WildGoose

CH002

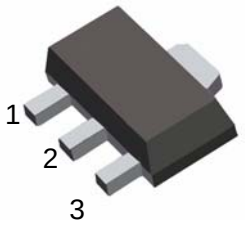
30V N-Channel MOSFET

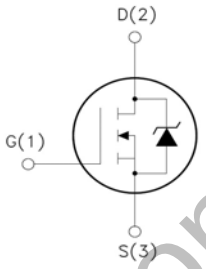
Features:

- ☐ Low Intrinsic Capacitances.
- ☐ Excellent Switching Characteristics.
- ☐ Extended Safe Operating Area.
- ☐ Unrivalled Gate Charge :Qg=17.5nC (Typ.).
- ☐ BVDSS=30V,I_D=20A
- ☐ R_{DS}(on) : 0.015Ω (Max) @V_G=10V
- ☐ 100% Avalanche Tested

RoHS COMPLIANT

SOT-89





1.Gate (G)
2.Drain (D)
3.Source (S)

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

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V_{DS}	30	V
Gate-Source Voltage	V_{GS}	±20	V
Drain Current-Continuous	I_D	20	A
Drain Current-Continuous(T_C=100℃)	I_D (100℃)	16	A
Pulsed Drain Current	I_{DM}	80	A
Maximum Power Dissipation	P_D	40	W
Derating factor		0.27	W/℃
Single pulse avalanche energy (Note 5)	E_{AS}	72	mJ
Operating Junction and Storage Temperature Range	T_J,T_{STG}	-55 To 175	℃

Thermal Characteristic

Thermal Resistance,Junction-to-Case (Note 2)	$R_{\theta JC}$	3.8	℃/W

Electrical Characteristics (T_C=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	-	-	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	1.0	1.5	2.2	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	V_{GS}=10V, I_D=20A	-	10	15	mΩ
		V_{GS}=4.5V, I_D=15A	-	14	20	mΩ
Forward Transconductance	g_{FS}	V_{DS}=5V,I_D=20A	26	-	-	S
Dynamic Characteristics (Note4)						
Input Capacitance	C_{lss}	V_{DS}=15V,V_{GS}=0V, F=1.0MHz	-	938	-	PF
Output Capacitance	C_{oss}		-	142	-	PF
Reverse Transfer Capacitance	C_{rss}		-	99	-	PF
Switching Characteristics (Note 4)						
Turn-on Delay Time	$t_{d(on)}$	V_{DD}=15V, R_L=0.75Ω V_{GS}=10V,R_G=3Ω	-	5	-	nS
Turn-on Rise Time	t_r		-	12	-	nS
Turn-Off Delay Time	$t_{d(off)}$		-	19	-	nS
Turn-Off Fall Time	t_f		-	6	-	nS
Total Gate Charge	Q_g	V_{DS}=15V,I_D=20A, V_{GS}=10V	-	17.5		nC
Gate-Source Charge	Q_{gs}		-	3		nC
Gate-Drain Charge	Q_{gd}		-	4.1		nC
Drain-Source Diode Characteristics						
Diode Forward Voltage (Note 3)	V_{SD}	V_{GS}=0V,I_S=20A	-		1.2	V
Diode Forward Current (Note 2)	I_S		-	-	20	A
Reverse Recovery Time	t_{rr}	TJ = 25°C, IF =20A di/dt = 100A/μs (Note3)	-	19	-	nS
Reverse Recovery Charge	Qrr		-	10	-	nC
Forward Turn-On Time	t_{on}	Intrinsic turn-on time is negligible (turn-on is dominated by LS+LD)				

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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
5. EAS condition：Tj=25℃,V_{DD}=30V,V_G=10V,L=0.5mH,Rg=25Ω

Typical Electrical and Thermal Characteristics (Curves)

