



**Advanced Power  
Electronics Corp.**

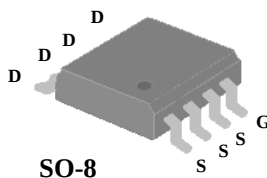
**AP9410AGM-HF**

**Halogen-Free Product**

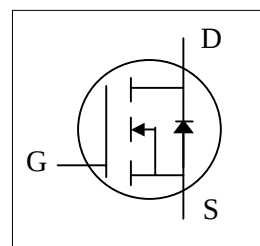
**N-CHANNEL ENHANCEMENT MODE**

**POWER MOSFET**

- ▼ Simple Drive Requirement
- ▼ Low On-resistance
- ▼ Fast Switching Characteristic
- ▼ RoHS Compliant & Halogen-Free



|              |               |
|--------------|---------------|
| $BV_{DSS}$   | 30V           |
| $R_{DS(ON)}$ | 5.5m $\Omega$ |
| $I_D$        | 18A           |



## Description

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

The SO-8 package is widely 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                  | 30         | V                |
| $V_{GS}$                   | Gate-Source Voltage                   | $\pm 12$   | V                |
| $I_D@T_A=25^\circ\text{C}$ | Continuous Drain Current <sup>3</sup> | 18         | A                |
| $I_D@T_A=70^\circ\text{C}$ | Continuous Drain Current <sup>3</sup> | 15         | A                |
| $I_{DM}$                   | Pulsed Drain Current <sup>1</sup>     | 80         | A                |
| $P_D@T_A=25^\circ\text{C}$ | Total Power Dissipation               | 2.5        | W                |
| $T_{STG}$                  | 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                      |
|-------------|-----------------------------------------------------------|-------|---------------------------|
| $R_{thj-a}$ | Maximum Thermal Resistance, Junction-ambient <sup>3</sup> | 50    | $^\circ\text{C}/\text{W}$ |



## AP9410AGM-HF

### Electrical Characteristics@T<sub>j</sub>=25°C(unless otherwise specified)

| Symbol              | Parameter                                      | Test Conditions                                          | Min. | Typ. | Max. | Units |
|---------------------|------------------------------------------------|----------------------------------------------------------|------|------|------|-------|
| BV <sub>DSS</sub>   | Drain-Source Breakdown Voltage                 | V <sub>GS</sub> =0V, I <sub>D</sub> =250uA               | 30   | -    | -    | V     |
| R <sub>DS(ON)</sub> | Static Drain-Source On-Resistance <sup>2</sup> | V <sub>GS</sub> =10V, I <sub>D</sub> =15A                | -    | 4.2  | 5    | mΩ    |
|                     |                                                | V <sub>GS</sub> =4.5V, I <sub>D</sub> =12A               | -    | 4.7  | 5.5  | mΩ    |
|                     |                                                | V <sub>GS</sub> =2.5V, I <sub>D</sub> =6A                | -    | 6    | 8    | mΩ    |
| V <sub>GS(th)</sub> | Gate Threshold Voltage                         | V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250uA | 0.5  | -    | 1.2  | V     |
| g <sub>fs</sub>     | Forward Transconductance                       | V <sub>DS</sub> =10V, I <sub>D</sub> =12A                | -    | 60   | -    | S     |
| I <sub>DSS</sub>    | Drain-Source Leakage Current                   | V <sub>DS</sub> =24V, V <sub>GS</sub> =0V                | -    | -    | 10   | uA    |
| I <sub>GSS</sub>    | Gate-Source Leakage                            | V <sub>GS</sub> =±12V, V <sub>DS</sub> =0V               | -    | -    | ±100 | nA    |
| Q <sub>g</sub>      | Total Gate Charge <sup>2</sup>                 | I <sub>D</sub> =12A                                      | -    | 28   | 45   | nC    |
| Q <sub>gs</sub>     | Gate-Source Charge                             | V <sub>DS</sub> =15V                                     | -    | 3    | -    | nC    |
| Q <sub>gd</sub>     | Gate-Drain ("Miller") Charge                   | V <sub>GS</sub> =4.5V                                    | -    | 12.5 | -    | nC    |
| t <sub>d(on)</sub>  | Turn-on Delay Time <sup>2</sup>                | V <sub>DS</sub> =15V                                     | -    | 13   | -    | ns    |
| t <sub>r</sub>      | Rise Time                                      | I <sub>D</sub> =1A                                       | -    | 14   | -    | ns    |
| t <sub>d(off)</sub> | Turn-off Delay Time                            | R <sub>G</sub> =3.3Ω                                     | -    | 40   | -    | ns    |
| t <sub>f</sub>      | Fall Time                                      | V <sub>GS</sub> =5V                                      | -    | 23   | -    | ns    |
| C <sub>iss</sub>    | Input Capacitance                              | V <sub>GS</sub> =0V                                      | -    | 2050 | 3280 | pF    |
| C <sub>oss</sub>    | Output Capacitance                             | V <sub>DS</sub> =15V                                     | -    | 510  | -    | pF    |
| C <sub>rss</sub>    | Reverse Transfer Capacitance                   | f=1.0MHz                                                 | -    | 280  | -    | pF    |
| R <sub>g</sub>      | Gate Resistance                                | f=1.0MHz                                                 | -    | 1    | 2    | Ω     |

