

# AP2310

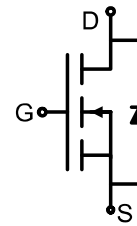
## N-Channel Enhancement Mosfet

### Feature

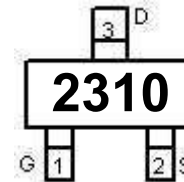
- 60V,3A  
 $R_{DS(ON)} < 80m\Omega @ V_{GS}=10V$  TYP=55 m $\Omega$   
 $R_{DS(ON)} < 90m\Omega @ V_{GS}=4.5V$  TYP=70m $\Omega$
- Advanced Trench Technology
- Lead free product is acquired

### Application

- Interfacing Switching
- Load Switching
- Power management



Schematic Diagram



Marking and Pin Assignment



SOT-23 -3L Top View

### Package Marking and Ordering Information

Device Marking	Device	Device Package	Reel Size	Tape width	Quantity (PCS)
2310	AP2310	Sot-23-3	7 inch	-	3000

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

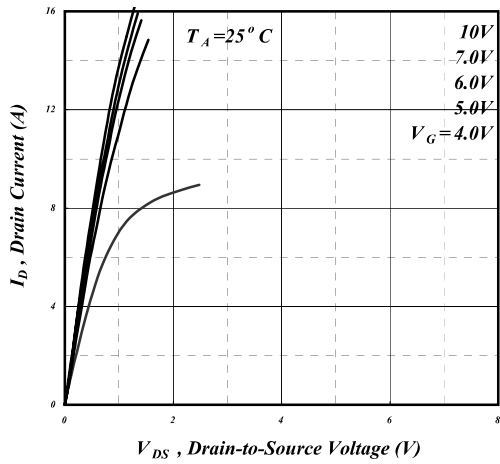
Parameter	Symbol	Value	Unit
Drain-Source Voltage	$V_{DS}$	60	V
Gate-Source Voltage	$V_{GS}$	$\pm 20$	V
Continuous Drain Current ( $T_a = 25^\circ\text{C}$ )	$I_D$	3	A
Continuous Drain Current ( $T_a = 70^\circ\text{C}$ )	$I_D$	2.3	A
Pulsed Drain Current	$I_{DM}$	12	A
Power Dissipation	$P_D$	1.68	W
Thermal Resistance from Junction to Ambient <sup>(4)</sup>	$R_{\theta JA}$	90	$^\circ\text{C}/\text{W}$
Junction Temperature	$T_J$	150	$^\circ\text{C}$
Storage Temperature	$T_{STG}$	-55~ +150	$^\circ\text{C}$

MOSFET ELECTRICAL CHARACTERISTICS( $T_a=25^{\circ}\text{C}$  unless otherwise noted)

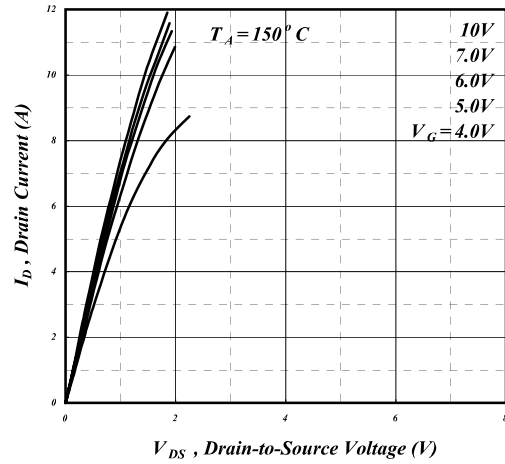
Parameter	Symbol	Test Condition	Min	Type	Max	Unit
<b>Static Characteristics</b>						
Drain-source breakdown voltage	$V_{(BR)DSS}$	$V_{GS} = 0V, I_D = 250\mu A$	60	-	-	V
Zero gate voltage drain current	$I_{DSS}$	$V_{DS} = 60V, V_{GS} = 0V$	-	-	1	$\mu A$
Gate-body leakage current	$I_{GSS}$	$V_{GS} = \pm 20V, V_{DS} = 0V$	-	-	$\pm 100$	nA
Gate threshold voltage <sup>(3)</sup>	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\mu A$	1.2	1.7	2.5	V
Drain-source on-resistance <sup>(3)</sup>	$R_{DS(on)}$	$V_{GS} = 10V, I_D = 3A$	-	55	80	m $\Omega$
		$V_{GS} = 4.5V, I_D = 2A$	-	75	90	
<b>Dynamic characteristics</b>						
Input Capacitance	$C_{iss}$	$V_{DS} = 25V, V_{GS} = 0V, f = 1MHz$	-	460	-	pF
Output Capacitance	$C_{oss}$		-	35	-	
Reverse Transfer Capacitance	$C_{rss}$		-	30	-	
<b>Switching characteristics</b>						
Turn-on delay time	$t_{d(on)}$	$V_{DD} = 30V, I_D = 1A,$ $V_{GS} = 10V, R_G = 3.3\Omega$	-	5	-	ns
Turn-on rise time	$t_r$		-	6	-	
Turn-off delay time	$t_{d(off)}$		-	17	-	
Turn-off fall time	$t_f$		-	3.5	-	
Total Gate Charge	$Q_g$	$V_{DS} = 30V, I_D = 3A,$ $V_{GS} = 4.5V$	-	6	-	nC
Gate-Source Charge	$Q_{gs}$		-	1.5	-	
Gate-Drain Charge	$Q_{gd}$		-	3.5	-	
<b>Source-Drain Diode characteristics</b>						
Diode Forward voltage <sup>(3)</sup>	$V_{DS}$	$V_{GS} = 0V, I_S = 3A$	-	-	1.2	V
Diode Forward current <sup>(4)</sup>	$I_S$		-	-	3.0	A

