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[Diodes Incorporated](#)  
[DSS60600MZ4-13](#)

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**DSS60600MZ4**

**LOW  $V_{CE(SAT)}$  PNP SURFACE MOUNT TRANSISTOR**

NEW PRODUCT

### Features

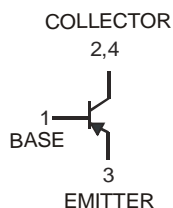
- Ideally Suited for Automated Assembly Processes
- Ultra Low Collector-Emitter Saturation Voltage
- Complementary NPN Type Available (DSS60601MZ4)
- Ideal for Medium Power Switching or Amplification Applications
- **Lead Free By Design/RoHS Compliant (Note 1)**
- **"Green" Device (Note 2)**

### Mechanical Data

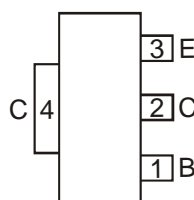
- Case: SOT-223
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020D
- Terminals: Finish — Matte Tin annealed over Copper leadframe (Lead Free Plating). Solderable per MIL-STD-202, Method 208
- Marking Information: See Page 4
- Ordering Information: See Page 4
- Weight: 0.115 grams (approximate)



Top View



Device Schematic



Pin Out Configuration

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

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	$V_{CBO}$	-100	V
Collector-Emitter Voltage	$V_{CEO}$	-60	V
Emitter-Base Voltage	$V_{EBO}$	-6	V
Peak Pulse Current	$I_{CM}$	-12	A
Continuous Collector Current	$I_C$	-6	A

### Thermal Characteristics

Characteristic	Symbol	Value	Unit
Power Dissipation (Note 3) @ $T_A = 25^\circ\text{C}$	$P_D$	1.2	W
Thermal Resistance, Junction to Ambient Air (Note 3) @ $T_A = 25^\circ\text{C}$	$R_{\theta JA}$	104	$^\circ\text{C/W}$
Power Dissipation (Note 4) @ $T_A = 25^\circ\text{C}$	$P_D$	2	W
Thermal Resistance, Junction to Ambient Air (Note 4) @ $T_A = 25^\circ\text{C}$	$R_{\theta JA}$	62.5	$^\circ\text{C/W}$
Operating and Storage Temperature Range	$T_J, T_{STG}$	-55 to +150	$^\circ\text{C}$

- Notes:
1. No purposefully added lead.
  2. Diodes Inc.'s "Green" policy can be found on our website at [http://www.diodes.com/products/lead\\_free/index.php](http://www.diodes.com/products/lead_free/index.php).
  3. Device mounted on FR-4 PCB with minimum recommended pad layout.
  4. Device mounted on Polyimide PCB with 330mm<sup>2</sup> 2oz. Copper pad layout.



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**Electrical Characteristics** @T<sub>A</sub> = 25°C unless otherwise specified

