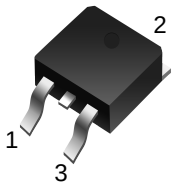
WGD75N02

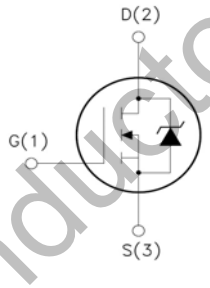
Features:

- ☐ Advanced Trench Technology
- ☐ Excellent Switching Characteristics
- ☐ Extended Safe Operating Area
- ☐ Ultra Low Gate Charge:Qg=36nC (Typ.)
- ☐ VDSS=20V, ID=75A
- ☐ Rds(on):3.8mΩ(Typ.) @VG=4.5V
- ☐ 100% Avalanche Tested

TO-252

RoHS COMPLIANT





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

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

Symbol	Parameter		Value	Units
V_{DS}	Drain-to-Source Voltage		20	V
V_{GS}	Gate-to-Source Voltage		±12	V
I_D	Continuous Drain Current	T_C = 25°C	75	A
		T_C = 100°C	48	
I_{DM}	Pulsed Drain Current (1)		300	A
E_{AS}	Single Pulsed Avalanche Energy (2)		100	mJ
P_D	Power Dissipation	T_C = 25°C	39	W
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient(3)		33	°C/W
$R_{\theta JC}$	Thermal Resistance, Junction to Case		3.2	
T_J, T_{STG}	Junction & Storage Temperature Range		-55 to 150	°C

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Electrical Characteristics (T_J = 25°C unless otherwise specified)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
Off Characteristics						
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	I_D = 250μA, V_{GS} = 0V	20	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS} = 20V, V_{GS} = 0V	-	-	1.0	μA
I_{GSS}	Gate-Body Leakage Current	V_{DS} = 0V, V_{GS} = ±12V	-	-	±100	nA
On Characteristics						
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS} = V_{GS}, I_D = 250μA	0.5	0.8	1.1	V
$R_{DS(ON)}$	Static Drain-Source ON-Resistance(4)	V_{GS} = 4.5V, I_D = 30A	-	3.8	4.9	mΩ
		V_{GS} = 2.5V, I_D = 20A	-	5.0	6.5	mΩ
Dynamic Characteristics						
C_{iss}	Input Capacitance	V_{GS} = 0V, V_{DS} = 10V, f = 1MHz	-	3174	-	pF
C_{oss}	Output Capacitance		-	396	-	pF
C_{rss}	Reverse Transfer Capacitance		-	365	-	pF
Q_g	Total Gate Charge	V_{GS} = 0 to 4.5V V_{DD} = 10V, I_D = 30A	-	36	-	nC
Q_{gs}	Gate Source Charge		-	6	-	nC
Q_{gd}	Gate Drain("Miller") Charge		-	10	-	nC
Switching Characteristics						
$t_{d(on)}$	Turn-On DelayTime	V_{GS} = 4.5V, V_{DD} = 10V I_D= 30A, R_{GEN} = 3Ω	-	13	-	ns
t_r	Turn-On Rise Time		-	31	-	ns
$t_{d(off)}$	Turn-Off DelayTime		-	73	-	ns
t_f	Turn-Off Fall Time		-	92	-	ns
Drain-Source Diode Characteristics and Max Ratings						
I_S	Maximum Continuous Drain to Source Diode Forward Current		-	-	75	A
I_{SM}	Maximum Pulsed Drain to Source Diode Forward Current		-	-	300	A
V_{SD}	Drain to Source Diode Forward Voltage	V_{GS} = 0V, I_S = 30A	-	-	1.2	V
trr	Body Diode Reverse Recovery Time	I_F=20A,di/dt=100A/μs	-	13	-	ns
Qrr	Body Diode Reverse Recovery Charge		-	4	-	nC

Notes: 1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature.

2. E_{AS} condition: Starting T_J=25C, V_{DD}=10V, V_G=10V, R_G=25ohm, L=0.5mH, I_{AS}=20A

3. $R_{\theta JA}$ is measured with the device mounted on a 1inch^2 pad of 2oz copper FR4 PCB

4. Pulse Test: Pulse Width≤300μs, Duty Cycle≤0.5%.

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Typical Performance Characteristics

