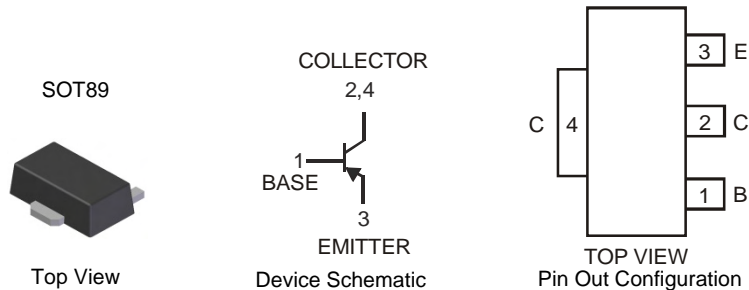


Features

- Epitaxial Planar Die Construction
- Ideally Suited for Automated Assembly Processes
- Ideal for Medium Power Switching or Amplification Applications
- **Lead Free By Design/RoHS Compliant (Note 1)**
- **"Green" Device (Note 2)**

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: 0.055 grams (approximate)



Ordering Information (Note 3)

Part Number	Case	Packaging
2DB1386Q-13	SOT89	2500/Tape & Reel
2DB1386R-13	SOT89	2500/Tape & Reel

- 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



KP3x = Product Type Marking Code,
 where: KP3Q = 2DB1386Q
 KP3R = 2DB1386R
 YWW = Date Code Marking
 Y = Last digit of year (ex: 7 = 2007)
 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}	-30	V
Collector-Emitter Voltage	V_{CEO}	-20	V
Emitter-Base Voltage	V_{EBO}	-6	V
Peak Pulse Current	I_{CM}	-10	A
Continuous Collector Current	I_{C}	-5	A

Thermal Characteristics

Characteristic	Symbol	Value	Unit
Power Dissipation (Note 4) @ $T_A = 25^\circ\text{C}$	P_{D}	1	W
Thermal Resistance, Junction to Ambient Air (Note 4) @ $T_A = 25^\circ\text{C}$	$R_{\theta\text{JA}}$	125	$^\circ\text{C/W}$
Operating and Storage Temperature Range	$T_{\text{J}}, T_{\text{STG}}$	-55 to +150	$^\circ\text{C}$

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

Characteristic	Symbol	Min	Typ	Max	Unit	Conditions
OFF CHARACTERISTICS (Note 5)						
Collector-Base Breakdown Voltage	$V_{\text{(BR)CBO}}$	-30	—	—	V	$I_{\text{C}} = -50\mu\text{A}, I_{\text{E}} = 0$
Collector-Emitter Breakdown Voltage	$V_{\text{(BR)CEO}}$	-20	—	—	V	$I_{\text{C}} = -1\text{mA}, I_{\text{B}} = 0$
Emitter-Base Breakdown Voltage	$V_{\text{(BR)EBO}}$	-6	—	—	V	$I_{\text{E}} = -50\mu\text{A}, I_{\text{C}} = 0$
Collector Cut-Off Current	I_{CBO}	—	—	-0.5	μA	$V_{\text{CB}} = -20\text{V}, I_{\text{E}} = 0$
Emitter Cut-Off Current	I_{EBO}	—	—	-0.5	μA	$V_{\text{EB}} = -5\text{V}, I_{\text{C}} = 0$
ON CHARACTERISTICS (Note 5)						
Collector-Emitter Saturation Voltage	$V_{\text{CE(SAT)}}$	—	-0.25	-1.0	V	$I_{\text{C}} = -4\text{A}, I_{\text{B}} = -0.1\text{A}$
DC Current Gain	2DB1386Q	120	—	270	—	$I_{\text{C}} = -0.5\text{A}, V_{\text{CE}} = -2\text{V}$
	2DB1386R	180	—	390		
SMALL SIGNAL CHARACTERISTICS						
Output Capacitance	C_{obo}	—	55	—	pF	$V_{\text{CB}} = -20\text{V}, I_{\text{E}} = 0, f = 1\text{MHz}$
Current Gain-Bandwidth Product	f_{T}	—	100	—	MHz	$V_{\text{CE}} = -6\text{V}, I_{\text{E}} = 50\text{mA}, f = 30\text{MHz}$

- Notes:
- Device mounted on FR-4 PCB; pad layout as shown on page 4 or in Diodes Inc. suggested pad layout document AP02001, which can be found on our website at <http://www.diodes.com>.
 - Measured under pulsed conditions. Pulse width = 300 μs . Duty cycle $\leq 2\%$.

