

## Features

- Halogen Free. "Green" Device (Note 1)
- AEC-Q101 Qualified
- Moisture Sensitivity Level 1
- Epoxy Meets UL 94 V-0 Flammability Rating
- Lead Free Finish/RoHS Compliant ("P" Suffix Designates RoHS Compliant. See Ordering Information)

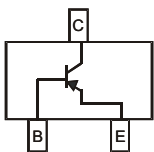
## Maximum Ratings

- Operating Junction Temperature Range: -55°C to +150°C
- Storage Temperature Range: -55°C to +150°C
- Thermal Resistance: 417°C/W Junction to Ambient

Parameter	Symbol	Rating	Unit
Collector-Base Voltage	$V_{CBO}$	-40	V
Collector-Emitter Voltage	$V_{CEO}$	-40	V
Emitter-Base Voltage	$V_{EBO}$	-5	V
Collector Current	$I_C$	-200	mA
Power Dissipation	$P_D$	300	mW

Note: 1. Halogen free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.

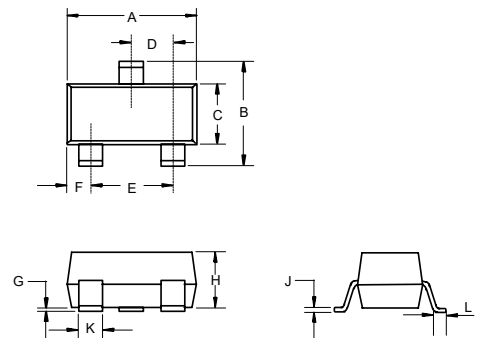
## Internal Structure



Marking: 2A

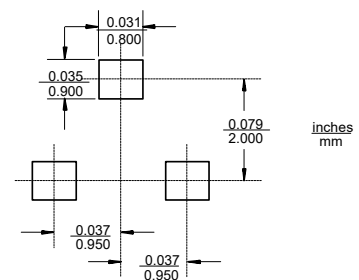
# PNP General Purpose Amplifier

## SOT-23



DIM	INCHES		MM		NOTE
	MIN	MAX	MIN	MAX	
A	0.110	0.120	2.80	3.04	
B	0.083	0.104	2.10	2.64	
C	0.047	0.055	1.20	1.40	
D	0.034	0.041	0.85	1.05	
E	0.067	0.083	1.70	2.10	
F	0.018	0.024	0.45	0.60	
G	0.0004	0.006	0.01	0.15	
H	0.035	0.043	0.90	1.10	
J	0.003	0.007	0.08	0.18	
K	0.014	0.020	0.35	0.51	
L	0.007	0.020	0.20	0.50	

## Suggested Solder Pad Layout

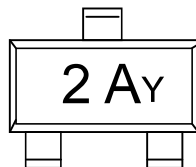


**Electrical Characteristics @ 25°C Unless Otherwise Specified**

Parameter	Symbol	Min	Typ	Max	Units	Conditions
Collector-Base Breakdown Voltage	$V_{(BR)CBO}$	-40			V	$I_C=-10\mu A, I_E=0$
Collector-Emitter Breakdown Voltage <sup>(2)</sup>	$V_{(BR)CEO}$	-40			V	$I_C=-1mA, I_B=0$
Emitter-Base Breakdown Voltage	$V_{(BR)EBO}$	-5			V	$I_E=-10\mu A, I_C=0$
Collector Cutoff Current	$I_{CBO}$			-100	nA	$V_{CB}=-40V, I_E=0$
Collector Cutoff Current	$I_{CEX}$			-50	nA	$V_{CE}=-30V, V_{BE}=-3V$
Emitter-Base Cutoff Current	$I_{EBO}$			-100	nA	$V_{EB}=-5V, I_C=0$
DC Current Gain <sup>(2)</sup>	$h_{FE1}$	100		300		$V_{CE}=-1V, I_C=-10mA$
	$h_{FE2}$	60				$V_{CE}=-1V, I_C=-50mA$
	$h_{FE3}$	30				$V_{CE}=-1V, I_C=-100mA$
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$			-0.25	V	$I_C=-10mA, I_B=-1mA$
				-0.4	V	$I_C=-50mA, I_B=-5mA$
Base-Emitter Saturation Voltage	$V_{BE(sat)}$	-0.65		-0.85	V	$I_C=-10mA, I_B=-1mA$
				-0.95	V	$I_C=-50mA, I_B=-5mA$
Transition Frequency	$f_T$	250			MHz	$V_{CE}=-20V, I_C=-10mA, f=100MHz$
Output Capacitance	$C_{obo}$			4.5	pF	$V_{CB}=-5V, I_E=0, f=1MHz,$
Input Capacitance	$C_{ibo}$			10	pF	$V_{BE}=-0.5V, I_C=0, f=1MHz,$
Noise Figure	NF			4.0	dB	$V_{CE}=-5V, I_C=-100\mu A, R_S=1K\Omega,$ $f=1.0KHz$ )
Delay Time	$t_d$			35	ns	$V_{CC}=-3V, I_C=-10mA$
Rise Time	$t_r$			35	ns	$V_{BE}=-0.5V, I_{B1}=-1mA$
Storage Time	$t_s$			225	ns	$V_{CC}=-3V, I_C=-10mA$
Fall Time	$t_f$			75	ns	$I_{B1}=I_{B2}=-1mA$

