

Product Summary

BV _{DSS}	R _{DS(ON)} Max	I _D T _A = +25°C
-100V	250mΩ @ V _{GS} = -10V	-2.3A
	300mΩ @ V _{GS} = -4.5V	-2.1A

Description and Applications

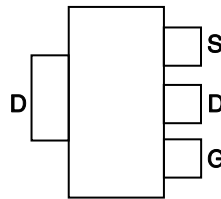
This MOSFET is designed to meet the stringent requirements of Automotive applications. It is qualified to AEC-Q101, supported by a PPAP and is ideal for use in:

- Engine Management Systems
- Body Control Electronics
- DC-DC Converters

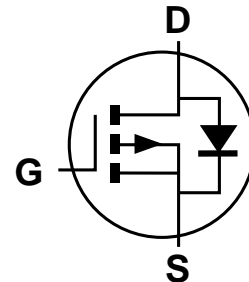
SOT223



Top View



Pin Out - Top View



Equivalent Circuit

Features and Benefits

- Low Gate Drive
- Low Input Capacitance
- Fast Switching Speed
- **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

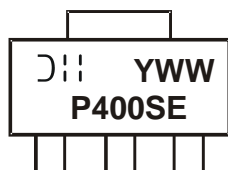
- Case: SOT223
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals Connections: See Diagram Below
- Terminals: Finish - Matte Tin Annealed over Copper Lead Frame. Solderable per MIL-STD-202, Method 208
- Weight: 0.112 grams (Approximate)

Ordering Information (Note 5)

Part Number	Case	Packaging
DMP10H400SEQ-13	SOT223	2,500 / Tape & Reel

- Notes:
1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant.
 2. See http://www.diodes.com/quality/lead_free.html 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 http://www.diodes.com/product_compliance_definitions.html.
 5. For packaging details, go to our website at <http://www.diodes.com/products/packages.html>.

Marking Information



= Manufacturer's Marking
 P400SE = Marking Code
 YWW = Date Code Marking
 Y or Y = Year (ex: 15 = 2015)
 WW = Week (01 to 53)

Maximum Ratings (@T_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Value	Unit
Drain-Source Voltage	V _{DSS}	-100	V
Gate-Source Voltage	V _{GSS}	±20	V
Continuous Drain Current, V _{GS} = -10V (Note 6)	I _D	T _C = +25°C	-6.0
Steady State		T _A = +25°C	-2.3
Maximum Body Diode Forward Current (Note 6)	I _S	-1.9	A
Pulsed Drain Current (380µs Pulse, Duty Cycle = 1%)	I _{DM}	-10	A

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

Characteristic	Symbol	Value	Unit
Total Power Dissipation (Note 6)	P _D	T _A = +25°C	2.0
		T _A = +70°C	1.3
Thermal Resistance, Junction to Ambient (Note 6)	R _{θJA}	62	°C/W
Total Power Dissipation (Note 6)	P _D	13.7	W
Thermal Resistance, Junction to Case (Note 6)	R _{θJC}	9.1	°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	Test Condition
OFF CHARACTERISTICS (Note 7)						
Drain-Source Breakdown Voltage	BV _{DSS}	-100	—	—	V	V _{GS} = 0V, I _D = -250µA
Zero Gate Voltage Drain Current	I _{DSS}	—	—	1	µA	V _{DS} = -80V, V _{GS} = 0V
Gate-Source Leakage	I _{GSS}	—	—	±100	nA	V _{GS} = ±20V, V _{DS} = 0V
ON CHARACTERISTICS (Note 7)						
Gate Threshold Voltage	V _{GS(TH)}	-1.0	-2.2	-3.0	V	V _{DS} = V _{GS} , I _D = -250µA
Static Drain-Source On-Resistance	R _{DS(ON)}	—	203	250	mΩ	V _{GS} = -10V, I _D = -5A
		—	241	300		V _{GS} = -4.5V, I _D = -5A
Diode Forward Voltage	V _{SD}	—	-0.9	-1.2	V	V _{GS} = 0V, I _S = -5A
DYNAMIC CHARACTERISTICS (Note 8)						
Input Capacitance	C _{ISS}	—	1239	—	pF	V _{DS} = -25V, V _{GS} = 0V, f = 1.0MHz
Output Capacitance	C _{OSS}	—	42	—		
Reverse Transfer Capacitance	C _{ISS}	—	28	—		
Gate Resistance	R _g	—	13	—	Ω	V _{DS} = 0V, V _{GS} = 0V, f = 1.0MHz
Total Gate Charge (V _{GS} = -4.5V)	Q _g	—	8.4	—	nC	V _{DS} = -60V, I _D = -5A
Total Gate Charge (V _{GS} = -10V)	Q _g	—	17.5	—		
Gate-Source Charge	Q _{gs}	—	2.8	—		
Gate-Drain Charge	Q _{gd}	—	3.2	—		
Turn-On Delay Time	t _{D(ON)}	—	9.1	—	ns	V _{DD} = -50V, R _g = 9.1Ω, I _D = -5A
Turn-On Rise Time	t _r	—	14.9	—		
Turn-Off Delay Time	t _{D(OFF)}	—	57.4	—		
Turn-Off Fall Time	t _f	—	34.4	—		
Body Diode Reverse Recovery Time	t _{RR}	—	25.2	—	ns	V _{GS} = 0V, I _S = -5A, di/dt = 100A/µs
Body Diode Reverse Recovery Charge	Q _{RR}	—	24.5	—	nC	V _{GS} = 0V, I _S = -5A, di/dt = 100A/µs

