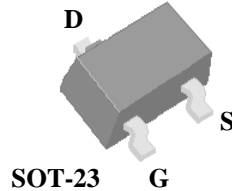




- ▼ Capable of 2.5V Gate Drive
- ▼ Small Outline Package
- ▼ Surface Mount Device

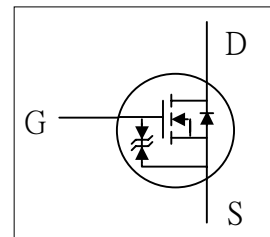


$BV_{DSS}$	30V
$R_{DS(ON)}$	50m $\Omega$
$I_D$	4.1A

## Description

Advanced Power MOSFETs utilized advanced processing techniques to achieve the lowest possible on-resistance, extremely efficient and cost-effectiveness device.

The SOT-23 package is widely used for commercial-industrial applications.



## Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
$V_{DS}$	Drain-Source Voltage	30	V
$V_{GS}$	Gate-Source Voltage	+6	V
$I_D@T_A=25^\circ C$	Continuous Drain Current <sup>3</sup> , $V_{GS}$ @ 4.5V	4.1	A
$I_D@T_A=70^\circ C$	Continuous Drain Current <sup>3</sup> , $V_{GS}$ @ 4.5V	3.3	A
$I_{DM}$	Pulsed Drain Current <sup>1</sup>	16	A
$P_D@T_A=25^\circ C$	Total Power Dissipation	1.38	W
$T_{STG}$	Storage Temperature Range	-55 to 150	$^\circ C$
$T_J$	Operating Junction Temperature Range	-55 to 150	$^\circ C$

## Thermal Data

Symbol	Parameter	Value	Unit
Rthj-a	Maximum Thermal Resistance, Junction-ambient <sup>3</sup>	90	$^\circ C/W$



# AP2306AGEN

## Electrical Characteristics @T<sub>j</sub>=25°C (unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
$BV_{DSS}$	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	30	-	-	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance <sup>2</sup>	$V_{GS}=4.5V, I_D=4A$	-	-	50	mΩ
		$V_{GS}=2.5V, I_D=3A$	-	-	72	mΩ
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=250\mu A$	0.5	-	1.5	V
$g_{fs}$	Forward Transconductance	$V_{DS}=10V, I_D=3A$	-	15	-	S
$I_{DSS}$	Drain-Source Leakage Current	$V_{DS}=30V, V_{GS}=0V$	-	-	10	μA
$I_{GSS}$	Gate-Source Leakage	$V_{GS}=\pm 6V$	-	-	±30	μA
$Q_g$	Total Gate Charge <sup>2</sup>	$I_D=3A$ $V_{DS}=15V$ $V_{GS}=4.5V$	-	8.7	14	nC
$Q_{gs}$	Gate-Source Charge		-	1.3	-	nC
$Q_{gd}$	Gate-Drain ("Miller") Charge		-	3.5	-	nC
$t_{d(on)}$	Turn-on Delay Time <sup>2</sup>	$V_{DS}=15V$ $I_D=1A$	-	65	-	ns
$t_r$	Rise Time		-	130	-	ns
$t_{d(off)}$	Turn-off Delay Time	$R_G=3.3\Omega, V_{GS}=5V$ $R_D=15\Omega$	-	470	-	ns
$t_f$	Fall Time		-	290	-	ns
$C_{iss}$	Input Capacitance	$V_{GS}=0V$ $V_{DS}=25V$ $f=1.0MHz$	-	610	1000	pF
$C_{oss}$	Output Capacitance		-	60	-	pF
$C_{riss}$	Reverse Transfer Capacitance		-	50	-	pF

## Source-Drain Diode

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
$V_{SD}$	Forward On Voltage <sup>2</sup>	$I_S=1.2A, V_{GS}=0V$	-	-	1.2	V
$t_{rr}$	Reverse Recovery Time <sup>2</sup>	$I_S=6A, V_{GS}=0V,$ $di/dt=100A/\mu s$	-	220	-	ns
$Q_{rr}$	Reverse Recovery Charge		-	600	-	nC

### Notes:

1. Pulse width limited by Max. junction temperature.
2. Pulse test
3. Surface mounted on 1 in<sup>2</sup> copper pad of FR4 board ; 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.