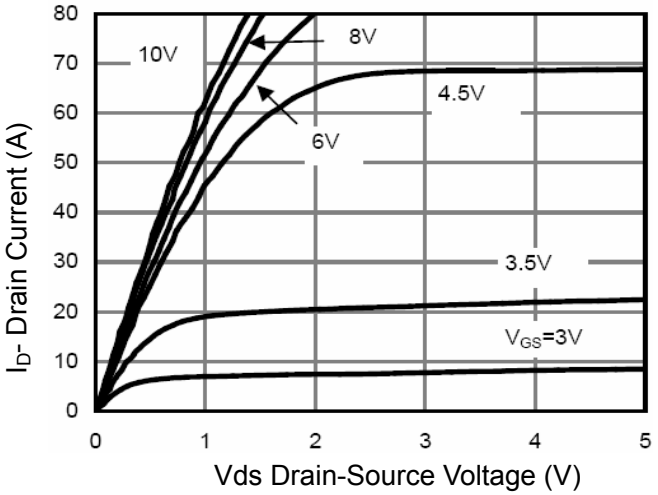


Figure 1 Output Characteristics

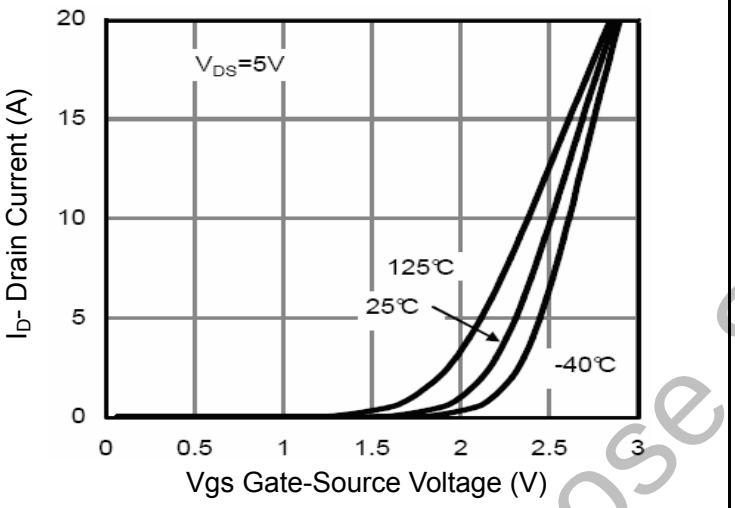


Figure 2 Transfer Characteristics

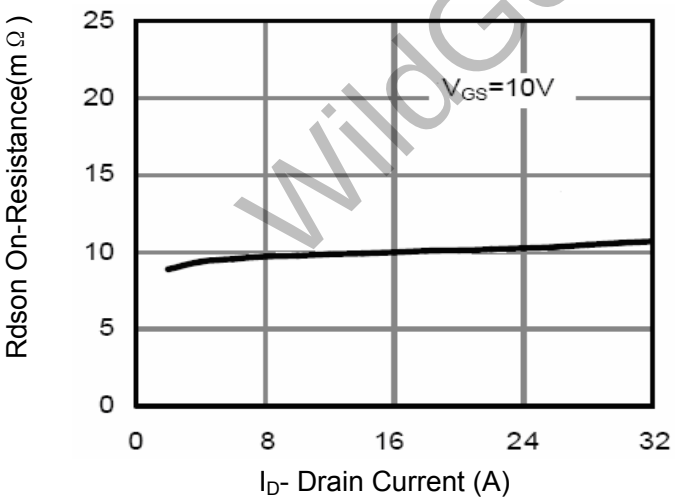


Figure 3 Rdson- Drain Current

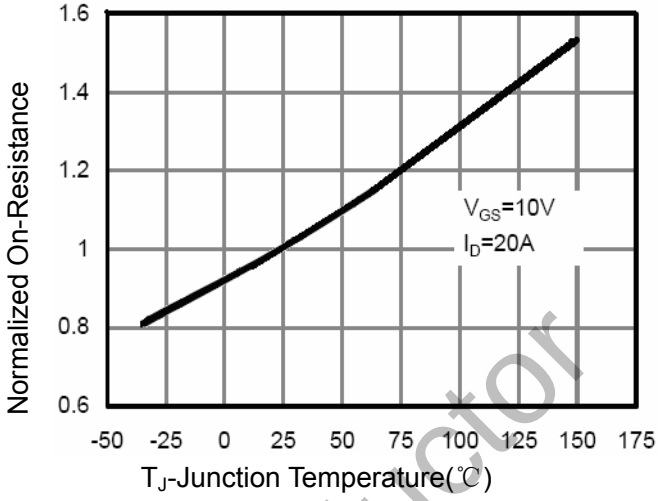


