

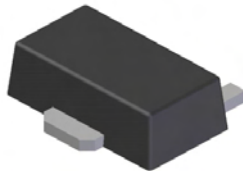
Features

- 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
- **"Lead Free", RoHS Compliant (Note 1)**
- **Halogen and Antimony Free. "Green" Device (Note 2)**
- **Qualified to AEC-Q101 Standards for High Reliability**

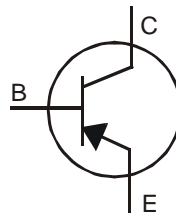
Mechanical Data

- Case: SOT89
- Case Material: Molded Plastic, "Green" Molding Compound.
UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish — Matte Tin annealed over Copper Leadframe
(Lead Free Plating). Solderable per MIL-STD-202, Method 208
- Weight: 0.052 grams (approximate)

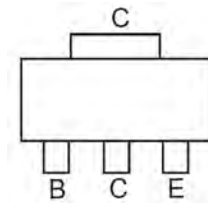
SOT89



Top View



Device Schematic



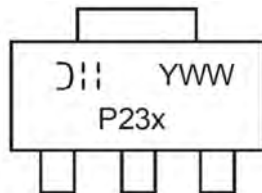
Pin Out - Top view

Ordering Information (Note 3)

Product	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 purposefully added lead
 2. Diodes Inc's "Green" policy can be found on our website at <http://www.diodes.com>.
 3. 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

JII = Manufacturers' code marking
 YWW = Date Code Marking
 Y = Last Digit of Year (ex: 1 = 2011)
 WW = Week Code (01 – 53)

Maximum Ratings @ $T_A = 25^\circ\text{C}$ unless otherwise specified

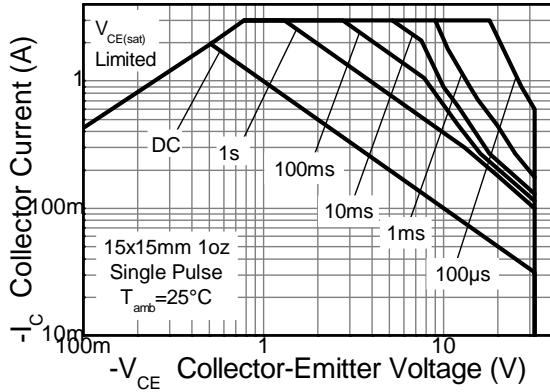
Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V_{CBO}	-40	V
Collector-Emitter Voltage	V_{CEO}	-32	V
Emitter-Base Voltage	V_{EBO}	-5	V
Continuous Collector Current	I_C	-2	A
Peak Pulse Collector Current	I_{CM}	-3	A

Thermal Characteristics @ $T_A = 25^\circ\text{C}$ unless otherwise specified

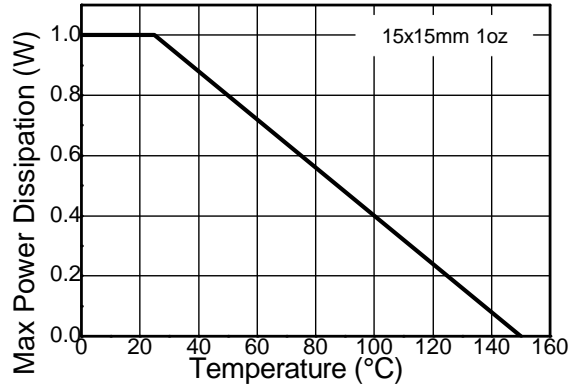
Characteristic	Symbol	Value	Unit
Power Dissipation (Note 4)	P_D	1	W
Thermal Resistance, Junction to Ambient (Note 4)	$R_{\theta JA}$	125	$^\circ\text{C}/\text{W}$
Operating and Storage Temperature Range	T_J, T_{STG}	-55 to +150	$^\circ\text{C}$

Notes: 4. Device mounted on 15mm X 15mm FR-4 PCB with high coverage of single sided 1 oz copper, in still air conditions

