

**P-CHANNEL ENHANCEMENT MODE MOSFET**
**Product Summary**

BV <sub>DSS</sub>	R <sub>DS(ON)</sub> Max	I <sub>D</sub> T <sub>A</sub> = +25°C
-30V	77mΩ @ V <sub>GS</sub> = -10V	-3.5A
	95mΩ @ V <sub>GS</sub> = -4.5V	-3.0A
	150mΩ @ V <sub>GS</sub> = -2.5V	-2.4A

**Description and Applications**

This new generation MOSFET has been designed to minimize the on-state resistance (R<sub>DS(ON)</sub>) and yet maintain superior switching performance, making it ideal for high efficiency power management applications.

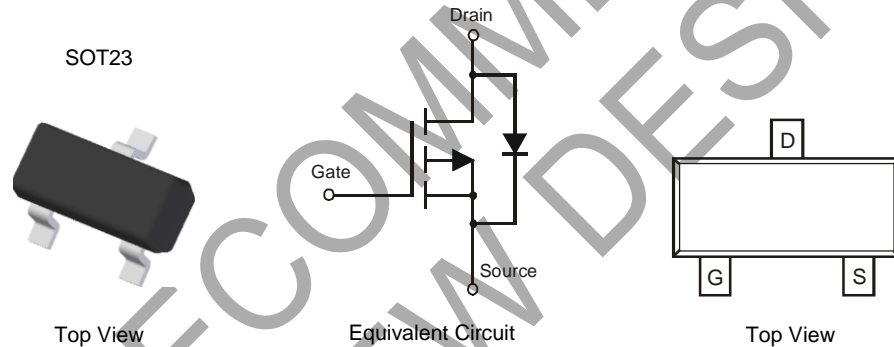
- DC-DC Converters
- Power Management Functions
- Analog Switch

**Features and Benefits**

- Low On-Resistance
- Low Gate Threshold Voltage
- Low Input Capacitance
- Fast Switching Speed
- Low Input/Output Leakage
- **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**
- **An Automotive-Compliant Part is Available Under Separate Datasheet ([DMP3130LQ](#))**

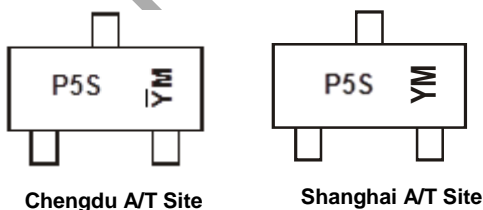
**Mechanical Data**

- Case: SOT23
- 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. Solderable per MIL-STD-202, Method 208 <sup>Ⓔ</sup>
- Terminal Connections: See Diagram
- Weight: 0.008 grams (Approximate)


**Ordering Information** (Note 4)

Part Number	Case	Packaging
DMP3130L-7	SOT23	3000/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](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. For packaging details, go to our website at <https://www.diodes.com/design/support/packaging/diodes-packaging/>.

**Marking Information**


P5S = Product Type Marking Code  
 YM = Date Code Marking for SAT (Shanghai Assembly/ Test Site)  
 Y = Date Code Marking for CAT (Chengdu Assembly/ Test Site)  
 Y or Y = Year (ex: E = 2017)  
 M = Month (ex: 9 = September)

**Date Code Key**

Year	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Code	V	W	X	Y	Z	A	B	C	D	E	F

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Code	1	2	3	4	5	6	7	8	9	O	N	D

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

Characteristic			Symbol	Value	Unit
Drain-Source Voltage			V <sub>DSS</sub>	-30	V
Gate-Source Voltage			V <sub>GSS</sub>	±12	V
Continuous Drain Current (Note 5) V <sub>GS</sub> = -4.5V	Steady State	T <sub>A</sub> = +25°C	I <sub>D</sub>	-3.0	A
		T <sub>A</sub> = +70°C	I <sub>D</sub>	-2.6	A
	t < 10s	T <sub>A</sub> = +25°C T <sub>A</sub> = +70°C	I <sub>D</sub>	-4.1 -3.2	A
Maximum Continuous Body Diode Forward Current (Note 5)			I <sub>S</sub>	-1.6	A
Pulsed Drain Current (10µs Pulse, Duty Cycle = 1%)			I <sub>DM</sub>	-20	A

