

# SILICON EPITAXIAL NPN TRANSISTOR

## BC109DCSM

- Dual Silicon Planar NPN Transistors
- Hermetic Ceramic Surface Mount Package
- Designed For Low Noise General Purpose Amplifiers, Driver Stages and Signal Processing Applications
- Screening Options Available



### ABSOLUTE MAXIMUM RATINGS (T<sub>A</sub> = 25°C unless otherwise stated)

			Each Side	Total Device
V <sub>CB0</sub>	Collector – Base Voltage		30V	
V <sub>CEO</sub>	Collector – Emitter Voltage		20V	
V <sub>EBO</sub>	Emitter – Base Voltage		5V	
I <sub>C</sub>	Continuous Collector Current		100mA	
I <sub>CM</sub>	Peak Collector Current		200mA	
P <sub>D</sub>	Total Power Dissipation at	T <sub>A</sub> = 25°C	300mW	500mW <sup>(1)</sup>
		Derate Above 25°C	2mW/°C	3.3mW/°C
		T <sub>C</sub> = 25°C	750mW	
		Derate Above 25°C	5mW/°C	
T <sub>J</sub>	Junction Temperature Range		-65 to +175°C	
T <sub>stg</sub>	Storage Temperature Range		-65 to +175°C	

### THERMAL PROPERTIES (Each Side)

Symbols	Parameters	Min.	Typ.	Max.	Units
R <sub>θJA</sub>	Thermal Resistance, Junction To Ambient			500	°C/W
R <sub>θJC</sub>	Thermal Resistance, Junction To Case			200	°C/W

#### Notes

(1) Total device power dissipation limited by package.

# SILICON EPITAXIAL NPN TRANSISTOR BC109DCSM

## ELECTRICAL CHARACTERISTICS (Each Side, $T_A = 25^\circ\text{C}$ unless otherwise stated)

Symbols	Parameters	Test Conditions	Min.	Typ	Max.	Units
$I_{CBO}$	Collector-Cut-Off Current	$V_{CB} = 20\text{V}$			15	nA
		$T_A = 150^\circ\text{C}$			15	$\mu\text{A}$
$V_{(BR)CBO}$	Collector-Base Breakdown Voltage	$I_C = 10\mu\text{A}$	30			V
$V_{(BR)CEO}^{(2)}$	Collector-Emitter Breakdown Voltage	$I_C = 10\text{mA}$	20			
$V_{(BR)EBO}$	Emitter-Base Breakdown Voltage	$I_E = 10\mu\text{A}$	5			
$V_{BE}^{(2)}$	Base-Emitter Voltage	$I_C = 2\text{mA}$ $V_{CE} = 5\text{V}$	550		700	mV
		$I_C = 10\text{mA}$ $V_{CE} = 5\text{V}$			700	
$V_{CE(sat)}^{(2)}$	Collector-Emitter Saturation Voltage	$I_C = 10\text{mA}$ $I_B = 0.5\text{mA}$			250	
		$I_C = 100\text{mA}$ $I_B = 5\text{mA}$			600	
$V_{BE(sat)}^{(2)}$	Base-Emitter Saturation Voltage	$I_C = 10\text{mA}$ $I_B = 0.5\text{mA}$		750		
		$I_C = 100\text{mA}$ $I_B = 5\text{mA}$		900		
$h_{FE}^{(2)}$	Forward-current transfer ratio	$I_C = 2\text{mA}$ $V_{CE} = 5\text{V}$	200		800	
		$I_C = 10\mu\text{A}$ $V_{CE} = 5\text{V}$	40			

## DYNAMIC CHARACTERISTICS

$f_T$	Transition Frequency	$I_C = 10\text{mA}$ $V_{CE} = 5\text{V}$ $f = 100\text{MHz}$	150			MHz
$h_{fe}$	Small-Signal Current Gain	$I_C = 2\text{mA}$ $V_{CE} = 5\text{V}$ $f = 1.0\text{KHz}$	240		900	
$C_{obo}$	Output Capacitance	$V_{CB} = 10\text{V}$ $I_E = 0$ $f = 1.0\text{MHz}$			6	$\mu\text{F}$
$C_{ibo}$	Input Capacitance	$V_{EB} = 0.5\text{V}$ $I_C = 0$ $f = 1.0\text{MHz}$		12		$\mu\text{F}$

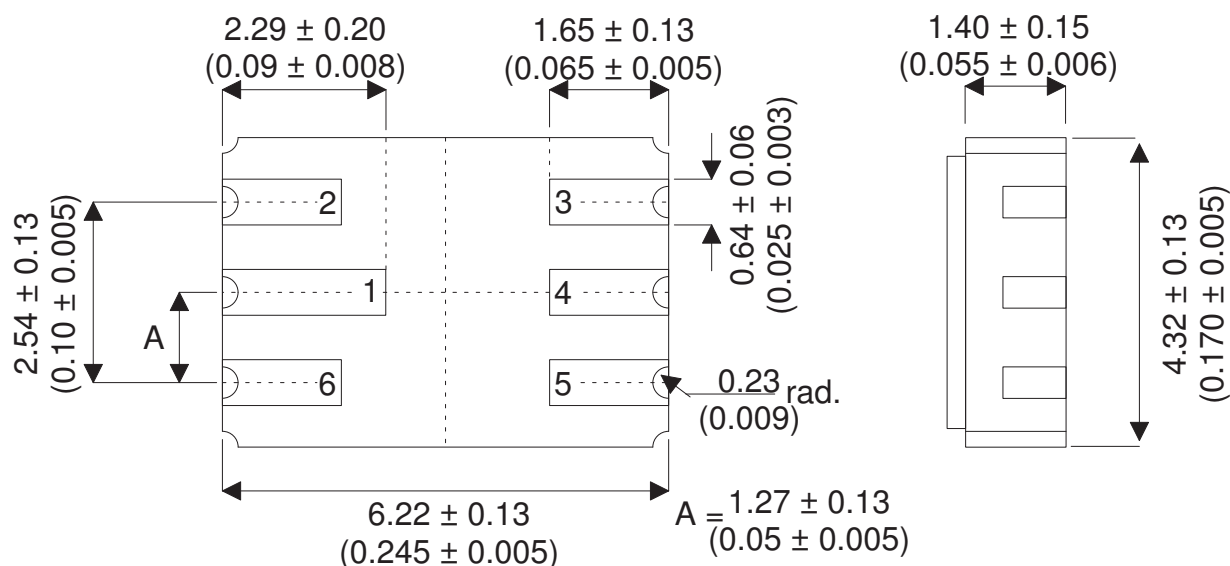
### Notes

(2) Pulse Width  $\leq 300\mu\text{s}$ ,  $\delta \leq 2\%$

# SILICON EPITAXIAL NPN TRANSISTOR BC109DCSM

## MECHANICAL DATA

Dimensions in mm (inches)



### LCC2 (MO-041BB)

#### 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