



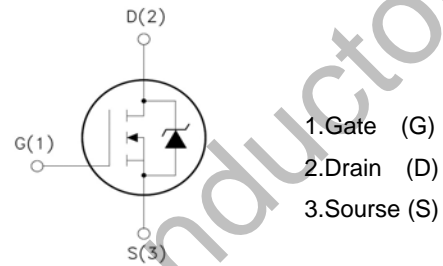
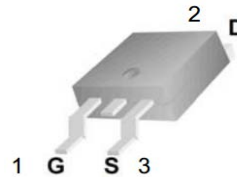
WGD40N10V

100V N-Channel MOSFET

Features:

- Low Intrinsic Capacitances.
- Excellent Switching Characteristics.
- Extended Safe Operating Area.
- Unrivalled Gate Charge : $Q_g = 12.7\text{nC}$ (Typ.).
- $BV_{DSS} = 100\text{V}$, $I_D = 40\text{A}$
- $R_{DS(on)} : 17\text{m}\Omega$ (Max) @ $V_G = 10\text{V}$
- 100% Avalanche Tested

TO-252



Absolute Maximum Ratings* ($T_c = 25^\circ\text{C}$ Unless otherwise noted)

Symbol	PARAMETER	Value	Unit
V_{DSS}	Drain-Source Voltage	100	V
I_D	Drain Current	$T_c = 25^\circ\text{C}$	40
		$T_c = 100^\circ\text{C}$	25
V_{GSS}	Gate-to-Source Voltage	± 20	V
E_{AS}	Single Pulse Avalanche Energy (note1)	0.92	mJ
I_{AR}	Avalanche Current (note2)	40	A
P_D	Power Dissipation ($T_c = 25^\circ\text{C}$)	52	W
T_j	Junction Temperature (MAX)	150	$^\circ\text{C}$
T_{stg}	Storage Temperature	-55~+150	$^\circ\text{C}$
TL	Maximum lead temperature for soldering purpose, 1/8" from case for 5 seconds	300	$^\circ\text{C}$

Thermal Characteristics

Symbol	PARAMETER	Typ.	MAX.	Unit
$R_{\theta JC}$	Thermal Resistance, Junction to Case	-	1.8	$^\circ\text{C}/\text{W}$
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient	-	65	$^\circ\text{C}/\text{W}$
$R_{\theta CS}$	Thermal Resistance, Case to Sink	-	110	$^\circ\text{C}/\text{W}$

Electrical Characteristics ($T_C=25^\circ\text{C}$ unless otherwise noted)

Symbol	Parameter	Condition	Min	Typ	Max	Unit
Off Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	100	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS}=100V, V_{GS}=0V$	-	-	1	μA
I_{GSS}	Gate-Body Leakage Current	$V_{GS}=\pm 20V, V_{DS}=0V$	-	-	± 100	nA
On Characteristics (Note 3)						
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=250\mu A$	1.2	1.9	2.5	V
$R_{DS(ON)}$	Drain-Source On-State Resistance	$V_{GS}=10V, I_D=10A$	-	14	17	m Ω
g_{FS}	Forward Transconductance	$V_{DS}=5V, I_D=20A$	-	48	-	S
Dynamic Characteristics (Note 4)						
C_{iss}	Input Capacitance	$V_{DS}=50V, V_{GS}=0V,$ $F=1.0\text{MHz}$	-	769	-	PF
C_{oss}	Output Capacitance		-	171	-	PF
C_{rss}	Reverse Transfer Capacitance		-	5.1	-	PF
Switching Characteristics (Note 4)						
$t_{d(on)}$	Turn-on Delay Time	$V_{DD}=50V, R_L=2.5\Omega$ $V_{GS}=10V, R_{GEN}=6\Omega$	-	4.3	-	nS
t_r	Turn-on Rise Time		-	5.1	-	nS
$t_{d(off)}$	Turn-Off Delay Time		-	16.7	-	nS
t_f	Turn-Off Fall Time		-	8.7	-	nS
Q_g	Total Gate Charge	$V_{DS}=50V, I_D=10A,$ $V_{GS}=10V$	-	12.7	-	nC
Q_{gs}	Gate-Source Charge		-	6.7	-	nC
Q_{gd}	Gate-Drain Charge		-	3.3	-	nC
Drain-Source Diode Characteristics						
V_{SD}	Diode Forward Voltage (Note 3)	$V_{GS}=0V, I_S=10A$	-	-	1.0	V
I_S	Diode Forward Current (Note 2)	-	-	-	40	A
t_{rr}	Reverse Recovery Time	$T_J = 25^\circ\text{C}, I_F = 15A$	-	39	-	nS
Q_{rr}	Reverse Recovery Charge	$di/dt = 100A/\mu s$ (Note 3)	-	30	-	nC
t_{on}	Forward Turn-On Time	Intrinsic turn-on time is negligible (turn-on is dominated by LS+LD)				

