



**Advanced Power  
Electronics Corp.**

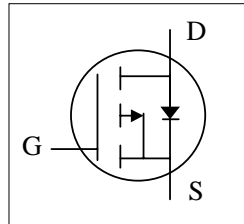
**AP3403GH/J**

**Pb Free Plating Product**

*P-CHANNEL ENHANCEMENT MODE*

*POWER MOSFET*

- ▼ Low Gate Charge
- ▼ Simple Drive Requirement
- ▼ Fast Switching

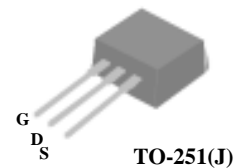
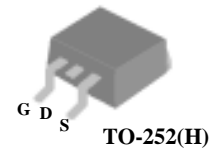


$BV_{DSS}$	-30V
$R_{DS(ON)}$	200m $\Omega$
$I_D$	-10A

## Description

Advanced Power MOSFETs utilized advanced processing techniques to achieve the lowest possible on-resistance, extremely efficient and cost-effectiveness device.

The TO-252/TO-251 package is universally used for all commercial-industrial application.



## Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
$V_{DS}$	Drain-Source Voltage	-30	V
$V_{GS}$	Gate-Source Voltage	$\pm 20$	V
$I_D@T_A=25^\circ C$	Continuous Drain Current	-10	A
$I_D@T_A=70^\circ C$	Continuous Drain Current	-8.6	A
$I_{DM}$	Pulsed Drain Current <sup>1</sup>	-48	A
$P_D@T_A=25^\circ C$	Total Power Dissipation	36.7	W
	Linear Derating Factor	0.29	W/ $^\circ C$
$T_{STG}$	Storage Temperature Range	-55 to 150	$^\circ C$
$T_J$	Operating Junction Temperature Range	-55 to 150	$^\circ C$

## Thermal Data

Symbol	Parameter	Value	Unit
Rthj-case	Thermal Resistance Junction-case	Max. 3.4	$^\circ C/W$
Rthj-amb	Thermal Resistance Junction-ambient	Max. 110	$^\circ C/W$



**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
ΔBV <sub>DSS</sub> /ΔT <sub>j</sub>	Breakdown Voltage Temperature Coefficient	Reference to 25°C, I <sub>D</sub> =-1mA	-	-0.1	-	V/°C
R <sub>DS(ON)</sub>	Static Drain-Source On-Resistance <sup>2</sup>	V <sub>GS</sub> =-10V, I <sub>D</sub> =-6A	-	-	200	mΩ
		V <sub>GS</sub> =-4.5V, I <sub>D</sub> =-4A	-	-	400	mΩ
V <sub>GS(th)</sub>	Gate Threshold Voltage	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =-250uA	-1	-	-3	V
g <sub>fs</sub>	Forward Transconductance	V <sub>DS</sub> =-10V, I <sub>D</sub> =-6A	-	2	-	S
I <sub>DSS</sub>	Drain-Source Leakage Current (T <sub>j</sub> =25°C)	V <sub>DS</sub> =-30V, V <sub>GS</sub> =0V	-	-	-1	uA
	Drain-Source Leakage Current (T <sub>j</sub> =150°C)	V <sub>DS</sub> =-24V, V <sub>GS</sub> =0V	-	-	-25	uA
I <sub>GSS</sub>	Gate-Source Leakage	V <sub>GS</sub> = ± 20V	-	-	±100	nA
Q <sub>g</sub>	Total Gate Charge <sup>2</sup>	I <sub>D</sub> =-6A	-	3.8	-	nC
Q <sub>gs</sub>	Gate-Source Charge	V <sub>DS</sub> =-24V	-	1.7	-	nC
Q <sub>gd</sub>	Gate-Drain ("Miller") Charge	V <sub>GS</sub> =-4.5V	-	1.6	-	nC
t <sub>d(on)</sub>	Turn-on Delay Time <sup>2</sup>	V <sub>DS</sub> =-15V	-	6.7	-	ns
t <sub>r</sub>	Rise Time	I <sub>D</sub> =-6A	-	20.8	-	ns
t <sub>d(off)</sub>	Turn-off Delay Time	R <sub>G</sub> =2Ω, V <sub>GS</sub> =-10V	-	14.9	-	ns
t <sub>f</sub>	Fall Time	R <sub>D</sub> =2.5Ω	-	4.4	-	ns
C <sub>iss</sub>	Input Capacitance	V <sub>GS</sub> =0V	-	217	-	pF
C <sub>oss</sub>	Output Capacitance	V <sub>DS</sub> =-25V	-	103	-	pF
C <sub>rss</sub>	Reverse Transfer Capacitance	f=1.0MHz	-	31	-	pF

**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> =-1.25A, V <sub>GS</sub> =0V	-	-	-1.2	V
t <sub>rr</sub>	Reverse Recovery Time	I <sub>S</sub> =-6A, V <sub>GS</sub> =0V,	-	35	-	ns
Q <sub>rr</sub>	Reverse Recovery Charge	dI/dt=-100A/μs	-	63	-	nC

**Notes:**

- 1.Pulse width limited by Max. junction temperature.
- 2.Pulse width ≤300us , duty cycle ≤2%.

