

# AP3100A

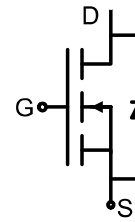
## N-Channel Enhancement Mosfet

# AIPOWER

## DATA SHEET

### Feature

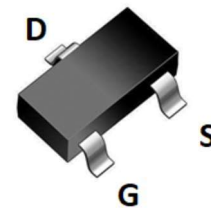
- 30V,8A  
 $R_{DS(ON)} < 12m\Omega @ V_{GS}=10V$  TYP:9.8m $\Omega$   
 $R_{DS(ON)} < 16m\Omega @ V_{GS}=4.5V$  TYP:13.5 m $\Omega$
- Advanced Trench Technology
- Lead free product is acquired
- Excellent  $R_{DS(ON)}$  and Low Gate Charge



Schematic Diagram

### Application

- PWM applications
- Load Switch
- Power management



SOT-23-3 top view

### Package Marking and Ordering Information

Device Marking	Device	Device Package	Reel Size	Tape width	Quantity (PCS)
3100A	AP3100A	SOT23-3	7 inch	-	3000

### ABSOLUTE MAXIMUM RATINGS ( $T_a=25^{\circ}C$ unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	$V_{DS}$	30	V
Gate-Source Voltage	$V_{GS}$	$\pm 20$	V
Continuous Drain Current ( $T_a=25^{\circ}C$ )	$I_D$	8	A
Continuous Drain Current ( $T_a=100^{\circ}C$ )	$I_D$	6.2	A
Pulsed Drain Current <sup>(1)</sup>	$I_{DM}$	40	A
Power Dissipation	$P_D$	1.6	W
Thermal Resistance from Junction to Ambient <sup>(3)</sup>	$R_{\theta JA}$	78	$^{\circ}C/W$
Junction Temperature	$T_J$	150	$^{\circ}C$
Storage Temperature	$T_{STG}$	-55~ +150	$^{\circ}C$

**MOSFET ELECTRICAL CHARACTERISTICS(T<sub>a</sub>=25°C unless otherwise noted)**

Parameter	Symbol	Test Condition	Min	Type	Max	Unit
<b>Static Characteristics</b>						
Drain-source breakdown voltage	V <sub>(BR)DSS</sub>	V <sub>GS</sub> = 0V, I <sub>D</sub> =250μA	30	-	-	V
Zero gate voltage drain current	I <sub>DSS</sub>	V <sub>DS</sub> =30V, V <sub>GS</sub> = 0V	-	-	1	μA
Gate-body leakage current	I <sub>GSS</sub>	V <sub>GS</sub> =±20V, V <sub>DS</sub> = 0V	-	-	±100	nA
Gate threshold voltage <sup>(2)</sup>	V <sub>GS(th)</sub>	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250μA	1	1.5	2.5	V
Drain-source on-resistance <sup>(2)</sup>	R <sub>DS(on)</sub>	V <sub>GS</sub> =10V, I <sub>D</sub> =8A	-	9.8	12	mΩ
		V <sub>GS</sub> =4.5V, I <sub>D</sub> =4A	-	13.5	16	
<b>Dynamic characteristics</b>						
Input Capacitance	C <sub>iss</sub>	V <sub>DS</sub> =15V, V <sub>GS</sub> =0V, f =1MHz	-	1140	-	pF
Output Capacitance	C <sub>oss</sub>		-	175	-	
Reverse Transfer Capacitance	C <sub>rss</sub>		-	151	-	
<b>Switching characteristics</b>						
Turn-on delay time	t <sub>d(on)</sub>	V <sub>DD</sub> =15V, I <sub>D</sub> =4A, V <sub>GS</sub> =10V, R <sub>G</sub> =3Ω	-	15	-	ns
Turn-on rise time	t <sub>r</sub>		-	19	-	
Turn-off delay time	t <sub>d(off)</sub>		-	35	-	
Turn-off fall time	t <sub>f</sub>		-	21	-	
Total Gate Charge	Q <sub>g</sub>	V <sub>DS</sub> =15V, I <sub>D</sub> =4A, V <sub>GS</sub> =10V	-	13.3	-	nC
Gate-Source Charge	Q <sub>gs</sub>		-	3.1	-	
Gate-Drain Charge	Q <sub>gd</sub>		-	5	-	
<b>Source-Drain Diode characteristics</b>						
Diode Forward voltage <sup>(2)</sup>	V <sub>DS</sub>	V <sub>GS</sub> =0V, I <sub>S</sub> =8A	-	-	1.2	V
Diode Forward current <sup>(3)</sup>	I <sub>S</sub>		-	-	8	A