Figure 1: Output Characteristics

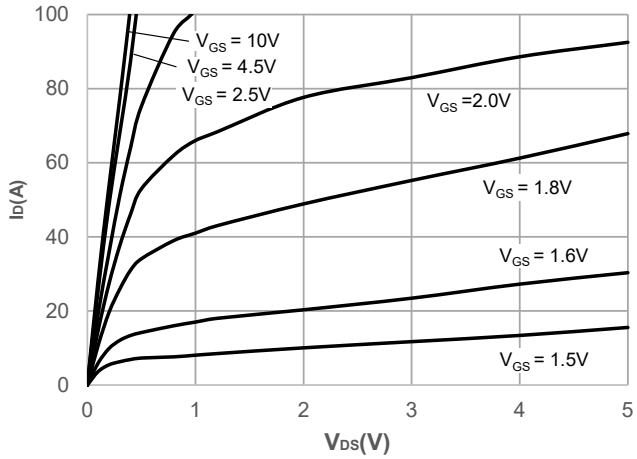


Figure 2: Typical Transfer Characteristics

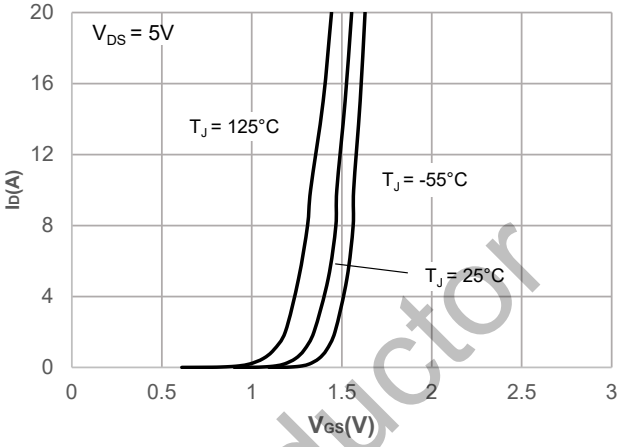


Figure 3: On-resistance vs. Drain Current

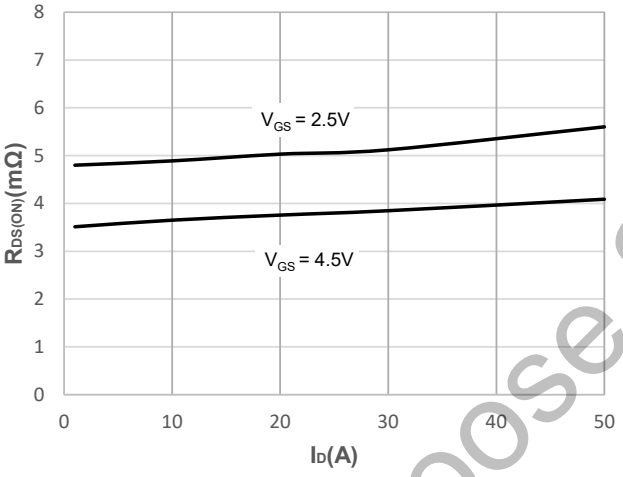


Figure 4: Body Diode Characteristics

