



**Advanced Power
Electronics Corp.**

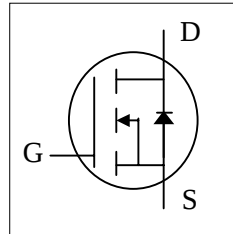
AP9431GH-HF

Halogen-Free Product

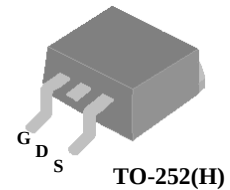
N-CHANNEL ENHANCEMENT MODE

POWER MOSFET

- ▼ Lower Gate Charge
- ▼ Simple Drive Requirement
- ▼ Fast Switching Characteristic
- ▼ RoHS Compliant & Halogen-Free



BV_{DSS}	55V
$R_{DS(ON)}$	24m Ω
I_D	23.5A



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 TO-252 package is widely preferred for 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	55	V
V_{GS}	Gate-Source Voltage	+20	V
$I_D@T_C=25^{\circ}C$	Continuous Drain Current	23.5	A
$I_D@T_C=70^{\circ}C$	Continuous Drain Current	16.6	A
I_{DM}	Pulsed Drain Current ¹	70	A
$P_D@T_C=25^{\circ}C$	Total Power Dissipation	30	W
$P_D@T_A=25^{\circ}C$	Total Power Dissipation	2.4	W
T_{STG}	Storage Temperature Range	-55 to 175	$^{\circ}C$
T_J	Operating Junction Temperature Range	-55 to 175	$^{\circ}C$

Thermal Data

Symbol	Parameter	Value	Units
Rthj-c	Maximum Thermal Resistance, Junction-case	5	$^{\circ}C/W$
Rthj-a	Maximum Thermal Resistance, Junction-ambient (PCB mount) ³	62.5	$^{\circ}C/W$



AP9431GH-HF

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	55	-	-	V
R _{DS(ON)}	Static Drain-Source On-Resistance ²	V _{GS} =10V, I _D =18A	-	-	24	mΩ
		V _{GS} =4.5V, I _D =12A	-	-	42	mΩ
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =250uA	1	-	3	V
g _{fs}	Forward Transconductance	V _{DS} =10V, I _D =18A	-	21	-	S
I _{DSS}	Drain-Source Leakage Current	V _{DS} =44V, V _{GS} =0V	-	-	25	uA
I _{GSS}	Gate-Source Leakage	V _{GS} =±20V, V _{DS} =0V	-	-	±100	nA
Q _g	Total Gate Charge ²	I _D =18A	-	13	21	nC
Q _{gs}	Gate-Source Charge	V _{DS} =44V	-	3.5	-	nC
Q _{gd}	Gate-Drain ("Miller") Charge	V _{GS} =4.5V	-	9	-	nC
t _{d(on)}	Turn-on Delay Time ²	V _{DS} =30V	-	8	-	ns
t _r	Rise Time	I _D =18A	-	31	-	ns
t _{d(off)}	Turn-off Delay Time	R _G =2Ω, V _{GS} =10V	-	22	-	ns
t _f	Fall Time	R _D =1.67Ω	-	5	-	ns
C _{iss}	Input Capacitance	V _{GS} =0V	-	800	1280	pF
C _{oss}	Output Capacitance	V _{DS} =25V	-	80	-	pF
C _{rss}	Reverse Transfer Capacitance	f=1.0MHz	-	70	-	pF
R _g	Gate Resistance	f=1.0MHz	-	2.1	-	Ω

Source-Drain Diode

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
V _{SD}	Forward On Voltage ²	I _S =18A, V _{GS} =0V	-	-	1.3	V
t _{rr}	Reverse Recovery Time ²	I _S =10A, V _{GS} =0V,	-	22	-	ns
Q _{rr}	Reverse Recovery Charge	dI/dt=100A/μs	-	17	-	nC

Notes:

- 1.Pulse width limited by Max. junction temperature
- 2.Pulse test
- 3.Surface mounted on 1 in² copper pad of FR4 board

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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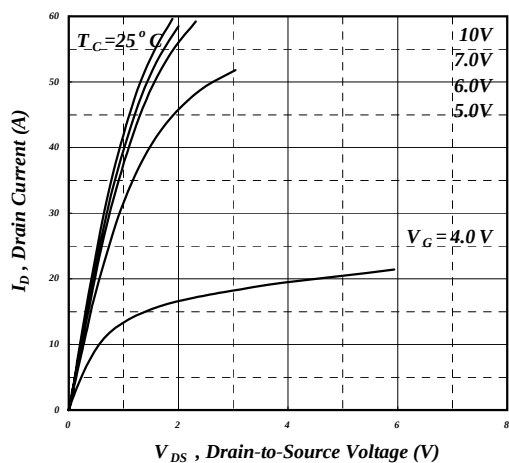