**Notes:**

1. Repetitive Rating: pulse width limited by maximum junction temperature
2. Pulse Test: pulse width≤300μs, duty cycle≤2%
3. Surface Mounted on FR4 Board,t≤10 sec

**Test Circuit**

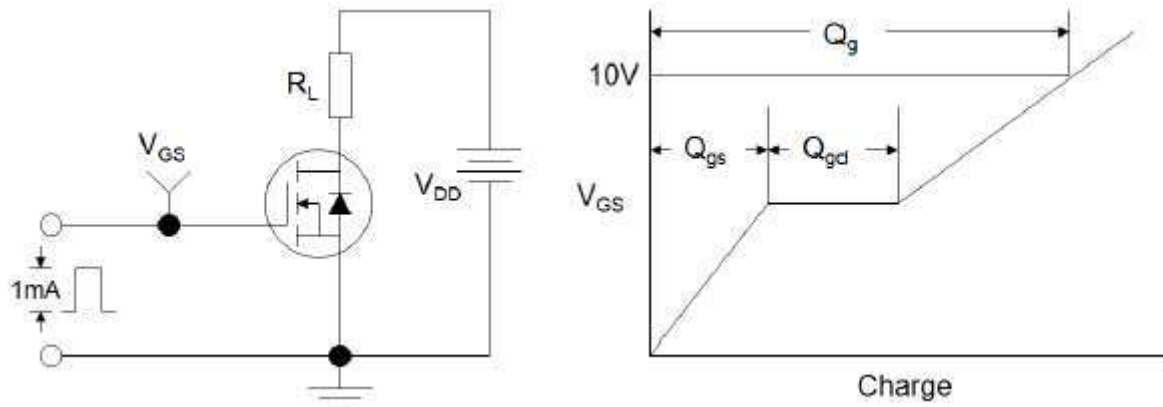


Figure1:Gate Charge Test Circuit & Waveform

