


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**

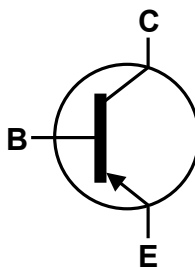
Mechanical Data

- 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)

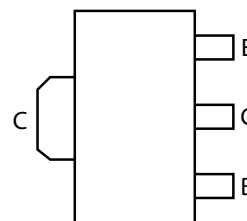
SOT89



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 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

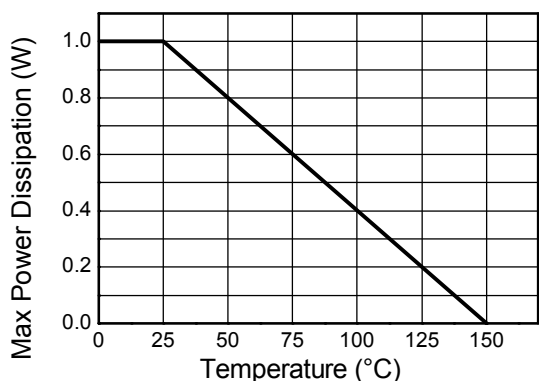
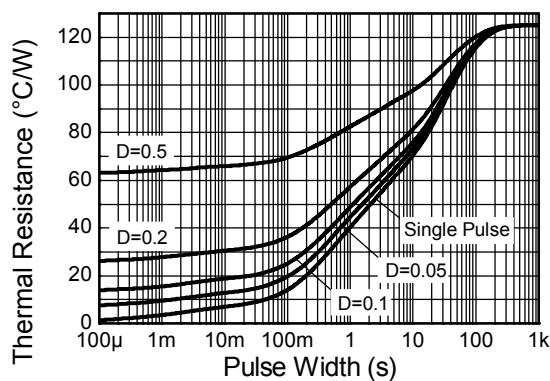
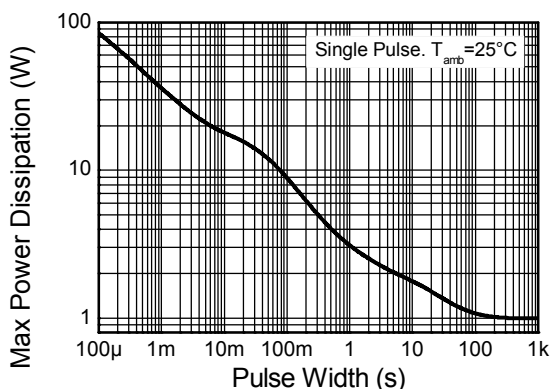
Maximum Ratings (@T_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V _{CBO}	-50	V
Collector-Emitter Voltage	V _{CEO}	-50	V
Emitter-Base Voltage	V _{EBO}	-6	V
Continuous Collector Current	I _C	-2	A
Peak Pulse Current	I _{CM}	-2.5	A
Base Current	I _B	-500	mA

Thermal Characteristics (@T_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Value	Unit
Power Dissipation (Note 5)	P _D	1	W
Thermal Resistance, Junction to Ambient (Note 5)	R _{θJA}	125	°C/W
Thermal Resistance, Junction to Leads (Note 6)	R _{θJL}	18.3	°C/W
Operating and Storage Temperature Range	T _J , T _{STG}	-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 (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	BV_{CBO}	-50	—	—	V	$I_C = -100\mu\text{A}$
Collector-Emitter Breakdown Voltage (Note 7)	BV_{CEO}	-50	—	—	V	$I_C = -10\text{mA}$
Emitter-Base Breakdown Voltage	BV_{EBO}	-6	—	—	V	$I_E = -100\mu\text{A}$
Collector Cut-off Current	I_{CBO}	—	—	-100	nA	$V_{CB} = -50\text{V}$
Emitter Cut-off Current	I_{EBO}	—	—	-100	nA	$V_{EB} = -5\text{V}$
DC Current Gain (Note 8)	2DA12130	h_{FE}	70	140	—	$I_C = -500\text{mA}$, $V_{CE} = -2\text{V}$
	2DA1213Y		120	240		$I_C = -500\text{mA}$, $V_{CE} = -2\text{V}$
	2DA12130, 2DA1213Y		20	—		$I_C = -2\text{A}$, $V_{CE} = -2\text{V}$
Collector-Emitter Saturation Voltage (Note 7)	$V_{CE(sat)}$	—	—	-0.5	V	$I_C = -1\text{A}$, $I_B = -50\text{mA}$
Base-Emitter Turn-On Voltage (Note 7)	$V_{BE(sat)}$	—	—	-1.2	V	$I_C = -1\text{A}$, $I_B = -50\text{mA}$
Transition Frequency	f_T	—	160	—	MHz	$I_C = -100\text{mA}$, $V_{CE} = -2\text{V}$, $f = 100\text{MHz}$
Output Capacitance	C_{obo}	—	17	—	pF	$V_{CB} = -10\text{V}$, $I_E = 0$, $f = 1\text{MHz}$
Turn-On Time	t_{on}	—	25	—	ns	$V_{CE} = -2\text{V}$, $I_C = -1\text{A}$, $I_{B1} = -I_{B2} = -50\text{mA}$
Storage Time	$t_{(s)}$	—	130	—	ns	
Fall Time	$t_{(f)}$	—	12	—	ns	

Note: 7. Measured under pulsed conditions. Pulse width $\leq 300\mu\text{s}$. Duty cycle $\leq 2\%$.

