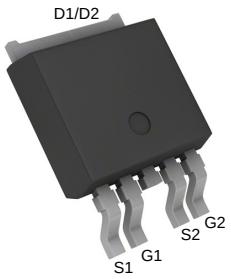
WGDM4901C

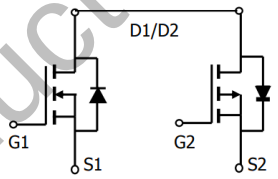
Features:

- ☐ Advanced Trench Technology.
- ☐ Excellent Switching Characteristics.
- ☐ Extended Safe Operating Area.
- ☐ V_{DS} = 40V I_D =57 A
- ☐ $R_{DS(ON)}$ < 8.7 mΩ @ V_{GS}=10V (Type: 6.7 mΩ)
- ☐ V_{DS} = -40V I_D =-34 A
- ☐ $R_{DS(ON)}$ < 24 mΩ @ V_{GS}=10V (Type: 18.5mΩ)

TO-252-4L

RoHS COMPLIANT





WildGoose Semiconductor

Absolute Maximum Ratings* (Tc=25℃ Unless otherwise noted)

Symbol	Parameter	Rating		Units
		N-Ch	P-Ch	
V_{DS}	Drain-Source Voltage	40	-40	V
V_{GS}	Gate-Source Voltage	±20	±20	V
I_D@T_C=25℃	Continuous Drain Current, V_{GS} @ 10V	57	-34	A
I_D@T_C=100℃	Continuous Drain Current, V_{GS} @ 10V	32	-25	A
I_{DM}	Pulsed Drain Current L=0.5mH,VG=10V,VD=50V,Vds=40V	108		A
I_{DM}	Pulsed Drain Current L=0.5mH,VG=-10V,VD=-50V,Vds=-40V		-96	A
P_D@T_C=25℃	Total Power Dissipation[4]	55	33	W
T_{STG}	Storage Temperature Range	-55 to 150	-55 to 150	℃
T_J	Operating Junction Temperature Range	-55 to 150	-55 to 150	℃
$R_{\theta JA}$	Thermal Resistance Junction-Ambient [1]	95		℃/W
$R_{\theta JC}$	Thermal Resistance Junction-Case[1]	4.0		℃/W

N-Channel Electrical Characteristics (T_J=25℃ unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
On/Off States						
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V I_D=250μA	40			V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=40V, V_{GS}=0V T_J=25℃			1	μA
		V_{DS}=40V, V_{GS}=0V T_J=125℃			100	μA
I_{GSS}	Gate-Body Leakage Current	V_{GS}=±20V, V_{DS}=0V			±100	nA
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS}, I_D=250μA	1		2.5	V
g_{FS}	Forward Transconductance	V_{DS}=10V, I_D=20A		36		S
$R_{DS(ON)}$	Drain-Source On-State Resistance	V_{GS}=10V, I_D=20A T_J=25℃		6.7	8.7	mΩ
		V_{GS}=4.5V, I_D=15A T_J=25℃		7.9	10.5	mΩ
Dynamic Characteristics						
C_{iss}	Input Capacitance	V_{DS}=20V,V_{GS}=0V, f=1.0MHz		2094		pF
C_{oss}	Output Capacitance			160		pF
C_{rss}	Reverse Transfer Capacitance			132		pF
R_g	Gate resistance	V_{GS}=0V, V_{DS}=0V, f=1.0MHz		2.3		Ω
Switching Parameters						
$t_{d(on)}$	Turn-on Delay Time	V_{GS}=10V, V_{DS}=20V, R_L=1Ω, R_{GEN}=3Ω		8.4		nS
t_r	Turn-on Rise Time			6.2		nS
$t_{d(off)}$	Turn-Off Delay Time			40.2		nS
t_f	Turn-Off Fall Time			7.8		nS
Q_g	Total Gate Charge	V_{GS}=10V, V_{DS}=20V, I_D=20A		41.4		nC
Q_{gs}	Gate-Source Charge			5.8		nC
Q_{gd}	Gate-Drain Charge			8.2		nC
Source-Drain Diode Characteristics						
I_{SD}	Source-Drain Current (Body Diode)				57	A
V_{SD}	Forward on Voltage (Note 3)	V_{GS}=0V, I_S=20A			1.2	V
t_{rr}	Reverse Recovery Time	I_F=20A, dI/dt=100A/μs		18.3		ns
Q_{rr}	Reverse Recovery Charge	I_F=20A, dI/dt=100A/μs		12.8		nC

Notes 1.Repetitive Rating: Pulse width limited by maximum junction temperature.
Notes 2.E_{AS} condition: T_J=25℃,V_{DD}=40V,V_G=10V, Rg=25Ω, L=0.5mH.
Notes 3.Repetitive Rating: Pulse width limited by maximum junction temperature.