**Notes:**

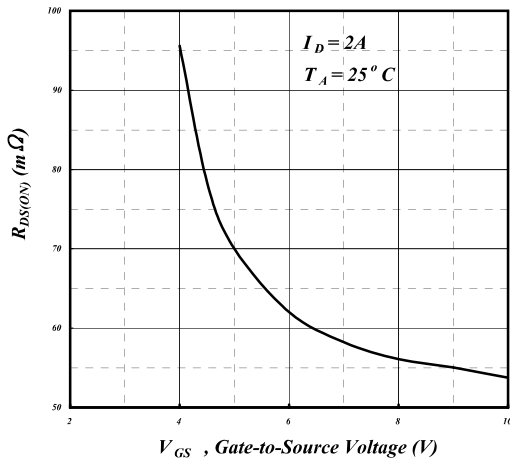
1. Repetitive Rating: pulse width limited by maximum junction temperature
2. Pulse Test: pulse width  $\leq 300\mu s$ , duty cycle  $\leq 2\%$
3. Surface Mounted on FR4 Board,  $t_s \leq 10$  sec



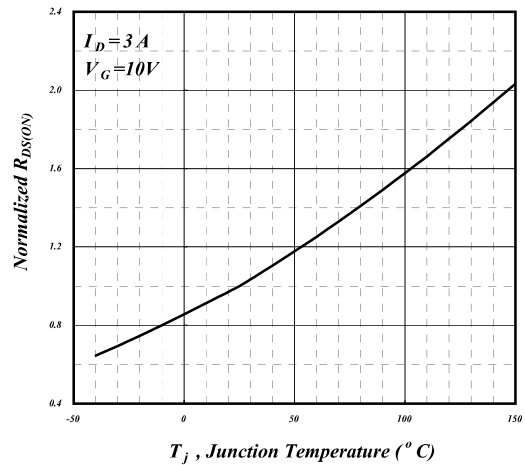
**Fig 1. Typical Output Characteristics**



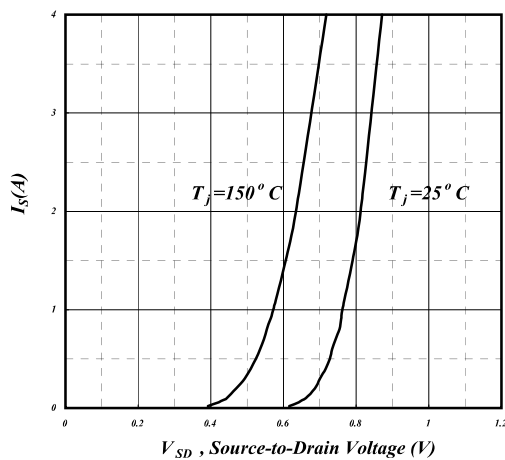
**Fig 2. Typical Output Characteristics**



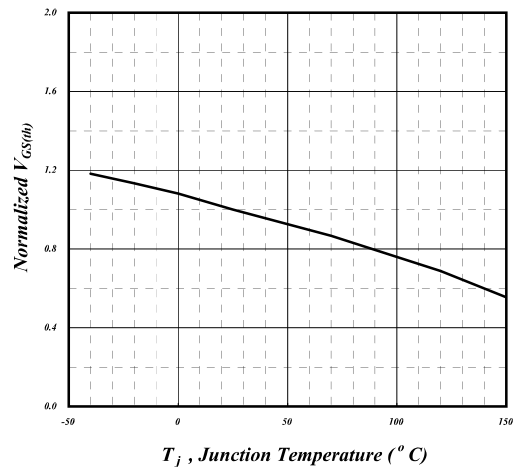
**Fig 3. On-Resistance v.s. Gate Voltage**



