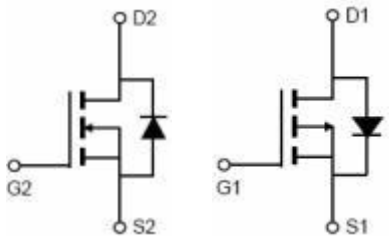
WG4606C

General Features

- **N-Channel**
  - V_{DS} = 30V,I_D =6.5A
  - $R_{DS(ON)}$ < 25mΩ @ V_{GS}=10V
  - $R_{DS(ON)}$ < 32mΩ @ V_{GS}=4.5V
- **P-Channel**
  - V_{DS} = -30V,I_D = -7.0A
  - $R_{DS(ON)}$ < 19mΩ @ V_{GS}=-10V
  - $R_{DS(ON)}$ < 25mΩ @ V_{GS}=-4.5V

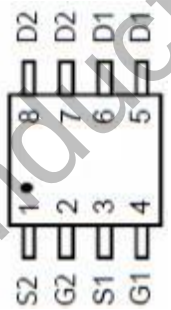
Application

- High power and current handing capability
- Lead free product is acquired
- Surface mount package



N-channel **P-channel**

Schematic diagram



Marking and pin assignment



WildGoose Semiconductor

Absolute Maximum Ratings (T_A=25℃unless otherwise noted)

Parameter		Symbol	N-Channel	P-Channel	Unit
Drain-Source Voltage		V_{DS}	30	-30	V
Gate-Source Voltage		V_{GS}	±20	±20	V
Continuous Drain Current	T_A=25℃	I_D	6.5	-7	A
	T_A=70℃		5.4	-5.8	
Pulsed Drain Current (Note 1)		I_{DM}	30	-30	A
Maximum Power Dissipation	T_A=25℃	P_D	2.0	2.0	W
Single pulse avalanche energy (Note 6)		E_{AS}	39	72	mJ
Operating Junction and Storage Temperature Range		T_J,T_{STG}	-55 To 150	-55 To 150	℃

Thermal Characteristic

Thermal Resistance,Junction-to-Ambient (Note2)	$R_{\theta JA}$	N-Ch	62.5	℃/W
Thermal Resistance,Junction-to-Ambient (Note2)	$R_{\theta JA}$	P-Ch	62.5	℃/W

N-CH Electrical Characteristics (T_A=25℃unless otherwise noted)

Parameter	Symbol	Condition		Min	Typ	Max	Unit
Off Characteristics							
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V I_D=250μA		30	33	-	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=30V,V_{GS}=0V		-	-	1	μA
Gate-Body Leakage Current	I_{GSS}	V_{GS}=±20V,V_{DS}=0V		-	-	±100	nA
On Characteristics (Note 3)							
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS},I_D=250μA		1	1.7	2.5	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	V_{GS}=10V, I_D=6A	T_J=25℃	-	15	25	mΩ
		V_{GS}=4.5V, I_D=5A	T_J=25℃	-	22	32	mΩ
Gate resistance	R_G	V_{DS}=0V,V_{GS}=0V,F=1.0MHz		-	1.1	-	Ω
Forward Transconductance	g_{FS}	V_{DS}=5V,I_D=6A		15	-	-	S
Dynamic Characteristics (Note4)							
Input Capacitance	C_{lss}	V_{DS}=15V,V_{GS}=0V, F=1.0MHz		-	530.3	-	PF
Output Capacitance	C_{oss}			-	67.1	-	PF
Reverse Transfer Capacitance	C_{rss}			-	61.2	-	PF
Switching Characteristics (Note 4)							
Turn-on Delay Time	$t_{d(on)}$	V_{DD}=15V, I_D=6A V_{GS}=10V,R_{GEN}=3Ω		-	4.5	-	nS
Turn-on Rise Time	t_r			-	2.5	-	nS
Turn-Off Delay Time	$t_{d(off)}$			-	14.5	-	nS
Turn-Off Fall Time	t_f			-	3.5	-	nS
Total Gate Charge	Q_g	V_{DS}=15V,I_D=6A, V_{GS}=10V		-	14.2	-	nC
Gate-Source Charge	Q_{gs}			-	1.8	-	nC
Gate-Drain Charge	Q_{gd}			-	3.3	-	nC
Drain-Source Diode Characteristics							
Diode Forward Voltage (Note 3)	V_{SD}	V_{GS}=0V,I_S=6A		-	0.8	1.2	V
Diode Forward Current (Note 2)	I_S			-	-	6.5	A
Reverse Recovery Time	t_{rr}	T_J = 25°C, I_F = I_S di/dt = 100A/μs(Note3)		-	10	-	nS
Reverse Recovery Charge	Qrr			-	5	-	nC