Fig 1. Typical Output Characteristics

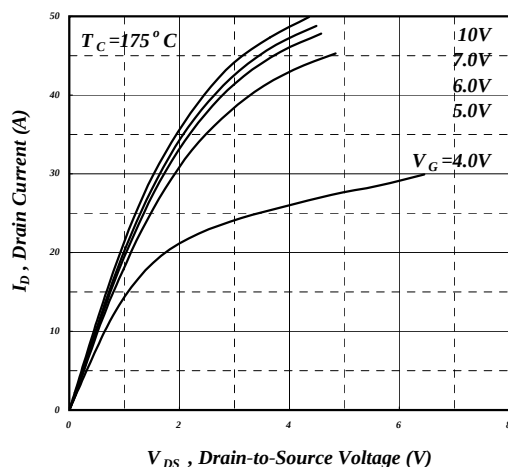


Fig 2. Typical Output Characteristics

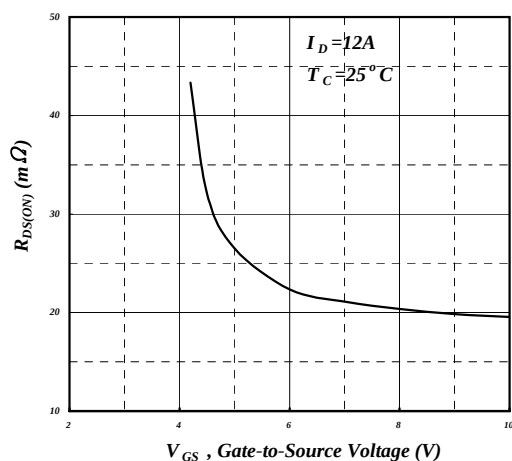


Fig 3. On-Resistance v.s. Gate Voltage

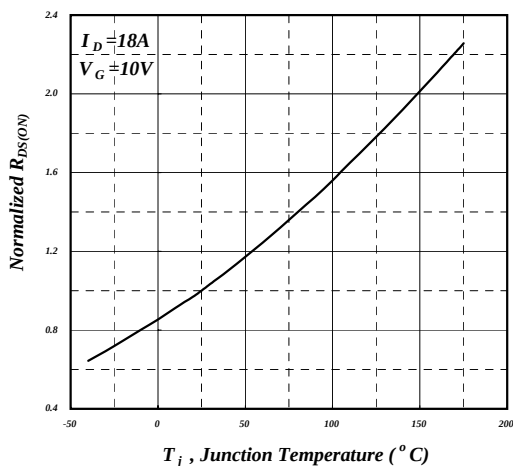


Fig 4. Normalized On-Resistance
v.s. Junction Temperature

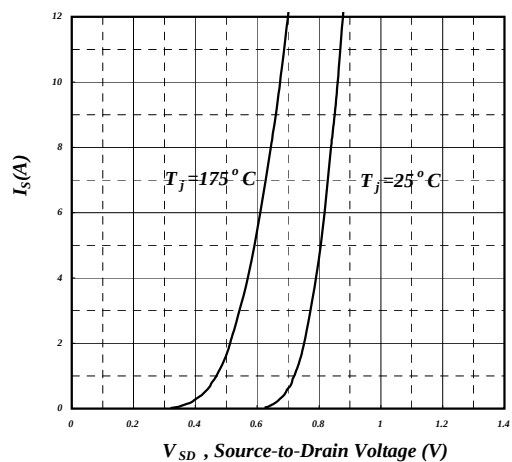


Fig 5. Forward Characteristic of
Reverse Diode

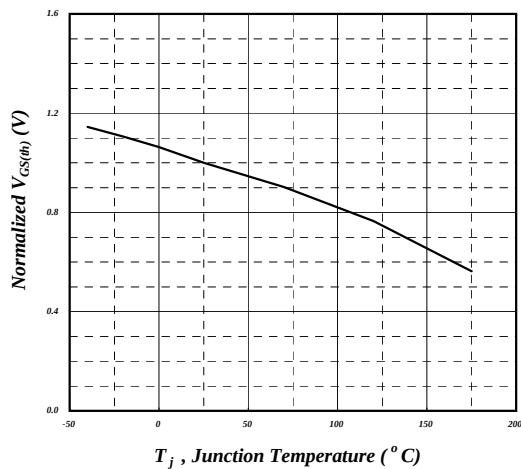


Fig 6. Gate Threshold Voltage v.s.
Junction Temperature

