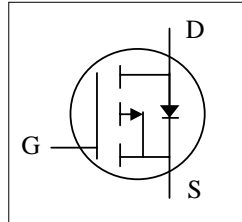




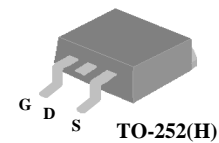
- ▼ Simple Drive Requirement
- ▼ 2.5V Gate Drive Capability
- ▼ Fast Switching Characteristic



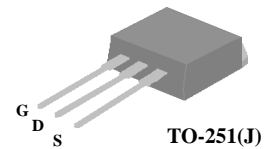
$BV_{DSS}$	-20V
$R_{DS(ON)}$	150m $\Omega$
$I_D$	-10A

## Description

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



This device is suited for low voltage and battery power applications.



## Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
$V_{DS}$	Drain-Source Voltage	- 20	V
$V_{GS}$	Gate-Source Voltage	$\pm 12$	V
$I_D@T_C=25^\circ C$	Continuous Drain Current, $V_{GS}$ @ 4.5V	-10	A
$I_D@T_C=100^\circ C$	Continuous Drain Current, $V_{GS}$ @ 4.5V	-6.2	A
$I_{DM}$	Pulsed Drain Current <sup>1</sup>	-24	A
$P_D@T_C=25^\circ C$	Total Power Dissipation	25	W
	Linear Derating Factor	0.01	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	Units
Rthj-c	Maximum Thermal Resistance, Junction-case	5.0	$^\circ C/W$
Rthj-a	Maximum Thermal Resistance, Junction-ambient (PCB mount) <sup>3</sup>	62.5	$^\circ C/W$
Rthj-a	Maximum Thermal Resistance, Junction-ambient	110	$^\circ C/W$



# AP3310GH/J-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	-20	-	-	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> =-4.5V, I <sub>D</sub> =-2.8A	-	-	150	mΩ
		V <sub>GS</sub> =-2.5V, I <sub>D</sub> =-2.0A	-	-	250	mΩ
V <sub>GS(th)</sub>	Gate Threshold Voltage	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =-250uA	-0.5	-	-	V
g <sub>fs</sub>	Forward Transconductance	V <sub>DS</sub> =-5V, I <sub>D</sub> =-2.8A	-	4.4	-	S
I <sub>DSS</sub>	Drain-Source Leakage Current	V <sub>DS</sub> =-20V, V <sub>GS</sub> =0V	-	-	-1	uA
	Drain-Source Leakage Current (T <sub>J</sub> =125°C)	V <sub>DS</sub> =-16V, V <sub>GS</sub> =0V	-	-	-250	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> =-2.8A	-	6	-	nC
Q <sub>gs</sub>	Gate-Source Charge	V <sub>DS</sub> =-6V	-	1.5	-	nC
Q <sub>gd</sub>	Gate-Drain ("Miller") Charge	V <sub>GS</sub> =-5V	-	0.6	-	nC
t <sub>d(on)</sub>	Turn-on Delay Time <sup>2</sup>	V <sub>DS</sub> =-6V	-	25	-	ns
t <sub>r</sub>	Rise Time	I <sub>D</sub> =-1A	-	60	-	ns
t <sub>d(off)</sub>	Turn-off Delay Time	R <sub>G</sub> =6Ω, V <sub>GS</sub> =-5V	-	70	-	ns
t <sub>f</sub>	Fall Time	R <sub>D</sub> =6Ω	-	60	-	ns
C <sub>iss</sub>	Input Capacitance	V <sub>GS</sub> =0V	-	300	-	pF
C <sub>oss</sub>	Output Capacitance	V <sub>DS</sub> =-6V	-	180	-	pF
C <sub>rss</sub>	Reverse Transfer Capacitance	f=1.0MHz	-	60	-	pF

## Source-Drain Diode

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
I <sub>S</sub>	Continuous Source Current ( Body Diode )	V <sub>D</sub> =V <sub>G</sub> =0V, V <sub>S</sub> =-1.2V	-	-	-10	A
I <sub>SM</sub>	Pulsed Source Current ( Body Diode ) <sup>1</sup>		-	-	-24	A
V <sub>SD</sub>	Forward On Voltage <sup>2</sup>	T <sub>J</sub> =25°C, I <sub>S</sub> =-10A, V <sub>GS</sub> =0V	-	-	-1.2	V

