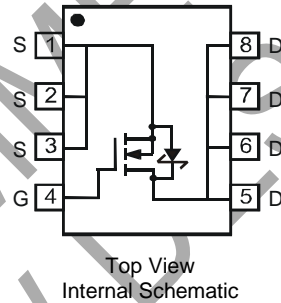


Features

- DIOFET Utilizes a Unique Patented Process to Monolithically Integrate a MOSFET and a Schottky in a Single Die to Deliver:
 - Low $R_{DS(ON)}$ —Minimizes Conduction Losses
 - Low V_{SD} —Reduces Losses Due to Body Diode Conduction
 - Low Q_{rr} —Lower Q_{rr} of the Integrated Schottky Reduces Body Diode Switching Losses
 - Low Gate Capacitance (Q_g/Q_{gs}) Ratio—Reduces Risk of Shoot-Through or Cross Conduction Currents at High Frequencies
 - Avalanche Rugged— I_{AR} and E_{AR} Rated
- **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**

Mechanical Data

- Case: SO-8
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminal Connections: See Diagram Below
- Marking Information: See Page 5
- Weight: 0.072 grams (Approximate)



Ordering Information (Note 4)

Part Number	Case	Packaging
DMS3014SSS-13	SO-8	2500/Tape & Reel

- Note:
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 <http://www.diodes.com/>.

Maximum Ratings @ $T_A = 25^\circ\text{C}$ unless otherwise specified

Characteristic	Symbol	Value	Unit
Drain-Source Voltage	V_{DSS}	30	V
Gate-Source Voltage	V_{GSS}	± 12	V
Continuous Drain Current (Note 5) $V_{GS} = 4.5\text{V}$	I_D	10.4	A
Steady State		6.6	
Pulsed Drain Current (Note 6)	I_{DM}	63	A
Avalanche Current (Notes 6 & 7)	I_{AR}	30	A
Repetitive Avalanche Energy (Notes 6 & 7) $L = 0.1\text{mH}$	E_{AR}	45	mJ

Thermal Characteristics

Characteristic	Symbol	Value	Unit
Power Dissipation (Note 5)	P_D	1.55	W
Thermal Resistance, Junction to Ambient @ $T_A = 25^\circ\text{C}$ (Note 5)	$R_{\theta JA}$	81.3	$^\circ\text{C/W}$
Operating and Storage Temperature Range	T_J, T_{STG}	-55 to +150	$^\circ\text{C}$

- Notes:
- Device mounted on 1in x 1in FR-4 PCB with 2oz. Copper. The value in any given application depends on the user's specific board design.
 - Repetitive rating, pulse width limited by junction temperature.
 - I_{AR} and E_{AR} rating are based on low frequency and duty cycles to keep $T_J = 25^\circ\text{C}$.

