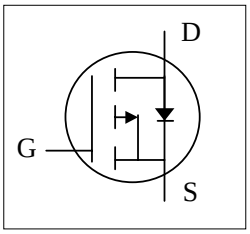
AP3310GH/J

RoHS-compliant Product

Advanced Power Electronics Corp.

P-CHANNEL ENHANCEMENT MODE POWER MOSFET

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

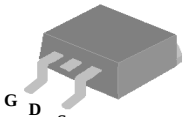


BV_{DSS}	-20V
$R_{DS(ON)}$	150mΩ
I_D	-10A

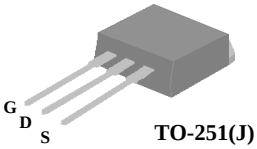
Description

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.



TO-252(H)



TO-251(J)

Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	- 20	V
V_{GS}	Gate-Source Voltage	±12	V
I_D@T_C=25℃	Continuous Drain Current, V_{GS} @ 4.5V	-10	A
I_D@T_C=100℃	Continuous Drain Current, V_{GS} @ 4.5V	-6.2	A
I_{DM}	Pulsed Drain Current[1]	-24	A
P_D@T_C=25℃	Total Power Dissipation	25	W
	Linear Derating Factor	0.01	W/℃
T_{STG}	Storage Temperature Range	-55 to 150	℃
T_J	Operating Junction Temperature Range	-55 to 150	℃

Thermal Data

Symbol	Parameter	Value	Units
Rthj-c	Maximum Thermal Resistance, Junction-case	5.0	℃/W
Rthj-a	Maximum Thermal Resistance, Junction-ambient (PCB mount)[3]	62.5	℃/W
Rthj-a	Maximum Thermal Resistance, Junction-ambient	110	℃/W

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	-20	-	-	V
$\Delta BV_{DSS}/\Delta T_j$	Breakdown Voltage Temperature Coefficient	Reference to 25℃, I_D=-1mA	-	-0.1	-	V/℃
$R_{DS(ON)}$	Static Drain-Source On-Resistance[2]	V_{GS}=-4.5V, I_D=-2.8A	-	-	150	mΩ
		V_{GS}=-2.5V, I_D=-2.0A	-	-	250	mΩ
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS}, I_D=-250uA	-0.5	-	-	V
g_{fs}	Forward Transconductance	V_{DS}=-5V, I_D=-2.8A	-	4.4	-	S
I_{DSS}	Drain-Source Leakage Current	V_{DS}=-20V, V_{GS}=0V	-	-	-1	uA
	Drain-Source Leakage Current (T_j=125°C)	V_{DS}=-16V, V_{GS}=0V	-	-	-250	uA
I_{GSS}	Gate-Source Leakage	V_{GS}=±12V, V_{DS}=0V	-	-	±100	nA
Q_g	Total Gate Charge[2]	I_D=-2.8A	-	6	-	nC
Q_{gs}	Gate-Source Charge	V_{DS}=-6V	-	1.5	-	nC
Q_{gd}	Gate-Drain ("Miller") Charge	V_{GS}=-5V	-	0.6	-	nC
$t_{d(on)}$	Turn-on Delay Time[2]	V_{DS}=-6V	-	25	-	ns
t_r	Rise Time	I_D=-1A	-	60	-	ns
$t_{d(off)}$	Turn-off Delay Time	R_G=6Ω,V_{GS}=-5V	-	70	-	ns
t_f	Fall Time	R_D=6Ω	-	60	-	ns
C_{iss}	Input Capacitance	V_{GS}=0V	-	300	-	pF
C_{oss}	Output Capacitance	V_{DS}=-6V	-	180	-	pF
C_{rss}	Reverse Transfer Capacitance	f=1.0MHz	-	60	-	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	-	-	-10	A
I_{SM}	Pulsed Source Current (Body Diode)[1]		-	-	-24	A
V_{SD}	Forward On Voltage[2]	T_j=25℃, I_S=-10A, V_{GS}=0V	-	-	-1.2	V

Notes:

1.Pulse width limited by Max. junction temperature.