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P-CH Electrical Characteristics (T_A=25℃unless otherwise noted)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Off Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V I_D=-250μA	-30	-33	-	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=-30V,V_{GS}=0V	-	-	-1	μA
Gate-Body Leakage Current	I_{GSS}	V_{GS}=±20V,V_{DS}=0V	-	-	±100	nA
On Characteristics (Note 3)						
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS},I_D=-250μA	-1.3	-1.65	-2.5	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	V_{GS}=-10V, I_D=-6.5A, T_J=25℃	-	16	19	mΩ
		V_{GS}=-4.5V, I_D=-6.5A, T_J=25℃	-	22	25	mΩ
Gate resistance	R_G	V_{DS}=0V,V_{GS}=0V,F=1.0MHz	-	4.2	-	Ω
Forward Transconductance	g_{FS}	V_{DS}=-5V,I_D=-6.5A	10	-	-	S
Dynamic Characteristics (Note4)						
Input Capacitance	C_{lss}	V_{DS}=-15V,V_{GS}=0V, F=1.0MHz	-	729.4	-	PF
Output Capacitance	C_{oss}		-	112.6	-	PF
Reverse Transfer Capacitance	C_{rss}		-	107.5	-	PF
Switching Characteristics (Note 4)						
Turn-on Delay Time	$t_{d(on)}$	V_{DD}=-15V, I_D=-6.5A V_{GS}=-10V,R_{GEN}=6Ω	-	7.5	-	nS
Turn-on Rise Time	t_r		-	5.5	-	nS
Turn-Off Delay Time	$t_{d(off)}$		-	19	-	nS
Turn-Off Fall Time	t_f		-	7	-	nS
Total Gate Charge	Q_g	V_{DS}=-15V,I_D=-6.5A V_{GS}=-10V	-	16.6	-	nC
Gate-Source Charge	Q_{gs}		-	1.8	-	nC
Gate-Drain Charge	Q_{gd}		-	4.2	-	nC
Drain-Source Diode Characteristics						
Diode Forward Voltage (Note 3)	V_{SD}	V_{GS}=0V,I_S=-6.5A	-	-	-1.2	V
Diode Forward Current (Note 2)	I_S		-	-	-7	A
Reverse Recovery Time	t_{rr}	T_J = 25°C, I_F = I_S di/dt = 100A/μs (Note3)	-	15	-	nS
Reverse Recovery Charge	Qrr		-	10	-	nC

Notes:

1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. Surface Mounted on FR4 Board, t ≤ 10 sec.
3. Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2%.
4. Guaranteed by design, not subject to production

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N- Channel Typical Electrical and Thermal Characteristics (Curves)

