

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

| $V_{(BR)DSS}$ | $R_{DS(ON)} \text{ max}$               | $I_D \text{ max}$<br>$T_A = +25^\circ\text{C}$ |
|---------------|----------------------------------------|------------------------------------------------|
| -30V          | 11m $\Omega$ @ $V_{GS} = -10\text{V}$  | -13A                                           |
|               | 17m $\Omega$ @ $V_{GS} = -4.5\text{V}$ | -9.9A                                          |

**Description**

This MOSFET is designed to minimize the on-state resistance ( $R_{DS(on)}$ ) yet maintain superior switching performance, making it ideal for high-efficiency power management applications.

**Applications**

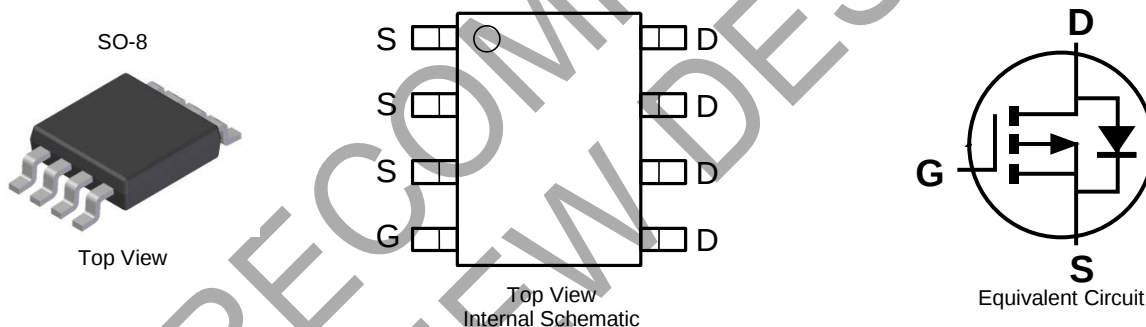
- Backlighting
- Power Management Functions
- DC-DC Converters

**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**

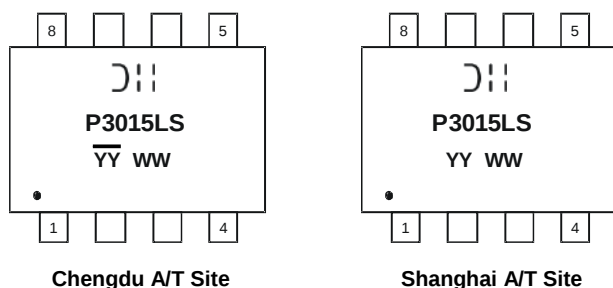
**Mechanical Data**

- Case: SO-8
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020D
- Terminals Connections: See Diagram
- Terminals: Finish—Matte Tin Annealed over Copper Leadframe. Solderable per MIL-STD-202, Method 208
- Weight: 0.074g (Approximate)


**Ordering Information (Note 4)**

| Part Number   | Case | Packaging        |
|---------------|------|------------------|
| DMP3015LSS-13 | SO-8 | 2500/Tape & 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 <http://www.diodes.com/products/packages.html>.

**Marking Information**


- DII = Manufacturer's Marking  
 P3015LS = Product Type Marking Code  
 YYWW = Date Code Marking  
 YY or YY = Year (ex: 13 = 2013)  
 WW = Week (01 - 53)  
 YY = Date Code Marking for SAT (Shanghai Assembly/ Test site)  
 YY = Date Code Marking for CAT (Chengdu Assembly/ Test site)

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

| Characteristic                |                 |                        | Symbol           | Value | Units |
|-------------------------------|-----------------|------------------------|------------------|-------|-------|
| Drain-Source Voltage          |                 |                        | V <sub>DSS</sub> | -30   | V     |
| Gate-Source Voltage           |                 |                        | V <sub>GSS</sub> | ±20   | V     |
| Drain Current (Note 5)        | Steady<br>State | T <sub>A</sub> = +25°C | I <sub>D</sub>   | -13   | A     |
|                               |                 | T <sub>A</sub> = +70°C |                  | -9.75 |       |
| Pulsed Drain Current (Note 6) |                 |                        | I <sub>DM</sub>  | -45   | A     |

