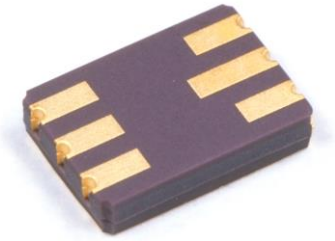
SILICON NPN DUAL TRANSISTORS

2N3904DCSM



Features:

- Hermetic Ceramic Surface Mount Package
- Designed For General Purpose and Switching Applications
- Screening Option Available

Absolute Maximum Ratings (T_A = 25°C unless otherwise noted)

			Each Side	Total Device
V_{CBO}	Collector – Base Voltage		60V	
V_{CEO}	Collector – Emitter Voltage		40V	
V_{EBO}	Emitter – Base Voltage		6V	
I_C	Collector Current		200mA	
P_D	Total Power Dissipation at	T_A= 25°C	500mW	600mW(1)
		Derate Above 25°C	2.86mW/°C	3.43mW/°C
T_J	Junction Temperature Range		-55 to +200°C	
T_{stg}	Storage Temperature Range		-55 to +200°C	

Thermal Properties (Each Side)

$R_{\Theta JA}$	Thermal Resistance Junction to Ambient	Max. 350°C/W

Notes
(1) Total device power dissipation limited by package.

Semelab Welwyn
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Electrical Specifications

Electrical Characteristics (Each Side, T_A = 25° C unless otherwise noted)

SYMBOL	PARAMETER	TEST CONDITIONS		MIN	TYP	MAX	UNITS
$V_{(BR)CEO}$ [2]	Collector-Emitter Breakdown Voltage	I_C = 1.0mA	I_B = 0	40			V
$V_{(BR)CBO}$	Collector-Base Breakdown Voltage	I_C = 10µA	I_E = 0	60			V
$V_{(BR)EBO}$	Emitter-Base Breakdown Voltage	I_E = 10µA	I_C = 0	6			V
I_{CEX}	Collector-Emitter Cut-off Current	V_{CE} = 30V	V_{EB} = 3V			50	nA
$V_{CE(sat)}$ [2]	Collector-Emitter Saturation Voltage	I_C = 10mA	I_B = 1.0mA			0.2	V
		I_C = 50mA	I_B = 5mA			0.3	V
$V_{BE(sat)}$ [2]	Collector-Base Saturation Voltage	I_C = 10mA	I_B = 1.0mA	0.65		0.85	V
		I_C = 50mA	I_B = 5mA			0.95	V
h_{FE} [2]	DC Current Gain	V_{CE} = 1.0V	I_C = 0.1mA	40			
		V_{CE} = 1.0V	I_C = 1.0mA	70			
		V_{CE} = 1.0V	I_C = 10mA	100		300	
		V_{CE} = 1.0V	I_C = 50mA	60			
		V_{CE} = 1.0V	I_C = 100mA	30			

Notes
(2) Pulse Width ≤ 380us, δ ≤ 2%

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Dynamic Characteristics (Each Side, T_A = 25° C unless otherwise noted)

SYMBOL	PARAMETER	TEST CONDITIONS	MIN	TYP	MAX	UNITS
f_T	Transition Frequency	V_{CE} = 20V I_C = 10mA f = 100MHz	250	300		MHz
C_{obo}	Output Capacitance	V_{CB} = 5V I_E = 0 f = 1.0MHz			4	pF
C_{ibo}	Input Capacitance	V_{BE} = 0.5V I_C = 0 f = 1.0MHz			8	pF
h_{ie} (3)	Input Impedance	V_{CE} = 20V I_C = 1.0mA f = 1.0KHz	1.0		10	KΩ
h_{oe} (3)	Output Admittance		1.0		40	µS
h_{re} (3)	Voltage Feedback Ratio		0.5		8	x 10^{-4}
h_{fe}	Small Signal Current Gain		100		400	
N_F (3)	Noise Figure	V_{CE} = 5V I_C = 100µA f = 1.0KHz R_S = 1.0KΩ			5	dB
t_d	Delay Time	V_{CC} = 3V I_C = 10mA I_{B1} = 1.0mA			35	ns
t_r	Rise Time				35	ns
t_s	Storage Time	V_{CC} = 3V I_C = 10mA I_{B1} = -I_{B2} = 1 .0mA			200	ns
t_f	Fall Time				50	ns

Notes
(3) By design only, not a production test

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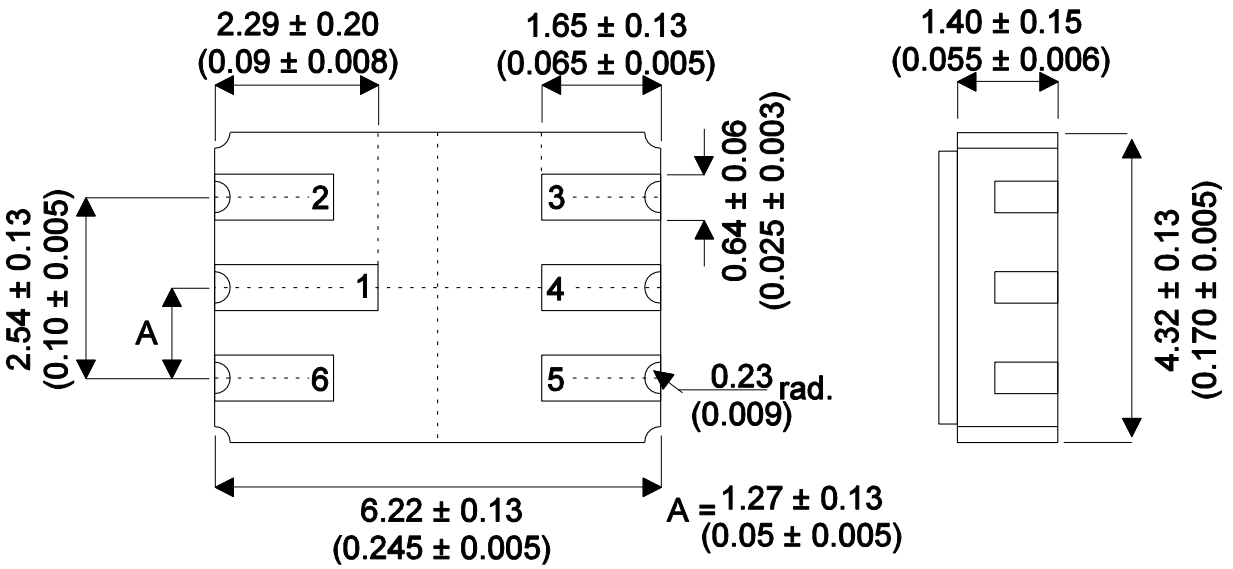
Mechanical Data

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

PART NUMBER VARIANTS

Part Number Reference	Termination Finish[i]	SML ROHS
2N3904DCSM	Gold (Au)	G4[ii]

Notes:

i. Other lead finish options available. Specify lead finish requirements at point of order.

ii. G4 = e4 as defined in J-STD-609 2nd Level Interconnect Category.

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