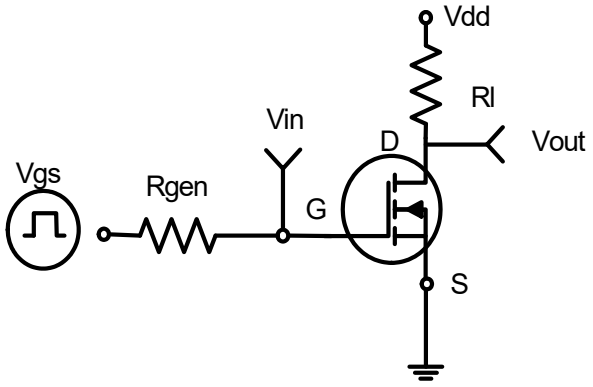

Figure 1:Switching Test Circuit

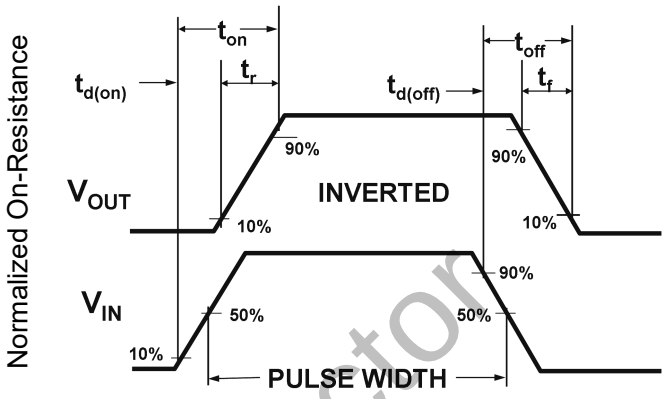

Figure 2:Switching Waveforms

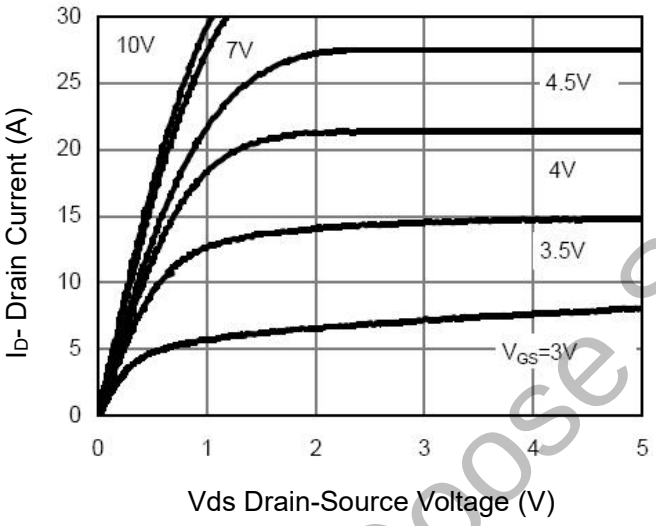

Figure 3 Output Characteristics

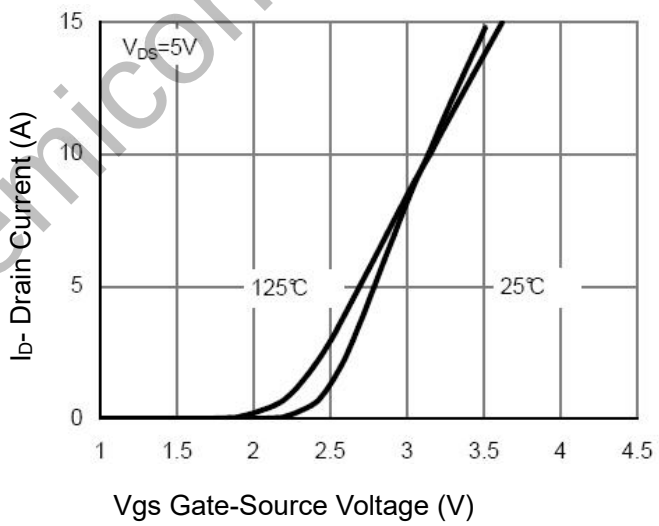

Figure 4 Transfer Characteristics

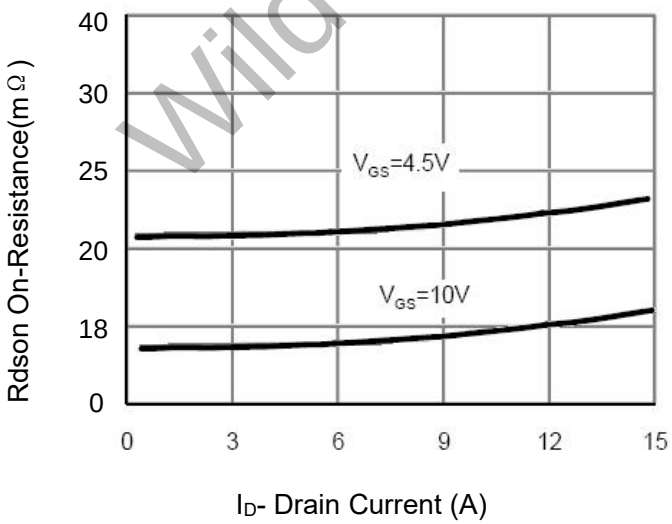

Figure 5 Drain-Source On-Resistance

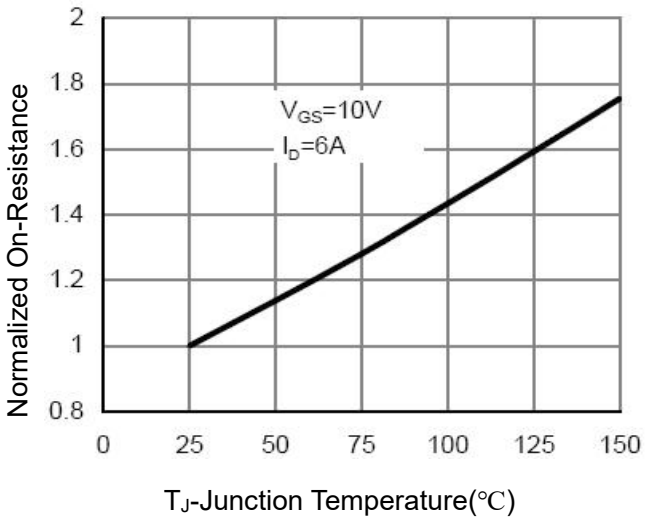

Figure 6 Drain-Source On-Resistance

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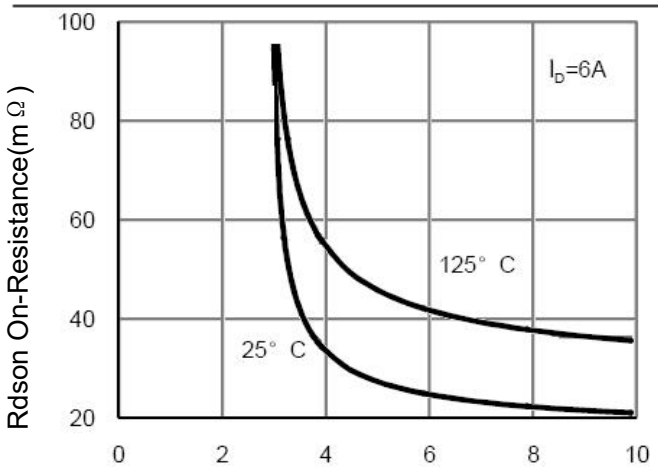