**Thermal Characteristics**

| Characteristic                          | Symbol                            | Value       | Unit |
|-----------------------------------------|-----------------------------------|-------------|------|
| Total Power Dissipation (Note 5)        | P <sub>D</sub>                    | 2.5         | W    |
| Thermal Resistance, Junction to Ambient | R <sub>θJA</sub>                  | 50          | °C/W |
| Operating and Storage Temperature Range | T <sub>J</sub> , T <sub>STG</sub> | -55 to +150 | °C   |

Notes: 5. Device mounted on 2 oz. copper pads on FR-4 PCB with R<sub>θJA</sub> = 50°C/W.  
6. Pulse width ≤10μs, duty cycle ≤1%.

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

| Characteristic                            | Symbol              | Min      | Typ          | Max  | Unit | Test Condition                                                                                                                                  |
|-------------------------------------------|---------------------|----------|--------------|------|------|-------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>OFF CHARACTERISTICS (Note 7)</b>       |                     |          |              |      |      |                                                                                                                                                 |
| Drain-Source Breakdown Voltage            | BV <sub>DSS</sub>   | -30      | —            | —    | V    | V <sub>GS</sub> = 0V, I <sub>D</sub> = -250μA                                                                                                   |
| Zero Gate Voltage Drain Current           | I <sub>DSS</sub>    | —        | —            | -1   | μA   | V <sub>DS</sub> = -30V, V <sub>GS</sub> = 0V                                                                                                    |
| Gate-Source Leakage                       | I <sub>GSS</sub>    | —        | —            | ±100 | nA   | V <sub>GS</sub> = ±20V, V <sub>DS</sub> = 0V                                                                                                    |
| <b>ON CHARACTERISTICS (Note 7)</b>        |                     |          |              |      |      |                                                                                                                                                 |
| Gate Threshold Voltage                    | V <sub>GS(th)</sub> | -1       | —            | -2   | V    | V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = -250μA                                                                                     |
| Static Drain-Source On-Resistance         | R <sub>DS(on)</sub> | —9<br>14 | 11<br>17     | —    | mΩ   | V <sub>GS</sub> = -10V, I <sub>D</sub> = -13A<br>V <sub>GS</sub> = -4.5V, I <sub>D</sub> = -10A                                                 |
| Forward Transconductance                  | g <sub>fs</sub>     | —        | 15           | —    | S    | V <sub>DS</sub> = -15V, I <sub>D</sub> = -8A                                                                                                    |
| Diode Forward Voltage (Note 7)            | V <sub>SD</sub>     | -0.5     | —            | -1.1 | V    | V <sub>GS</sub> = 0V, I <sub>S</sub> = -2.1A                                                                                                    |
| <b>DYNAMIC CHARACTERISTICS (Note 8)</b>   |                     |          |              |      |      |                                                                                                                                                 |
| Input Capacitance                         | C <sub>iss</sub>    | —        | 2748         | —    | pF   | V <sub>DS</sub> = -20V, V <sub>GS</sub> = 0V<br>f = 1.0MHz                                                                                      |
| Output Capacitance                        | C <sub>oss</sub>    | —        | 357          | —    | pF   |                                                                                                                                                 |
| Reverse Transfer Capacitance              | C <sub>rss</sub>    | —        | 356          | —    | pF   |                                                                                                                                                 |
| Gate Resistance                           | R <sub>G</sub>      | —        | 2.0          | —    | Ω    | V <sub>DS</sub> = 0V, V <sub>GS</sub> = 0V<br>f = 1.0MHz                                                                                        |
| <b>SWITCHING CHARACTERISTICS (Note 8)</b> |                     |          |              |      |      |                                                                                                                                                 |
| Total Gate Charge                         | Q <sub>g</sub>      | —        | 30.0<br>60.4 | —    | nC   | V <sub>DS</sub> = -10V, V <sub>GS</sub> = -4.5V, I <sub>D</sub> = -13A<br>V <sub>DS</sub> = -10V, V <sub>GS</sub> = -10V, I <sub>D</sub> = -13A |
| Gate-Source Charge                        | Q <sub>gs</sub>     | —        | 7.2          | —    |      | V <sub>DS</sub> = -10V, V <sub>GS</sub> = -10V, I <sub>D</sub> = -13A                                                                           |
| Gate-Drain Charge                         | Q <sub>gd</sub>     | —        | 16.4         | —    |      | V <sub>DS</sub> = -10V, V <sub>GS</sub> = -10V, I <sub>D</sub> = -13A                                                                           |
| Turn-On Delay Time                        | t <sub>d(on)</sub>  | —        | 11.2         | —    | ns   | V <sub>DS</sub> = -15V, V <sub>GS</sub> = -10V,<br>I <sub>D</sub> = -1A, R <sub>G</sub> = 6.0Ω                                                  |
| Rise Time                                 | t <sub>r</sub>      | —        | 12.4         | —    |      |                                                                                                                                                 |
| Turn-Off Delay Time                       | t <sub>d(off)</sub> | —        | 104.9        | —    |      |                                                                                                                                                 |
| Fall Time                                 | t <sub>f</sub>      | —        | 61.7         | —    |      |                                                                                                                                                 |

