

100V P-CHANNEL ENHANCEMENT MODE MOSFET
Product Summary

$V_{(BR)DSS}$	$R_{DS(on)}$	I_D $T_A = +25^\circ C$
-100V	350mΩ @ $V_{GS} = -10V$	-1.6A
	450mΩ @ $V_{GS} = -6.0V$	-1.4A

Description

This MOSFET has been designed to minimize the on-state resistance and yet maintain superior switching performance, making it ideal for high efficiency power management applications.

Applications

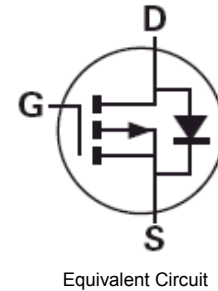
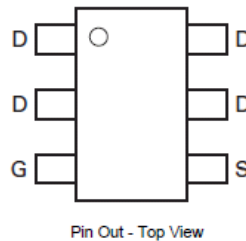
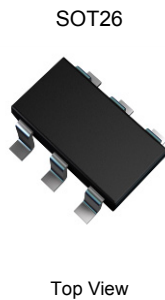
- Motor Control
- DC-DC Converters
- Power Management Functions
- Uninterrupted Power Supply

Features and Benefits

- Fast Switching Speed
- Low gate drive
- Low input capacitance
- **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 Available**

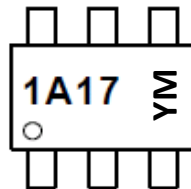
Mechanical Data

- Case: SOT26
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals Connections: See diagram below
- Terminals: Finish - Matte Tin annealed over Copper lead frame. Solderable per MIL-STD-202, Method 208 ③
- Weight: 0.018 grams (approximate)


Ordering Information (Note 4 & 5)

Part Number	Qualification	Case	Packaging
ZXMP10A17E6QTA	Automotive	SOT26	3,000/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 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/quality/product_grade_definitions/.
 5. For packaging details, go to our website at <http://www.diodes.com/products/packages.html>.

Marking Information


1A17 = Product Type Marking Code
 YM = Date Code Marking
 Y = Year ex: A = 2013
 M = Month ex: 9 = September

Date Code Key

Year	2013	2014	2015	2016	2017	2018	2019
Code	A	B	C	D	E	F	G

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_A = +25°C, unless otherwise specified.)

Characteristic			Symbol	Value	Unit
Drain-Source Voltage			V _{DSS}	-100	V
Gate-Source Voltage			V _{GS}	±20	V
Continuous Drain Current	V _{GS} = 10V	(Note 7)	I _D	-1.6	A
		T _A = +70°C (Note 7)		-1.3	
		(Note 6)		-1.3	
Pulsed Drain Current	V _{GS} = 10V	(Note 8)	I _{DM}	-7.7	A
Continuous Source Current (Body diode)			I _S	-2.1	A
Pulsed Source Current (Body diode)			I _{SM}	-7.7	A

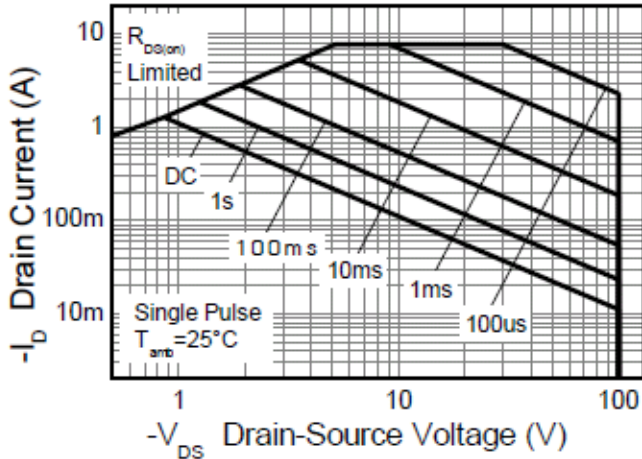
Thermal Characteristics (@T_A = +25°C, unless otherwise specified.)

