

## UNITIZED DUAL NPN SILICON TRANSISTOR

Qualified per MIL-PRF-19500/270

### Devices

2N2060  
2N2060L

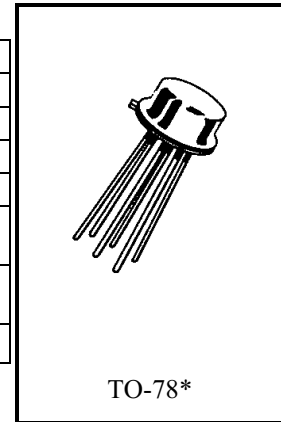
### Qualified Level

JAN  
JANTX  
JANTXV

### MAXIMUM RATINGS

Ratings		Symbol	2N2060		Unit
Collector-Emitter Voltage		$V_{CEO}$	60		Vdc
Collector-Base Voltage		$V_{CBO}$	100		Vdc
Emitter-Base Voltage		$V_{EBO}$	7.0		Vdc
Collector Current		$I_C$	500		mAdc
			One Section	Both Sections	
Total Power Dissipation	@ $T_A = +25^{\circ}\text{C}$ <sup>(1)</sup>	$P_T$	540	600	mW
	@ $T_C = +25^{\circ}\text{C}$ <sup>(2)</sup>		1.5	2.12	W
Operating & Storage Junction Temperature Range		$T_J, T_{stg}$	-65 to +200		$^{\circ}\text{C}$

- 1) Derate linearly 3.08 mW/ $^{\circ}\text{C}$  for  $T_A > 25^{\circ}\text{C}$  for one section, 3.48 mW/ $^{\circ}\text{C}$  for both sections  
 2) Derate linearly 8.6 mW/ $^{\circ}\text{C}$  for  $T_C > 25^{\circ}\text{C}$  for one section, 12.1 mW/ $^{\circ}\text{C}$  for both sections



\*See appendix A for package outline

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

Characteristics	Symbol	Min.	Max.	Unit
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#### OFF CHARACTERISTICS

Collector-Emitter Breakdown Voltage <sup>(3)</sup> $R_{BE} \leq 10 \Omega, I_C = 10 \text{ mAdc}$	$V_{(BR)CER}$	80		Vdc
Collector-Emitter Breakdown Voltage $I_C = 30 \text{ mAdc}$	$V_{(BR)CEO}$	60		Vdc
Collector-Base Cutoff Current $V_{CB} = 100 \text{ Vdc}$ $V_{CB} = 80 \text{ Vdc}$	$I_{CBO}$		10 2.0	$\mu\text{Adc}$ $\eta\text{Adc}$
Emitter-Base Cutoff Current $V_{EB} = 7.0 \text{ Vdc}$ $V_{EB} = 5.0 \text{ Vdc}$	$I_{EBO}$		10 2.0	$\mu\text{Adc}$ $\eta\text{Adc}$

**ELECTRICAL CHARACTERISTICS (con't)**

Characteristics	Symbol	Min.	Max.	Unit
<b>ON CHARACTERISTICS <sup>(3)</sup></b>				
Forward-Current Transfer Ratio I <sub>C</sub> = 10 μA <sub>dc</sub> , V <sub>CE</sub> = 5.0 V <sub>dc</sub> I <sub>C</sub> = 100 μA <sub>dc</sub> , V <sub>CE</sub> = 5.0 V <sub>dc</sub> I <sub>C</sub> = 1.0 mA <sub>dc</sub> , V <sub>CE</sub> = 5.0 V <sub>dc</sub> I <sub>C</sub> = 10 mA <sub>dc</sub> , V <sub>CE</sub> = 5.0 V <sub>dc</sub>	h <sub>FE</sub>	25 30 40 50	75 90 120 150	
Collector-Emitter Saturation Voltage I <sub>C</sub> = 50 mA <sub>dc</sub> , I <sub>B</sub> = 5.0 mA <sub>dc</sub>	V <sub>CE(sat)</sub>		0.3	V <sub>dc</sub>
Base-Emitter Saturation Voltage I <sub>C</sub> = 50 mA <sub>dc</sub> , I <sub>B</sub> = 5.0 mA <sub>dc</sub>	V <sub>BE(sat)</sub>		0.9	V <sub>dc</sub>

**DYNAMIC CHARACTERISTICS**

Common Emitter Small-Signal Short-Circuit Forward-Current Transfer ratio I <sub>C</sub> = 50 mA <sub>dc</sub> , V <sub>CE</sub> = 10 V <sub>dc</sub> , f = 20 MHz	h <sub>fe</sub>	3	25	
Small-Signal Short-Circuit Input Impedance I <sub>C</sub> = 1.0 mA <sub>dc</sub> , V <sub>CB</sub> = 5.0 V <sub>dc</sub> , f = 1.0 kHz	h <sub>ib</sub>	20	30	Ω
Small-Signal Short-Circuit Forward-Current Transfer Ratio I <sub>C</sub> = 1.0 mA <sub>dc</sub> , V <sub>CE</sub> = 5.0 V <sub>dc</sub> , f = 1.0 kHz	h <sub>fe</sub>	50	150	
Small-Signal Short-Circuit Input Impedance I <sub>C</sub> = 1.0 mA <sub>dc</sub> , V <sub>CE</sub> = 5.0 V <sub>dc</sub> , f = 1.0 kHz	h <sub>ie</sub>	1,000	4,000	Ω
Small-Signal Open-Circuit Output Admittance I <sub>C</sub> = 1.0 mA <sub>dc</sub> , V <sub>CE</sub> = 5.0 V <sub>dc</sub> , f = 1.0 kHz	h <sub>oe</sub>	0	16	μmhos
Input Capacitance V <sub>EB</sub> = 0.5 V <sub>dc</sub> , I <sub>E</sub> = 0, 100 kHz ≤ f ≤ 1.0 MHz	C <sub>ibo</sub>		85	pF
Output Capacitance V <sub>CB</sub> = 10 V <sub>dc</sub> , I <sub>E</sub> = 0, 100 kHz ≤ f ≤ 1.0 MHz	C <sub>obo</sub>		15	pF

(3)Pulse Test: Pulse Width 250 to 350μs, Duty Cycle ≤ 2.0%.

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