



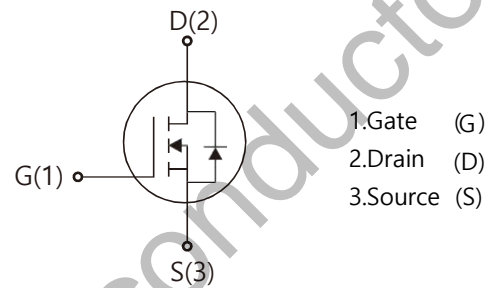
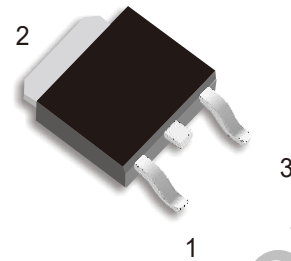
## WGD65R550G

## Features

- Super Junction technology
- Much lower Ron\*A Performance for On-state efficiency
- Better efficiency due to very low FOM
- Ultra-fast body diode
- VDSS=650V, ID=8A
- $R_{DS(on)} : 0.42\text{m}\Omega$  (Typ) @VG=10V



TO-252



## Absolute Maximum Ratings

Parameter	Symbol	Value	Unit
Drain-source voltage	$V_{DS}$	650	V
Continuous drain current $T_C = 25^\circ\text{C}$ $T_C = 100^\circ\text{C}$	$I_D$	8 5	A
Pulsed drain current ( $T_C = 25^\circ\text{C}$ , $t_p$ limited by $T_{jmax}$ )	$I_{D\ pulse}$	32	A
Avalanche energy, single pulse ( $L=30\text{mH}$ , $R_g=30\Omega$ )	$E_{AS}$	65	mJ
Gate-Source voltage	$V_{GS}$	$\pm 30$	V
Power dissipation ( $T_C = 25^\circ\text{C}$ )	$P_{tot}$	73	W
Operating junction and storage temperature	$T_j, T_{stg}$	-55...+150	$^\circ\text{C}$

**Thermal Resistance**

Parameter	Symbol	Value	Unit
Thermal resistance, junction – case. Max	$R_{thJC}$	1.70	°C/W
Thermal resistance, junction – ambient. Max	$R_{thJA}$	143	

**Electrical Characteristic (at  $T_j = 25\text{ °C}$ , unless otherwise specified)**

Parameter	Symbol	Value			Unit	Test Condition
		min.	typ.	max.		
<b>Static Characteristic</b>						
Drain-source breakdown voltage	$BV_{DSS}$	650	-	-	V	$V_{GS}=0V, I_D=250\mu A$
Gate threshold voltage	$V_{GS(th)}$	3	-	4	V	$V_{DS}=V_{GS}, I_D=250\mu A$
Zero gate voltage drain current	$I_{DSS}$	-	-	1	$\mu A$	$V_{DS}=650V, V_{GS}=0V$ $T_C=25\text{ °C}$
		-	1	-		$T_C=150\text{ °C}$
Gate-source leakage current	$I_{GSS}$	-	0.5	100	nA	$V_{GS}=\pm 30V, V_{DS}=0V$
Drain-source on-state resistance	$R_{DS(on)}$	-	0.42	0.55	$\Omega$	$V_{GS}=10V, I_D=4A,$ $T_C=25\text{ °C}$
		-	0.75	-		$T_C=150\text{ °C}$
Transconductance	$g_{fs}$	-	6.6	-	S	$V_{DS}=20V, I_D=4A$
<b>Dynamic Characteristic</b>						
Input Capacitance	$C_{iss}$	-	470	-	pF	$V_{GS}=0V, V_{DS}=100V,$ $f=1MHz$
Output Capacitance	$C_{oss}$	-	25	-		
Reverse Transfer Capacitance	$C_{riss}$	-	0.47	-		
Gate Total Charge	$Q_G$	-	15.6	-	nC	$V_{GS}=10V, V_{DS}=480V,$ $I_D=4A$
Gate-Source charge	$Q_{gs}$	-	3.1	-		
Gate-Drain charge	$Q_{gd}$	-	6.5	-		
Turn-on delay time	$t_{d(on)}$	-	15	-	ns	$T_j=25\text{ °C}, V_{GS}=10V,$ $I_D=4A, V_{DS}=400V,$ $R_g=27\Omega$
Rise time	$t_r$	-	17	-		
Turn-off delay time	$t_{d(off)}$	-	78	-		
Fall time	$t_f$	-	16	-		
Gate resistance	$R_{gint}$	-	14	-	$\Omega$	$f=1MHz$