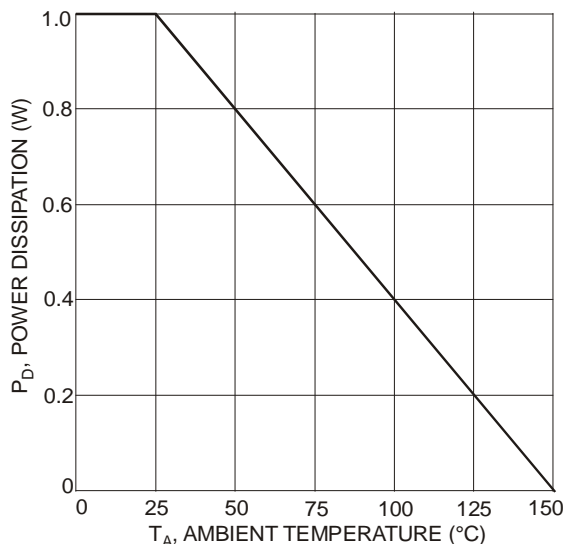


Fig. 1 Power Dissipation vs. Ambient Temperature (Note 4)

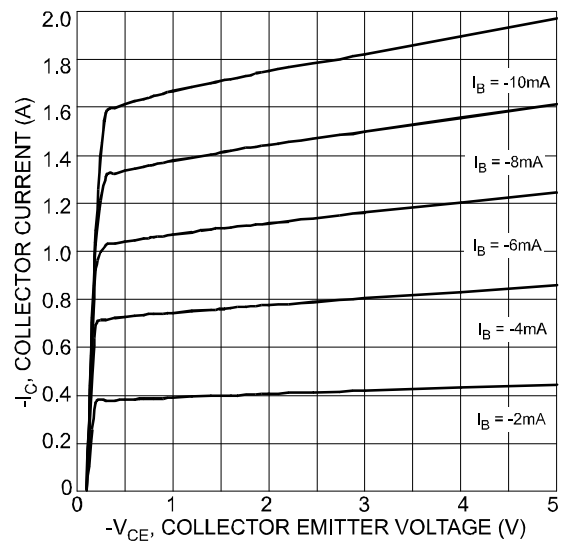


Fig. 2 Typical Collector Current vs. Collector-Emitter Voltage

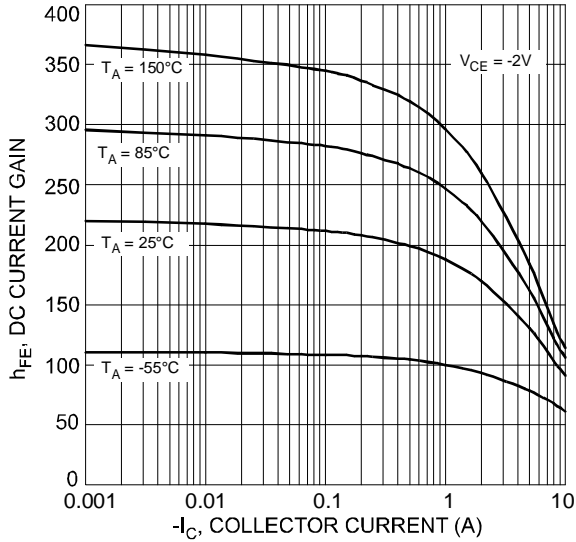


Fig. 3 Typical DC Current Gain vs. Collector Current (2DB1386Q)