Electrical Characteristics @ $T_A = 25^\circ\text{C}$ unless otherwise stated

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS (Note 8)						
Drain-Source Breakdown Voltage	BV_{DSS}	30	—	—	V	$V_{GS} = 0\text{V}, I_D = 250\mu\text{A}$
Zero Gate Voltage Drain Current	I_{DSS}	—	—	100	μA	$V_{DS} = 30\text{V}, V_{GS} = 0\text{V}$
Gate-Source Leakage	I_{GSS}	—	—	± 100	nA	$V_{GS} = \pm 12\text{V}, V_{DS} = 0\text{V}$
ON CHARACTERISTICS (Note 8)						
Gate Threshold Voltage	$V_{GS(th)}$	1.0	-	2.2	V	$V_{DS} = V_{GS}, I_D = 250\mu\text{A}$
Static Drain-Source On-Resistance	$R_{DS(on)}$	—	9	13	m Ω	$V_{GS} = 10\text{V}, I_D = 10.4\text{A}$
		—	10	14		$V_{GS} = 4.5\text{V}, I_D = 10.4\text{A}$
Forward Transfer Admittance	$ Y_{fs} $	—	23	—	S	$V_{DS} = 5\text{V}, I_D = 10.4\text{A}$
Diode Forward Voltage	V_{SD}	—	0.37	0.5	V	$V_{GS} = 0\text{V}, I_S = 1\text{A}$
Maximum Body-Diode + Schottky Continuous Current	I_S	—	—	5	A	—
DYNAMIC CHARACTERISTICS (Note 9)						
Input Capacitance	C_{iss}	—	2296	—	pF	$V_{DS} = 15\text{V}, V_{GS} = 0\text{V}, f = 1.0\text{MHz}$
Output Capacitance	C_{oss}	—	164	—	pF	
Reverse Transfer Capacitance	C_{rss}	—	120	—	pF	
Gate Resistance	R_g	0.26	1.3	2.34	Ω	$V_{DS} = 0\text{V}, V_{GS} = 0\text{V}, f = 1\text{MHz}$
Total Gate Charge $V_{GS} = 4.5\text{V}$	Q_g	—	19.3	—	nC	$V_{DS} = 15\text{V}, V_{GS} = 10\text{V}, I_D = 10.4\text{A}$
Total Gate Charge $V_{GS} = 10\text{V}$	Q_g	—	45.7	—	nC	
Gate-Source Charge	Q_{gs}	—	5.0	—	nC	
Gate-Drain Charge	Q_{gd}	—	2.9	—	nC	
Turn-On Delay Time	$t_{D(on)}$	—	5.5	—	ns	$V_{GS} = 10\text{V}, V_{DS} = 15\text{V}, R_G = 3\Omega, R_L = 1.2\Omega$
Turn-On Rise Time	t_r	—	24.4	—	ns	
Turn-Off Delay Time	$t_{D(off)}$	—	33.1	—	ns	
Turn-Off Fall Time	t_f	—	6.6	—	ns	

- Notes:
- Short duration pulse test used to minimize self-heating effect.
 - Guaranteed by design. Not subject to production testing.