- Notes:
- Device mounted on FR-4 substrate PC board, 2oz copper, with 1inch square copper plate.
 - Short duration pulse test used to minimize self-heating effect.
 - Guaranteed by design. Not subject to production testing.

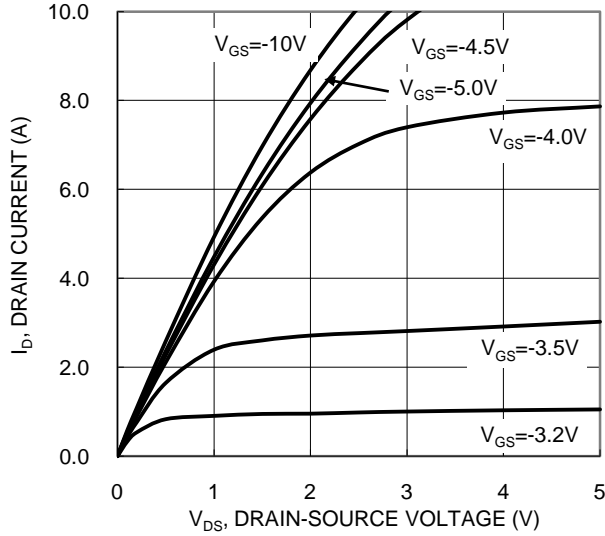


