



**Advanced Power
Electronics Corp.**

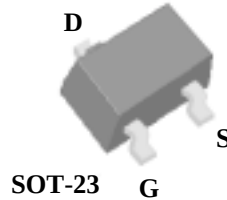
AP2302GN

Pb Free Plating Product

N-CHANNEL ENHANCEMENT MODE

POWER MOSFET

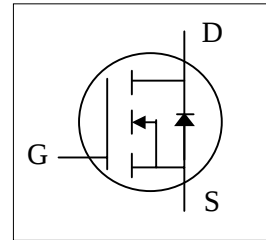
- ▼ Capable of 2.5V gate drive
- ▼ Small package outline
- ▼ Surface mount package



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

Description

The Advanced Power MOSFETs from APEC provide the designer with the best combination of fast switching, low on-resistance and cost-effectiveness.



Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	20	V
V_{GS}	Gate-Source Voltage	± 12	V
$I_D @ T_A = 25^\circ\text{C}$	Continuous Drain Current ³ , V_{GS} @ 4.5V	3.2	A
$I_D @ T_A = 70^\circ\text{C}$	Continuous Drain Current ³ , V_{GS} @ 4.5V	2.6	A
I_{DM}	Pulsed Drain Current ^{1,2}	10	A
$P_D @ T_A = 25^\circ\text{C}$	Total Power Dissipation	1.38	W
	Linear Derating Factor	0.01	W/ $^\circ\text{C}$
T_{STG}	Storage Temperature Range	-55 to 150	$^\circ\text{C}$
T_J	Operating Junction Temperature Range	-55 to 150	$^\circ\text{C}$

Thermal Data

Symbol	Parameter	Value	Unit
Rthj-a	Thermal Resistance Junction-ambient ³ Max.	90	$^\circ\text{C}/\text{W}$

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
ΔBV _{DSS} /ΔT _j	Breakdown Voltage Temperature Coefficient	Reference to 25°C, I _D =1mA	-	0.1	-	V/°C
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 (T _j =25°C)	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	-	-	±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, V _{GS} =5V	-	15	-	ns
t _f	Fall Time	R _D =2.8Ω	-	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

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 width ≤300us, duty cycle ≤2%.
- 3.Surface mounted on 1 in² copper pad of FR4 board; 270°C/W when mounted on min. copper pad.

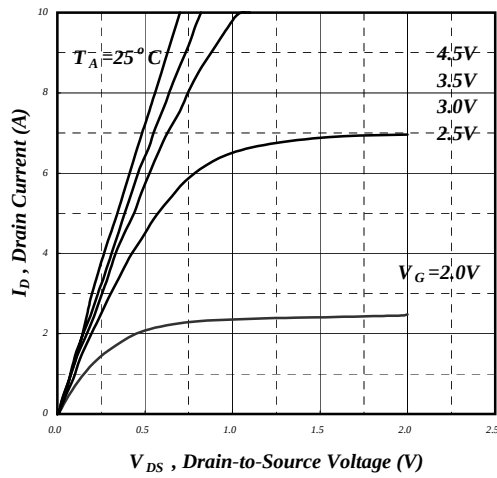


Fig 1. Typical Output Characteristics

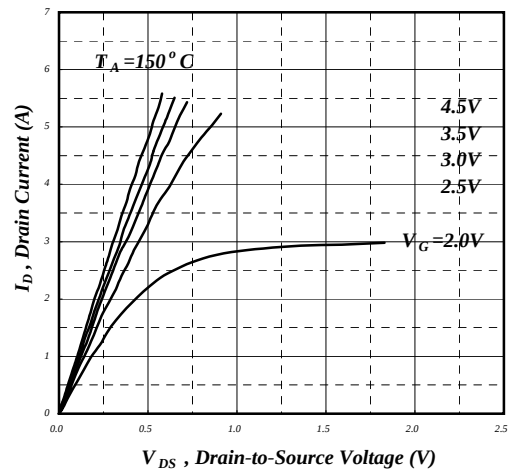


Fig 2. Typical Output Characteristics

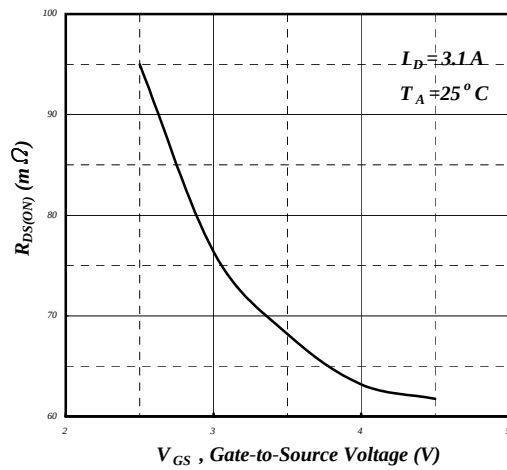


Fig 3. On-Resistance v.s. Gate Voltage

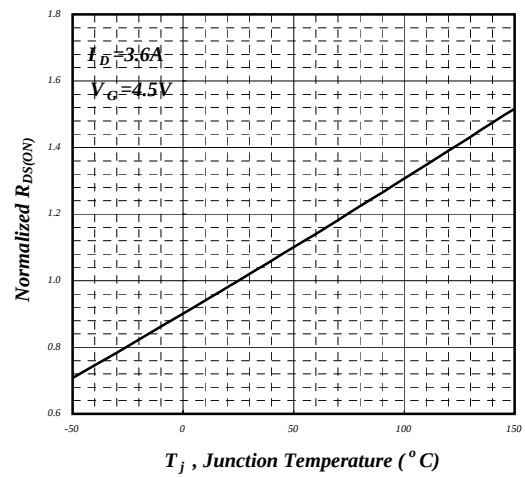


Fig 4. Normalized On-Resistance

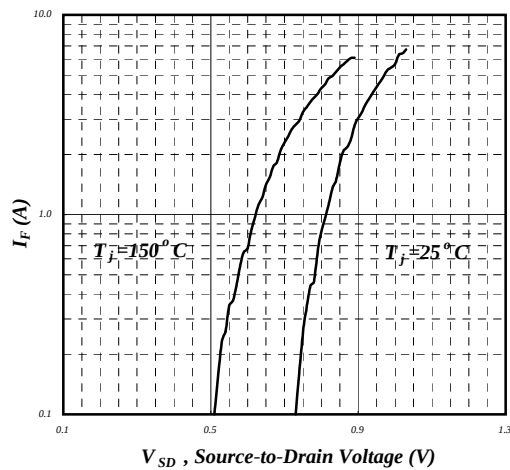


Fig 5. Forward Characteristic of Reverse Diode

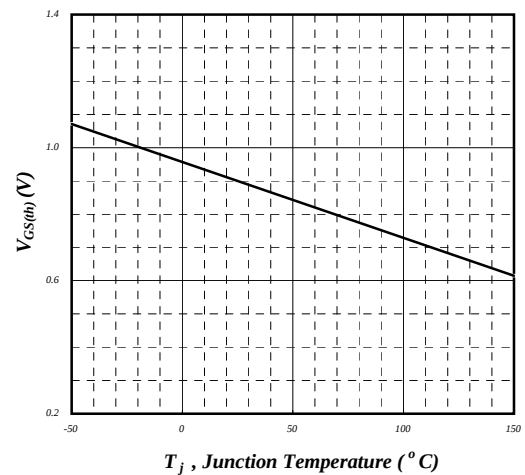


Fig 6. Gate Threshold Voltage v.s. Junction Temperature

