Lead-free Green

2DB1386Q/R

PNP SURFACE MOUNT TRANSISTOR

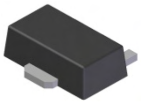
Features

- 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)**

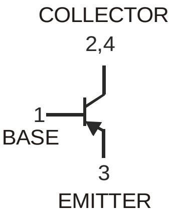
Mechanical Data

- 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)

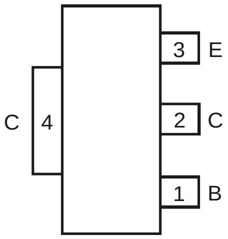
SOT89



Top View



Device Schematic



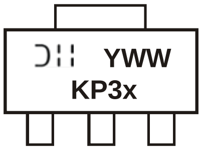
TOP VIEW
Pin Out Configuration

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°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°C	P_D	1	W
Thermal Resistance, Junction to Ambient Air (Note 4) @ T_A = 25°C	$R_{\theta JA}$	125	°C/W
Operating and Storage Temperature Range	T_J, T_{STG}	-55 to +150	°C

Electrical Characteristics @T_A = 25°C unless otherwise specified

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

Notes: 4. 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.

5. Measured under pulsed conditions. Pulse width = 300µs. Duty cycle ≤2%.

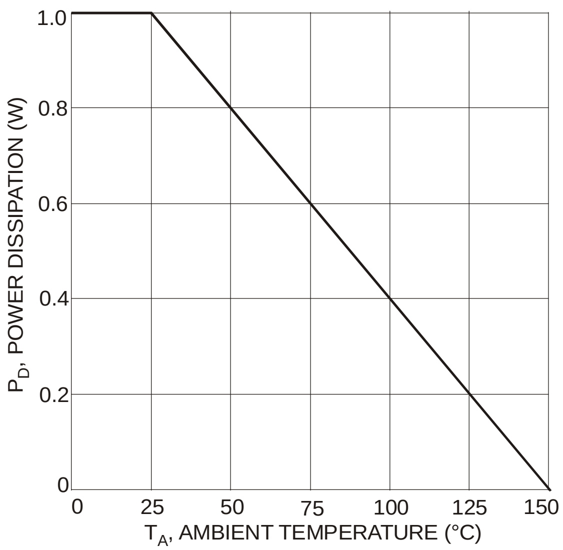


Fig. 1 Power Dissipation vs. Ambient Temperature (Note 4)

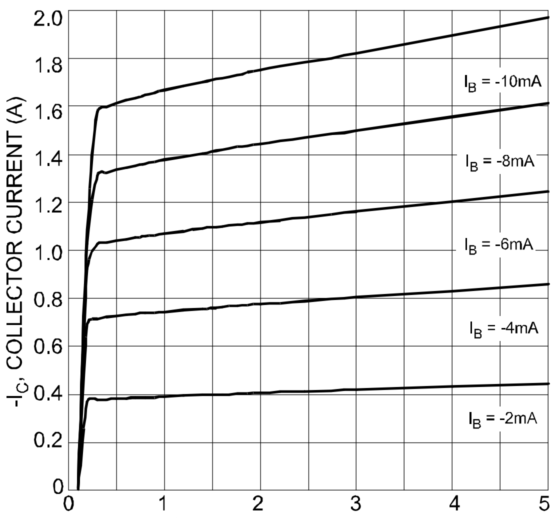


Fig. 2 Typical Collector Current vs. Collector-Emitter Voltage

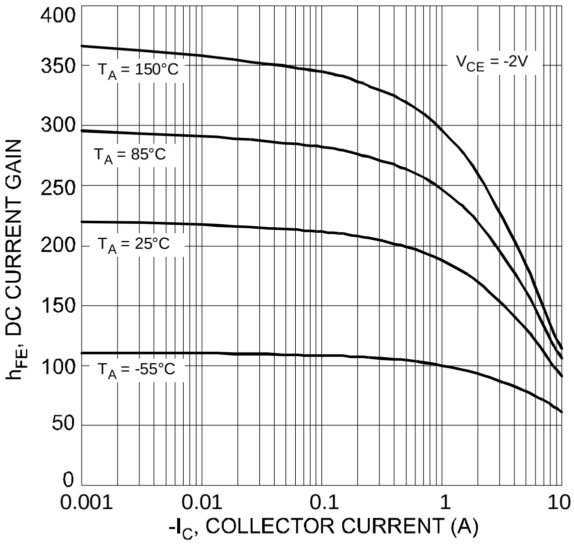


Fig. 3 Typical DC Current Gain vs. Collector Current (2DB1386Q)