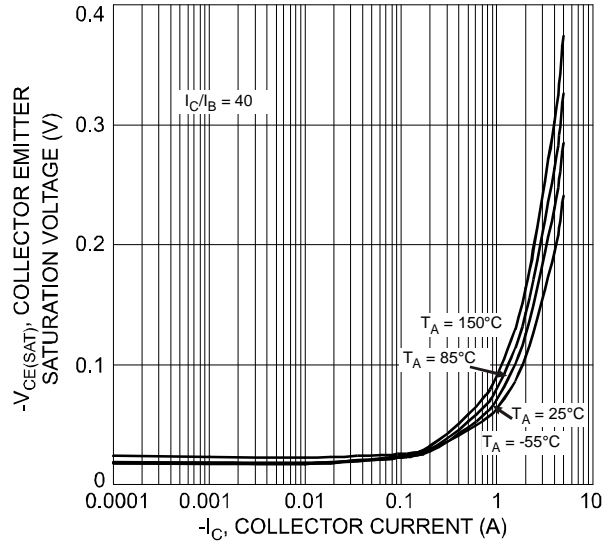


Fig. 4 Typical Collector-Emitter Saturation Voltage vs. Collector Current

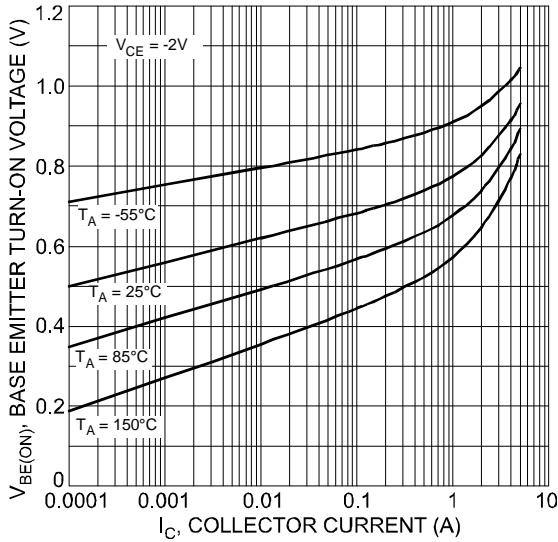


Fig. 5 Typical Base-Emitter Turn-On Voltage vs. Collector Current

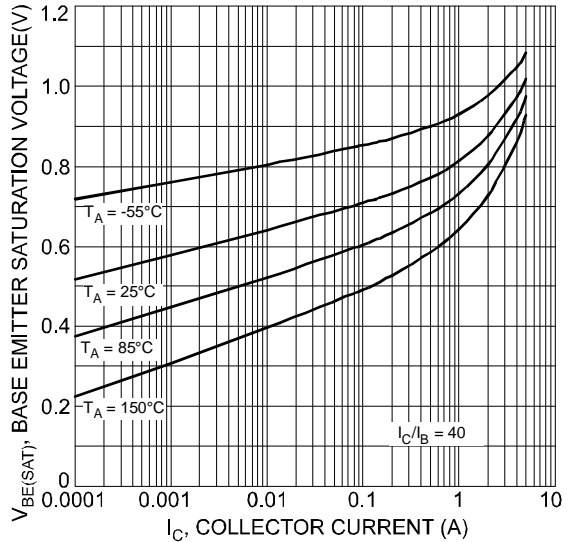


Fig. 6 Typical Base-Emitter Saturation Voltage vs. Collector Current

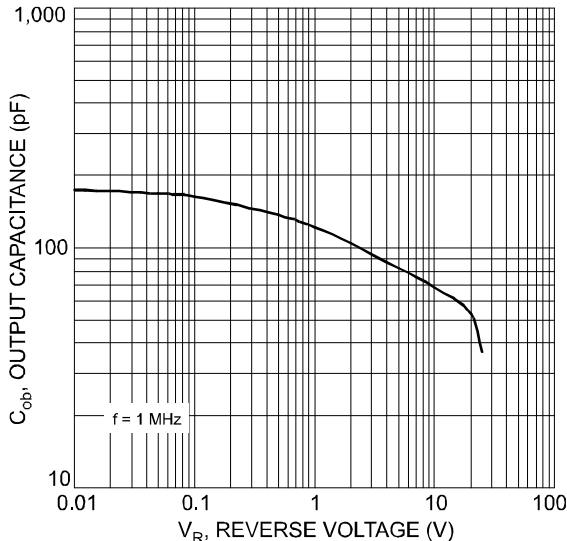


Fig. 7 Typical Output Capacitance Characteristics

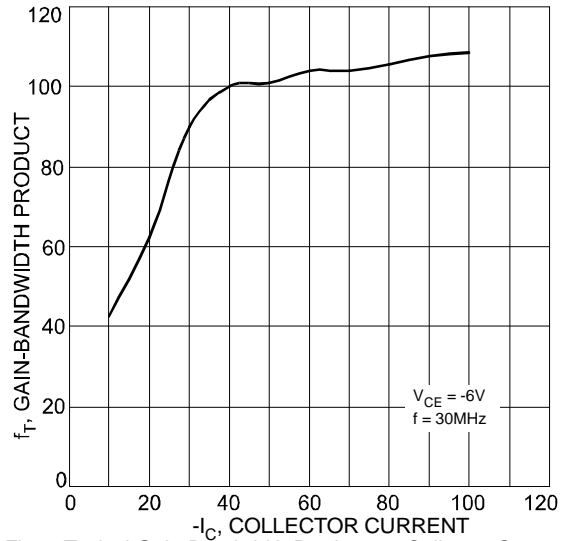
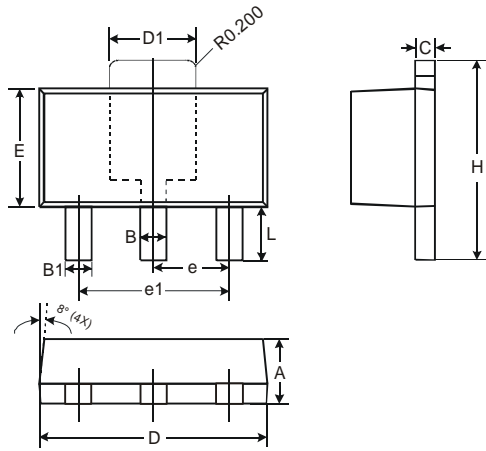


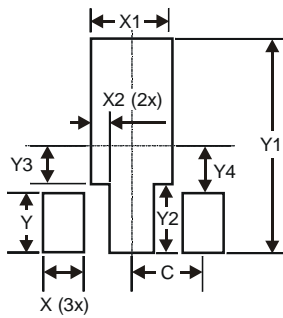
Fig. 8 Typical Gain-Bandwidth Product vs. Collector Current

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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