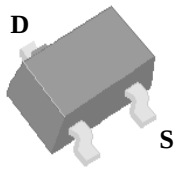
Advanced Power Electronics Corp.

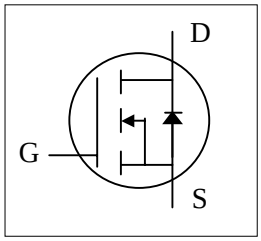
N-CHANNEL ENHANCEMENT MODE POWER MOSFET

- ▼ **Capable of 2.5V Gate Drive**
- ▼ **Small Package Outline**
- ▼ **Surface Mount Package**
- ▼ **RoHS Compliant**



SOT-23

BV_{DSS}	20V
$R_{DS(ON)}$	85mΩ
I_D	3.2A



Description

AP2302 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°C(unless otherwise specified)

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	20	V
V_{GS}	Gate-Source Voltage	±12	V
I_D@T_A=25℃	Drain Current[3], V_{GS} @ 4.5V	3.2	A
I_D@T_A=70℃	Drain Current[3], V_{GS} @ 4.5V	2.6	A
I_{DM}	Pulsed Drain Current[1]	10	A
P_D@T_A=25℃	Total Power Dissipation	1.38	W
	Linear Derating Factor	0.01	W/℃
T_{STG}	Storage Temperature Range	-55 to 150	℃
T_J	Operating Junction Temperature Range	-55 to 150	℃

Thermal Data

Symbol	Parameter	Value	Unit
Rthj-a	Maximum Thermal Resistance, Junction-ambient[3]	90	℃/W

Electrical Characteristics@T_j=25°C(unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V, I_D=250uA	20	-	-	V
$\Delta BV_{DSS}/\Delta T_j$	Breakdown Voltage Temperature Coefficient	Reference to 25℃, I_D=1mA	-	0.1	-	V/℃
$R_{DS(ON)}$	Static Drain-Source On-Resistance[2]	V_{GS}=4.5V, I_D=3.6A	-	-	85	mΩ
		V_{GS}=2.5V, I_D=3.1A	-	-	115	mΩ
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS}, I_D=250uA	0.5	-	1.2	V
g_{fs}	Forward Transconductance	V_{DS}=5V, I_D=3.6A	-	6	-	S
I_{DSS}	Drain-Source Leakage Current	V_{DS}=20V, V_{GS}=0V	-	-	1	uA
	Drain-Source Leakage Current (T_j=70°C)	V_{DS}=20V ,V_{GS}=0V	-	-	10	uA
I_{GSS}	Gate-Source Leakage	V_{GS}=±12V, V_{DS}=0V	-	-	±100	nA
Q_g	Total Gate Charge[2]	I_D=3.6A	-	4.4	-	nC
Q_{gs}	Gate-Source Charge	V_{DS}=10V	-	0.6	-	nC
Q_{gd}	Gate-Drain ("Miller") Charge	V_{GS}=4.5V	-	1.9	-	nC
$t_{d(on)}$	Turn-on Delay Time[2]	V_{DS}=10V	-	5.2	-	ns
t_r	Rise Time	I_D=3.6A	-	37	-	ns
$t_{d(off)}$	Turn-off Delay Time	R_G=6Ω	-	15	-	ns
t_f	Fall Time	V_{GS}=5V	-	5.7	-	ns
C_{iss}	Input Capacitance	V_{GS}=0V	-	145	-	pF
C_{oss}	Output Capacitance	V_{DS}=10V	-	100	-	pF
C_{rss}	Reverse Transfer Capacitance	f=1.0MHz	-	50	-	pF
R_g	Gate Resistance	f=1.0MHz	-	5.3	-	Ω

Source-Drain Diode

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
I_S	Continuous Source Current (Body Diode)	V_D=V_G=0V , V_S=1.2V	-	-	1	A
I_{SM}	Pulsed Source Current (Body Diode)[1]		-	-	10	A
V_{SD}	Forward On Voltage[2]	I_S=1.6A, V_{GS}=0V	-	-	1.2	V

Notes:

1.Pulse width limited by Max. junction temperature.

2.Pulse test

3.Surface mounted on 1 in^2 copper pad of FR4 board, t ≤ 10s ; 270℃/W when mounted on min. copper pad.