2.Pulse test

3.Surface mounted on 1 in^2 copper pad of FR4 board

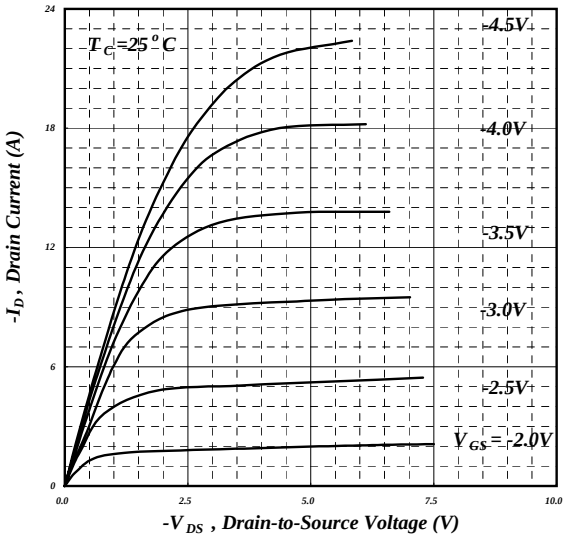


Fig 1. Typical Output Characteristics

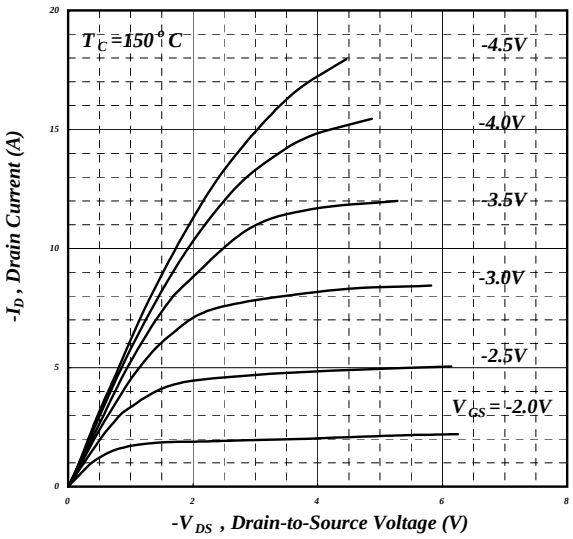


Fig 2. Typical Output Characteristics

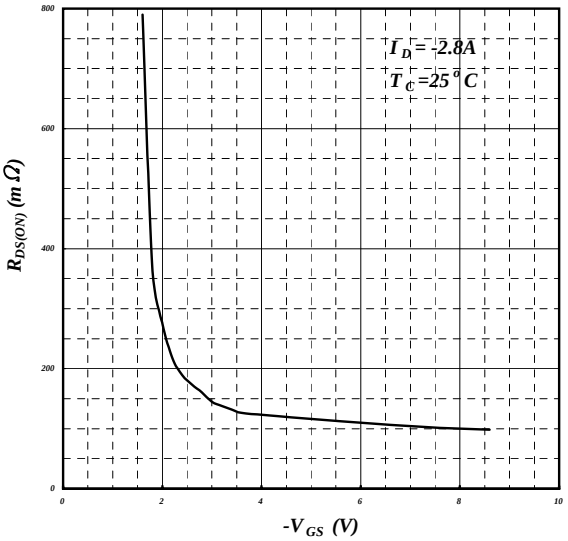


Fig 3. On-Resistance v.s. Gate Voltage

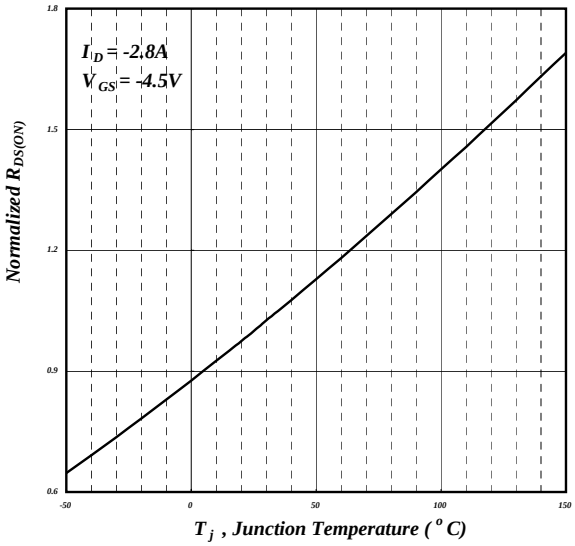


