

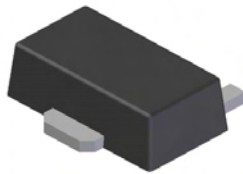
Features

- Epitaxial Planar Die Construction
- Low Collector-Emitter Saturation Voltage
- Complementary NPN Type Available (2DD1766)
- Ideally Suited for Automated Assembly Processes
- Ideal for Medium Power Switching or Amplification Applications
- **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**

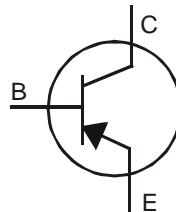
Mechanical Data

- Case: SOT89
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Terminals: Matte Tin Finish 3
- Solderable per MIL-STD-202, Method 208
- Weight: 0.055 grams (approximate)

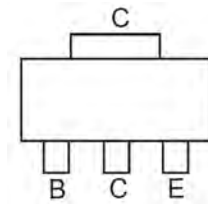
SOT89



Top View



Device Schematic



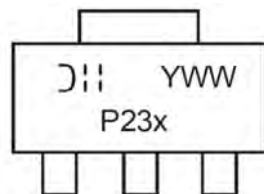
Top view
Pin-Out

Ordering Information (Note 4)

Part Number	Marking	Reel size (inches)	Tape width (mm)	Quantity per reel
2DB1188P-13	P23P	13	12	2,500
2DB1188Q-13	P23Q	13	12	2,500
2DB1188R-13	P23R	13	12	2,500

- 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. For packaging details, go to our website at <http://www.diodes.com>.

Marking Information



P23x = Product Type Marking Code
 Where P23P = 2DB1188P
 P23Q = 2DB1188Q
 P23R = 2DB1188R
 DII = Manufacturers' code marking
 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.)

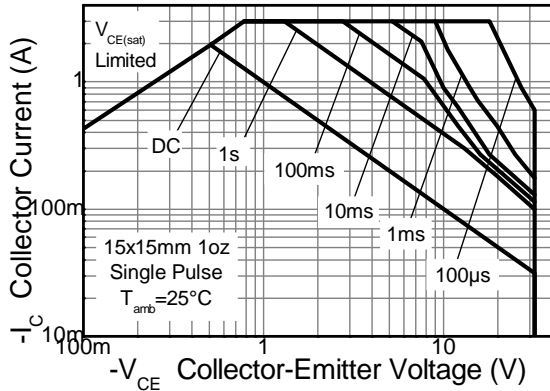
Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V _{CBO}	-40	V
Collector-Emitter Voltage	V _{CEO}	-32	V
Emitter-Base Voltage	V _{EBO}	-6	V
Continuous Collector Current	I _C	-2	A
Peak Pulse Collector Current (Note 5)	I _{CM}	-3	A

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

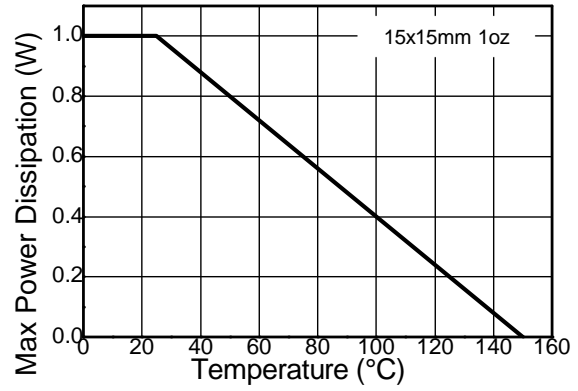
Characteristic	Symbol	Value	Unit
Power Dissipation (Note 6)	P _D	1	W
Thermal Resistance, Junction to Ambient (Note 6)	R _{θJA}	125	°C/W
Thermal Resistance, Junction to Leads (Note 7)	R _{θJL}	19	°C/W
Operating and Storage Temperature Range	T _J , T _{STG}	-55 to +150	°C

- Notes:
- 5. Measured under pulsed conditions. Pulse width = 300µs. Duty cycle ≤ 2%.
 - 6. For a device surface mounted on 15mm X 15mm FR4 PCB with high coverage of single sided 1 oz copper, in still air conditions
 - 7. Thermal resistance from junction to solder-point (at the end of the collector lead).