### 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

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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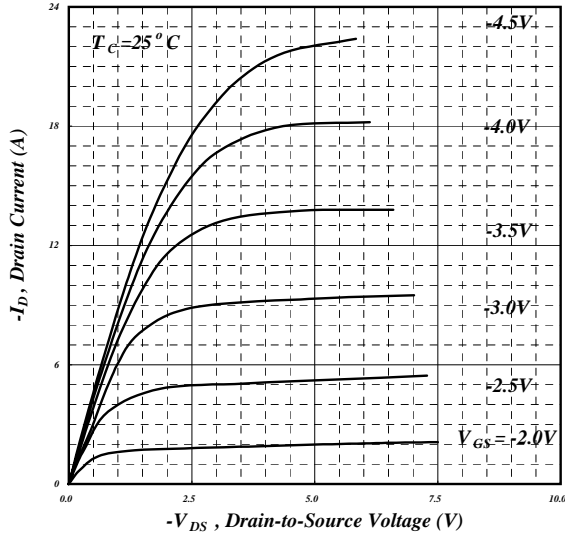


Fig 1. Typical Output Characteristics

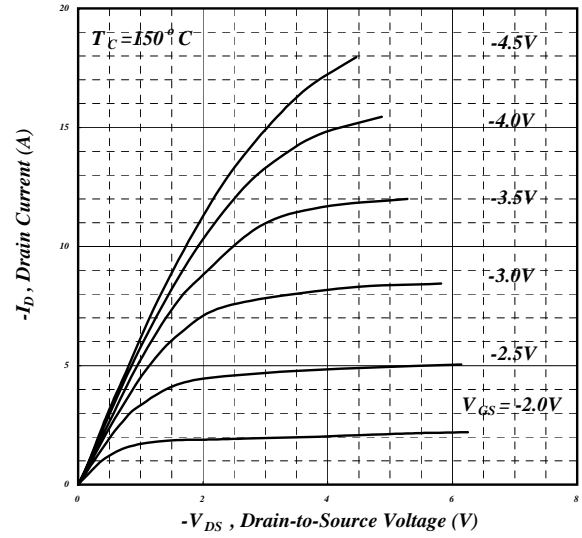


Fig 2. Typical Output Characteristics

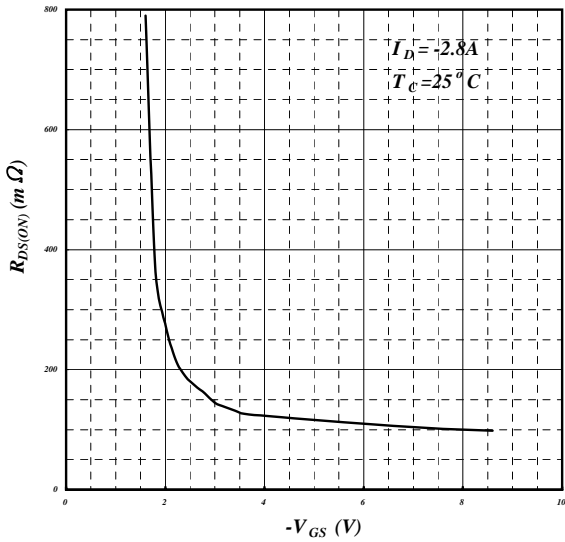


