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With the principle of “Quality Parts,Customers Priority,Honest Operation,and Considerate Service”,our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip,ALPS,ROHM,Xilinx,Pulse,ON,Everlight and Freescale. Main products comprise IC,Modules,Potentiometer,IC Socket,Relay,Connector.Our parts cover such applications as commercial,industrial, and automotives areas.

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## Features

- $BV_{CEO} > -120V$
- Darlington Transistor  $h_{FE} > 3k @ -1A$
- Low Saturation Voltage  $< -1.3V @ -1A$
- $I_C = -1A$  Continuous Collector Current
- Specification is also available in Eline and SOT223 package outlines
- **Lead-Free Finish; 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)

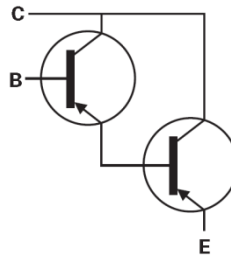
## Applications

- Various Driving Functions
  - Lamps
  - Motors
  - Relays and Solenoids
- High Output Current Switches

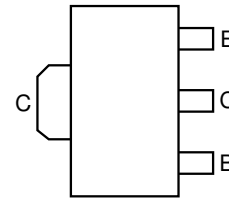
SOT89



Top View



Device Symbol



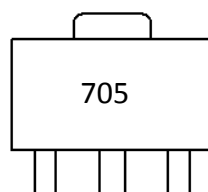
Top View  
Pin-Out

## Ordering Information (Note 4)

Part Number	Compliance	Marking	Reel size (inches)	Tape width (mm)	Quantity per reel
FCX705TA	AEC-Q101	705	7	8	1,000

- Notes:
1. EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant. All applicable RoHS exemptions applied.
  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



705 = Product Type Marking Code

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

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V <sub>CBO</sub>	-140	V
Collector-Emitter Voltage	V <sub>CEO</sub>	-120	V
Emitter-Base Voltage	V <sub>EBO</sub>	-10	V
Continuous Collector Current	I <sub>C</sub>	-1	A
Peak Pulse Current	I <sub>CM</sub>	-4	A

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

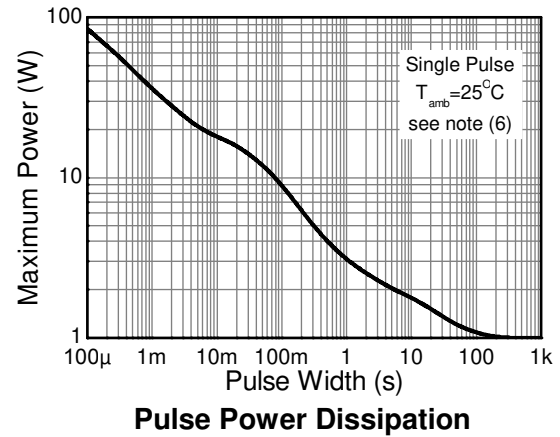
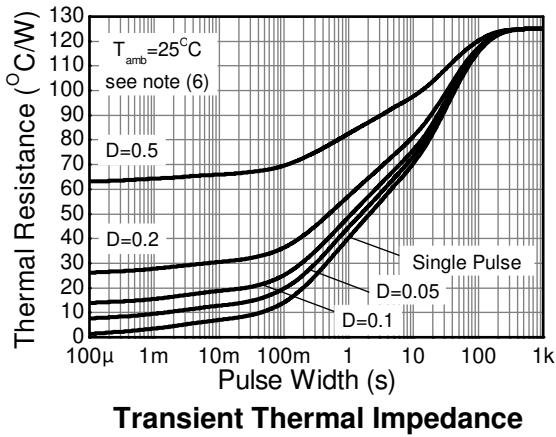
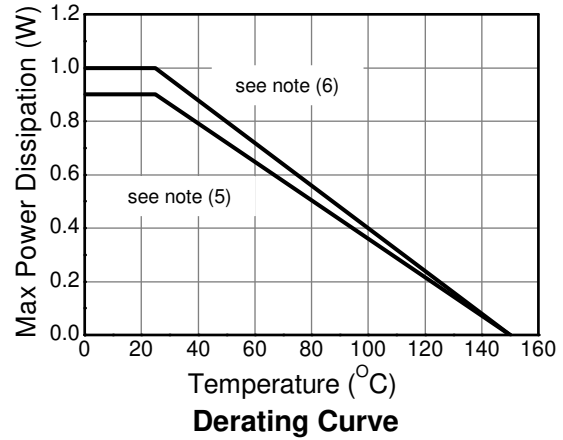
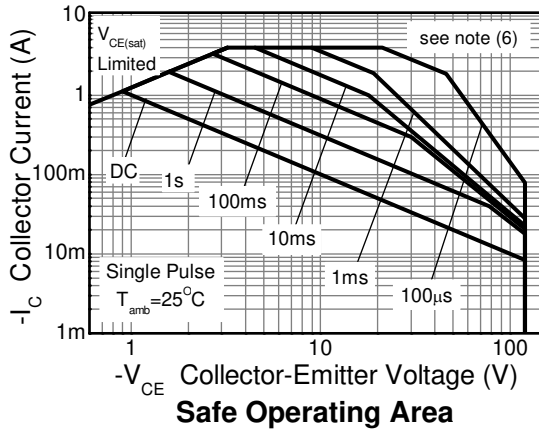
Characteristic	Symbol	Value	Unit
Power Dissipation	P <sub>D</sub>	0.9	W
		1	
Thermal Resistance, Junction to Ambient	R <sub>θJA</sub>	139	°C/W
		125	
Thermal Resistance, Junction to Leads	R <sub>θJL</sub>	5.2	°C/W
Operating and Storage Temperature Range	T <sub>J</sub> , T <sub>STG</sub>	-55 to +150	°C

