



**THE DATASHEET OF  
2DA1201YQTC**



**120V PNP SILICON TRANSISTOR IN SOT89**

**Features**

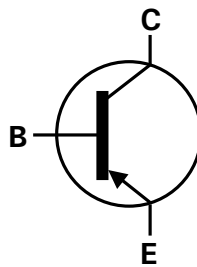
- $BV_{CEO} > -120V$
- Max Continuous Current  $I_C = -0.8A$
- High Gain Holds up  $h_{FE} \geq 120 @ I_C = -100mA$
- **Totally Lead-Free & Fully RoHS compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **Qualified to AEC-Q101 Standards for High Reliability**
- **PPAP capable (Note 4)**

**Mechanical Data**

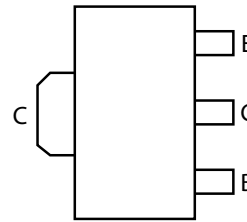
- Case: SOT89
- Case material: molded plastic. "Green" molding compound.
- UL Flammability Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish - Matte Tin Plated Leads, Solderable per MIL-STD-202, Method 208  $\text{E3}$
- Weight: 0.05 grams (Approximate)



Top View



Device Symbol



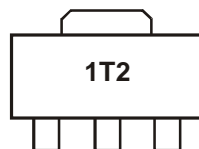
Top View  
Pin Out

**Ordering Information** (Notes 4 & 5)

Product	Compliance	Marking	Reel size (inches)	Tape width (mm)	Quantity per reel
2DA1201Y-7	AEC-Q101	1T2	7	12	1,000
2DA1201YQTC	Automotive	1T2	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> 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. Automotive products are AEC-Q101 qualified and are PPAP capable. Automotive, AEC-Q101 and standard products are electrically and thermally the same, except where specified.
  5. For packaging details, go to our website at <http://www.diodes.com>.

**Marking Information**



1T2 = Product Type Marking Code

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

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V <sub>CB0</sub>	-120	V
Collector-Emitter Voltage	V <sub>CEO</sub>	-120	V
Emitter-Base Voltage	V <sub>EBO</sub>	-7	V
Continuous Collector Current	I <sub>C</sub>	-800	mA
Peak Pulse Current (Note 6)	I <sub>CM</sub>	-3	A
Base Current	I <sub>B</sub>	-160	mA