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P-Channel Electrical Characteristics (T_J=25℃ unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
On/Off States						
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V I_D=-250μA	-40			V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=-40V, V_{GS}=0V T_J=25℃			-1	μA
		V_{DS}=-40V, V_{GS}=0V T_J=125℃			-100	μA
I_{GSS}	Gate-Body Leakage Current	V_{GS}=±20V, V_{DS}=0V			±100	nA
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS}, I_D=-250μA	-1		-2.5	V
g_{FS}	Forward Transconductance	V_{DS}=-5V, I_D=-5A		20		S
$R_{DS(ON)}$	Drain-Source On-State Resistance	V_{GS}=-10V, I_D=-5 A T_J=25℃		18.5	24.0	mΩ
$R_{DS(ON)}$	Drain-Source On-State Resistance	V_{GS}=-4.5V, I_D=-4 A T_J=25℃		22.5	30.0	mΩ
Dynamic Characteristics						
C_{iss}	Input Capacitance	V_{DS}=-20V,V_{GS}=0V, f=1.0MHz		1280		pF
C_{oss}	Output Capacitance			205		pF
C_{rss}	Reverse Transfer Capacitance			155		pF
Rg	Gate resistance	V_{GS}=0V, V_{DS}=0V, f=1.0MHz		2		Ω
Switching Parameters						
$t_{d(on)}$	Turn-on Delay Time	V_{GS}=-10V, V_{DS}=-20V, R_L=0.75Ω, R_{GEN}=3Ω		7.5		nS
t_r	Turn-on Rise Time			13		nS
$t_{d(off)}$	Turn-Off Delay Time			20		nS
t_f	Turn-Off Fall Time			5.3		nS
Q_g	Total Gate Charge	V_{GS}=-10V, V_{DS}=-10V, I_D=-20A		15.5		nC
Q_{gs}	Gate-Source Charge			2.9		nC
Q_{gd}	Gate-Drain Charge			3.5		nC
Source-Drain Diode Characteristics						
I_{SD}	Source-Drain Current (Body Diode)				-34	A
V_{SD}	Forward on Voltage (Note 3)	V_{GS}=0V, I_S=-20A			-1.2	V

Notes 1.Repetitive Rating: Pulse width limited by maximum junction temperature.
Notes 2.E_{AS} condition: T_J=25℃,V_{DD}=-40V,V_G=-10V, Rg=25Ω, L=0.5mH.
Notes 3.Repetitive Rating: Pulse width limited by maximum junction temperature.

WildGoose Semiconductor

N-Channel Typical Electrical And Thermal Characteristics (Curves)