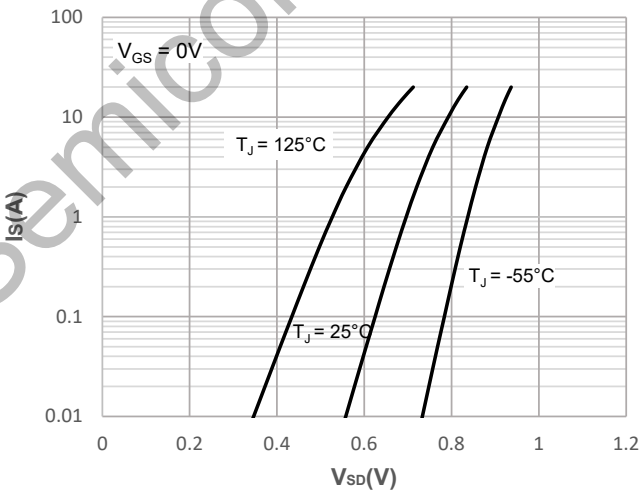


Figure 5: Gate Charge Characteristics

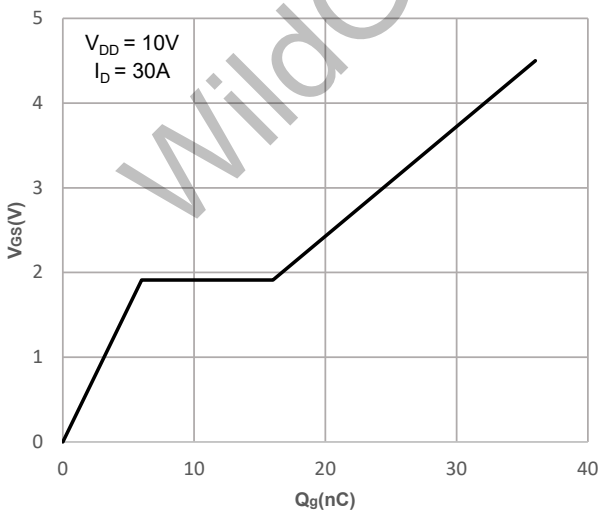
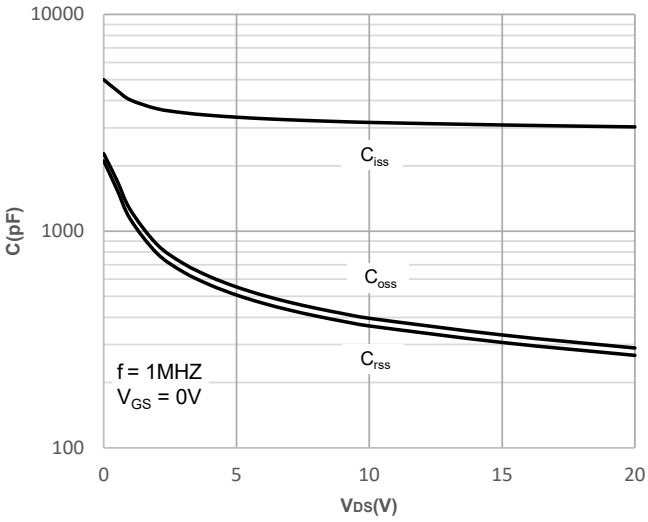


Figure 6: Capacitance Characteristics



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Typical Performance Characteristics