Characteristic	Symbol	Min	Typ	Max	Unit	Test Conditions
<b>OFF CHARACTERISTICS</b>						
Collector-Base Breakdown Voltage	V <sub>(BR)CBO</sub>	-100	—	—	V	I <sub>C</sub> = -100μA
Collector-Emitter Breakdown Voltage (Note 5)	V <sub>(BR)CEO</sub>	-60	—	—	V	I <sub>C</sub> = -10mA
Emitter-Base Breakdown Voltage	V <sub>(BR)EBO</sub>	-6	—	—	V	I <sub>E</sub> = -100μA
Collector-Base Cutoff Current	I <sub>CBO</sub>	—	—	-100	nA	V <sub>CB</sub> = -100V, I <sub>E</sub> = 0
Emitter-Base Cutoff Current	I <sub>EBO</sub>	—	—	-100	nA	V <sub>CB</sub> = -100V, I <sub>E</sub> = 0, T <sub>A</sub> = 150°C
<b>ON CHARACTERISTICS (Note 5)</b>						
DC Current Gain	h <sub>FE</sub>	150	—	—	—	V <sub>CE</sub> = -2V, I <sub>C</sub> = -0.5A
		120	—	360		V <sub>CE</sub> = -2V, I <sub>C</sub> = -1A
		100	—	—		V <sub>CE</sub> = -2V, I <sub>C</sub> = -2A
		70	—	—		V <sub>CE</sub> = -2V, I <sub>C</sub> = -6A
Collector-Emitter Saturation Voltage	V <sub>CE(SAT)</sub>	—	—	-50	mV	I <sub>C</sub> = -0.1A, I <sub>B</sub> = -2mA
		—	-50	-70		I <sub>C</sub> = -1A, I <sub>B</sub> = -100mA
		—	-90	-120		I <sub>C</sub> = -2A, I <sub>B</sub> = -200mA
		—	—	-250		I <sub>C</sub> = -3A, I <sub>B</sub> = -60mA
		—	—	-350		I <sub>C</sub> = -6A, I <sub>B</sub> = -600mA
Equivalent On-Resistance	R <sub>CE(SAT)</sub>	—	45	60	mΩ	I <sub>C</sub> = -2A, I <sub>B</sub> = -200mA
Base-Emitter Saturation Voltage	V <sub>BE(SAT)</sub>	—	—	-1.0	V	I <sub>C</sub> = 1A, I <sub>B</sub> = -100mA
Base-Emitter Turn-on Voltage	V <sub>BE(ON)</sub>	—	—	-0.9	V	V <sub>CE</sub> = -2V, I <sub>C</sub> = -1A
<b>SMALL SIGNAL CHARACTERISTICS</b>						
Transition Frequency	f <sub>T</sub>	100	—	—	MHz	V <sub>CE</sub> = -10V, I <sub>C</sub> = -100mA, f = 100MHz
Output Capacitance	C <sub>obo</sub>	—	50	—	pF	V <sub>CB</sub> = -10V, f = 1MHz
Input Capacitance	C <sub>ibo</sub>	—	300	—	pF	V <sub>EB</sub> = -5V, f = 1MHz
<b>SWITCHING CHARACTERISTICS</b>						
Turn-On Time	t <sub>on</sub>	—	350	—	ns	V <sub>CC</sub> = -30V, I <sub>C</sub> = -750mA, I <sub>B1</sub> = -15mA
Delay Time	t <sub>d</sub>	—	180	—	ns	
Rise Time	t <sub>r</sub>	—	170	—	ns	
Turn-Off Time	t <sub>off</sub>	—	400	—	ns	V <sub>CC</sub> = -30V, I <sub>C</sub> = -750mA, I <sub>B1</sub> = I <sub>B2</sub> = -15mA
Storage Time	t <sub>s</sub>	—	300	—	ns	
Fall Time	t <sub>f</sub>	—	100	—	ns	

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

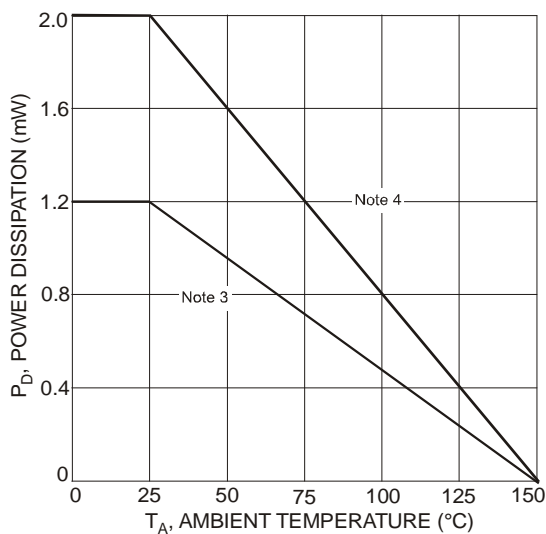


Fig. 1 Power Dissipation vs. Ambient Temperature

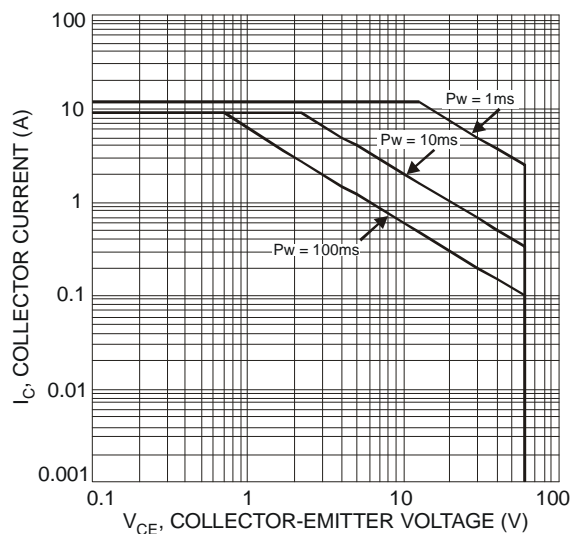


Fig. 2 Typical Collector Current vs. Collector-Emitter Voltage (Note 3)



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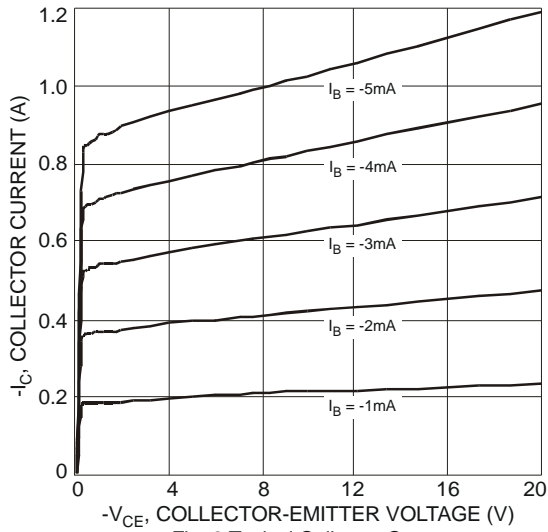