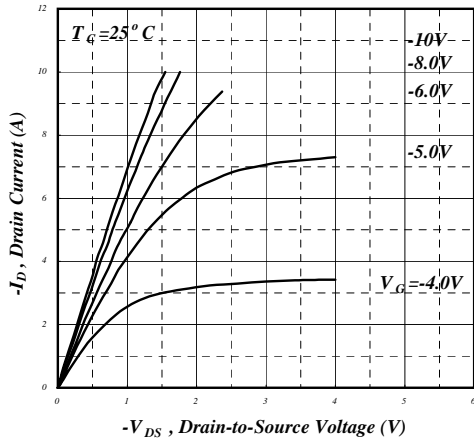


Fig 1. Typical Output Characteristics

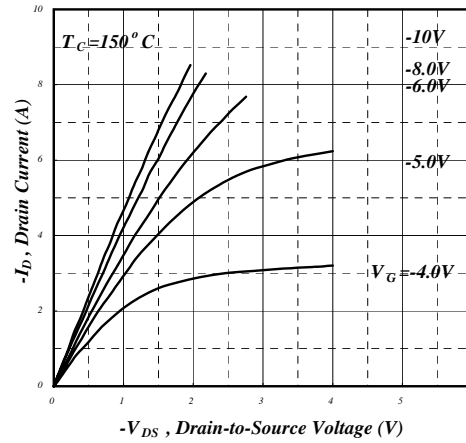


Fig 2. Typical Output Characteristics

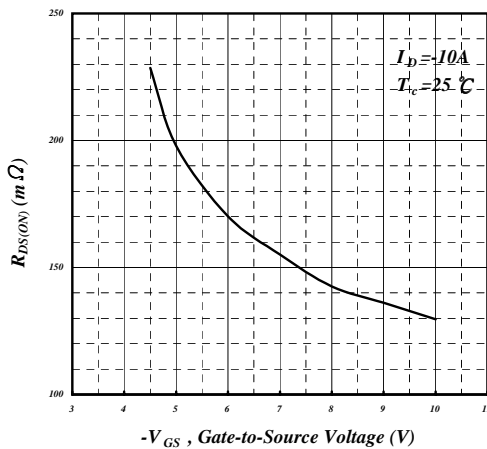


Fig 3. On-Resistance v.s. Gate Voltage

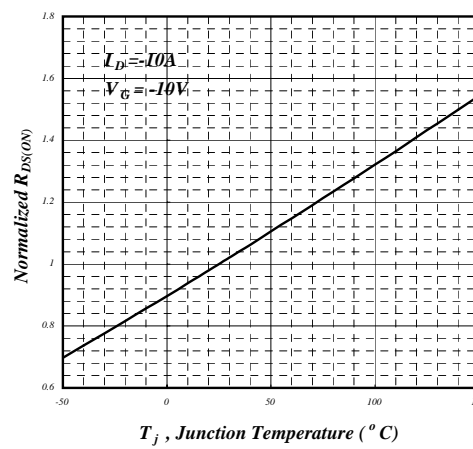


Fig 4. Normalized On-Resistance v.s. Junction Temperature

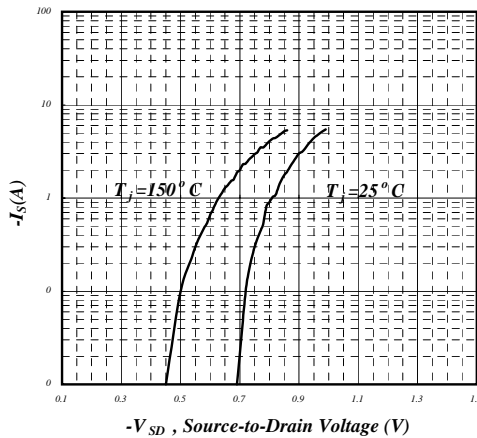


Fig5. Forward Characteristic of Reverse Diode

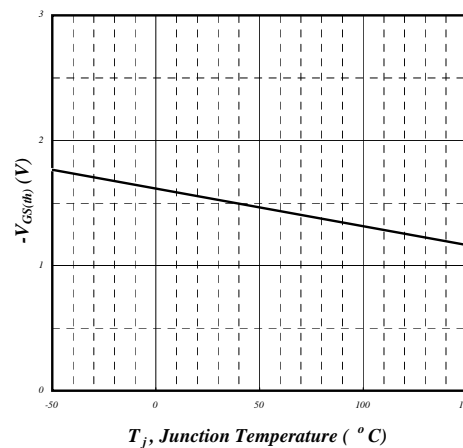