Notes:

1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. Surface Mounted on FR4 Board, $t \leq 10$ sec.
3. Pulse Test: Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 2\%$.
4. Guaranteed by design, not subject to production
5. EAS Condition : $T_J=25^\circ\text{C}, V_{DD}=50V, V_G=10V, L=0.5\text{mH}, R_g=25\Omega, I_{AS}=32A$

Typical Electrical & Thermal Characteristics

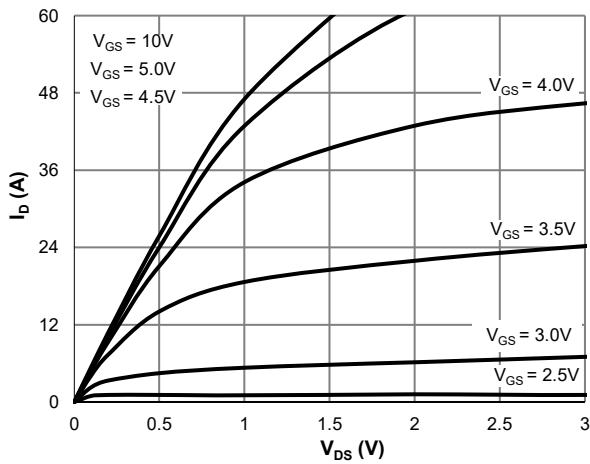


Figure 1: Saturation Characteristics

