



YOUSHANG SEMICONDUCTOR

设计研发新型功率器件

各类小信号开关

中低压及高压大电流等场效应管

0755-83047638

ysbdt@szyoushang.cn

www.szyoushang.cn



企业微信二维码



企业QQ二维码

Product Summary

BV _{DSS}	R _{DS(ON)} Max	I _D Max T _C = +25°C
30V	4mΩ @V _{GS} = 10V	75A
	7mΩ @V _{GS} = 4.5V	75A

Features

- Rated to +175°C – Ideal for High Ambient Temperature Environments
- High Conversion Efficiency
- Low R_{DS(ON)} – Minimizes On-State Losses
- Low Input Capacitance

Description and Applications

This MOSFET is designed to meet the stringent requirements of automotive applications. It is qualified to AECQ101, supported by a PPAP and is ideal for use in:

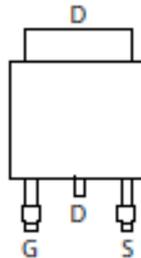
- Power Management Functions
- DC-DC Converters
- BLDC Motor control
- Reverse Polarity Protection

Mechanical Data

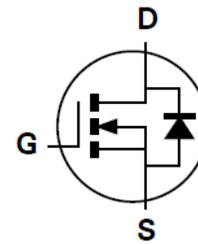
- Case: TO252 (DPAK)
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminal Connections: See Diagram
- Terminals: Matte Tin Finish. Solderable per MIL-STD-202, Method 208 (E3)
- Weight: 0.315 grams (Approximate)



Top View



Pin Out Top View



Equivalent Circuit

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}	+20 -16	V
Continuous Drain Current $V_{GS} = 10\text{V}$	Steady State (Note 7)	$T_C = +25^\circ\text{C}$ $T_C = +100^\circ\text{C}$	I_D	75 75	A
	Steady State (Note 6)	$T_A = +25^\circ\text{C}$ $T_A = +100^\circ\text{C}$	I_D	21 15	A
Pulsed Drain Current (10 μs Pulse, Duty Cycle=1%)			I_{DM}	105	A
Maximum Continuous Body Diode Forward Current			I_S	75	A
Avalanche Current $L=5\text{mH}$			I_{AS}	10.7	A
Avalanche Energy $L=5\text{mH}$			E_{AS}	287	mJ

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

Characteristic	Symbol	Value	Unit
Total Power Dissipation (Note 7)	P_D	107	W
Thermal Resistance, Junction to Ambient (Note 6)	$R_{\theta JA}$	50	$^\circ\text{C/W}$
Thermal Resistance, Junction to Case (Note 7)	$R_{\theta JC}$	1.4	$^\circ\text{C/W}$
Operating and Storage Temperature Range	T_J, T_{STG}	-55 to +175	$^\circ\text{C}$