Notes: 7. Short duration pulse test used to minimize self-heating effect.  
8. Guaranteed by design. Not subject to product testing.

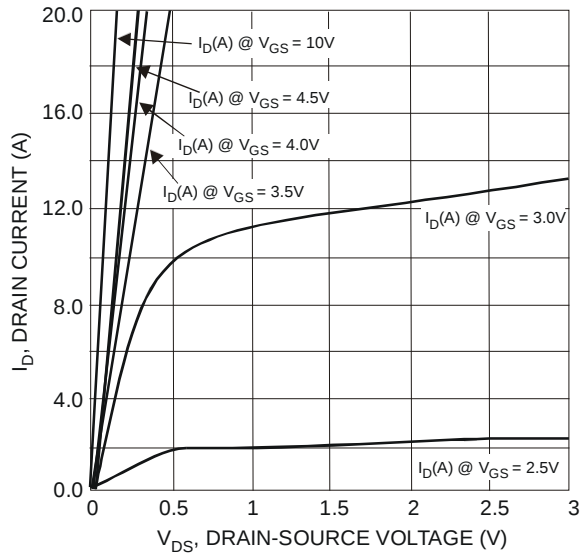


Fig. 1 Typical Output Characteristics

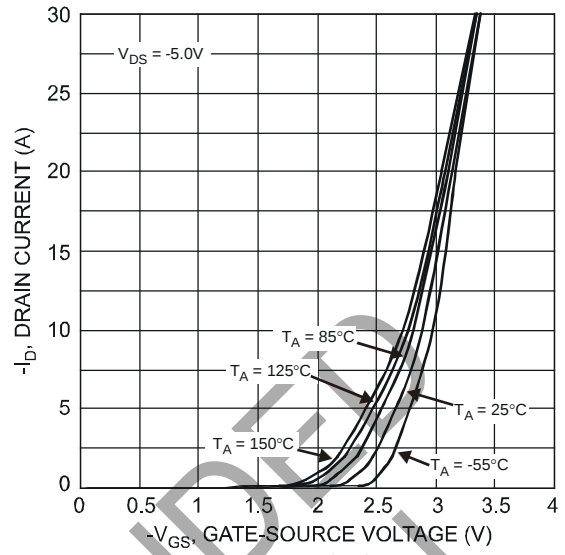


Fig. 2 Typical Transfer Characteristics

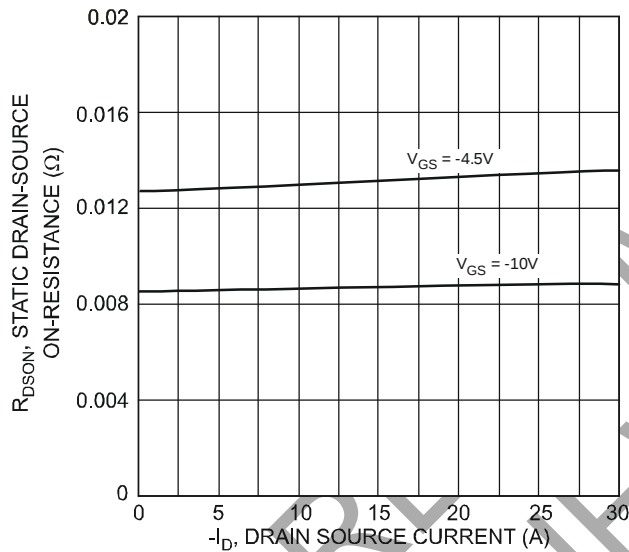


Fig. 3 On-Resistance vs. Drain Current & Gate Voltage