Figure7 Rdson vs Vgs

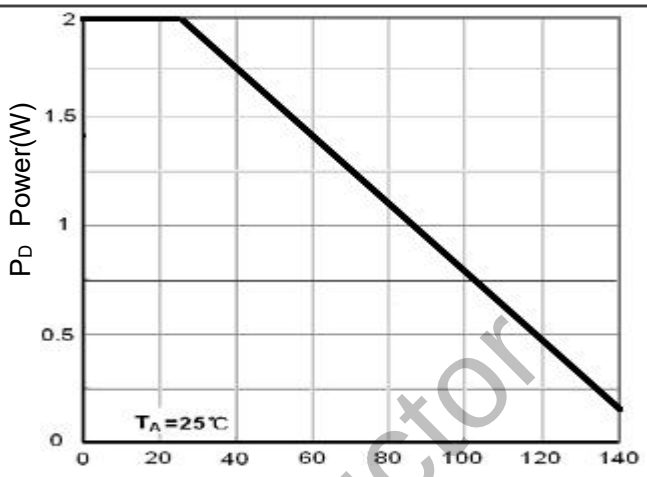

Figure 8 Power Dissipation

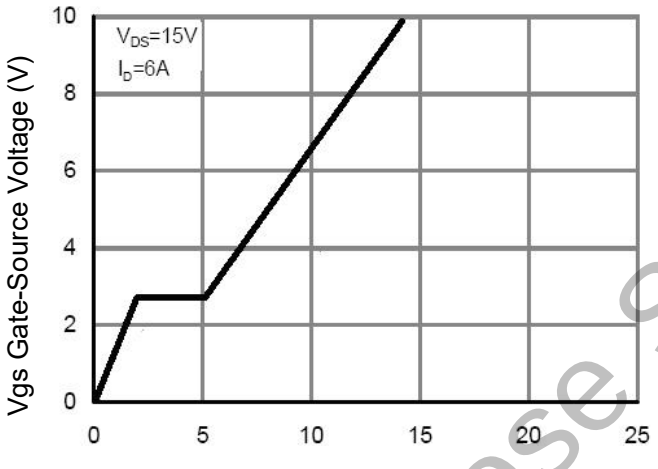

Figure 9 Gate Charge

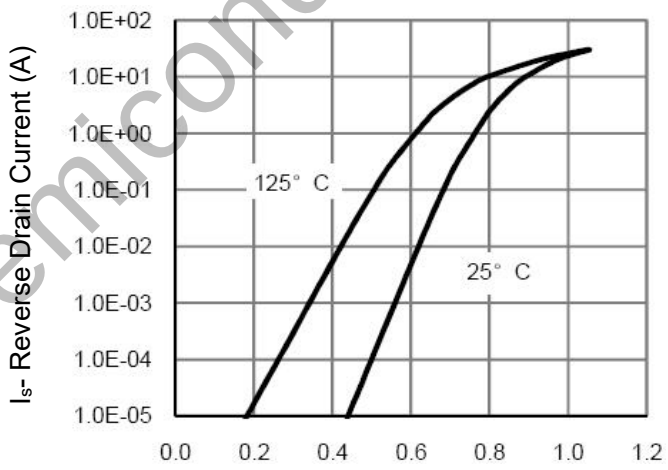

Figure 10 Source- Drain Diode Forward

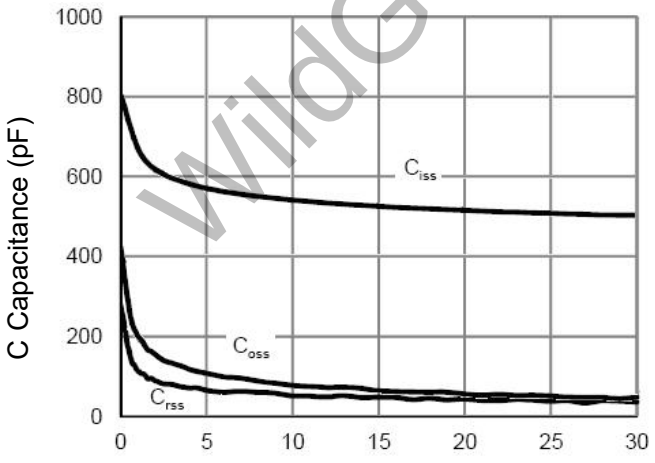

Figure 11 Capacitance vs Vds

