



**Advanced Power
Electronics Corp.**

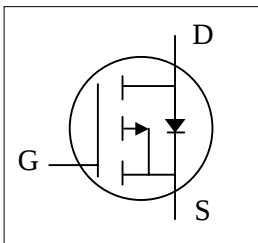
AP13P15GH/J-HF

Halogen-Free Product

P-CHANNEL ENHANCEMENT MODE

POWER MOSFET

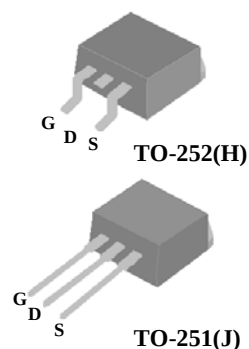
- ▼ Lower On-resistance
- ▼ Simple Drive Requirement
- ▼ Fast Switching Characteristic
- ▼ RoHS Compliant & Halogen-Free



BV_{DSS}	-150V
$R_{DS(ON)}$	300m Ω
I_D	-13A

Description

The TO-252 package is widely preferred for all commercial-industrial surface mount applications and suited for low voltage applications such as high efficiency switching DC/DC converters and DC motor control. The through-hole version (AP13P15GJ) is available for low-profile applications.



Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	-150	V
V_{GS}	Gate-Source Voltage	+20	V
$I_D@T_C=25^{\circ}C$	Continuous Drain Current, V_{GS} @ 10V	-13	A
$I_D@T_C=100^{\circ}C$	Continuous Drain Current, V_{GS} @ 10V	-8.2	A
I_{DM}	Pulsed Drain Current ¹	-52	A
$P_D@T_C=25^{\circ}C$	Total Power Dissipation	96	W
	Linear Derating Factor	0.77	W/ $^{\circ}C$
$P_D@T_A=25^{\circ}C$	Total Power Dissipation ³	2	W
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	1.3	$^{\circ}C/W$
Rthj-a	Maximum Thermal Resistance, Junction-ambient (PCB mount) ³	62.5	$^{\circ}C/W$
Rthj-a	Maximum Thermal Resistance, Junction-ambient	110	$^{\circ}C/W$



AP13P15GH/J-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	-150	-	-	V
R _{DS(ON)}	Static Drain-Source On-Resistance ²	V _{GS} =-10V, I _D =-7A	-	-	300	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 =-7A	-	6	-	S
I _{DSS}	Drain-Source Leakage Current	V _{DS} =-150V, 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 =-7A	-	38	60	nC
Q _{gs}	Gate-Source Charge	V _{DS} =-120V	-	5	-	nC
Q _{gd}	Gate-Drain ("Miller") Charge	V _{GS} =-10V	-	15	-	nC
t _{d(on)}	Turn-on Delay Time ²	V _{DS} =-75V	-	11	-	ns
t _r	Rise Time	I _D =-7A	-	21	-	ns
t _{d(off)}	Turn-off Delay Time	R _G =10Ω, V _{GS} =-10V	-	60	-	ns
t _f	Fall Time	R _D =10.7Ω	-	36	-	ns
C _{iss}	Input Capacitance	V _{GS} =0V	-	1210	1940	pF
C _{oss}	Output Capacitance	V _{DS} =-25V	-	220	-	pF
C _{rss}	Reverse Transfer Capacitance	f=1.0MHz	-	60	-	pF
R _g	Gate Resistance	f=1.0MHz	-	3.5	5	Ω

Source-Drain Diode

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
V _{SD}	Forward On Voltage ²	I _S =-7A, V _{GS} =0V	-	-	-1.3	V
t _{rr}	Reverse Recovery Time ²	I _S =-7A, V _{GS} =0V,	-	110	-	ns
Q _{rr}	Reverse Recovery Charge	dI/dt=-100A/μs	-	620	-	nC

Notes:

- 1.Pulse width limited by Maximum 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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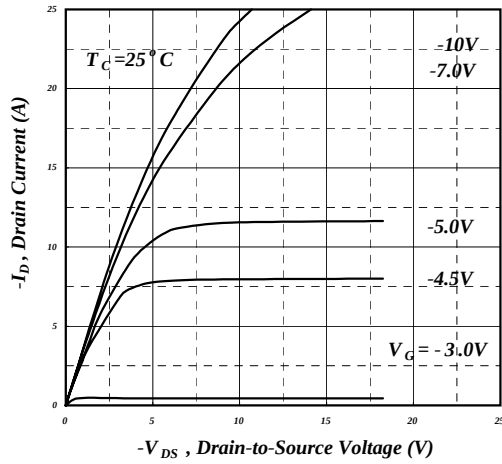


