

2SA1020

Preferred Device

One Watt High Current PNP Transistor

Features

- Pb-Free Packages are Available*

MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Collector-Emitter Voltage	V_{CE}	50	Vdc
Collector-Base Voltage	V_{CB}	50	Vdc
Emitter-Base Voltage	V_{EB}	5.0	Vdc
Collector Current - Continuous	I_C	2.0	Adc
Total Power Dissipation @ $T_A = 25^\circ\text{C}$ Derate above 25°C	P_D	900 5.0	mW mW/ $^\circ\text{C}$
Total Power Dissipation @ $T_C = 25^\circ\text{C}$ Derate above 25°C	P_D	1.5 12	W mW/ $^\circ\text{C}$
Operating and Storage Junction Temperature Range	T_J, T_{stg}	-55 to +150	$^\circ\text{C}$

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	125	$^\circ\text{C/W}$
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	83.3	$^\circ\text{C/W}$

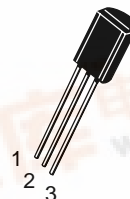
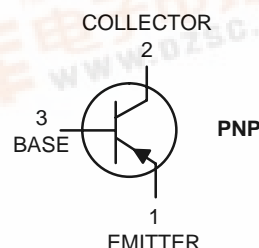
Stresses exceeding Maximum Ratings may damage the device. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect device reliability.



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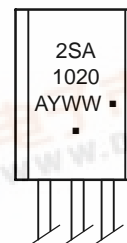
<http://onsemi.com>

VOLTAGE AND CURRENT ARE NEGATIVE FOR PNP TRANSISTORS



TO-92 (TO-226)
CASE 29-10
STYLE 14

MARKING DIAGRAM



A = Assembly Location
Y = Year
WW = Work Week
▪ = Pb-Free Package

(Note: Microdot may be in either location)

ORDERING INFORMATION

See detailed ordering and shipping information in the package dimensions section on page 2 of this data sheet.

Preferred devices are recommended choices for future use and best overall value.



*For additional information on our Pb-Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

2SA1020

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

Characteristic	Symbol	Min	Max	Unit
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OFF CHARACTERISTICS

Collector–Emitter Breakdown Voltage (Note 1) ($I_C = 10\text{ mA}$, $I_B = 0$)	$V_{(BR)CEO}$	50	–	Vdc
Collector Cutoff Current ($V_{CB} = 50\text{ Vdc}$, $I_E = 0$)	I_{CBO}	–	1.0	μAdc
Emitter Cutoff Current ($V_{EB} = 5.0\text{ V}$, $I_C = 0$)	I_{EBO}	–	1.0	μAdc

ON CHARACTERISTICS (Note 2)

DC Current Gain ($I_C = 500\text{ mA}$, $V_{CE} = 2.0\text{ V}$) ($I_C = 1.5\text{ A}$, $V_{CE} = 2.0\text{ V}$)	h_{FE}	70 40	240 –	–
Collector–Emitter Saturation Voltage ($I_C = 1.0\text{ A}$, $I_B = 50\text{ mA}$)	$V_{CE(sat)}$	–	0.5	Vdc
Base–Emitter Saturation Voltage ($I_C = 1.0\text{ A}$, $I_B = 50\text{ mA}$)	$V_{BE(sat)}$	–	1.2	Vdc

SMALL–SIGNAL CHARACTERISTICS

Current–Gain – Bandwidth Product (Note 3) ($I_C = 500\text{ mA}$, $V_{CE} = 2.0\text{ Vdc}$, $f = 100\text{ MHz}$)	f_T	100	–	MHz
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1. Pulse Test: Pulse Width $\leq 300\text{ }\mu\text{s}$, Duty Cycle = 2.0%.
2. Pulse Test: Pulse Width $\leq 300\text{ }\mu\text{s}$, Duty Cycle = 2.0%.
3. f_T is defined as the frequency at which $|h_{fe}|$ extrapolates to unity.

ORDERING INFORMATION

Device	Package	Shipping†
2SA1020	TO–92	5000 Units / Box
2SA1020G	TO–92 (Pb–Free)	
2SA1020RLRA	TO–92	2000 / Tape & Reel
2SA1020RLRAG	TO–92 (Pb–Free)	

†For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications Brochure, BRD8011/D.

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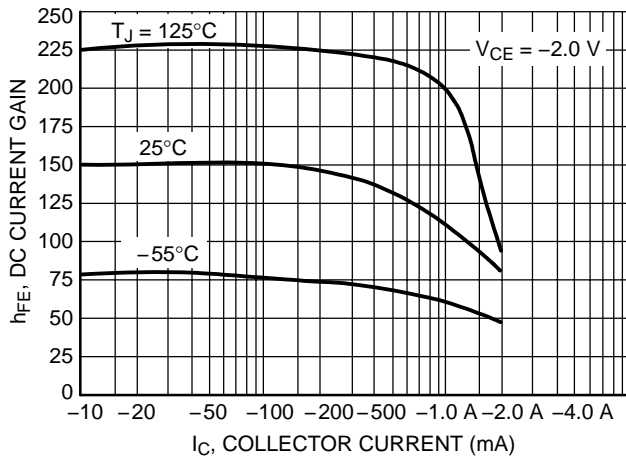