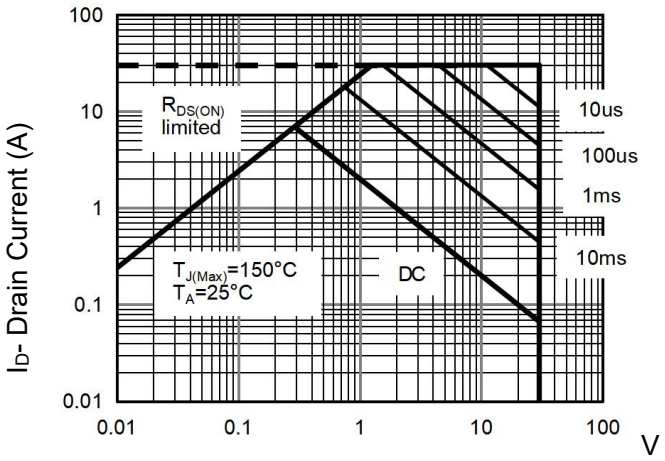

Figure 12 Safe Operation Area

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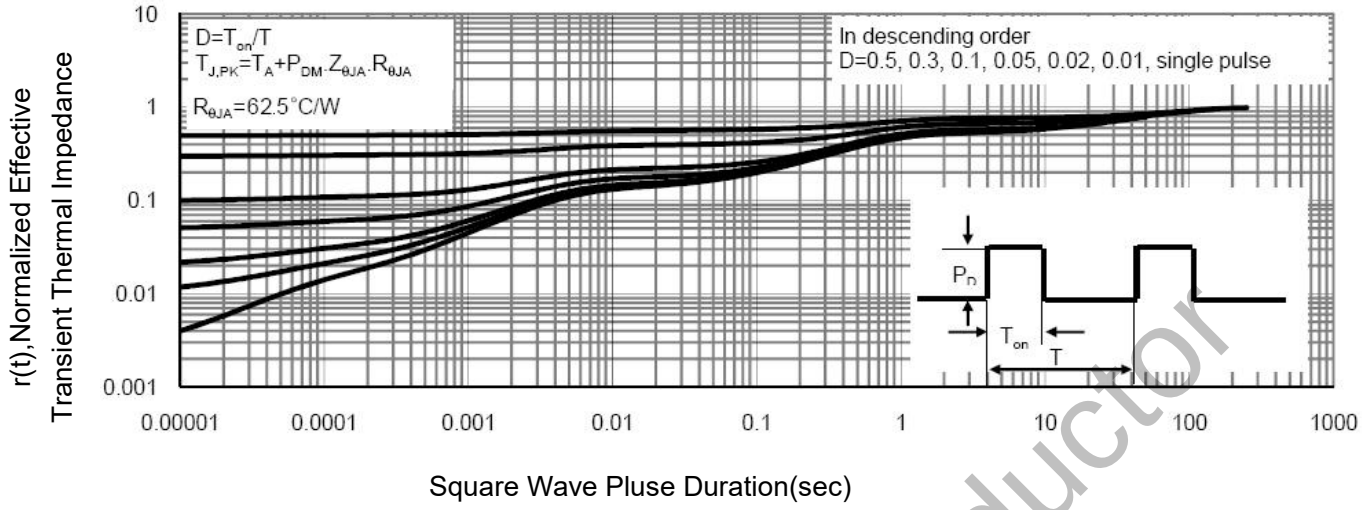

Figure 13 Normalized Maximum Transient Thermal Impedance

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P- Channel Typical Electrical and Thermal Characteristics (Curves)

