

## Product Summary

$BV_{DSS}$	$R_{DS(ON) MAX}$	$I_D$ $T_A = +25^\circ C$
-30V	45m $\Omega$ @ $V_{GS} = -10V$	-4.3A
	65m $\Omega$ @ $V_{GS} = -4.5V$	-3.3A

## Description

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

## Applications

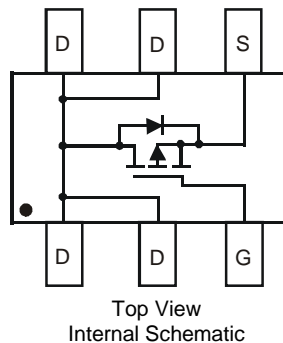
- General Purpose Interfacing Switch
- Power Management Functions
- Analog Switch

## Features

- Low Gate Threshold Voltage
- Low On-Resistance
- **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: SOT26
- Case Material – Molded Plastic, "Green" Molding Compound. UL Flammability 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  $\text{\textcircled{3}}$
- Terminal Connections: See Diagram
- Weight: 0.016 grams (Approximate)

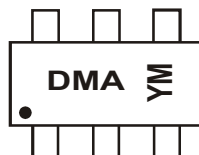


## Ordering Information (Note 5)

Part Number	Qualification	Case	Packaging
DMP3056LDM-7	Commercial	SOT26	3000/Tape & Reel
DMP3056LDMQ-7	Automotive	SOT26	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. Automotive products are AEC-Q101 qualified and are PPAP capable. Automotive, AEC-Q101 and standard products are electrically and thermally the same, except where specified. For more information, please refer to [http://www.diodes.com/product\\_compliance\\_definitions.html](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



DMA = Product Type Marking Code  
 YM = Date Code Marking  
 Y = Year (ex: V = 2008)  
 M = Month (ex: 9 = September)

### Date Code Key

Year	2008	~	2016	2017	2018	2019	2020	2021
Code	V	~	D	E	F	G	H	I

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>	±20	V		
Continuous Drain Current (Note 7) V <sub>GS</sub> = -10V	Steady State	T <sub>A</sub> = +25°C	I <sub>D</sub>	-4.3	A
	t < 10s	T <sub>A</sub> = +25°C	I <sub>D</sub>	-5.8	A
Maximum Continuous Body Diode Forward Current (Note 7)	I <sub>S</sub>	-2.3	A		
Pulsed Drain Current (10μs Pulse, Duty Cycle = 1%)	I <sub>DM</sub>	-13	A		

**Thermal Characteristics**

Characteristic	Symbol	Value	Unit
Total Power Dissipation (Note 6)	P <sub>D</sub>	1.25	W
Thermal Resistance, Junction to Ambient (Note 6)	R <sub>θJA</sub>	100	°C/W
Total Power Dissipation (Note 7)	P <sub>D</sub>	1.5	W
Thermal Resistance, Junction to Ambient (Note 7)	R <sub>θJA</sub>	86	°C/W
Thermal Resistance, Junction to Case	R <sub>θJC</sub>	15.6	°C/W
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
<b>STATIC PARAMETERS (Note 8)</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	T <sub>J</sub> = +25°C, V <sub>GS</sub> = 0V, V <sub>DS</sub> = -30V
Gate-Body Leakage Current	I <sub>GSS</sub>	—	—	±100 ±800	nA	V <sub>GS</sub> = ±20V, V <sub>DS</sub> = 0V V <sub>GS</sub> = ±25V, V <sub>DS</sub> = 0V
Gate Threshold Voltage	V <sub>GS(TH)</sub>	-1.0	—	-2.1	V	V <sub>GS</sub> = V <sub>DS</sub> , I <sub>D</sub> = -250μA
Static Drain-Source On-Resistance	R <sub>DS(ON)</sub>	—	—	45 65	mΩ	V <sub>GS</sub> = -10V, I <sub>D</sub> = -5A V <sub>GS</sub> = -4.5V, I <sub>D</sub> = -4.2A
Forward Transconductance	g <sub>FS</sub>	—	8	—	s	V <sub>DS</sub> = -10V, I <sub>D</sub> = -4.3A
Diode Forward Voltage	V <sub>SD</sub>	—	—	-1.2	V	V <sub>GS</sub> = 0V, I <sub>S</sub> = -1.7A
<b>DYNAMIC PARAMETERS (Note 9)</b>						
Input Capacitance	C <sub>iss</sub>	—	948	—	pF	V <sub>GS</sub> = 0V, V <sub>DS</sub> = -25V, f = 1.0MHz
Output Capacitance	C <sub>oss</sub>	—	105	—	pF	
Reverse Transfer Capacitance	C <sub>rss</sub>	—	100	—	pF	
<b>SWITCHING CHARACTERISTICS (Note 9)</b>						
Total Gate Charge	Q <sub>g</sub>	—	10.1	—	nC	V <sub>DS</sub> = -15V, V <sub>GS</sub> = -4.5V, I <sub>D</sub> = -6A
	Q <sub>g</sub>	—	21.1	—	nC	
Gate-Source Charge	Q <sub>gs</sub>	—	2.8	—	nC	V <sub>DS</sub> = -15V, V <sub>GS</sub> = -10V, I <sub>D</sub> = -6A
Gate-Drain Charge	Q <sub>gd</sub>	—	3.2	—	nC	
Gate Resistance	R <sub>g</sub>	—	13.15	—	Ω	V <sub>DS</sub> = 0V, V <sub>GS</sub> = 0V, f = 1MHz
Turn-On Delay Time	t <sub>D(ON)</sub>	—	10.2	—	ns	V <sub>DS</sub> = -15V, V <sub>GS</sub> = -10V, I <sub>D</sub> = -1A, R <sub>g</sub> = 6.0Ω
Rise Time	t <sub>R</sub>	—	6.6	—		
Turn-Off Delay Time	t <sub>D(OFF)</sub>	—	50.1	—		
Fall Time	t <sub>F</sub>	—	22.3	—		