Figure 1. Output Characteristics

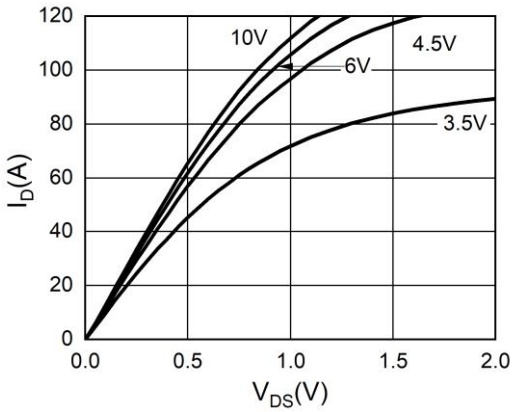


Figure 2. Transfer Characteristics

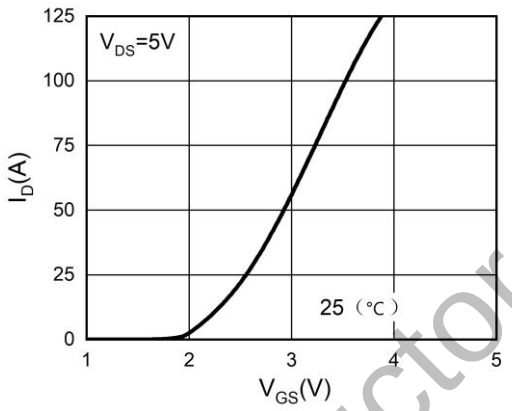


Figure 3. Power Dissipation

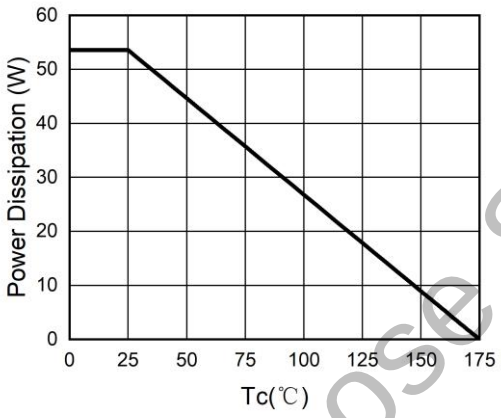


Figure 4. Drain Current

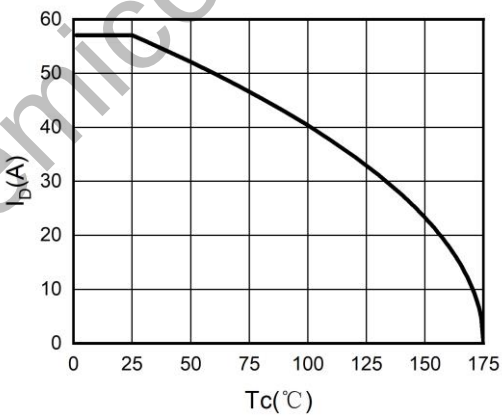


Figure 5. BV_{DSS} vs Junction Temperature

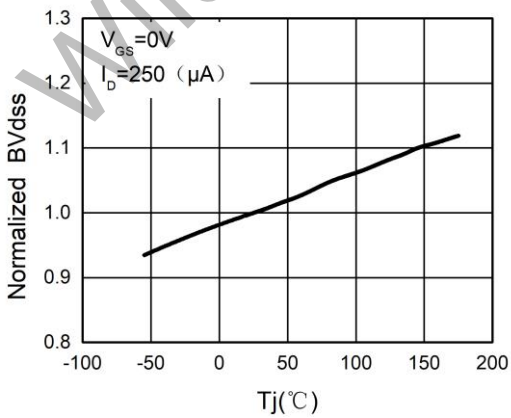
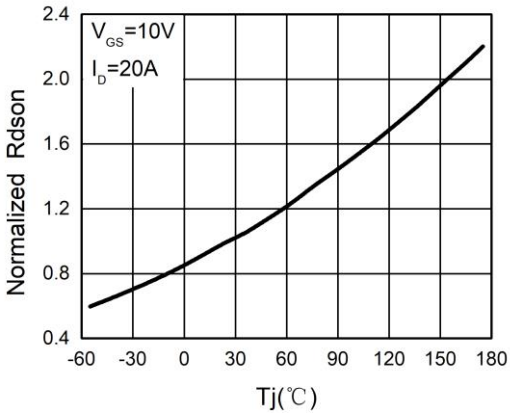


Figure 6. $R_{DS(ON)}$ vs Junction Temperature



WildGoose Semiconductor

N-Channel Typical Electrical And Thermal Characteristics (Curves)