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

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS (Note 8)						
Drain-Source Breakdown Voltage	BV_{DSS}	30	—	—	V	$V_{GS} = 0\text{V}, I_D = 1\text{mA}$
Zero Gate Voltage Drain Current	I_{DSS}	—	—	1	μA	$V_{DS} = 24\text{V}, V_{GS} = 0\text{V}$
Zero Gate Voltage Drain Current (Note 9)	I_{DSS}	—	—	10	μA	$V_{DS} = 24\text{V}, V_{GS} = 0\text{V}$ $T_A = +125^\circ\text{C}$
Gate-Source Leakage	I_{GSS}	—	—	± 100	nA	$V_{GS} = +20\text{V}, V_{DS} = 0\text{V}$ $V_{GS} = -16\text{V}, V_{DS} = 0\text{V}$
ON CHARACTERISTICS (Note 8)						
Gate Threshold Voltage	$V_{GS(TH)}$	1	1.7	3	V	$V_{DS} = V_{GS}, I_D = 250\mu\text{A}$
Static Drain-Source On-Resistance	$R_{DS(ON)}$	—	3.3	4	m Ω	$V_{GS} = 10\text{V}, I_D = 20\text{A}$
		—	5.5	7		$V_{GS} = 4.5\text{V}, I_D = 7\text{A}$
Diode Forward Voltage	V_{SD}	—	0.75	1	V	$V_{GS} = 0\text{V}, I_S = 1\text{A}$
DYNAMIC CHARACTERISTICS (Note 9)						
Input Capacitance	C_{ISS}	—	2,370	—	pF	$V_{DS} = 15\text{V}, V_{GS} = 0\text{V},$ $f = 1\text{MHz}$
Output Capacitance	C_{OSS}	—	1,360	—	pF	
Reverse Transfer Capacitance	C_{RSS}	—	240	—	pF	
Gate Resistance	R_G	0.15	0.6	1.5	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	—	20	—	nC	$V_{DS} = 15\text{V}, I_D = 20\text{A}$
Total Gate Charge ($V_{GS} = 10\text{V}$)	Q_G	—	44	—	nC	
Gate-Source Charge	Q_{GS}	—	7	—	nC	
Gate-Drain Charge	Q_{GD}	—	8	—	nC	
Turn-On Delay Time	$t_{D(ON)}$	—	6.2	—	ns	$V_{DD} = 15\text{V}, V_{GS} = 10\text{V},$ $R_L = 0.75\Omega, R_G = 3\Omega, I_D = 20\text{A}$
Turn-On Rise Time	t_R	—	4.3	—	ns	
Turn-Off Delay Time	$t_{D(OFF)}$	—	21	—	ns	
Turn-Off Fall Time	t_F	—	8	—	ns	$I_F = 15\text{A}, di/dt = 500\text{A}/\mu\text{s}$
Reverse Recovery Time	t_{RR}	—	25	—	ns	
Reverse Recovery Charge	Q_{RR}	—	37	—	nC	

- Notes:
- Device mounted on FR-4 substrate PC board, 2oz copper, with 1inch square copper plate.
 - Thermal resistance from junction to soldering point (on the exposed drain pad)
 - Short duration pulse test used to minimize self-heating effect.
 - Guaranteed by design. Not subject to product testing.