Fig 4. Normalized On-Resistance v.s. Junction Temperature

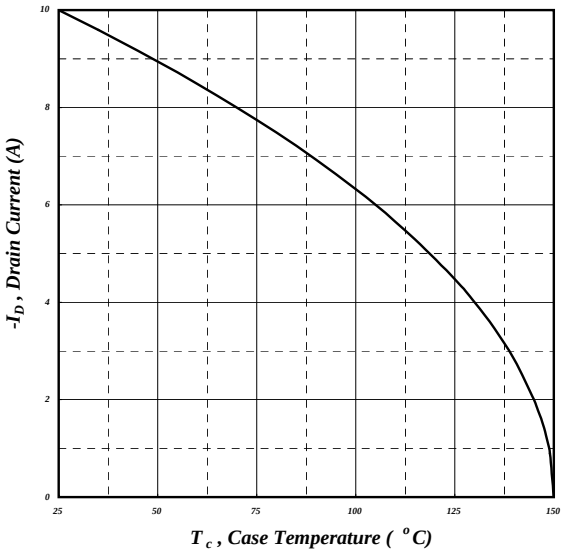


Fig 5. Maximum Drain Current v.s. Case Temperature

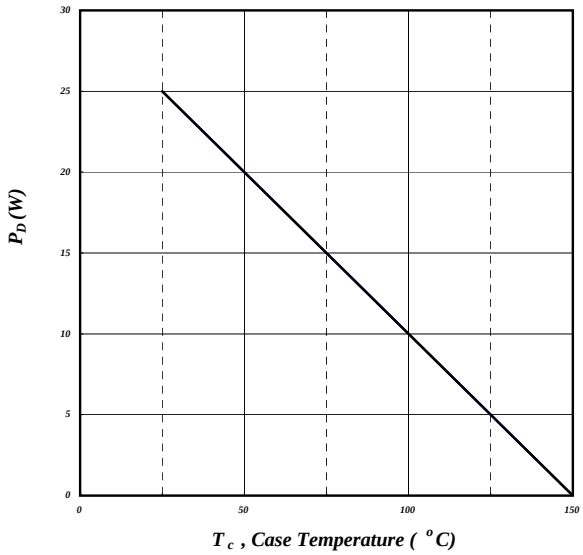


Fig 6. Typical Power Dissipation

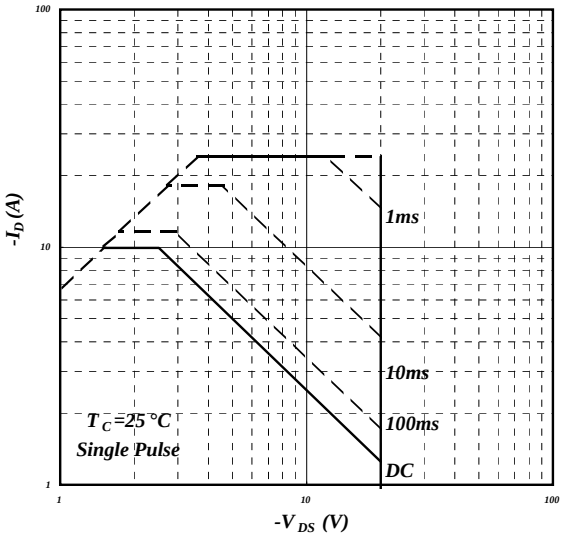


Fig 7. Maximum Safe Operating Area

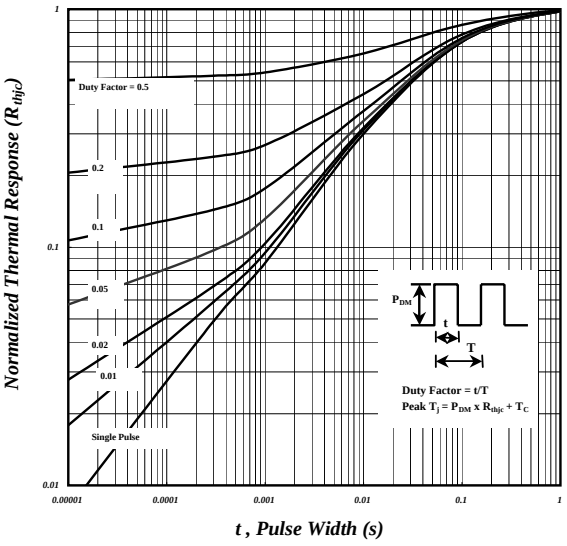