Fig 3. On-Resistance v.s. Gate Voltage

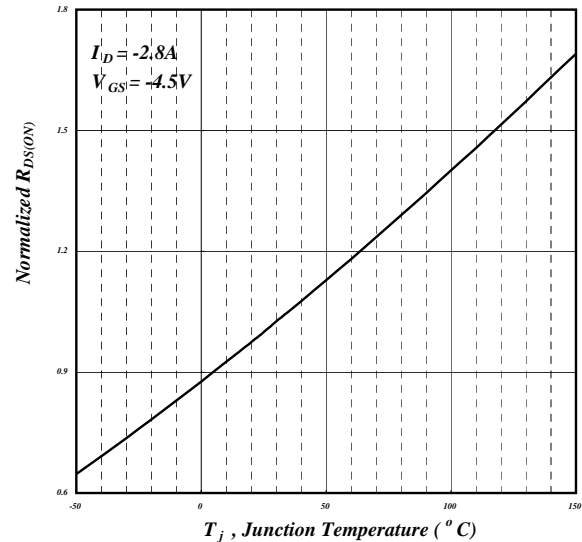


Fig 4. Normalized On-Resistance v.s. Junction Temperature

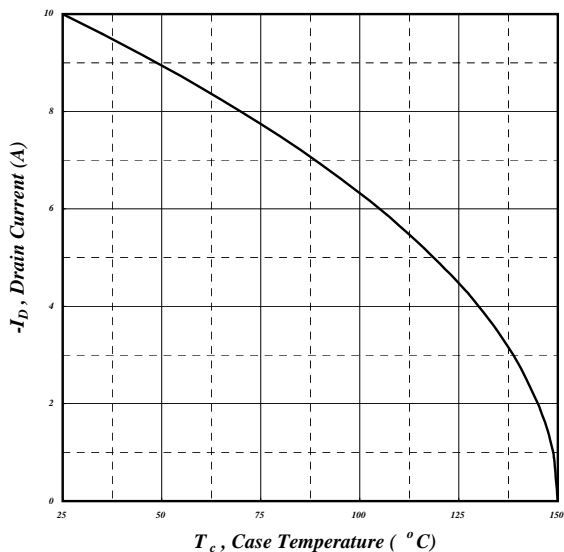


Fig 5. Maximum Drain Current v.s. Case Temperature

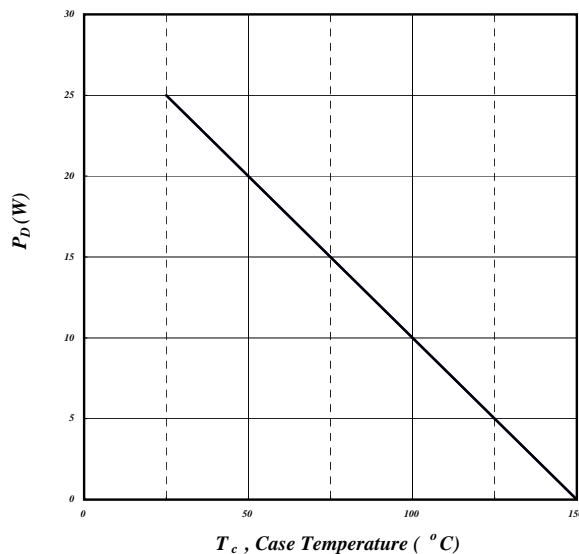


Fig 6. Typical Power Dissipation

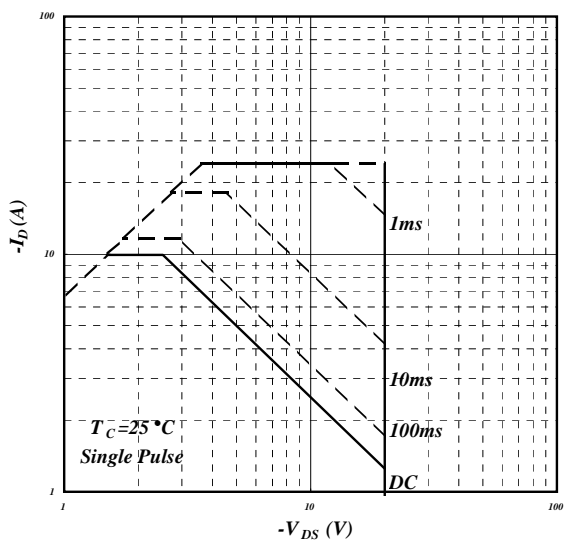


Fig 7. Maximum Safe Operating Area

