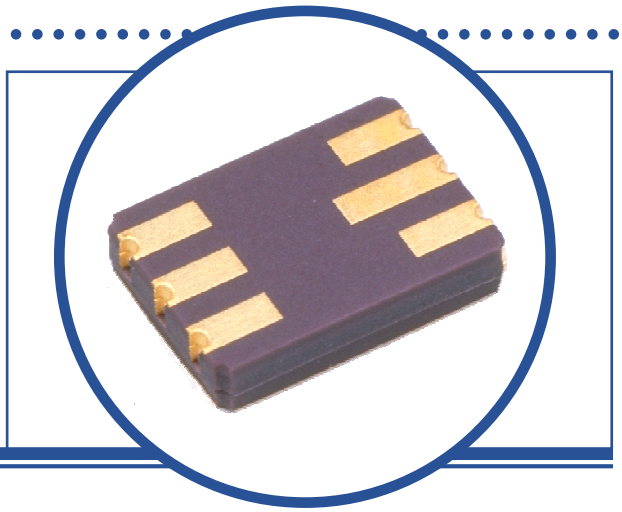
SILICON DUAL MATCHED NPN TRANSISTORS

TT electronics
Semelab Limited

2N2920ADCSM

- Dual Silicon NPN Matched Transistors
- Hermetic Ceramic Surface Mount Package
- Designed For Low Noise, Differential Amplifier Applications.
- Screening Options Available



ABSOLUTE MAXIMUM RATINGS (Each Side, T_A = 25°C unless otherwise stated)

			Each Side	Total Device
V_{CBO}	Collector – Base Voltage		60V	
V_{CEO}	Collector – Emitter Voltage		60V	
V_{EBO}	Emitter – Base Voltage		6V	
I_C	Continuous Collector Current		30mA	
P_D	Total Power Dissipation at	T_A = 25°C	300mW	500mW (1)
		Derate Above 25°C	1.71mW/°C	2.86mW/°C
T_J	Junction Temperature Range		-65 to +200°C	
T_{stg}	Storage Temperature Range		-65 to +200°C	

THERMAL PROPERTIES

Symbols	Parameters	Max.	Units
$R_{\theta JA}$	Each Side - Thermal Resistance, Junction To Ambient	583.3	°C/W
$R_{\theta JA}$ (1)	Total Device - Thermal Resistance, Junction To Ambient	350	°C/W

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

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ELECTRICAL CHARACTERISTICS (Each Side , T_A = 25°C unless otherwise stated)

Symbols	Parameters	Test Conditions		Min.	Typ.	Max.	Units
$V_{(BR)CBO}$	Collector-Base Breakdown Voltage	I_C = 10µA	I_E = 0	60			V
$V_{(BR)CEO}$ (2)	Collector-Emitter Breakdown Voltage	I_C = 10mA	I_B = 0	60			
$V_{(BR)EBO}$	Emitter-Base Breakdown Voltage	I_E = 10µA	I_C = 0	6			
I_{CEO}	Collector Cut-Off Current	V_{CE} = 5V				2	nA
I_{CBO}	Collector Cut-Off Current	V_{CB} = 45V				2	
			T_A = 150°C			10	µA
I_{EBO}	Emitter Cut-Off Current	V_{EB} = 5V				2	nA
h_{FE}	Forward-current transfer ratio	I_C = 10µA	V_{CE} = 5V	150		600	
			T_A = -55°C	50			
		I_C = 100µA	V_{CE} = 5V	225			
		I_C = 1.0mA	V_{CE} = 5V	300			
$V_{CE(sat)}$ (2)	Collector-Emitter Saturation Voltage	I_C = 1.0mA	I_B = 0.1mA			0.35	V
$V_{BE(sat)}$ (2)	Base-Emitter Saturation Voltage	I_C = 1.0mA	I_B = 0.1mA	0.5		1.0	

ELECTRICAL MATCHING CHARACTERISTICS (T_A = 25°C unless otherwise stated)