APEC DOES NOT ASSUME ANY LIABILITY ARISING OUT OF THE APPLICATION OR USE OF ANY PRODUCT OR CIRCUIT DESCRIBED HEREIN; NEITHER DOES IT CONVEY ANY LICENSE UNDER ITS PATENT RIGHTS, NOR THE RIGHTS OF OTHERS.

APEC RESERVES THE RIGHT TO MAKE CHANGES WITHOUT FURTHER NOTICE TO ANY PRODUCTS HEREIN TO IMPROVE RELIABILITY, FUNCTION OR DESIGN.

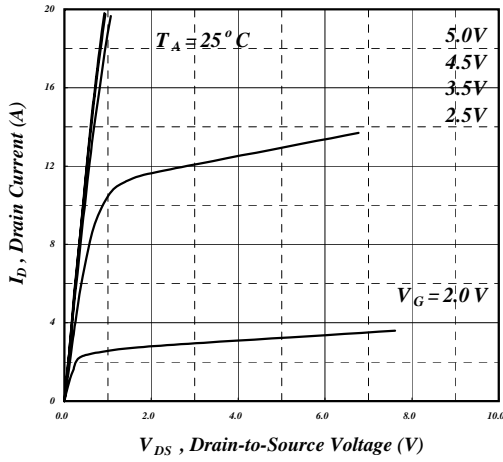


Fig 1. Typical Output Characteristics

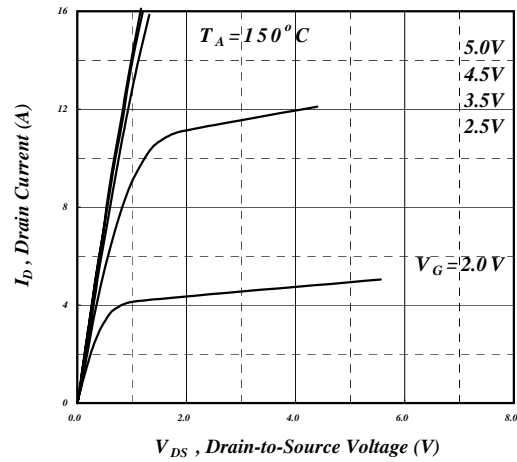


Fig 2. Typical Output Characteristics

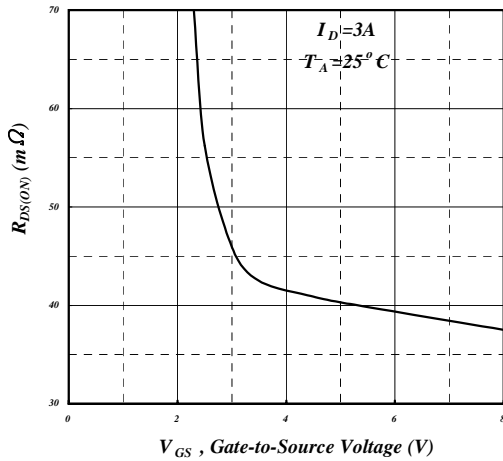


Fig 3. On-Resistance v.s. Gate Voltage

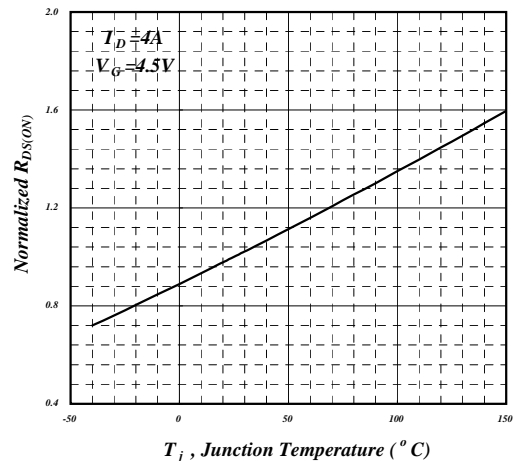


Fig 4. Normalized On-Resistance v.s. Junction Temperature