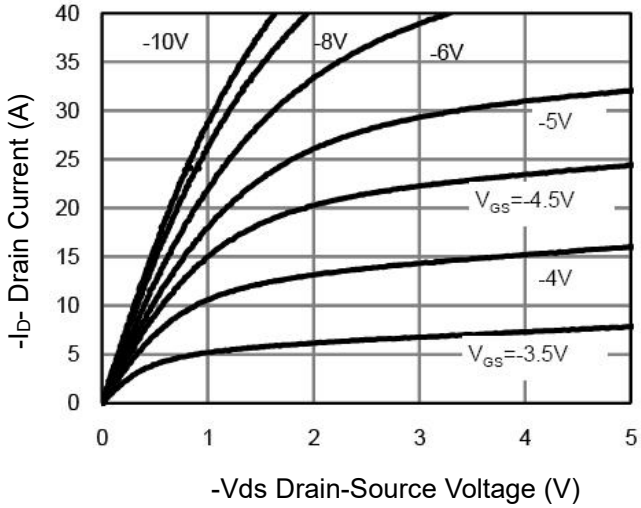

Figure 1 Output Characteristics

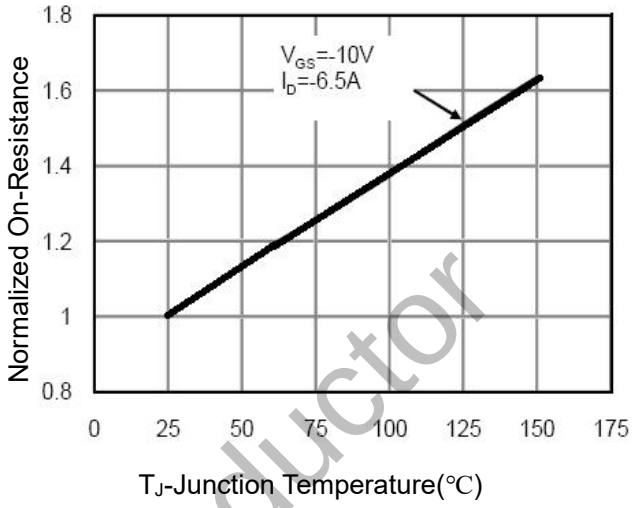

Figure 4 Rdson-Junction Temperature

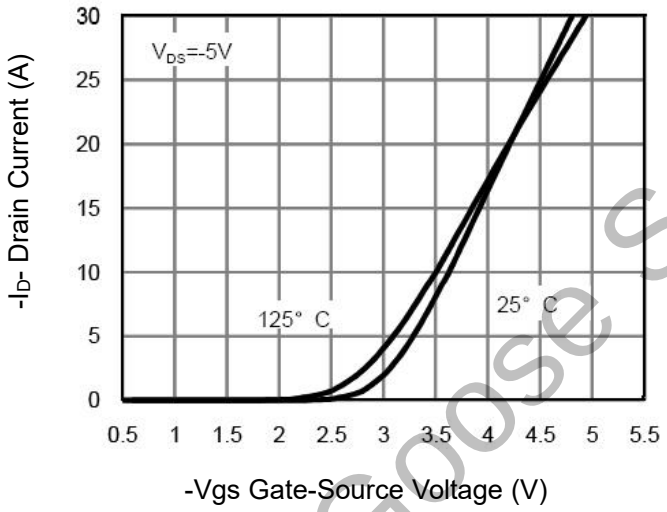

Figure 2 Transfer Characteristics

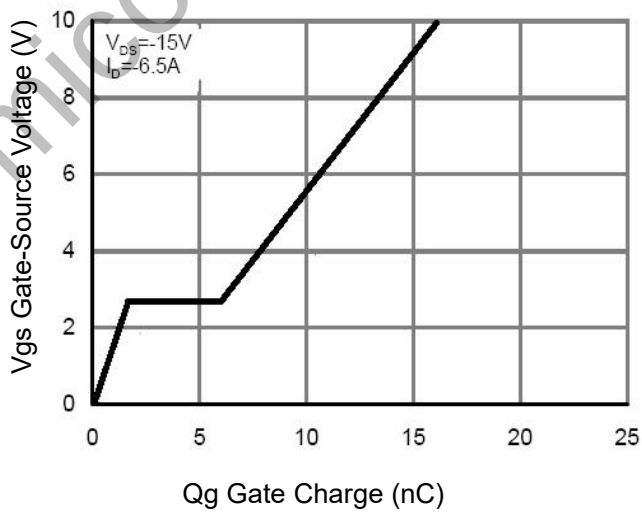

