


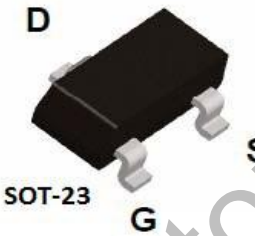
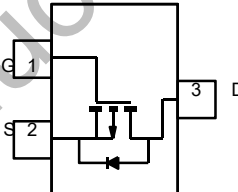


**WG2301**  
20V P-Channel MOSFET

**Features:**

- Low Intrinsic Capacitances.
- Excellent Switching Characteristics.
- Extended Safe Operating Area.
- Unrivalled Gate Charge :Qg= 3.3nC (Typ.).
- BVDSS=-20V, ID=-3A
- RDS(on) : 110m Ω (Max) @VG=-4.5V
- 100% Avalanche Tested

SOT-23 

Marking:A1SHB

Top View

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

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V <sub>DS</sub>	-20	V
Gate-Source Voltage	V <sub>GS</sub>	±12	V
Drain Current-Continuous	I <sub>D</sub>	-3	A
Drain Current -Pulsed (Note 1)	I <sub>DM</sub>	-10	A
Maximum Power Dissipation	P <sub>D</sub>	1	W
Operating Junction and Storage Temperature Range	T <sub>J</sub> , T <sub>STG</sub>	-55 To 150	°C

**Thermal Characteristic**

Thermal Resistance, Junction-to-Ambient (Note 2)	R <sub>θJA</sub>	125	°C/W
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**Electrical Characteristics (T<sub>A</sub>=25°C unless otherwise noted)**

Parameter	Symbol	Condition	Min	Typ	Max	Unit
<b>Off Characteristics</b>						
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	V <sub>GS</sub> =0V, I <sub>D</sub> =-250μA	-20	-24	-	V
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> =-20V, V <sub>GS</sub> =0V	-	-	-1	μA
<b>Parameter</b>	<b>Symbol</b>	<b>Condition</b>	<b>Min</b>	<b>Typ</b>	<b>Max</b>	<b>Unit</b>
Gate-Body Leakage Current	I <sub>GSS</sub>	V <sub>GS</sub> =±12V, V <sub>DS</sub> =0V	-	-	±100	nA
<b>On Characteristics (Note3)</b>						
Gate Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =-250μA	-0.4	-0.7	-1	V
Drain-Source On-State Resistance	R <sub>DS(ON)</sub>	V <sub>GS</sub> =-4.5V, I <sub>D</sub> =-3A	-	64	110	mΩ
		V <sub>GS</sub> =-2.5V, I <sub>D</sub> =-2A	-	89	140	mΩ
Forward Transconductance	g <sub>FS</sub>	V <sub>DS</sub> =-5V, I <sub>D</sub> =-2A	5	-	-	S
<b>Dynamic Characteristics (Note4)</b>						
Input Capacitance	C <sub>iss</sub>	V <sub>DS</sub> =-10V, V <sub>GS</sub> =0V, F=1.0MHz	-	405	-	PF
Output Capacitance	C <sub>oss</sub>		-	75	-	PF
Reverse Transfer Capacitance	C <sub>rss</sub>		-	55	-	PF
<b>Switching Characteristics (Note4)</b>						
Turn-on Delay Time	t <sub>d(on)</sub>	V <sub>DD</sub> =-10V, I <sub>D</sub> =-1A V <sub>GS</sub> =- 4.5V, R <sub>GEN</sub> =10Ω	-	11	-	nS
Turn-on Rise Time	t <sub>r</sub>		-	35	-	nS
Turn-Off Delay Time	t <sub>d(off)</sub>		-	30	-	nS
Turn-Off Fall Time	t <sub>f</sub>		-	10	-	nS
Total Gate Charge	Q <sub>g</sub>	V <sub>DS</sub> =-10V, I <sub>D</sub> =-3A, V <sub>GS</sub> =- 2.5V	-	3.3	12	nC
Gate-Source Charge	Q <sub>gs</sub>		-	0.7	-	nC
Gate-Drain Charge	Q <sub>gd</sub>		-	1.3	-	nC
<b>Drain-Source Diode Characteristics</b>						
Diode Forward Voltage (Note3)	V <sub>SD</sub>	V <sub>GS</sub> =0V, I <sub>S</sub> =1.3A	-	-	-1.2	V
Diode Forward Current (Note2)	I <sub>S</sub>		-	-	-3	A