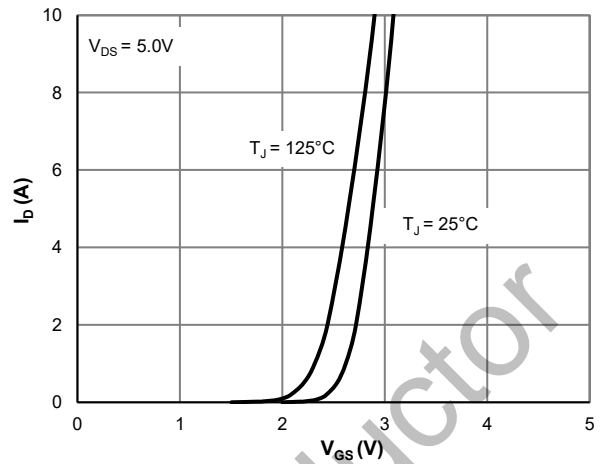


Figure 2: Transfer Characteristics

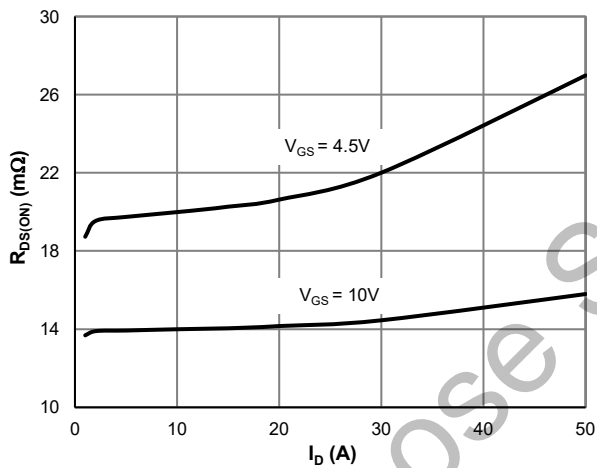


Figure 3: $R_{DS(ON)}$ vs. Drain Current

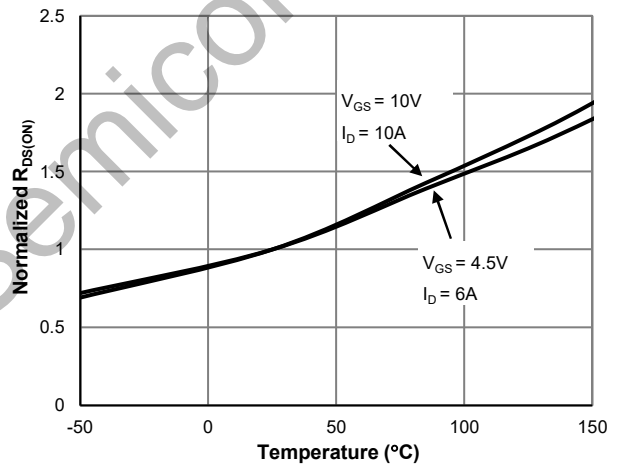


Figure 4: $R_{DS(ON)}$ vs. Junction Temperature

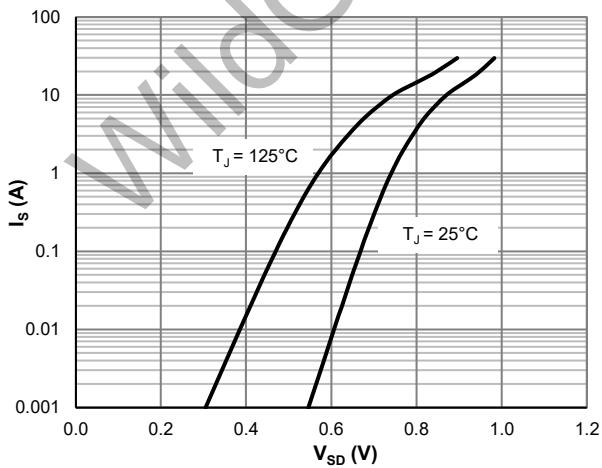


Figure 5: Body-Diode Characteristics

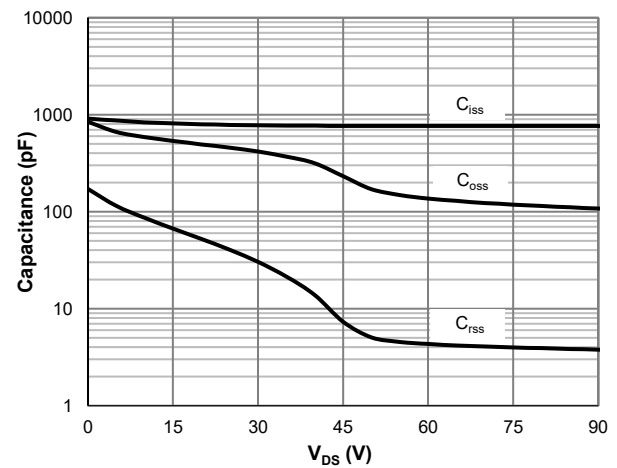


Figure 6: Capacitance Characteristics

Typical Electrical & Thermal Characteristics