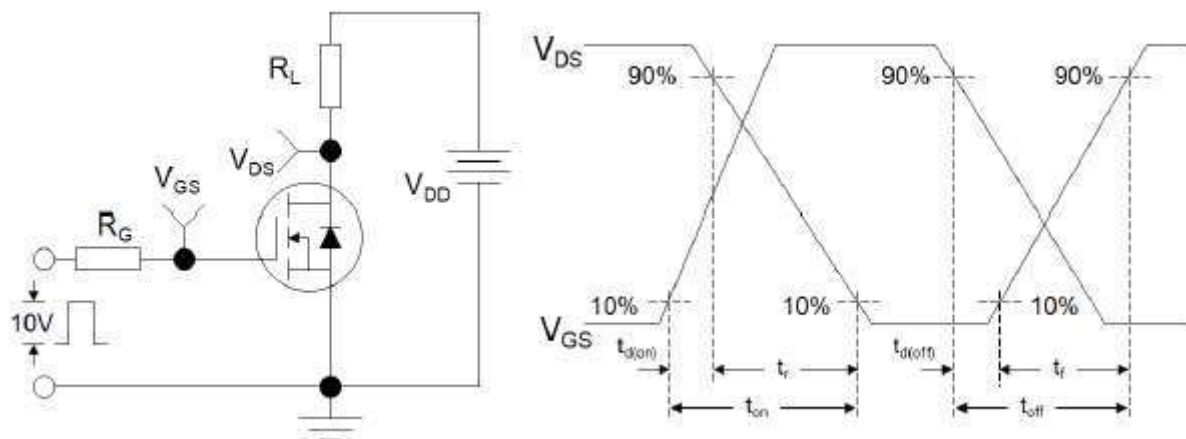


Figure 2: Resistive Switching Test Circuit & Waveforms

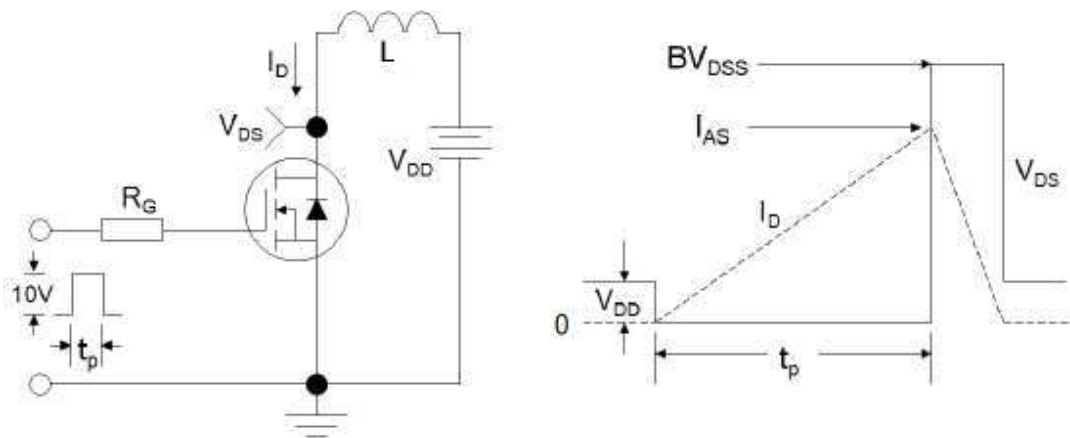
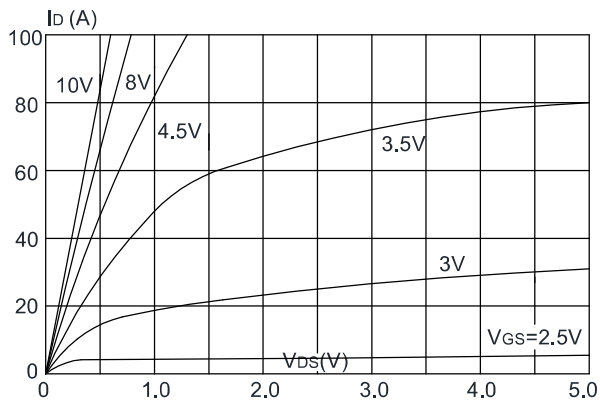


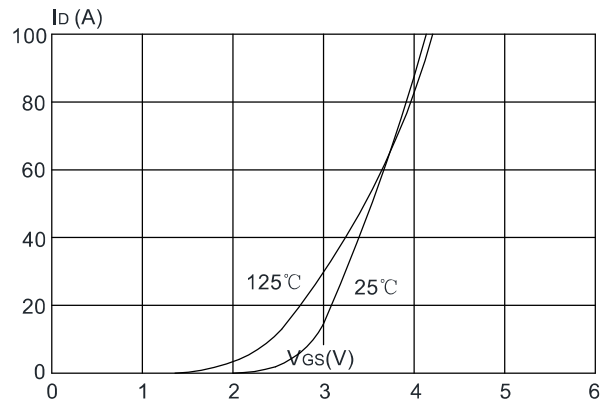
Figure 3:Unclamped Inductive Switching Test Circuit & Waveforms