Figure 7. Gate Charge Waveforms

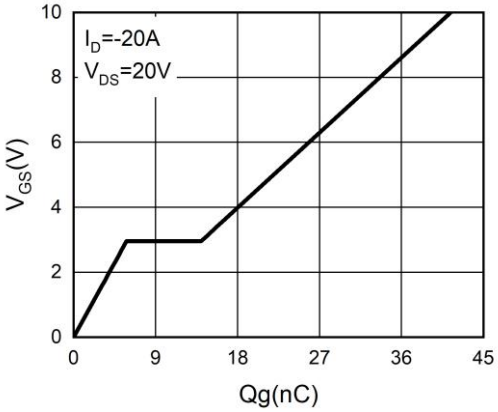


Figure 8. Capacitance

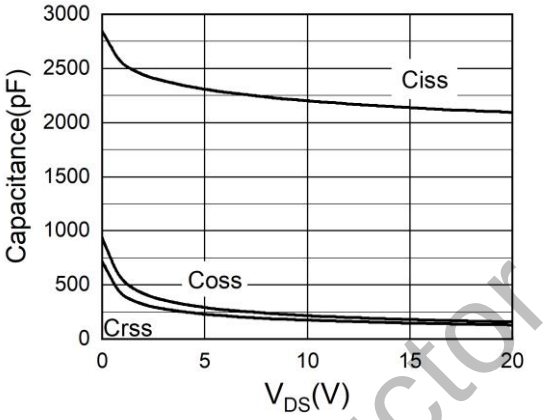


Figure 9. Body-Diode Characteristics

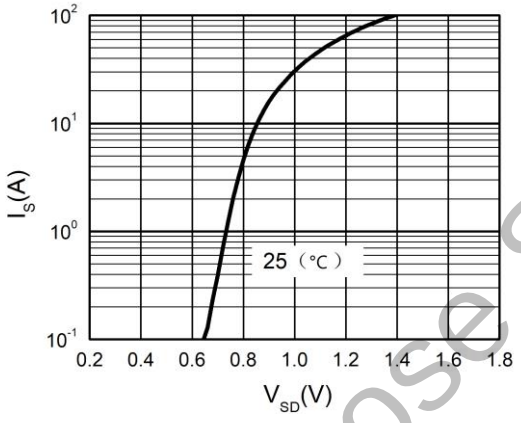
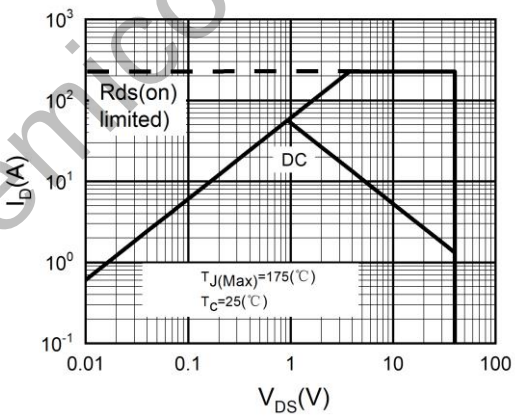


Figure 10. Maximum Safe Operating Area



WildGoose Semiconductor

P-Channel Typical Electrical And Thermal Characteristics (Curves)