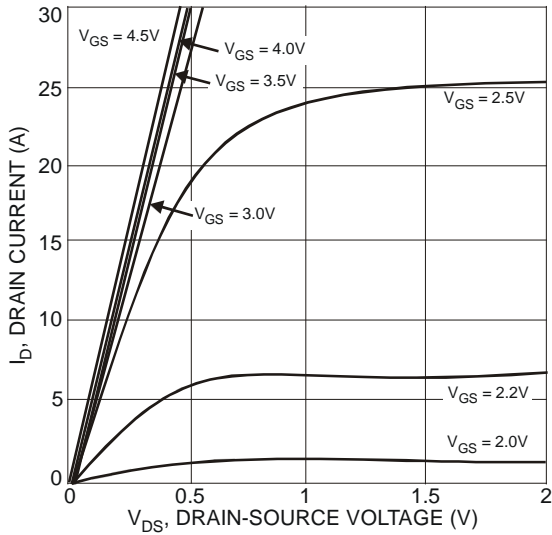


Fig. 1 Typical Output Characteristic

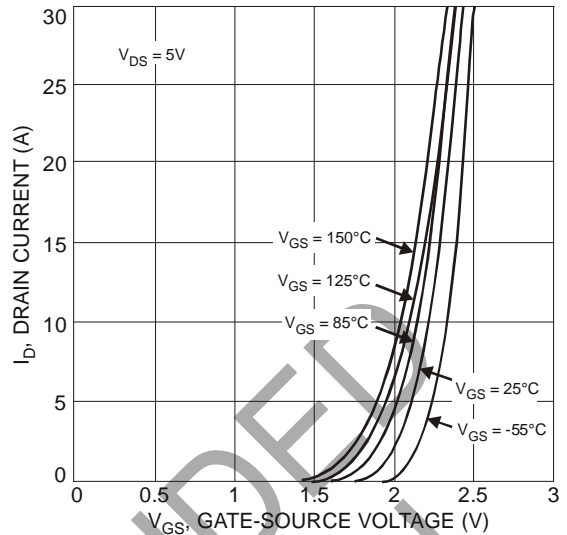


Fig. 2 Typical Transfer Characteristic

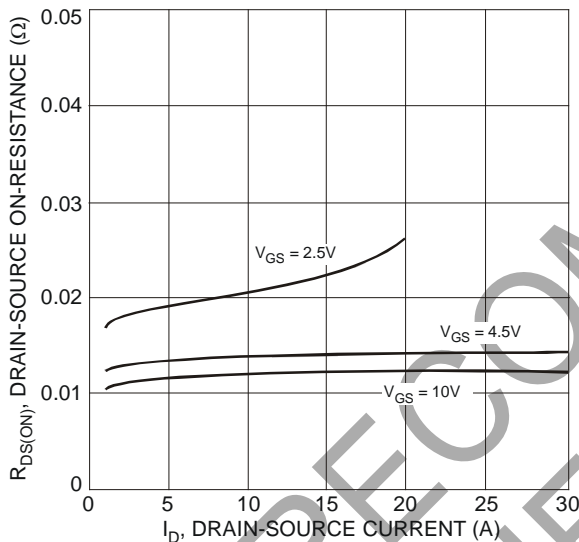


Fig. 3 Typical On-Resistance vs. Drain Current and Gate Voltage

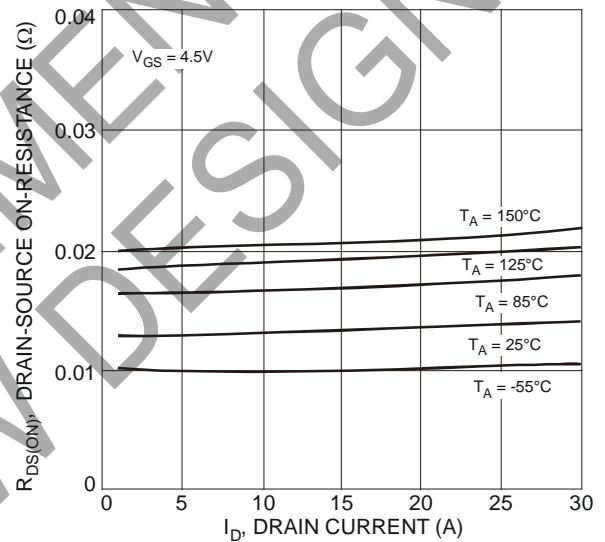


Fig. 4 Typical On-Resistance vs. Drain Current and Temperature