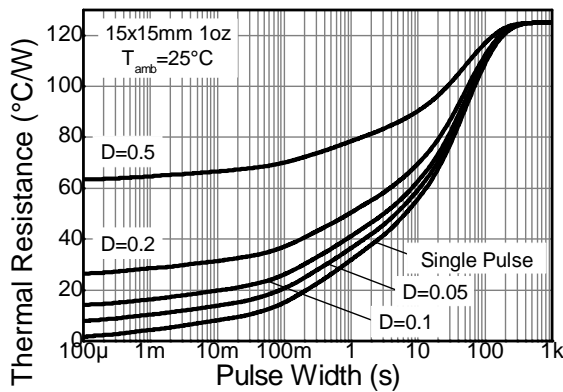
Thermal Characteristics



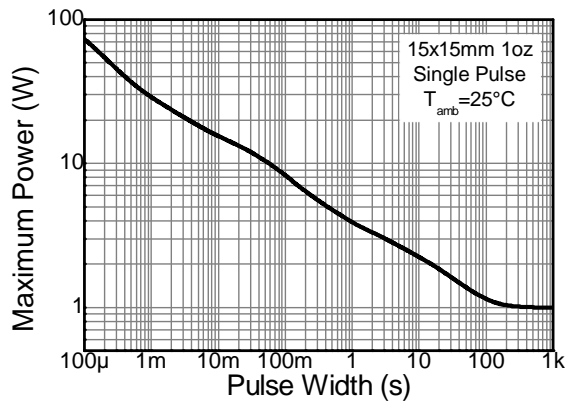
Safe Operating Area



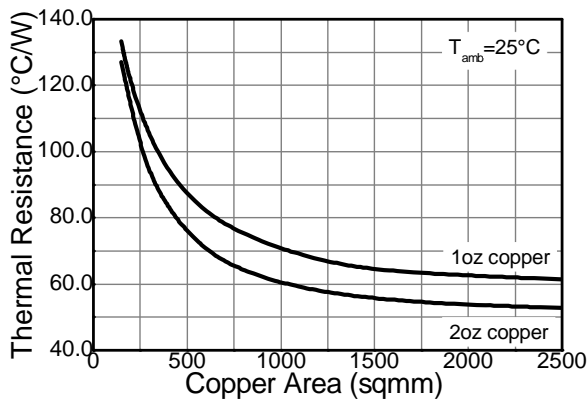
Derating Curve



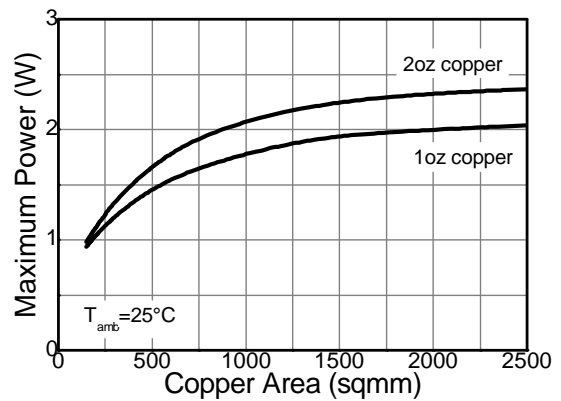
Transient Thermal Impedance



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	$I_C = -50\mu\text{A}, I_E = 0$
Collector-Emitter Breakdown Voltage	BV_{CEO}	-32	—	—	V	$I_C = -1\text{mA}, I_B = 0$
Emitter-Base Breakdown Voltage	BV_{EBO}	-5	—	—	V	$I_E = -50\mu\text{A}, I_C = 0$
Collector Cutoff Current	I_{CBO}	—	—	-1	μA	$V_{CB} = -20\text{V}, I_E = 0$
Emitter Cutoff Current	I_{EBO}	—	—	-1	μA	$V_{EB} = -4\text{V}, I_C = 0$
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 $\leq 2\%$.

