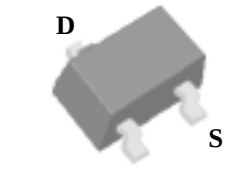
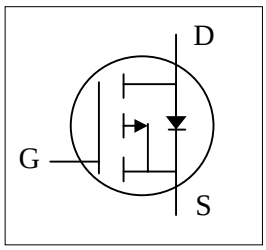
# AP2305GN

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

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




SOT-23




## 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℃ | Continuous Drain Current[3] | -4.2 | A |
| $I_D$@$T_A$=70℃ | Continuous Drain Current[3] | -3.4 | 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-amb | Thermal Resistance Junction-ambient[3] | Max. | 90 | ℃/W |

# AP2305GN

## 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, $I_D$=-4.5A | - | - | 53 | mΩ |
| | | $V_{GS}$=-4.5V, $I_D$=-4.2A | - | - | 65 | mΩ |
| | | $V_{GS}$=-2.5V, $I_D$=-2.0A | - | - | 100 | mΩ |
| | | $V_{GS}$=-1.8V, $I_D$=-1.0A | - | - | 250 | mΩ |
| $V_{GS(th)}$ | Gate Threshold Voltage | $V_{DS}$=$V_{GS}$, $I_D$=-250uA | -0.5 | - | - | V |
| $g_{fs}$ | Forward Transconductance | $V_{DS}$=-5V, $I_D$=-2.8A | - | 9 | - | 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] | $I_D$=-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[2] | $V_{DS}$=-15V | - | 5.9 | - | ns |
| $t_r$ | Rise Time | $I_D$=-4.2A | - | 3.6 | - | ns |
| $t_{d(off)}$ | Turn-off Delay Time | $R_G$=6Ω,$V_{GS}$=-10V | - | 32.4 | - | ns |
| $t_f$ | Fall Time | $R_D$=3.6Ω | - | 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=1.0MHz | - | 126 | - | 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 | $I_S$=-4.2A, $V_{GS}$=0V, | - | 27.7 | - | ns |
| Qrr | Reverse Recovery Charge | dI/dt=100A/μs | - | 22 | - | 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.