Figure 1. Typical DC Current Gain

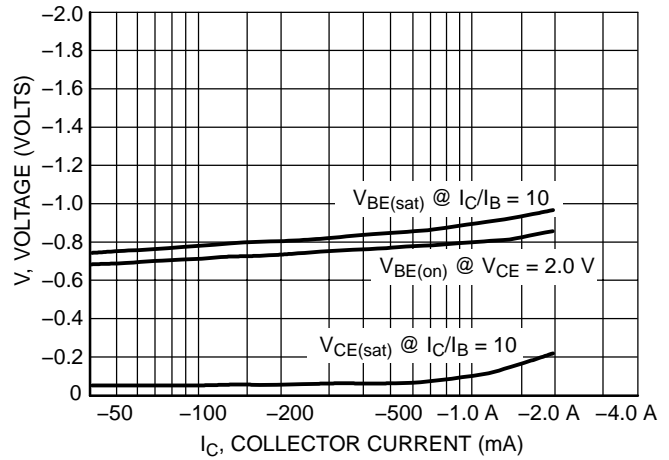


Figure 2. On Voltages

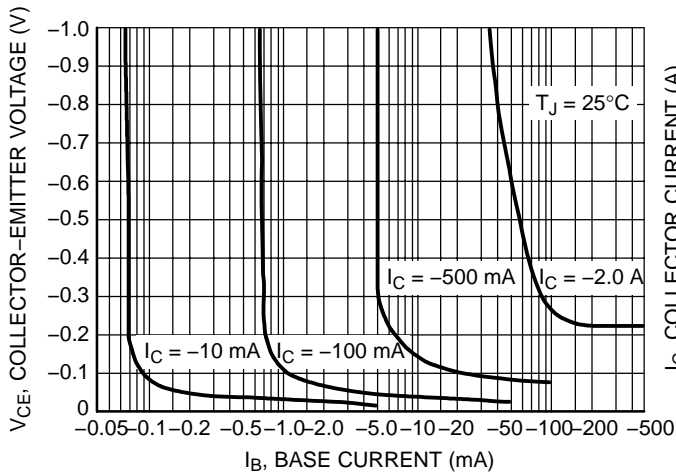


Figure 3. Collector Saturation Region

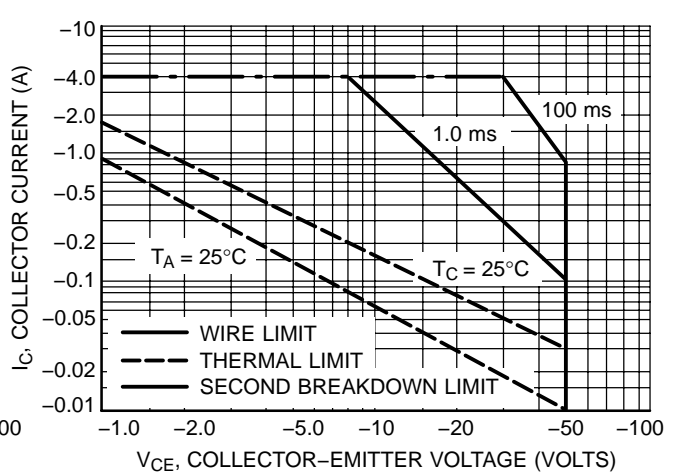
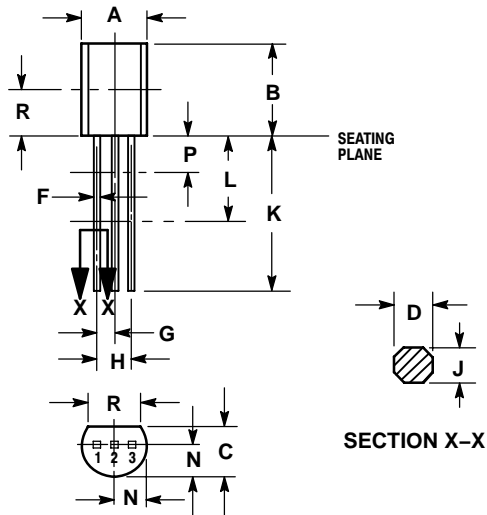


Figure 4. Safe Operating Area

2SA1020

PACKAGE DIMENSIONS

TO-92 (TO-226)
CASE 29-10
ISSUE AL




NOTES:

1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. CONTOUR OF PACKAGE BEYOND DIMENSION R IS UNCONTROLLED.
4. DIMENSION F APPLIES BETWEEN P AND L. DIMENSIONS D AND J APPLY BETWEEN L AND K MINIMUM. LEAD DIMENSION IS UNCONTROLLED IN P AND BEYOND DIMENSION K MINIMUM.

DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	0.175	0.205	4.44	5.21
B	0.290	0.310	7.37	7.87
C	0.125	0.165	3.18	4.19
D	0.018	0.021	0.457	0.533
F	0.016	0.019	0.407	0.482
G	0.045	0.055	1.15	1.39
H	0.095	0.105	2.42	2.66
J	0.018	0.024	0.46	0.61
K	0.500	---	12.70	---
L	0.250	---	6.35	---
N	0.080	0.105	2.04	2.66
P	---	0.100	---	2.54
R	0.135	---	3.43	---

STYLE 14:

1. EMITTER
2. COLLECTOR
3. BASE

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