hz Noise Bandwidth = 20Hz			7	dB
		V _{CE} = −10V I _C = −100μA R _G = 3kΩ f = 1kHz Noise Bandwidth = 200Hz			3	
		V _{CE} = −10V I _C = −100μA R _G = 3kΩ f = 10kHz Noise Bandwidth = 2kHz			2.5	
$\bar{F}$	Average Noise Figure	V _{CE} = −10V I _C = −100μA R _G = 3kΩ Noise Bandwidth = 15.7kHz See Note 3.			3.5	dB

NOTES

- 1) Terminals not under test are open circuited under all test conditions.
- 2) The lower of the two readings is taken as h_{FE1} .
- 3) Average noise figure is measured in an amplifier with response down 3dB at 10Hz and 10 kHz and a high frequency rolloff of 6dB / octave.

THERMAL INFORMATION





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