Fig. 3 Typical Collector Current vs. Collector-Emitter Voltage

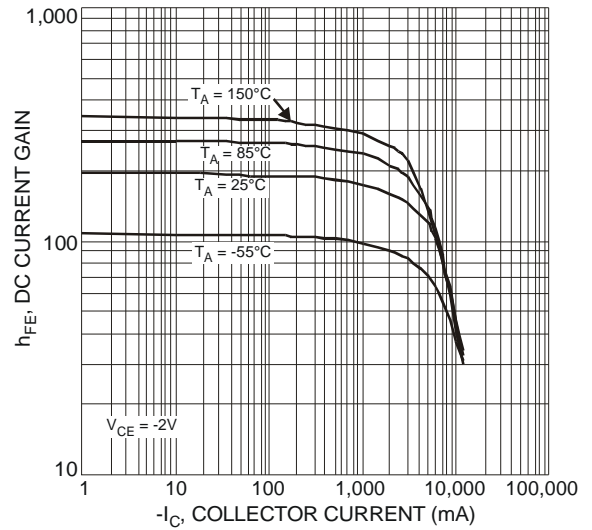


Fig. 4 Typical DC Current Gain vs. Collector Current

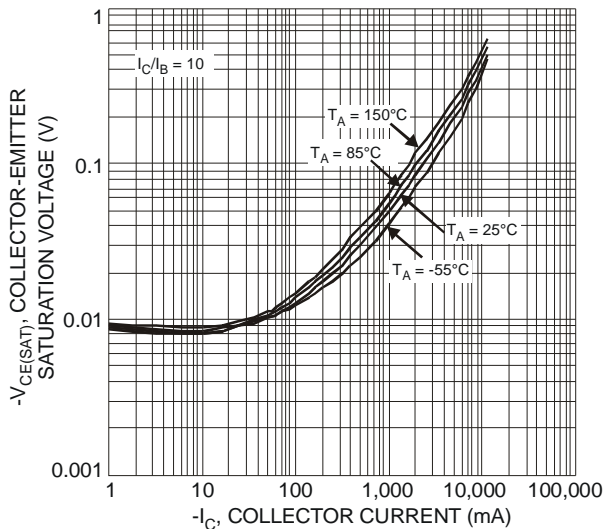


Fig. 5 Typical Collector-Emitter Saturation Voltage vs. Collector Current

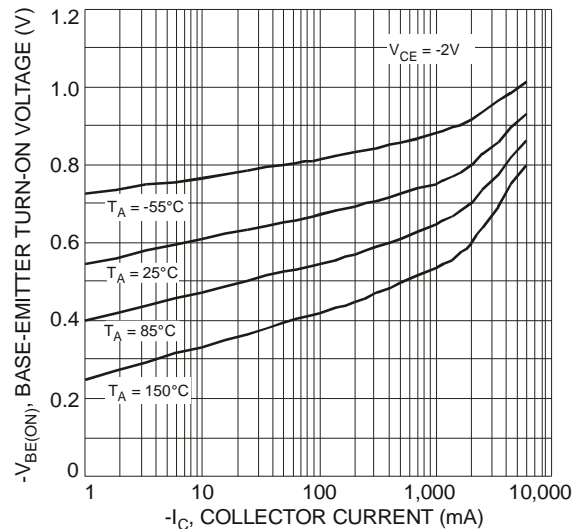


Fig. 6 Typical Base-Emitter Turn-On Voltage vs. Collector Current

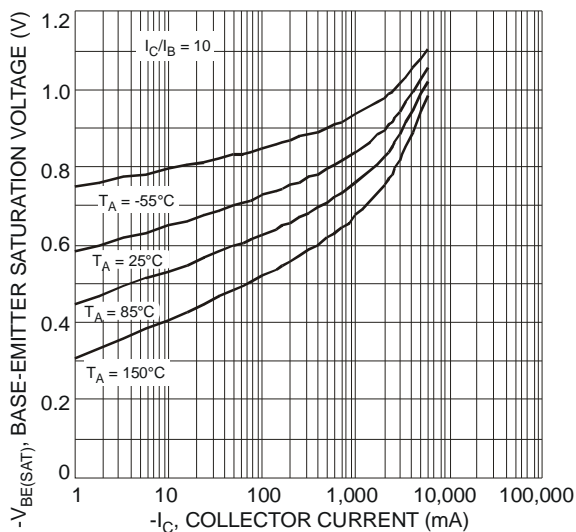


Fig. 7 Typical Base-Emitter Saturation Voltage vs. Collector Current

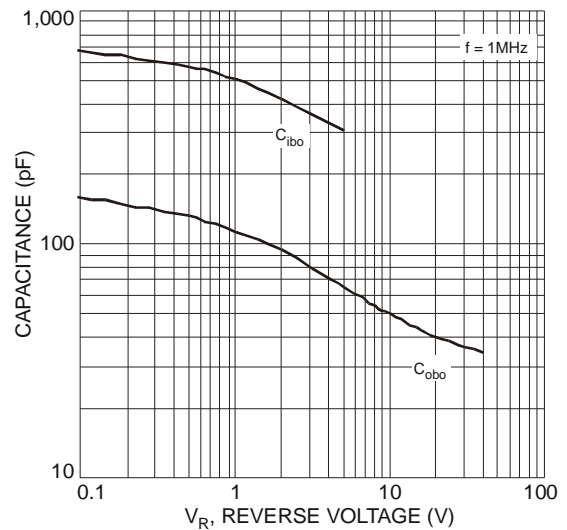


Fig. 8 Typical Capacitance Characteristics



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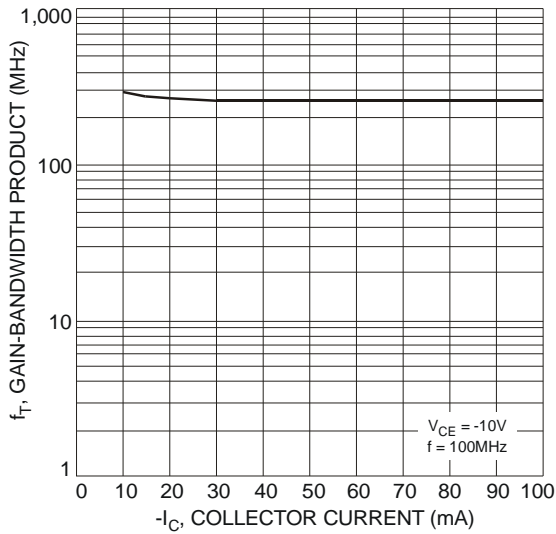


Fig. 9 Typical Gain-Bandwidth Product vs. Collector Current

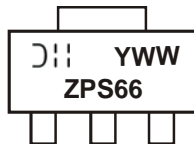
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**Ordering Information** (Note 6)

