60V PNP LOW SATURATION TRANSISTOR IN SOT223

Features

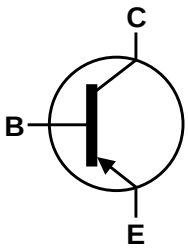
- Ideally Suited for Automated Assembly Processes
- Ultra Low Collector-Emitter Saturation Voltage
- Complementary NPN Type Available: DIODES™ DSS60601MZ4
- Ideal for Medium Power Switching or Amplification Applications
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **An automotive-compliant part is available under separate datasheet (DSS60600MZ4Q)**

Mechanical Data

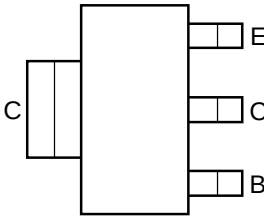
- Package: SOT223
- Package Material: Molded Plastic. "Green" Molding Compound. UL Flammability Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish - Matte Tin Plated Leads, Solderable per MIL-STD-202, Method 208 e3
- Weight: 0.112 grams (Approximate)

SOT223

Top View



Device Symbol



Top View
Pin-Out

Ordering Information (Note 4)

Part Number	Package	Marking	Reel Size (inches)	Tape Width (mm)	Packing	
					Qty.	Carrier
DSS60600MZ4-13	SOT223	ZPS66	13	12	2,500	Reel

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. For packaging details, go to our website at https://www.diodes.com/design/support/packaging/diodes-packaging/.

Marking Information

ZPS66 = Product Type Marking Code
YWW = Date Code Marking
Y or $\overline{Y}$ = Last Digit of Year (ex: 3 = 2023)
WW = Week Code (01 to 52)

Absolute Maximum Ratings (@T_A = +25°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}	-7	V
Continuous Collector Current	I_C	-6	A
Peak Pulse Current	I_{CM}	-12	A

Thermal Characteristics (@T_A = +25°C, unless otherwise specified.)

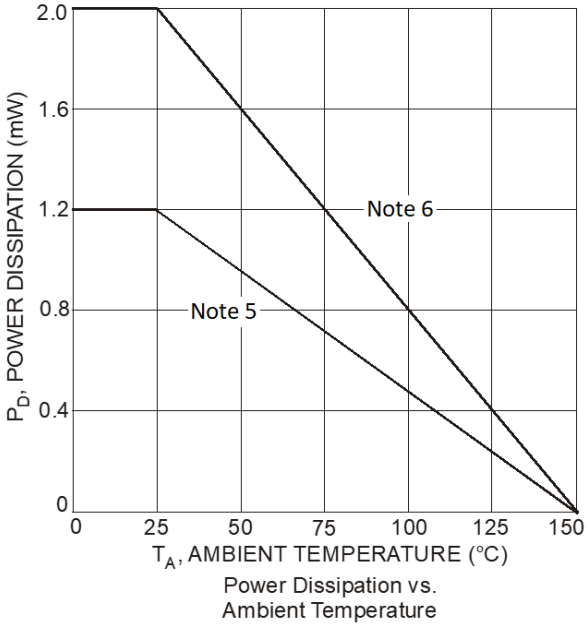
Characteristic		Symbol	Value	Unit
Power Dissipation	(Note 5)	P_D	1.2	W
	(Note 6)		2	W
Thermal Resistance, Junction to Ambient	(Note 5)	$R_{\theta JA}$	104	°C/W
	(Note 6)		62.5	°C/W
Operating and Storage Temperature Range		T_J, T_{STG}	-55 to +150	°C

ESD Ratings (Note 7)

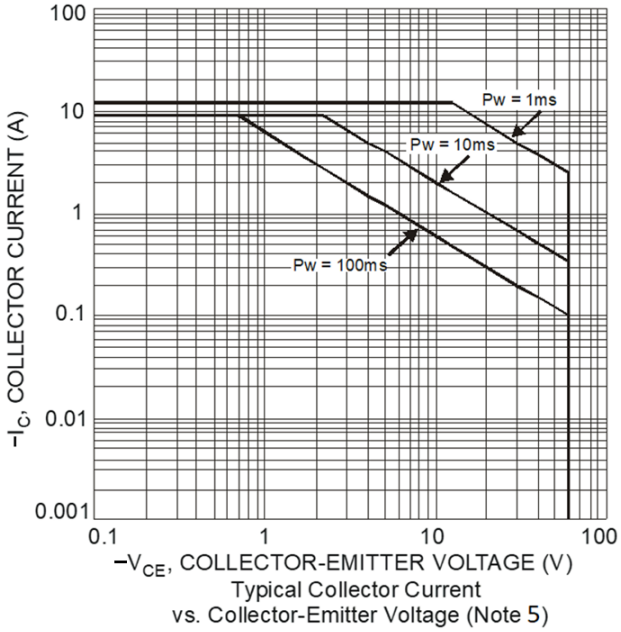
Characteristic	Symbol	Value	Unit	JEDEC Class
Electrostatic Discharge - Human Body Model	ESD HBM	4,000	V	3A
Electrostatic Discharge - Machine Model	ESD MM	400	V	C