Fig 1. Typical Output Characteristics

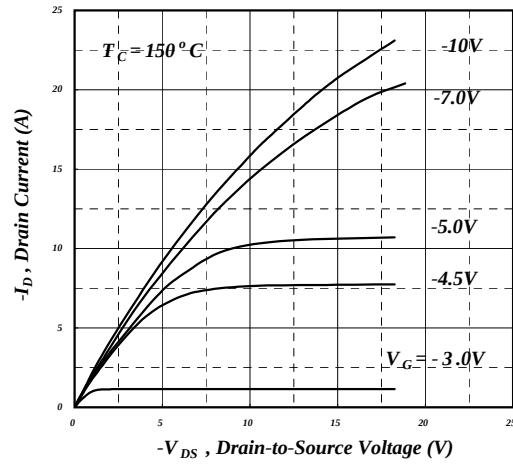


Fig 2. Typical Output Characteristics

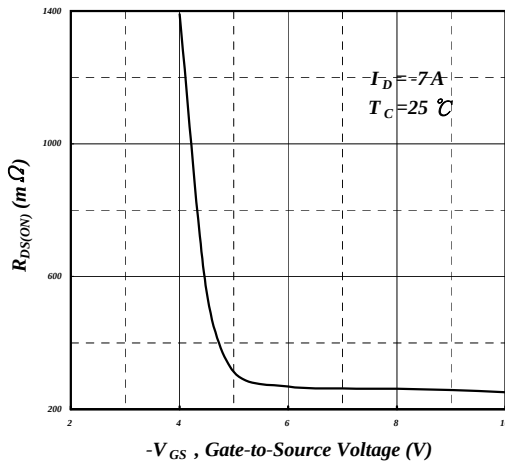


Fig 3. On-Resistance v.s. Gate Voltage

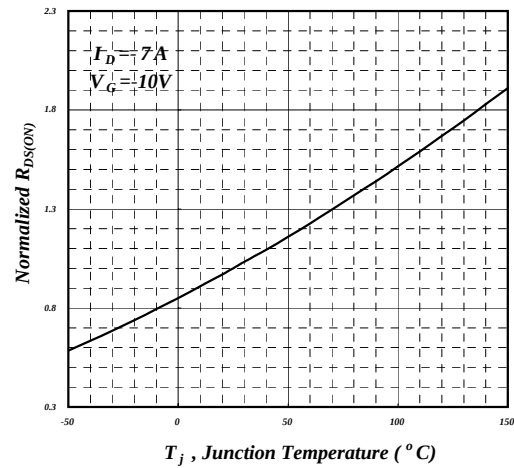


Fig 4. Normalized On-Resistance v.s. Junction Temperature

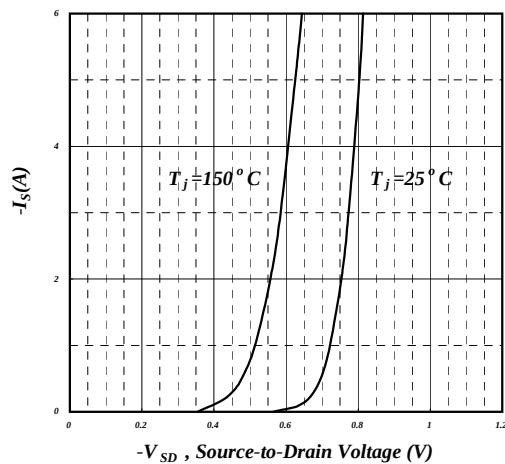


Fig 5. Forward Characteristic of Reverse Diode

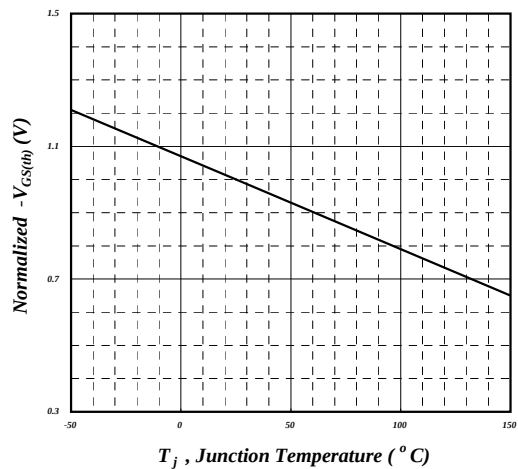


Fig 6. Gate Threshold Voltage v.s. Junction Temperature