Characteristic		Symbol	Value	Unit
Power dissipation	(Note 6)	P _D	1.1	W
			8.8	
Linear derating factor	(Note 7)		1.7	
Thermal Resistance, Junction to Ambient	(Note 6)	R _{θJA}	113	°C/W
	(Note 7)		73	
Operating and Storage Temperature Range		T _J , T _{STG}	-55 to +150	°C

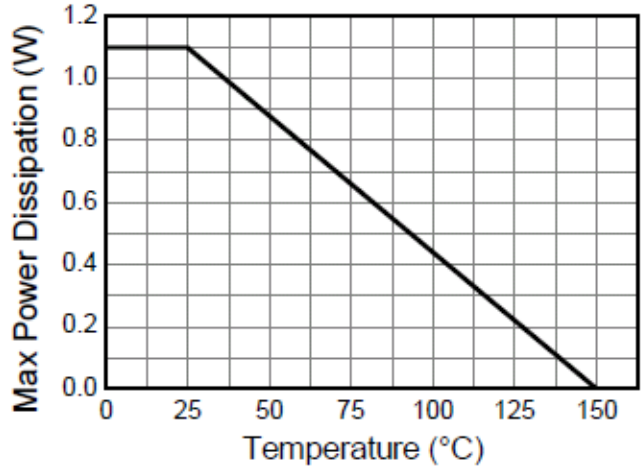
Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition	
OFF CHARACTERISTICS							
Drain-Source Breakdown Voltage	BV _{DSS}	-100	—	—	V	I _D = -250μA, V _{GS} = 0V	
Zero Gate Voltage Drain Current	I _{DSS}	—	—	-0.5	μA	V _{DS} = -100V, V _{GS} = 0V	
Gate-Source Leakage	I _{GSS}	—	—	±100	nA	V _{GS} = ±20V, V _{DS} = 0V	
ON CHARACTERISTICS							
Gate Threshold Voltage	V _{GS(th)}	-2.0	—	-4.0	V	I _D = -250μA, V _{DS} = V _{GS}	
Static Drain-Source On-Resistance (Note 9)	R _{DS(on)}	—	—	0.350	Ω	V _{GS} = -10V, I _D = -1.4A	
				0.450		V _{GS} = -6V, I _D = -1.2A	
Forward Transconductance (Notes 9 & 10)	g _{fs}	—	2.8	—	S	V _{DS} = -15V, I _D = -1.4A	
Diode Forward Voltage (Note 9)	V _{SD}	—	-0.85	-0.95	V	I _S = -1.7A, V _{GS} = 0V	
Reverse recovery time (Note 10)	t _{rr}	—	33	—	ns	I _S = -1.5A, di/dt = 100A/μs	
Reverse recovery charge (Note 10)	Q _{rr}	—	48	—	nC		
DYNAMIC CHARACTERISTICS (Note 10)							
Input Capacitance	C _{iss}	—	424	—	pF	V _{DS} = -50V, V _{GS} = 0V F = 1MHz	
Output Capacitance	C _{oss}	—	36.6	—	pF		
Reverse Transfer Capacitance	C _{rss}	—	29.8	—	pF		
Total Gate Charge (Note 11)	Q _g	—	7.1	—	nC	V _{GS} = -6V	
Total Gate Charge (Note 11)	Q _g	—	10.7	—	nC	V _{GS} = -10V	
Gate-Source Charge (Note 11)	Q _{gs}	—	1.7	—	nC		V _{DS} = -50V I _D = -1.4A
Gate-Drain Charge (Note 11)	Q _{gd}	—	3.8	—	nC		
Turn-On Delay Time (Note 11)	t _{D(on)}	—	3	—	ns	V _{DD} = -50V, V _{GS} = -10V I _D = -1A, R _G = 6.0Ω	
Turn-On Rise Time (Note 11)	t _r	—	3.5	—	ns		
Turn-Off Delay Time (Note 11)	t _{D(off)}	—	13.4	—	ns		
Turn-Off Fall Time (Note 11)	t _f	—	7.2	—	ns		

