

## Description

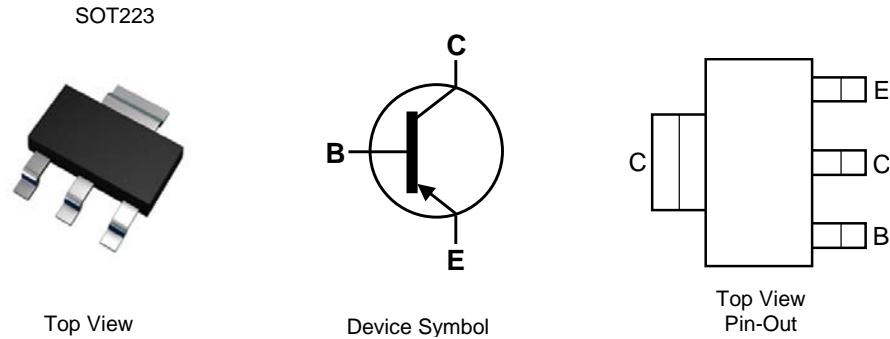
This bipolar junction transistor (BJT) is designed to meet the stringent requirements of automotive applications.

## Features

- Ideally Suited for Automated Assembly Processes
- Ultra Low Collector-Emitter Saturation Voltage
- Complementary NPN Type Available (DSS60601MZ4Q)
- 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**
- **PPAP Capable (Note 4)**

## Mechanical Data

- Case: SOT223
- Case Material: Molded Plastic. "Green" Molding Compound.
- UL Flammability Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish - Matte Tin Plated Leads, Solderable per MIL-STD-202, Method 208 <sup>(e3)</sup>
- Weight: 0.112 grams (Approximate)



## Ordering Information (Notes 4 and 5)

Product	Compliance	Marking	Reel Size (inches)	Tape Width (mm)	Quantity per Reel
DSS60600MZ4Q-13	Automotive	ZPS66	13	12	2500

- Notes:
1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS), 2011/65/EU (RoHS 2) & 2015/863/EU (RoHS 3) compliant.
  2. See <https://www.diodes.com/quality/lead-free/> 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. Automotive products are AEC-Q101 qualified and are PPAP capable. Refer to <https://www.diodes.com/quality/>.
  5. For packaging details, go to our website at <http://www.diodes.com/products/packages.html>.

## Marking Information



ZPS66 = Product Type Marking Code  
 YWW = Date Code Marking  
 Y = Last Digit of Year (ex: 8 = 2018)  
 WW = Week Code 01 - 52

**Absolute Maximum Ratings** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V <sub>CBO</sub>	-100	V
Collector-Emitter Voltage	V <sub>CEO</sub>	-60	V
Emitter-Base Voltage	V <sub>EBO</sub>	-7	V
Continuous Collector Current	I <sub>C</sub>	-6	A
Peak Pulse Current	I <sub>CM</sub>	-12	A