**ESD Ratings** (Note 8)

Characteristic	Symbol	Value	Unit	JEDEC Class
Electrostatic Discharge - Human Body Model	ESD HBM	2,000	V	2
Electrostatic Discharge - Machine Model	ESD MM	200	V	B

- Notes:
- For a device mounted with the exposed collector pad on 15mm x 15mm 1oz copper that is on a single-sided 1.6mm FR-4 PCB; device is measured under still air conditions whilst operating in a steady-state.
  - Same as Note 5, except the device is mounted on 25mm x 25mm 1oz copper.
  - Thermal resistance from junction to solder-point (at the end of the leads).
  - Refer to JEDEC specification JESD22-A114 and JESD22-A115.

## Thermal Characteristics and Derating Information



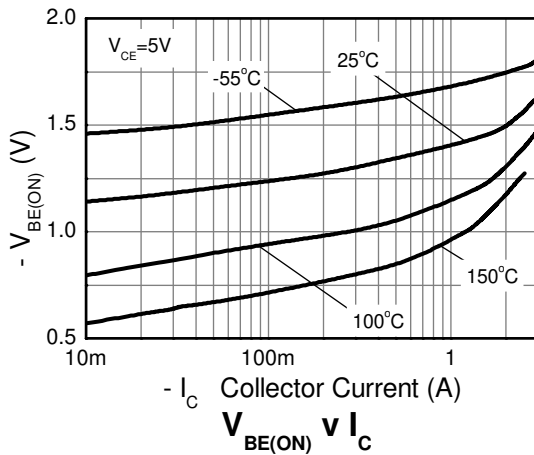
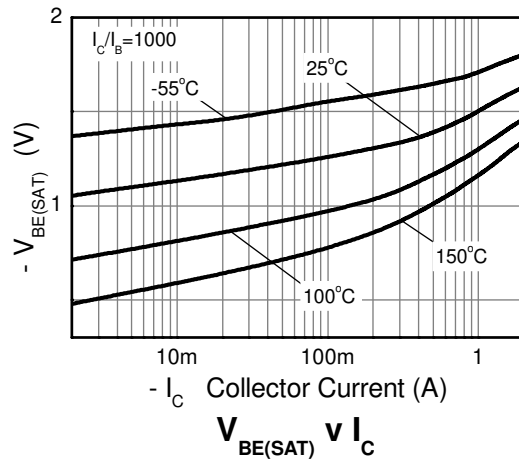
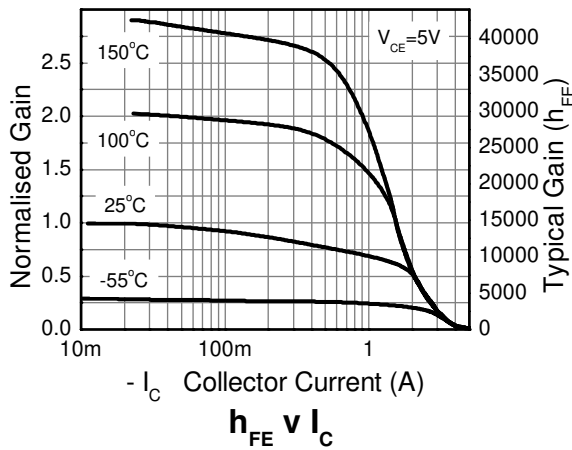
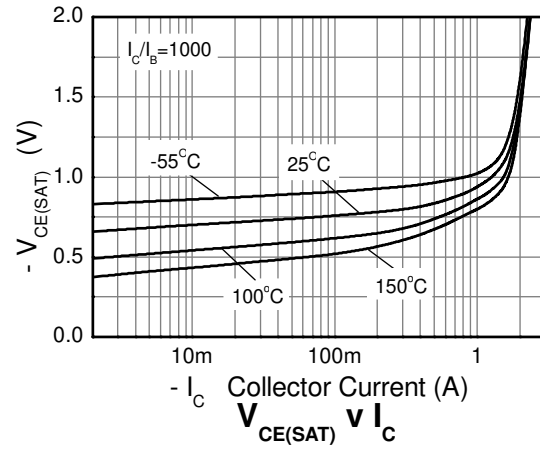
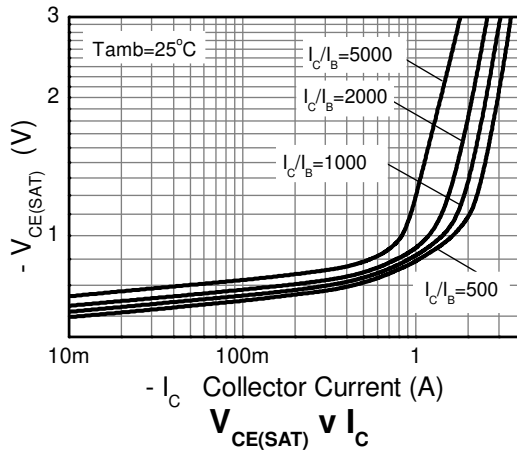