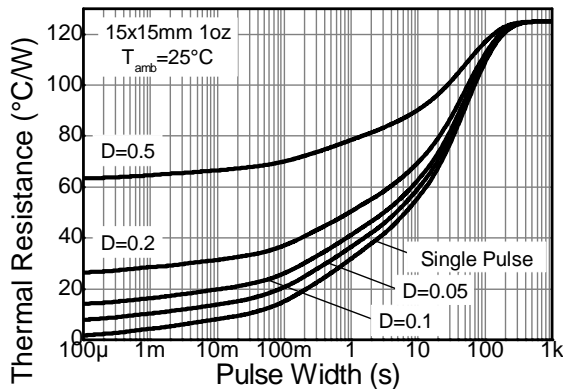
Thermal Characteristics



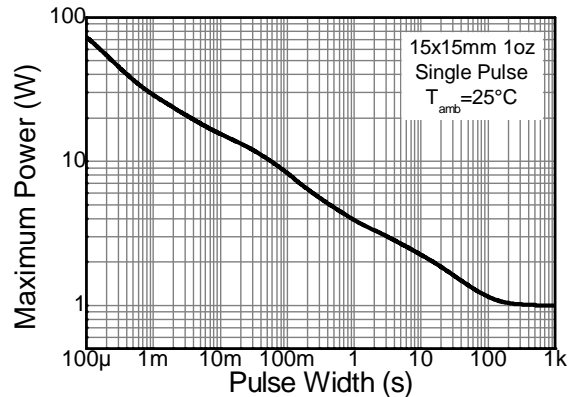
Safe Operating Area



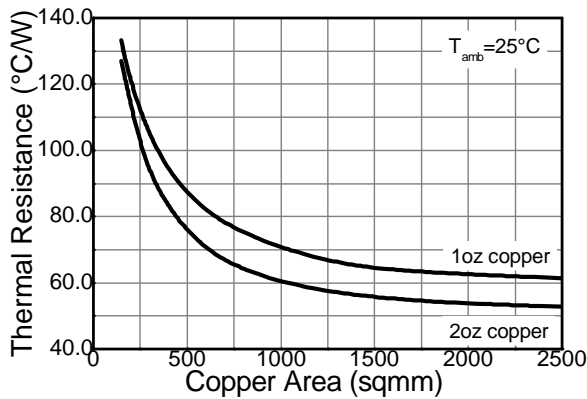
Derating Curve



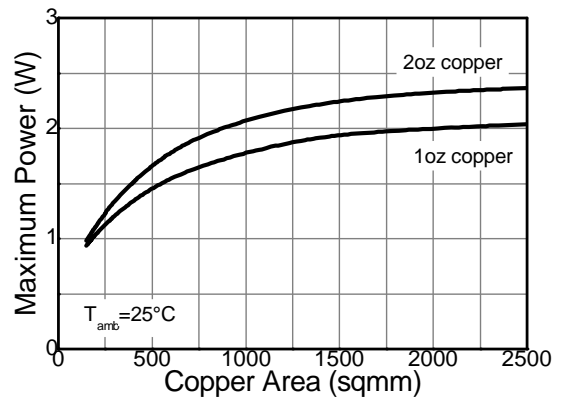
Transient Thermal Impedance



Pulse Power Dissipation



R_{TH} vs Area



P_D vs Area

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

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS (Note 5)						
Collector-Base Breakdown Voltage	BV_{CBO}	-40	—	—	V	$I_C = -100\mu\text{A}, I_E = 0$
Collector-Emitter Breakdown Voltage	BV_{CEO}	-32	—	—	V	$I_C = -10\text{mA}, I_B = 0$
Emitter-Base Breakdown Voltage	BV_{EBO}	-6	—	—	V	$I_E = -100\mu\text{A}, I_C = 0$
Collector Cutoff Current	I_{CBO}	—	—	-100	nA	$V_{CB} = -20\text{V}, I_E = 0$
Emitter Cutoff Current	I_{EBO}	—	—	-100	nA	$V_{EB} = -5\text{V}, I_C = 0$
ON CHARACTERISTICS (Note 5)						
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	—	-0.35	-0.8	V	$I_C = -2\text{A}, I_B = -0.2\text{A}$
DC Current Gain	2DB1188P	82	—	180	—	$V_{CE} = -3\text{V}, I_C = -0.5\text{A}$
	2DB1188Q	120	—	270	—	
	2DB1188R	180	—	390	—	
SMALL SIGNAL CHARACTERISTICS						
Current Gain-Bandwidth Product	f_T	—	120	—	MHz	$V_{CE} = -5\text{V}, I_C = -0.1\text{A}, f = 30\text{MHz}$
Output Capacitance	C_{obo}	—	20	—	pF	$V_{CB} = -10\text{V}, f = 1\text{MHz}$

Notes: 5. Measured under pulsed conditions. Pulse width = 300 μs . Duty cycle \leq 2%.