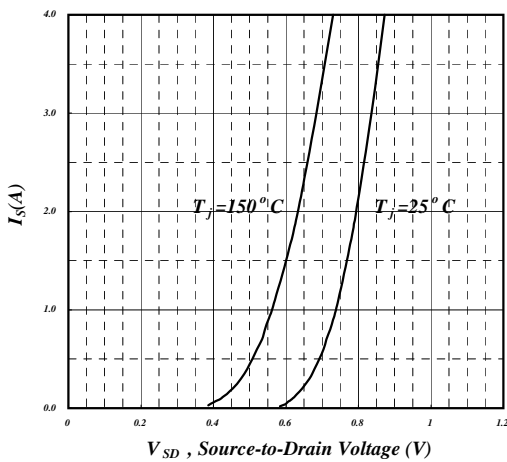


Fig 5. Forward Characteristic of Reverse Diode

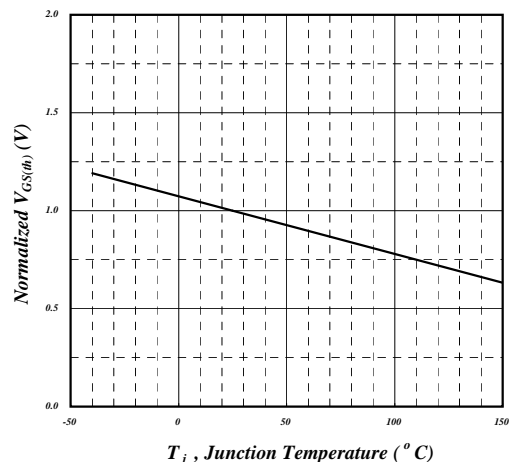


Fig 6. Gate Threshold Voltage v.s. Junction Temperature

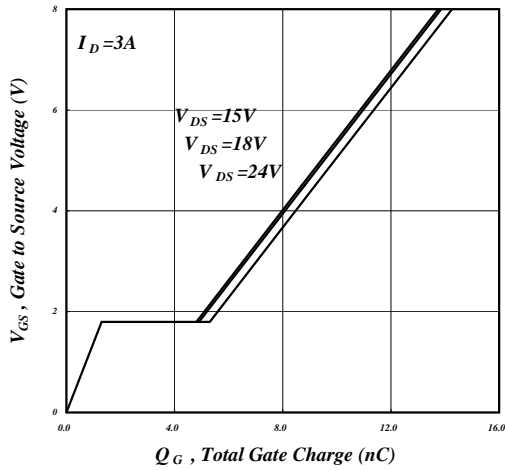


Fig 7. Gate Charge Characteristics

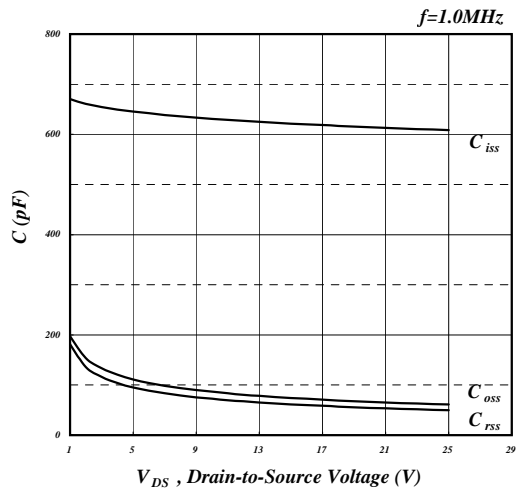


Fig 8. Typical Capacitance Characteristics

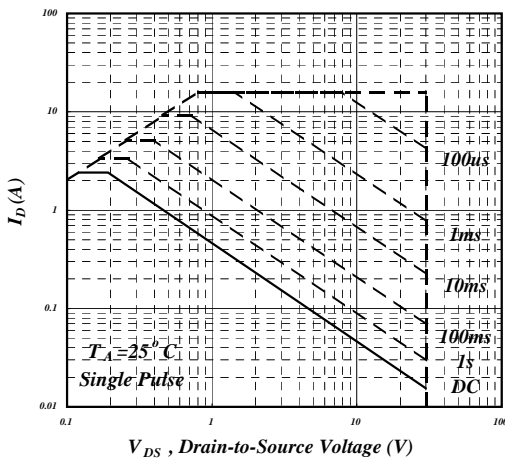


Fig 9. Maximum Safe Operating Area

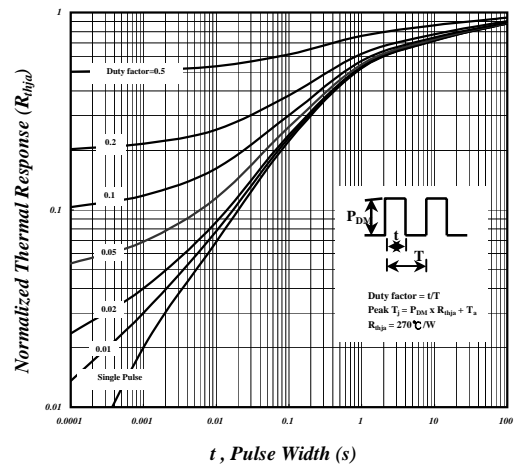


Fig 10. Effective Transient Thermal Impedance

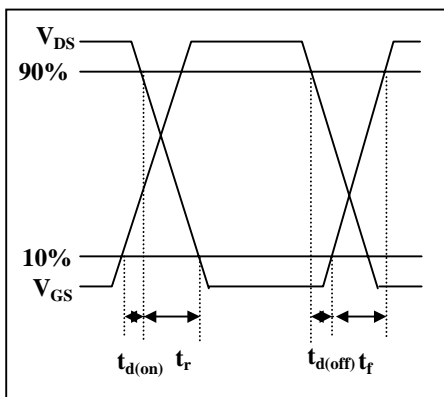


Fig 11. Switching Time Waveform

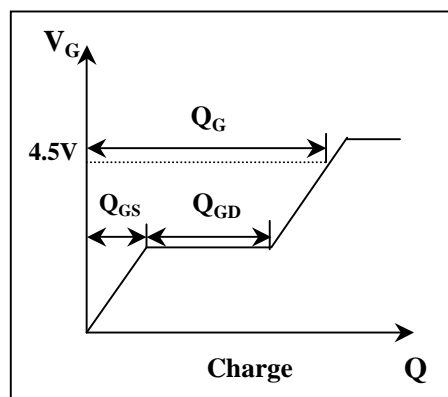
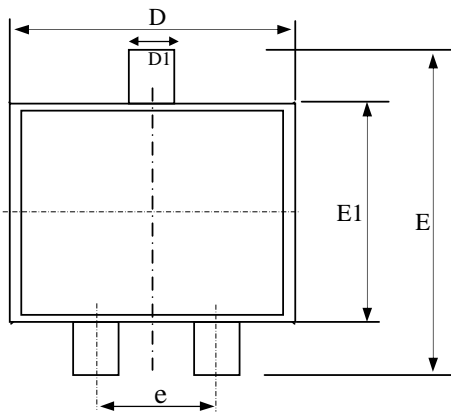