**Electrical Characteristics** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
<b>OFF CHARACTERISTICS</b>						
Collector-Base Breakdown Voltage	BV <sub>CBO</sub>	-140	—	—	V	I <sub>C</sub> = -100μA
Collector-Emitter Breakdown Voltage (Note 9)	BV <sub>CEO</sub>	-120	—	—	V	I <sub>CEO</sub> = -10mA
Emitter-Base Breakdown Voltage	BV <sub>EBO</sub>	-10	—	—	V	I <sub>EBO</sub> = -100μA
Collector Cut-off Current	I <sub>CBO</sub>	—	—	-100 -10	nA μA	V <sub>CB</sub> = -120V V <sub>CB</sub> = -120V, T <sub>A</sub> = +150°C
Emitter-base Cut-off Current	I <sub>EBO</sub>	—	—	-100	nA	V <sub>EB</sub> = -8V
<b>ON CHARACTERISTICS (Note 9)</b>						
Static Forward Current Transfer Ratio	h <sub>FE</sub>	3k 3k 3k 2k	— — — —	— — 30k —	—	I <sub>C</sub> = -10mA, V <sub>CE</sub> = -5V I <sub>C</sub> = -100mA, V <sub>CE</sub> = -5V I <sub>C</sub> = -1A, V <sub>CE</sub> = -5V I <sub>C</sub> = -2A, V <sub>CE</sub> = -5V
Collector-Emitter Saturation Voltage	V <sub>CE(SAT)</sub>	—	—	-1.3 -2.5	V	I <sub>C</sub> = -1A, I <sub>B</sub> = -1mA I <sub>C</sub> = -2A, I <sub>B</sub> = -2mA
Base-Emitter Saturation Voltage	V <sub>BE(SAT)</sub>	—	—	-1.8	V	I <sub>C</sub> = -1A, I <sub>B</sub> = -1mA
Base-Emitter Turn-On Voltage	V <sub>BE(ON)</sub>	—	—	-1.7	V	I <sub>C</sub> = -1A, V <sub>CE</sub> = -5V
<b>SMALL SIGNAL CHARACTERISTICS (Note 9)</b>						
Transition Frequency	f <sub>T</sub>	—	160	—	MHz	I <sub>C</sub> = -100mA, V <sub>CE</sub> = -10V f = 20MHz
Input Capacitance	C <sub>ibo</sub>	—	90	—	pF	V <sub>CB</sub> = -500mV, f = 1MHz
Output Capacitance	C <sub>obo</sub>	—	15	—	pF	V <sub>CB</sub> = -10V, f = 1MHz
Turn-On Time	t <sub>ON</sub>	—	0.6	—	μs	I <sub>C</sub> = -500mA, V <sub>CE</sub> = -10V I <sub>B1</sub> = -I <sub>B2</sub> = 0.5mA
Turn-Off Time	t <sub>OFF</sub>	—	0.8	—	μs	I <sub>C</sub> = -500mA, V <sub>CE</sub> = -10V I <sub>B1</sub> = -I <sub>B2</sub> = 0.5mA

Note: 9. Measured under pulsed conditions. Pulse width ≤ 300μs. Duty cycle ≤ 2%.

