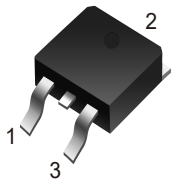
WGD180N03

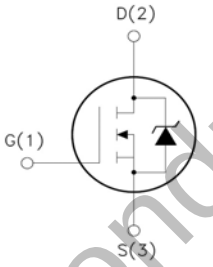
TO-252S

RoHS COMPLIANT



Features:

- ☐ Low Intrinsic Capacitances.
- ☐ Excellent Switching Characteristics.
- ☐ Extended Safe Operating Area.
- ☐ Unrivalled Gate Charge :Qg= 130nC (Typ.).
- ☐ BVDSS=30V,I_D=180A
- ☐ R_{DS}(on) : 1.8mΩ(Max) @V_G=10V
- ☐ 100% Avalanche Tested



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

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Absolute Maximum Ratings (T_A=25°C unless otherwise noted)

Symbol	Parameter		Maximum	Unit
V_{DSS}	Drain-to-Source Voltage		30	V
V_{GSS}	Gate-to-Source Voltage		±20	V
I_D	Continuous Drain Current	T_C=25°C	180	A
		T_C=100°C	116	
I_{DP}	Pulsed Drain Current	T_C=25°C	720	
IAS	Avalanche Current		28	
EAS	Avalanche energy		870	mJ
PD	Maximum Power Dissipation	T_C=25°C	1.96	W
		T_C=100°C	245	
T_J, T_{STG}	Junction & Storage Temperature Range		-55~150	°C

Thermal Characteristics

Symbol	Parameter	Typical	Unit
Rθjc	Thermal Resistance-Junction to Case	0.51	℃/W
Rθja	Thermal Resistance-Junction to Ambient	62.5	

Electrical Characteristics (TA=25°C unless otherwise noted)

Symbol	Parameter	Test Conditions	Min.	Typ	Max.	Unit
Static Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V,I_D=250uA	30	—	—	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=30V,V_{GS}=0V	—	—	1	uA
		T_J=100°C	—	—	90	
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS},I_D=250uA	1.2	—	2.4	V
I_{GSS}	Gate Leakage Current	V_{GS}=±20V, V_{DS}=0V	—	—	±95	nA
$R_{DS(on)}$[1]	Drain-Source On-Resistance	V_{GS}=10V, I_D=30A	—	—	1.8	mΩ
			—	—	—	
Diode Characteristics						
V_{SD}	Diode Forward Voltage	I_{SD}30A,V_{GS}=0V	—	—	1.3	V
I_S	Diode Continuous Forward Current		—	—	140	A
t_{rr}	Reverse Recovery Time	I_F=30A,VDD=50V	—	48	—	nS
Q_{rr}	Reverse Recovery Charge	dI/dt=100A/us	—	69.6	—	nC
Dynamic Characteristics[2]						
R_G	Gate Resistance	V_{GS}=0V, V_{DS}=0V, Frequency=1MHz	—	9.0	—	Ω
C_{iss}	Input Capacitance	V_{GS}=0V, V_{DS}=15V Frequency=1MHz	—	4882	—	pF
C_{oss}	Output Capacitance		—	635	—	
C_{rss}	Reverse Transfer Capacitance		—	342	—	
$t_{d(on)}$	Turn-On Delay Time	V_{DD}=15V,I_D=90A, V_{GS}=10V,R_G=6Ω	—	37.9	—	nS
t_r	Rise Time		—	22.7	—	
$t_{d(off)}$	Turn-Off Delay Time		—	68.8	—	
t_f	Fall Time		—	23.5	—	
Gate Charge Characteristics[2]						
Q_g	Total Gate Charge	V_{DS}=48V,V_{GS}=10V I_D=90A	—	86.2	—	nC
Q_{gs}	Gate-to-Source Charge		—	23.6	—	
Q_{gd}	Gate-to-Drain Charge		—	29.4	—	

Note: 1: Pulse test; pulse width ≦ 300us, duty cycle ≦ 2%.
2: Guaranteed by design, not subject to production testing.
3: Package limitation current is 8A.Calculated continuous current based on maximum allowable junction temperature.
4: Repetitive rating, pulse width limited by max junction temperature.
5: Starting TJ = 25°C,L = 0.5mH