**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

Typical Characteristics

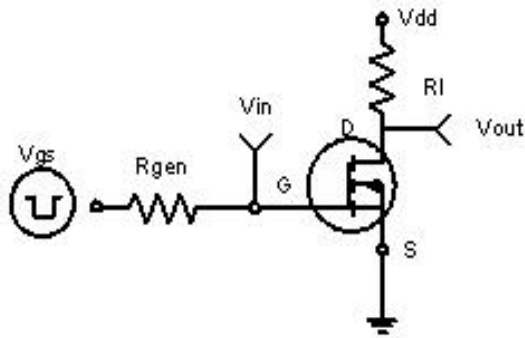


Figure 1: Switching Test Circuit

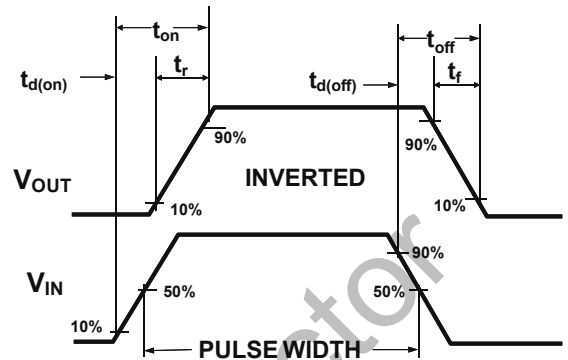


Figure 2: Switching Waveforms

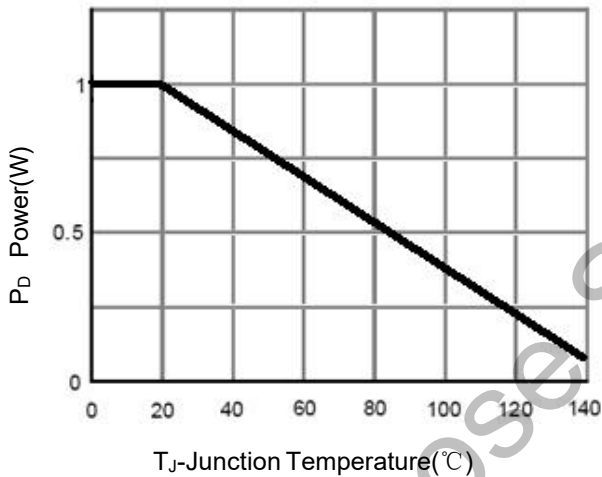


Figure 3 Power Dissipation

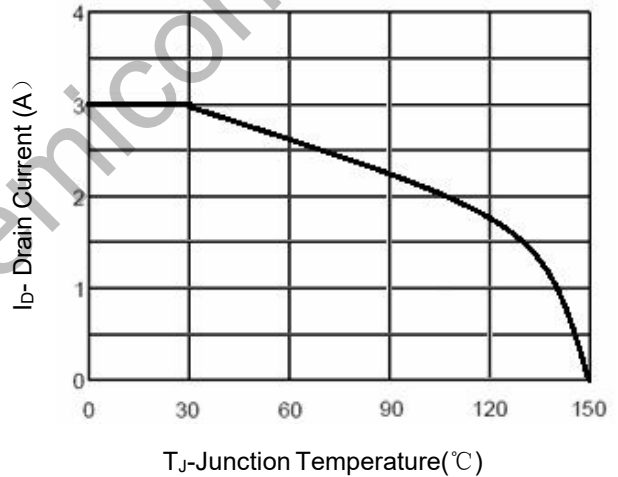


Figure 4 Drain Current

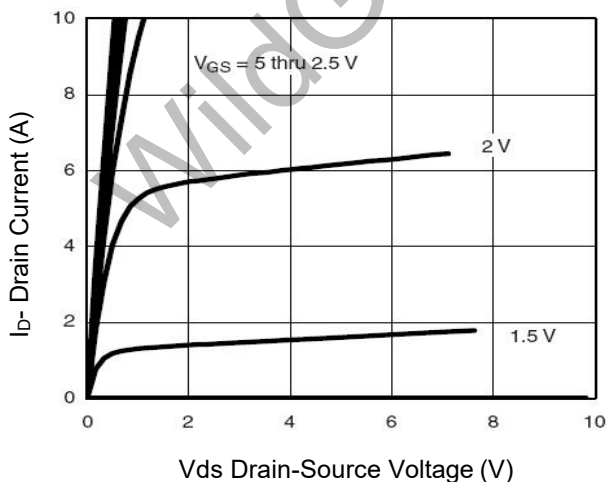


Figure 5 Output Characteristics

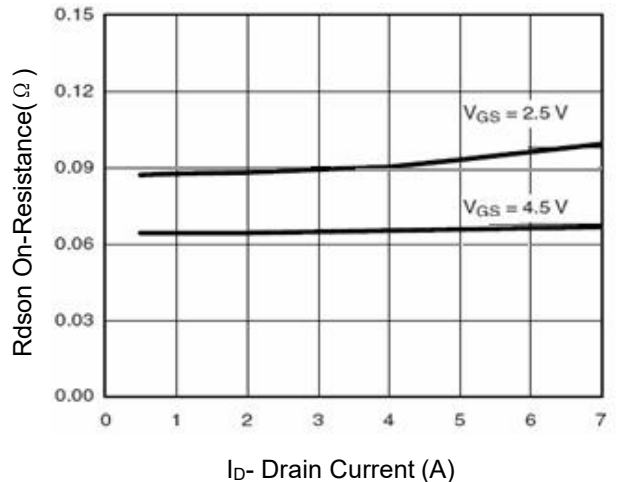


Figure 6 Drain-Source On-Resistance

Typical Characteristics (Continued)

