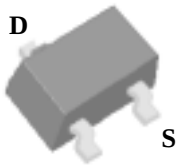
TY Semicondutor®

Product specification

AP2306N

- ▼ **Capable of 2.5V gate drive**
- ▼ **Lower on-resistance**
- ▼ **Surface mount package**

BV_{DSS}	20V
$R_{DS(ON)}$	32mΩ
I_D	5.3A

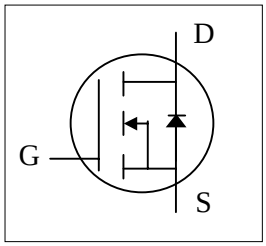


SOT-23

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 universally used for all commercial-industrial applications.



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℃	Continuous Drain Current[3], V_{GS} @ 4.5V	5.3	A
I_D@T_A=70℃	Continuous Drain Current[3], V_{GS} @ 4.5V	4.3	A
I_{DM}	Pulsed Drain Current[1,2]	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	Thermal Resistance Junction-ambient[3]	Max.	90	℃/W

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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	V_{GS}=10V, I_D=5.5A	-	-	27	mΩ
		V_{GS}=4.5V, I_D=5.3A	-	-	32	mΩ
		V_{GS}=2.5V, I_D=2.6A	-	-	50	mΩ
		V_{GS}=1.8V, I_D=1.0A	-	-	90	mΩ
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS}, I_D=250uA	0.5	-	-	V
g_{fs}	Forward Transconductance	V_{DS}=5V, I_D=5.3A	-	13	-	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=55°C)	V_{DS}=16V ,V_{GS}=0V	-	-	10	uA
I_{GSS}	Gate-Source Leakage	V_{GS}= ± 12V	-	-	±100	nA
Q_g	Total Gate Charge[2]	I_D=5.3A	-	8.7	-	nC
Q_{gs}	Gate-Source Charge	V_{DS}=10V	-	1.5	-	nC
Q_{gd}	Gate-Drain ("Miller") Charge	V_{GS}=4.5V	-	3.6	-	nC
$t_{d(on)}$	Turn-on Delay Time[2]	V_{DS}=15V	-	6	-	ns
t_r	Rise Time	I_D=1A	-	14	-	ns
$t_{d(off)}$	Turn-off Delay Time	R_G=2Ω,V_{GS}=10V	-	18.4	-	ns
t_f	Fall Time	R_D=15Ω	-	2.8	-	ns
C_{iss}	Input Capacitance	V_{GS}=0V	-	603	-	pF
C_{oss}	Output Capacitance	V_{DS}=15V	-	144	-	pF
C_{rss}	Reverse Transfer Capacitance	f=1.0MHz	-	111	-	pF

Source-Drain Diode

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
V_{SD}	Forward On Voltage[2]	I_S=1.2A, V_{GS}=0V	-	-	1.2	V
trr	Reverse Recovery Time	I_S=5A, V_{GS}=0V,	-	16.8	-	ns
Qrr	Reverse Recovery Charge	dI/dt=100A/μs	-	11	-	nC

Notes:

1.Pulse width limited by Max. junction temperature.

2.Pulse width ≤300us , duty cycle ≤2%.

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