



**Advanced Power
Electronics Corp.**

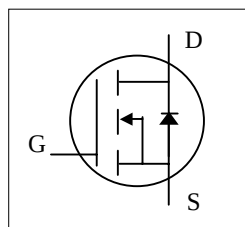
AP01L60H/J-A-HF

Halogen-Free Product

N-CHANNEL ENHANCEMENT MODE

POWER MOSFET

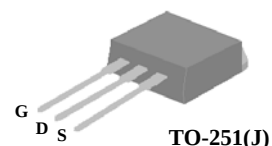
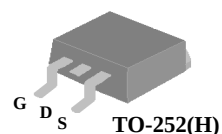
- ▼ 100% Avalanche Rated
- ▼ Fast Switching Speed
- ▼ Simple Drive Requirement
- ▼ RoHS Compliant & Halogen-Free



BV_{DSS}	650V
$R_{DS(ON)}$	12 Ω
I_D	1A

Description

The TO-252 package is widely preferred for commercial-industrial surface mount applications and suited for AC/DC converters. The through-hole version (AP01L60J) is available for low-profile applications.



Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	650	V
V_{GS}	Gate-Source Voltage	± 30	V
$I_D @ T_C = 25^\circ C$	Continuous Drain Current, $V_{GS} @ 10V$	1	A
$I_D @ T_C = 100^\circ C$	Continuous Drain Current, $V_{GS} @ 10V$	0.8	A
I_{DM}	Pulsed Drain Current ¹	3	A
$P_D @ T_C = 25^\circ C$	Total Power Dissipation	29	W
	Linear Derating Factor	0.232	W/ $^\circ C$
E_{AS}	Single Pulse Avalanche Energy ²	0.5	mJ
I_{AR}	Avalanche Current	1	A
E_{AR}	Repetitive Avalanche Energy	0.5	mJ
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	Units
Rthj-c	Maximum Thermal Resistance, Junction-case	4.3	$^\circ C/W$
Rthj-a	Maximum Thermal Resistance, Junction-ambient (PCB mount) ⁴	62.5	$^\circ C/W$
Rthj-a	Maximum Thermal Resistance, Junction-ambient	110	$^\circ C/W$



AP01L60H/J-A-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 =1mA	650	-	-	V
ΔBV _{DSS} /ΔT _j	Breakdown Voltage Temperature Coefficient	Reference to 25°C, I _D =1mA	-	0.8	-	V/°C
R _{DS(ON)}	Static Drain-Source On-Resistance ³	V _{GS} =10V, I _D =0.5A	-	-	12	Ω
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =250μA	2	-	4	V
g _{fs}	Forward Transconductance	V _{DS} =10V, I _D =0.5A	-	0.8	-	S
I _{DSS}	Drain-Source Leakage Current	V _{DS} =600V, V _{GS} =0V	-	-	10	μA
	Drain-Source Leakage Current (T _j =125°C)	V _{DS} =480V, V _{GS} =0V	-	-	100	μA
I _{GSS}	Gate-Source Leakage	V _{GS} =±30V	-	-	±100	nA
Q _g	Total Gate Charge ³	I _D =1A	-	4.0	-	nC
Q _{gs}	Gate-Source Charge	V _{DS} =480V	-	1.0	-	nC
Q _{gd}	Gate-Drain ("Miller") Charge	V _{GS} =10V	-	1.1	-	nC
t _{d(on)}	Turn-on Delay Time ³	V _{DD} =300V	-	6.6	-	ns
t _r	Rise Time	I _D =1A	-	5.0	-	ns
t _{d(off)}	Turn-off Delay Time	R _G =3.3Ω, V _{GS} =10V	-	11.7	-	ns
t _f	Fall Time	R _D =300Ω	-	9.2	-	ns
C _{iss}	Input Capacitance	V _{GS} =0V	-	170	-	pF
C _{oss}	Output Capacitance	V _{DS} =25V	-	30.7	-	pF
C _{rss}	Reverse Transfer Capacitance	f=1.0MHz	-	5.1	-	pF

Source-Drain Diode

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
I _S	Continuous Source Current (Body Diode)	V _D =V _G =0V, V _S =1.2V	-	-	1	A
I _{SM}	Pulsed Source Current (Body Diode) ¹		-	-	5	A
V _{SD}	Forward On Voltage ³	T _j =25°C, I _S =1A, V _{GS} =0V	-	-	1.2	V

Notes:

- 1.Pulse width limited by Max. junction temperature.
- 2.Starting T_j=25°C, V_{DD}=50V, L=1.0mH, R_G=25Ω, I_{AS}=1.0A.
- 3.Pulse test
- 4.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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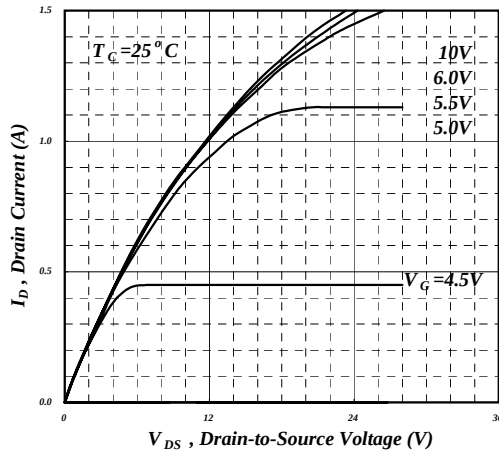


Fig 1. Typical Output Characteristics

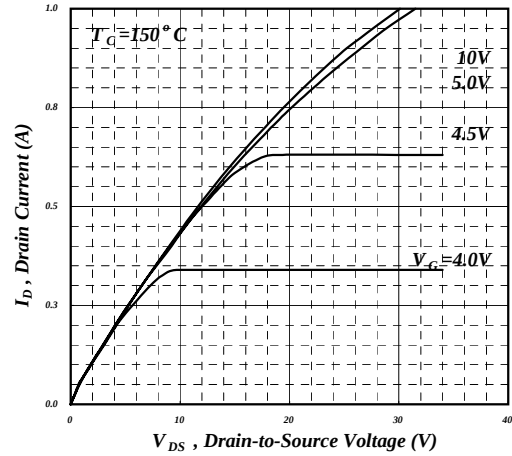


Fig 2. Typical Output Characteristics

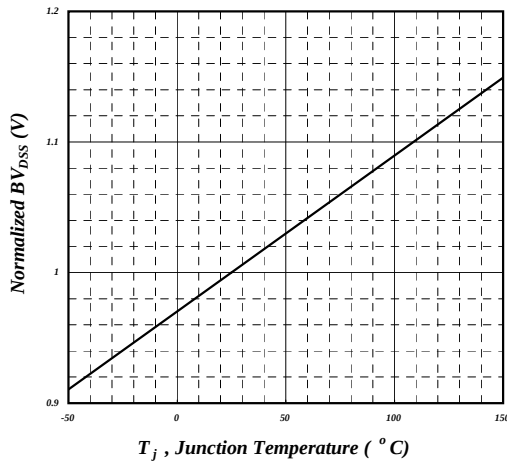


Fig 3. Normalized BV_{DSS} v.s. Junction Temperature

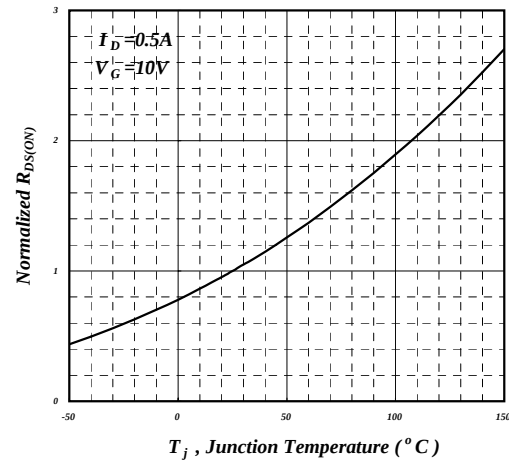


Fig 4. Normalized On-Resistance v.s. Junction Temperature

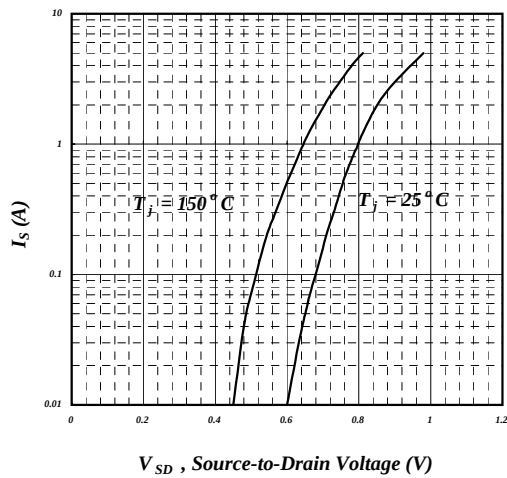