Symbols	Parameters	Test Conditions		Min.	Typ	Max.	Units
$\frac{h_{FE1}}{h_{FE2}}$	Forward-current transfer ratio (gain ratio)	I_C = 100µA	V_{CE} = 5V	0.9		1.0	
			T_A = -55°C	0.85		1.18	
			T_A = 125°C	0.85		1.18	
$\lvert V_{BE1}-V_{BE2}\rvert$	Base-Emitter Voltage Differential	I_C = 10µA	V_{CE} = 5V			2	mV
		I_C = 100µA	V_{CE} = 5V			1.5	
		I_C = 1.0mA	V_{CE} = 5V			2	
$\lvert\Delta(V_{BE1}-V_{BE2})\Delta T_A\rvert$ (3)	Base-Emitter Voltage Differential Change Due To Temperature	I_C = 100µA, T_{A1} = -55°C	V_{CE} = 5V, T_{A2} = 25°C			0.4	
		I_C = 100µA, T_{A1} = 25°C	V_{CE} = 5V, T_{A2} = 125°C			0.5	

Notes
(2) Pulse Width ≤ 300us, δ ≤ 2%
(3) By design only, not a production test

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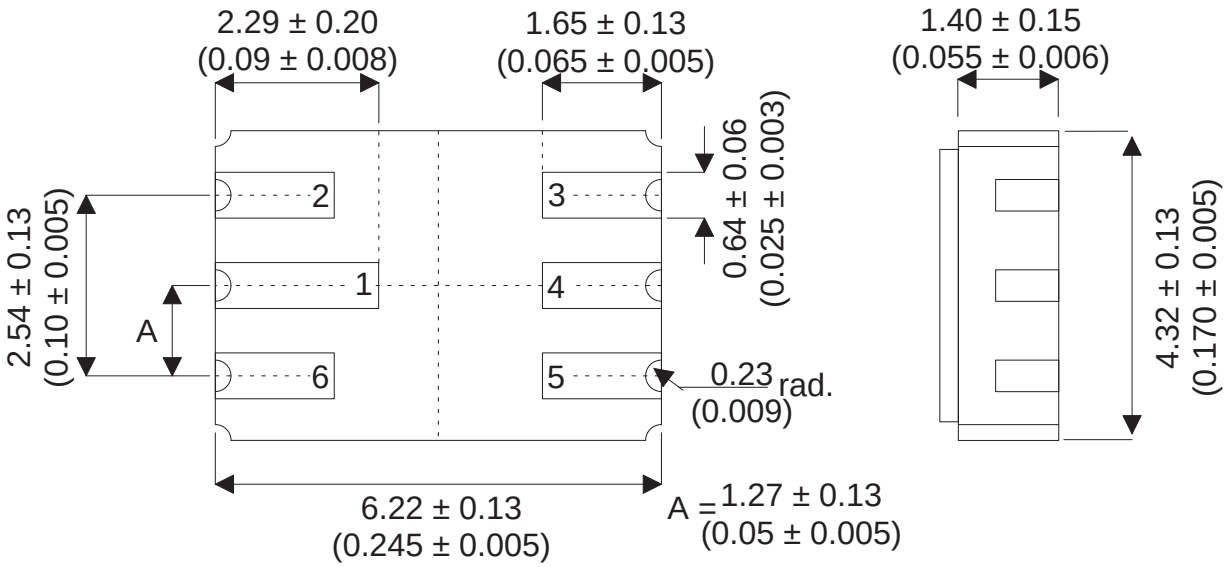
DYNAMIC CHARACTERISTICS (Each Side , T_A = 25°C unless otherwise stated)

Symbols	Parameters	Test Conditions		Min.	Typ.	Max.	Units
f_T	Transition Frequency	I_C = 500µA V_{CE} = 5V f = 20MHz		60			MHz
C_{obo}	Output Capacitance	V_{CB} = 5V I_E = 0 f = 1.0MHz				6	pF
h_{oe} (3)	Output Admittance	I_C = 1.0mA V_{CE} = 5V f = 1.0KHz				40	µmhos
h_{ie} (3)	Input Impedance			2		24	KΩ
h_{re} (3)	Reverse Voltage Ratio					800	$x10^{-6}$
N_F (3)	Spot Noise Figure	V_{CE} = 5V I_C = 10µA R_G = 10KΩ	f=1.0KHz BW=200Hz			3	dB
	Wide-Band Noise Figure		f=10Hz to 15.7KHz			3	

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

MECHANICAL DATA

Dimensions in mm (inches)



LCC2 (MO-041BB)

Underside View

Pad 1 – Collector 1
Pad 2 – Base 1
Pad 3 – Base 2
Pad 4 – Collector 2
Pad 5 – Emitter 2
Pad 6 – Emitter 1