### Source-Drain Diode

| Symbol          | Parameter                          | Test Conditions                           | Min. | Typ. | Max. | Units |
|-----------------|------------------------------------|-------------------------------------------|------|------|------|-------|
| V <sub>SD</sub> | Forward On Voltage <sup>2</sup>    | I <sub>S</sub> =2.1A, V <sub>GS</sub> =0V | -    | -    | 1.2  | V     |
| t <sub>rr</sub> | Reverse Recovery Time <sup>2</sup> | I <sub>S</sub> =10A, V <sub>GS</sub> =0V, | -    | 37   | -    | ns    |
| Q <sub>rr</sub> | Reverse Recovery Charge            | dI/dt=100A/μs                             | -    | 35   | -    | nC    |

#### Notes:

- 1.Pulse width limited by Max. junction temperature.
- 2.Pulse test
- 3.Surface mounted on 1 in<sup>2</sup> copper pad of FR4 board ; 125 °C/W when mounted on min. copper pad.

THIS PRODUCT IS SENSITIVE TO ELECTROSTATIC DISCHARGE, PLEASE HANDLE WITH CAUTION.

USE OF THIS PRODUCT AS A CRITICAL COMPONENT IN LIFE SUPPORT OR OTHER SIMILAR SYSTEMS IS NOT AUTHORIZED.

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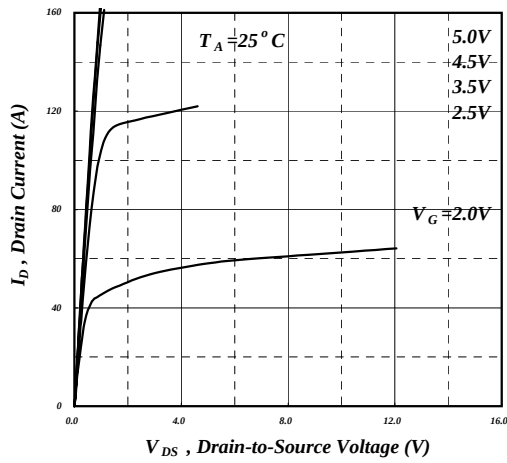