Fig 8. Effective Transient Thermal Impedance

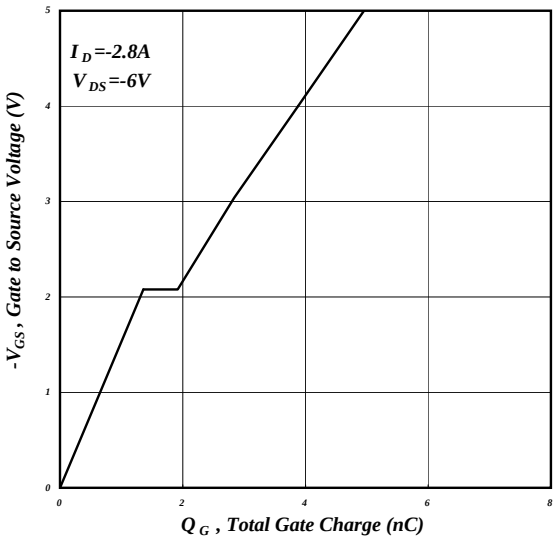


Fig 9. Gate Charge Characteristics

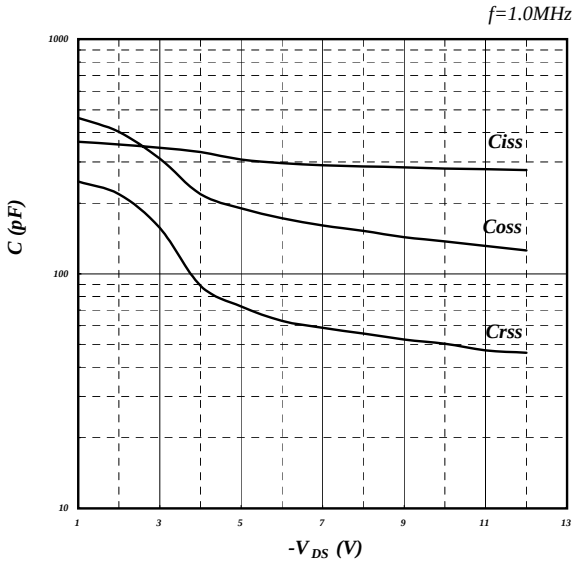


Fig 10. Typical Capacitance Characteristics

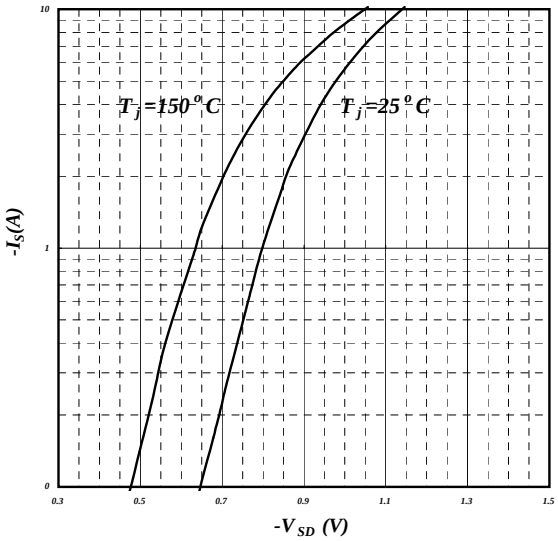


Fig 11. Forward Characteristic of Reverse Diode

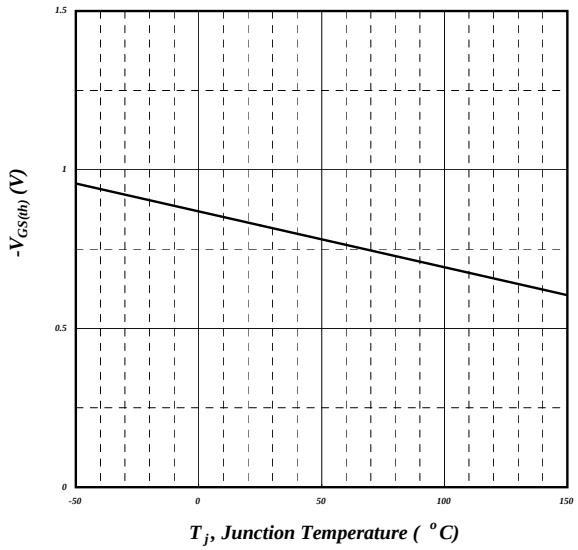