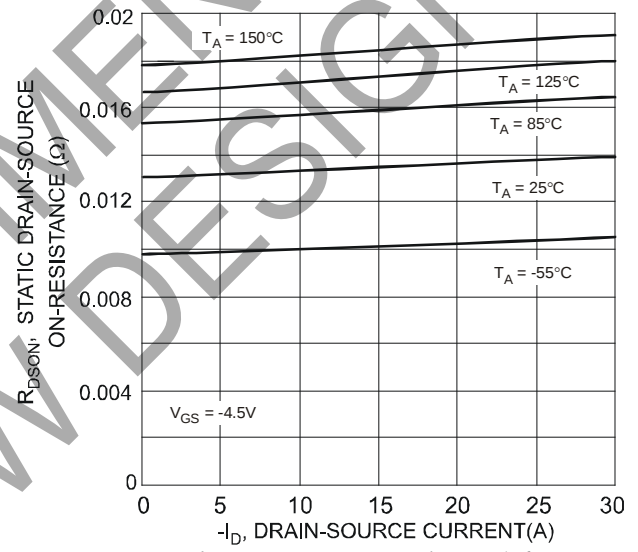


Fig. 4 On-Resistance vs. Drain Current & Gate Voltage

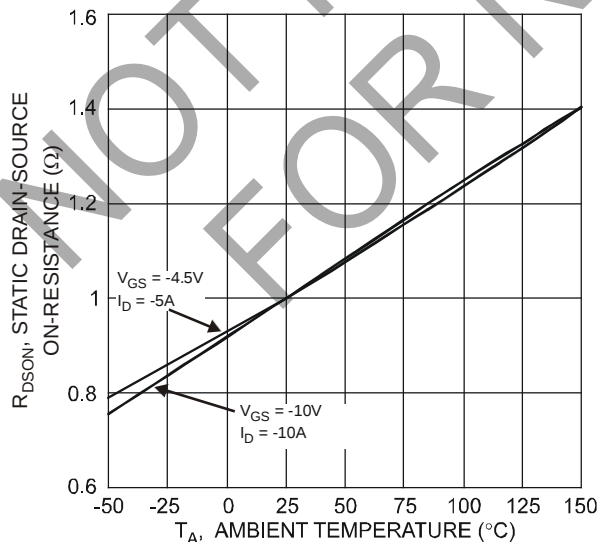


Fig. 5 Static Drain-Source On-Resistance vs. Ambient Temperature

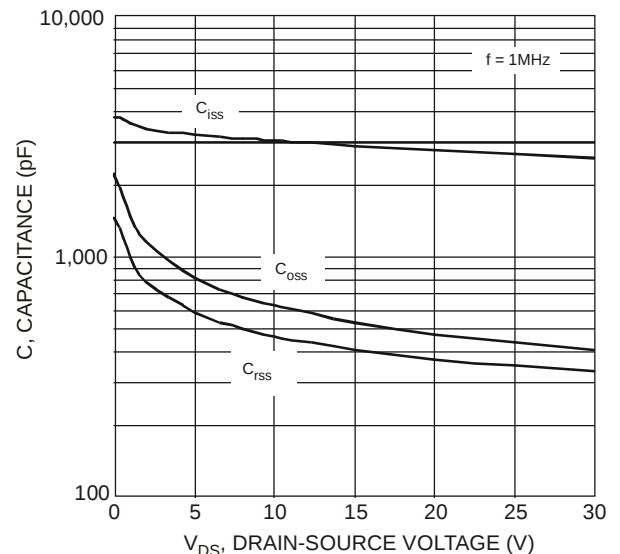


Fig. 6 Typical Total Capacitance

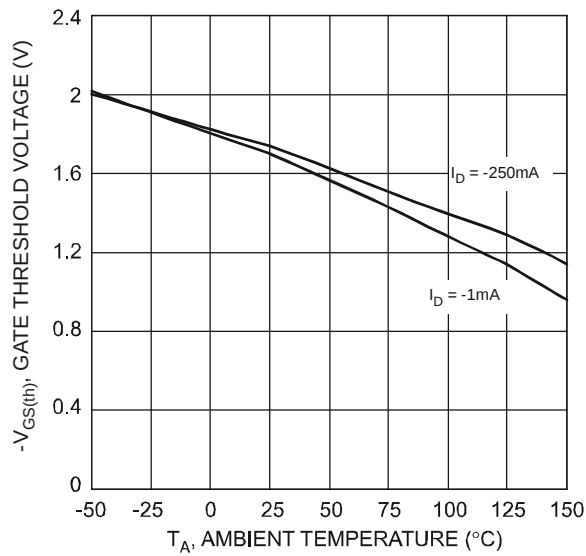


Fig. 7 Gate Threshold Variation vs. Ambient Temperature

