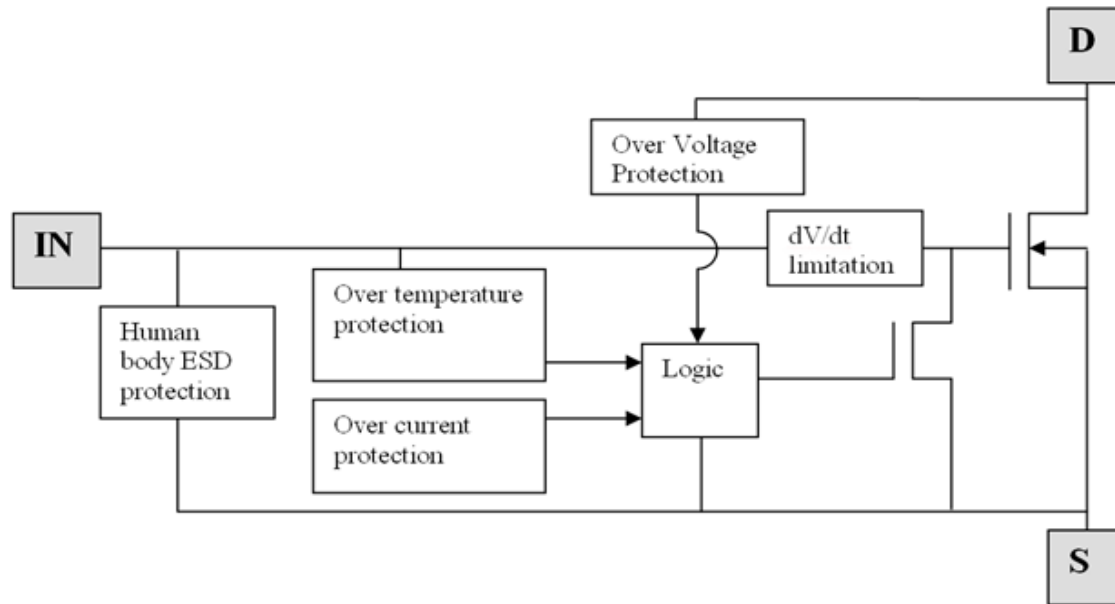


Functional Block Diagram



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

Characteristic	Symbol	Value	Unit
Continuous Drain-Source Voltage	V _{DS}	60	V
Drain-Source Voltage for Short Circuit Protection	V _{DS(SC)}	24	V
Continuous Input Voltage	V _{IN}	-0.5 to +6	V
Continuous Input Current @ -0.2V ≤ V _{IN} ≤ 6V	I _{IN}	No Limit	mA
Continuous Input Current @ V _{IN} < -0.2V or V _{IN} > 6V	I _{IN}	I _{IN} ≤ 2	mA
Pulsed Drain Current @ V _{IN} = 3.3V	I _{DM}	5	A
Pulsed Drain Current @ V _{IN} = 5V	I _{DM}	6	A
Continuous Source Current (Body Diode) (Note 6)	I _S	2.5	A
Pulsed Source Current (Body Diode)	I _{SM}	10	A
Unclamped Single Pulse Inductive Energy, T _J = +25°C, I _D = 0.5A, V _{DD} = 24V	E _{AS}	120	mJ
Electrostatic Discharge (Human Body Model)	V _{HBM}	4,000	V
Charged Device Model	V _{CDM}	1,000	V