**Body Diode Characteristic**

Parameter	Symbol	Value			Unit	Test Condition
		min.	typ.	max.		
Body Diode Forward Voltage	$V_{SD}$	0.6	0.85	1.1	V	$V_{GS}=0V, I_{SD}=4A$
Body Diode Reverse Recovery Time	$t_{rr}$	-	210	-	ns	$I_{sd}=4A$ $dI/dt=100A/us$ $V_{ds}=400V$
Body Diode Reverse Recovery Charge	$Q_{rr}$	-	1.76	-	uC	

Typical Performance Characteristics

Fig 1. Output Characteristics (Tj=25°C)

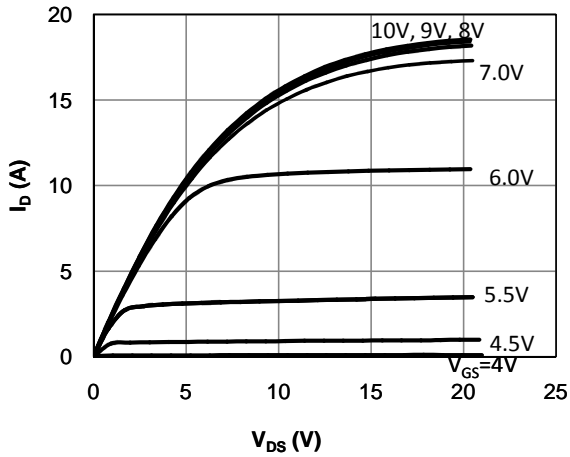


Fig 2. Output Characteristics (Tj=150°C)

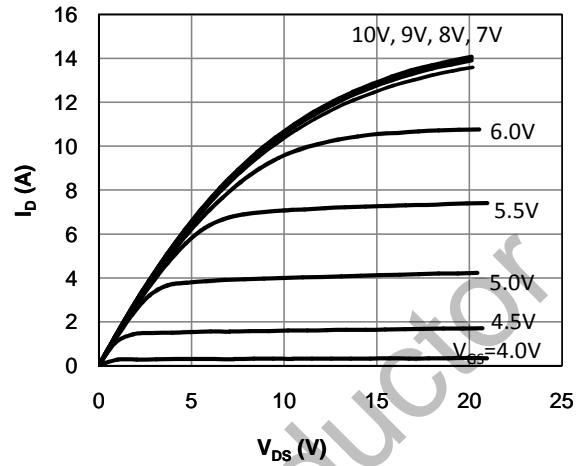


Fig 3: Transfer Characteristics

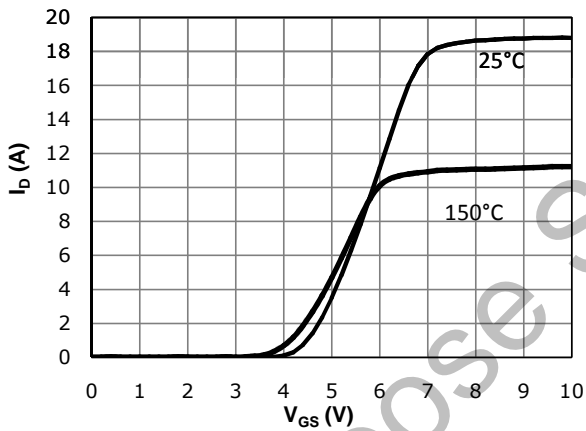


Fig 4: Vth Vs Tj Temperature Characteristics

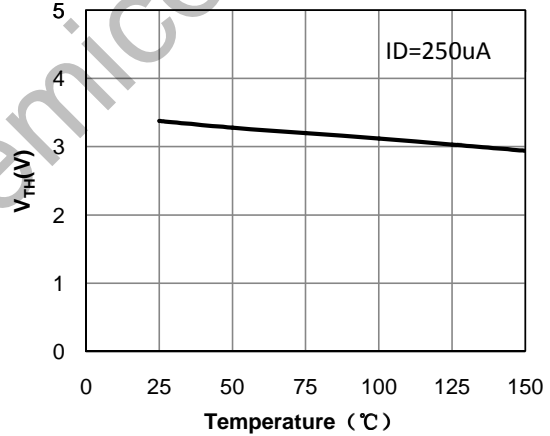


Fig 5: Rds(on) Vs Ids Characteristics (Tc=25°C)

