50V PNP POWER SWITCHING TRANSISTOR IN SOT89

Features

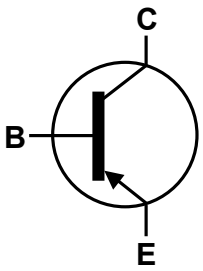
- BV_{CEO} > -50V
- I_C = -2A high Continuous Collector Current
- High Gain Holds up
- **Totally Lead-Free & Fully RoHS compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **Qualified to AEC-Q101 Standards for High Reliability**

Mechanical Data

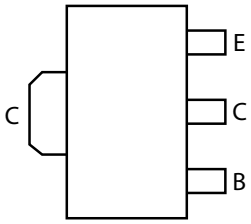
- Case: SOT89
- Case material: Molded Plastic. "Green" Molding Compound.
- UL Flammability Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish - Matte Tin Plated Leads, Solderable per MIL-STD-202, Method 208 e3
- Weight: 0.052 grams (Approximate)

SOT89

Top View



Device Symbol



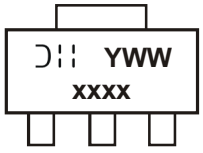
Top View
Pin Out

Ordering Information (Notes 4)

Product	Marking	Reel size (inches)	Tape width (mm)	Quantity per reel
2DA1213O-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 = 2DA1213O
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.)

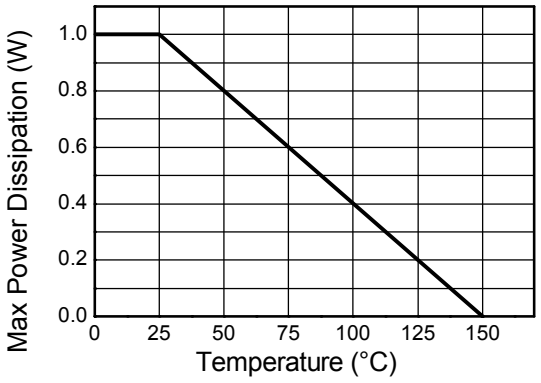
Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V_{CBO}	-50	V
Collector-Emitter Voltage	V_{CEO}	-50	V
Emitter-Base Voltage	V_{EBO}	-6	V
Continuous Collector Current	I_C	-2	A
Peak Pulse Current	I_{CM}	-2.5	A
Base Current	I_B	-500	mA

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

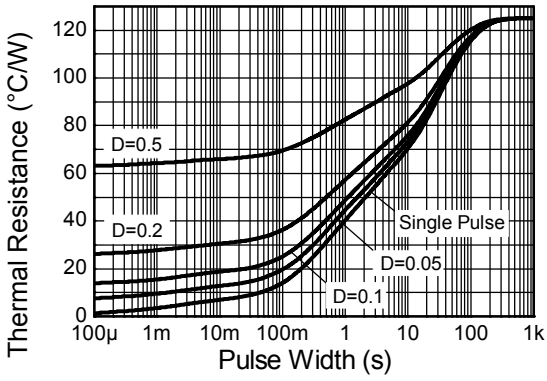
Characteristic	Symbol	Value	Unit
Power Dissipation (Note 5)	P_D	1	W
Thermal Resistance, Junction to Ambient (Note 5)	$R_{\theta JA}$	125	°C/W
Thermal Resistance, Junction to Leads (Note 6)	$R_{\theta JL}$	18.3	°C/W
Operating and Storage Temperature Range	T_J, T_{STG}	-55 to +150	°C

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).

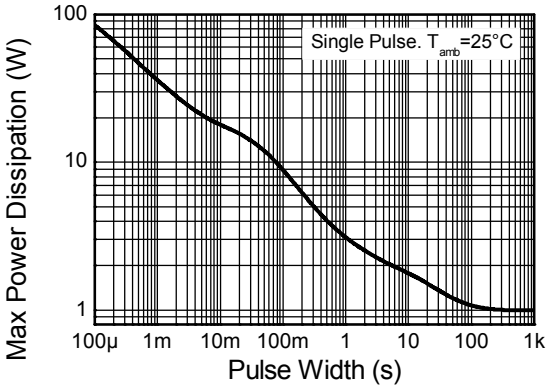
Thermal Characteristics and Derating Information