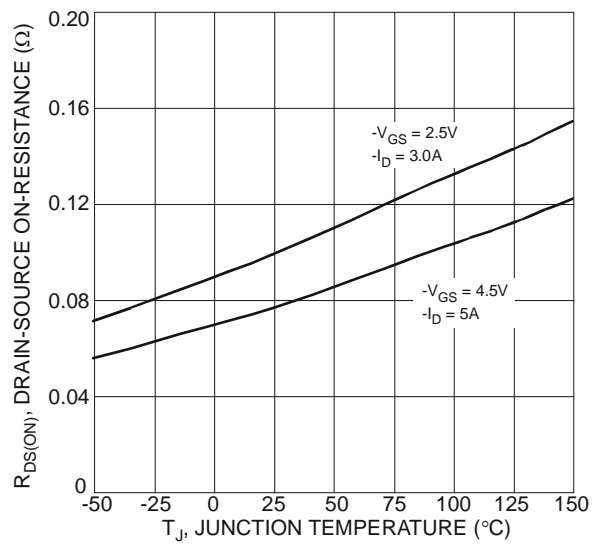
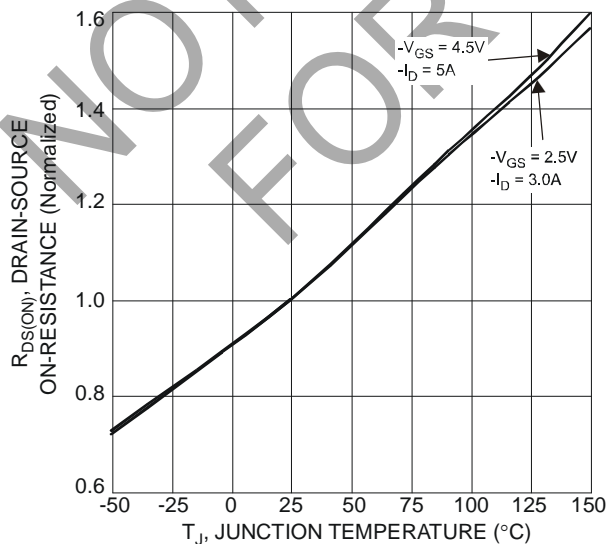
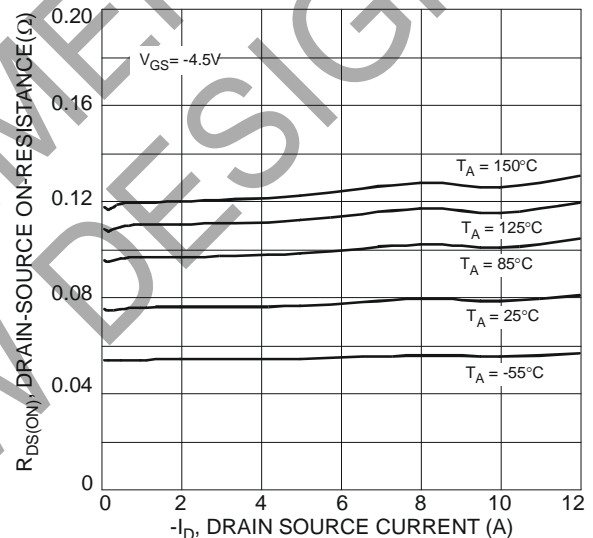