### Thermal Characteristics

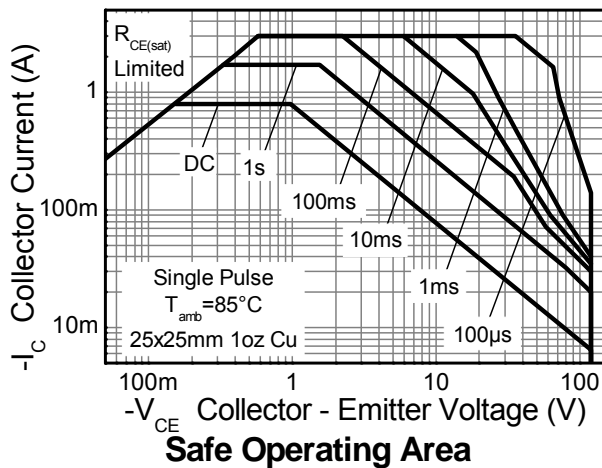
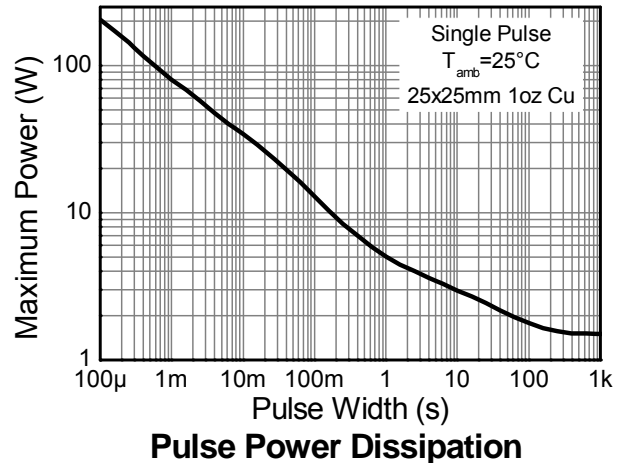
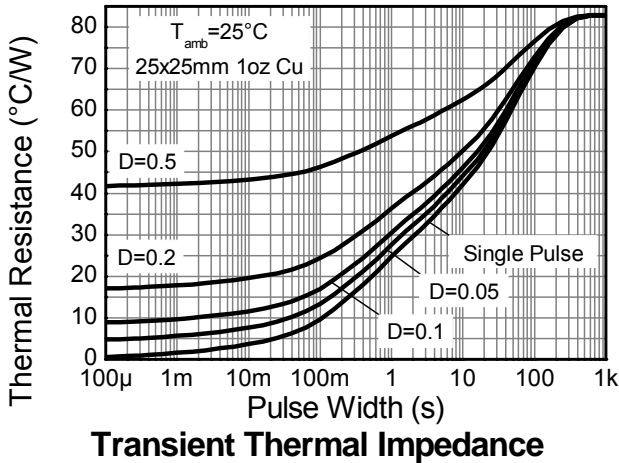
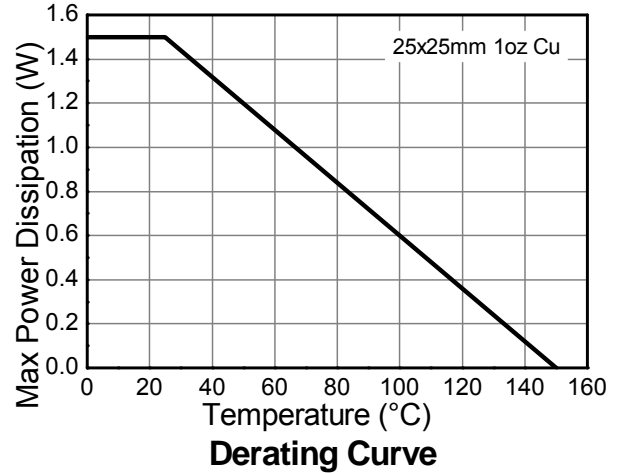
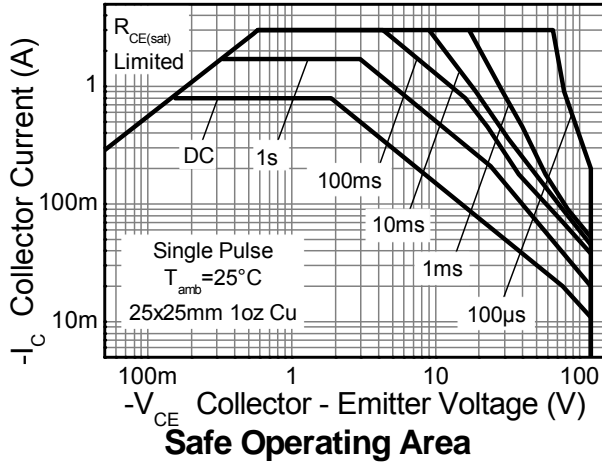
Characteristic	Symbol	Value	Unit
Power Dissipation (Note 7)	P <sub>D</sub>	1.5	W
Thermal Resistance, Junction to Ambient (Note 7)	R <sub>θJA</sub>	83	°C/W
Thermal Resistance, Junction to Leads (Note 8)	R <sub>θJL</sub>	18.3	°C/W
Operating and Storage Temperature Range	T <sub>J</sub> , T <sub>STG</sub>	-55 to +150	°C

### ESD Ratings (Note 9)

Characteristic	Symbol	Value	Unit	JEDEC Class
Electrostatic Discharge - Human Body Model	ESD HBM	≥ 8,000	V	3B
Electrostatic Discharge - Machine Model	ESD MM	≥ 400	V	C

- Notes:
6. Measured under pulsed conditions. Pulse width ≤ 300μs. Duty cycle ≤ 2%.
  7. For a device surface mounted on 25mm X 25mm FR4 PCB with high coverage of single sided 1 oz copper, in still air conditions.
  8. Thermal resistance from junction to solder-point (at the end of the collector lead).
  9. Refer to JEDEC specification JESD22-A114 and JESD22-A115.