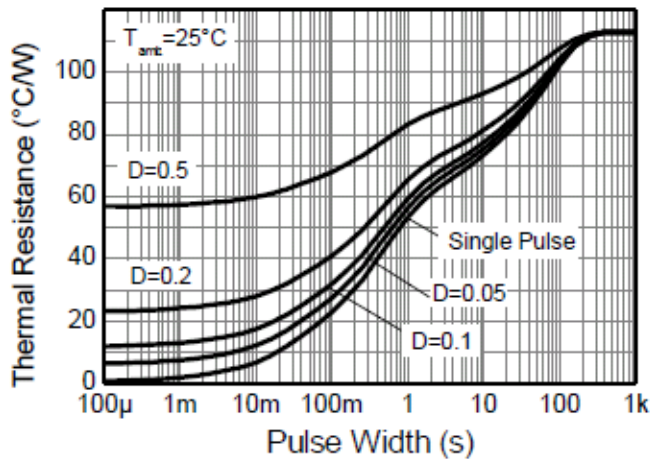
- Notes:
- For a device surface mounted on 25mm x 25mm FR4 PCB with high coverage of single sided 1oz copper, in still air conditions; the device is measured when operating in a steady-state condition.
 - Same as note (6), except the device is measured at t ≤ 5 sec.
 - Same as note (6), except the device is pulsed with D = 0.05 and pulse width 10μs. The pulse current is limited by the maximum junction temperature.
 - Measured under pulsed conditions. Pulse width ≤ 300μs; duty cycle ≤ 2%.
 - For design aid only, not subject to production testing.
 - Switching characteristics are independent of operating junction temperatures.



