

## Features

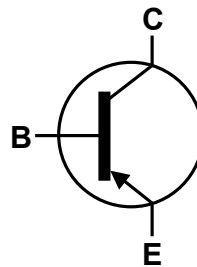
- $BV_{CEO} > -50V$
- $I_C = -2A$  high Continuous Collector Current
- High Gain Holds up
- **Totally Lead-Free & Fully RoHS compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **Qualified to AEC-Q101 Standards for High Reliability**

## Mechanical Data

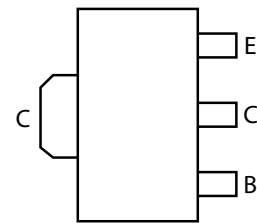
- Case: SOT89
- Case material: Molded Plastic. "Green" Molding Compound.
- UL Flammability Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish - Matte Tin Plated Leads, Solderable per MIL-STD-202, Method 208
- Weight: 0.052 grams (Approximate)



Top View



Device Symbol

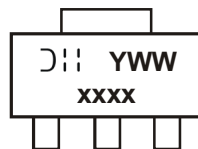

 Top View  
Pin Out

## Ordering Information (Notes 4)

Product	Marking	Reel size (inches)	Tape width (mm)	Quantity per reel
2DA12130-13	P25X	13	12	2,500
2DA1213Y-13	P25Y	13	12	2,500
2DA1213Y-13R	P25Y	13	12	4,000

- Notes:
1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant.
  2. See [http://www.diodes.com/quality/lead\\_free.html](http://www.diodes.com/quality/lead_free.html) for more information about Diodes Incorporated's definitions of Halogen- and Antimony-free, "Green" and Lead-free.
  3. Halogen- and Antimony-free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
  4. For packaging details, go to our website at <http://www.diodes.com/products/packages.html>

## Marking Information



xxxx = Product Type Marking Code:  
 P25X = 2DA12130  
 P25Y = 2DA1213Y  
 YWW = Date Code Marking  
 Y = Last digit of year (ex: 1 = 2011)  
 WW = Week code 01 - 53

**Maximum Ratings** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

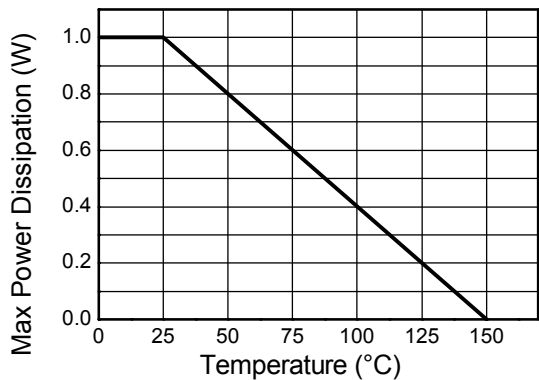
Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V <sub>CBO</sub>	-50	V
Collector-Emitter Voltage	V <sub>CEO</sub>	-50	V
Emitter-Base Voltage	V <sub>EB0</sub>	-6	V
Continuous Collector Current	I <sub>C</sub>	-2	A
Peak Pulse Current	I <sub>CM</sub>	-2.5	A
Base Current	I <sub>B</sub>	-500	mA

**Thermal Characteristics** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

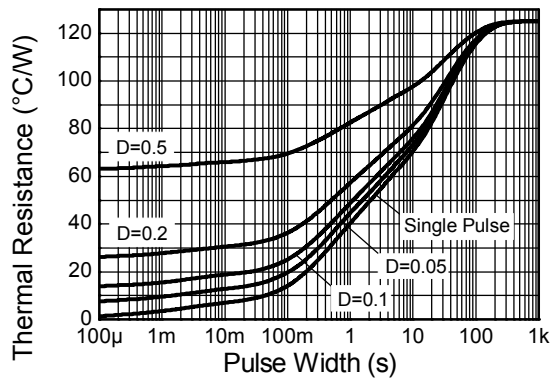
Characteristic	Symbol	Value	Unit
Power Dissipation (Note 5)	P <sub>D</sub>	1	W
Thermal Resistance, Junction to Ambient (Note 5)	R <sub>θJA</sub>	125	°C/W
Thermal Resistance, Junction to Leads (Note 6)	R <sub>θJL</sub>	18.3	°C/W
Operating and Storage Temperature Range	T <sub>J</sub> , T <sub>STG</sub>	-55 to +150	°C

- Notes: 5. For a device surface mounted on 15mm x 15mm x 0.6mm FR4 PCB with high coverage of single sided 1 oz copper, in still air conditions; the device is measured when operating in steady state condition.  
6. Thermal resistance from junction to solder-point (on the exposed collector pad).