- 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 1inch square copper pad.
  8. Short duration pulse test used to minimize self-heating effect.
  9. Guaranteed by design. Not subject to product testing.

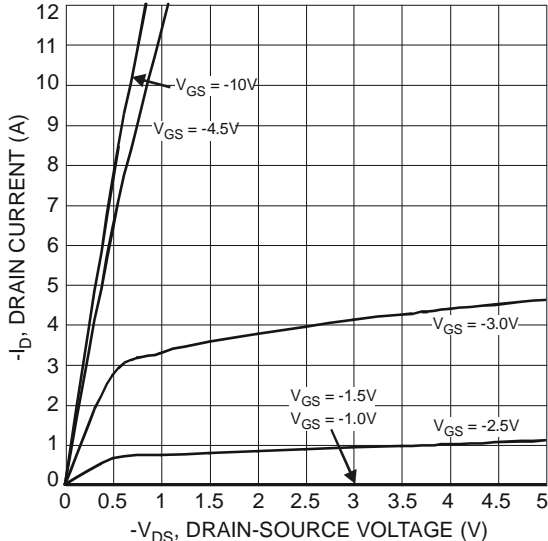


Fig. 1 Typical Output Characteristics

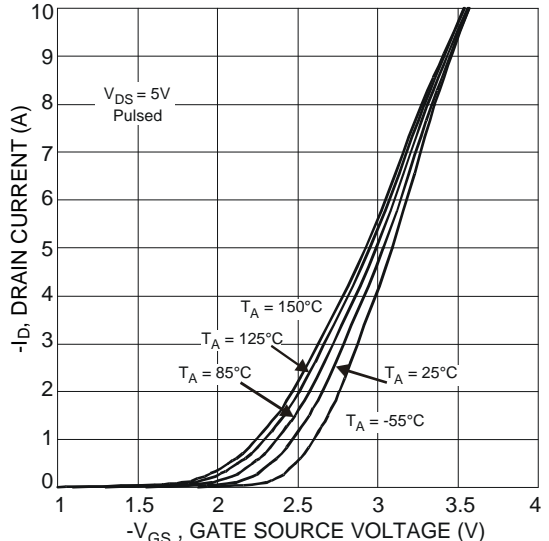


Fig. 2 Typical Transfer Characteristics

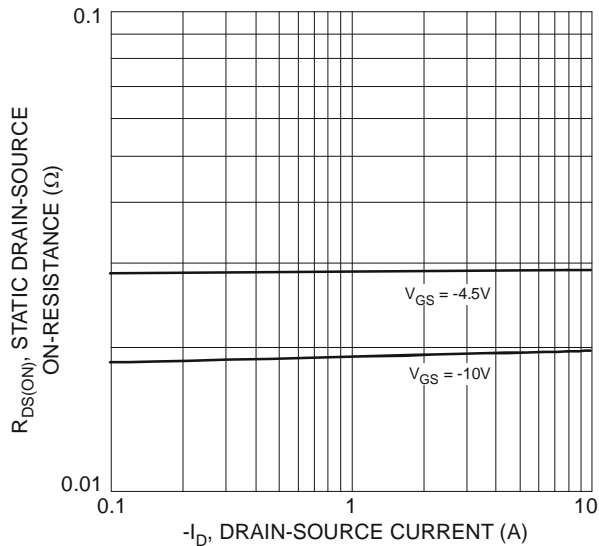


Fig. 3 On-Resistance vs. Drain Current & Gate Voltage