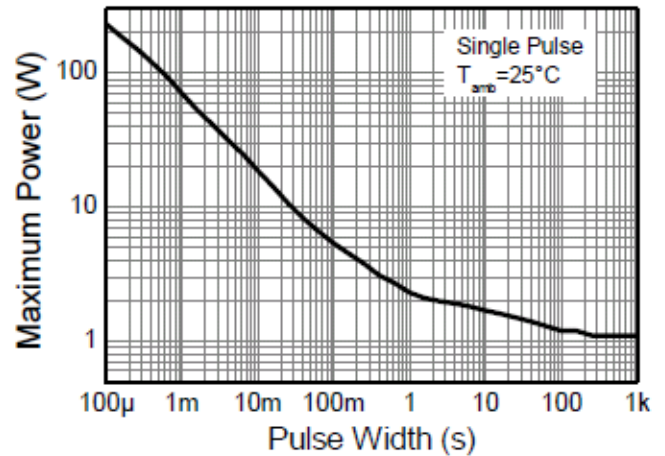
Safe Operating Area



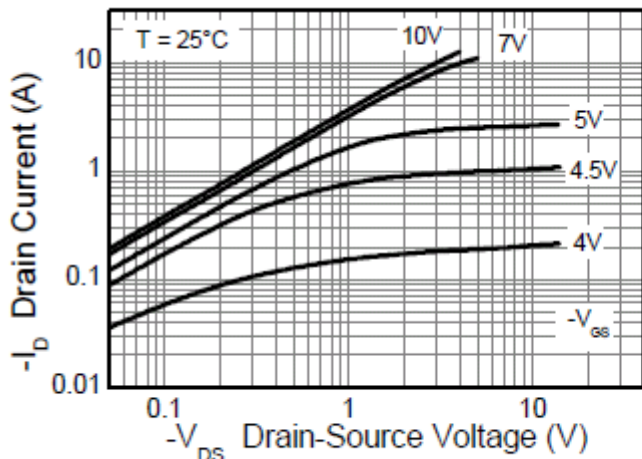
Derating Curve



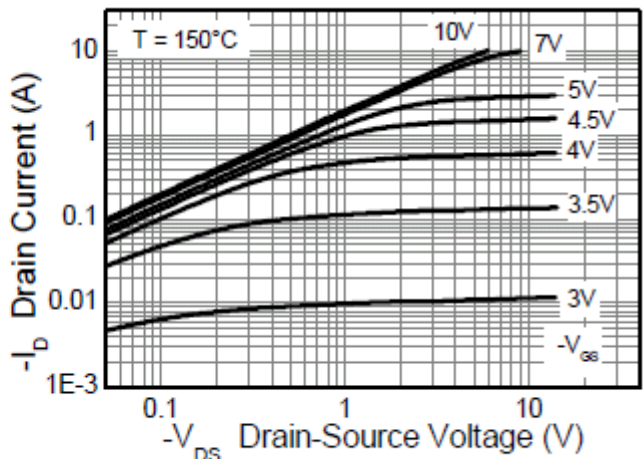
Transient Thermal Impedance



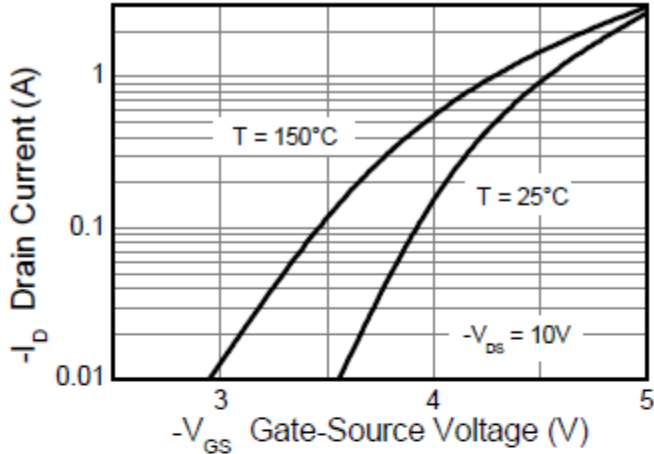
Pulse Power Dissipation



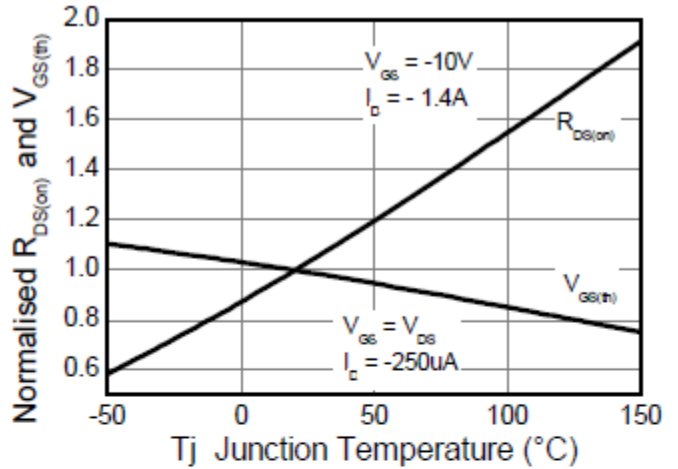
Output Characteristics



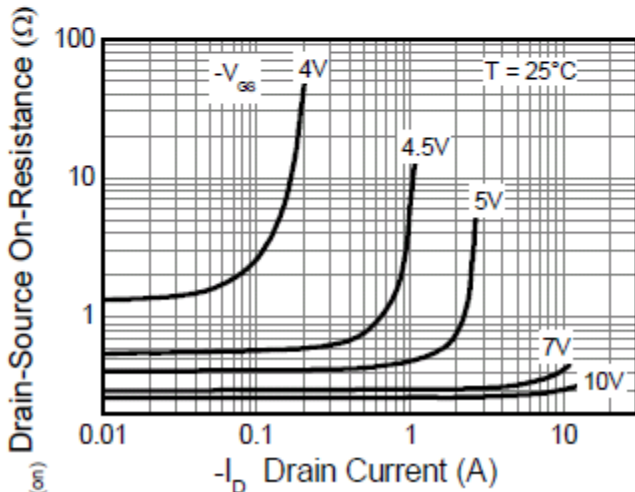
Output Characteristics



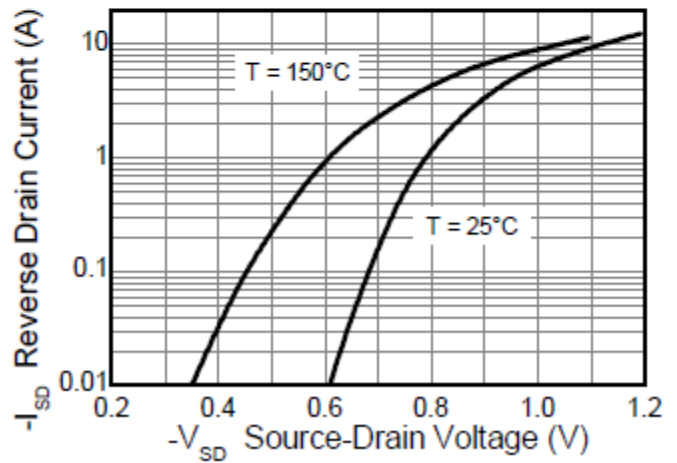
Typical Transfer Characteristics



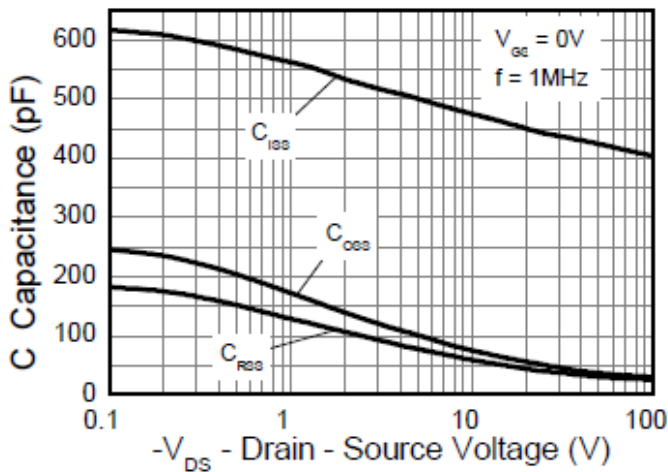
Normalised Curves v Temperature