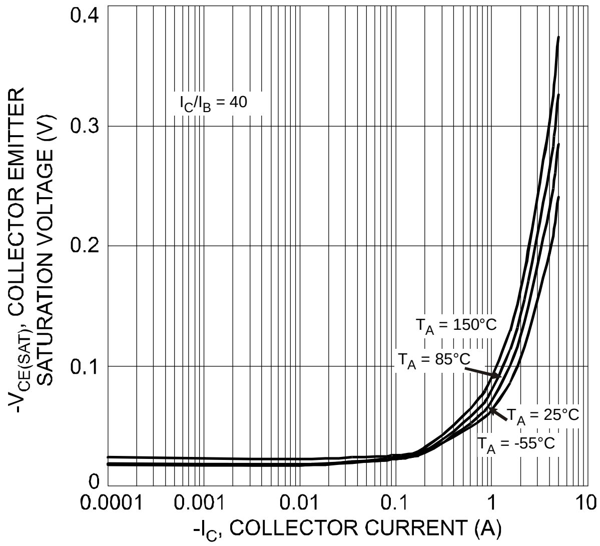


Fig. 4 Typical Collector-Emitter Saturation Voltage vs. Collector Current

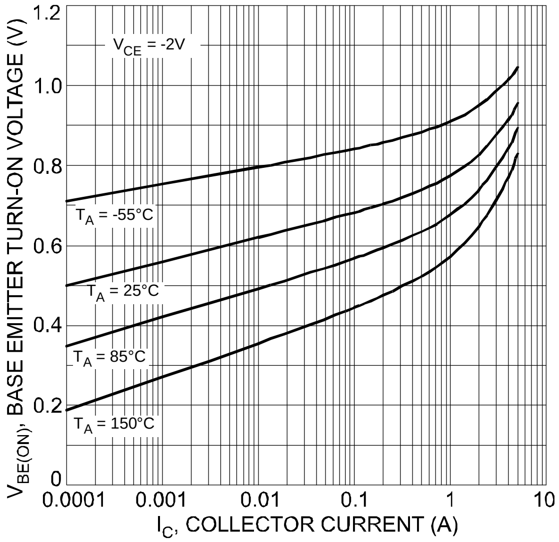


Fig. 5 Typical Base-Emitter Turn-On Voltage vs. Collector Current

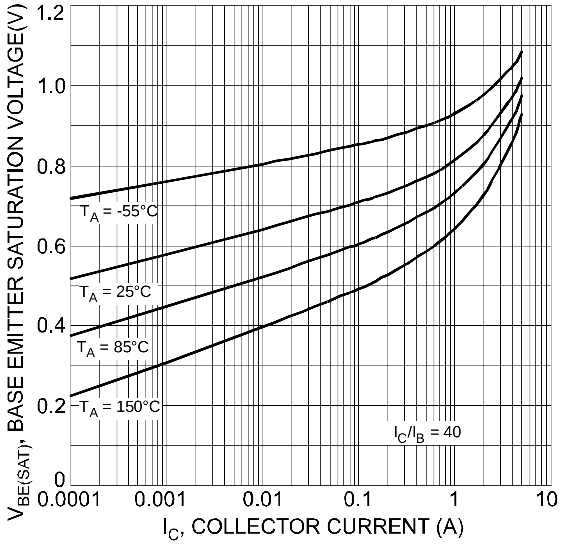


Fig. 6 Typical Base-Emitter Saturation Voltage vs. Collector Current

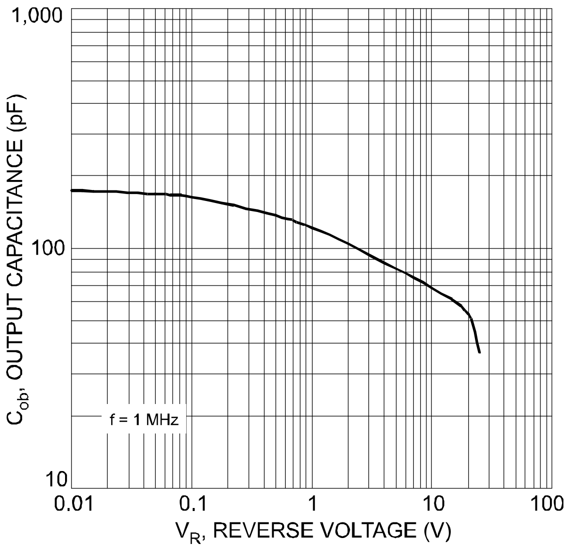


Fig. 7 Typical Output Capacitance Characteristics

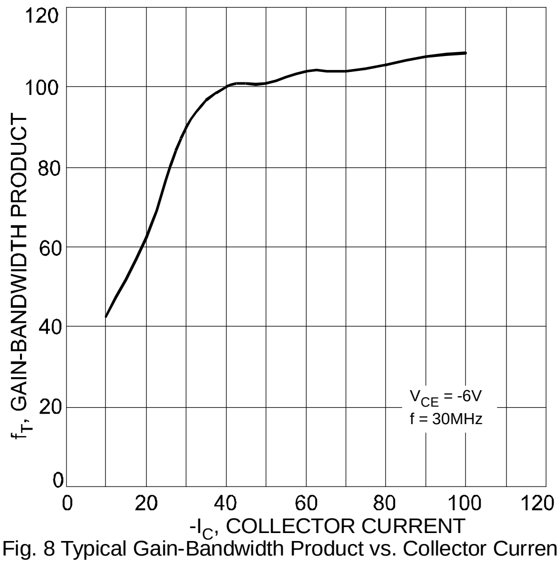
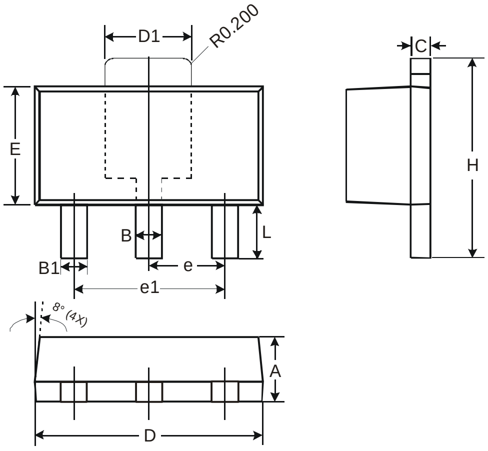


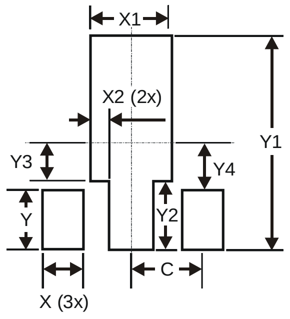
Fig. 8 Typical Gain-Bandwidth Product vs. Collector Current

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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ЭЛЕКТРОННЫХ КОМПОНЕНТОВ

многоканальный
+7 495 668 12 70
info@moschip.ru

Общество с ограниченной ответственностью «МосЧип» ИНН 7719860671 / КПП 771901001
Адрес: 105318, г.Москва, ул.Щербаковская д.3, офис 1107

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Офис по работе с юридическими лицами:

105318, г.Москва, ул.Щербаковская д.3, офис 1107, 1118, ДЦ «Щербаковский»

Телефон: +7 495 668-12-70 (многоканальный)

Факс: +7 495 668-12-70 (доб.304)

E-mail: info@moschip.ru

Skype отдела продаж:

moschip.ru	moschip.ru_6
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