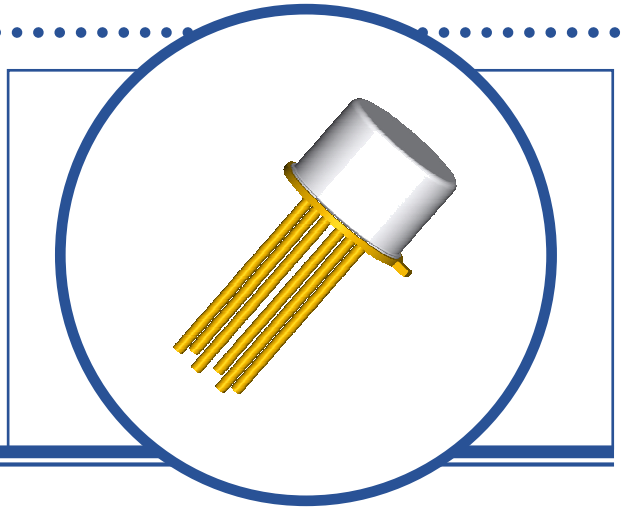
DUAL MATCHED NPN SILICON TRANSISTOR

TT electronics
Semelab Limited

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°C unless otherwise stated)

V_{CEO}	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	
			Per Side	Total Device
P_D	Total Power Dissipation at	T_A = 25°C	540 mW	600 mW
		Derate Above 25°C	3.08 mW/°C	3.48 mW/°C
		T_C = 25°C	1.5W	2.12W
		Derate Above 25°C	8.6 mW/°C	12.1 mW/°C
T_J	Junction Temperature Range		-65 to +200°C	
T_{stg}	Storage Temperature Range		-65 to +200°C	

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

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

DYNAMIC CHARACTERISTICS

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

Notes

(1) Pulse Width ≤ 300us, δ ≤ 2%

(2) The lowest H_{FE} reading is taken as H_{FE1} for this ratio

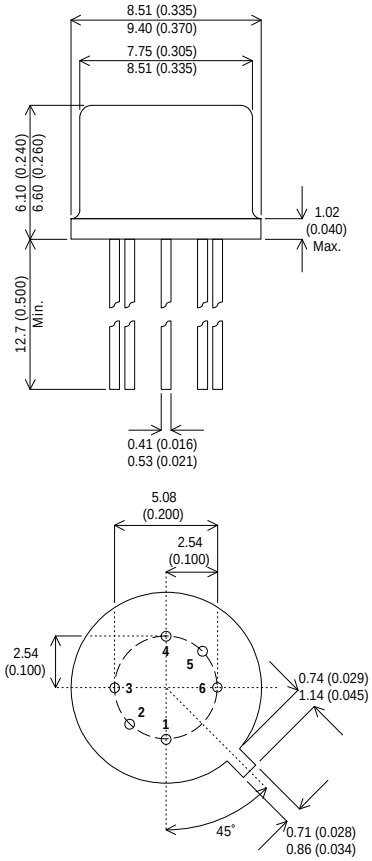
(3) Parameter by design only

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

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

MECHANICAL DATA

Dimensions in mm (inches)



TO-77 (MO-002AF) METAL PACKAGE

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