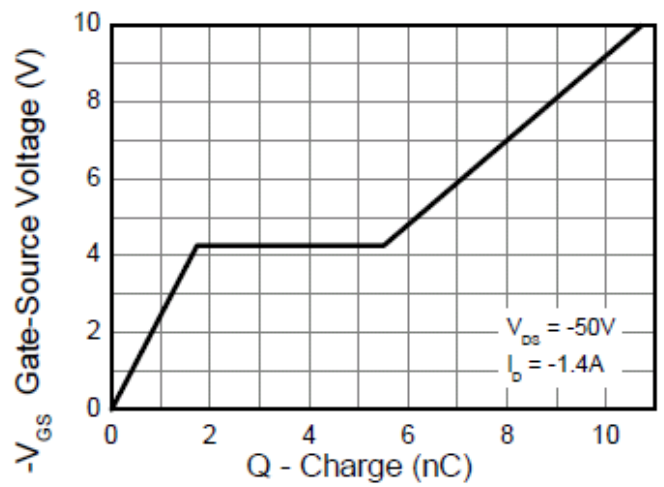
On-Resistance v Drain Current



Source-Drain Diode Forward Voltage

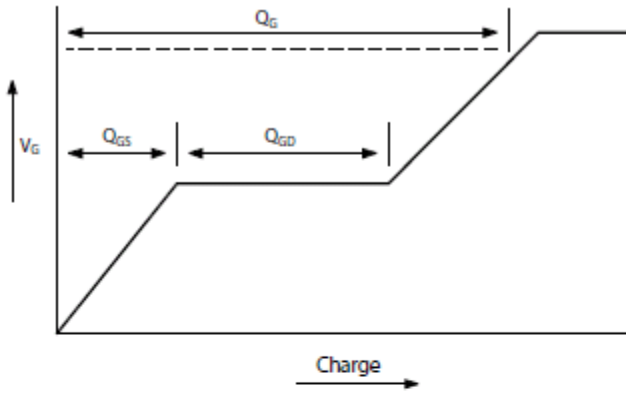


Capacitance v Drain-Source Voltage

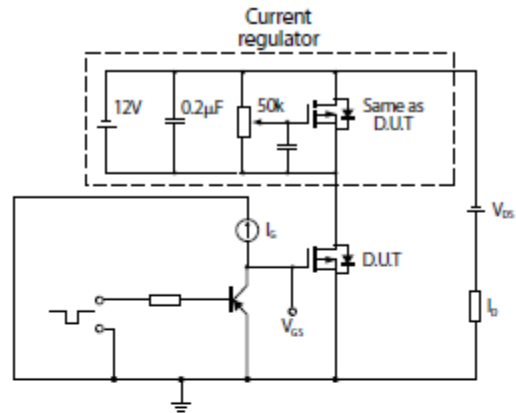


Gate-Source Voltage v Gate Charge

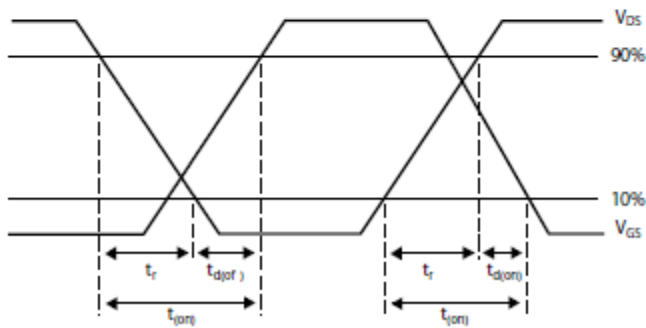
Test Circuits



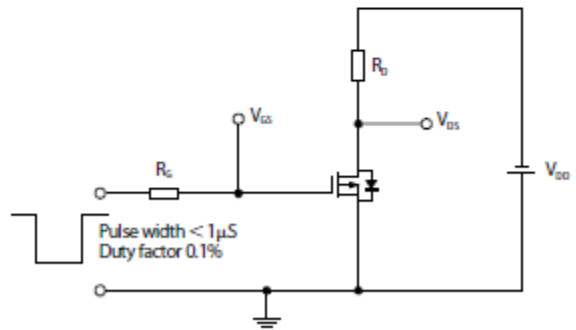
Basic gate charge waveform



Gate charge test circuit



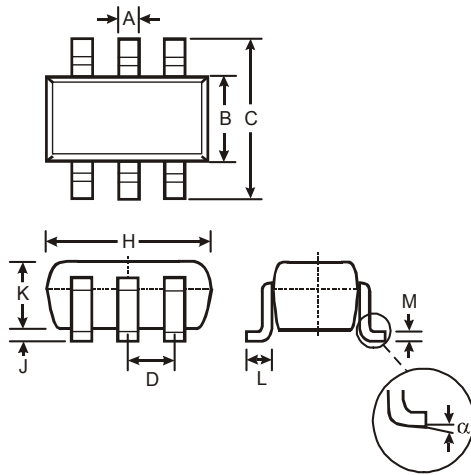
Switching time waveforms



Switching time test circuit

Package Outline Dimensions

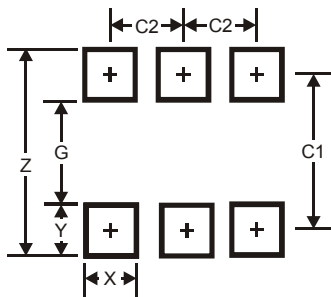
Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for latest version.



SOT26			
Dim	Min	Max	Typ
A	0.35	0.50	0.38
B	1.50	1.70	1.60
C	2.70	3.00	2.80
D	—	—	0.95
H	2.90	3.10	3.00
J	0.013	0.10	0.05
K	1.00	1.30	1.10
L	0.35	0.55	0.40
M	0.10	0.20	0.15
α	0°	8°	—
All Dimensions in mm			

Suggested Pad Layout

Please see AP02001 at <http://www.diodes.com/datasheets/ap02001.pdf> for the latest version.



Dimensions	Value (in mm)
Z	3.20
G	1.60
X	0.55
Y	0.80
C1	2.40
C2	0.95

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