Notes: 5. Device mounted on FR-4 PCB with minimum recommended pad layout.
6. Device mounted on Polyimide PCB with 330mm^2 2oz. copper pad layout.
7. Refer to JEDEC specification JESD22-A114 and JESD22-A115.

Thermal Characteristics and Derating Information



Power Dissipation vs.
Ambient Temperature



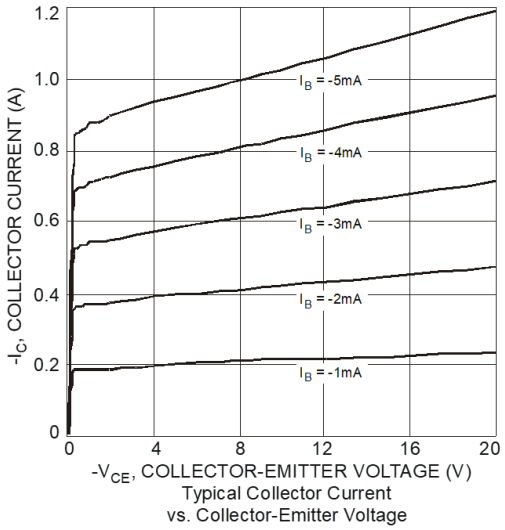
Typical Collector Current
vs. Collector-Emitter Voltage (Note 5)

Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)

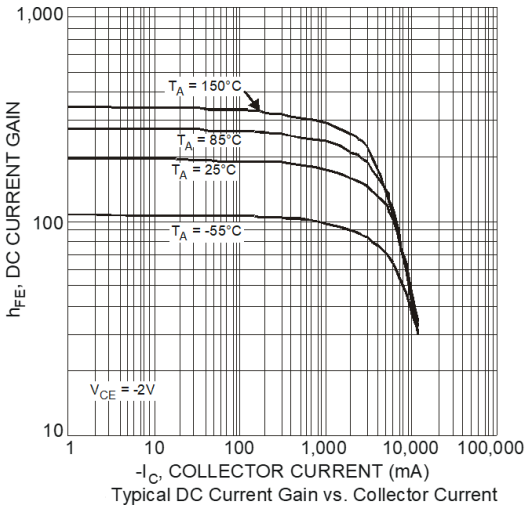
Characteristic	Symbol	Min	Typ	Max	Unit	Test Conditions
OFF CHARACTERISTICS						
Collector-Base Breakdown Voltage	BV_{CBO}	-100	—	—	V	I_C = -100µA
Collector-Emitter Breakdown Voltage (Note 8)	BV_{CEO}	-60	—	—	V	I_C = -10mA
Emitter-Base Breakdown Voltage	BV_{EBO}	-7	—	—	V	I_E = -100µA
Collector-Base Cutoff Current	I_{CBO}	—	—	-100	nA	V_{CB} = -100V
		—	—	-50	µA	V_{CB} = -100V, T_A = +150°C
Emitter-Base Cutoff Current	I_{EBO}	—	—	-100	nA	V_{EB} = -6V
ON CHARACTERISTICS (Note 8)						
DC Current Gain	h_{FE}	150	—	—	—	V_{CE} = -2V, I_C = -0.5A
		120	—	360		V_{CE} = -2V, I_C = -1A
		100	—	—		V_{CE} = -2V, I_C = -2A
		70	—	—		V_{CE} = -2V, I_C = -6A
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	—	—	-50	mV	I_C = -0.1A, I_B = -2mA
		—	-50	-70		I_C = -1A, I_B = -100mA
		—	-90	-120		I_C = -2A, I_B = -200mA
		—	—	-250		I_C = -3A, I_B = -60mA
		—	—	-350		I_C = -6A, I_B = -600mA
Equivalent On-Resistance	$R_{CE(sat)}$	—	45	60	mΩ	I_C = -2A, I_B = -200mA
Base-Emitter Saturation Voltage	$V_{BE(sat)}$	—	—	-1.0	V	I_C = 1A, I_B = -100mA
Base-Emitter Turn-on Voltage	$V_{BE(on)}$	—	—	-0.9	V	V_{CE} = -2V, I_C = -1A
SMALL SIGNAL CHARACTERISTICS						
Transition Frequency	f_T	100	—	—	MHz	V_{CE} = -10V, I_C = -100mA, f = 100MHz
Output Capacitance	C_{obo}	—	50	—	pF	V_{CB} = -10V, f = 1MHz
Input Capacitance	C_{ibo}	—	300	—	pF	V_{EB} = -5V, f = 1MHz
SWITCHING CHARACTERISTICS						
Turn-On Time	t_{on}	—	350	—	ns	V_{CC} = -30V, I_C = -750mA, I_{B1} = -15mA
Delay Time	t_d	—	180	—	ns	
Rise Time	t_r	—	170	—	ns	
Turn-Off Time	t_{off}	—	400	—	ns	V_{CC} = -30V, I_C = -750mA, I_{B1} = -I_{B2} = -15mA
Storage Time	t_s	—	300	—	ns	
Fall Time	t_f	—	100	—	ns	