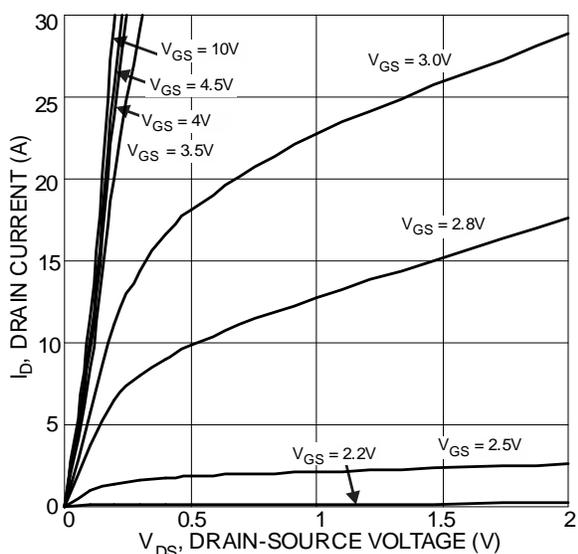


Figure 1 Typical Output Characteristic

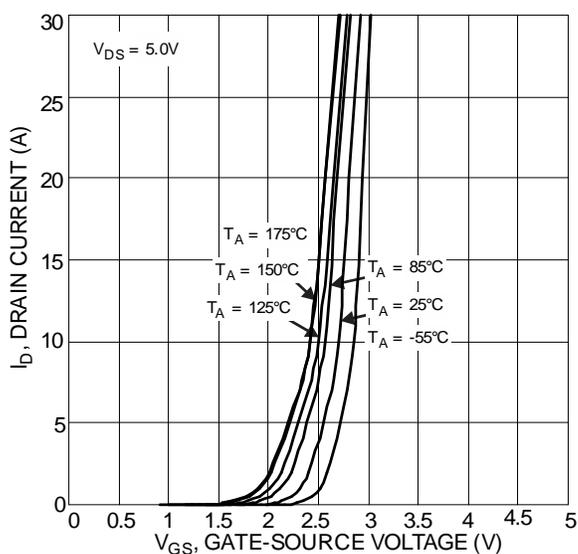


Figure 2 Typical Transfer Characteristics

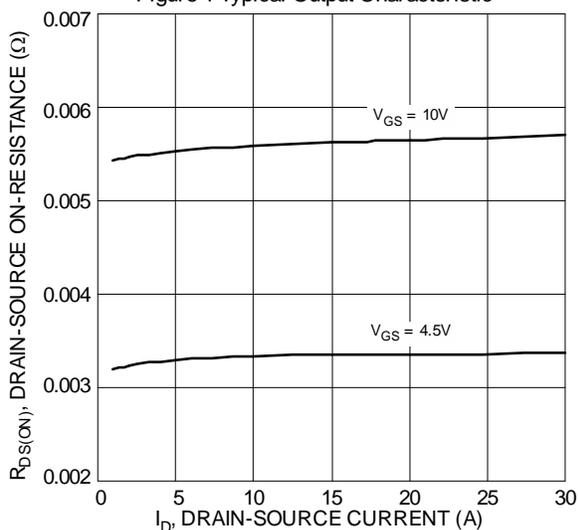


Figure 3 Typical On-Resistance vs. Drain Current and Gate Voltage

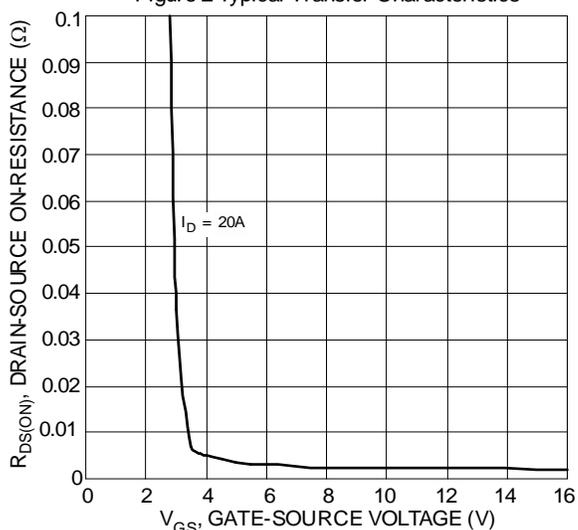


Figure 4 Typical Drain-Source On-Resistance vs. Gate-Source Voltage

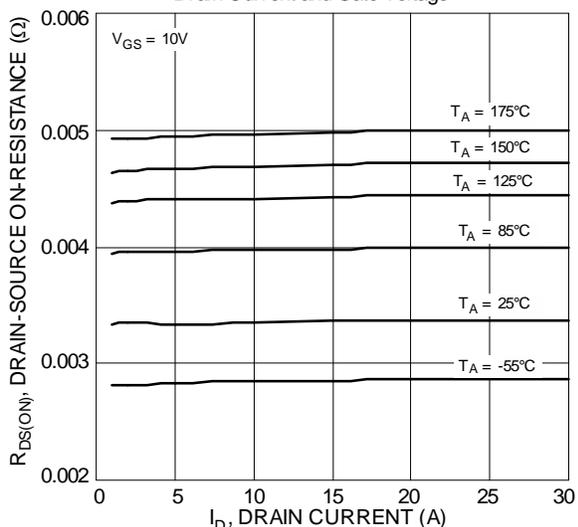


