



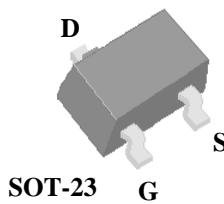
**Advanced Power
Electronics Corp.**

AP2310GN-HF

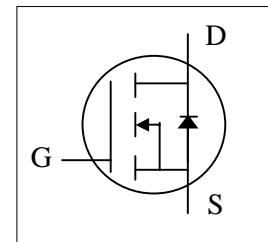
Halogen-Free Product

**N-CHANNEL ENHANCEMENT MODE
POWER MOSFET**

- ▼ Simple Drive Requirement
- ▼ Small Package Outline
- ▼ Surface Mount Device
- ▼ Halogen Free & RoHS Compliant Product



BV_{DSS}	60V
$R_{DS(ON)}$	90mΩ
I_D^3	3A



Description

AP2310 series are from Advanced Power innovated design and silicon process technology to achieve the lowest possible on-resistance and fast switching performance. It provides the designer with an extreme efficient device for use in a wide range of power applications.

The special design SOT-23 package with good thermal performance is widely preferred for all commercial-industrial surface mount applications using infrared reflow technique and suited for voltage conversion or switch applications.

Absolute Maximum Ratings@ $T_j=25^\circ\text{C}$ (unless otherwise specified)

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	60	V
V_{GS}	Gate-Source Voltage	+20	V
$I_D @ T_A=25^\circ\text{C}$	Drain Current ³ , $V_{GS} @ 10\text{V}$	3	A
$I_D @ T_A=70^\circ\text{C}$	Drain Current ³ , $V_{GS} @ 10\text{V}$	2.3	A
I_{DM}	Pulsed Drain Current ¹	10	A
$P_D @ T_A=25^\circ\text{C}$	Total Power Dissipation	1.38	W
T_{STG}	Storage Temperature Range	-55 to 150	°C
T_J	Operating Junction Temperature Range	-55 to 150	°C

Thermal Data

Symbol	Parameter	Value	Unit
R_{thj-a}	Maximum Thermal Resistance, Junction-ambient ³	90	°C/W



Electrical Characteristics@ $T_j=25^\circ\text{C}$ (unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{\text{GS}}=0\text{V}, I_{\text{D}}=250\mu\text{A}$	60	-	-	V
$R_{\text{DS(ON)}}$	Static Drain-Source On-Resistance ²	$V_{\text{GS}}=10\text{V}, I_{\text{D}}=3\text{A}$	-	70	90	$\text{m}\Omega$
		$V_{\text{GS}}=4.5\text{V}, I_{\text{D}}=2\text{A}$	-	90	120	$\text{m}\Omega$
$V_{\text{GS(th)}}$	Gate Threshold Voltage	$V_{\text{DS}}=V_{\text{GS}}, I_{\text{D}}=250\mu\text{A}$	1	1.55	3	V
g_{fs}	Forward Transconductance	$V_{\text{DS}}=5\text{V}, I_{\text{D}}=3\text{A}$	-	5	-	S
I_{DSS}	Drain-Source Leakage Current	$V_{\text{DS}}=48\text{V}, V_{\text{GS}}=0\text{V}$	-	-	25	μA
I_{GSS}	Gate-Source Leakage	$V_{\text{GS}}=\pm 20\text{V}, V_{\text{DS}}=0\text{V}$	-	-	± 100	nA
Q_{g}	Total Gate Charge	$I_{\text{D}}=3\text{A}$	-	6	10	nC
Q_{gs}	Gate-Source Charge	$V_{\text{DS}}=48\text{V}$	-	1.6	-	nC
Q_{gd}	Gate-Drain ("Miller") Charge	$V_{\text{GS}}=4.5\text{V}$	-	3	-	nC
$t_{\text{d(on)}}$	Turn-on Delay Time	$V_{\text{DS}}=30\text{V}$	-	6	-	ns
t_{r}	Rise Time	$I_{\text{D}}=1\text{A}$	-	5	-	ns
$t_{\text{d(off)}}$	Turn-off Delay Time	$R_{\text{G}}=3.3\Omega$	-	16	-	ns
t_{f}	Fall Time	$V_{\text{GS}}=10\text{V}$	-	3	-	ns
C_{iss}	Input Capacitance	$V_{\text{GS}}=0\text{V}$	-	550	880	pF
C_{oss}	Output Capacitance	$V_{\text{DS}}=15\text{V}$	-	70	-	pF
C_{rss}	Reverse Transfer Capacitance	f=1.0MHz	-	50	-	pF
R_{g}	Gate Resistance	f=1.0MHz	-	1.1	2.2	Ω