Recommended Operating Conditions

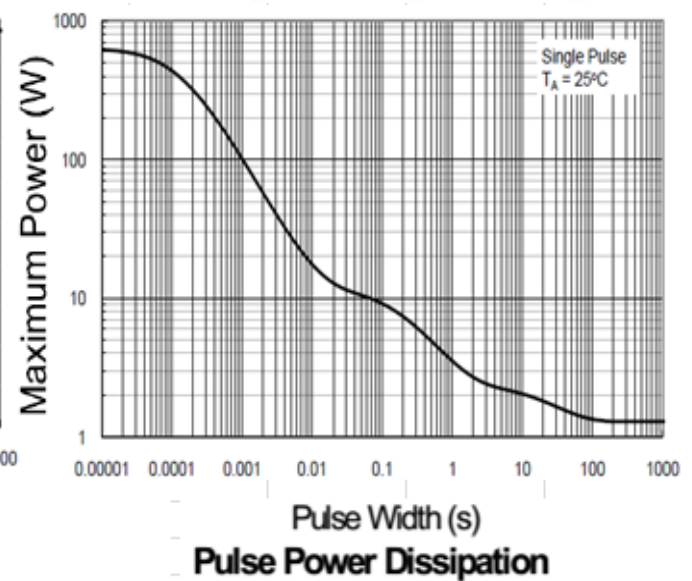
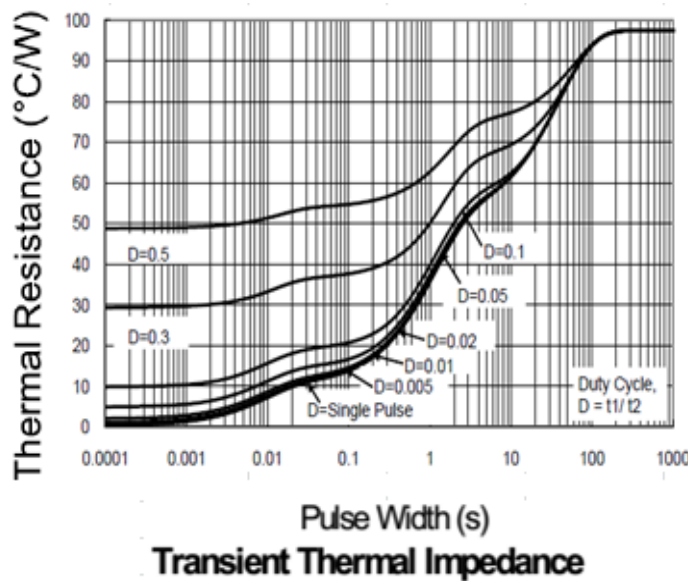
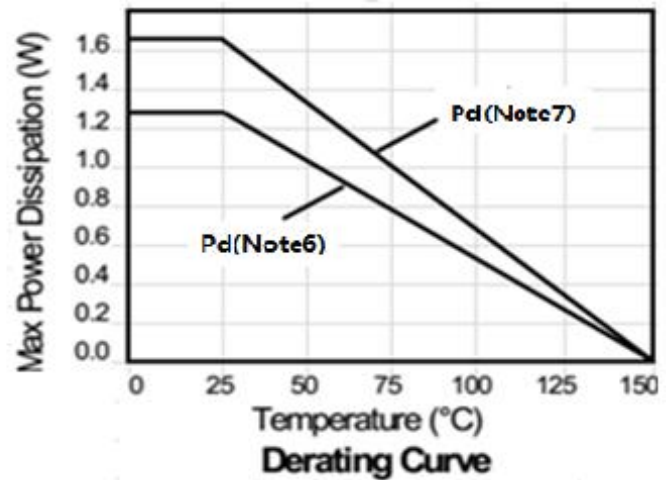
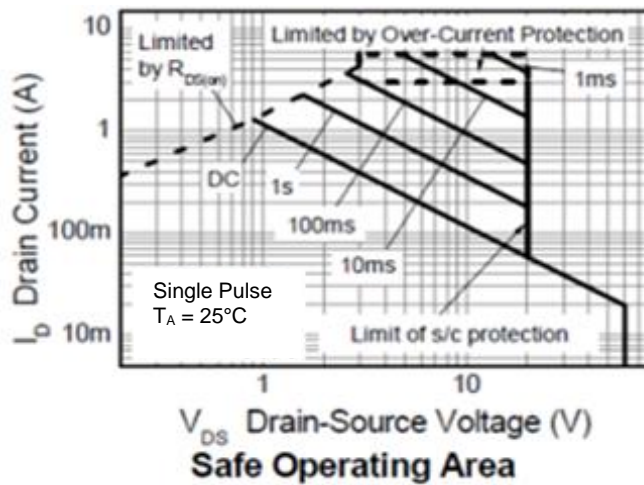
The ZXMS6005N8Q is optimized to use with μ C operating from 3.3V and 5V supplies.