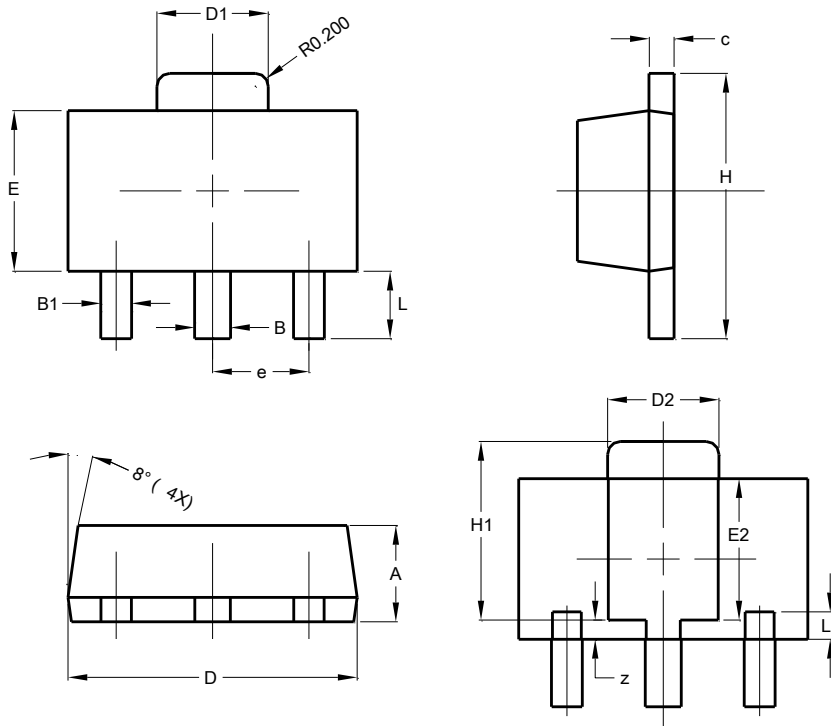
## Typical Electrical Characteristics



## Package Outline Dimensions

Please see <http://www.diodes.com/package-outlines.html> for the latest version.

SOT89

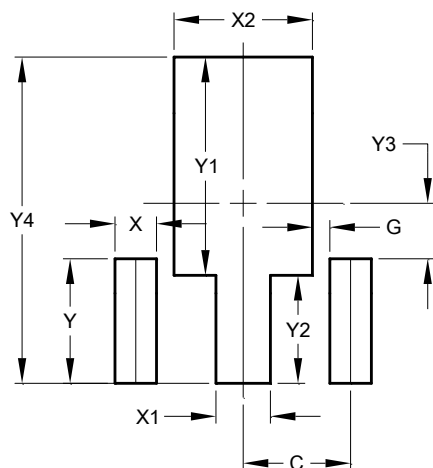


SOT89			
Dim	Min	Max	Typ
A	1.40	1.60	1.50
B	0.50	0.62	0.56
B1	0.42	0.54	0.48
c	0.35	0.43	0.38
D	4.40	4.60	4.50
D1	1.62	1.83	1.733
D2	1.61	1.81	1.71
E	2.40	2.60	2.50
E2	2.05	2.35	2.20
e	-	-	1.50
H	3.95	4.25	4.10
H1	2.63	2.93	2.78
L	0.90	1.20	1.05
L1	0.327	0.527	0.427
z	0.20	0.40	0.30
All Dimensions in mm			

## Suggested Pad Layout

Please see <http://www.diodes.com/package-outlines.html> for the latest version.

SOT89



Dimensions	Value (in mm)
C	1.500
G	0.244
X	0.580
X1	0.760
X2	1.933
Y	1.730
Y1	3.030
Y2	1.500
Y3	0.770
Y4	4.530

Note: For high voltage applications, the appropriate industry sector guidelines should be considered with regards to creepage and clearance distances between device Terminals and PCB tracking.

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