**Typical Performance Characteristics**

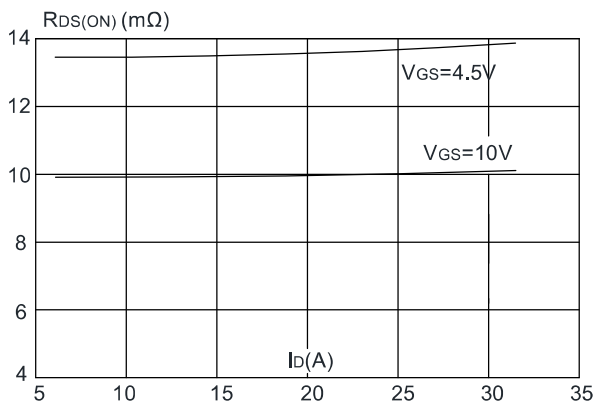
**Figure 1: Output Characteristics**



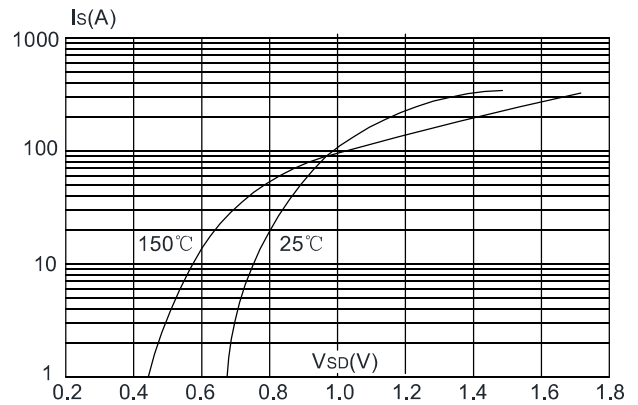
**Figure 2: Typical Transfer Characteristics**



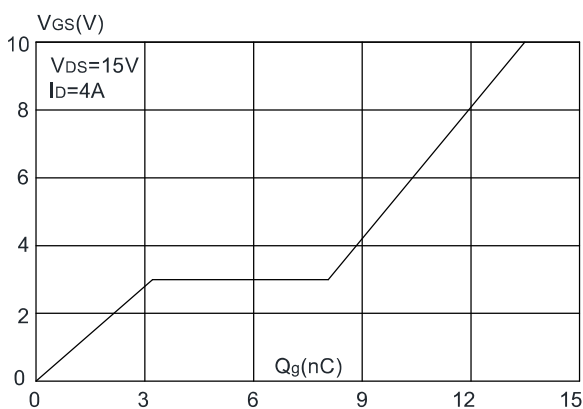
**Figure 3: On-resistance vs. Drain Current**



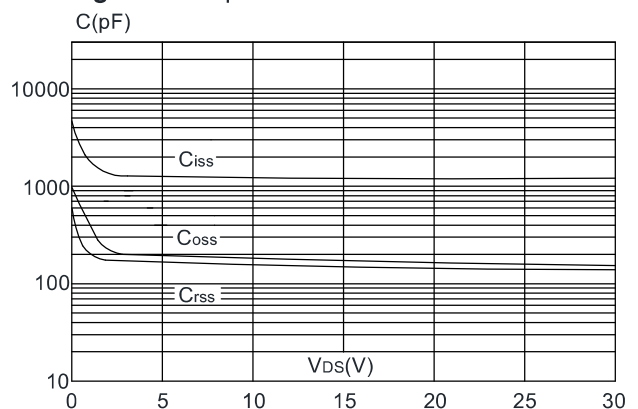
**Figure 4: Body Diode Characteristics**



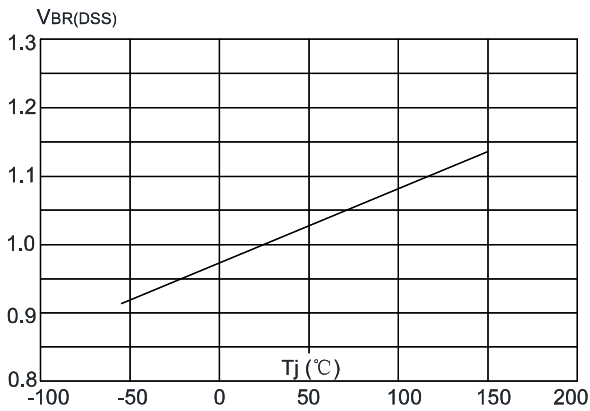
**Figure 5: Gate Charge Characteristics**