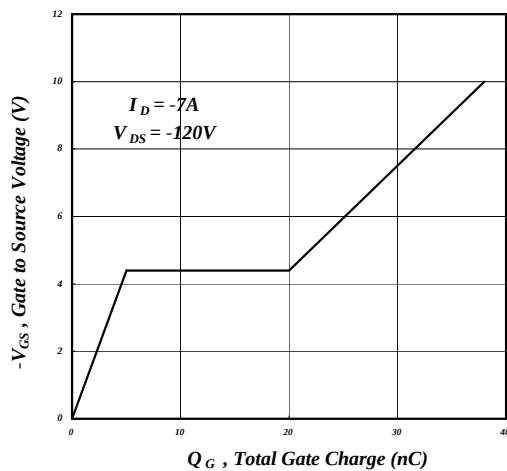


Fig 7. Gate Charge Characteristics

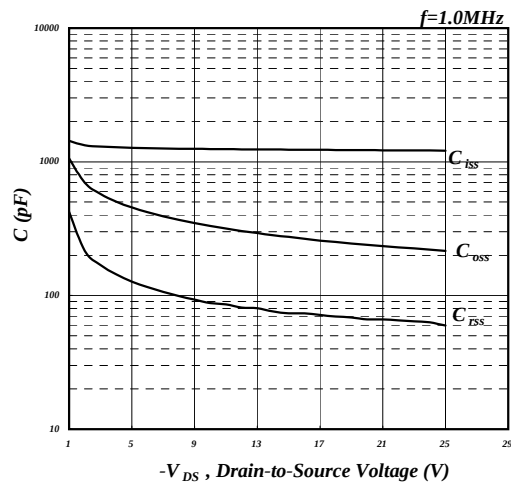


Fig 8. Typical Capacitance Characteristics

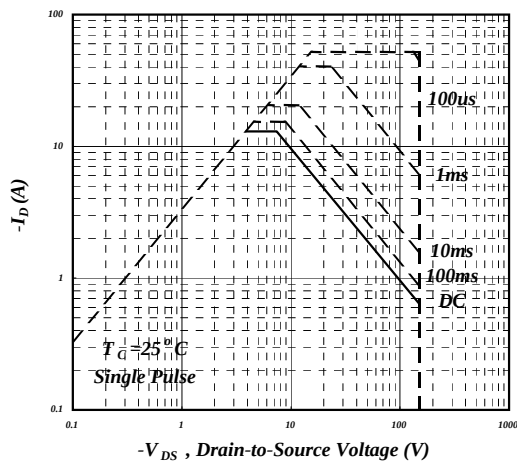


Fig 9. Maximum Safe Operating Area

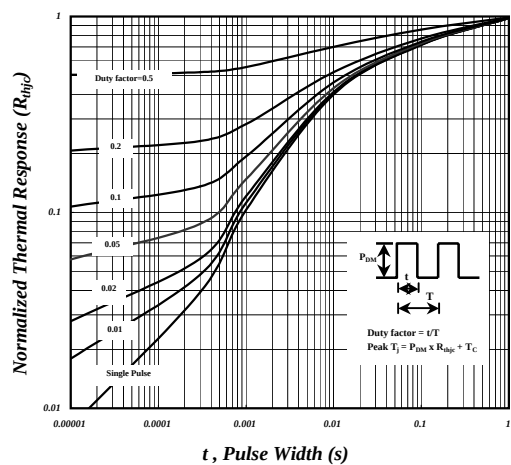


Fig 10. Effective Transient Thermal Impedance

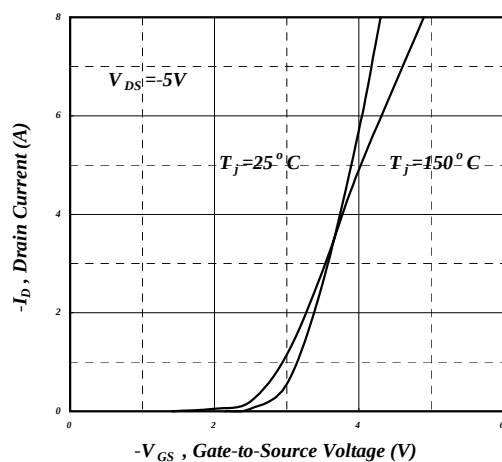


Fig 11. Transfer Characteristics

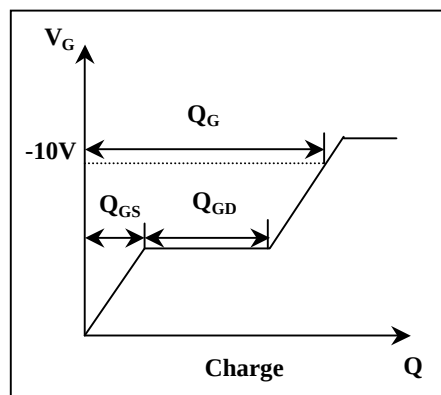


Fig 12. Gate Charge Waveform