Figure 4 Rdson-Junction Temperature

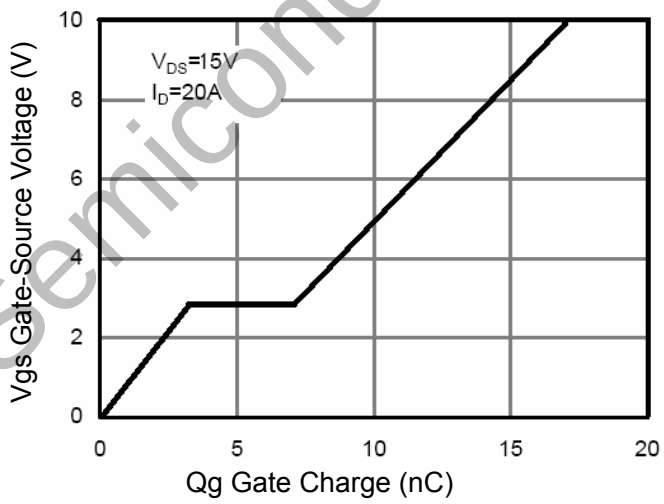


Figure 5 Gate Charge

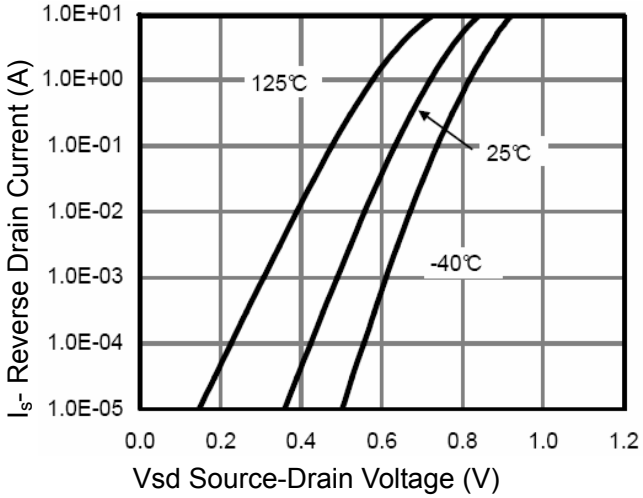


Figure 6 Source- Drain Diode Forward

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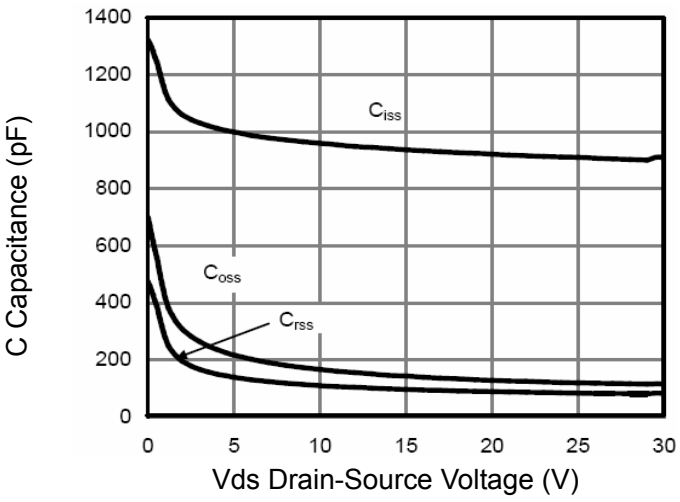