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Typical Characteristics

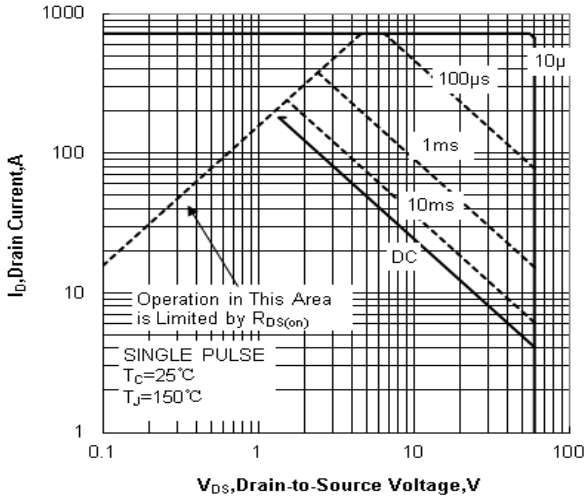

Figure 1 Maximum Forward Bias Safe Operating Area

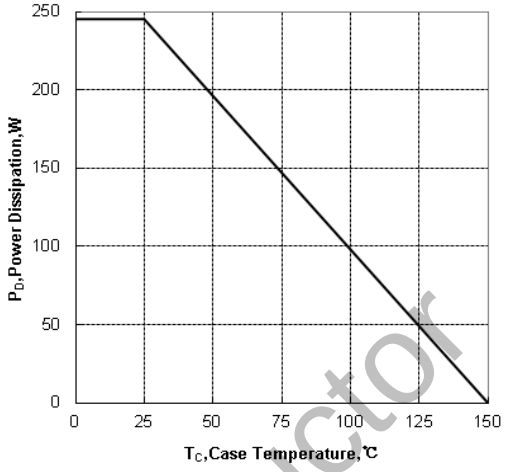

Figure 2 Maximum Power Dissipation vs Case Temperature

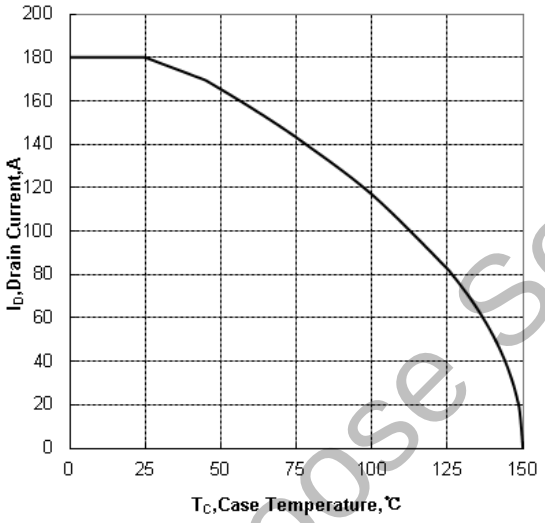

Figure 3 Maximum Continuous Drain Current vs Case Temperature

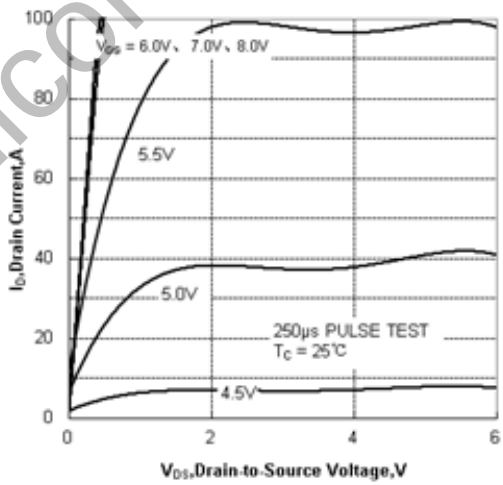

Figure 4 Typical Output Characteristics

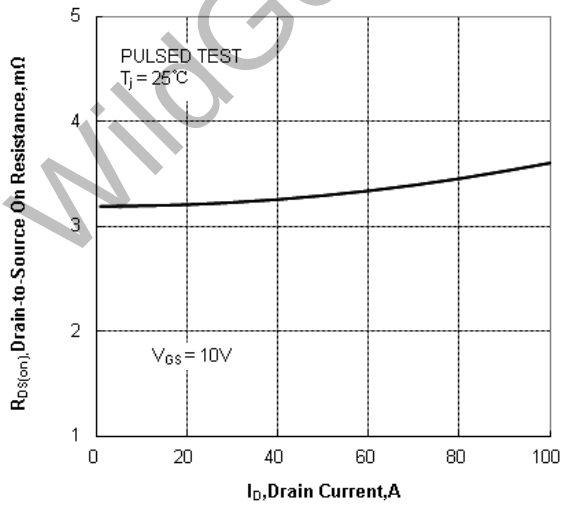

Figure 5 Drain-to-Source On Resistance vs Drain Current

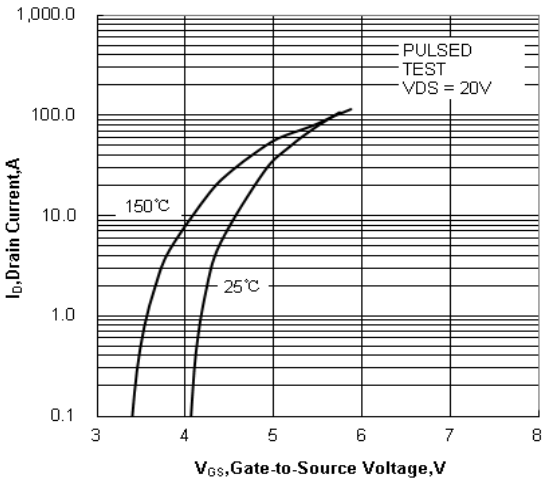

Figure 6 Typical Transfer Characteristics

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Typical Characteristics (Continued)