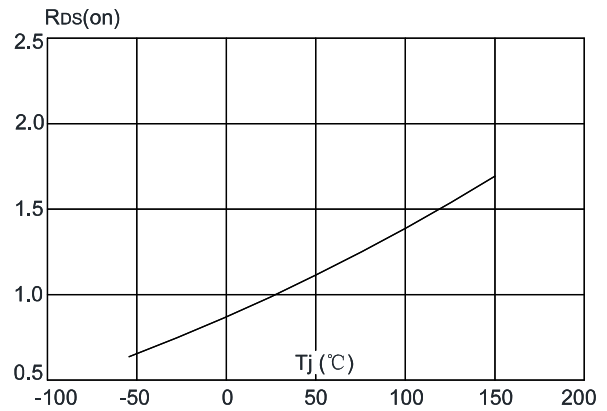
**Figure 6: Capacitance Characteristics**



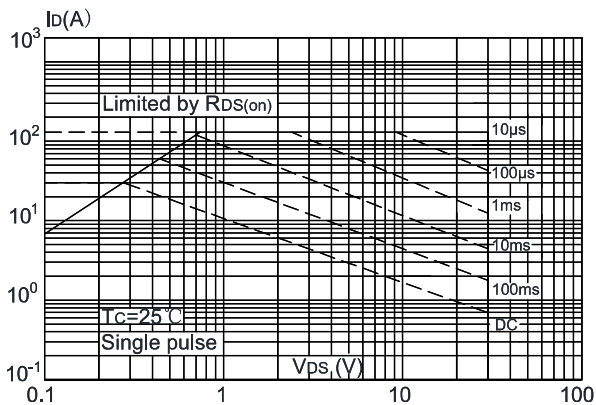
**Figure 7:** Normalized Breakdown Voltage vs. Junction Temperature



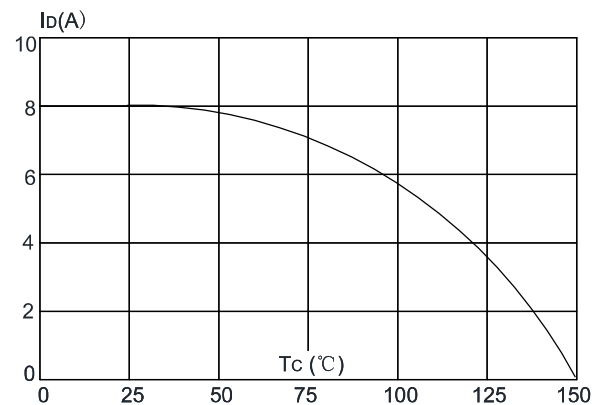
**Figure 8:** Normalized on Resistance vs. Junction Temperature



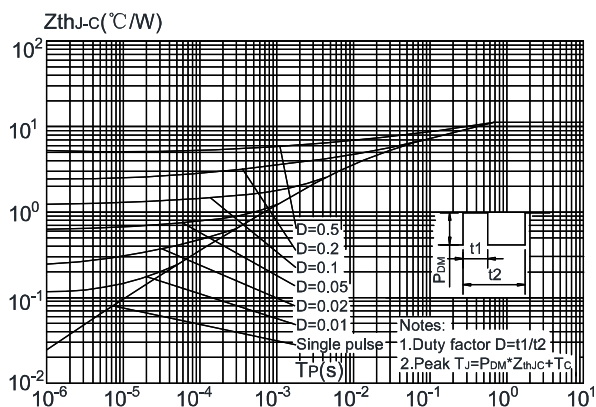
**Figure 9:** Maximum Safe Operating Area



**Figure 10:** Maximum Continuous Drain Current vs. Case Temperature



**Figure.11:** Maximum Effective Transient Thermal Impedance, Junction-to-Case



**SOT-23-3 Package Information**