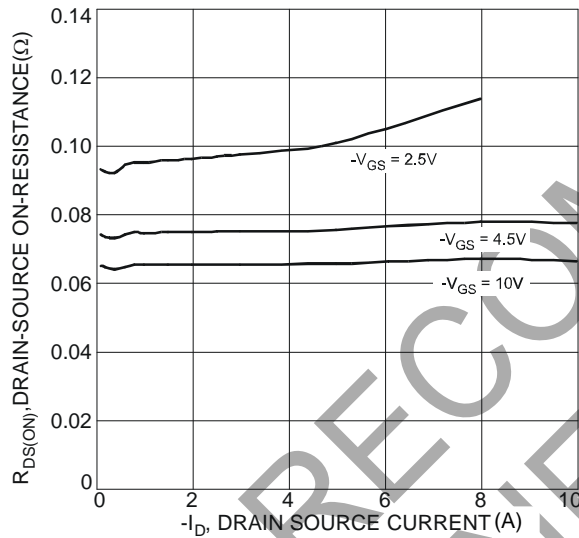
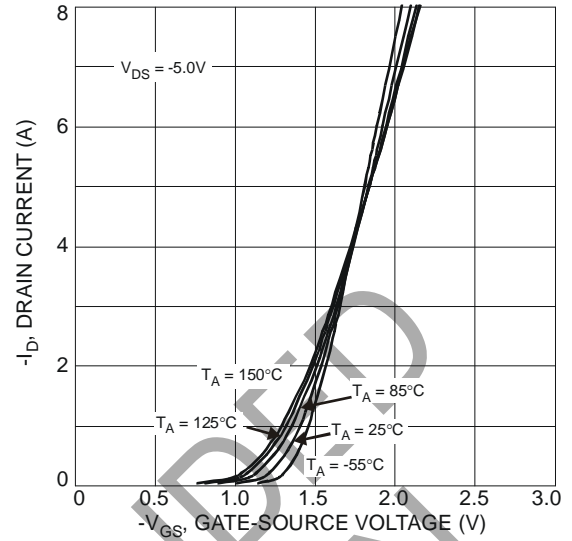
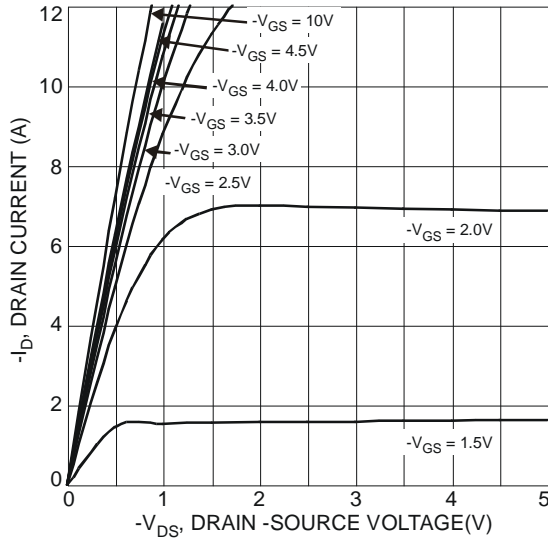
## Thermal Characteristics