**Thermal Characteristics and Derating Information**

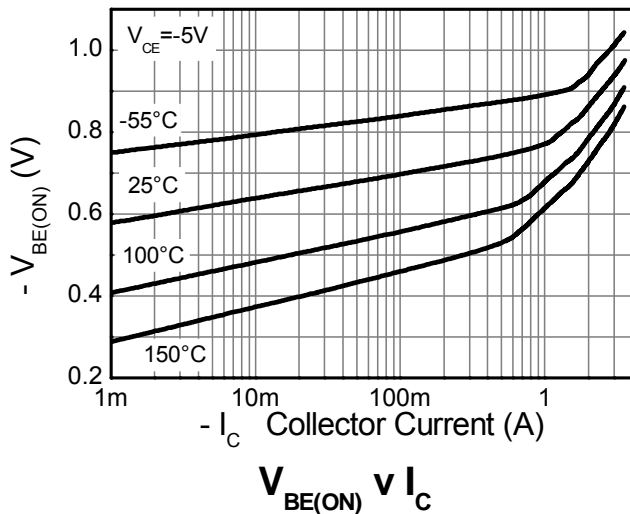
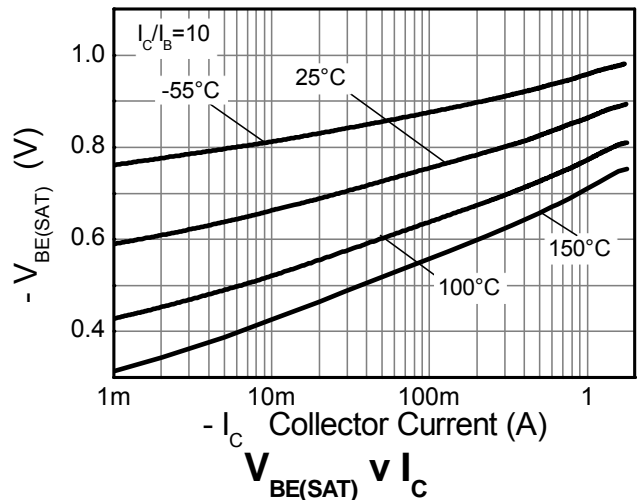
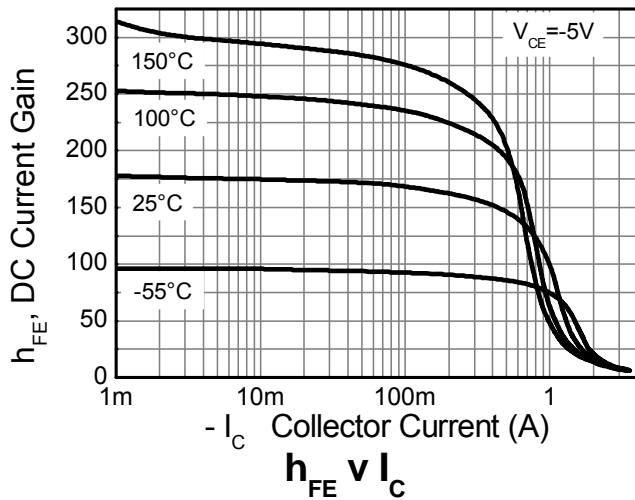
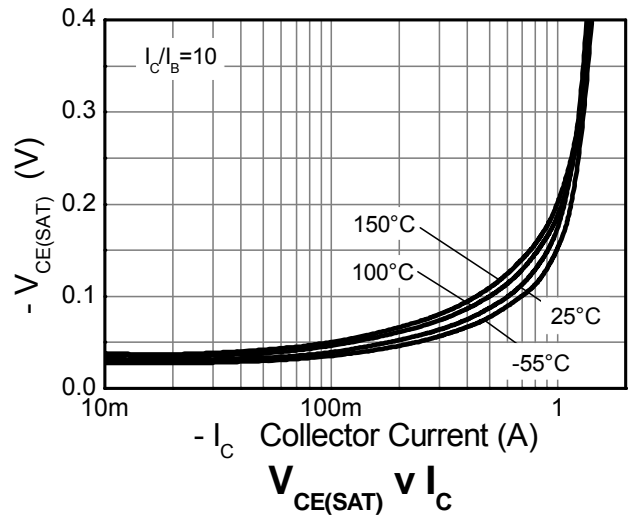
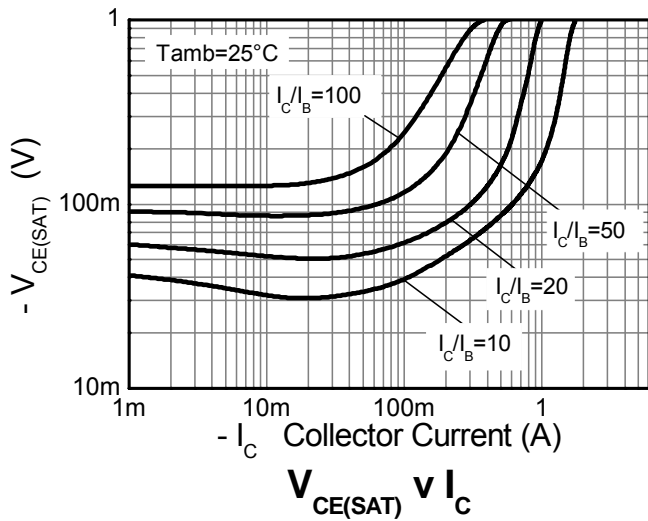