Figure 1. Output Characteristics

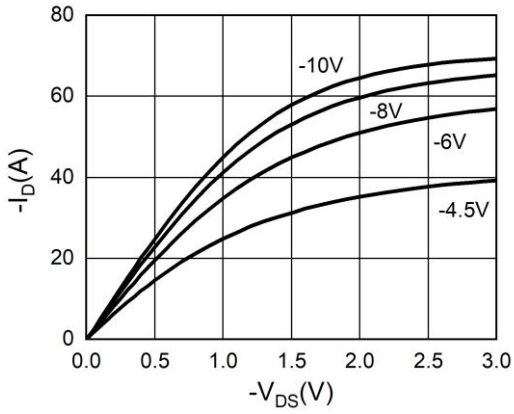


Figure 2. Transfer Characteristics

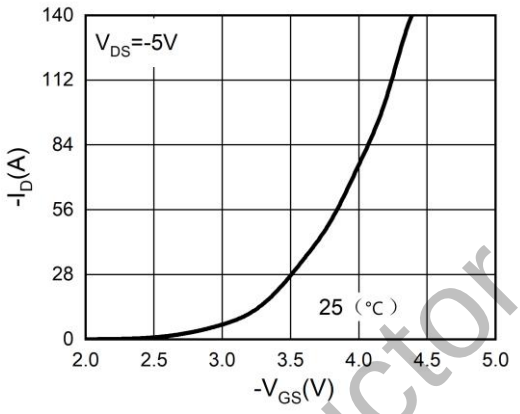


Figure 3. Power Dissipation

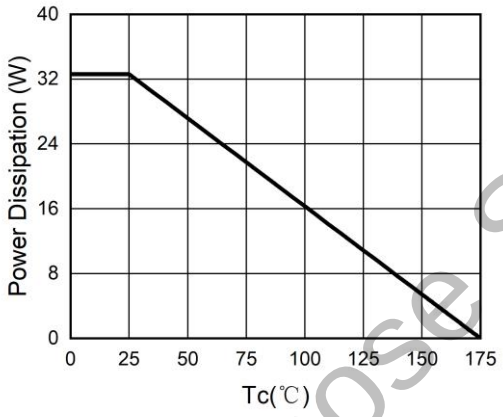


Figure 4. Drain Current

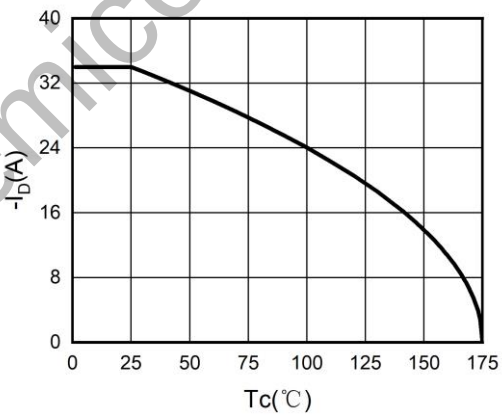


Figure 5. BV_{DSS} vs Junction Temperature

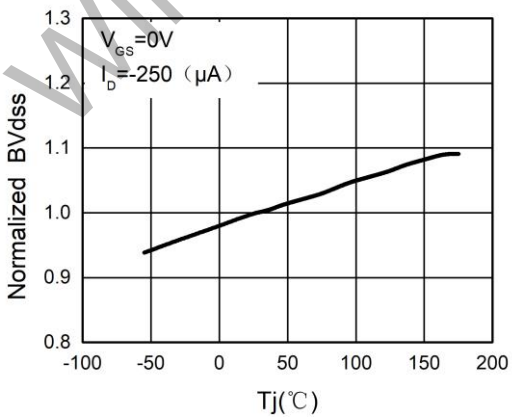
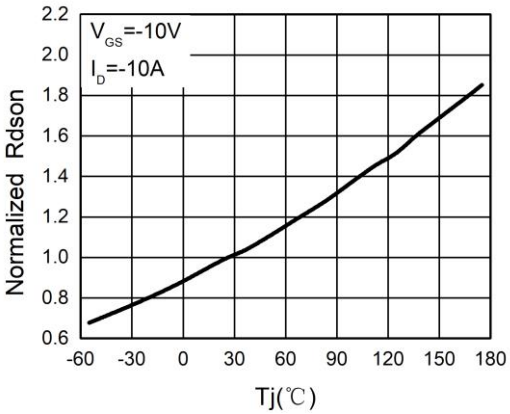


Figure 6. $R_{DS(ON)}$ vs Junction Temperature



WildGoose Semiconductor

P-Channel Typical Electrical And Thermal Characteristics (Curves)