**Thermal Characteristics** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

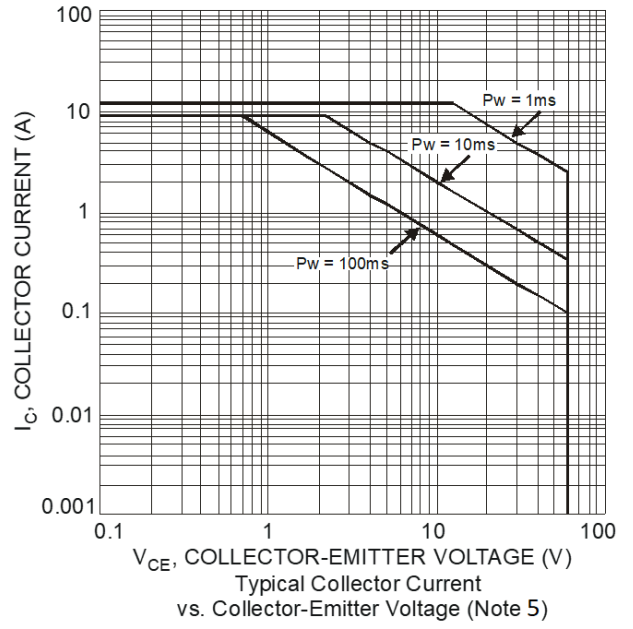
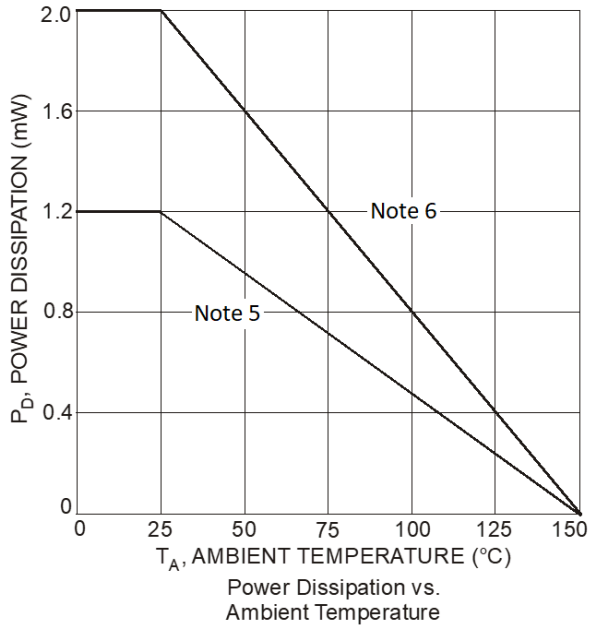
Characteristic	Symbol	Value	Unit
Power Dissipation	P <sub>D</sub>	1.2	W
		2.0	W
Thermal Resistance, Junction to Ambient	R <sub>θJA</sub>	104	°C/W
		62.5	°C/W
Operating and Storage Temperature Range	T <sub>J</sub> , T <sub>STG</sub>	-55 to +150	°C

**ESD Ratings** (Note 8)

Characteristic	Symbol	Value	Unit	JEDEC Class
Electrostatic Discharge—Human Body Model	ESD HBM	4000	V	3A
Electrostatic Discharge—Machine Model	ESD MM	400	V	C

- Notes:
6. Device mounted on FR-4 PCB with minimum recommended pad layout.
  7. Device mounted on Polyimide PCB with 330mm<sup>2</sup> 2oz. Copper pad layout.
  8. Refer to JEDEC specification JESD22-A114 and JESD22-A115.