Figure 7 Capacitance vs Vds

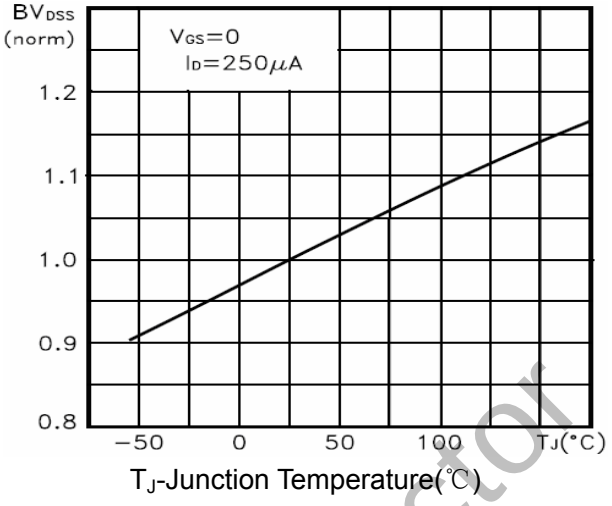


Figure 9 BV_{DSS} vs Junction Temperature

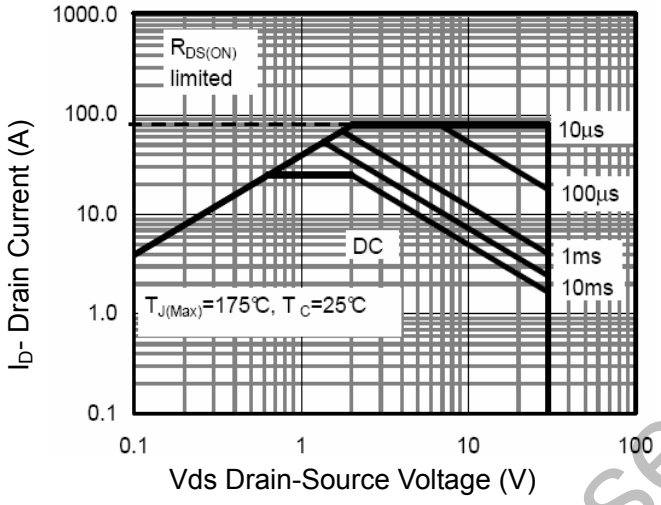


Figure 8 Safe Operation Area

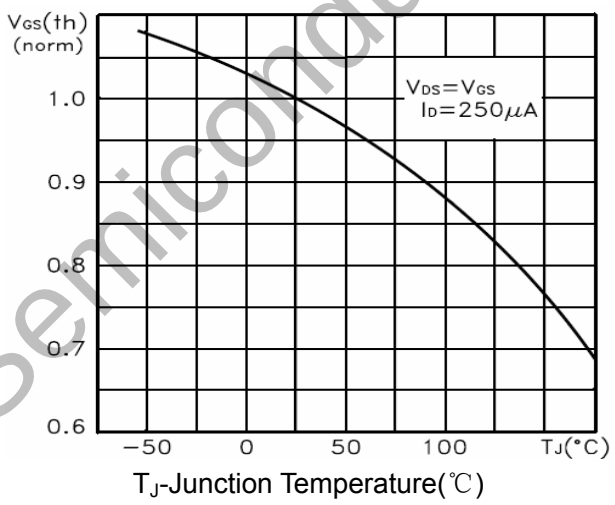


Figure 10 $V_{GS(th)}$ vs Junction Temperature