Characteristic		Symbol	Value	Unit
Total Power Dissipation (Note 5)	T <sub>A</sub> = +25°C	P <sub>D</sub>	0.7	W
	T <sub>A</sub> = +70°C		0.4	
Thermal Resistance, Junction to Ambient (Note 5)	Steady State	R <sub>θJA</sub>	184	°C/W
	t < 10s		115	
Total Power Dissipation (Note 6)	T <sub>A</sub> = +25°C	P <sub>D</sub>	1.3	W
	T <sub>A</sub> = +70°C		0.8	
Thermal Resistance, Junction to Ambient (Note 6)	Steady State	R <sub>θJA</sub>	94	°C/W
	t < 10s		61	
Thermal Resistance, Junction to Case		R <sub>θJC</sub>	25	°C
Operating and Storage Temperature Range		T <sub>J</sub> , T <sub>STG</sub>	-55 to +150	°C

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

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS (Note 7)						
Drain-Source Breakdown Voltage	$BV_{DSS}$	-30	—	—	V	$V_{GS} = 0V, I_D = -250\mu A$
Zero Gate Voltage Drain Current	$I_{DSS}$	—	—	-1	$\mu A$	$V_{DS} = -30V, V_{GS} = 0V$
Gate-Body Leakage	$I_{GSS}$	—	—	$\pm 100$	nA	$V_{GS} = \pm 12V, V_{DS} = 0V$
ON CHARACTERISTICS (Note 7)						
Gate Threshold Voltage	$V_{GS(TH)}$	-0.6	—	-1.3	V	$V_{DS} = V_{GS}, I_D = -250\mu A$
Static Drain-Source On-Resistance	$R_{DS(ON)}$	—	59	77	m $\Omega$	$V_{GS} = -10V, I_D = -4.2A$
		—	73	95		$V_{GS} = -4.5V, I_D = -4A$
		—	115	150		$V_{GS} = -2.5V, I_D = -3A$
Forward Transconductance	$g_{fs}$	—	8	—	S	$V_{DS} = -5V, I_D = -4A$
Source-Drain Diode Forward Voltage	$V_{SD}$	—	-0.8	-1.25	V	$V_{GS} = 0V, I_S = -3.0A$
DYNAMIC CHARACTERISTICS (Note 8)						
Input Capacitance	$C_{iss}$	—	432	864	pF	$V_{DS} = -15V, V_{GS} = 0V$ $f = 1.0MHz$
Output Capacitance	$C_{oss}$	—	87	174	pF	
Reverse Transfer Capacitance	$C_{rss}$	—	62	124	pF	
Gate Resistance	$R_G$	—	4.04	—	$\Omega$	$V_{DS} = 0V, V_{GS} = 0V, f = 1.0MHz$
SWITCHING CHARACTERISTICS (Note 8)						
Total Gate Charge	$Q_G$	—	5.9	11.8	nC	$V_{DS} = -15V, V_{GS} = -4.5V, I_D = -4.0A$
		—	12	24		$V_{DS} = -15V, V_{GS} = -10V, I_D = -4.0A$
Gate-Source Charge	$Q_{GS}$	—	1.0	2.0		$V_{DS} = -15V, V_{GS} = -4.5V, I_D = -4.0A$
Gate-Drain Charge	$Q_{GD}$	—	3.1	6.2		
Turn-On Delay Time	$t_{D(ON)}$	—	4.6	9.2		
Rise Time	$t_R$	—	6.5	13.0		
Turn-Off Delay Time	$t_{D(OFF)}$	—	27.8	55.6		
Fall Time	$t_F$	—	15.0	30.0	ns	$V_{DS} = -15V, V_{GS} = -10V,$ $I_D = -1A, R_G = 6.0\Omega$

- Notes:
- Device mounted on FR-4 PC board, with minimum recommended pad layout, single sided.
  - Device mounted on FR-4 substrate PC board, 2oz copper, with thermal vias to bottom layer 1inch square copper plate.
  - Short duration pulse test used to minimize self-heating effect.
  - Guaranteed by design. Not subject to production testing.