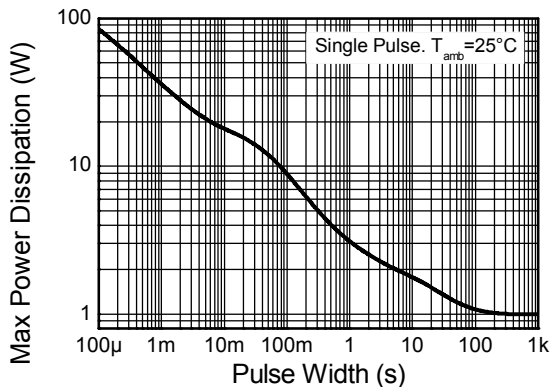
**Thermal Characteristics and Derating Information**



**Derating Curve**



**Transient Thermal Impedance**



**Pulse Power Dissipation**

**Electrical Characteristics** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	BV <sub>CBO</sub>	-50	—	—	V	I <sub>C</sub> = -100μA
Collector-Emitter Breakdown Voltage (Note 7)	BV <sub>CEO</sub>	-50	—	—	V	I <sub>C</sub> = -10mA
Emitter-Base Breakdown Voltage	BV <sub>EBO</sub>	-6	—	—	V	I <sub>E</sub> = -100μA
Collector Cut-off Current	I <sub>CBO</sub>	—	—	-100	nA	V <sub>CB</sub> = -50V
Emitter Cut-off Current	I <sub>EBO</sub>	—	—	-100	nA	V <sub>EB</sub> = -5V
DC Current Gain (Note 8)	2DA12130	70	—	140	—	I <sub>C</sub> = -500mA, V <sub>CE</sub> = -2V
	2DA1213Y	120	—	240		I <sub>C</sub> = -500mA, V <sub>CE</sub> = -2V
	2DA12130, 2DA1213Y	20	—	—		I <sub>C</sub> = -2A, V <sub>CE</sub> = -2V
Collector-Emitter Saturation Voltage (Note 7)	V <sub>CE(sat)</sub>	—	—	-0.5	V	I <sub>C</sub> = -1A, I <sub>B</sub> = -50mA
Base-Emitter Turn-On Voltage (Note 7)	V <sub>BE(sat)</sub>	—	—	-1.2	V	I <sub>C</sub> = -1A, I <sub>B</sub> = -50mA
Transition Frequency	f <sub>T</sub>	—	160	—	MHz	I <sub>C</sub> = -100mA, V <sub>CE</sub> = -2V, f = 100MHz
Output Capacitance	C <sub>Obo</sub>	—	17	—	pF	V <sub>CB</sub> = -10V, I <sub>E</sub> = 0, f = 1MHz
Turn-On Time	t <sub>on</sub>	—	25	—	ns	V <sub>CE</sub> = -2V, I <sub>C</sub> = -1A, I <sub>B1</sub> = -I <sub>B2</sub> = -50mA
Storage Time	t <sub>(s)</sub>	—	130	—	ns	
Fall Time	t <sub>(f)</sub>	—	12	—	ns	

Note: 7. Measured under pulsed conditions. Pulse width ≤ 300μs. Duty cycle ≤ 2%.