Figure 1. Typical Output Characteristic

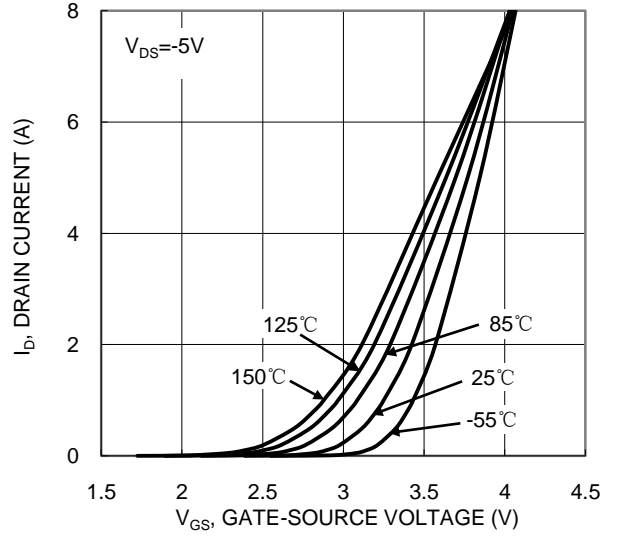


Figure 2. Typical Transfer Characteristic

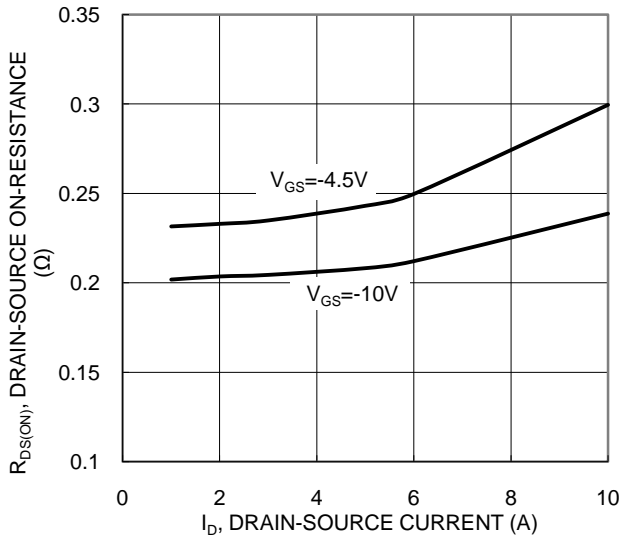


Figure 3. Typical On-Resistance vs. Drain Current and Gate Voltage