Source-Drain Diode

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
V_{SD}	Forward On Voltage ²	$I_{\text{S}}=1.2\text{A}, V_{\text{GS}}=0\text{V}$	-	-	1.2	V
t_{rr}	Reverse Recovery Time	$I_{\text{S}}=3\text{A}, V_{\text{GS}}=0\text{V},$ $dI/dt=100\text{A}/\mu\text{s}$	-	25	-	ns
			-	26	-	nC

Notes:

- 1.Pulse width limited by Max. junction temperature.
- 2.Pulse test
- 3.Surface mounted on 1 in² copper pad of FR4 board, t \leq 10s ; 270°C/W when mounted on min. copper pad.

THIS PRODUCT IS SENSITIVE TO ELECTROSTATIC DISCHARGE, PLEASE HANDLE WITH CAUTION.

USE OF THIS PRODUCT AS A CRITICAL COMPONENT IN LIFE SUPPORT OR OTHER SIMILAR SYSTEMS IS NOT AUTHORIZED.

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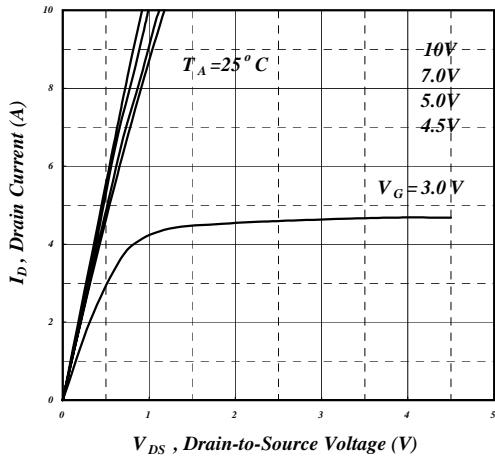