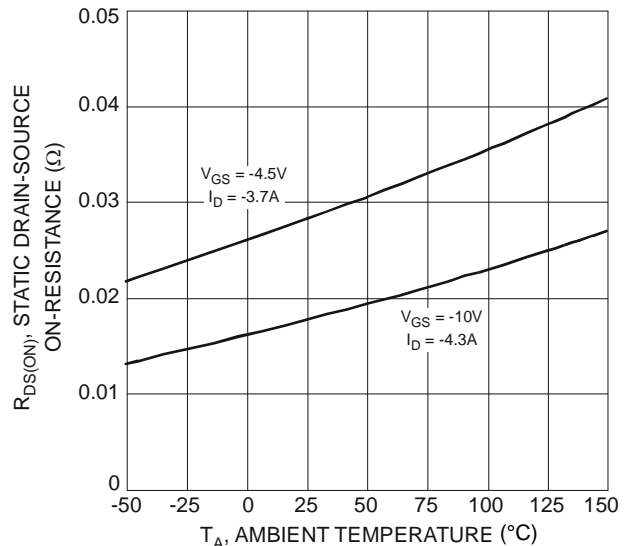


Fig. 4 Static Drain-Source On-Resistance vs. Ambient Temperature

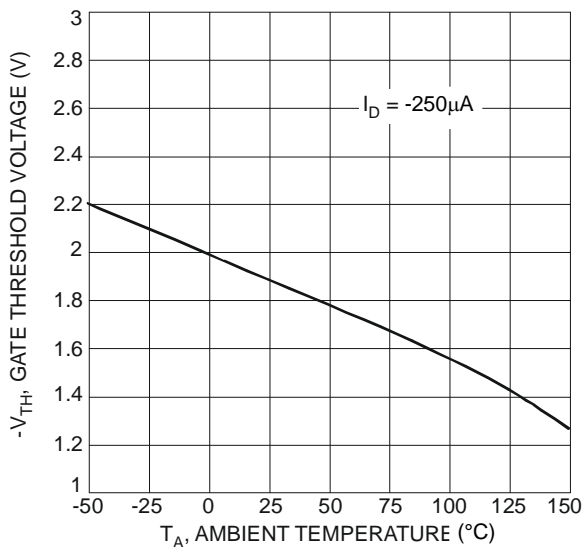


Fig. 5 Gate Threshold Variation vs. Ambient Temperature

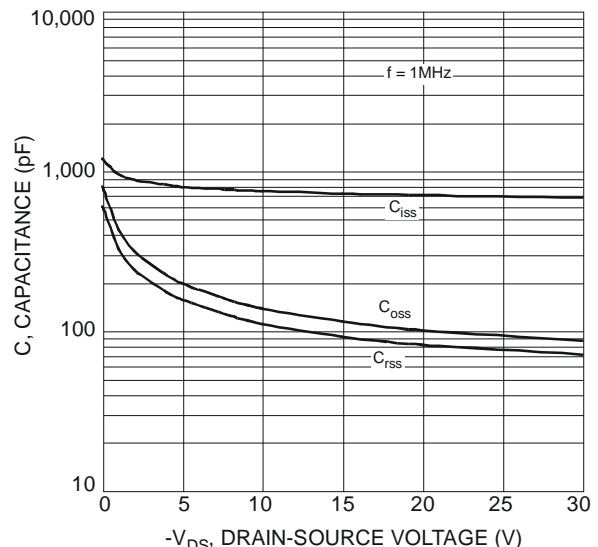


Fig. 6 Typical Total Capacitance

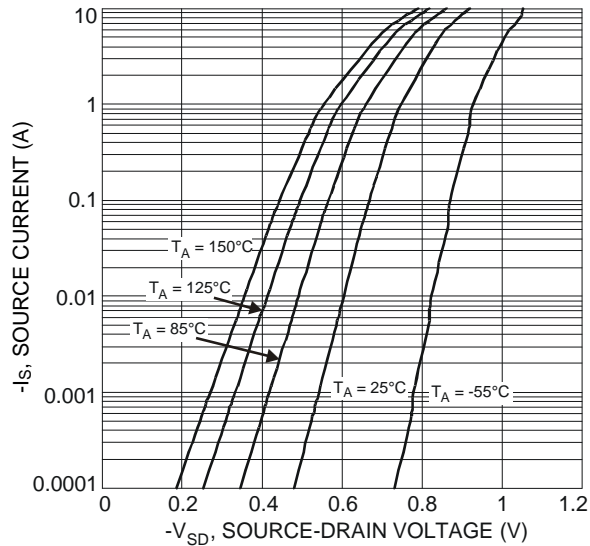


Fig. 7 Reverse Drain Current vs. Source-Drain Voltage

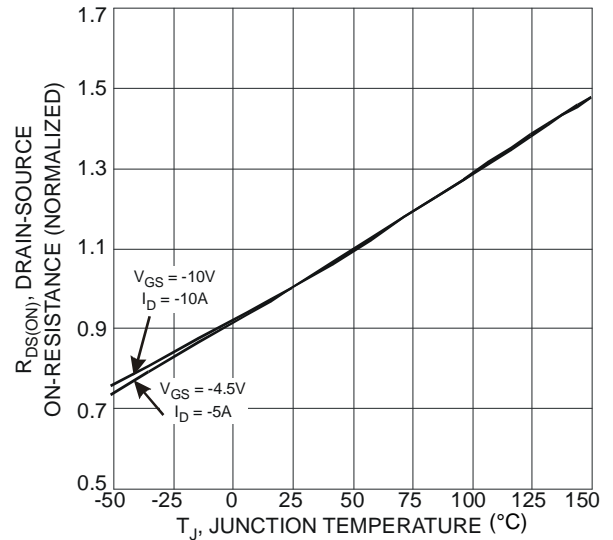


Fig. 8 On-Resistance Variation with Temperature