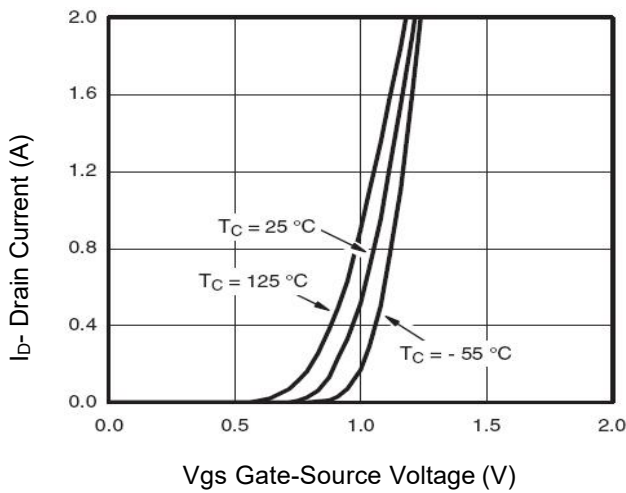


Figure 7 Transfer Characteristics

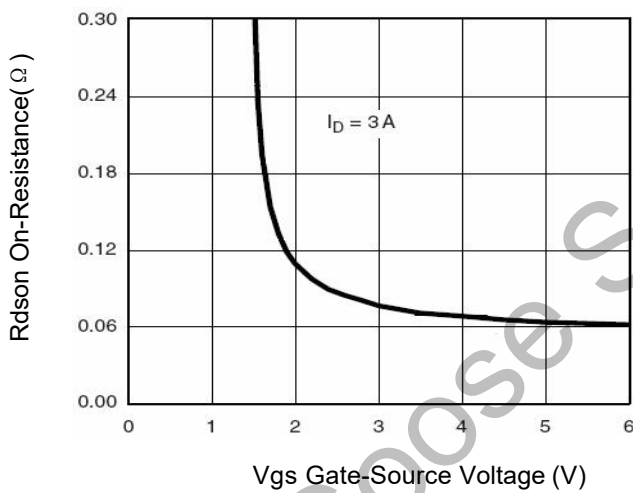


Figure 9 Rdson vs Vgs

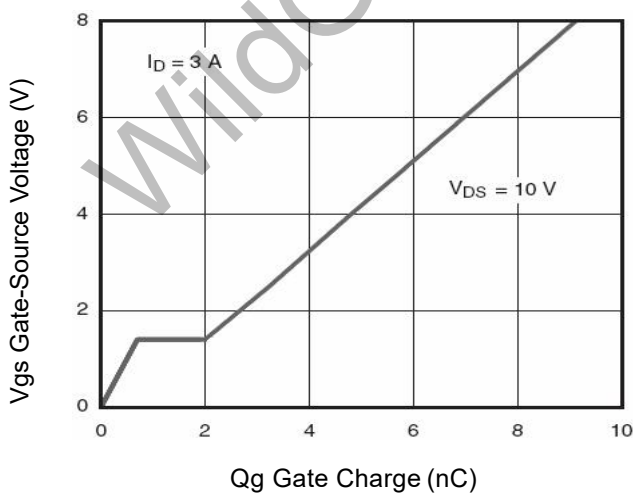


Figure 11 Gate Charge