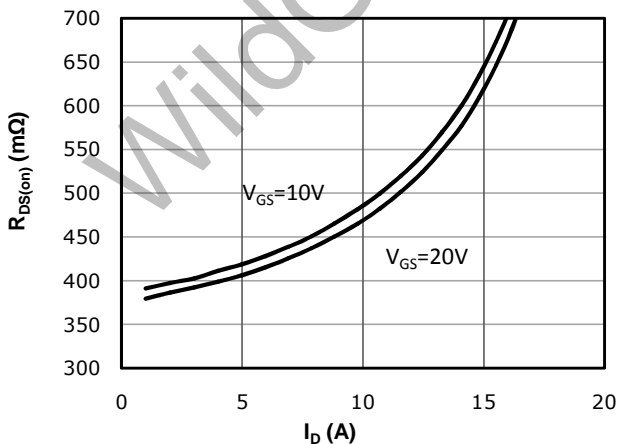


Fig 6: Rds(on) vs. Temperature

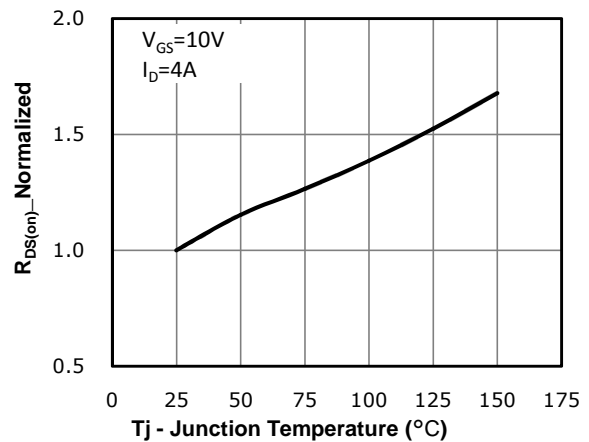


Fig 7: BVdss vs. Temperature

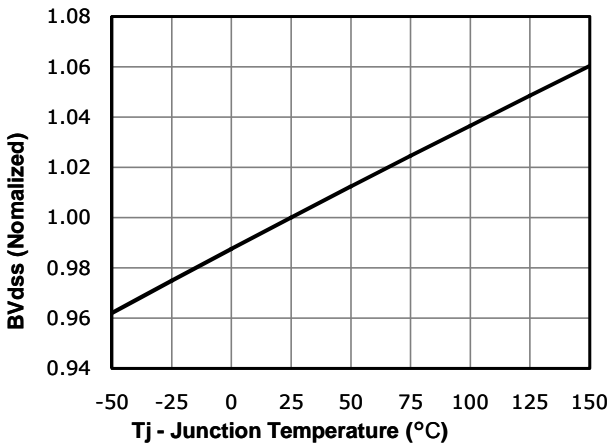


Fig 8: Rds(on) vs Gate Voltage

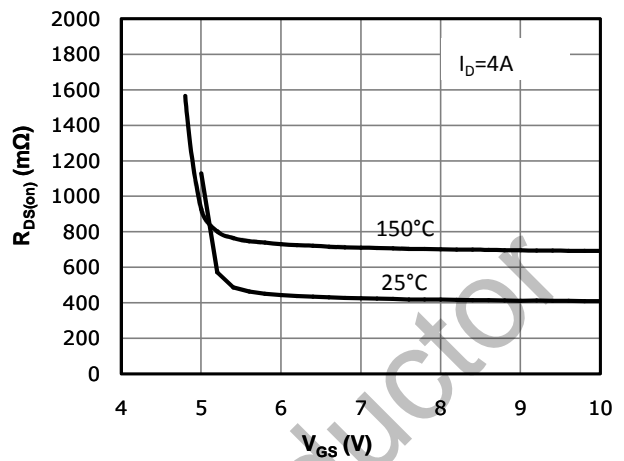