**Typical Electrical Characteristics** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

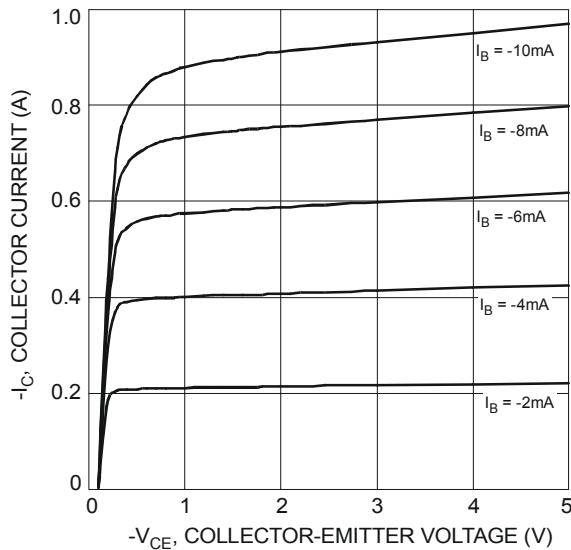


Figure 1 Typical Collector Current vs. Collector-Emitter Voltage

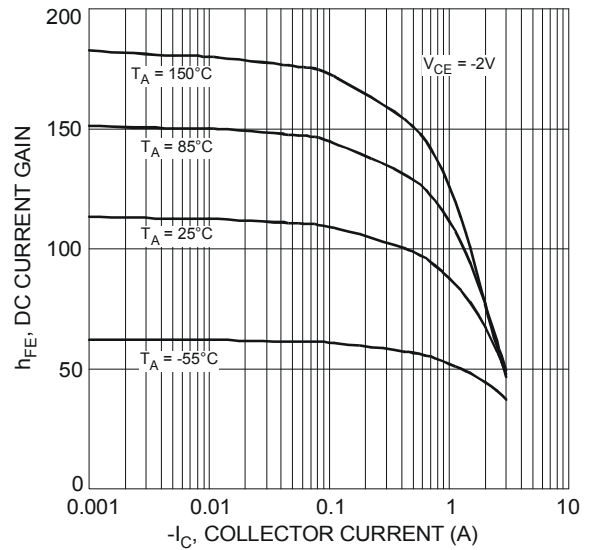


Figure 2 Typical DC Current Gain vs. Collector Current (2DA12130)