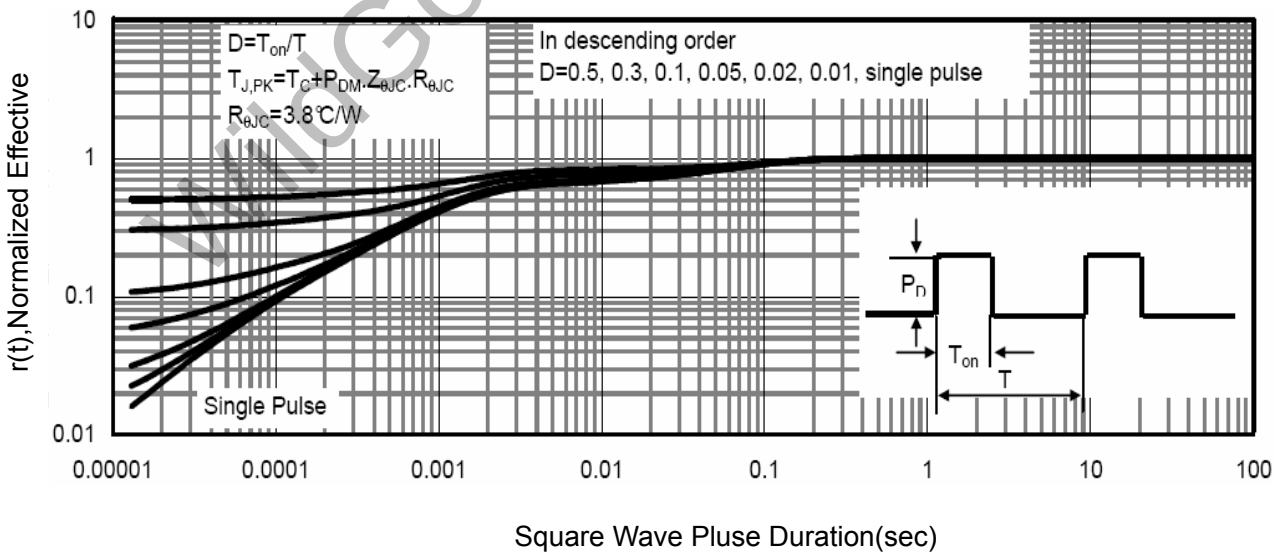
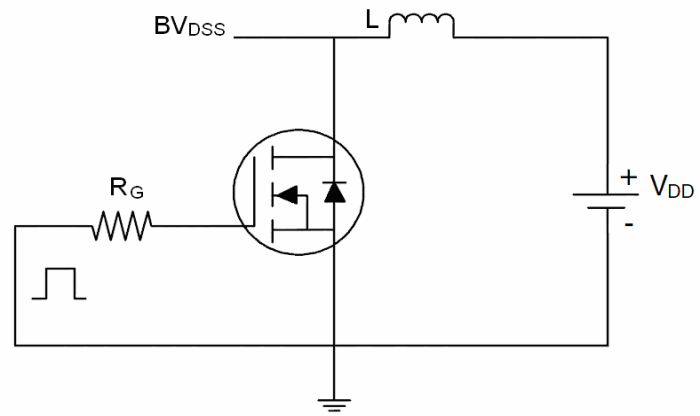


Figure 11 Normalized Maximum Transient Thermal Impedance

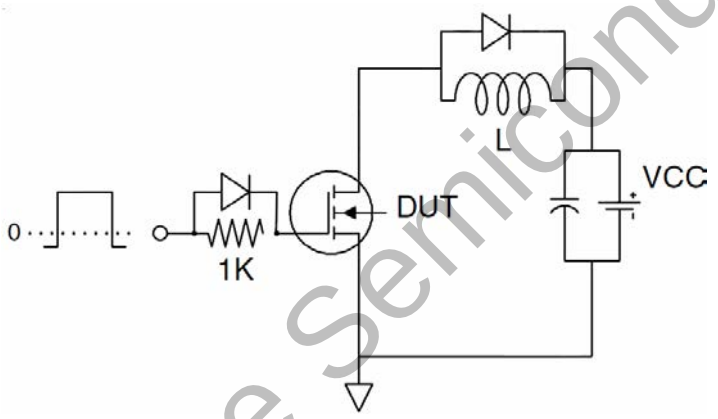
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Test Circuit