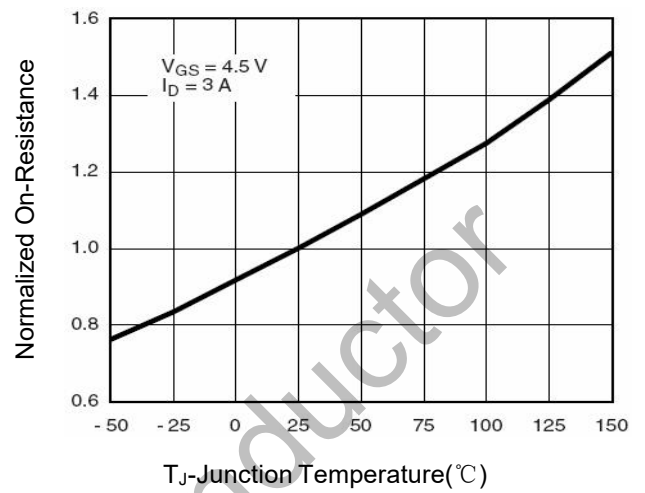


Figure 8 Drain-Source On-Resistance

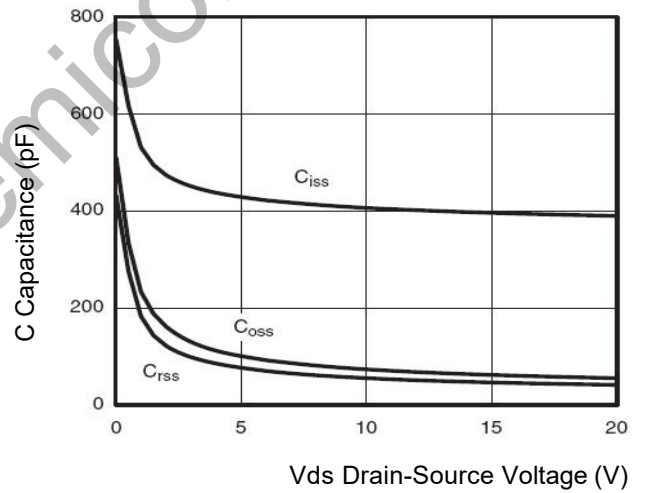


Figure 10 Capacitance vs Vds

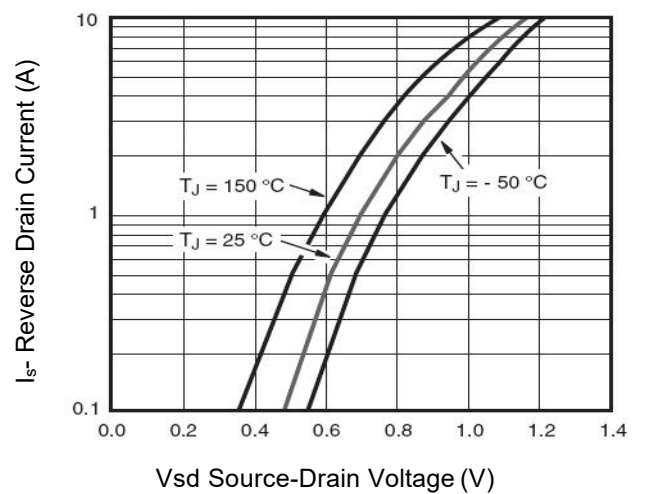


Figure 12 Source- Drain Diode Forward

