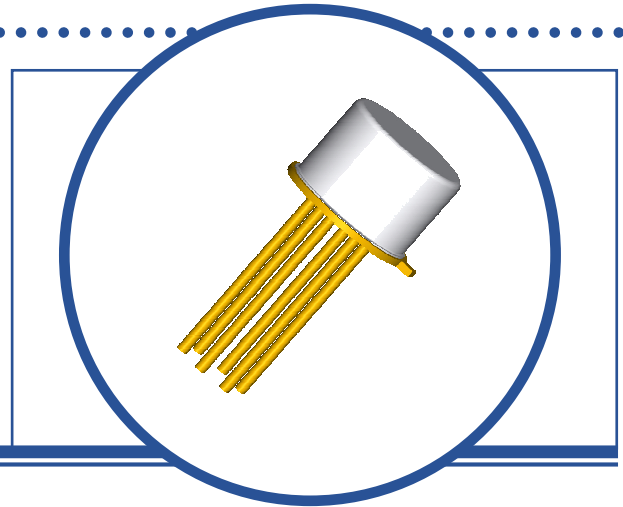


DUAL MATCHED NPN SILICON TRANSISTOR

2N2060 / 2N2060A

- Matched Dual NPN Transistors
- Low Power
- Hermetically Sealed TO-77 Metal Package
- High Reliability Screening Options Available



ABSOLUTE MAXIMUM RATINGS ($T_A = 25^\circ\text{C}$ unless otherwise stated)

V_{CE0}	Collector – Emitter Voltage	60V	
V_{CER}	Collector – Emitter Voltage	80V	
V_{CBO}	Collector – Base Voltage	100V	
V_{EBO}	Emitter – Base Voltage	7V	
I_C	Continuous Collector Current	500mA	
P_D	Total Power Dissipation at $T_A = 25^\circ\text{C}$ Derate Above 25°C $T_C = 25^\circ\text{C}$ Derate Above 25°C	Per Side	Total Device
		540 mW	600 mW
		3.08 mW/ $^\circ\text{C}$	3.48 mW/ $^\circ\text{C}$
		1.5W	2.12W
T_J	Junction Temperature Range	-65 to +200 $^\circ\text{C}$	
		T_{stg}	Storage Temperature Range

Semelab Limited 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.



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DUAL MATCHED NPN SILICON TRANSISTOR 2N2060 / 2N2060A



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

Symbols	Parameters	Test Conditions	Min	Typ	Max	Units
I_{CBO}	Collector-Cut-Off Current	$V_{CB} = 80\text{V}$ $I_E = 0$			0.002	μA
		$T_A = 150^\circ\text{C}$			10	
I_{EBO}	Emitter Cut-off Current	$V_{BE} = 5\text{V}$ $I_C = 0$			2.0	nA
$V_{(BR)CBO}$	Collector-Base Breakdown Voltage	$I_C = 100\mu\text{A}$ $I_E = 0$	100			V
$V_{(BR)EBO}$	Emitter-Base Breakdown Voltage	$I_E = 100\mu\text{A}$ $I_C = 0$	7			
$V_{(BR)CER}^{(1)}$	Collector – Emitter Breakdown Voltage	$I_C = 100\text{mA}$ $R_{BE} \leq 10\Omega$	80			
$V_{(BR)CEO}^{(1)}$	Collector – Emitter Breakdown Voltage	$I_C = 30\text{mA}$ $I_B = 0$	60			
$V_{BE(sat)}$	Base-Emitter Saturation Voltage	$I_C = 50\text{mA}$ $I_B = 5\text{mA}$			0.9	
$V_{CE(sat)}$	Collector - Emitter Saturation Voltage	2N2060A $I_C = 50\text{mA}$ $I_B = 5\text{mA}$			0.6	
		2N2060 $I_C = 50\text{mA}$ $I_B = 5\text{mA}$			1.2	
H_{FE}	Forward-current transfer ratio	$I_C = 10\mu\text{A}$ $V_{CE} = 5\text{V}$	25		75	-
		$I_C = 100\mu\text{A}$ $V_{CE} = 5\text{V}$	30		90	
		$I_C = 1.0\text{mA}$ $V_{CE} = 5\text{V}$	40		120	
		$I_C = 10\text{mA}$ $V_{CE} = 5\text{V}$	50		150	