Fig 1. Typical Output Characteristics

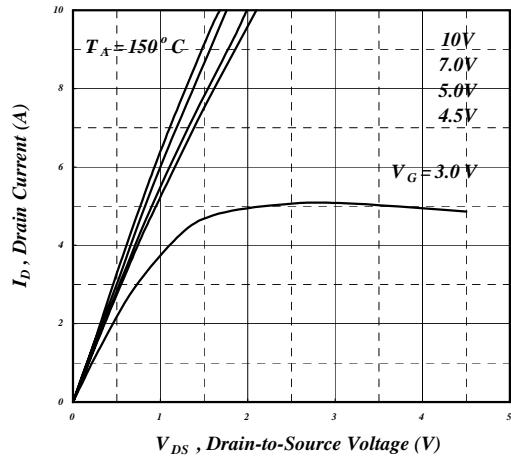


Fig 2. Typical Output Characteristics

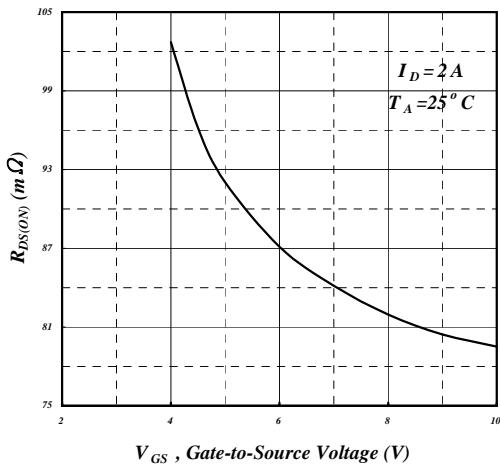


Fig 3. On-Resistance v.s. Gate Voltage

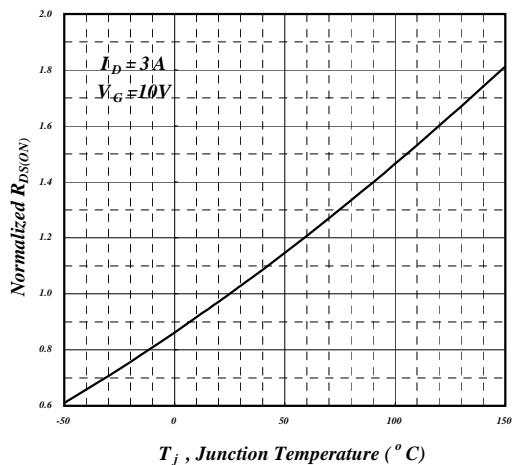


Fig 4. Normalized On-Resistance v.s. Junction Temperature

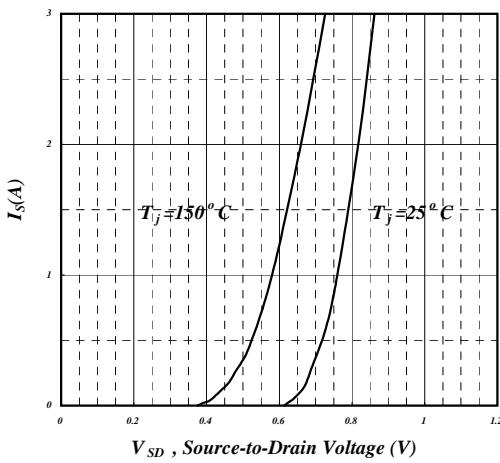


Fig 5. Forward Characteristic of Reverse Diode

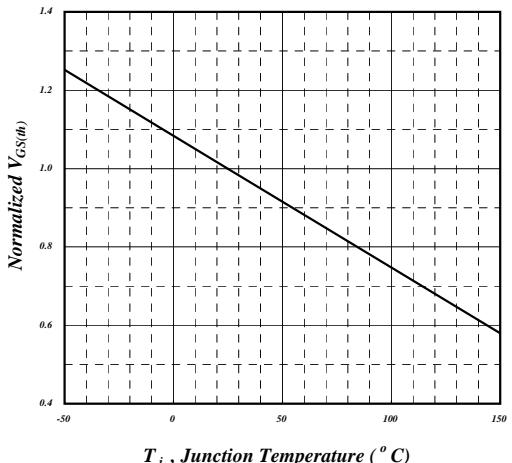


Fig 6. Gate Threshold Voltage v.s. Junction Temperature

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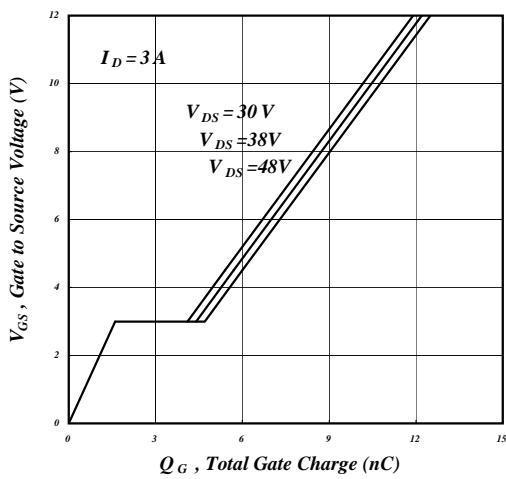