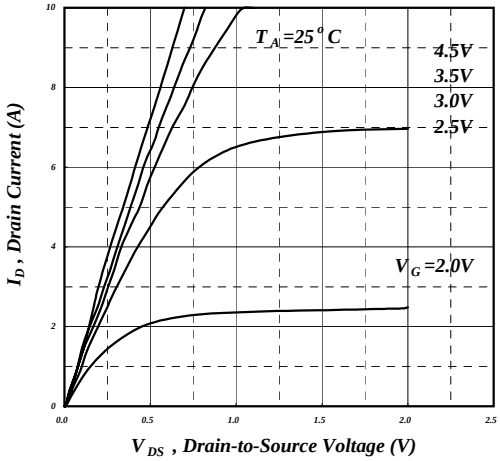


Fig 1. Typical Output Characteristics

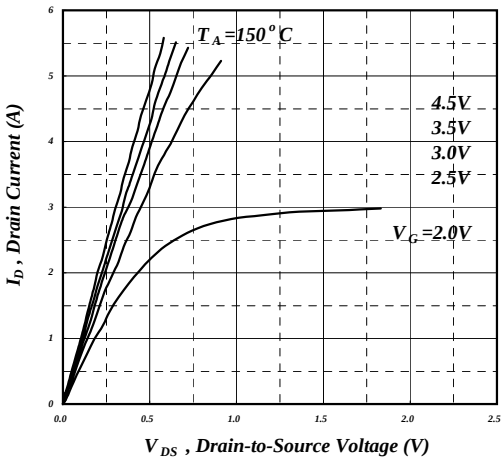


Fig 2. Typical Output Characteristics

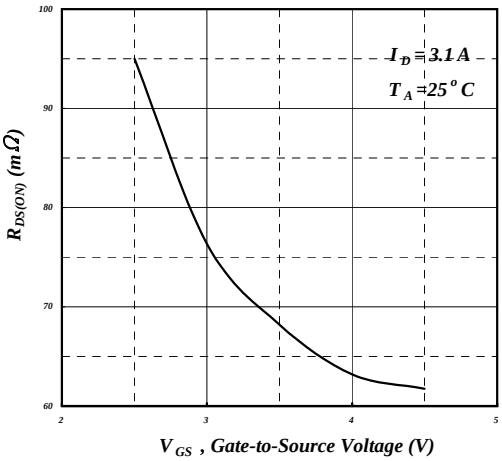


Fig 3. On-Resistance v.s. Gate Voltage

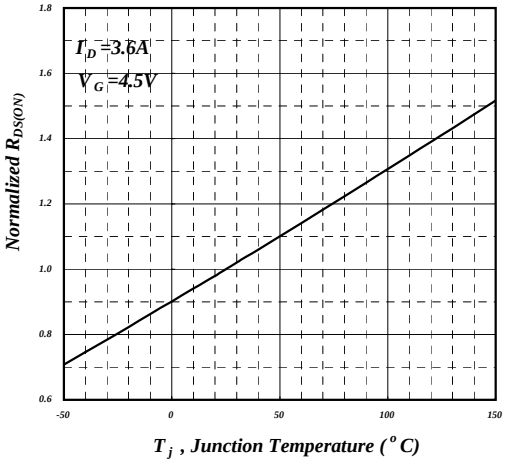


Fig 4. Normalized On-Resistance

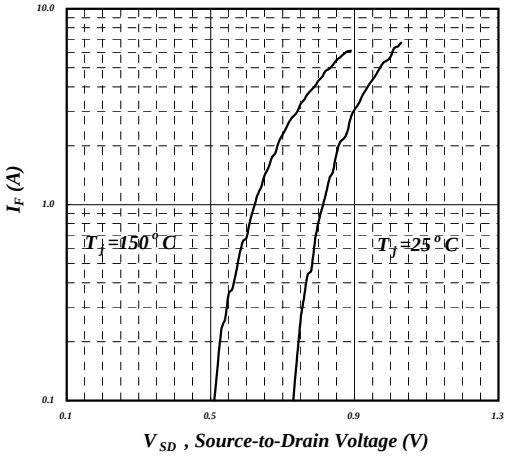


Fig 5. Forward Characteristic of Reverse Diode

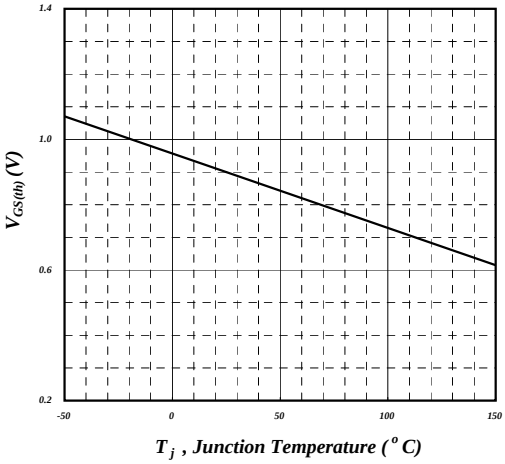


Fig 6. Gate Threshold Voltage v.s. Junction Temperature

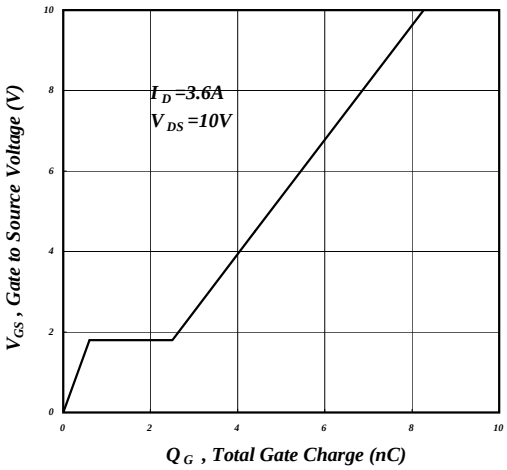


Fig 7. Gate Charge Characteristics