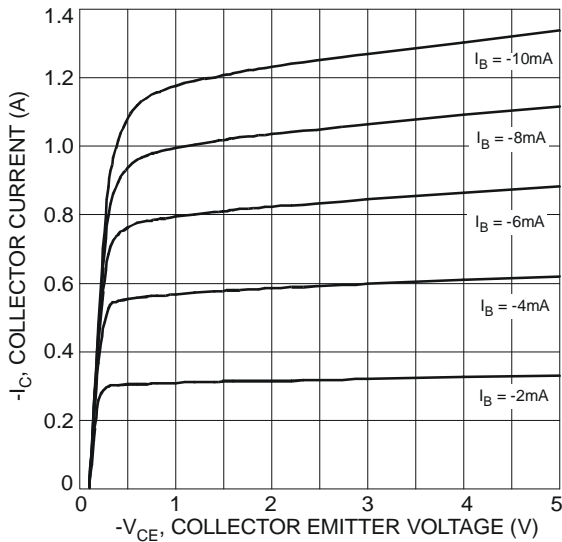


Figure 1. Typical Collector Current vs. Collector-Emitter Voltage

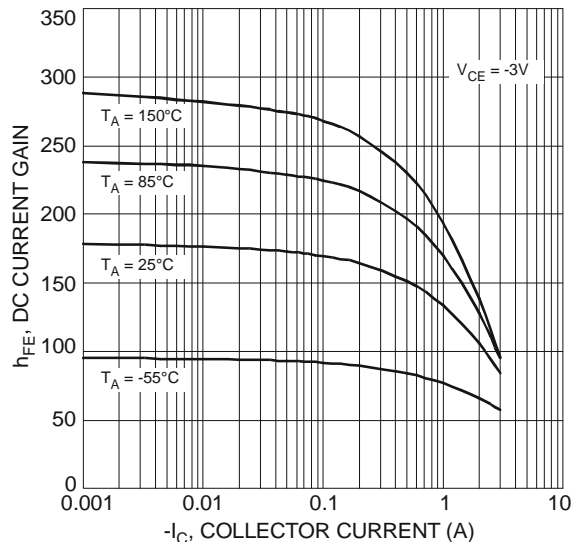


Figure 2. Typical DC Current Gain vs. Collector Current (2DB1188Q)