Derating Curve



Transient Thermal Impedance



Pulse Power Dissipation

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

Characteristic		Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage		BV_{CBO}	-50	—	—	V	I_C = -100μA
Collector-Emitter Breakdown Voltage (Note 7)		BV_{CEO}	-50	—	—	V	I_C = -10mA
Emitter-Base Breakdown Voltage		BV_{EBO}	-6	—	—	V	I_E = -100μA
Collector Cut-off Current		I_{CBO}	—	—	-100	nA	V_{CB} = -50V
Emitter Cut-off Current		I_{EBO}	—	—	-100	nA	V_{EB} = -5V
DC Current Gain (Note 8)	2DA1213O	h_{FE}	70	—	140	—	I_C = -500mA, V_{CE} = -2V
	2DA1213Y		120		240		I_C = -500mA, V_{CE} = -2V
	2DA1213O, 2DA1213Y		20		—		I_C = -2A, V_{CE} = -2V
Collector-Emitter Saturation Voltage (Note 7)		$V_{CE(sat)}$	—	—	-0.5	V	I_C = -1A, I_B = -50mA
Base-Emitter Turn-On Voltage (Note 7)		$V_{BE(sat)}$	—	—	-1.2	V	I_C = -1A, I_B = -50mA
Transition Frequency		f_T	—	160	—	MHz	I_C = -100mA, V_{CE} = -2V, f = 100MHz
Output Capacitance		C_{obo}	—	17	—	pF	V_{CB} = -10V, I_E = 0, f = 1MHz
Turn-On Time		t_{on}	—	25	—	ns	V_{CE}= -2V, I_C = -1A, I_{B1} = -I_{B2} = -50mA
Storage Time		$t_{(s)}$	—	130	—	ns	
Fall Time		$t_{(f)}$	—	12	—	ns	

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

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

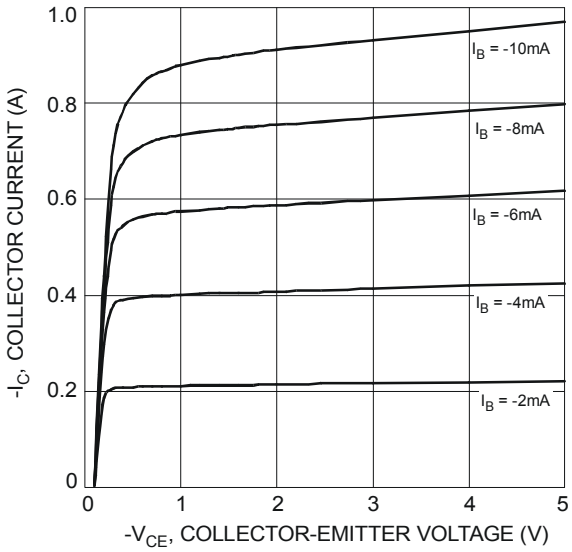


Figure 1 Typical Collector Current vs. Collector-Emitter Voltage

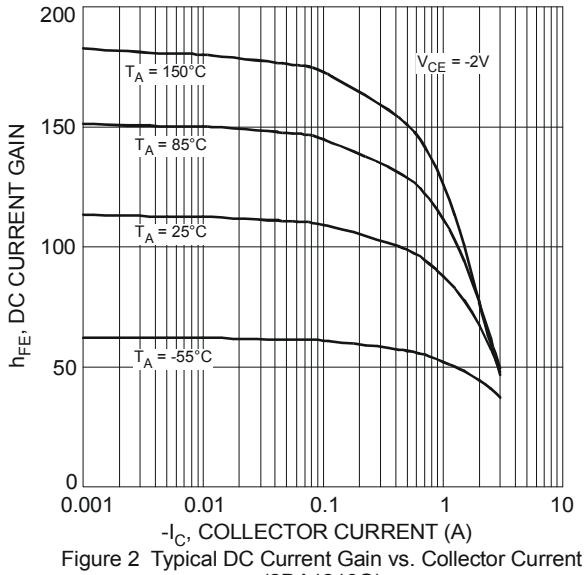


Figure 2 Typical DC Current Gain vs. Collector Current (2DA1213O)