Figure 7: Normalized Breakdown voltage vs. Junction Temperature

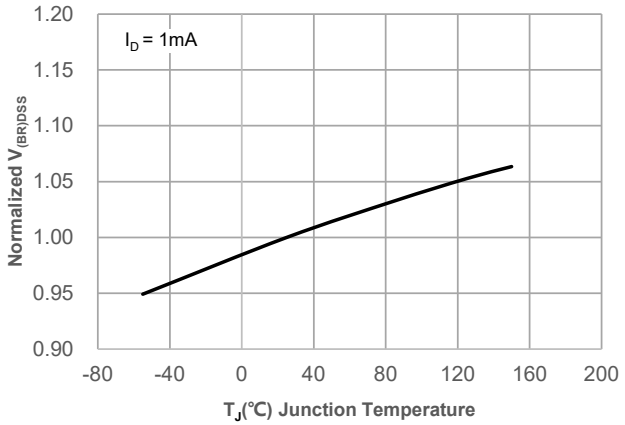


Figure 8: Normalized on Resistance vs. Junction Temperature

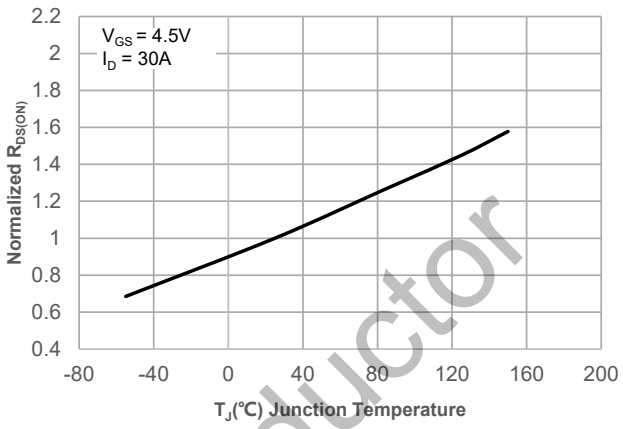


Figure 9: Maximum Safe Operating Area

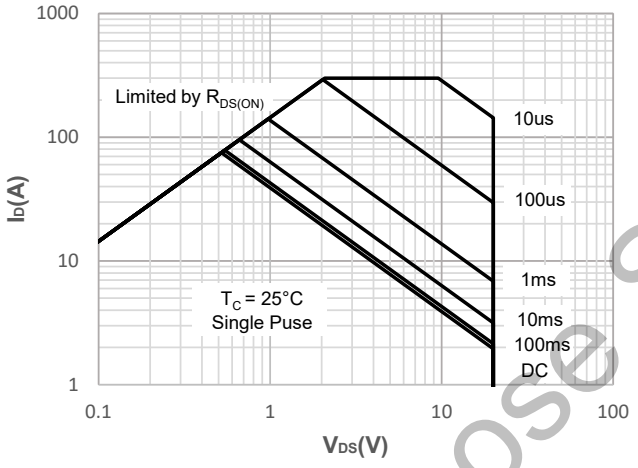


Figure 10: Maximum Continuous Drian Current vs. Case Temperature

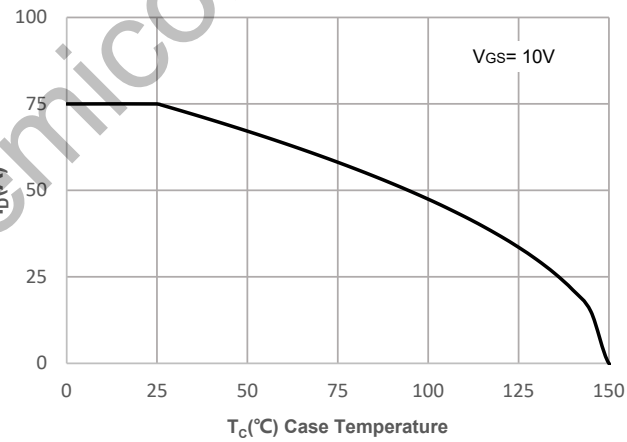


Figure 11: Normalized Maximum Transient Thermal Impedance

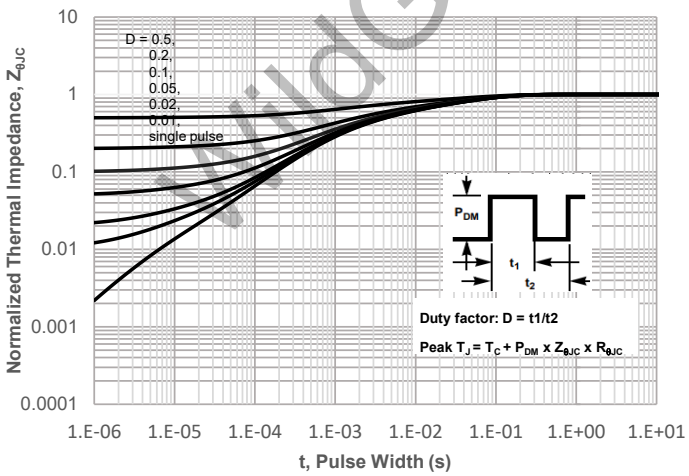
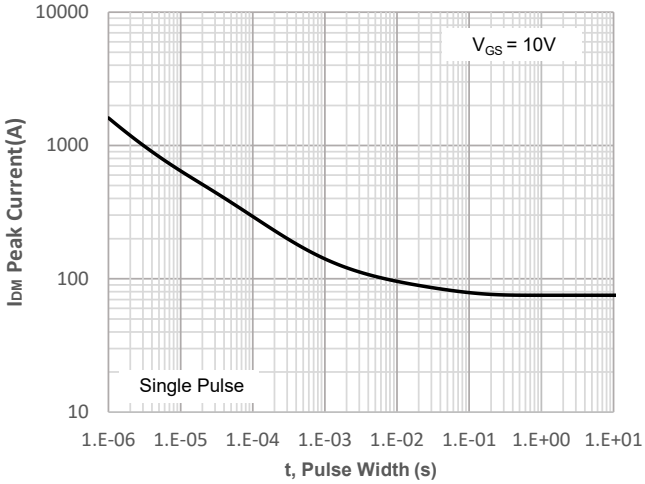