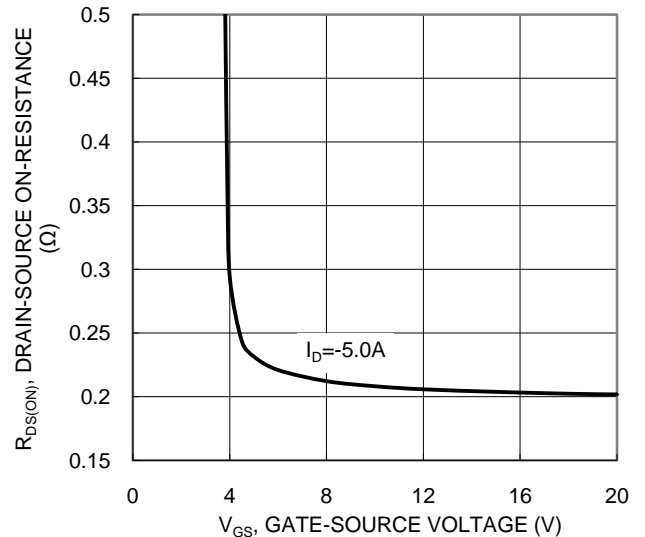


Figure 4. Typical Transfer Characteristic

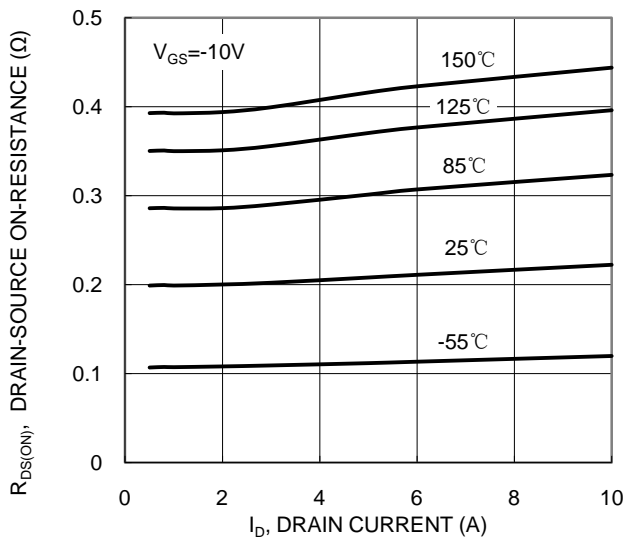


Figure 5. Typical On-Resistance vs. Drain Current and Junction Temperature

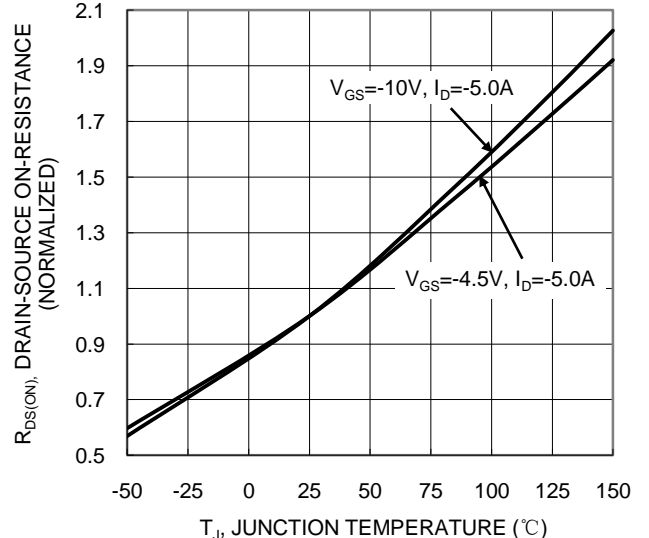