**Electrical Characteristics** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	BV <sub>CBO</sub>	-120	-	-	V	I <sub>C</sub> = -100μA
Collector-Emitter Breakdown Voltage (Note 10)	BV <sub>CEO</sub>	-120	-	-	V	I <sub>C</sub> = -10mA
Emitter-Base Breakdown Voltage	BV <sub>EBO</sub>	-7	-	-	V	I <sub>E</sub> = -100μA
Collector-Emitter Cut-off Current	I <sub>CES</sub>	-	-	-100	nA	V <sub>CE</sub> = -120V
Collector Cut-off Current	I <sub>CBO</sub>	-	-	-100	nA	V <sub>CB</sub> = -120V
Emitter Cut-off Current	I <sub>EBO</sub>	-	-	-100	nA	V <sub>EB</sub> = -5V
Static Forward Current Transfer Ratio (Note 10)	h <sub>FE</sub>	120	-	240	-	I <sub>C</sub> = -100mA, V <sub>CE</sub> = -5V
Collector-Emitter Saturation Voltage (Note 10)	V <sub>CE(sat)</sub>	-	-	-1	V	I <sub>C</sub> = -500mA, I <sub>B</sub> = -50mA
Base-Emitter Turn-On Voltage (Note 10)	V <sub>BE(on)</sub>	-	-	-1	V	I <sub>C</sub> = -500mA, V <sub>CE</sub> = -5V
Transition Frequency	f <sub>T</sub>	-	160	-	MHz	I <sub>C</sub> = -100mA, V <sub>CE</sub> = -5V
Output Capacitance	C <sub>OBO</sub>		15		pF	V <sub>CB</sub> = -10V, I <sub>E</sub> = 0, f = 1MHz
Delay Time	t <sub>(d)</sub>	-	62	-	ns	V <sub>CC</sub> = -80V, I <sub>C</sub> = -100mA, I <sub>B1</sub> = -10mA, I <sub>B2</sub> = 20mA
Rise Time	t <sub>(r)</sub>	-	50	-	ns	
Storage Time	t <sub>(s)</sub>	-	440	-	ns	
Fall Time	t <sub>(f)</sub>	-	42	-	ns	

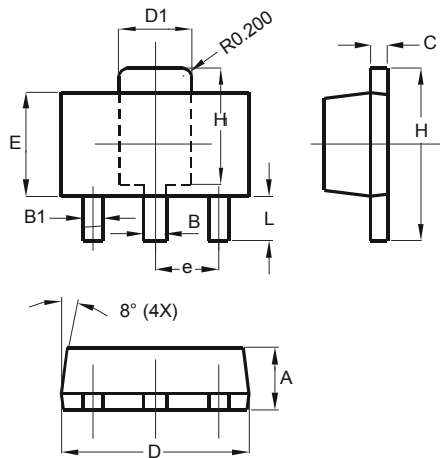
Note: 10. Measured under pulsed conditions. Pulse width ≤ 300μs. Duty cycle ≤ 2%.

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



## Package Outline Dimensions

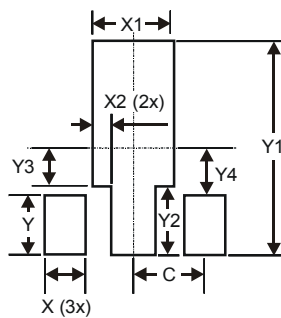
Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for latest version.



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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