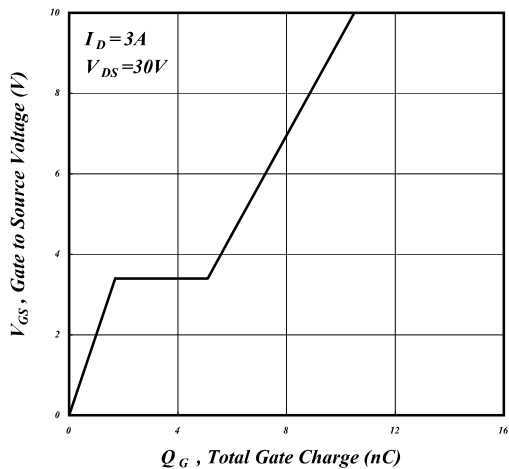
**Fig 4. Normalized On-Resistance v.s. Junction Temperature**



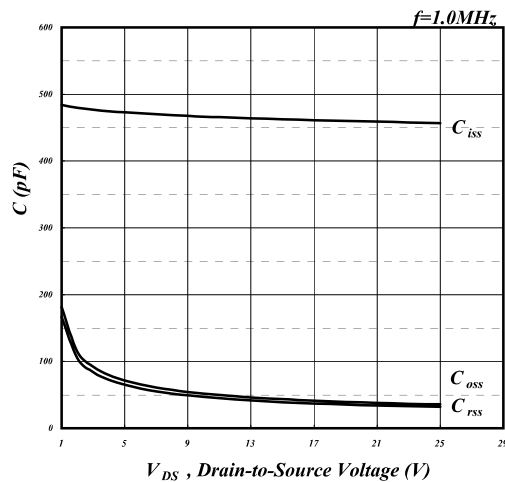
**Fig 5. Forward Characteristic of Reverse Diode**



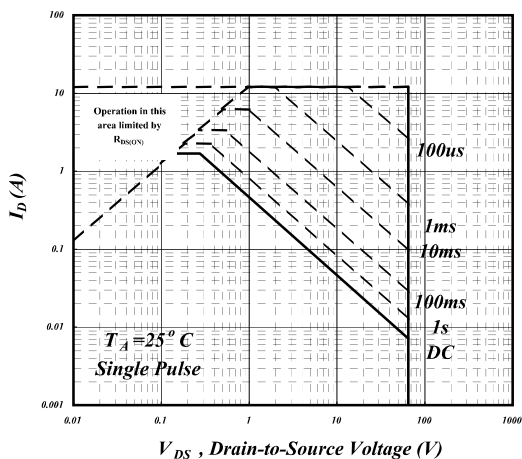
**Fig 6. Gate Threshold Voltage v.s. Junction Temperature**



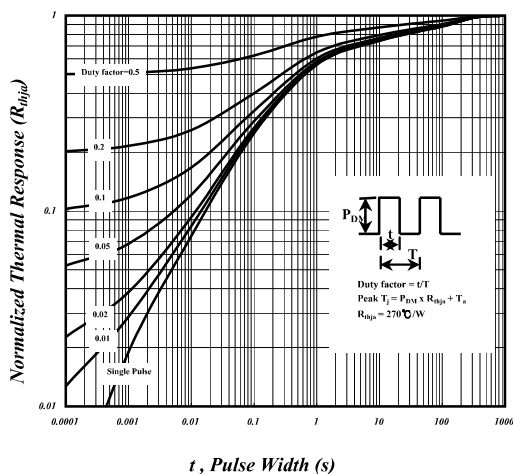
**Fig 7. Gate Charge Characteristics**



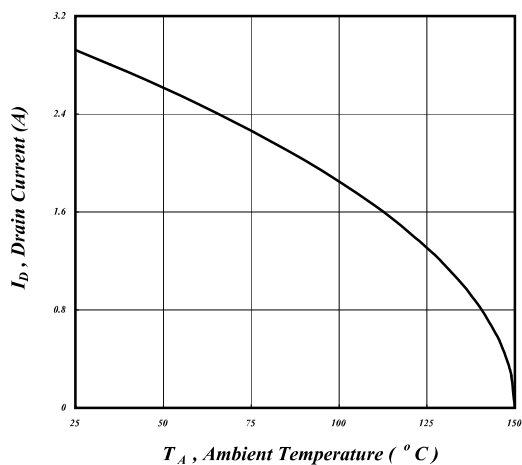
**Fig 8. Typical Capacitance Characteristics**



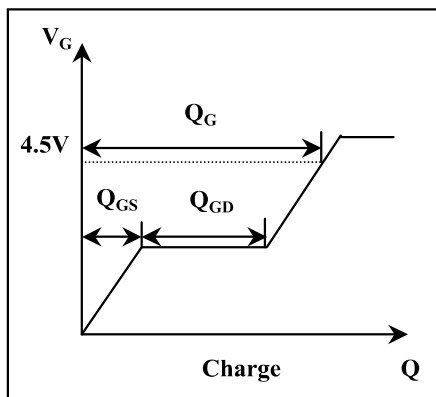
**Fig 9. Maximum Safe Operating Area**



**Fig 10. Effective Transient Thermal Impedance**



**Fig 11. Maximum Continuous Drain Current v.s. Ambient Temperature**



**Fig 12. Gate Charge Waveform**

**SOT-23-3 Package Information**

