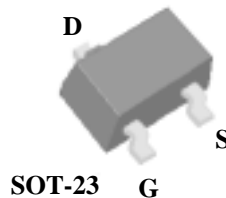


# AP2305N

- ▼ Simple Drive Requirement
- ▼ Small Package Outline
- ▼ Surface Mount Device

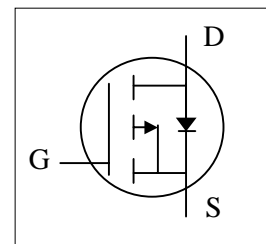


$BV_{DSS}$	-20V
$R_{DS(ON)}$	65mΩ
$I_D$	- 4.2A

## Description

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

The SOT-23 package is universally preferred for all commercial-industrial surface mount applications and suited for low voltage applications such as DC/DC converters.



## Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
$V_{DS}$	Drain-Source Voltage	- 20	V
$V_{GS}$	Gate-Source Voltage	± 12	V
$I_D@T_A=25^{\circ}C$	Continuous Drain Current <sup>3</sup>	-4.2	A
$I_D@T_A=70^{\circ}C$	Continuous Drain Current <sup>3</sup>	-3.4	A
$I_{DM}$	Pulsed Drain Current <sup>1,2</sup>	-10	A
$P_D@T_A=25^{\circ}C$	Total Power Dissipation	1.38	W
	Linear Derating Factor	0.01	W/°C
$T_{STG}$	Storage Temperature Range	-55 to 150	°C
$T_J$	Operating Junction Temperature Range	-55 to 150	°C

## Thermal Data

Symbol	Parameter	Value	Unit
Rthj-amb	Thermal Resistance Junction-ambient <sup>3</sup>	Max. 90	°C/W

## AP2305N

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	$V_{GS}=0V, I_D=-250\mu A$	-20	-	-	V
$\Delta BV_{DSS}/\Delta T_j$	Breakdown Voltage Temperature Coefficient	Reference to $25^{\circ}\text{C}$ , $I_D=-1\text{mA}$	-	-0.1	-	$V/^{\circ}\text{C}$
$R_{DS(ON)}$	Static Drain-Source On-Resistance	$V_{GS}=-10V, I_D=-4.5A$	-	-	53	$\text{m}\Omega$
		$V_{GS}=-4.5V, I_D=-4.2A$	-	-	65	$\text{m}\Omega$
		$V_{GS}=-2.5V, I_D=-2.0A$	-	-	100	$\text{m}\Omega$
		$V_{GS}=-1.8V, I_D=-1.0A$	-	-	250	$\text{m}\Omega$
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=-250\mu A$	-0.5	-	-	V
$g_{fs}$	Forward Transconductance	$V_{DS}=-5V, I_D=-2.8A$	-	9	-	S
$I_{DSS}$	Drain-Source Leakage Current ( $T_j=25^{\circ}\text{C}$ )	$V_{DS}=-20V, V_{GS}=0V$	-	-	-1	$\mu A$
	Drain-Source Leakage Current ( $T_j=55^{\circ}\text{C}$ )	$V_{DS}=-16V, V_{GS}=0V$	-	-	-10	$\mu A$
$I_{GSS}$	Gate-Source Leakage	$V_{GS}=\pm 12V$	-	-	$\pm 100$	nA
$Q_g$	Total Gate Charge <sup>2</sup>	$I_D=-4.2A$	-	10.6	-	nC
$Q_{gs}$	Gate-Source Charge	$V_{DS}=-16V$	-	2.32	-	nC
$Q_{gd}$	Gate-Drain ("Miller") Charge	$V_{GS}=-4.5V$	-	3.68	-	nC
$t_{d(on)}$	Turn-on Delay Time <sup>2</sup>	$V_{DS}=-15V$	-	5.9	-	ns
$t_r$	Rise Time	$I_D=-4.2A$	-	3.6	-	ns
$t_{d(off)}$	Turn-off Delay Time	$R_G=6\Omega, V_{GS}=-10V$	-	32.4	-	ns
$t_f$	Fall Time	$R_D=3.6\Omega$	-	2.6	-	ns
$C_{iss}$	Input Capacitance	$V_{GS}=0V$	-	740	-	pF
$C_{oss}$	Output Capacitance	$V_{DS}=-15V$	-	167	-	pF
$C_{rss}$	Reverse Transfer Capacitance	$f=1.0\text{MHz}$	-	126	-	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	$I_S=-4.2A, V_{GS}=0V,$	-	27.7	-	ns
$Q_{rr}$	Reverse Recovery Charge	$di/dt=100A/\mu s$	-	22	-	nC

## Notes:

1. Pulse width limited by Max. junction temperature.
2. Pulse width  $\leq 300\mu s$ , duty cycle  $\leq 2\%$ .
3. Surface mounted on 1 in<sup>2</sup> copper pad of FR4 board;  $270^{\circ}\text{C}/W$  when mounted on min. copper pad.