Fig 5. Forward Characteristic of Reverse Diode

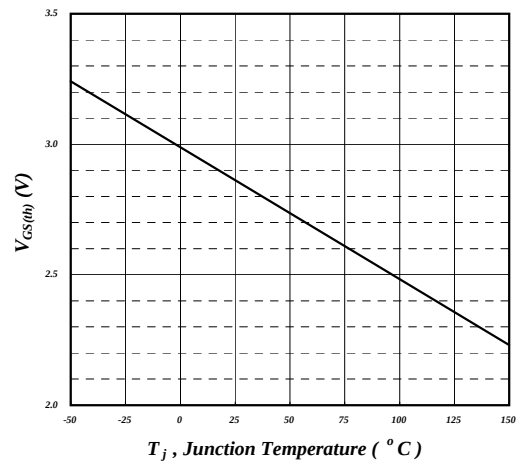


Fig 6. Gate Threshold Voltage v.s. Junction Temperature

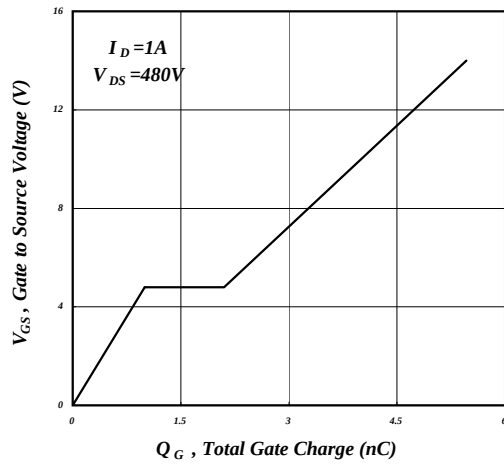


Fig 7. Gate Charge Characteristics

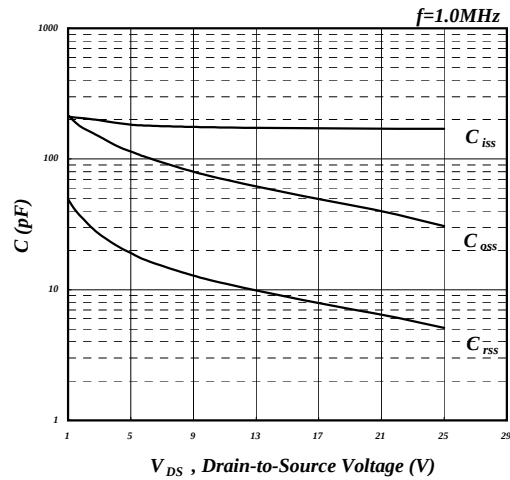


Fig 8. Typical Capacitance Characteristics

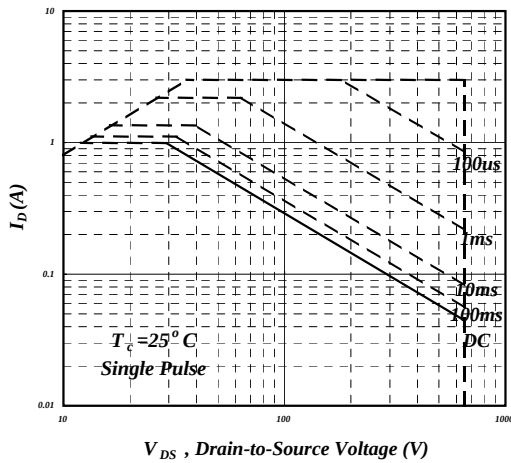


Fig 9. Maximum Safe Operating Area

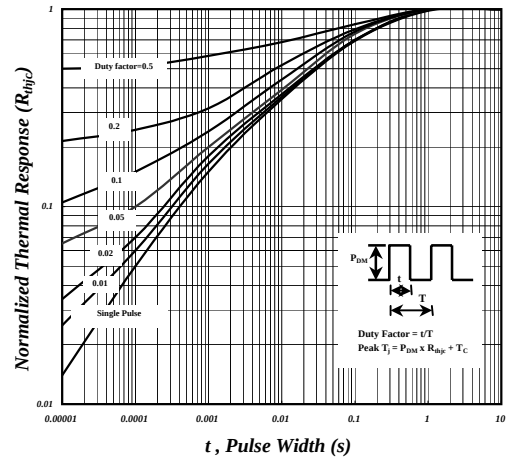


Fig 10. Effective Transient Thermal Impedance

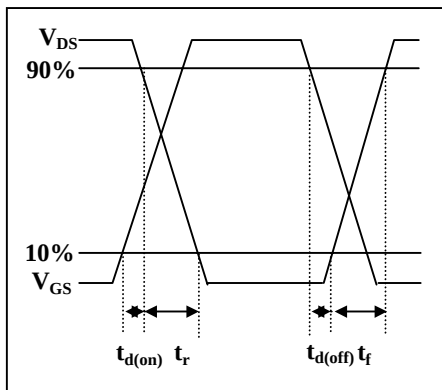


Fig 11. Switching Time Waveform

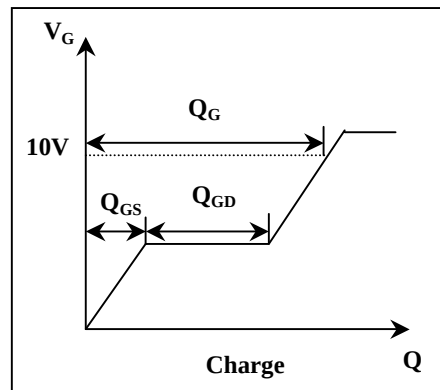


Fig 12. Gate Charge Waveform