Typical Characteristics (Continued)

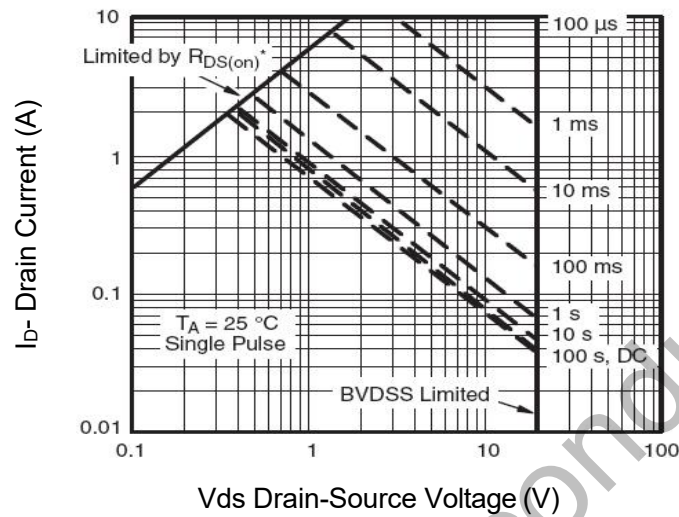


Figure 13 Safe Operation Area

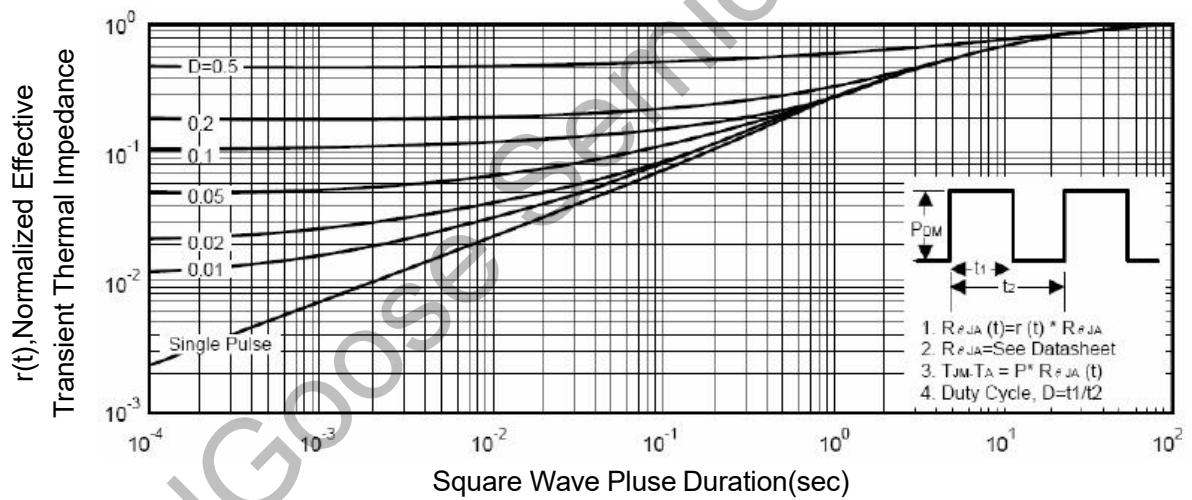


Figure 14 Normalized Maximum Transient Thermal Impedance