Note: 8. Measured under pulsed conditions. Pulse width ≤ 300µs. Duty cycle ≤ 2%.

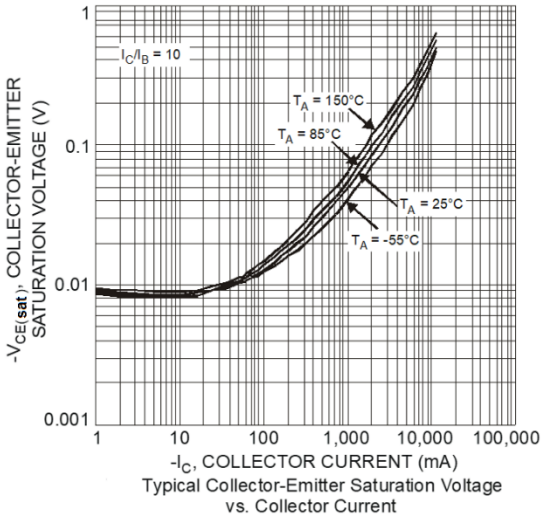
Typical Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)



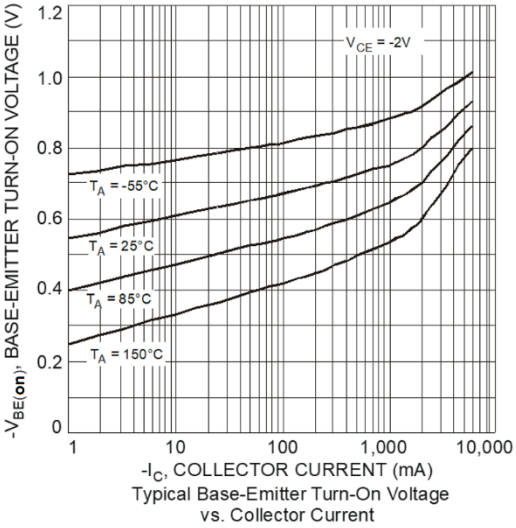
Typical Collector Current
vs. Collector-Emitter Voltage



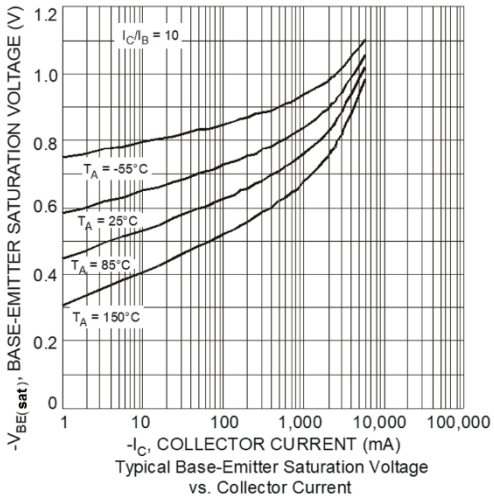
Typical DC Current Gain vs. Collector Current