Figure 5 Gate Charge

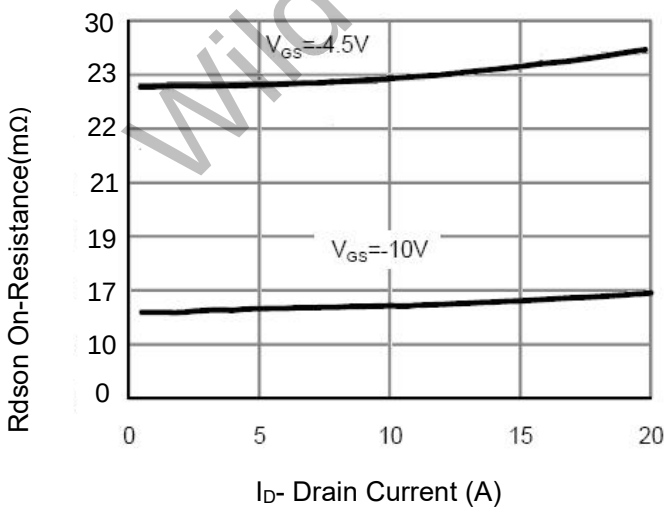

Figure 3 Rdson- Drain Current

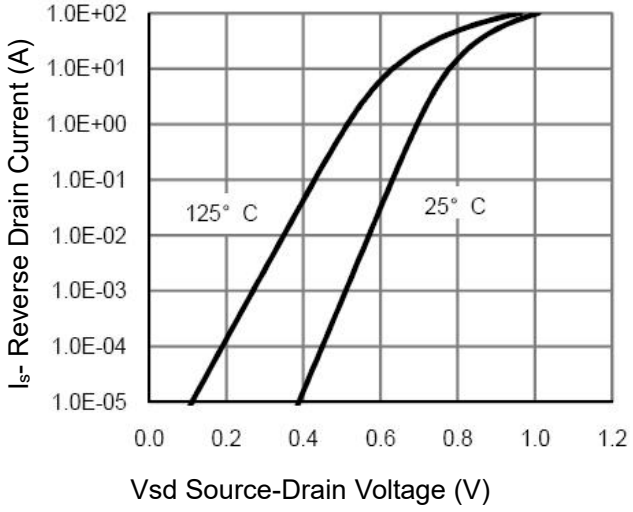

Figure 6 Source- Drain Diode Forward

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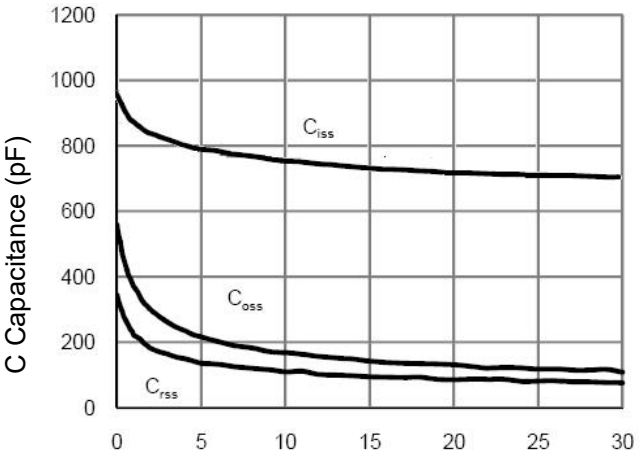