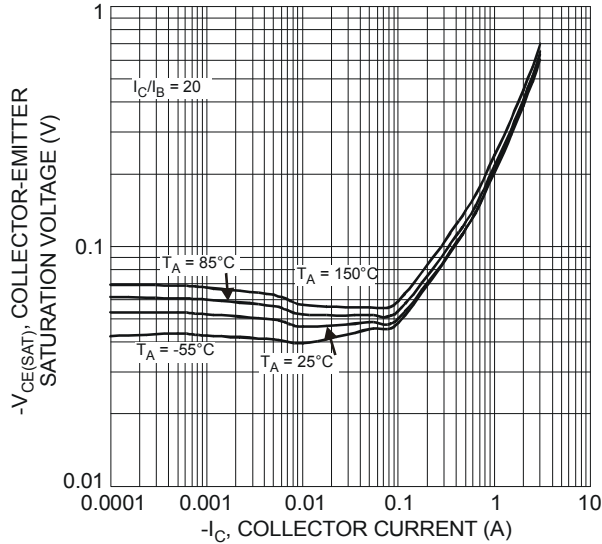


Figure 3 Typical Collector-Emitter Saturation Voltage vs. Collector Current

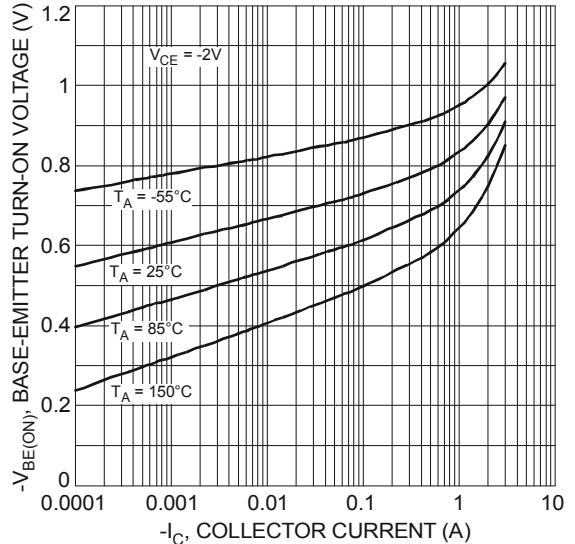


Figure 4 Typical Base-Emitter Turn-On Voltage vs. Collector Current

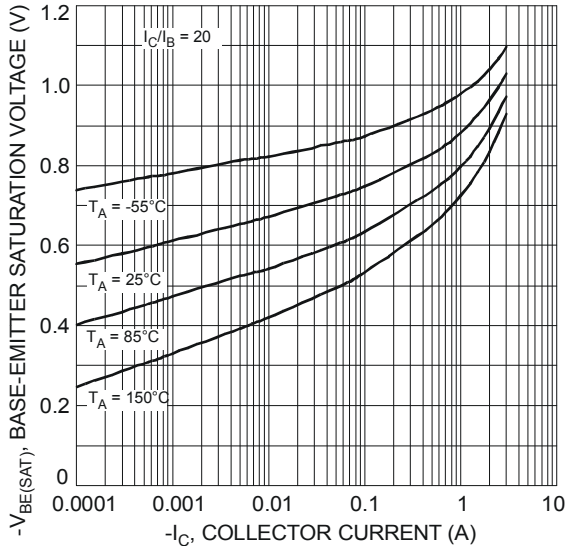


Figure 5 Typical Base-Emitter Saturation Voltage vs. Collector Current

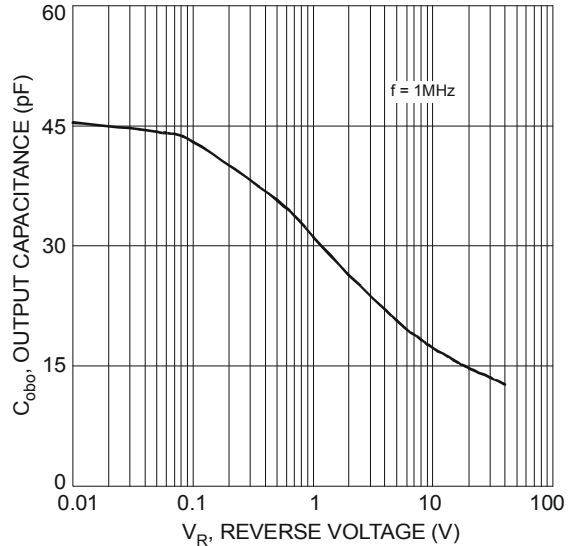


Figure 6 Typical Output Capacitance Characteristics

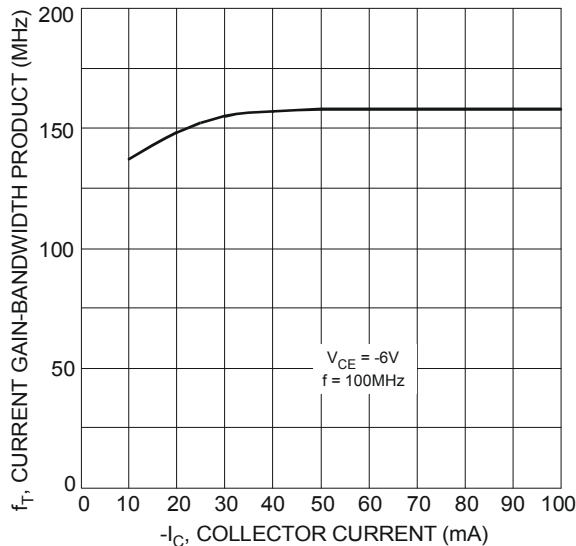
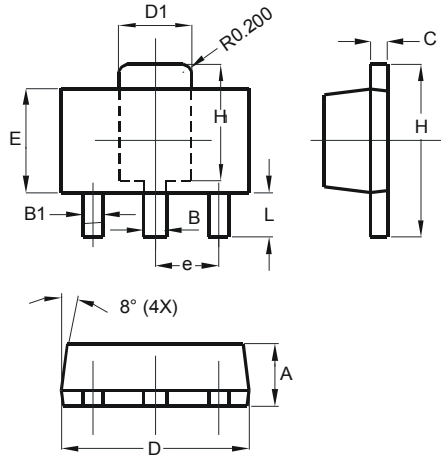


Figure 7 Typical Gain-Bandwidth Product vs. Collector Current

**Package Outline Dimensions**

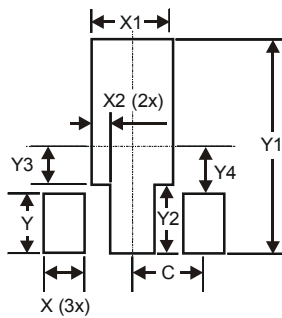
Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for latest version.



SOT89		
Dim	Min	Max
A	1.40	1.60
B	0.44	0.62
B1	0.35	0.54
C	0.35	0.44
D	4.40	4.60
D1	1.62	1.83
E	2.29	2.60
e	1.50 Typ	
H	3.94	4.25
H1	2.63	2.93
L	0.89	1.20
All Dimensions in mm		

**Suggested Pad Layout**

Please see AP02001 at <http://www.diodes.com/datasheets/ap02001.pdf> for the latest version.



Dimensions	Value (in mm)
X	0.900
X1	1.733
X2	0.416
Y	1.300
Y1	4.600
Y2	1.475
Y3	0.950
Y4	1.125
C	1.500

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