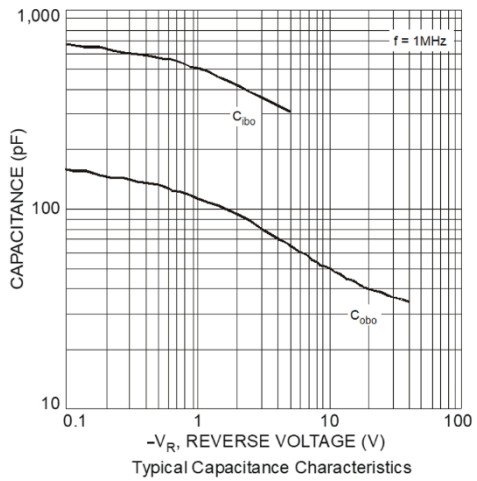
Typical Collector-Emitter Saturation Voltage
vs. Collector Current



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

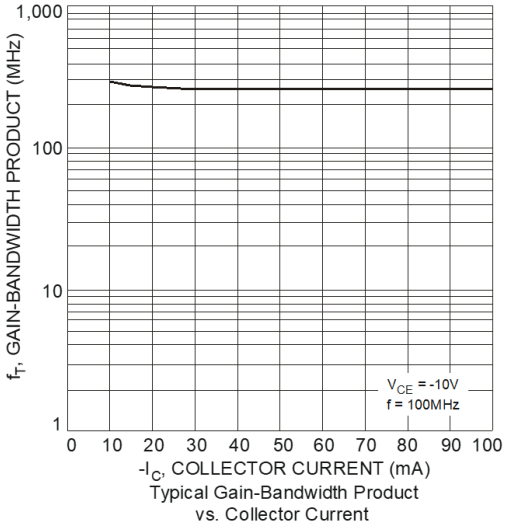


Typical Base-Emitter Saturation Voltage
vs. Collector Current



Typical Capacitance Characteristics

Typical Electrical Characteristics (continued)



Typical Gain-Bandwidth Product
vs. Collector Current

Package Outline Dimensions

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

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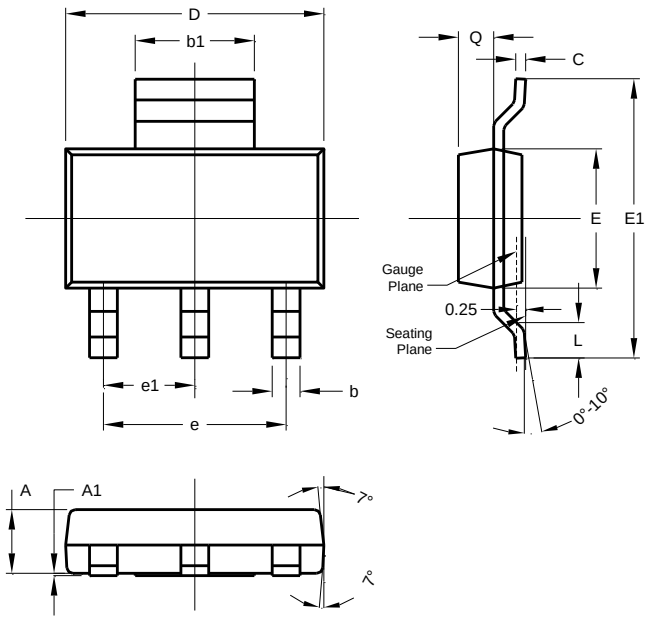
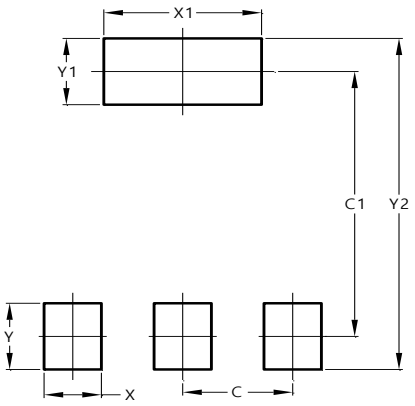


SOT223			
Dim	**Min**	**Max**	**Typ**
A	1.55	1.65	1.60
A1	0.010	0.15	0.05
b	0.60	0.80	0.70
b1	2.90	3.10	3.00
C	0.20	0.30	0.25
D	6.45	6.55	6.50
E	3.45	3.55	3.50
E1	6.90	7.10	7.00
e	-	-	4.60
e1	-	-	2.30
L	0.85	1.05	0.95
Q	0.84	0.94	0.89
All Dimensions in mm			

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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