Figure 7 Capacitance vs Vds

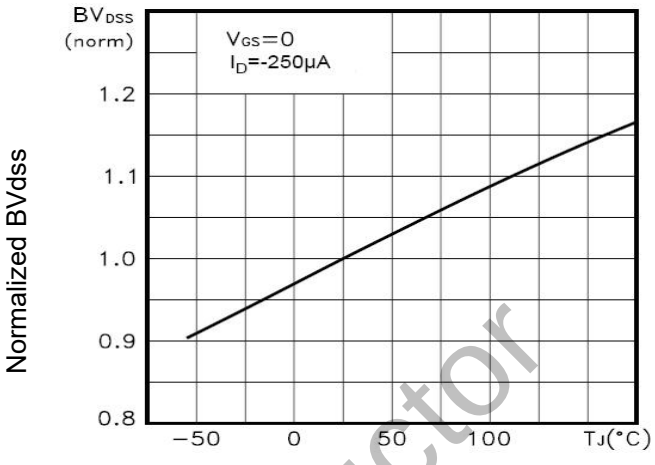


Figure 9 BV_{DSS} vs Junction Temperature

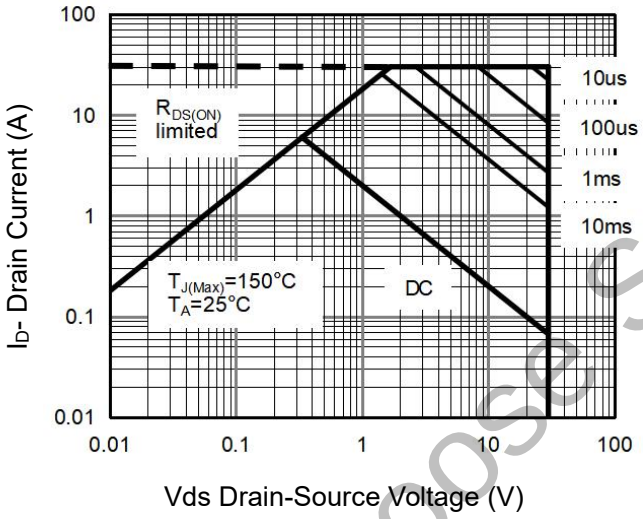


Figure 8 Safe Operation Area

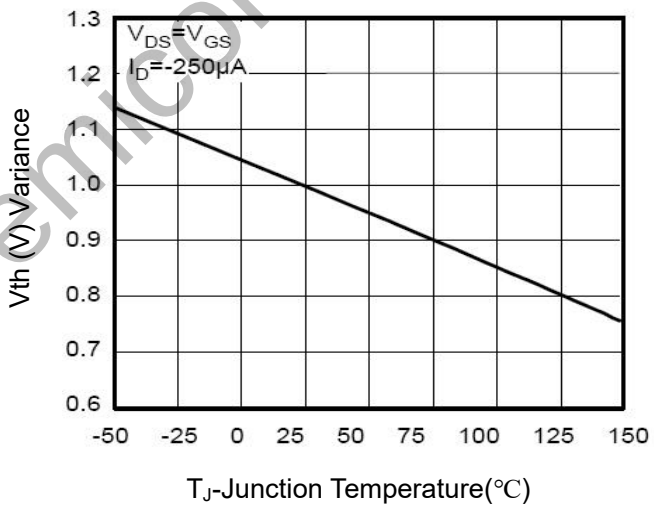


Figure 10 $V_{GS(th)}$ vs Junction Temperature

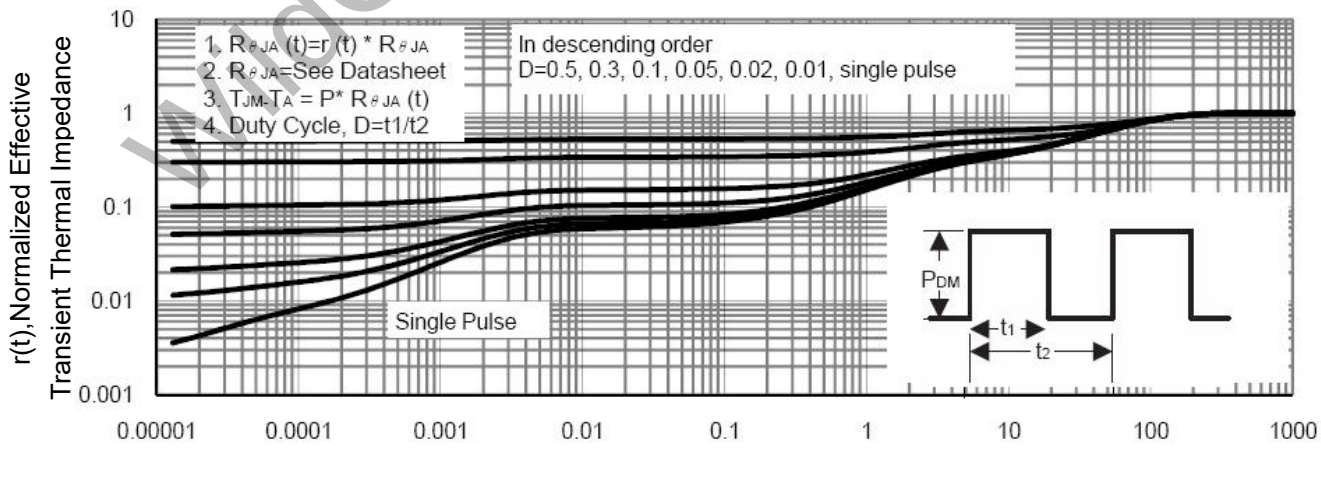


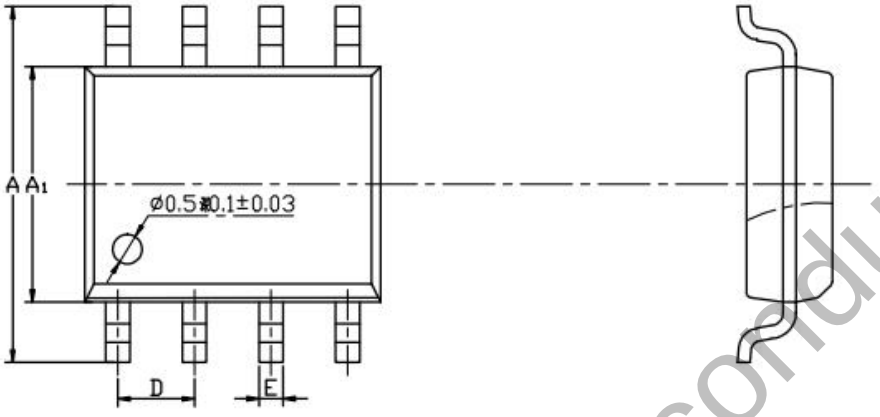
Figure 11 Normalized Maximum Transient Thermal Impedance

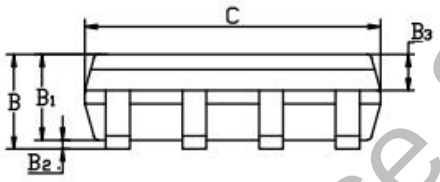
WildGoose Semiconductor

Package Dimension

SOP-8

Unit: mm





尺寸数据：			单位：mm	
标注	Min	Nom	Max	备注
A	5.80	6.00	6.20	跨度
A1	3.70	3.90	4.10	
B	1.50	1.60	1.75	
B1	1.30	1.40	1.50	
B2	0.05	0.125	0.2	站高
B3	0.60	0.70	0.75	
C	4.75	4.85	5.05	
D	1.27BSC			
E	0.39	0.44	0.49	
H	0.10	0.20	0.25	
L	0.25BSC			
L1	0.40	0.6	0.8	
L2	0.95	1.05	1.20	脚长
e	0	4°	8°	

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