Characteristic	Symbol	Min	Max	Unit
Input Voltage Range	V _{IN}	0	5.5	V
Ambient Temperature Range	T _A	-40	+125	°C
High Level Input Voltage for MOSFET to be On	V _{IH}	3	5.5	V
Low Level Input Voltage for MOSFET to be Off	V _{IL}	0	0.7	V
Peripheral Supply Voltage (Voltage to Which Load is Referred)	V _P	0	24	V

Thermal Resistance (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)

Characteristic	Symbol	Value	Unit
Power Dissipation at $T_A = +25^\circ\text{C}$ (Note 6)	P_D	1.28	W
Linear Derating Factor		10	mW/ $^\circ\text{C}$
Power Dissipation at $T_A = +25^\circ\text{C}$ (Note 7)	P_D	1.65	W
Linear Derating Factor		12.4	mW/ $^\circ\text{C}$
Thermal Resistance, Junction to Ambient (Note 6)	$R_{\theta JA}$	98	$^\circ\text{C/W}$
Thermal Resistance, Junction to Ambient (Note 7)	$R_{\theta JA}$	76	$^\circ\text{C/W}$
Thermal Resistance, Junction to Case (Note 8)	$R_{\theta JC}$	12	$^\circ\text{C/W}$
Operating Temperature Range	T_J	-40 to +150	$^\circ\text{C}$
Storage Temperature Range	T_{STG}	-55 to +150	$^\circ\text{C}$

Notes: 6. Device mounted on FR-4 substrate PC board, 2oz copper, with minimum recommended pad layout.
7. Device mounted on FR-4 substrate PC board, 2oz copper, with 1-inch square copper plate.
8. Thermal resistance between junction and the mounting surfaces of drain and source pins.

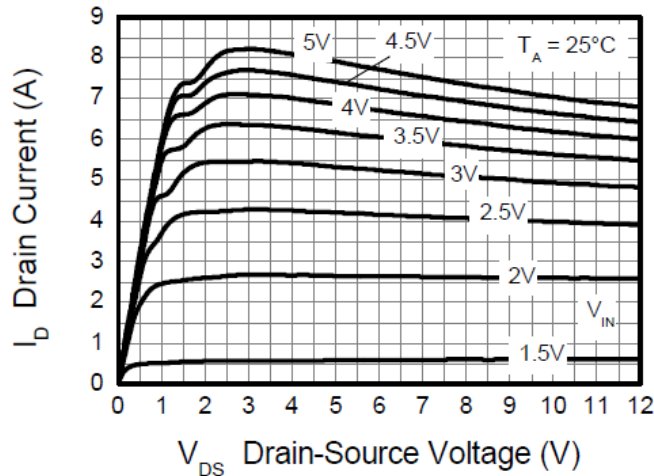


Electrical Characteristics (@ $T_A = +25^\circ\text{C}$, unless otherwise stated.)

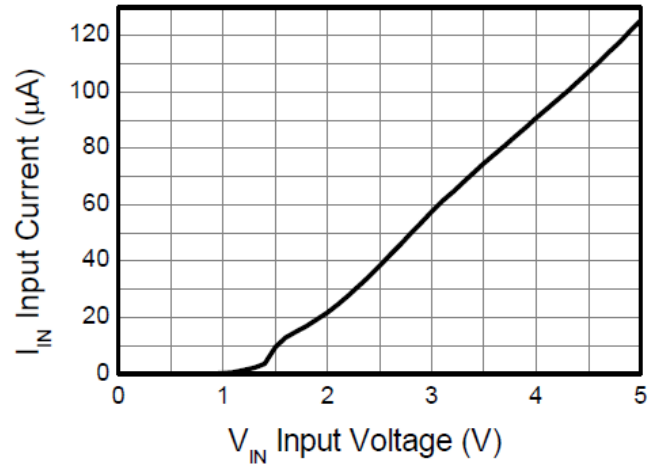
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Static Characteristics						
Drain-Source Clamp Voltage	$V_{DS(AZ)}$	60	65	70	V	$I_D = 10\text{mA}$
Off-State Drain Current	I_{DSS}	—	—	1	μA	$V_{DS} = 12\text{V}, V_{IN} = 0\text{V}$
		—	—	2		$V_{DS} = 36\text{V}, V_{IN} = 0\text{V}$
Input Threshold Voltage	$V_{IN(TH)}$	0.7	1	1.5	V	$V_{DS} = V_{GS}, I_D = 1\text{mA}$
Input Current	I_{IN}	—	60	100	μA	$V_{IN} = 3\text{V}$
		—	120	200		$V_{IN} = 5\text{V}$
Input Current While Overtemperature Active	—	—	—	300	μA	$V_{IN} = 5\text{V}$
Static Drain-Source On-State Resistance	$R_{DS(ON)}$	—	170	250	$\text{m}\Omega$	$V_{IN} = 3\text{V}, I_D = 1.0\text{A}$
		—	150	200		$V_{IN} = 5\text{V}, I_D = 1.0\text{A}$
Continuous Drain Current (Note 6)	I_D	1.4	—	—	A	$V_{IN} = 3\text{V}, T_A = +25^\circ\text{C}$
		1.6	—	—		$V_{IN} = 5\text{V}, T_A = +25^\circ\text{C}$
Continuous Drain Current (Note 7)		1.9	—	—		$V_{IN} = 3\text{V}, T_A = +25^\circ\text{C}$
		2.0	—	—		$V_{IN} = 5\text{V}, T_A = +25^\circ\text{C}$
Current Limit (Note 9)	$I_{D(LIM)}$	2.2	5	—	A	$V_{IN} = 3\text{V}$
		3.3	7	—		$V_{IN} = 5\text{V}$
Dynamic Characteristics						
Turn-On Delay Time	$t_{D(ON)}$	—	5	—	μs	$V_{DD} = 12\text{V}, I_D = 0.5\text{A}, V_{GS} = 5\text{V}$
Rise Time	t_R	—	14	—		
Turn-Off Delay Time	$t_{D(OFF)}$	—	34	—		
Fall Time	t_F	—	19	—		
Overtemperature Protection						
Thermal Overload Trip Temperature (Note 10)	T_{JT}	+150	+175	—	$^\circ\text{C}$	—
Thermal Hysteresis (Note 10)	ΔT_{JT}	—	+10	—	$^\circ\text{C}$	—