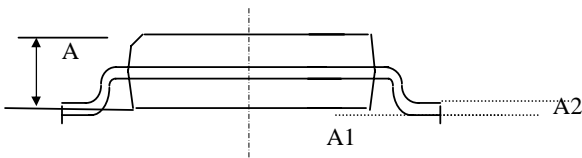
Fig 12. Gate Charge Circuit



**Package Outline : SOT-23**



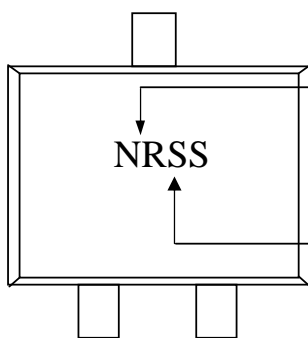
SYMBOLS	Millimeters		
	MIN	NOM	MAX
A	1.00	1.15	1.30
A1	0.00	--	0.10
A2	0.10	0.15	0.25
D1	0.30	0.40	0.50
e	1.70	2.00	2.30
D	2.70	2.90	3.10
E	2.40	2.65	3.00
E1	1.40	1.50	1.60



- 1.All Dimension Are In Millimeters.
- 2.Dimension Does Not Include Mold Protrusions.

**Part Marking Information & Packing : SOT-23**

Laser Marking



Part Number : NR

Date Code :

SS:2004,2008,2012...

SS:2003,2007,2011...

SS:2002,2006,2010...

SS:2001,2005,2009...

"A~Z" showed on 3rd position --> week 1 ~ week 26,

"A~Z" showed on 4th position --> week 27 ~ week 52.