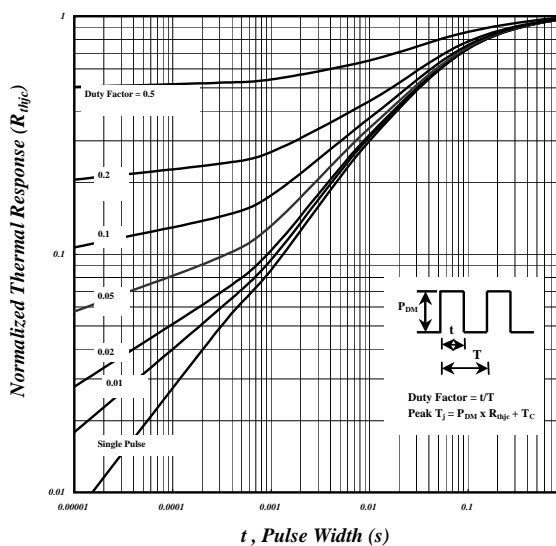


Fig 8. Effective Transient Thermal Impedance

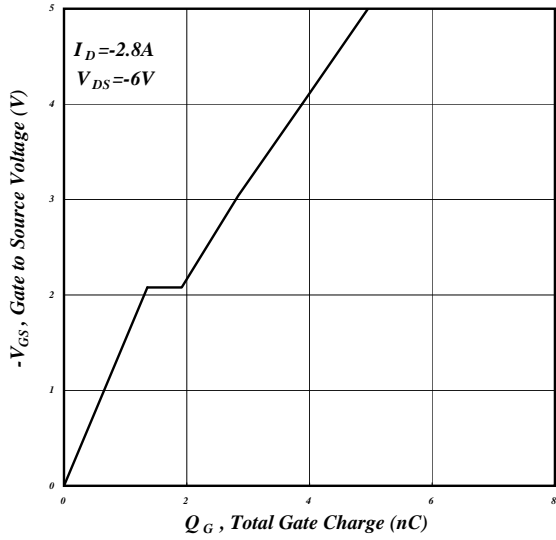


Fig 9. Gate Charge Characteristics

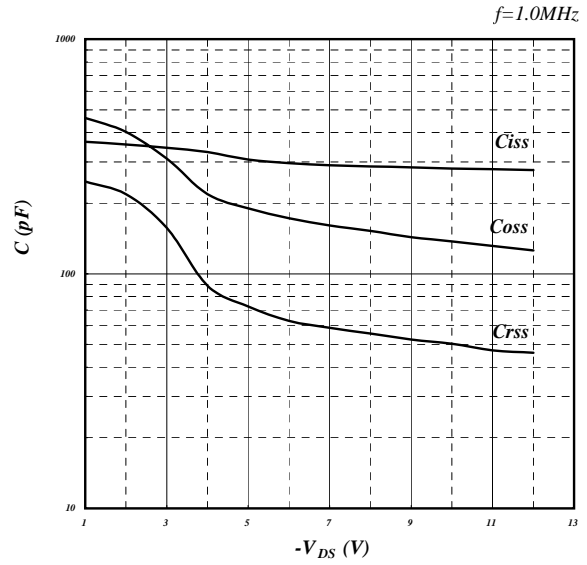


Fig 10. Typical Capacitance Characteristics

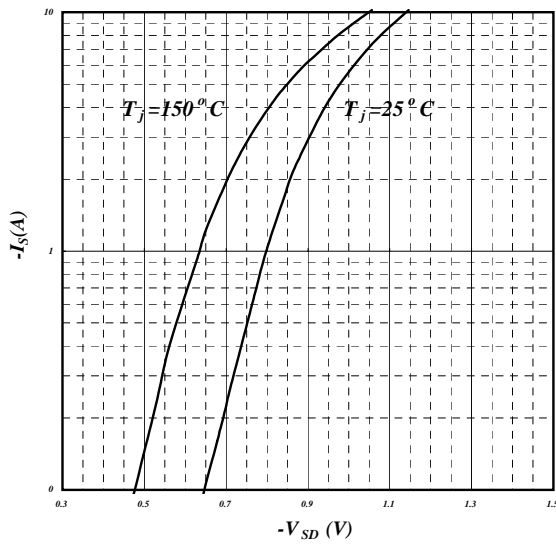


Fig 11. Forward Characteristic of Reverse Diode