- Notes:
- The drain current is restricted only when the device is in saturation (see graph "Typical Output Characteristic"). This allows the device to be used in the fully on state without interference from the current limit. The device is fully protected at all drain currents, as the low power dissipation generated outside saturation makes current limit unnecessary.
 - Overtemperature protection is designed to prevent device destruction under fault conditions. Fault conditions are considered as "outside" normal operating range, so this part is not designed to withstand over-temperature for extended periods.

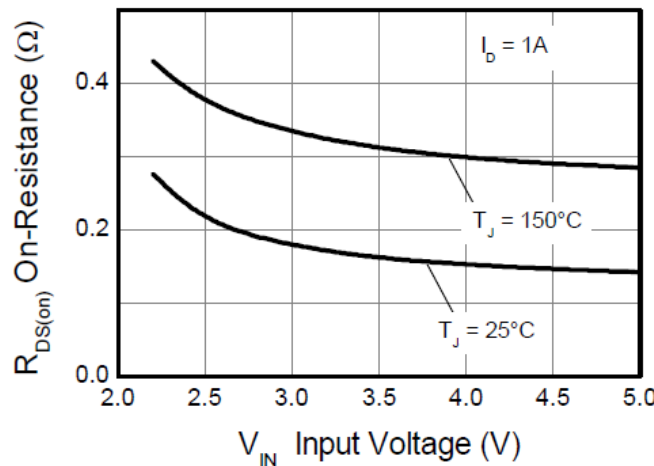
Typical Characteristics



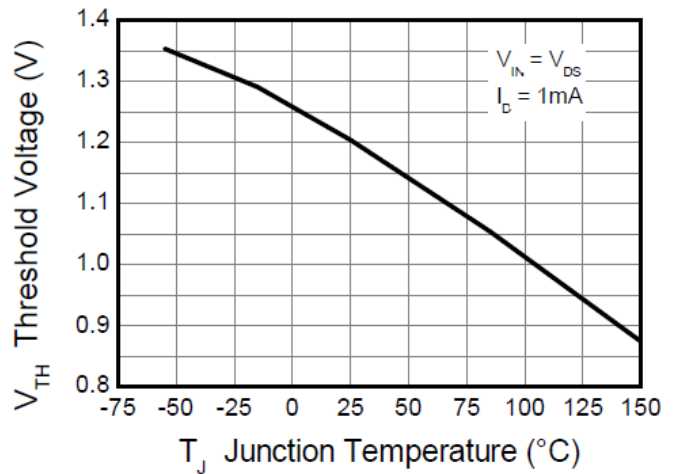
Typical Output Characteristic



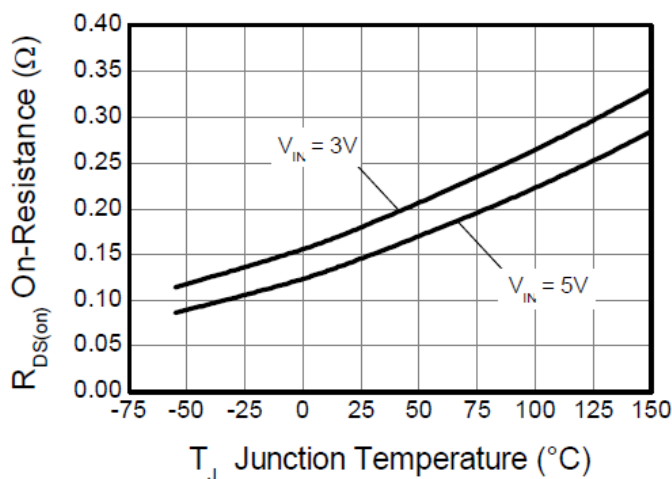
Input Current vs Input Voltage



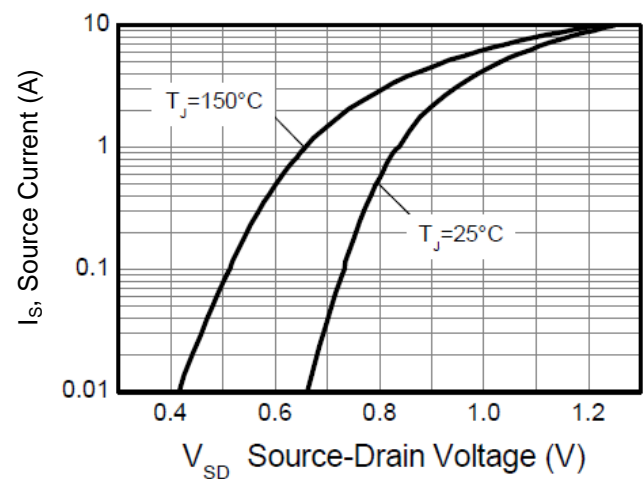
On-Resistance vs Input Voltage



Threshold Voltage vs Temperature

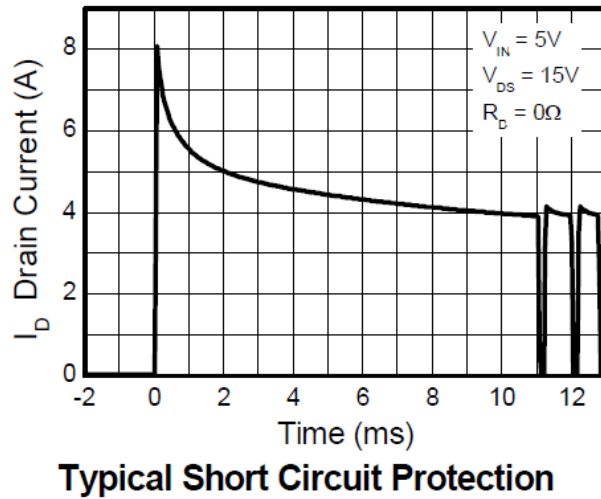
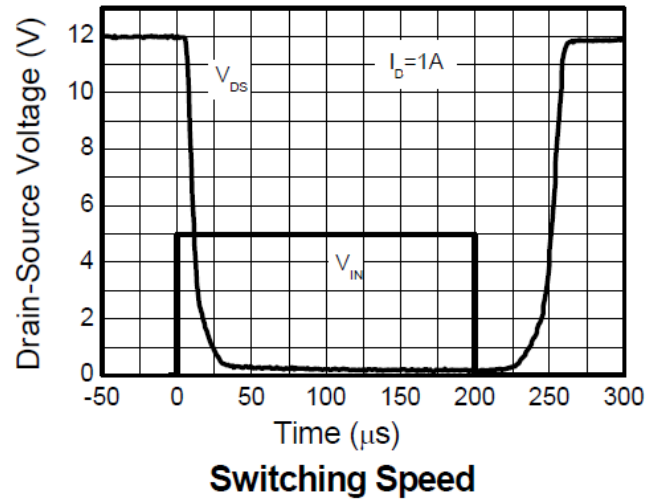
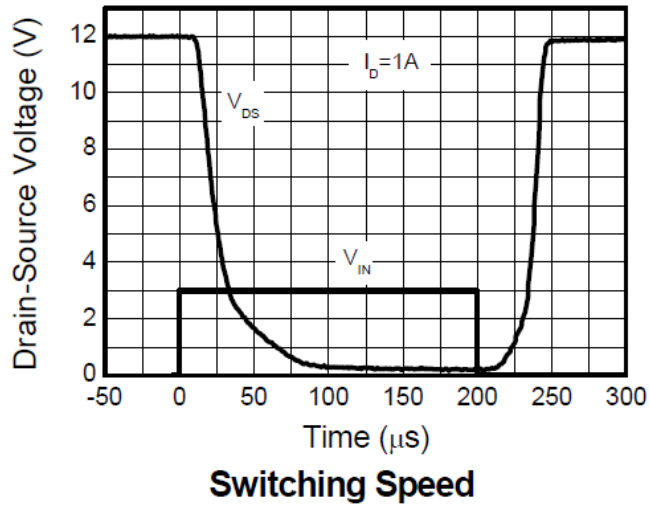