Part Number	Case	Packaging
DSS60600MZ4-13	SOT-223	2500/Tape & Reel

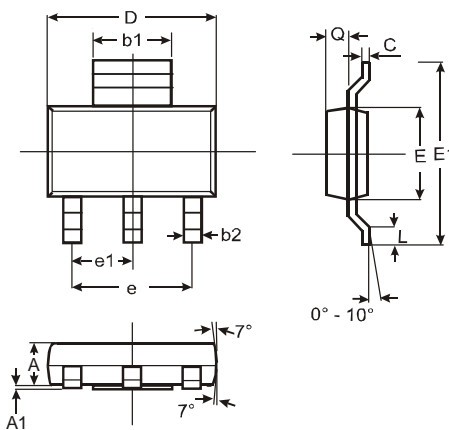
Notes: 6. For packaging details, go to our website at <http://www.diodes.com/datasheets/ap02007.pdf>.

**Marking Information**



ZPS66 = Product Type Marking Code  
 YWW = Date Code Marking  
 Y = Last digit of year (ex: 8 = 2008)  
 WW = Week code 01 - 52

**Package Outline Dimensions**

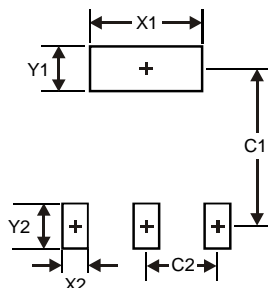


SOT-223			
Dim	Min	Max	Typ
A	1.55	1.65	1.60
A1	0.010	0.15	0.05
b1	2.90	3.10	3.00
b2	0.60	0.80	0.70
C	0.20	0.30	0.25
D	6.45	6.55	6.50
E	3.45	3.55	3.50
E1	6.90	7.10	7.00
e	—	—	4.60
e1	—	—	2.30
L	0.85	1.05	0.95
Q	0.84	0.94	0.89
All Dimensions in mm			



**DSS60600MZ4**

**Suggested Pad Layout**



Dimensions	Value (in mm)
<b>X1</b>	3.3
<b>X2</b>	1.2
<b>Y1</b>	1.6
<b>Y2</b>	1.6
<b>C1</b>	6.4
<b>C2</b>	2.3

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