Fig 1. Typical Output Characteristics

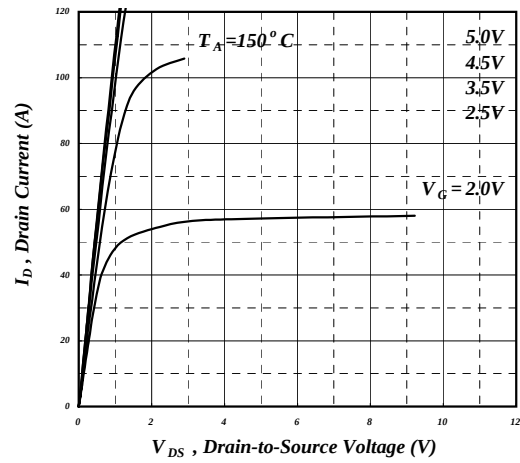


Fig 2. Typical Output Characteristics

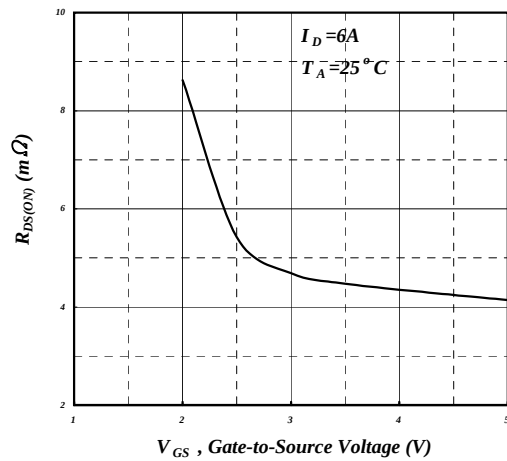


Fig 3. On-Resistance v.s. Gate Voltage

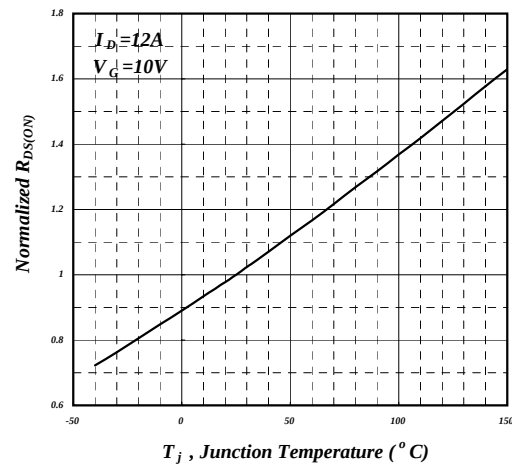


Fig 4. Normalized On-Resistance v.s. Junction Temperature

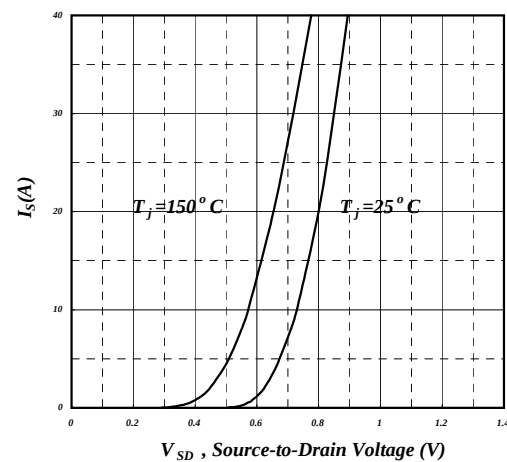


Fig 5. Forward Characteristic of Reverse Diode

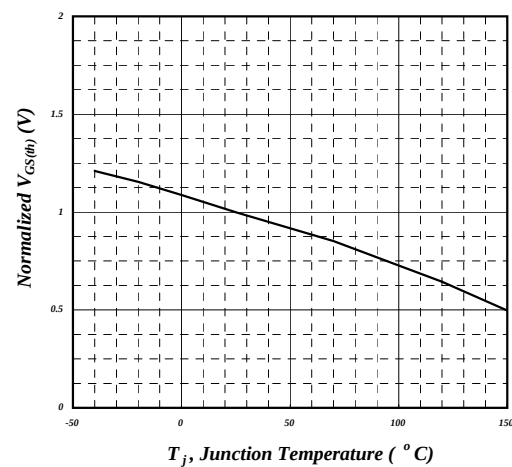


Fig 6. Gate Threshold Voltage v.s. Junction Temperature