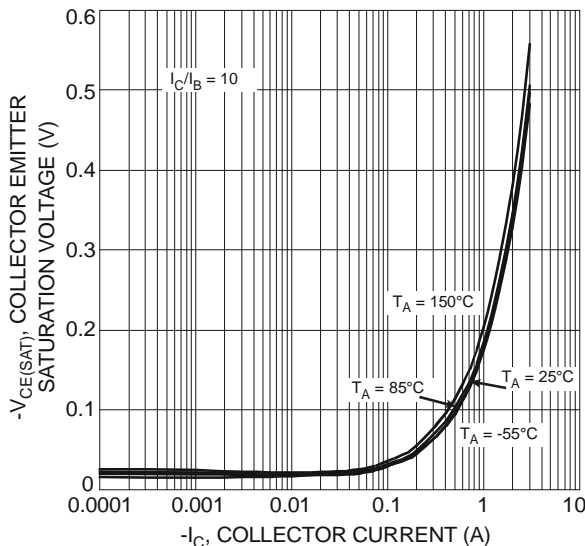


Figure 3. Typical Collector-Emitter Saturation Voltage vs. Collector Current

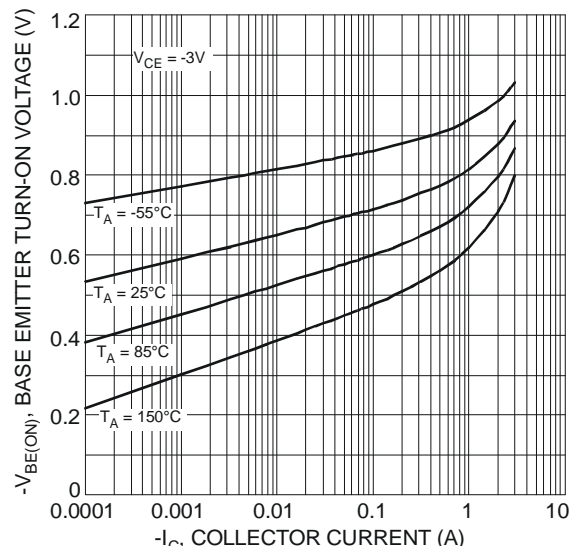


Figure 4. Typical Base-Emitter Turn-On Voltage vs. Collector Current

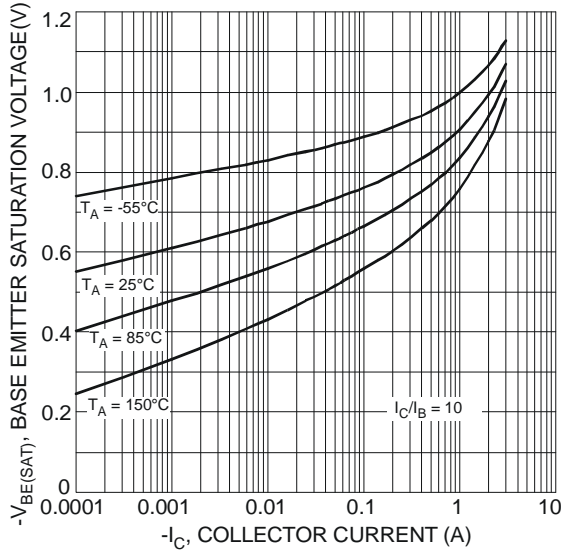


Figure 5. Typical Base-Emitter Saturation Voltage vs. Collector Current

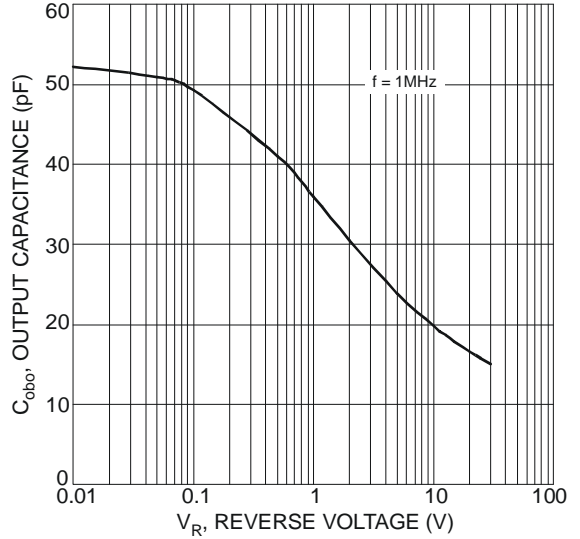


Figure 6. Typical Output Capacitance Characteristics

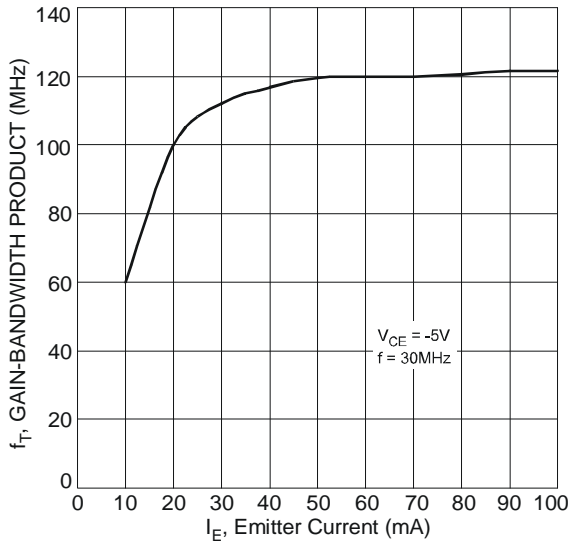
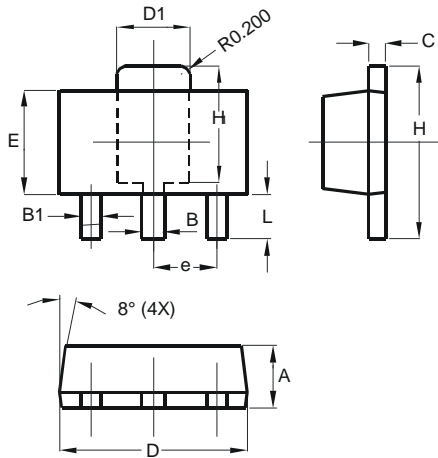


Figure 7. Typical Gain-Bandwidth Product vs. Emitter Current

Package Outline Dimensions

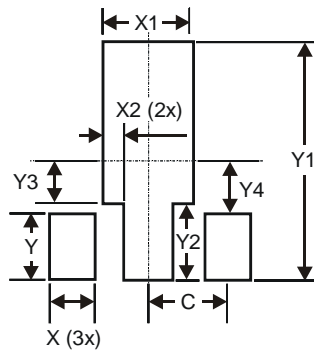
Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for latest version.



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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