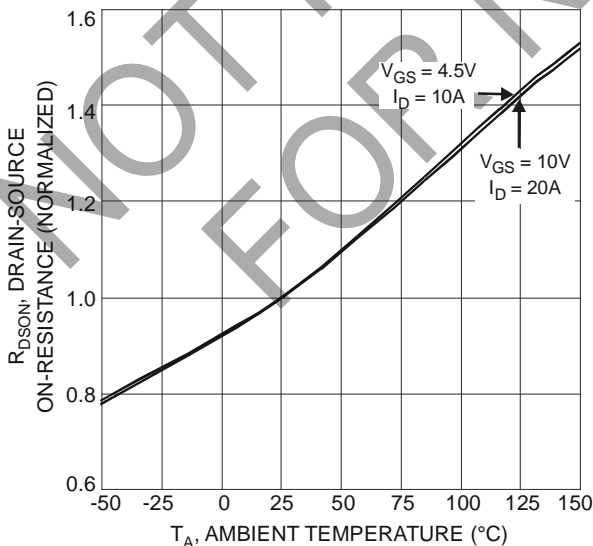


Fig. 5 On-Resistance Variation with Temperature

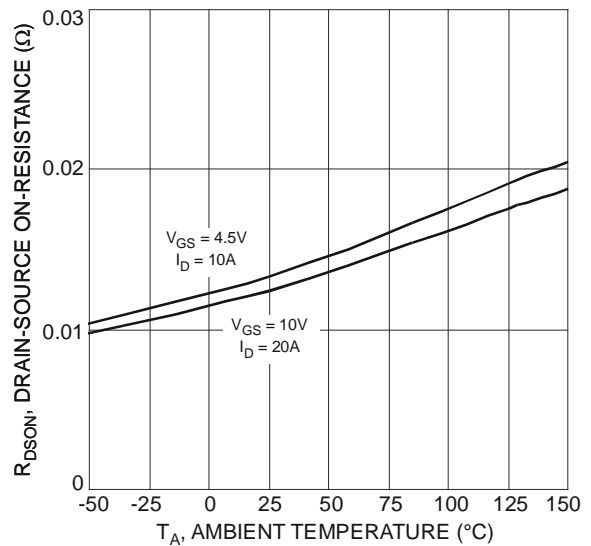


Fig. 6 On-Resistance Variation with Temperature

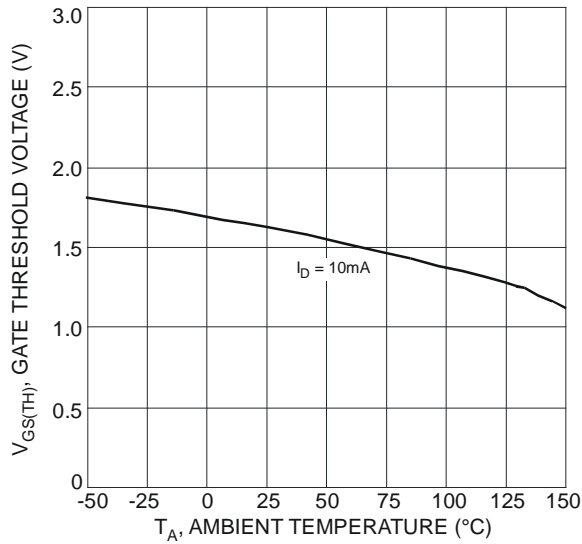


Fig. 7 Gate Threshold Variation vs. Ambient Temperature

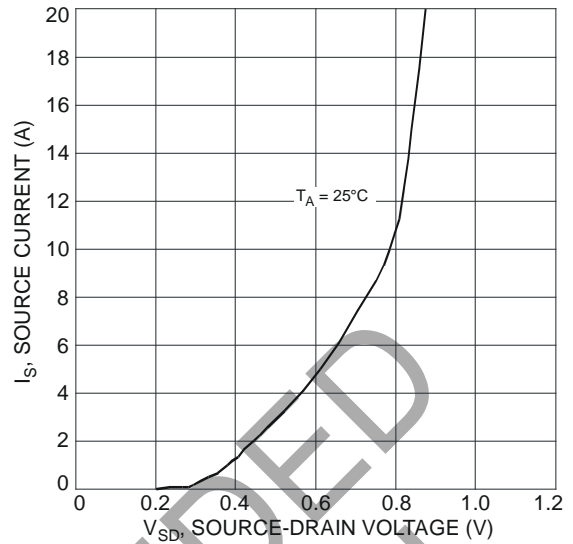


Fig. 8 Diode Forward Voltage vs. Current