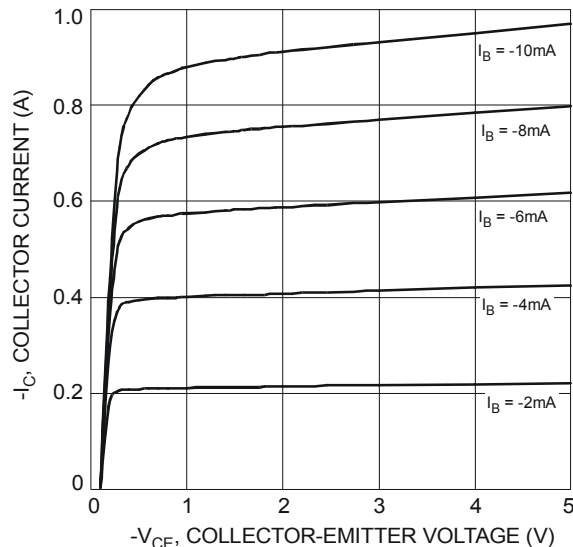
Typical Electrical Characteristics (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)


Figure 1 Typical Collector Current vs. Collector-Emitter Voltage

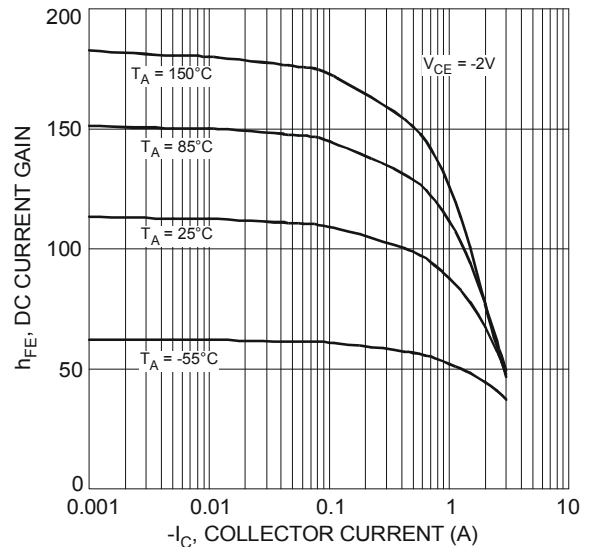


Figure 2 Typical DC Current Gain vs. Collector Current (2DA12130)