Figure 5 Typical On-Resistance vs. Drain Current and Temperature

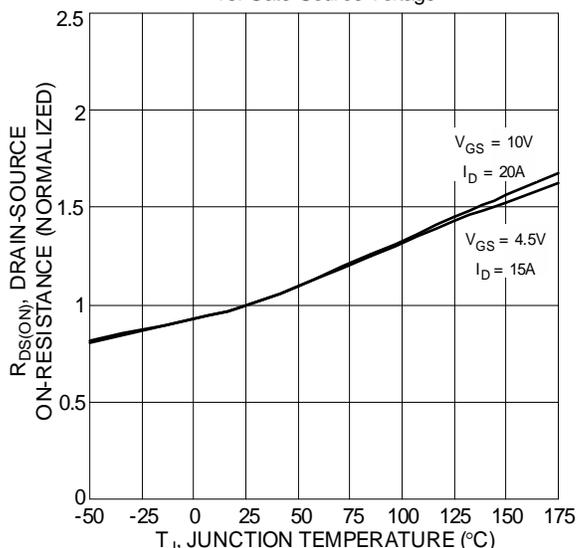


Figure 6 On-Resistance Variation with Temperature

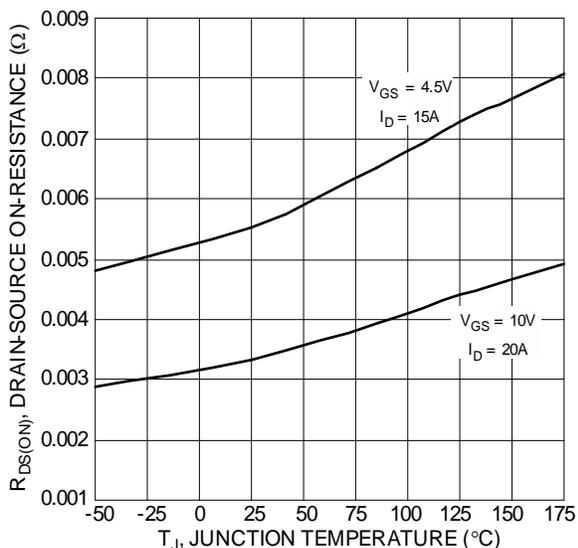


Figure 7 On-Resistance Variation with Temperature

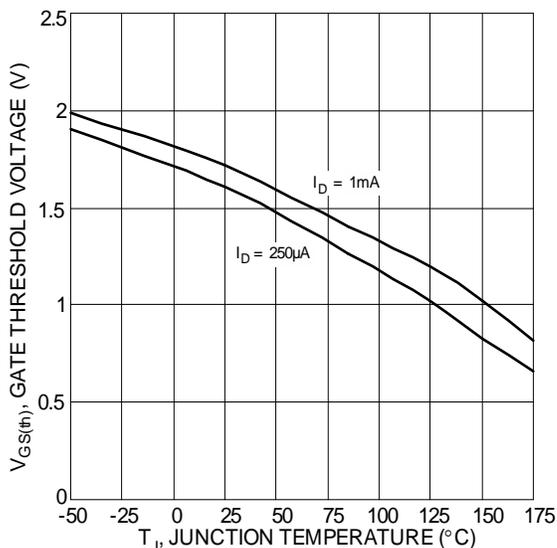


Figure 8 Gate Threshold Variation vs. Ambient Temperature

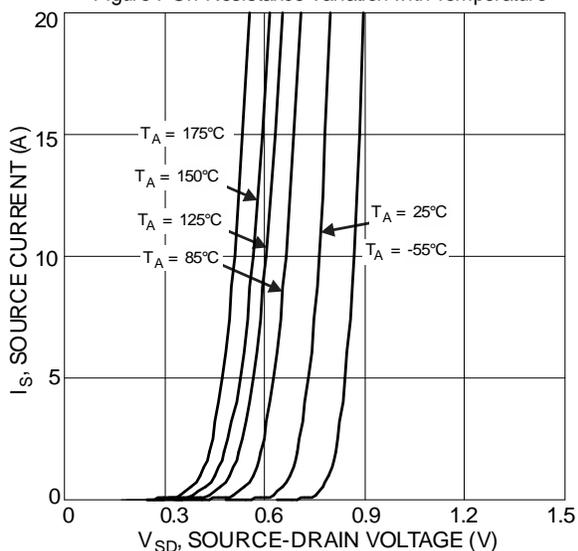


Figure 9 Diode Forward Voltage vs. Current