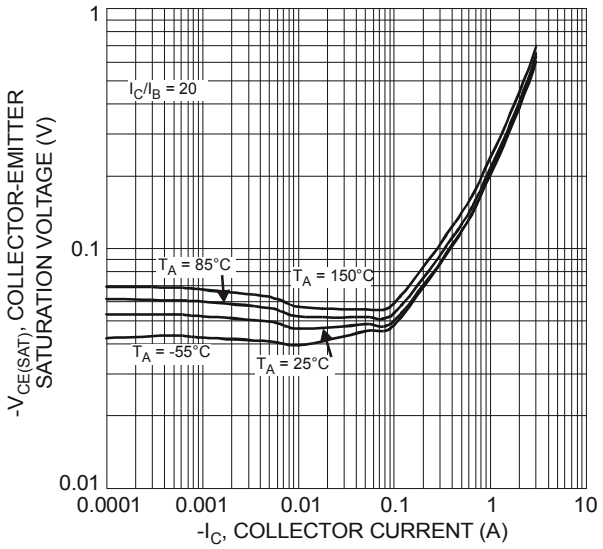


Figure 3 Typical Collector-Emitter Saturation Voltage vs. Collector Current

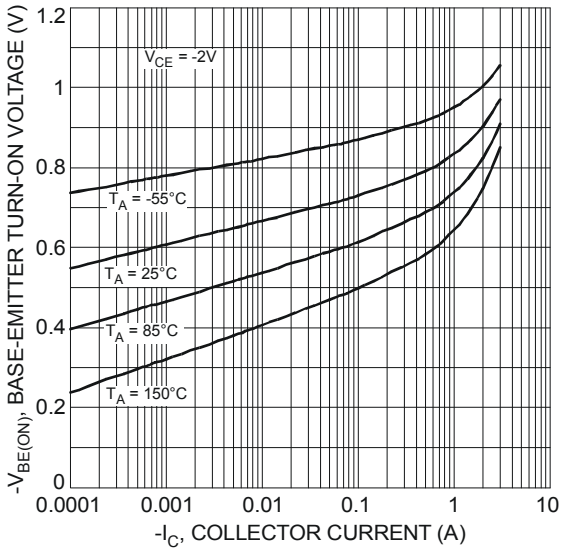


Figure 4 Typical Base-Emitter Turn-On Voltage vs. Collector Current

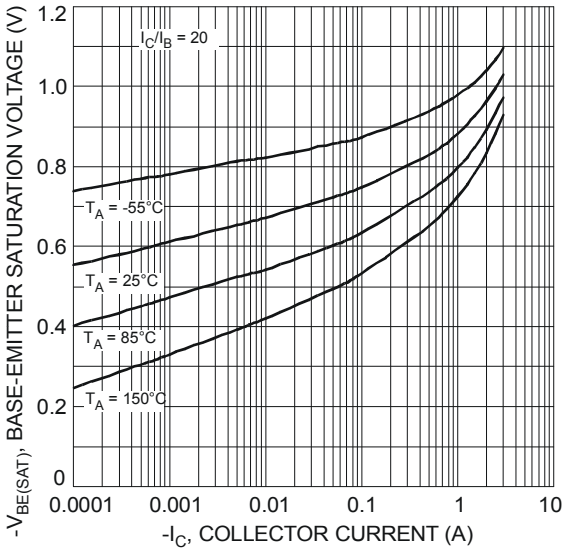


Figure 5 Typical Base-Emitter Saturation Voltage vs. Collector Current

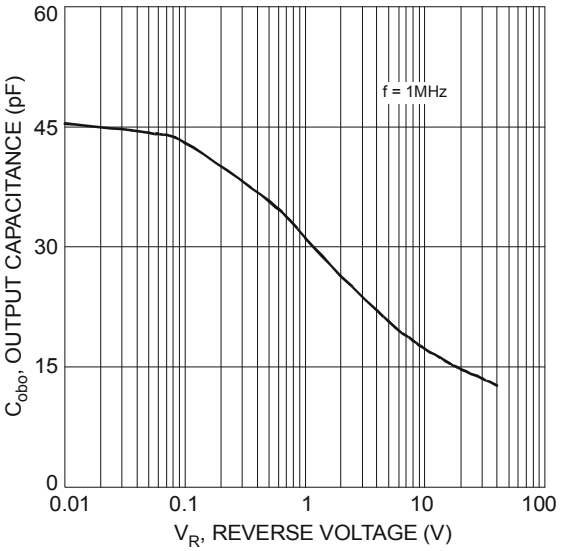


Figure 6 Typical Output Capacitance Characteristics

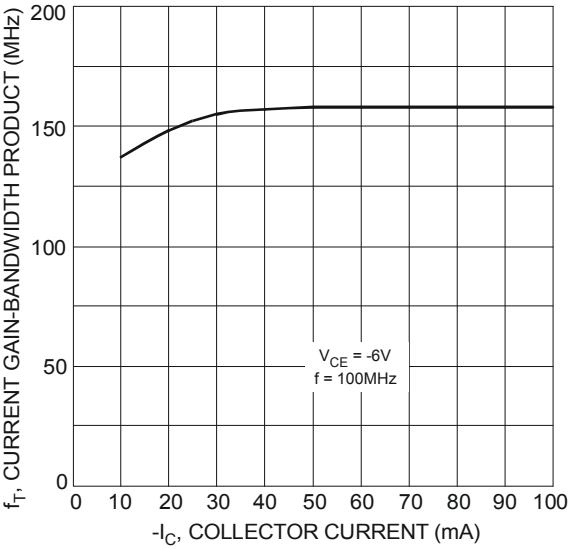
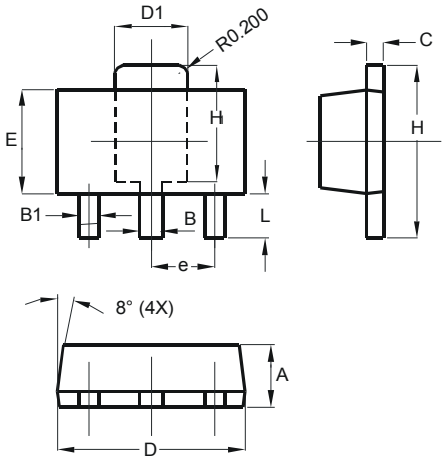


Figure 7 Typical Gain-Bandwidth Product vs. Collector Current

Package Outline Dimensions

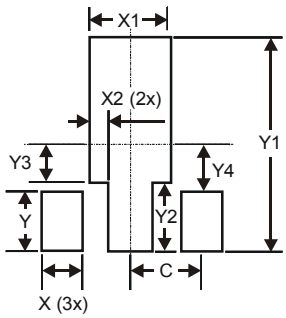
Please see AP02002 at http://www.diodes.com/datasheets/ap02002.pdf for latest version.



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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