Fig 6. Gate Threshold Voltage v.s. Junction Temperature

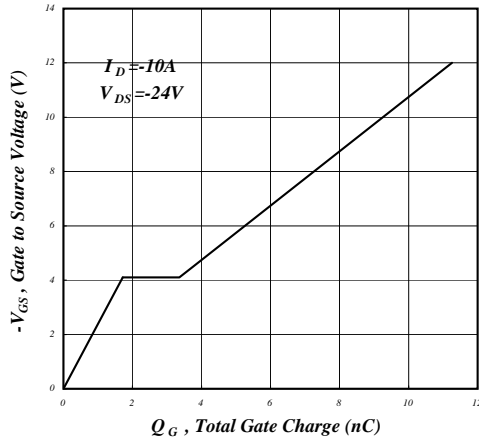


Fig 7. Gate Charge Characteristics

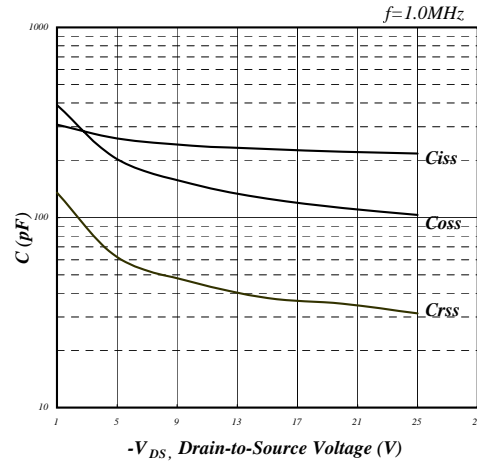


Fig 8. Typical Capacitance Characteristics

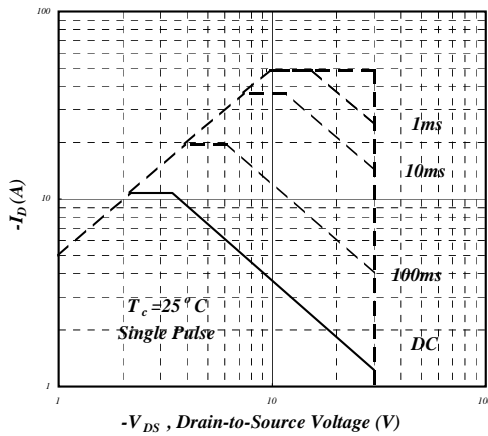


Fig 9. Maximum Safe Operating Area

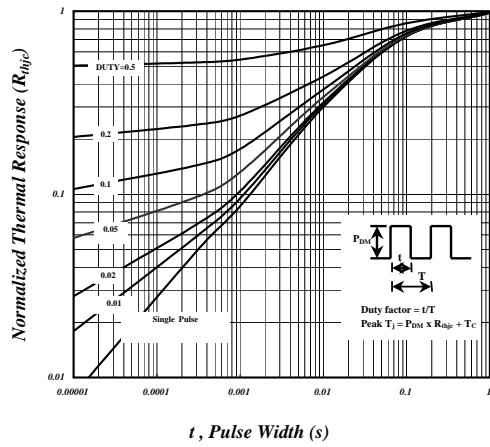


Fig 10. Effective Transient Thermal Impedance

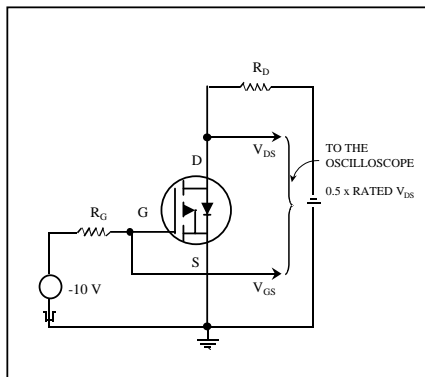


Fig11. Switching Time Circuit

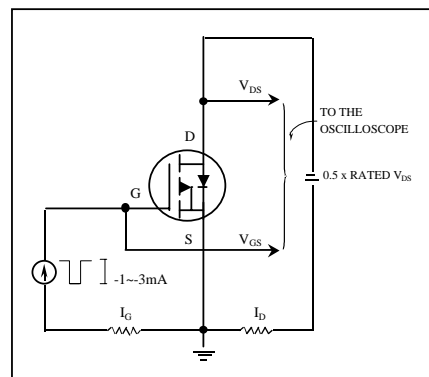


Fig 12. Gate Charge Circuit