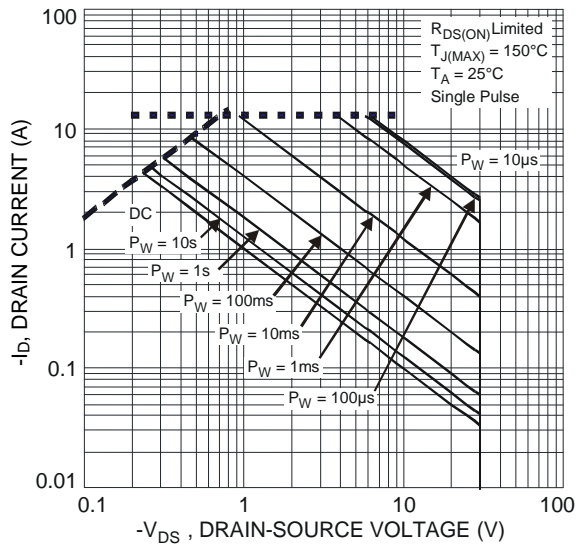


Fig. 9 Safe Operation Area

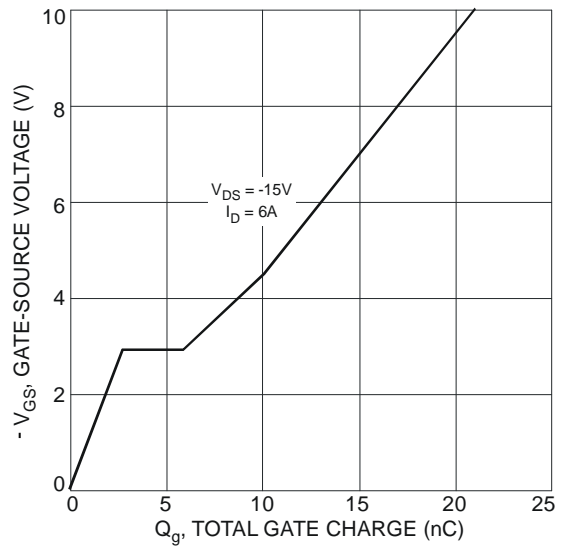


Fig. 10 Gate-Charge Characteristics

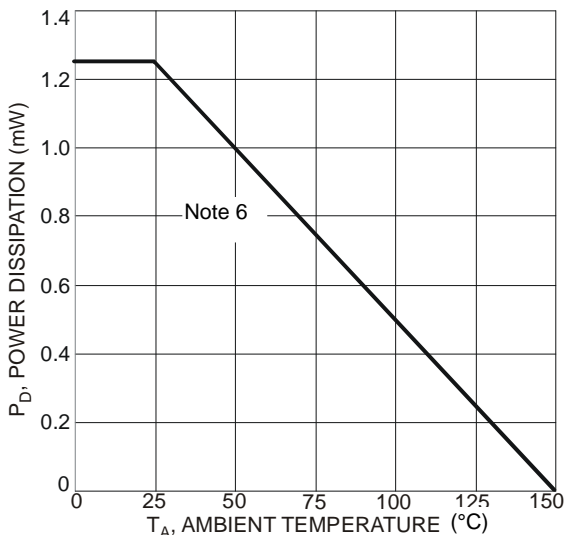


Fig. 11 Power Dissipation vs. Ambient Temperature

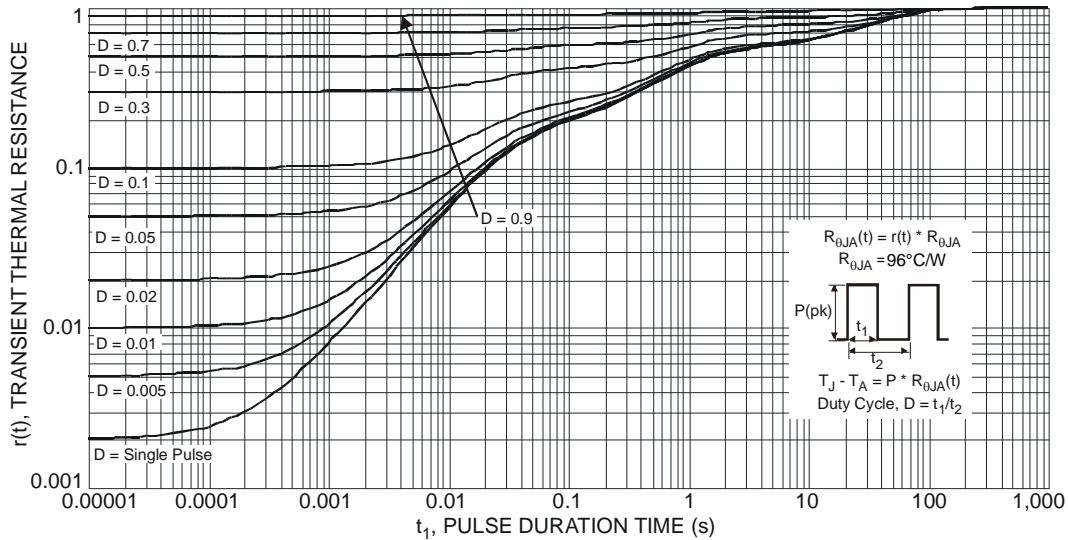
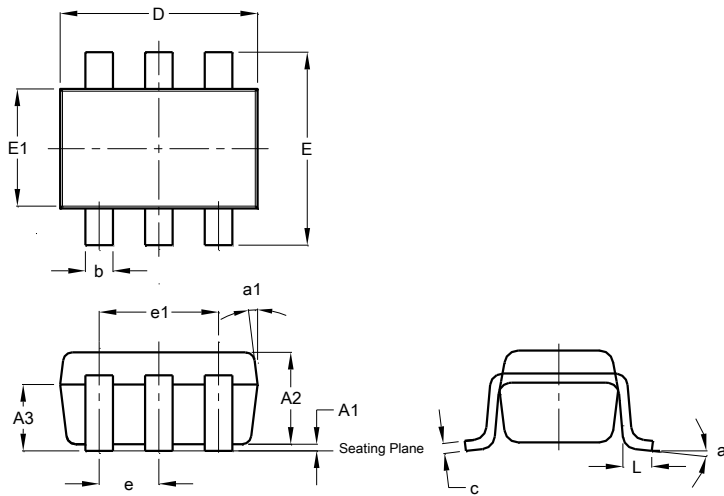


Fig. 12 Transient Thermal Response

**Package Outline Dimensions**

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

**SOT26**

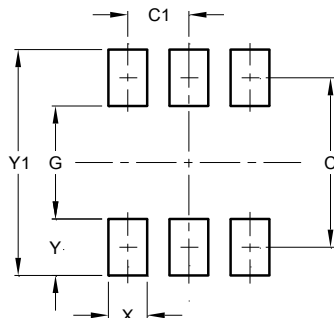


SOT26			
Dim	Min	Max	Typ
A1	0.013	0.10	0.05
A2	1.00	1.30	1.10
A3	0.70	0.80	0.75
b	0.35	0.50	0.38
c	0.10	0.20	0.15
D	2.90	3.10	3.00
e	-	-	0.95
e1	-	-	1.90
E	2.70	3.00	2.80
E1	1.50	1.70	1.60
L	0.35	0.55	0.40
a	-	-	8°
a1	-	-	7°
All Dimensions in mm			

**Suggested Pad Layout**

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

**SOT26**



Dimensions	Value (in mm)
C	2.40
C1	0.95
G	1.60
X	0.55
Y	0.80
Y1	3.20

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