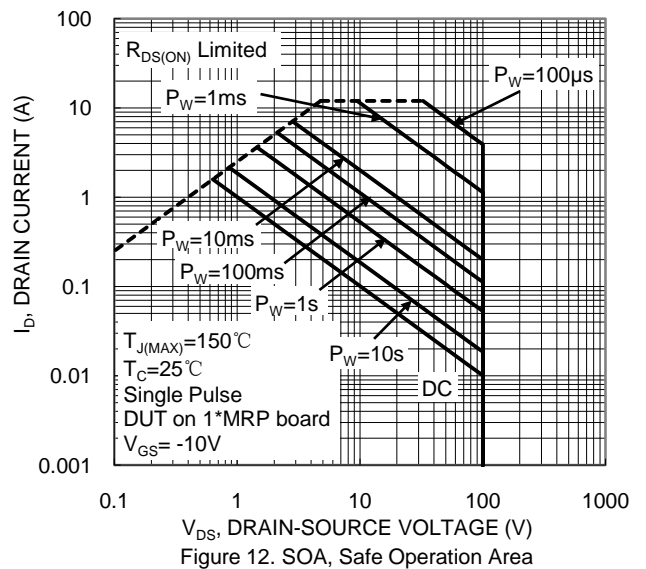
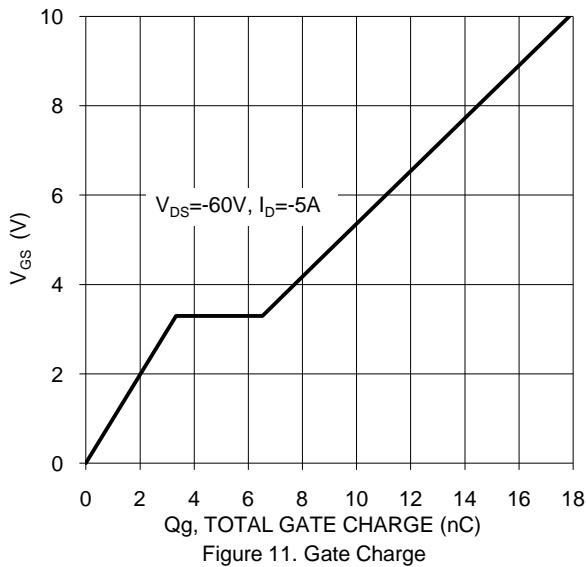
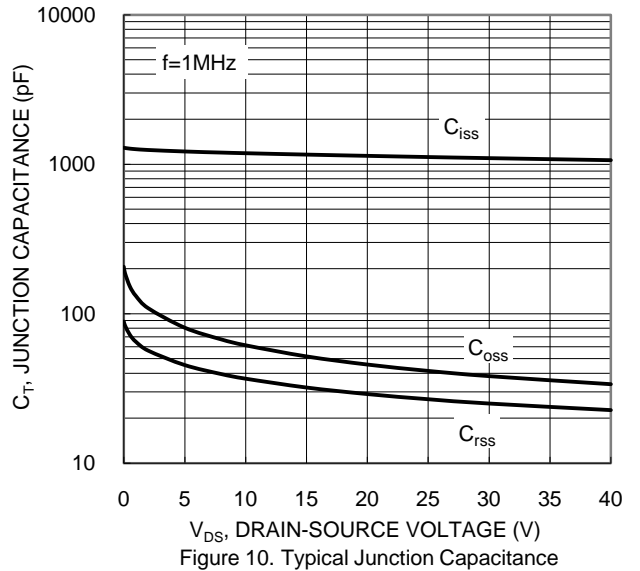
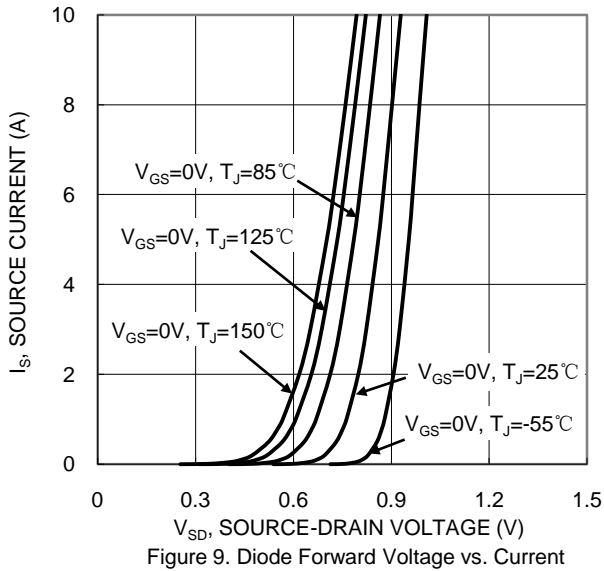
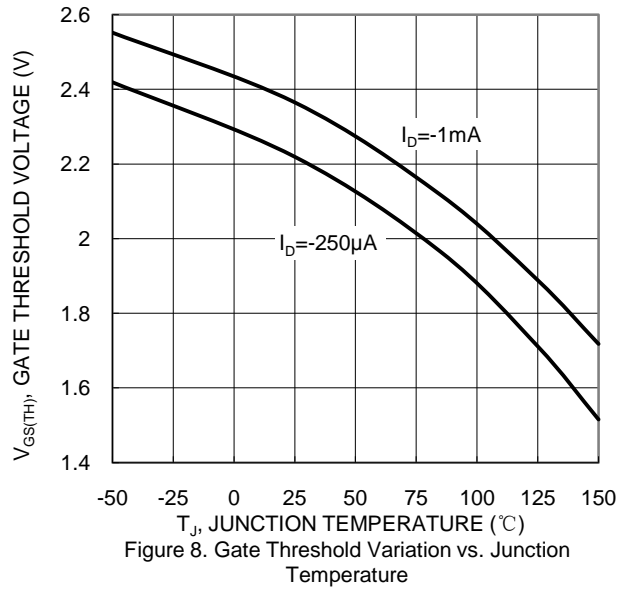
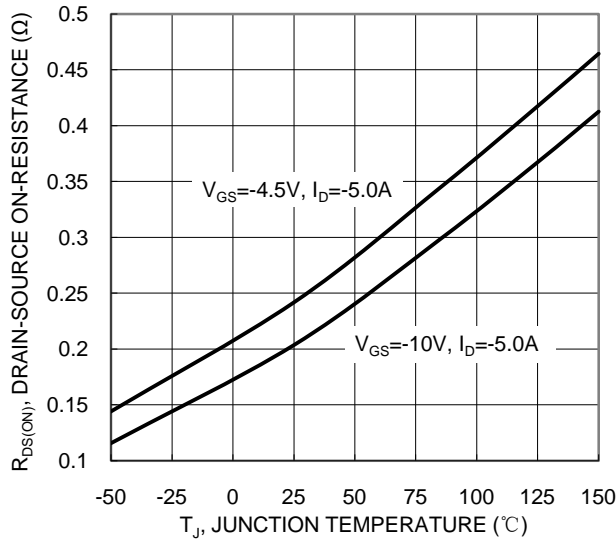