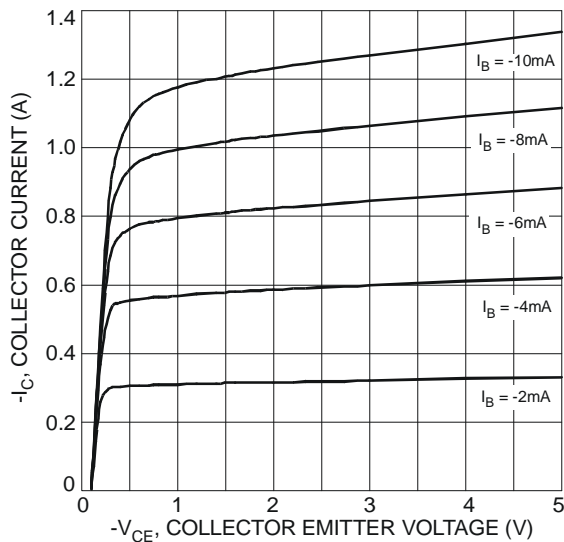


Fig. 1 Typical Collector Current vs. Collector-Emitter Voltage

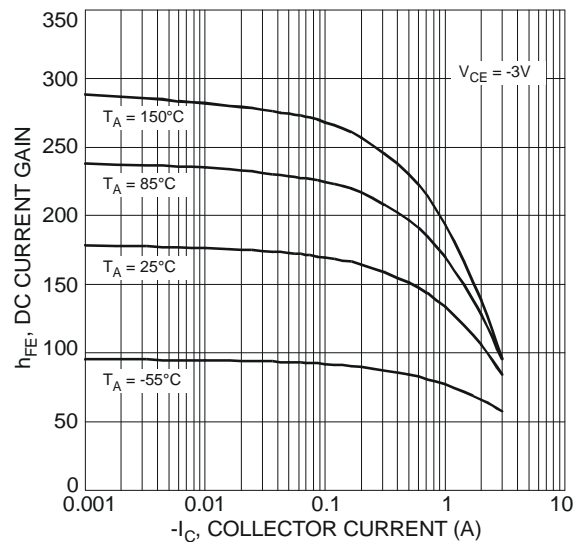


Fig. 2 Typical DC Current Gain vs. Collector Current (2DB1188Q)