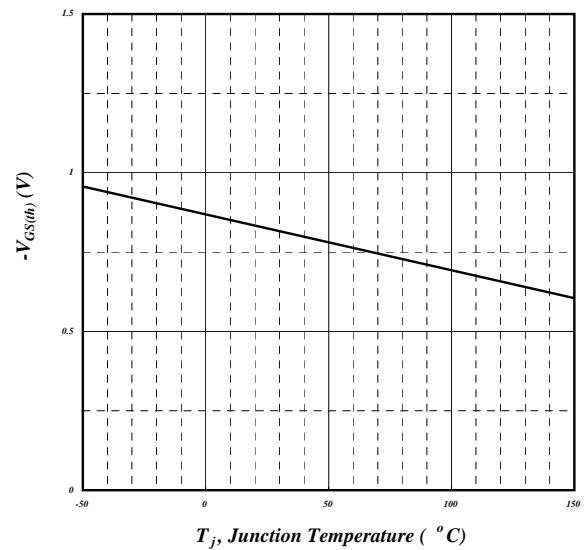


Fig 12. Gate Threshold Voltage v.s. Junction Temperature

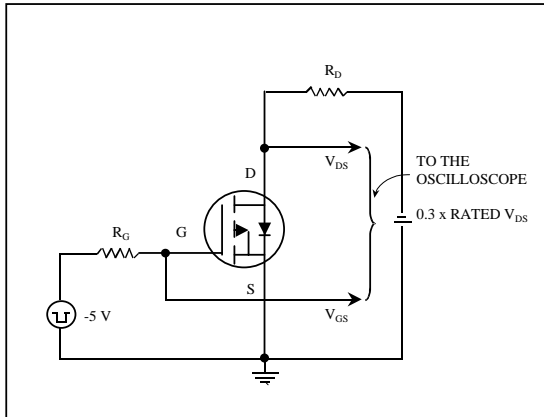


Fig 13. Switching Time Circuit

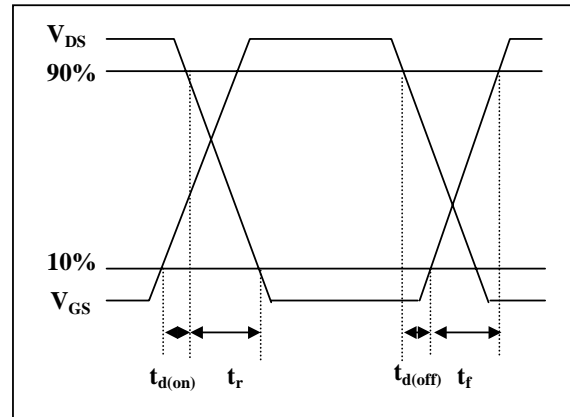


Fig 14. Switching Time Waveform

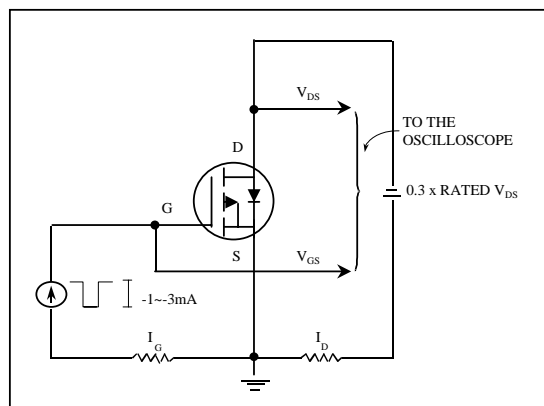


Fig 15. Gate Charge Circuit

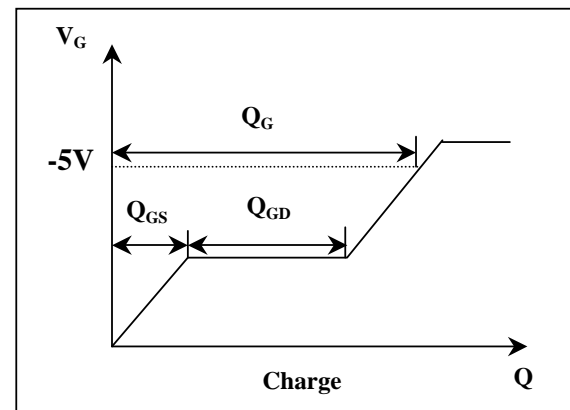


Fig 16. Gate Charge Waveform