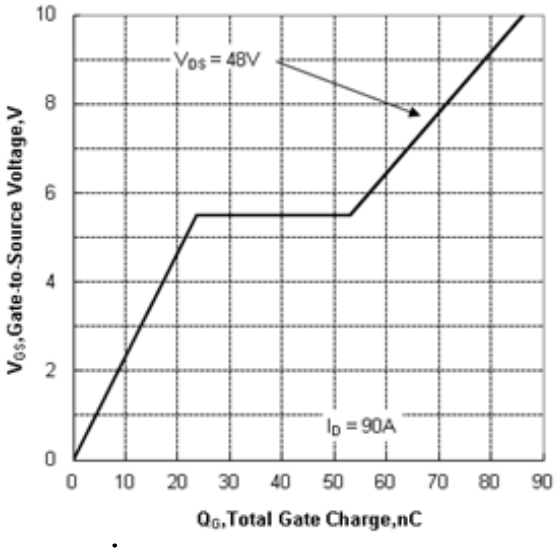

Figure 7 Typical Gate Charge vs Gate to Source Voltage

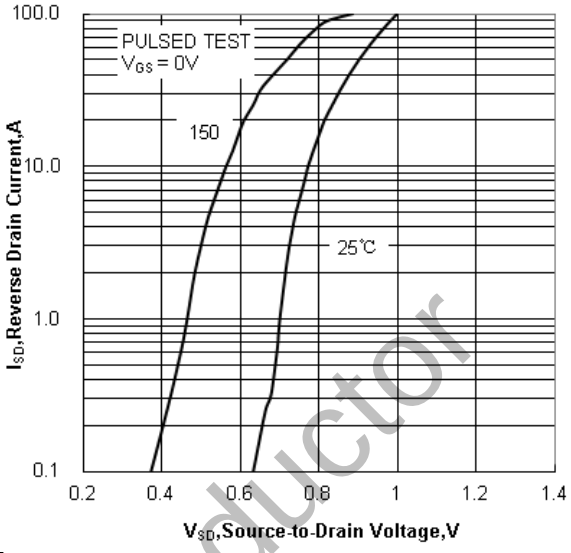

Figure 8 Typical Body Diode Transfer Characteristics

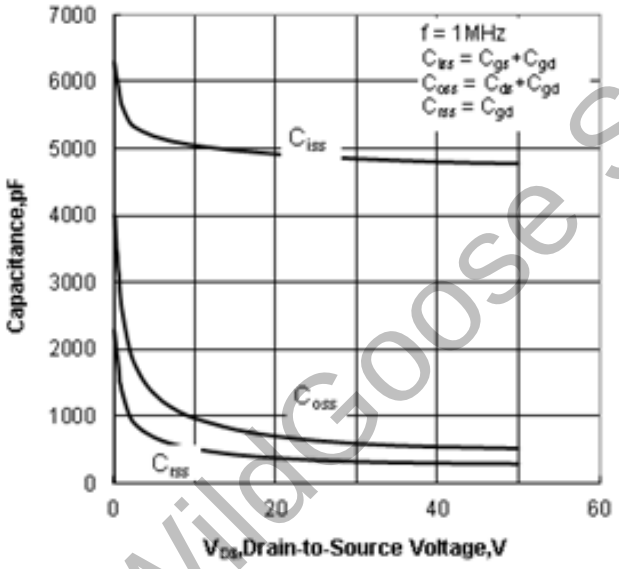

Figure 9 Typical Capacitance vs Drain to Source Voltage

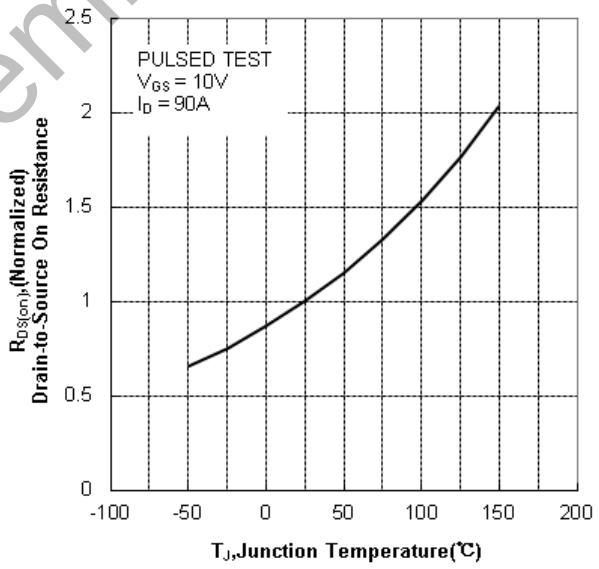

Figure 10 Typical Drian to Source on Resistance vs Junction Temperature

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Typical Characteristics (Continued)