Fig 9: Body-diode Forward Characteristics

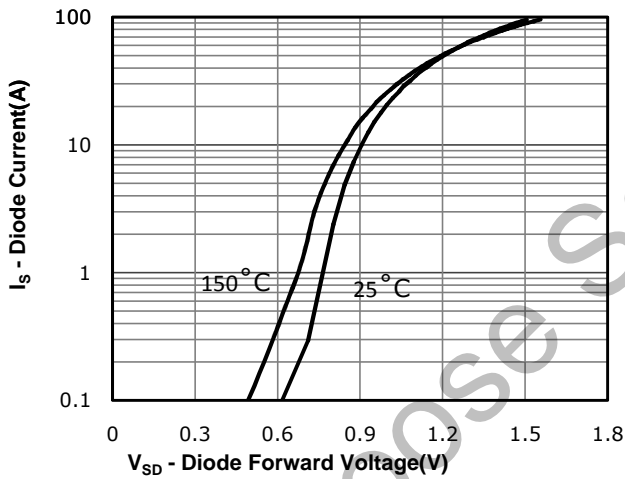


Fig 10: Gate Charge Characteristics

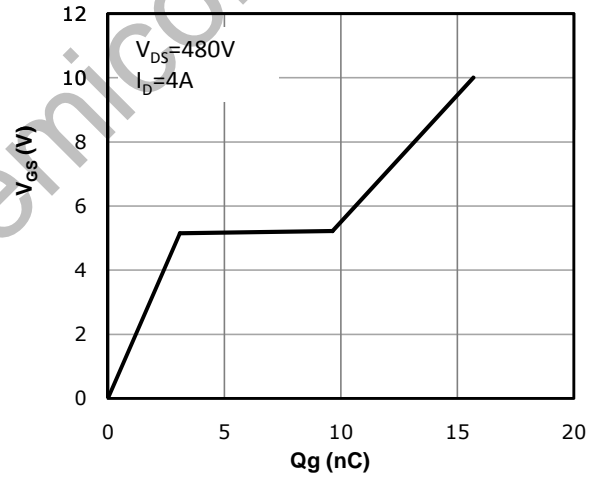


Fig 11: Capacitance Characteristics

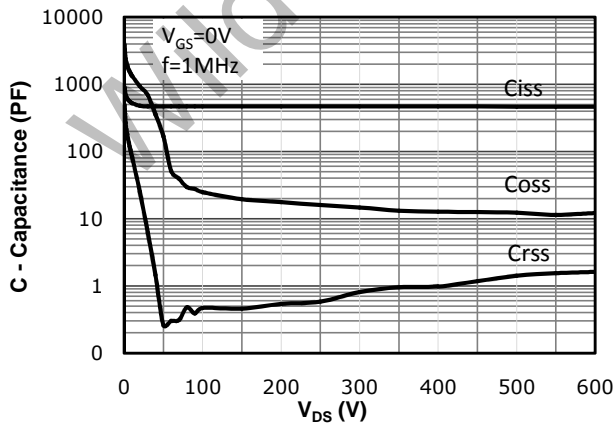


Fig 12: Safe Operating Area

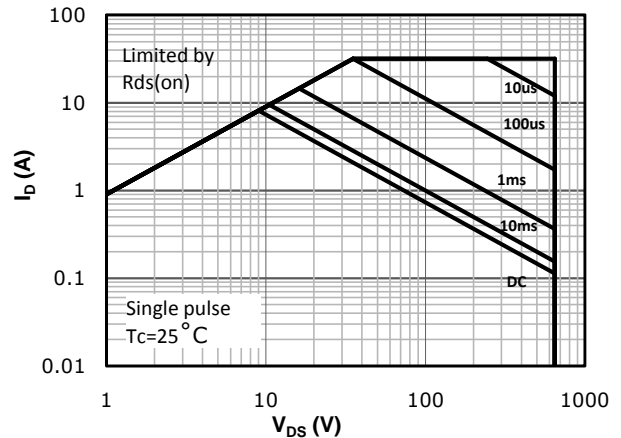