DYNAMIC CHARACTERISTICS

f_T	Current Gain Bandwidth Product	$I_C = 50\text{mA}$ $V_{CE} = 10\text{V}$ $f = 20\text{MHz}$	60			MHz
h_{fe}	Small-Signal Current Gain	$I_C = 1.0\text{mA}$ $V_{CE} = 5\text{V}$ $f = 1.0\text{KHz}$	50		150	-
$h_{ie}^{(3)}$	Input Impedance	$I_C = 1.0\text{mA}$ $V_{CE} = 5\text{V}$ $f = 1.0\text{KHz}$	1000		4000	Ω
$h_{ib}^{(3)}$	Input Impedance	$I_C = 1.0\text{mA}$ $V_{CB} = 10\text{V}$ $f = 1.0\text{KHz}$	20		30	
C_{obo}	Output Capacitance	$V_{CB} = 10\text{V}$ $I_E = 0$ $f = 1.0\text{MHz}$			15	pF
C_{ibo}	Input Capacitance	$V_{BE} = 0.5\text{V}$ $I_C = 0$ $f = 1.0\text{MHz}$			85	pF

Notes

- (1) Pulse Width $\leq 300\mu\text{s}$, $\delta \leq 2\%$
- (2) The lowest H_{FE} reading is taken as H_{FE1} for this ratio
- (3) Parameter by design only

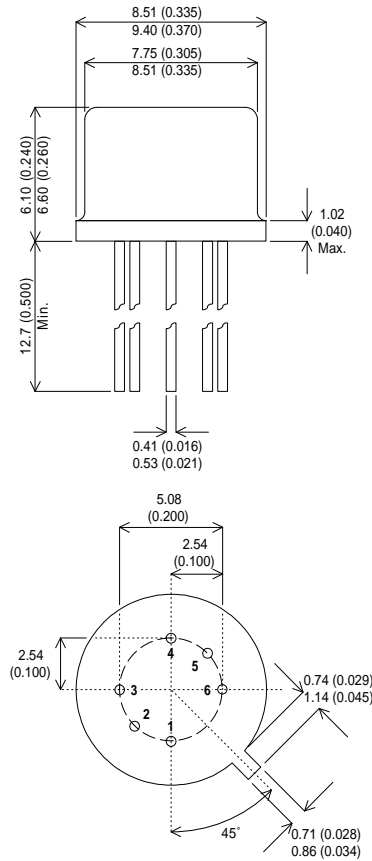
DUAL MATCHED NPN SILICON TRANSISTOR 2N2060 / 2N2060A

MATCHING CHARACTERISTICS ($T_A = 25^\circ\text{C}$ unless otherwise stated)

Symbols	Parameters	Test Conditions	Min	Typ	Max	Units
H_{FE1}/H_{FE2}	DC Current Gain Ratio ⁽²⁾	$I_C = 100\mu\text{A}$ $V_{CE} = 5\text{V}$	0.9		1.0	-
		$I_C = 1.0\text{mA}$ $V_{CE} = 5\text{V}$	0.9		1.0	
$ V_{BE1} - V_{BE2} $	Base – Emitter Voltage Differential	$I_C = 100\mu\text{A}$ $V_{CE} = 5\text{V}$			3.0	mV
		$I_C = 1.0\text{mA}$ $V_{CE} = 5\text{V}$			5.0	
$\Delta \frac{(V_{BE1} - V_{BE2})}{\Delta T}$	Base – Emitter Voltage Differential Change Due To Temperature	$I_C = 1.0\text{mA}$ $V_{CE} = 5\text{V}$ $T_A = -55^\circ\text{C}$ to $+125^\circ\text{C}$			5.0	$\mu\text{V}/^\circ\text{C}$

MECHANICAL DATA

Dimensions in mm (inches)



TO-77 (MO-002AF) METAL PACKAGE

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