Figure 6. On-Resistance Variation with Junction Temperature



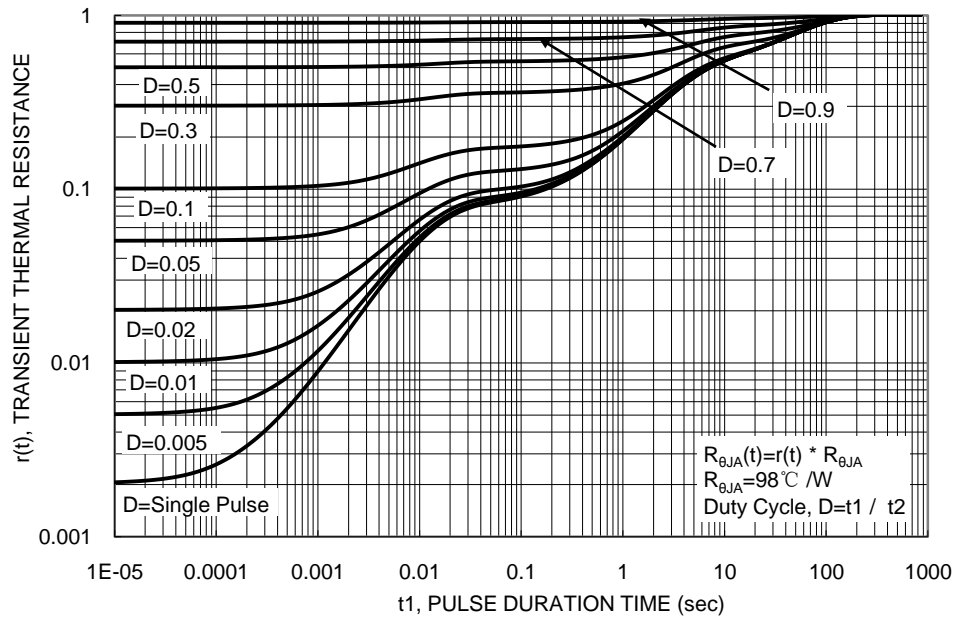
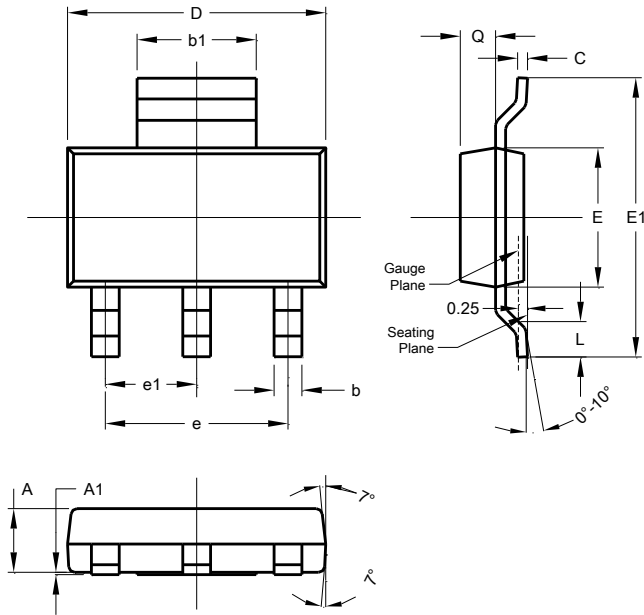


Figure 13. Transient Thermal Resistance

Package Outline Dimensions

Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for the latest version.

SOT223

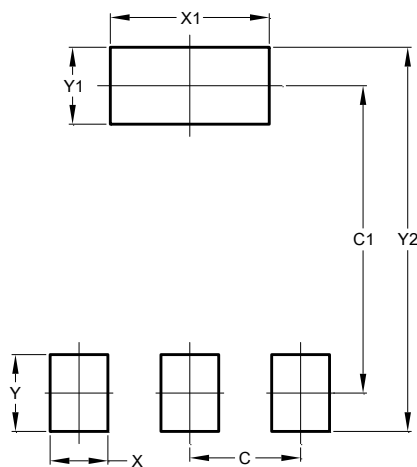


SOT223			
Dim	Min	Max	Typ
A	1.55	1.65	1.60
A1	0.010	0.15	0.05
b	0.60	0.80	0.70
b1	2.90	3.10	3.00
C	0.20	0.30	0.25
D	6.45	6.55	6.50
E	3.45	3.55	3.50
E1	6.90	7.10	7.00
e	-	-	4.60
e1	-	-	2.30
L	0.85	1.05	0.95
Q	0.84	0.94	0.89
All Dimensions in mm			

Suggested Pad Layout

Please see AP02001 at <http://www.diodes.com/datasheets/ap02001.pdf> 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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