 Note: 2. Pulse Width  $\leq 300\mu s$ , Duty Cycle  $\leq 2.0\%$

## Marking Information



2A = Product Type Marking Code

Y=Date Code Marking

Date Code Key (2 years a cycle)

Year	2019											
Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Code	J	O	L	C	K	B	P	D	M	E	G	F

Year	2020											
Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Code	W	N	Y	T	R	H	A	I	U	X	Z	S

**Curve Characteristics**

Fig. 1 - Static Characteristics

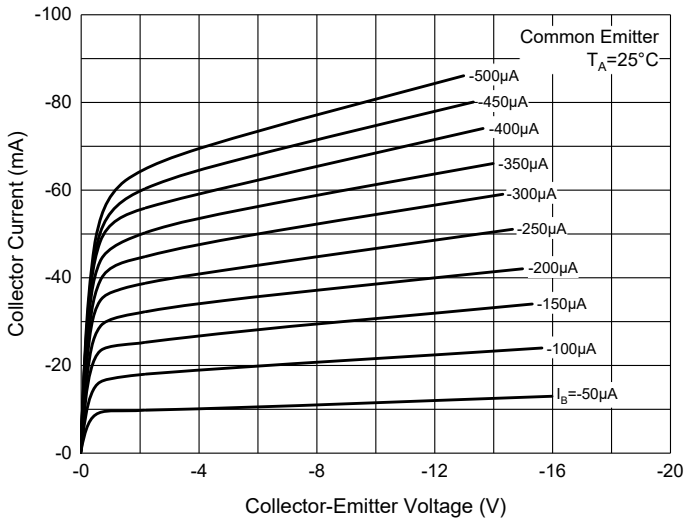


Fig. 2 - DC Current Gain Characteristics