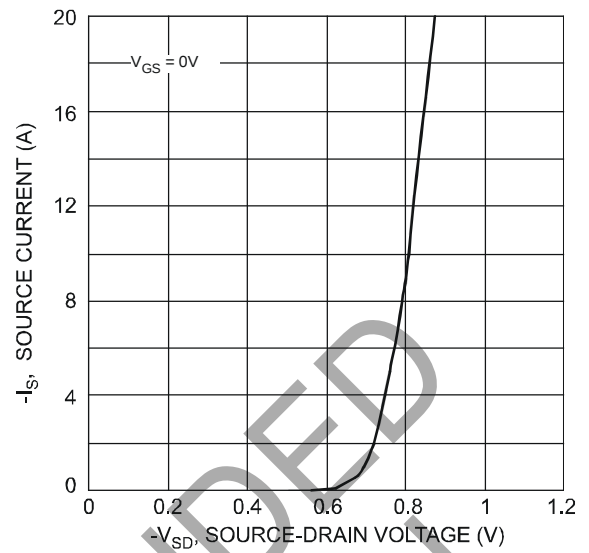


Fig. 8 Forward Drain Current vs. Source-Drain Voltage

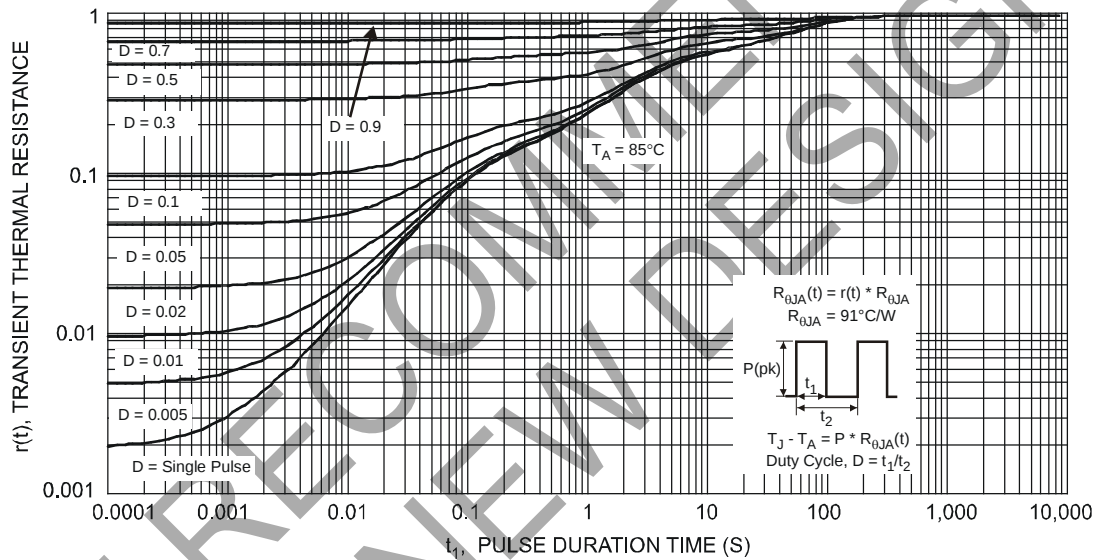
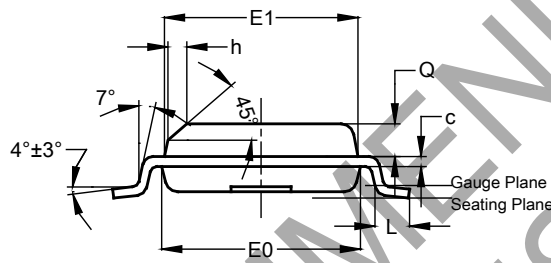
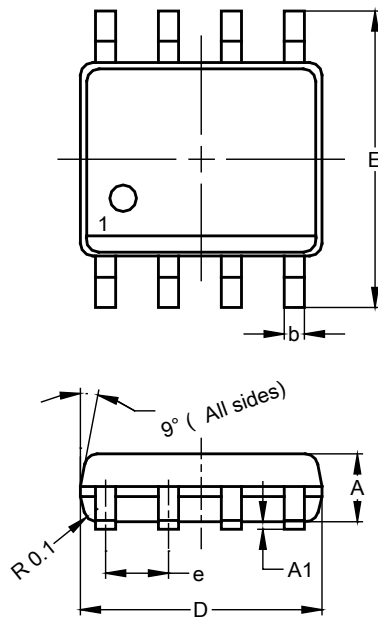


Fig. 9 Transient Thermal Resistance

## Package Outline Dimensions

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

**SO-8**

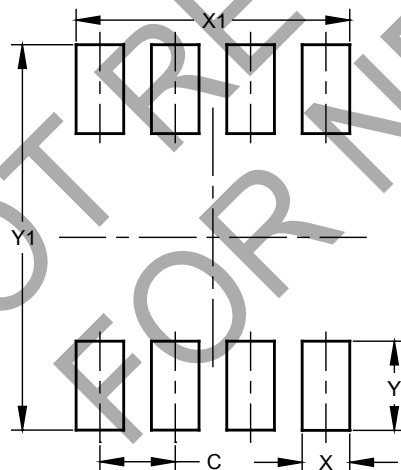


| SO-8                 |      |      |      |
|----------------------|------|------|------|
| Dim                  | Min  | Max  | Typ  |
| A                    | 1.40 | 1.50 | 1.45 |
| A1                   | 0.10 | 0.20 | 0.15 |
| b                    | 0.30 | 0.50 | 0.40 |
| c                    | 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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