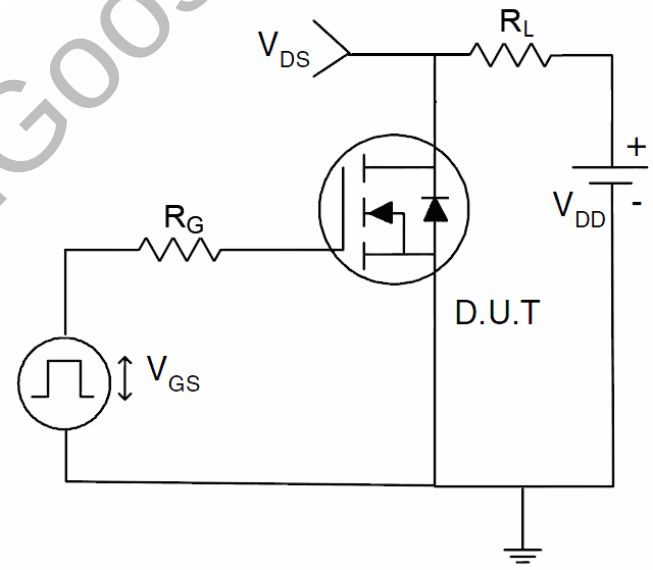
1) E_{AS} test Circuit



2) Gate charge test Circuit



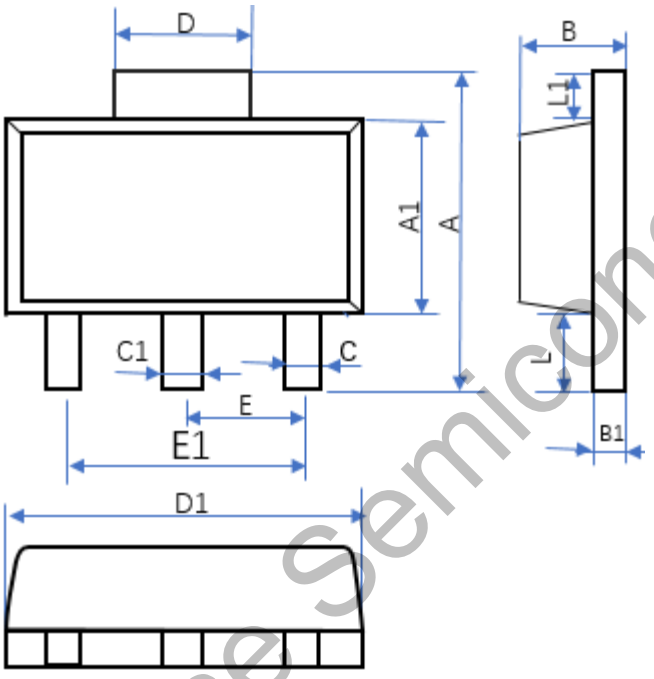
3) Switch Time Test Circuit



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Package Dimension

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Symbol	Size	+	-
A	4.10	-0.15	0.15
A1	2.50	-0.05	0.05
B	1.49	-0.05	0.05
B1	0.40	-0.05	0.05
C	0.40	-0.05	0.05
C1	0.50	-0.05	0.05
D	1.70	-0.05	0.05
D1	4.50	-0.05	0.05
E	1.50	-0.05	0.05
E1	3.00	-0.05	0.05
L	1.02	-0.05	0.05
L1	0.60	-0.05	0.05

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