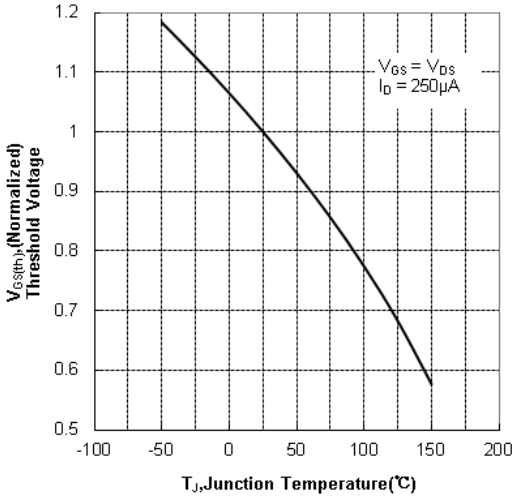

Figure 11 Typical Theshold Voltage vs Junction Temperature

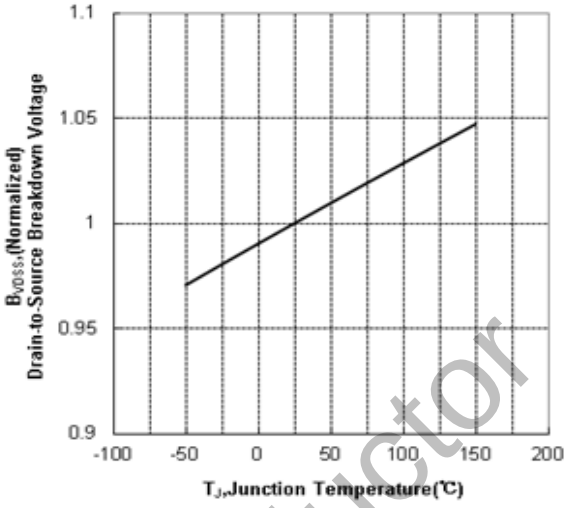

Figure 12 Typical Breakdown Voltage vs Junction Temperature

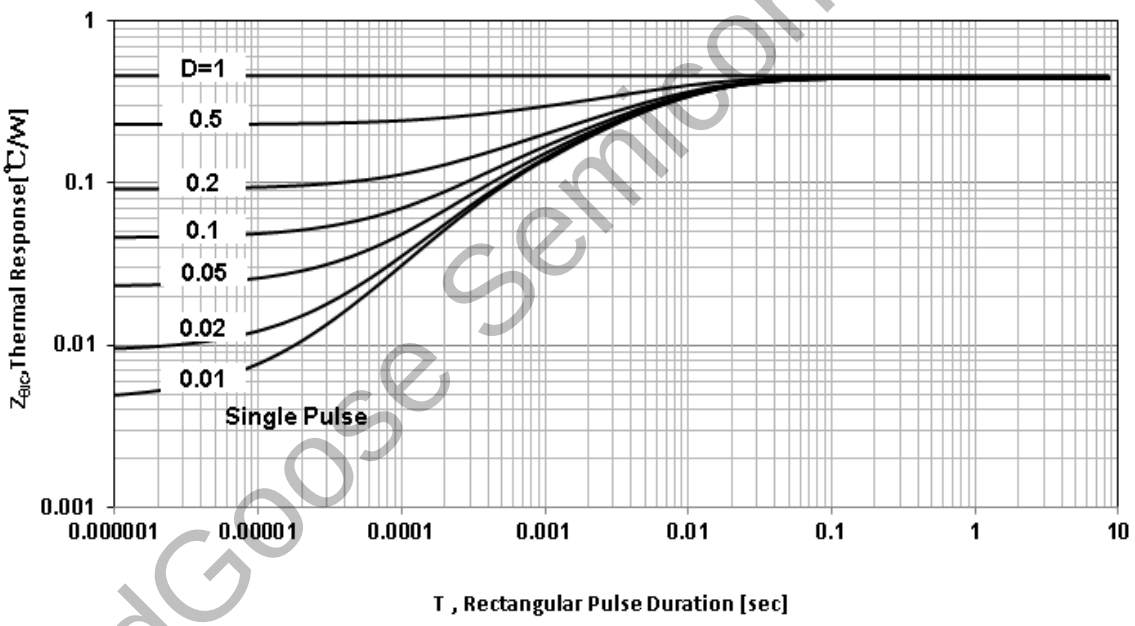

Figure 13 Maximum Effective Transient Thermal Impedance, Junction-to-Case

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Package Dimension

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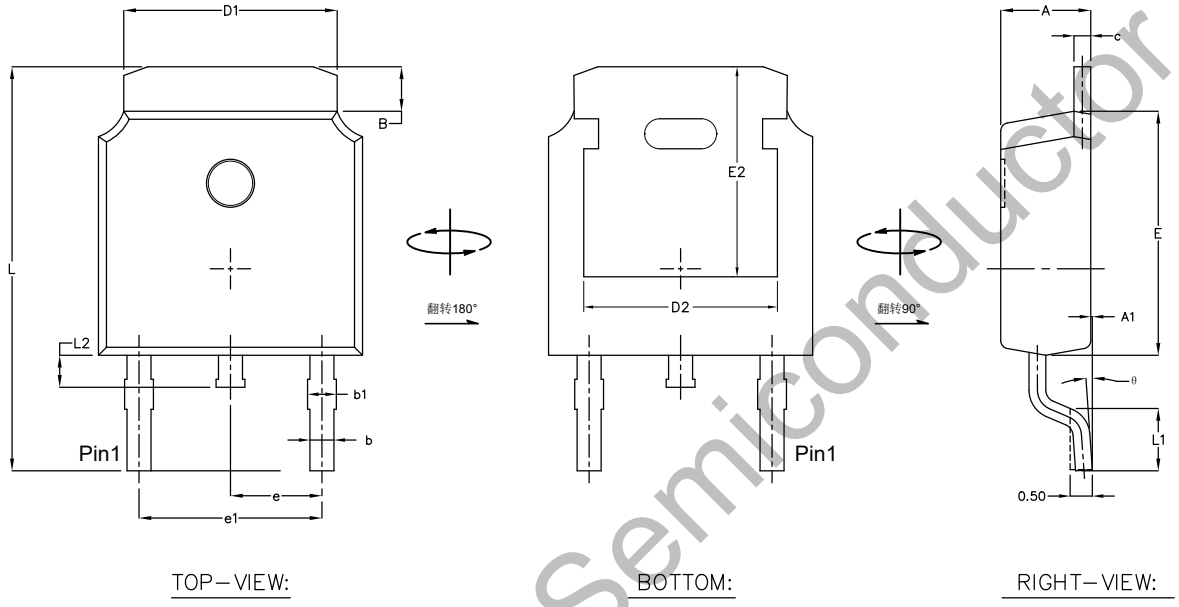
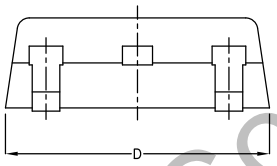
Unit: mm



TOP—VIEW: BOTTOM: RIGHT—VIEW:



FRONT—VIEW:

SYMBOL	MILLIMETER		
	MIN	NOM	MAX
A	2.20	2.25	2.30
A1	0.03	0.08	0.13
B	0.85	1.00	1.15
b	0.59	0.69	0.79
b1	0.74	0.84	0.94
c	0.48	0.50	0.52
D	6.55	6.60	6.65
D1	5.23	5.33	5.43
D2	4.74	4.84	4.94
E	6.05	6.10	6.15
E2	5.15	5.25	5.35
e	2.286TYP.		
e1	4.47	4.57	4.67
L	9.77	9.97	10.17
L1	1.40	1.50	1.60
L2	0.70	0.80	0.90
θ	0°	3°	6°

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