**Thermal Characteristics and Derating Information**

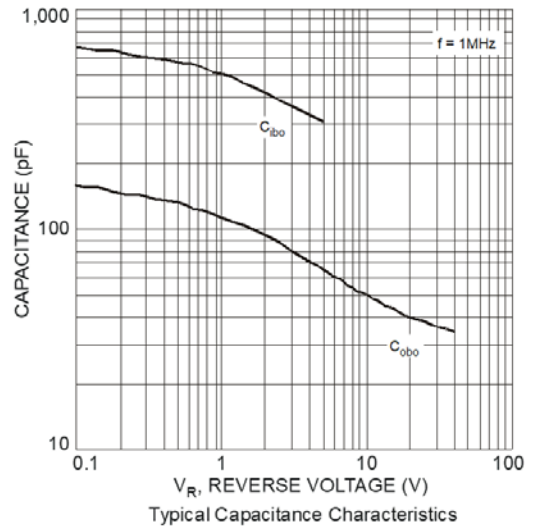
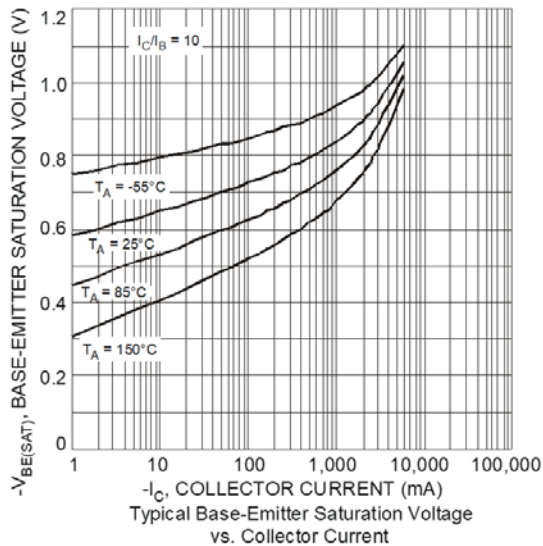
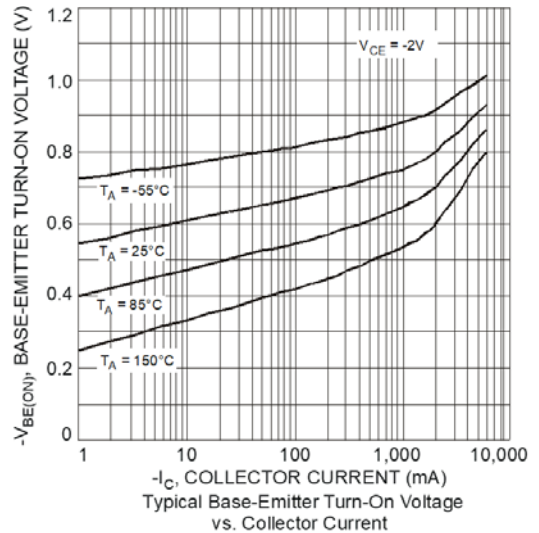
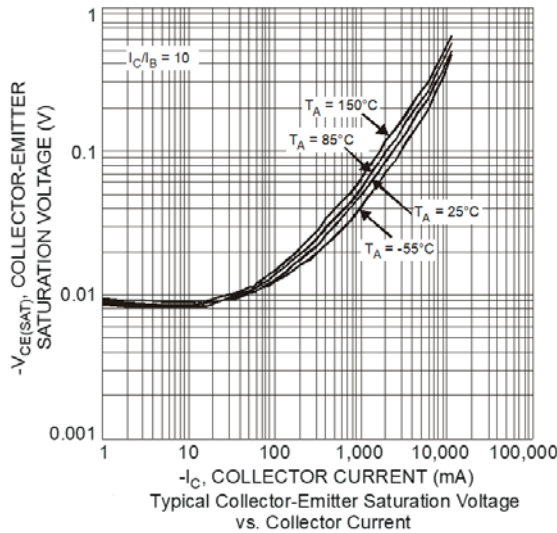
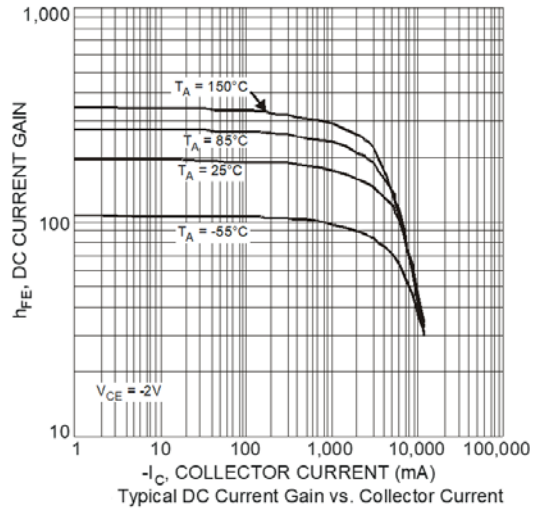
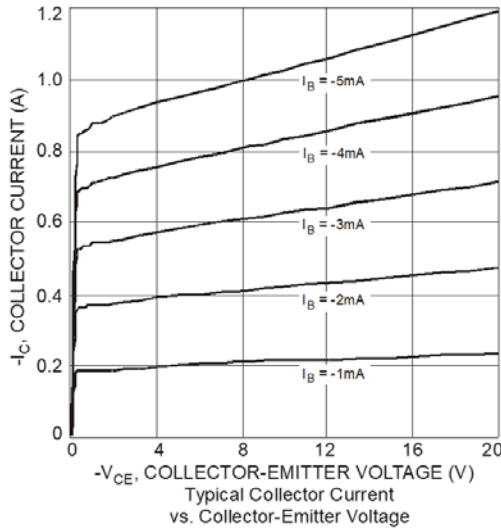