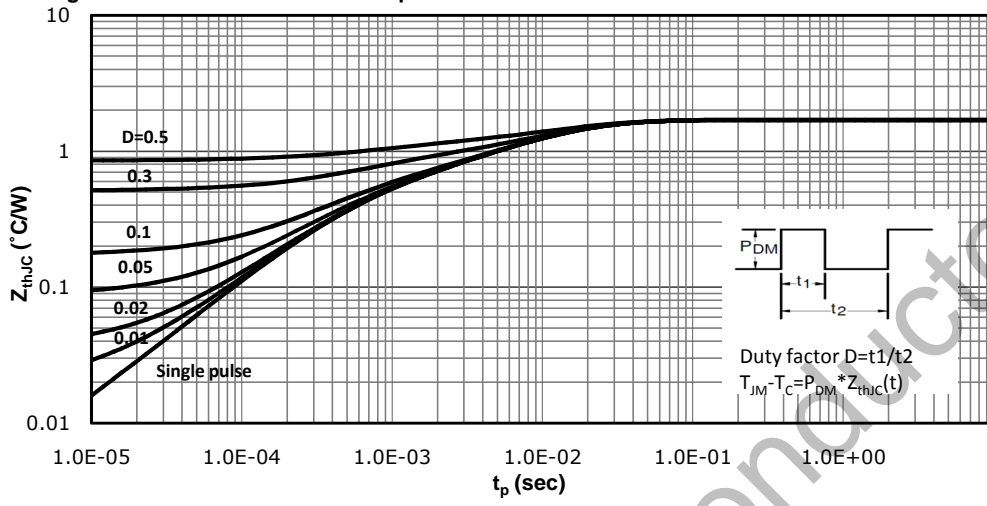


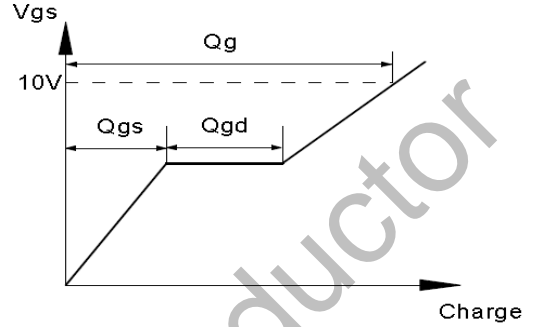
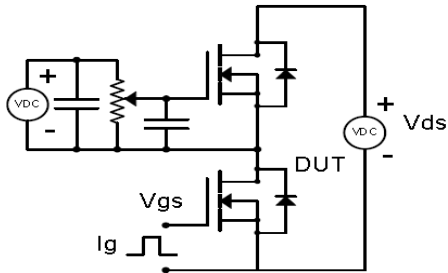
Fig 13: Max. Transient Thermal Impedance



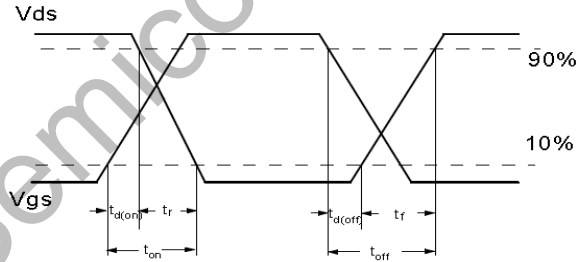
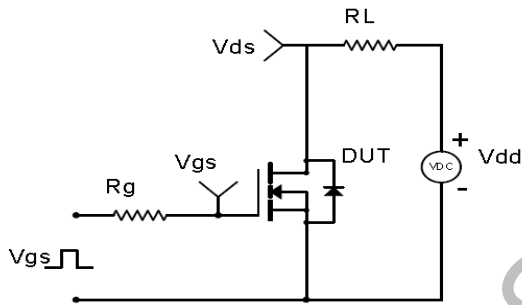
WildGoose Semiconductor