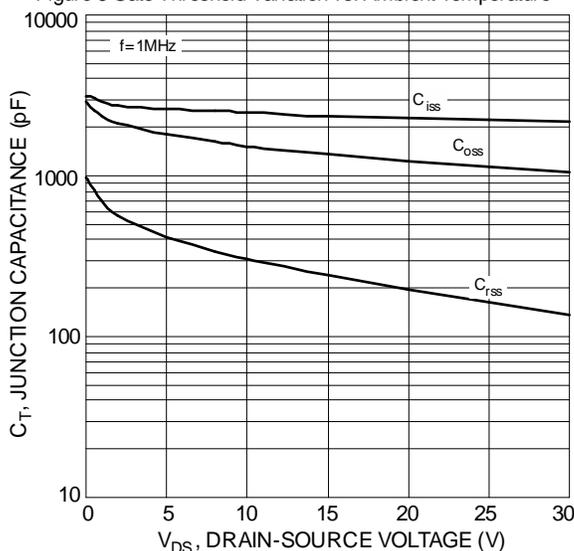


Figure 10 Typical Junction Capacitance

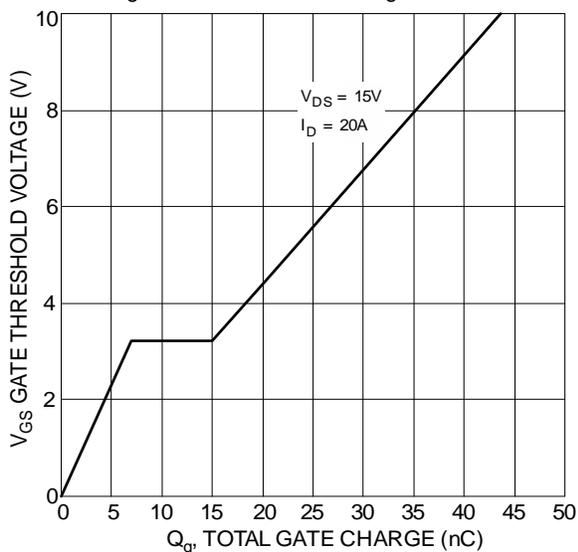


Figure 11 Gate Charge

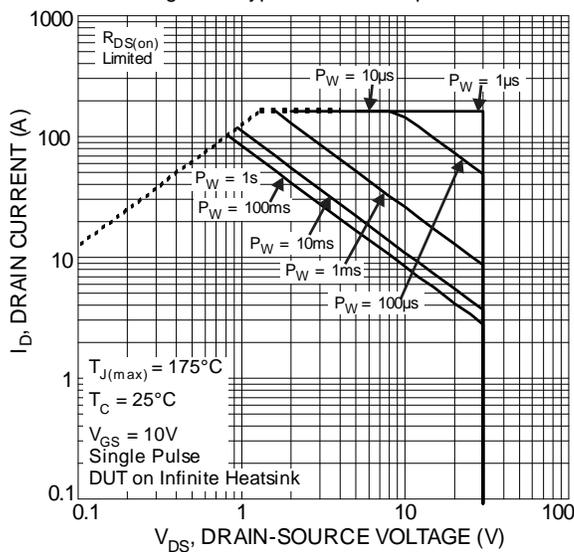
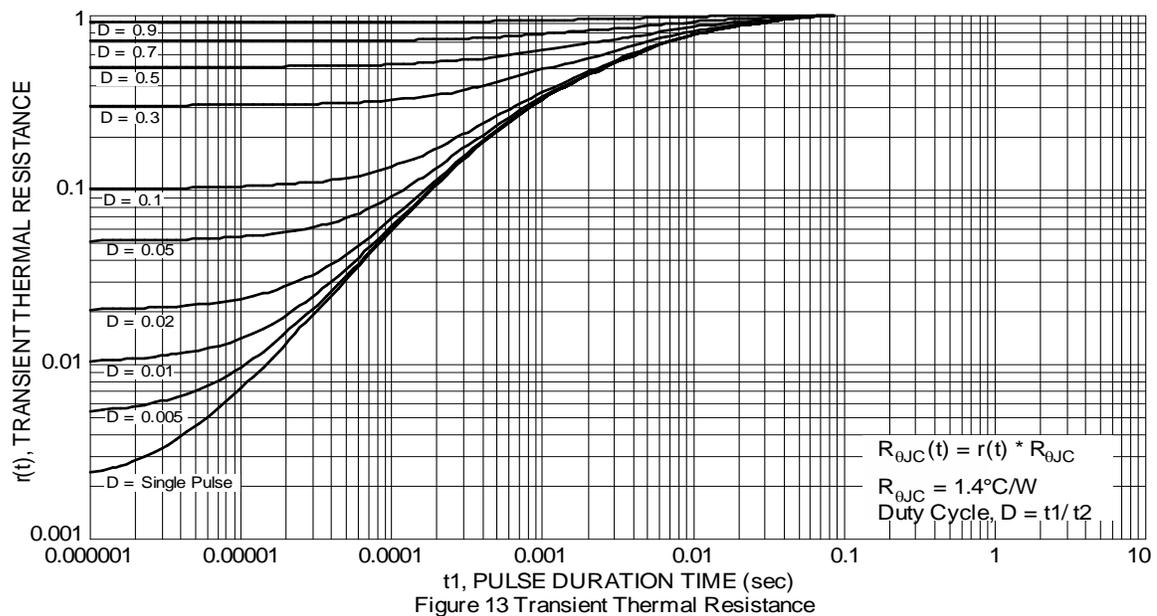
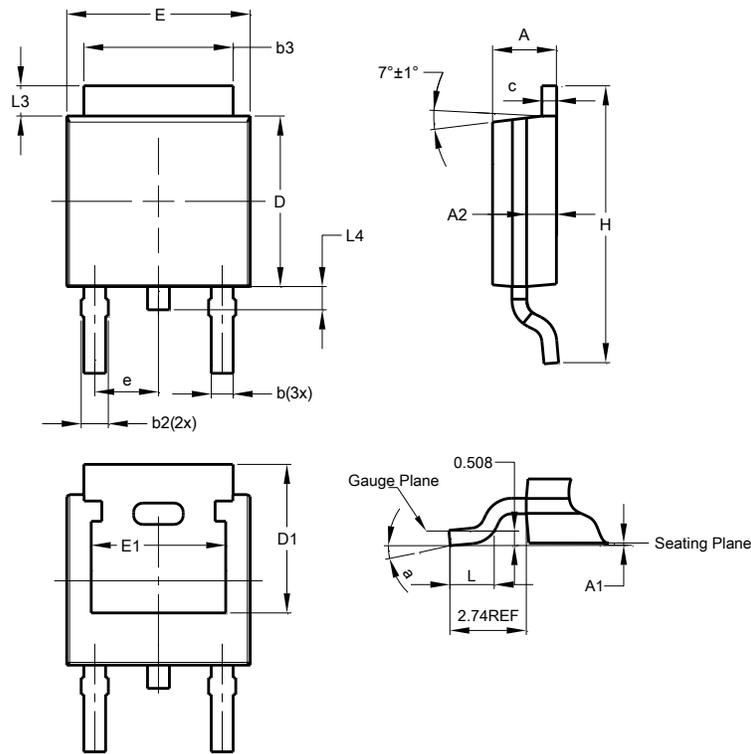


Figure 12 SOA, Safe Operation Area



Package Outline Dimensions

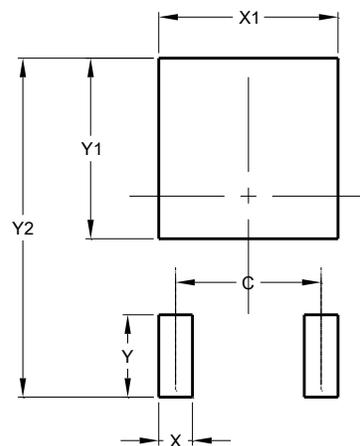
TO252 (DPAK)



TO252 (DPAK)			
Dim	Min	Max	Typ
A	2.19	2.39	2.29
A1	0.00	0.13	0.08
A2	0.97	1.17	1.07
b	0.64	0.88	0.783
b2	0.76	1.14	0.95
b3	5.21	5.46	5.33
c	0.45	0.58	0.531
D	6.00	6.20	6.10
D1	5.21	-	-
e	-	-	2.286
E	6.45	6.70	6.58
E1	4.32	-	-
H	9.40	10.41	9.91
L	1.40	1.78	1.59
L3	0.88	1.27	1.08
L4	0.64	1.02	0.83
a	0°	10°	-
All Dimensions in mm			

Suggested Pad Layout

TO252 (DPAK)



Dimensions	Value (in mm)
C	4.572
X	1.060
X1	5.632
Y	2.600
Y1	5.700
Y2	10.700