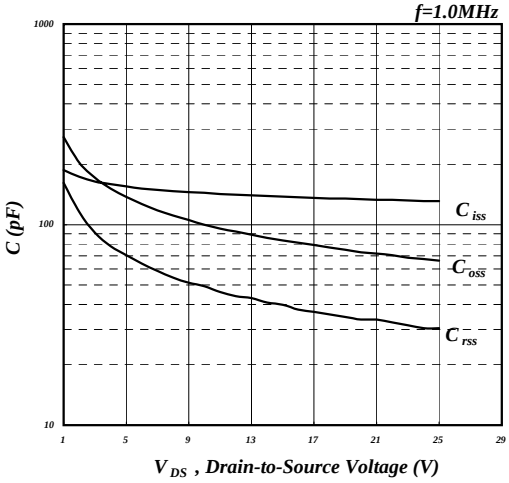


Fig 8. Typical Capacitance Characteristics

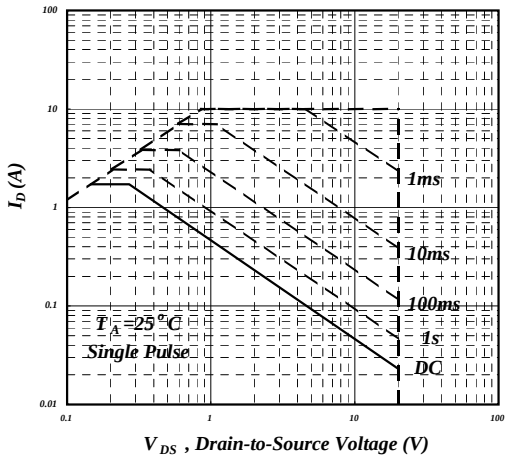


Fig 9. Maximum Safe Operating Area

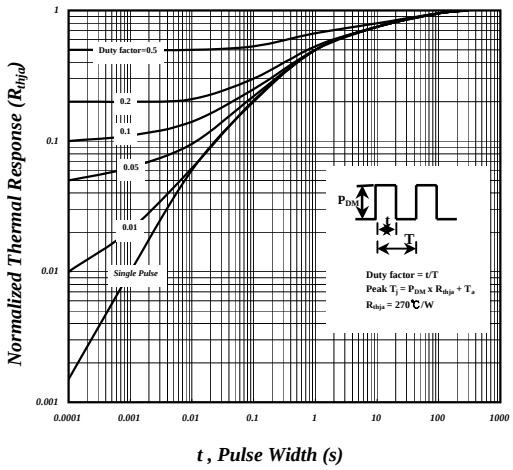


Fig 10. Effective Transient Thermal Impedance

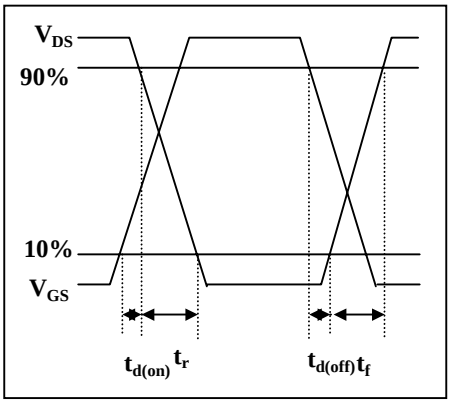


Fig 11. Switching Time Waveform

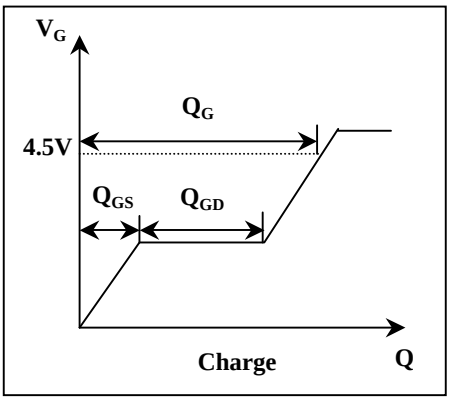
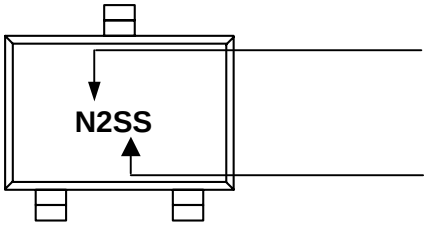


Fig 12. Gate Charge Waveform

MARKING INFORMATION



Part Number : N2

Date Code : SS

SS:2004,2008,2012,2016,2020...

SS:2003,2007,2011,2015,2019...

SS:2002,2006,2010,2014,2018...

SS:2001,2005,2009,2013,2017...