**Test Circuit & Waveform**

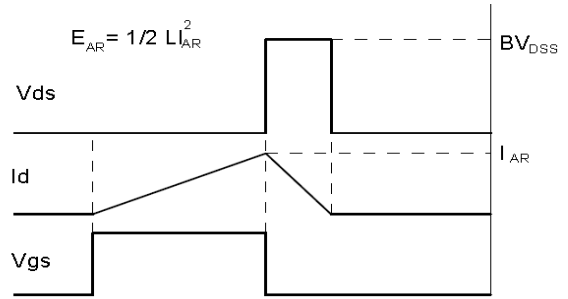
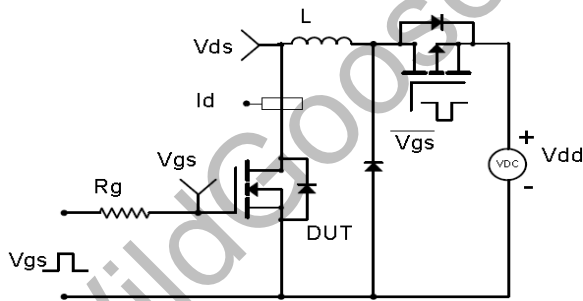
Gate Charge Test Circuit & Waveform



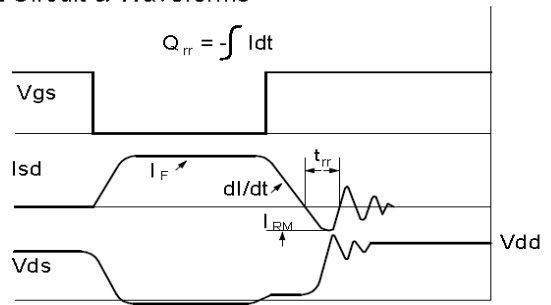
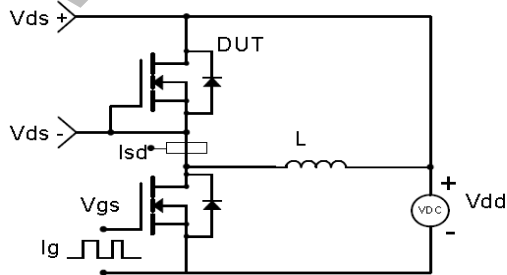
Resistive Switching Test Circuit & Waveforms



Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



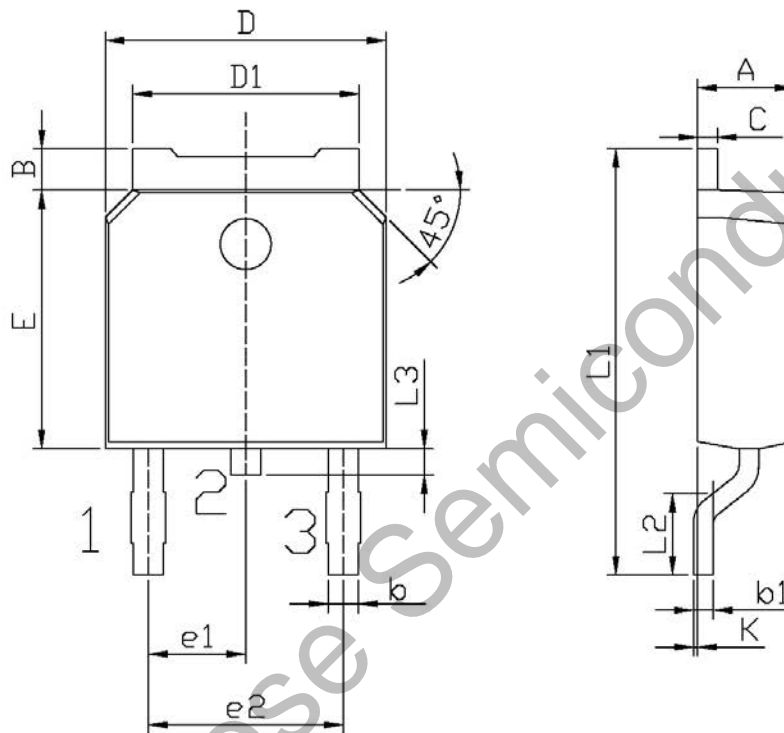
Diode Recovery Test Circuit & Waveforms



**Package Dimension**

TO-252

Unit: mm



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