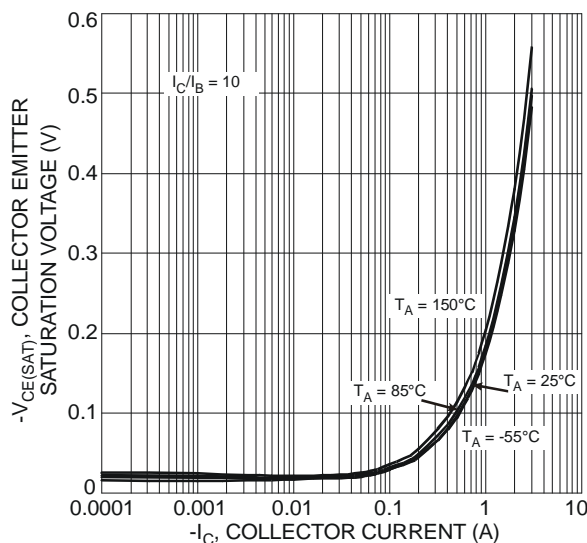


Fig. 3 Typical Collector-Emitter Saturation Voltage vs. Collector Current

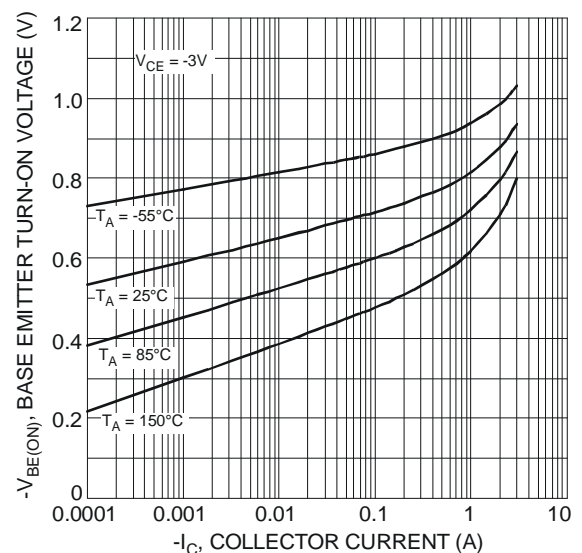


Fig. 4 Typical Base-Emitter Turn-On Voltage vs. Collector Current

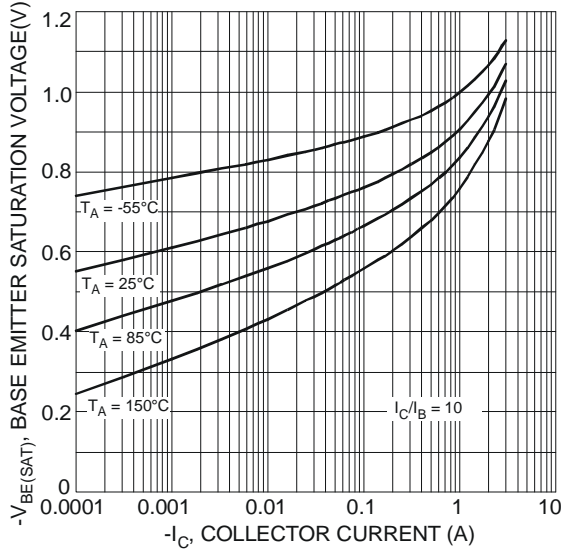


Fig. 5 Typical Base-Emitter Saturation Voltage vs. Collector Current

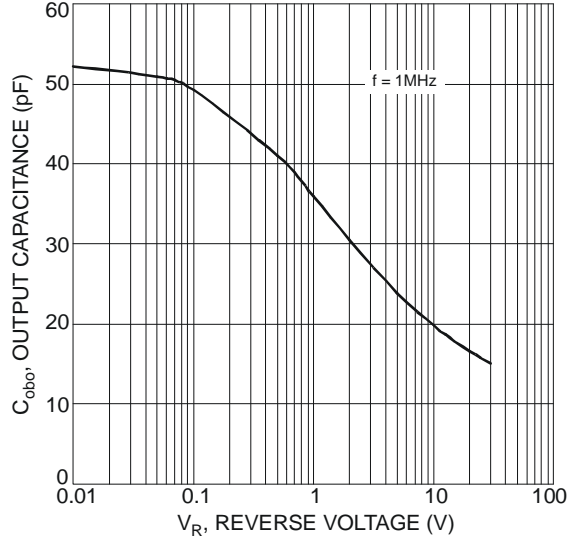


Fig. 6 Typical Output Capacitance Characteristics

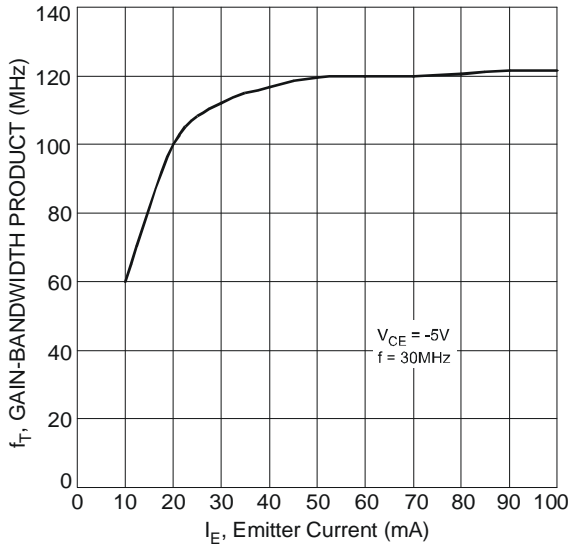
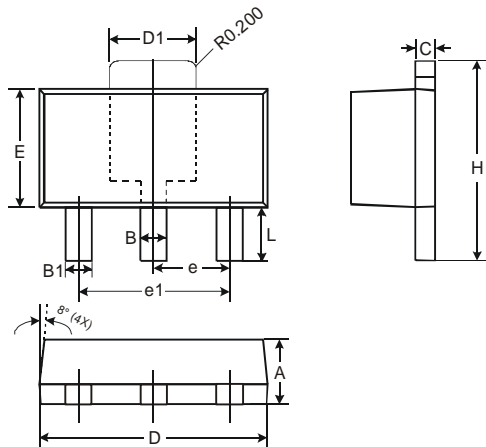


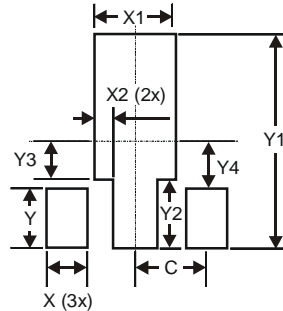
Fig. 7 Typical Gain-Bandwidth Product vs. Emitter Current

Package Outline Dimensions



SOT89		
Dim	Min	Max
A	1.40	1.60
B	0.44	0.62
B1	0.35	0.54
C	0.35	0.43
D	4.40	4.60
D1	1.52	1.83
E	2.29	2.60
e	1.50 Typ	
e1	3.00 Typ	
H	3.94	4.25
L	0.89	1.20
All Dimensions in mm		

Suggested Pad Layout



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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