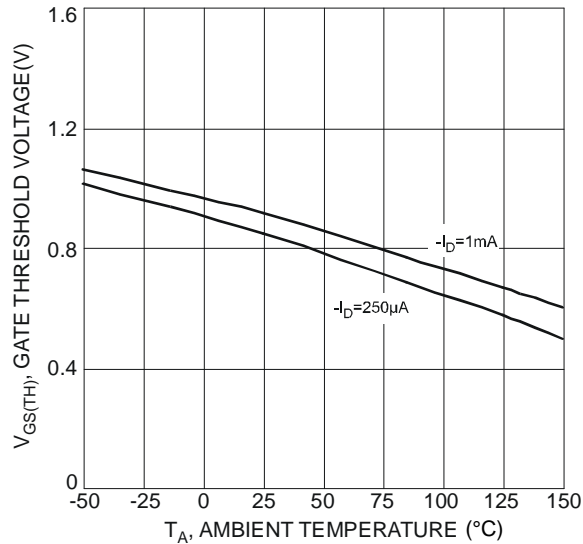


Fig. 7 Gate Threshold Variation vs. Ambient Temperature

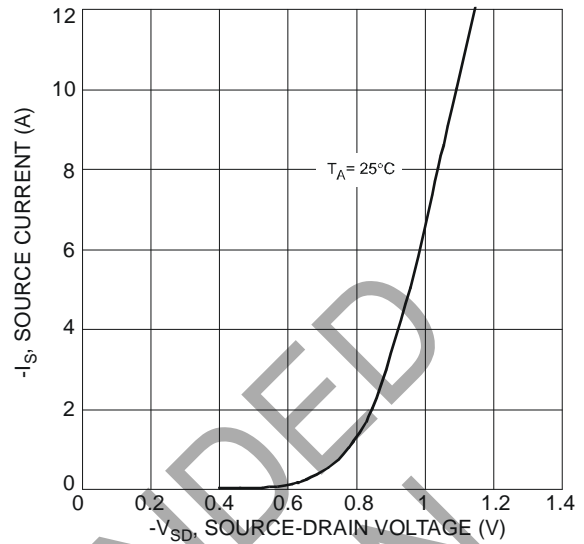


Fig. 8 Diode Forward Voltage vs. Current

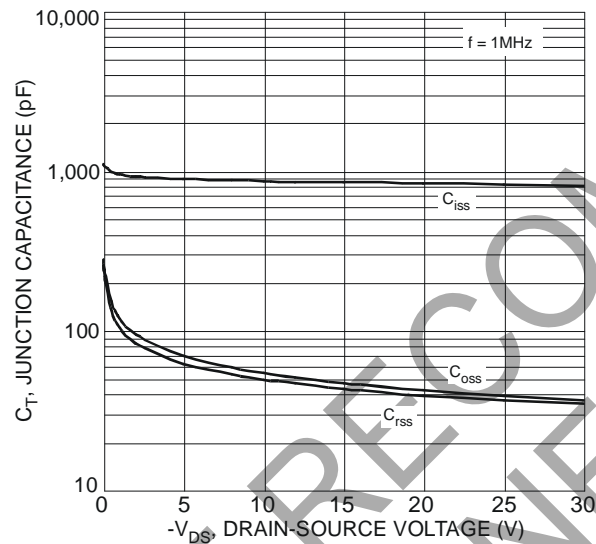


Fig. 9 Typical Junction Capacitance

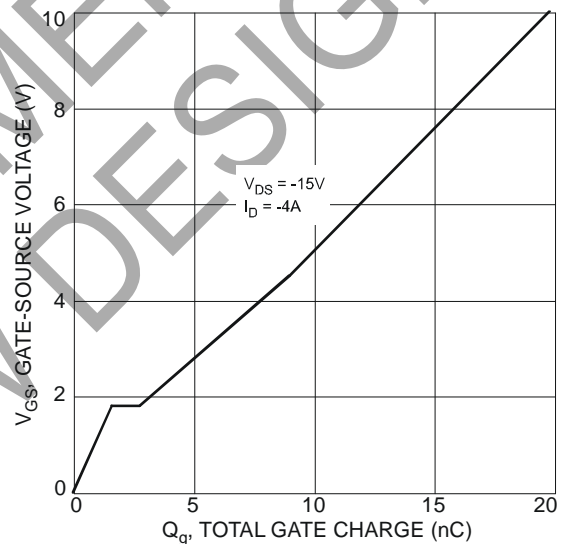


Fig. 10 Gate-Charge Characteristics

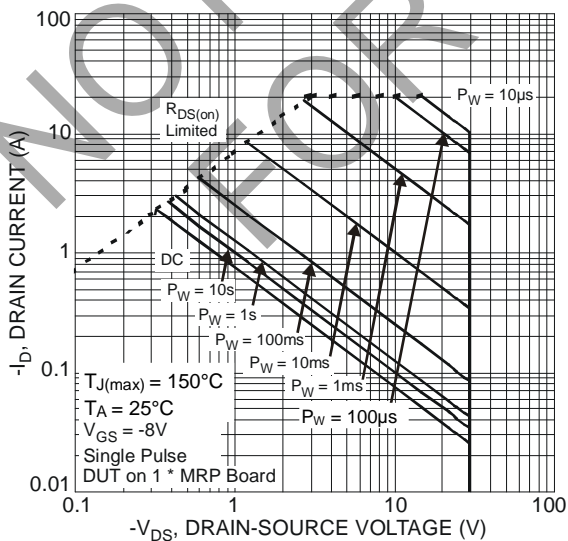


Fig. 11 SOA, Safe Operation Area

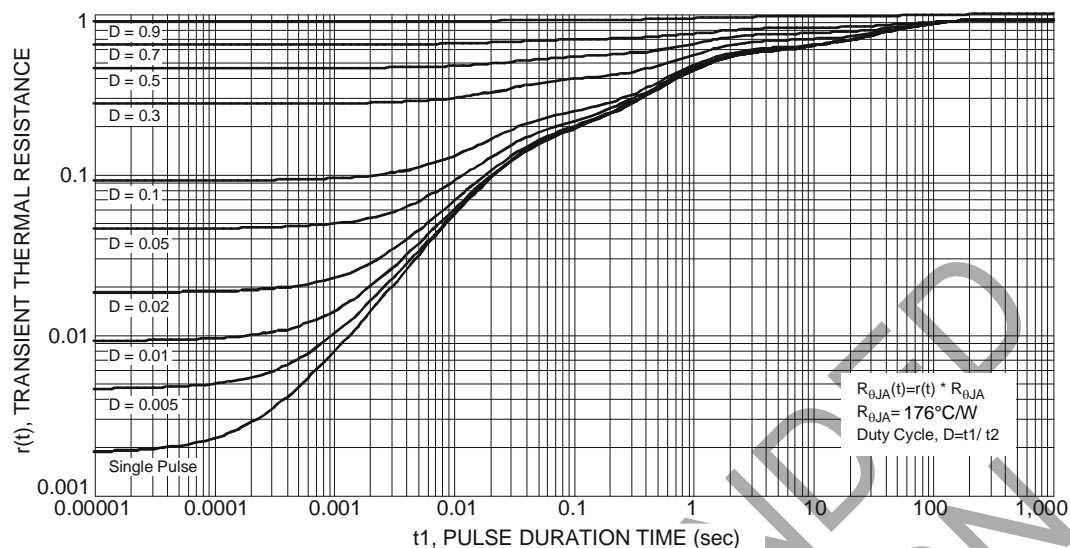
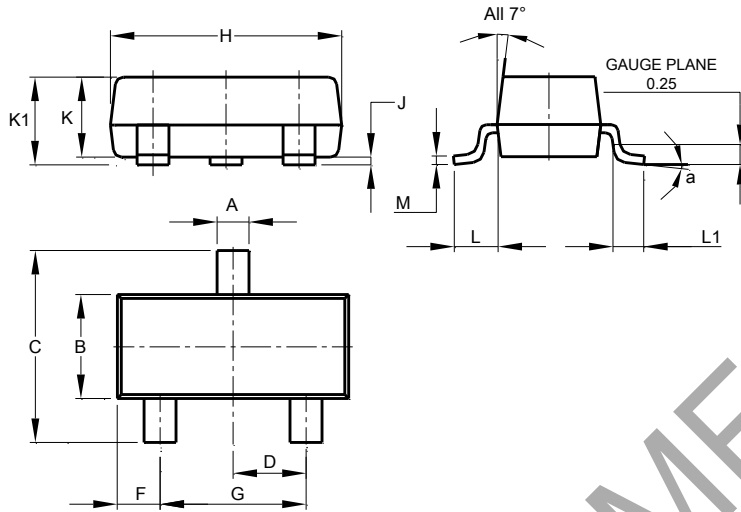


Fig. 12 Transient Thermal Resistance

## Package Outline Dimensions

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

**SOT23**

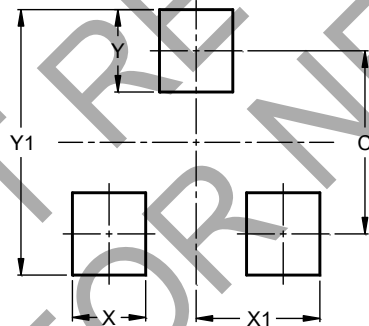


SOT23			
Dim	Min	Max	Typ
A	0.37	0.51	0.40
B	1.20	1.40	1.30
C	2.30	2.50	2.40
D	0.89	1.03	0.915
F	0.45	0.60	0.535
G	1.78	2.05	1.83
H	2.80	3.00	2.90
J	0.013	0.10	0.05
K	0.890	1.00	0.975
K1	0.903	1.10	1.025
L	0.45	0.61	0.55
L1	0.25	0.55	0.40
M	0.085	0.150	0.110
a	0°	8°	--
All Dimensions in mm			

## Suggested Pad Layout

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

**SOT23**



Dimensions	Value (in mm)
C	2.0
X	0.8
X1	1.35
Y	0.9
Y1	2.9

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