Figure 7. Gate Charge Waveforms

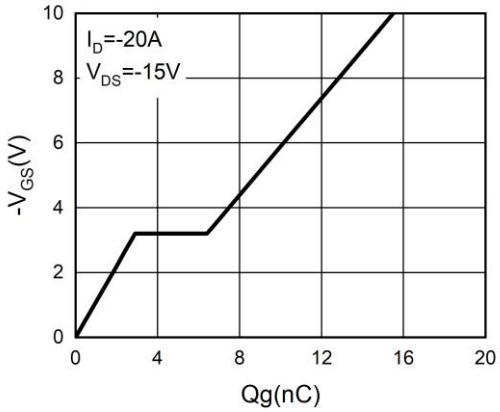


Figure 8. Capacitance

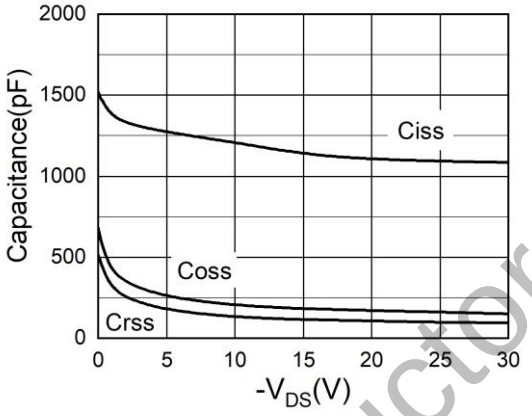


Figure 9. Body-Diode Characteristics

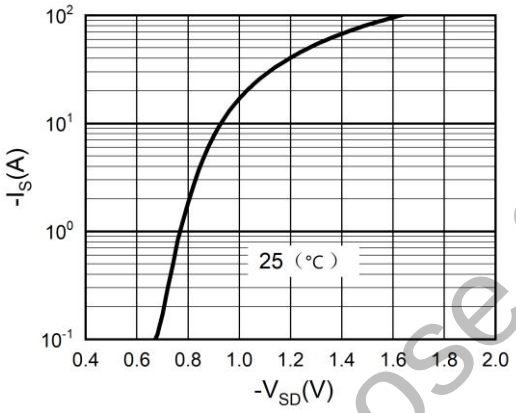
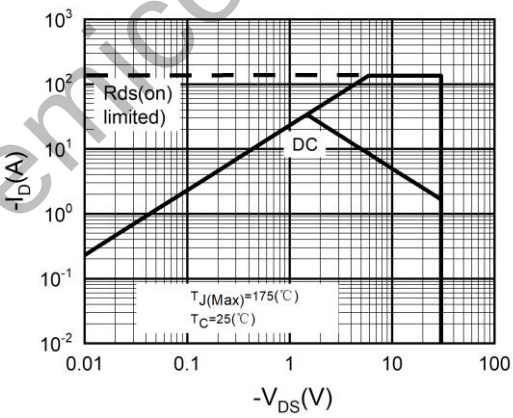


Figure 10. Maximum Safe Operating Area

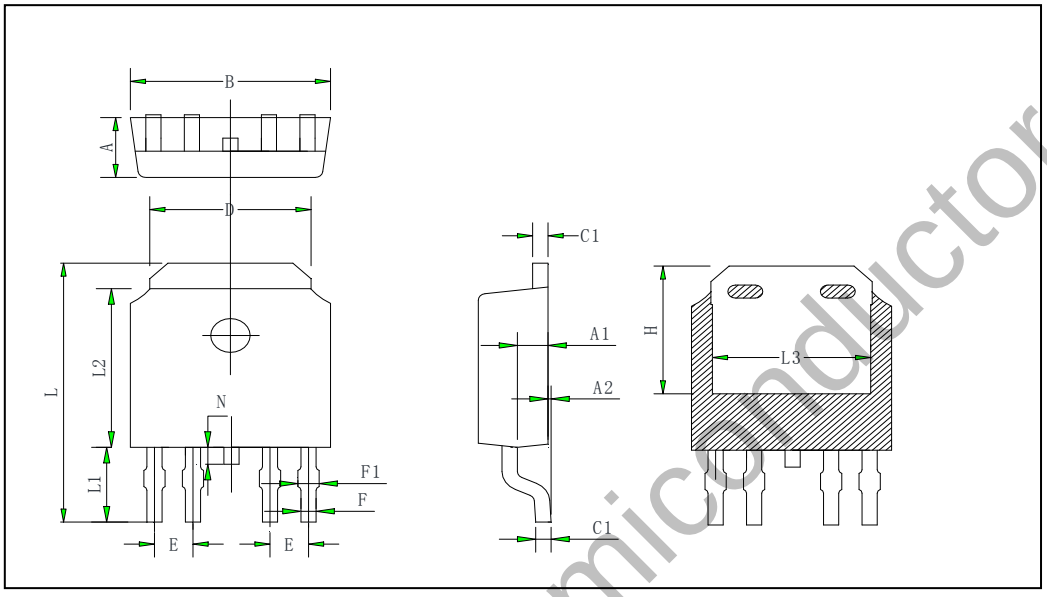


WildGoose Semiconductor

Package Dimension

TO-252-4L

Unit: mm



Symbol	Min	Typ	Max
A	2.20	2.30	2.40
A1	0.91	1.01	1.11
A2	0.05	0.15	0.25
B	6.45	6.60	6.75
C	0.45	0.50	0.58
C1	0.45	0.50	0.58
D	5.12	5.32	5.52
E		1.27 TYP	
F1	0.45	0.60	0.75
F	0.40	0.50	0.60
H	4.70	4.90	5.10
L	9.70	10.00	10.20
L1	2.6	2.8	3.0
L2	5.95	6.10	6.25
L3	5.00	5.20	5.40`
N	0.45	0.65	0.85

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