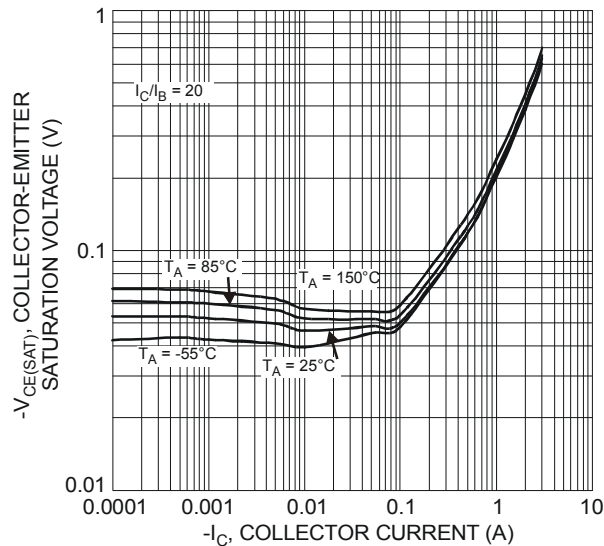


Figure 3 Typical Collector-Emitter Saturation Voltage vs. Collector Current

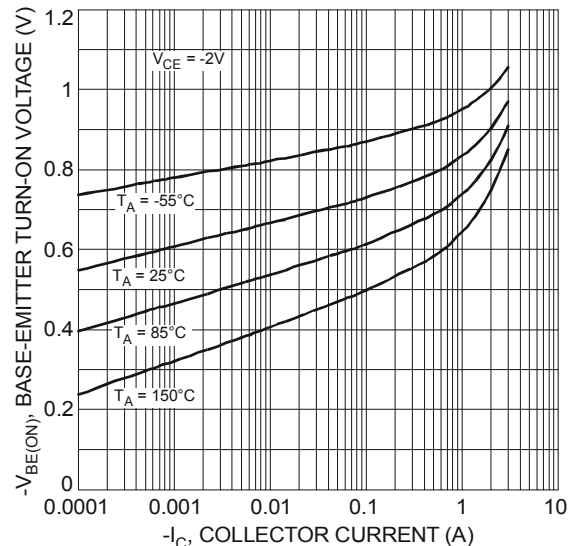


Figure 4 Typical Base-Emitter Turn-On Voltage vs. Collector Current

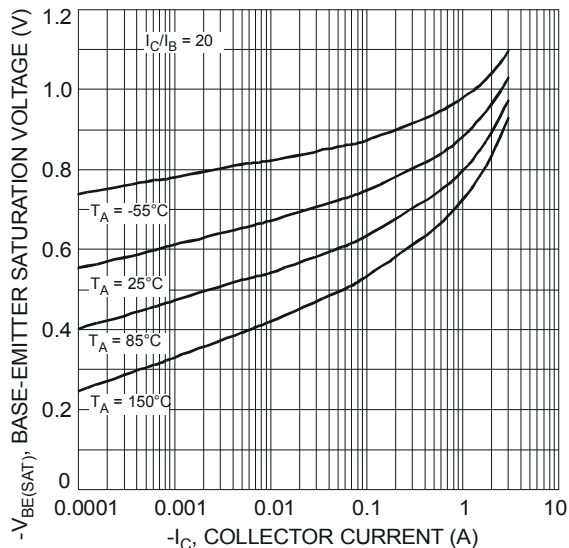


Figure 5 Typical Base-Emitter Saturation Voltage vs. Collector Current

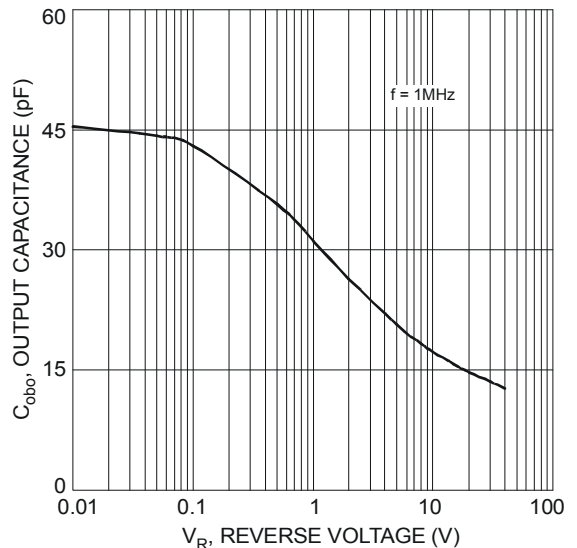


Figure 6 Typical Output Capacitance Characteristics

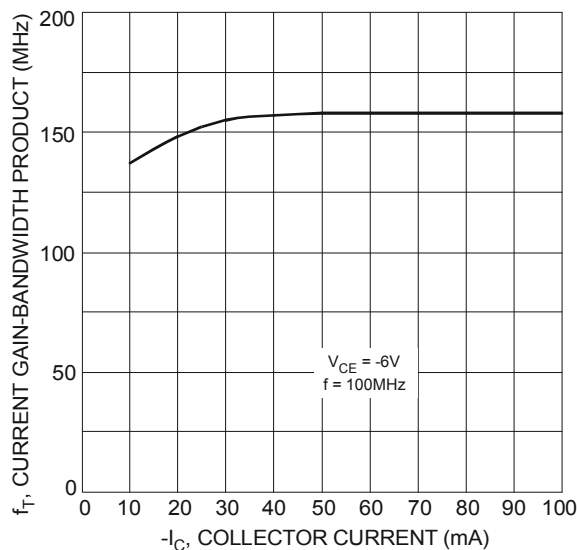
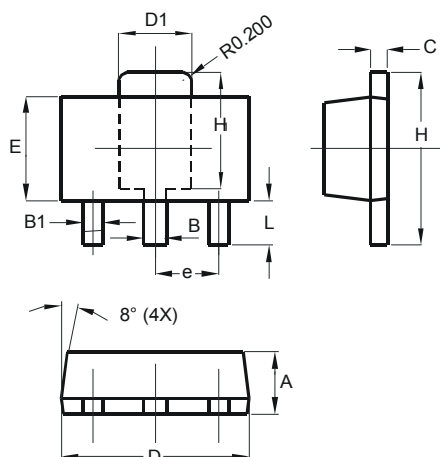


Figure 7 Typical Gain-Bandwidth Product vs. Collector Current

Package Outline Dimensions

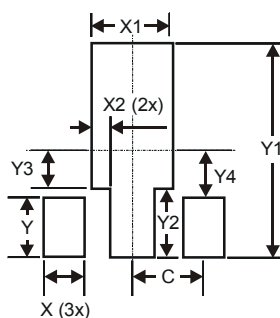
Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for latest version.



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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