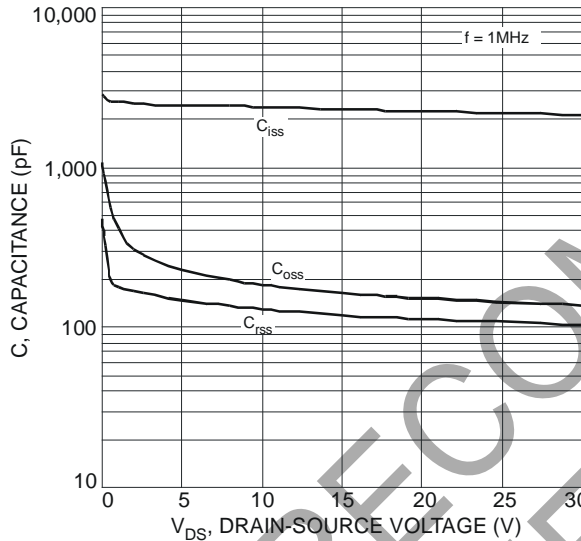


Fig. 9 Typical Total Capacitance

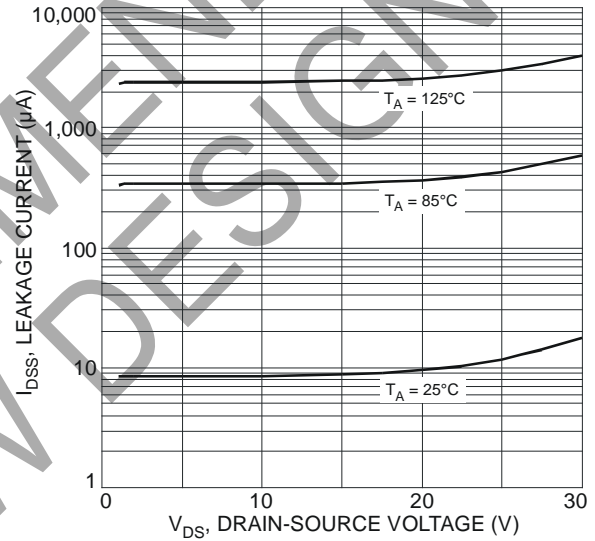


Fig. 10 Typical Leakage Current vs. Drain-Source Voltage

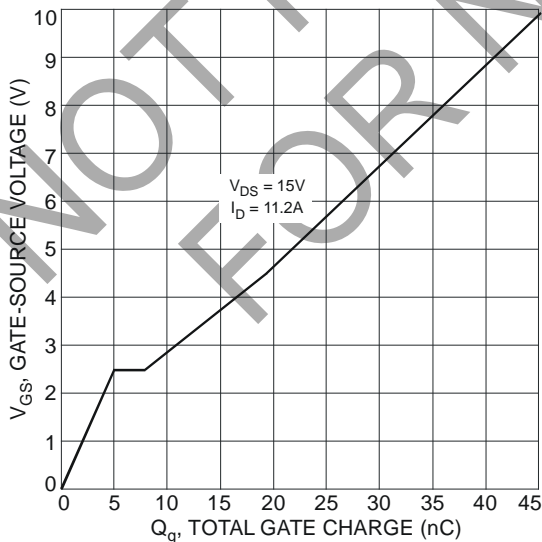


Fig. 11 Gate-Source Voltage vs. Total Gate Charge

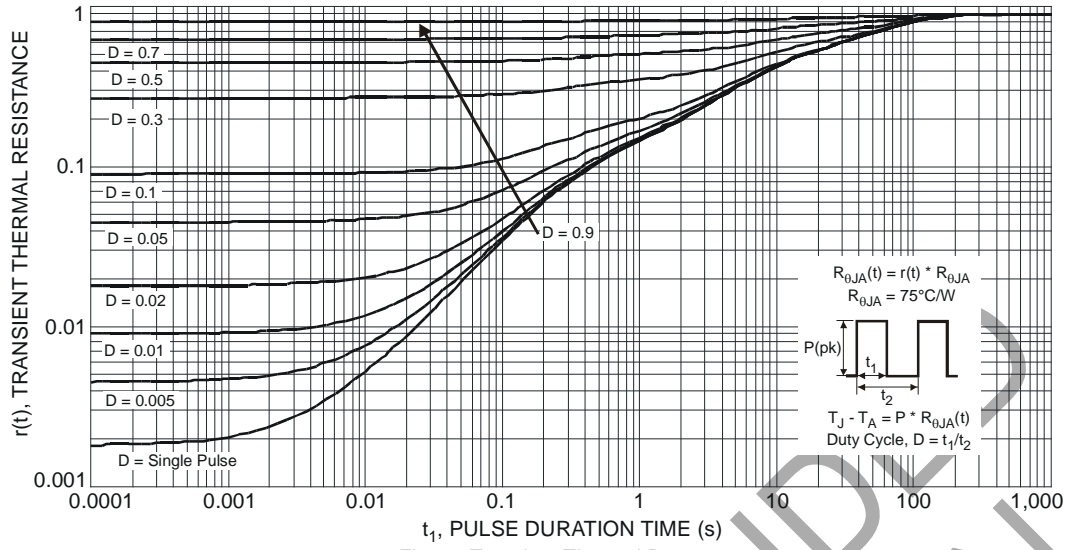
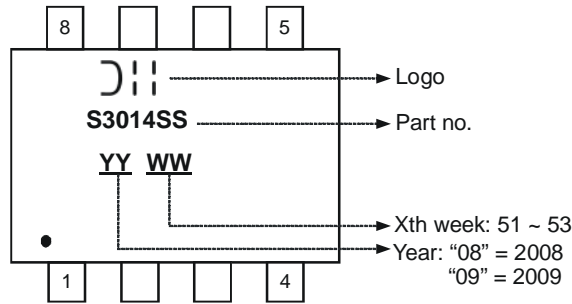