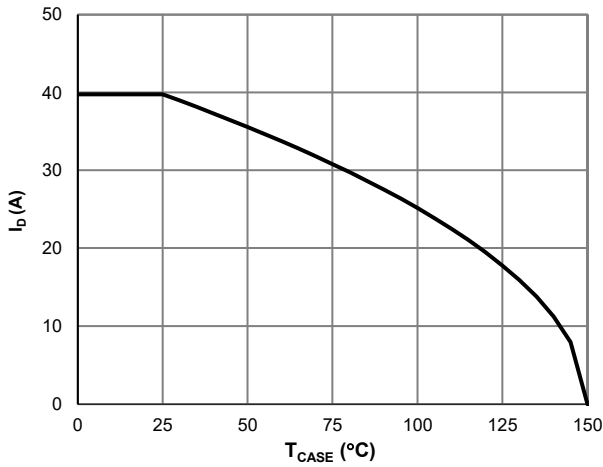


Figure 7: Current De-rating

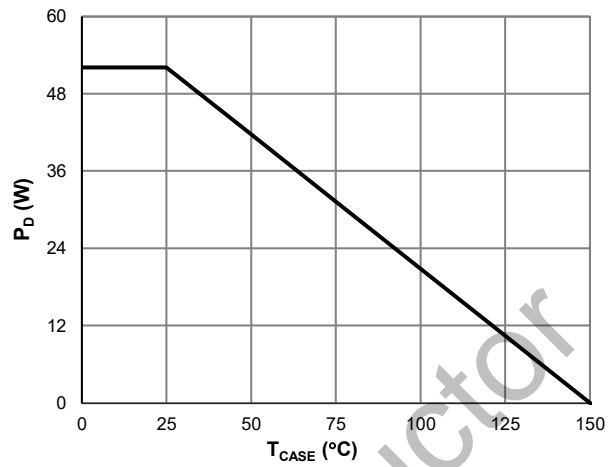


Figure 8: Power De-rating

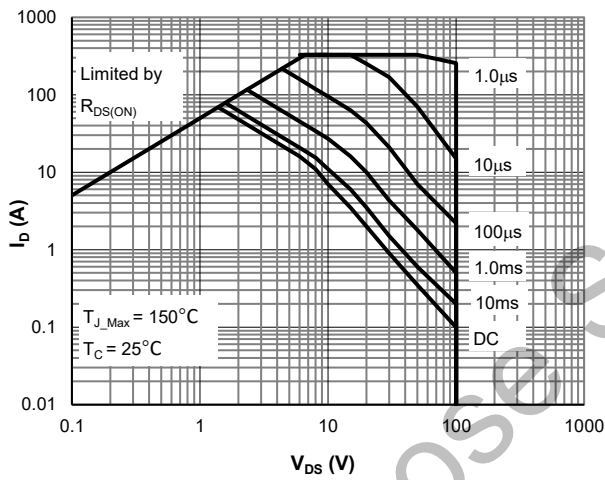


Figure 9: Maximum Safe Operating Area

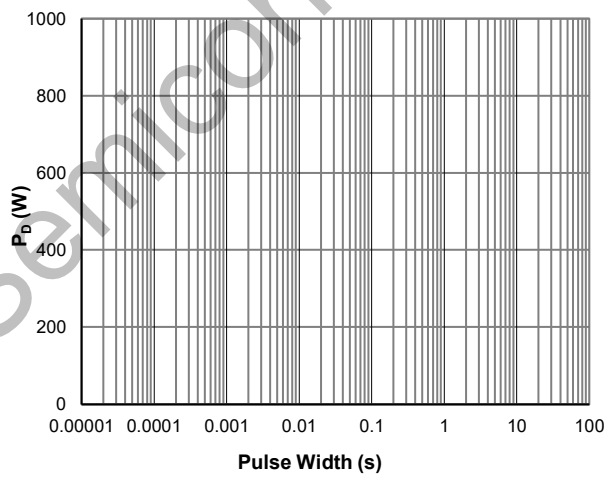


Figure 10: Single Pulse Power Rating, Junction-to-Case

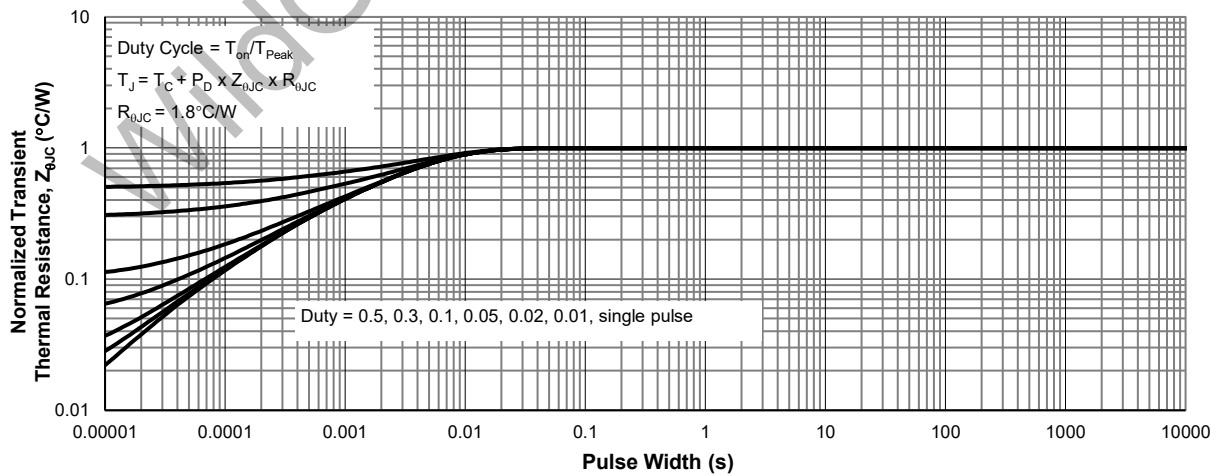


Figure 11: Normalized Maximum Transient Thermal Impedance

Package Dimension

TO-252

Unit:mm