On-Resistance vs Temperature



Reverse Diode Characteristic

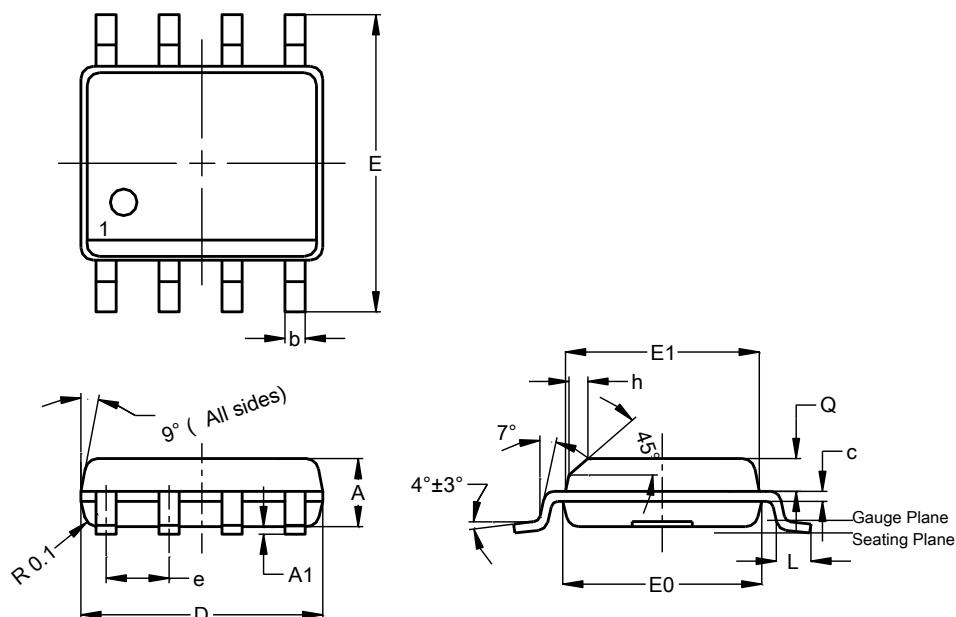
Typical Characteristics (Cont.)



Package Outline Dimensions

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

SO-8

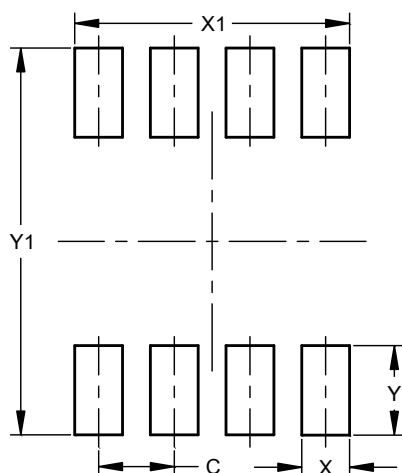


SO-8			
Dim	Min	Max	Typ
A	1.40	1.50	1.45
A1	0.10	0.20	0.15
b	0.30	0.50	0.40
c	0.15	0.25	0.20
D	4.85	4.95	4.90
E	5.90	6.10	6.00
E1	3.80	3.90	3.85
E0	3.85	3.95	3.90
e	--	--	1.27
h	-	--	0.35
L	0.62	0.82	0.72
Q	0.60	0.70	0.65
All Dimensions in mm			

Suggested Pad Layout

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

SO-8



Dimensions	Value (in mm)
C	1.27
X	0.802
X1	4.612
Y	1.505
Y1	6.50

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