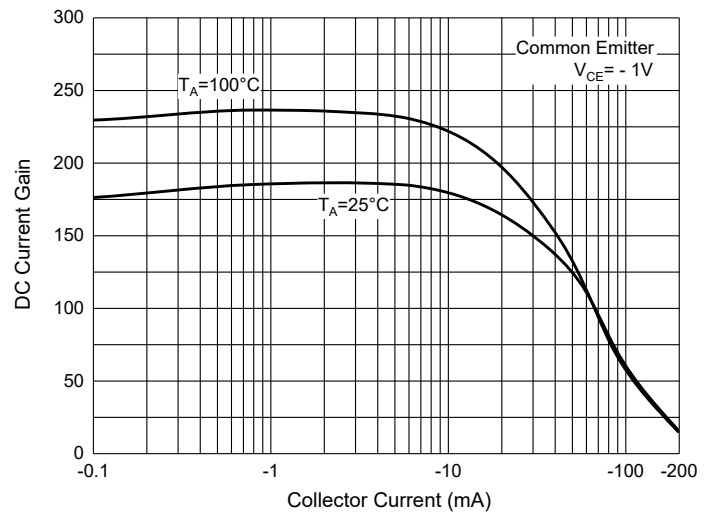


Fig. 3 - Collector-Emitter Saturation Voltage Characteristics

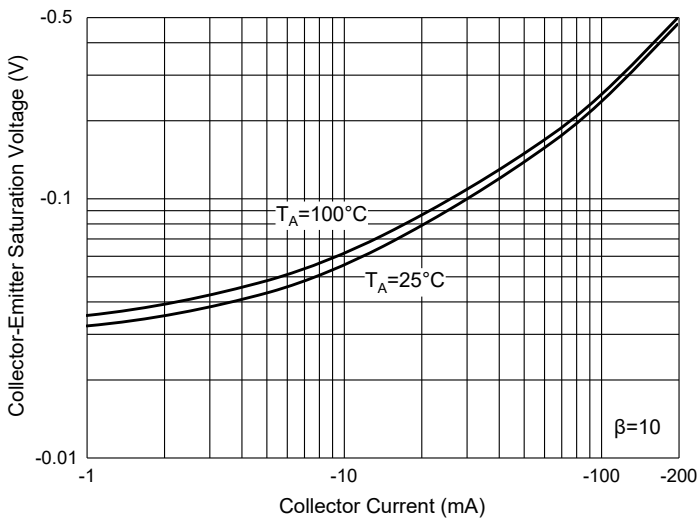


Fig. 4 - Base-Emitter Saturation Voltage Characteristics

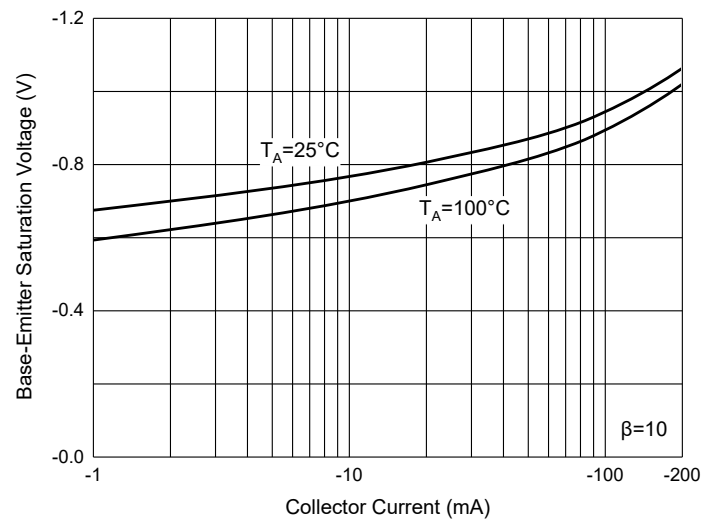


Fig. 5 - Base-Emitter Voltage Characteristics

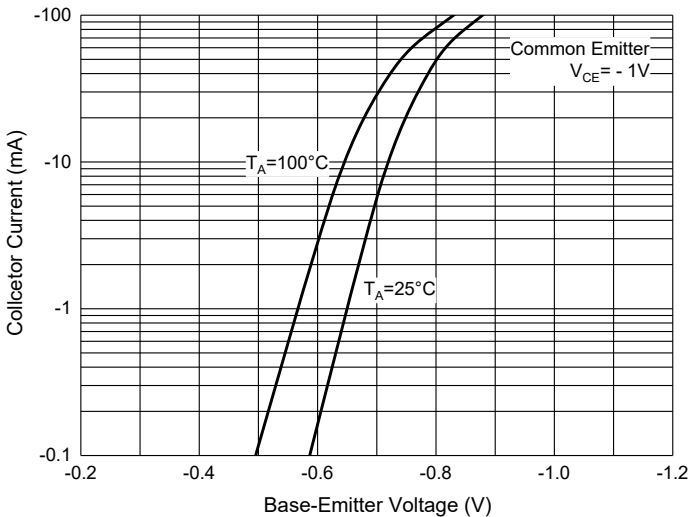
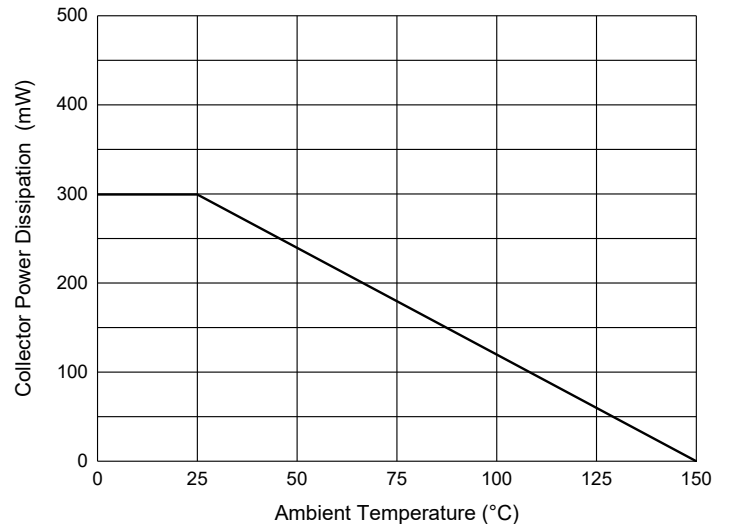


Fig. 6 - Collector Power Derating Curve



## Ordering Information

Device	Packing
Part Number-TP	Tape&Reel: 3Kpcs/Reel

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