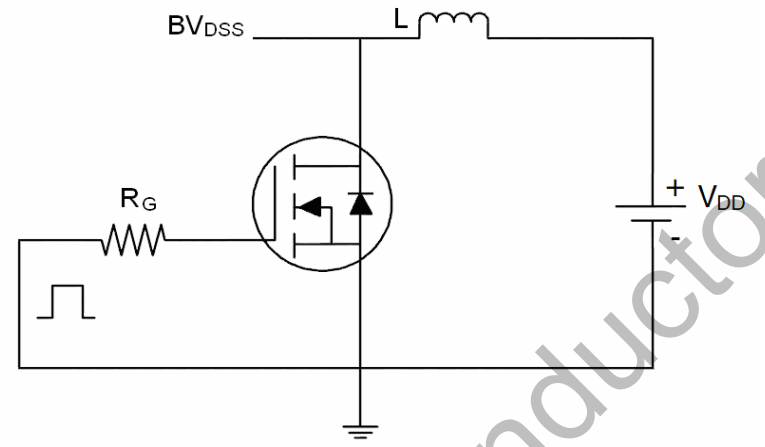
Figure 12: Peak Current Capacity



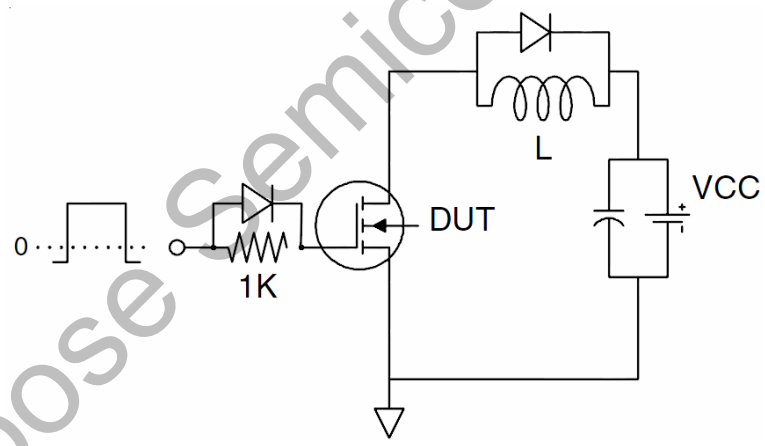
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Gate Charge Test Circuit & Waveform

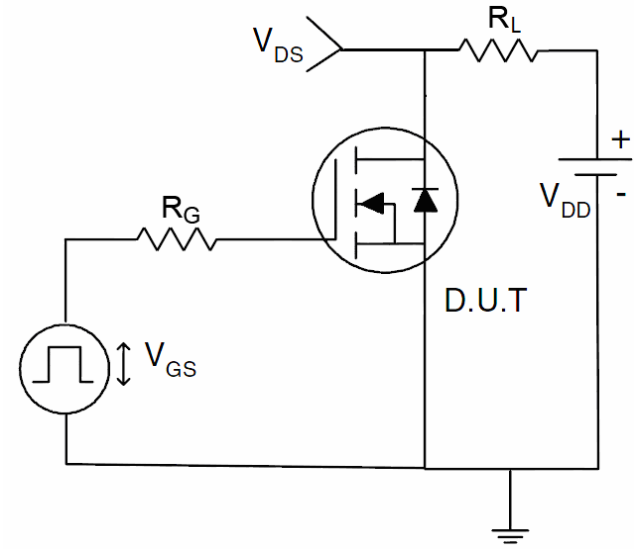
1）E_{AS} test Circuits



2）Gate charge test Circuit:



3）Switch Time Test Circuit：

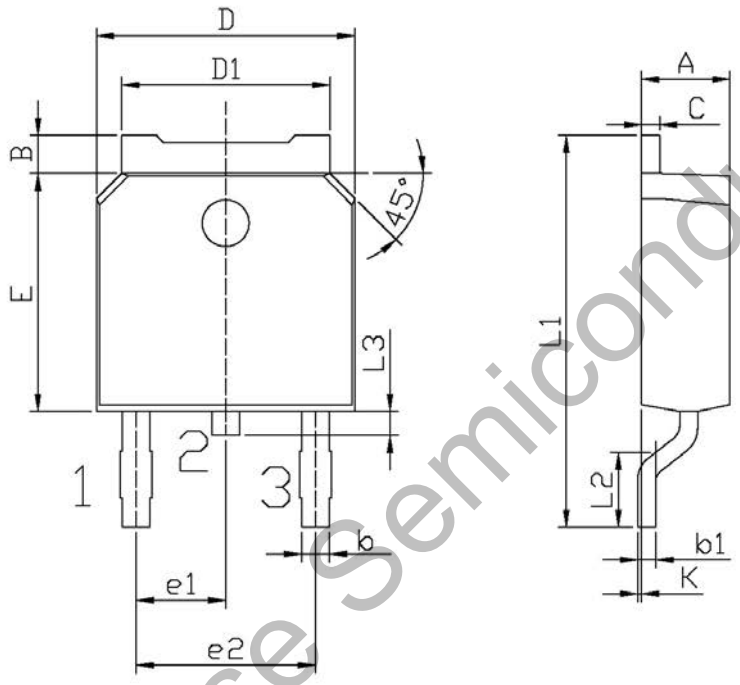


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Package Dimension

TO-252

Unit: mm



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单位：mm

Symbol	Dimensions In Millimeters		Symbol	Dimensions In Millimeters	
	Min	Max		Min	Max
A	2.20	2.40	E	5.95	6.25
B	0.95	1.25	e1	2.24	2.34
b	0.70	0.90	e2	4.43	4.73
b1	0.45	0.55	L1	9.85	10.35
C	0.45	0.55	L2	1.25	1.75
D	6.45	6.75	L3	0.60	0.90
D1	5.20	5.40	K	0.00	0.10