Fig 12. Gate Threshold Voltage v.s. Junction Temperature

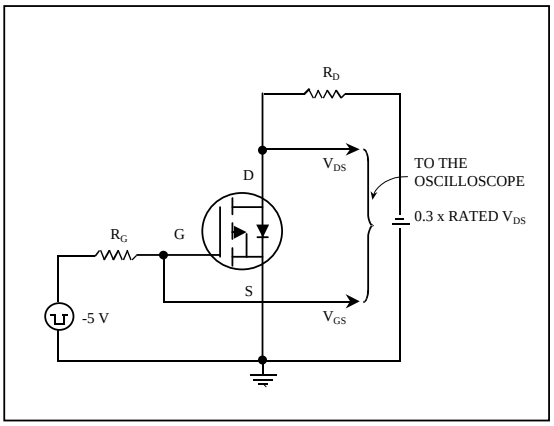


Fig 13. Switching Time Circuit

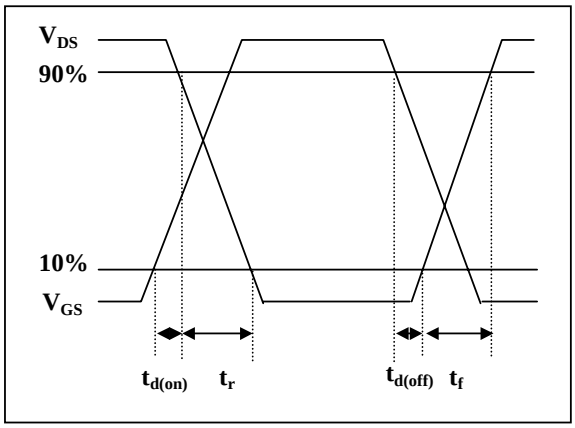


Fig 14. Switching Time Waveform

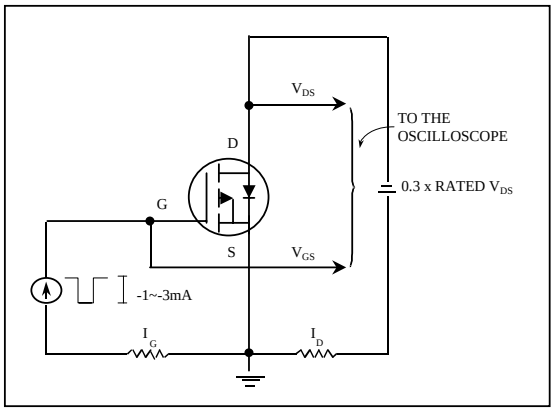


Fig 15. Gate Charge Circuit

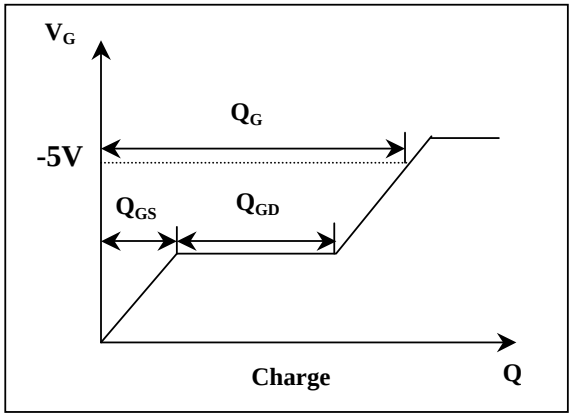


Fig 16. Gate Charge Waveform