**Electrical Characteristics** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

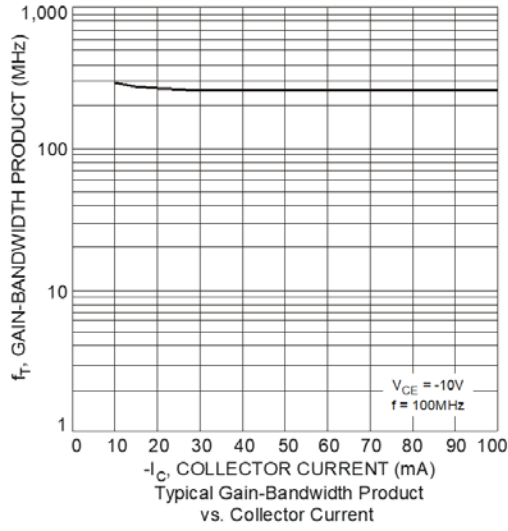
Characteristic	Symbol	Min	Typ	Max	Unit	Test Conditions
<b>OFF CHARACTERISTICS</b>						
Collector-Base Breakdown Voltage	V <sub>(BR)CBO</sub>	-100	—	—	V	I <sub>C</sub> = -100μA
Collector-Emitter Breakdown Voltage (Note 9)	V <sub>(BR)CEO</sub>	-60	—	—	V	I <sub>C</sub> = -10mA
Emitter-Base Breakdown Voltage	V <sub>(BR)EBO</sub>	-7	—	—	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>	—	—	-50	μA	V <sub>CB</sub> = -100V, I <sub>E</sub> = 0, T <sub>A</sub> = 150°C
		—	—	-100	nA	V <sub>EB</sub> = -6V, I <sub>C</sub> = 0
<b>ON CHARACTERISTICS (Note 9)</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	

Note: 9. Measured under pulsed conditions. Pulse width ≤ 300 μs. Duty cycle ≤ 2%

**Typical Electrical Characteristics** (@T<sub>A</sub> = +25°C, unless otherwise specified.)



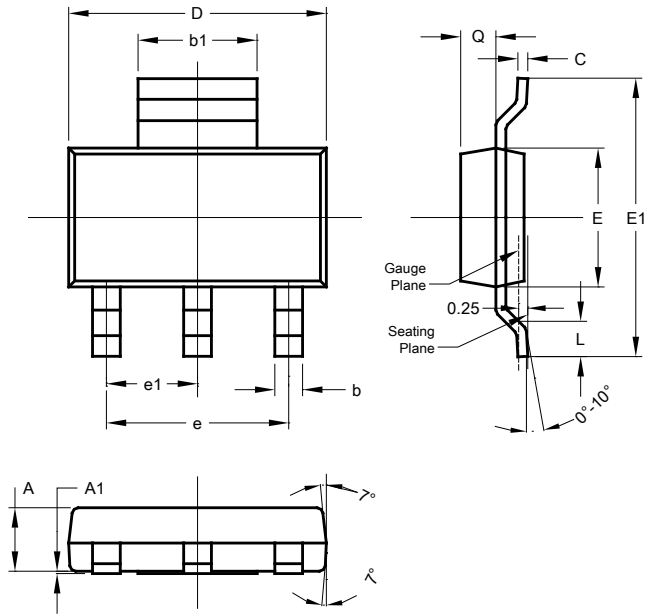
**Typical Electrical Characteristics** (continued)



**Package Outline Dimensions**

Please see <http://www.diodes.com/package-outlines.html> for the latest version.

**SOT223**

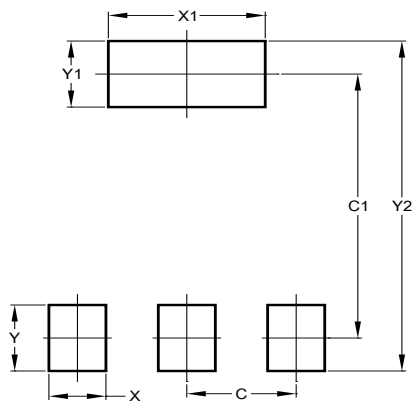


SOT223			
Dim	Min	Max	Typ
A	1.55	1.65	1.60
A1	0.010	0.15	0.05
b	0.60	0.80	0.70
b1	2.90	3.10	3.00
C	0.20	0.30	0.25
D	6.45	6.55	6.50
E	3.45	3.55	3.50
E1	6.90	7.10	7.00
e	—	—	4.60
e1	—	—	2.30
L	0.85	1.05	0.95
Q	0.84	0.94	0.89
All Dimensions in mm			

**Suggested Pad Layout**

Please see <http://www.diodes.com/package-outlines.html> for the latest version.

**SOT223**



Dimensions	Value (in mm)
C	2.30
C1	6.40
X	1.20
X1	3.30
Y	1.60
Y1	1.60
Y2	8.00

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