Fig. 12 Transient Thermal Response

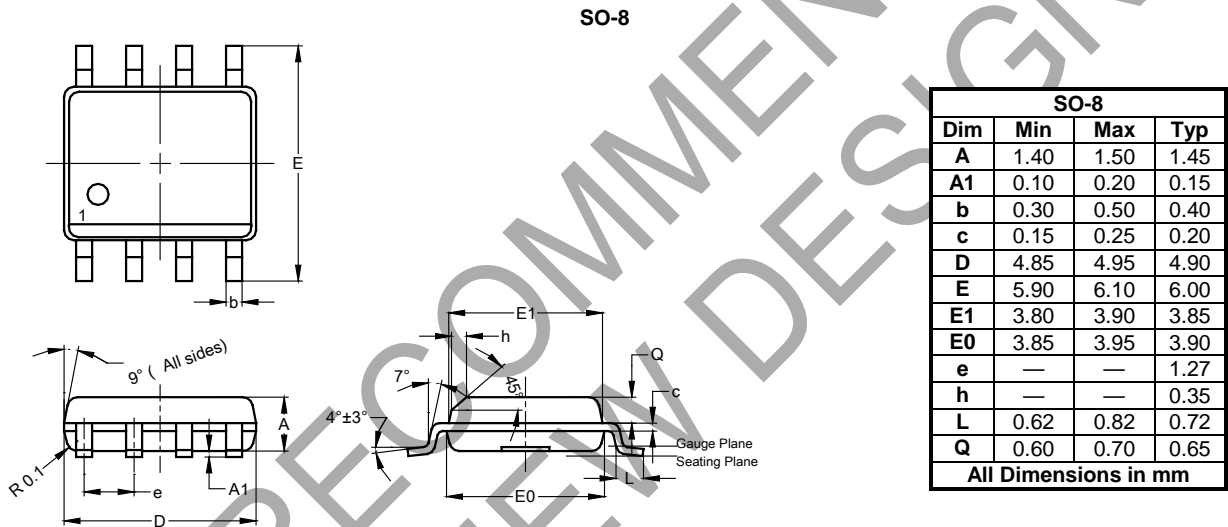
NOT RECOMMENDED FOR NEW DESIGN

Marking Information



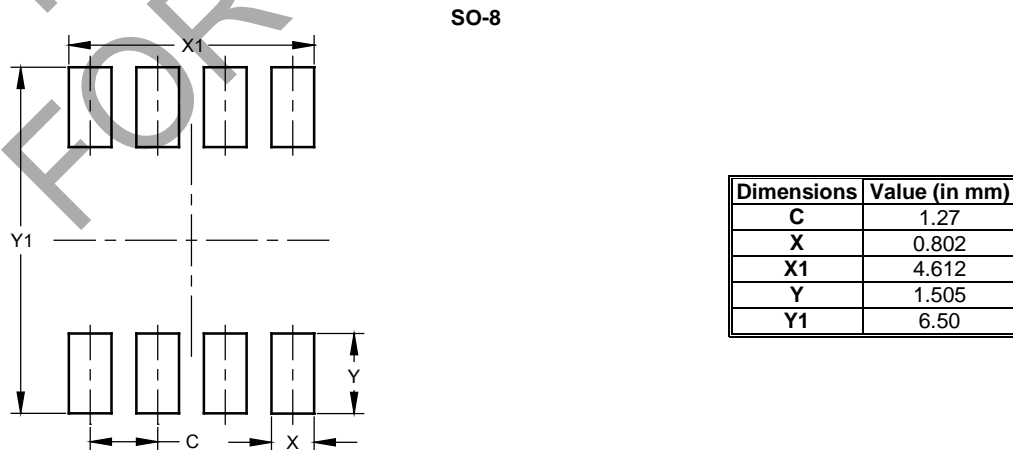
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