Fig 7. Gate Charge Characteristics

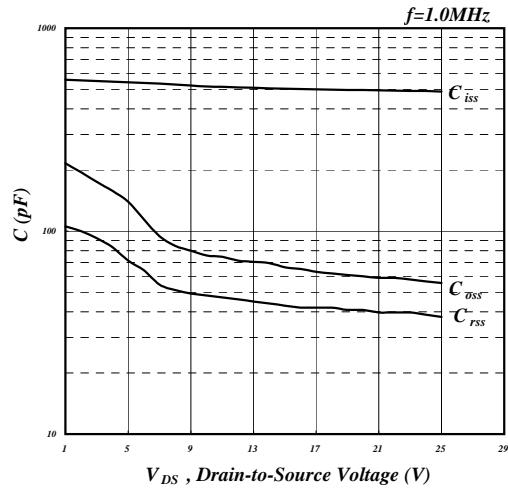


Fig 8. Typical Capacitance Characteristics

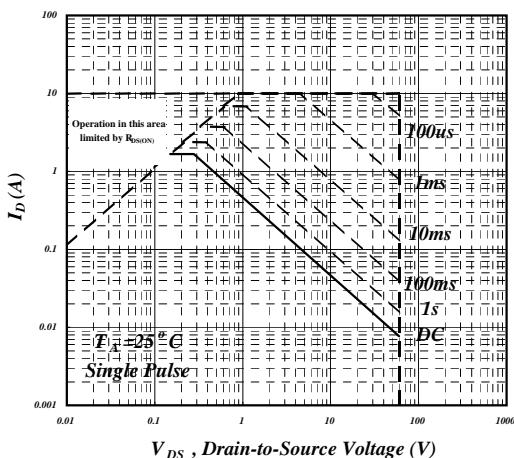


Fig 9. Maximum Safe Operating Area

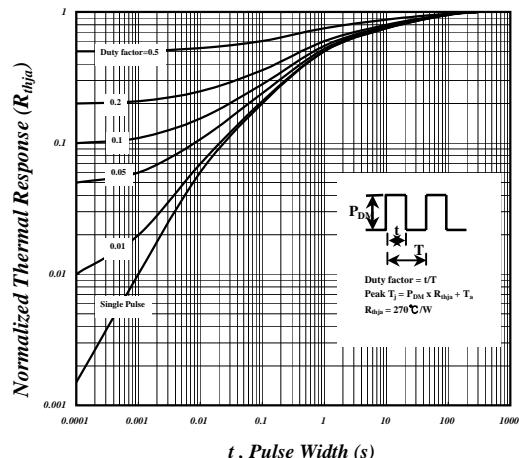


Fig 10. Effective Transient Thermal Impedance

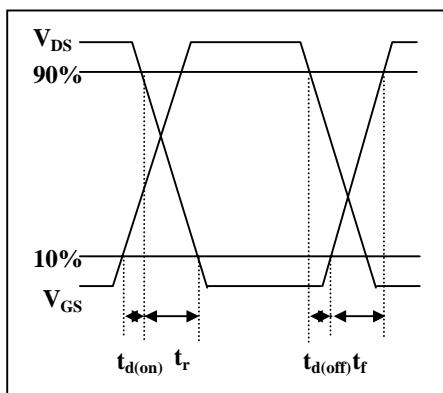


Fig 11. Switching Time Waveform

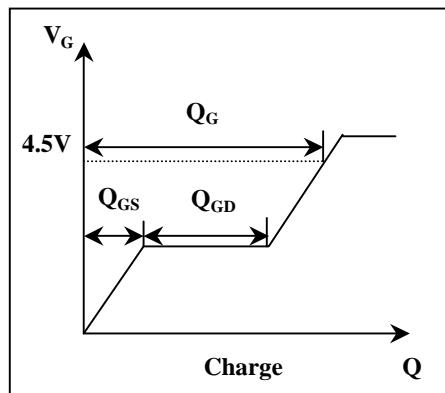


Fig 12. Gate Charge Waveform



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MARKING INFORMATION

