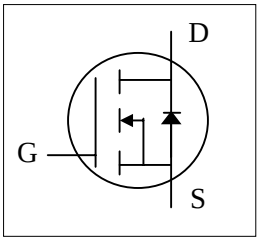
AP20T15GI-HF

Halogen-Free Product

Advanced Power Electronics Corp.

N-CHANNEL ENHANCEMENT MODE POWER MOSFET

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

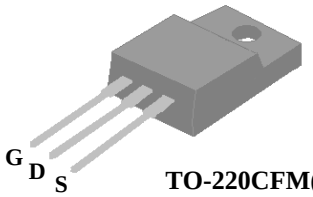


BV_{DSS}	150V
$R_{DS(ON)}$	70mΩ
I_D	22.2A

Description

AP20T15 series are from Advanced Power innovated design and silicon process technology to achieve the lowest possible on-resistance and fast switching performance. It provides the designer with an extreme efficient device for use in a wide range of power applications.

The TO-220CFM package is widely preferred for all commercial-industrial through hole applications. The mold compound provides a high isolation voltage capability and low thermal resistance between the tab and the external heat-sink



TO-220CFM(I)

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℃	Continuous Drain Current, V_{GS} @ 10V[3]	22.2	A
I_D@T_C=100℃	Continuous Drain Current, V_{GS} @ 10V[3]	14	A
I_{DM}	Pulsed Drain Current[1]	60	A
P_D@T_C=25℃	Total Power Dissipation	31.3	W
P_D@T_A=25℃	Total Power Dissipation	1.92	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	4	℃/W
Rthj-a	Maximum Thermal Resistance, Junction-ambient	65	℃/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	150	-	-	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance[2]	V_{GS}=10V, I_D=15A	-	-	70	mΩ
		V_{GS}=4.5V, I_D=10A	-	-	120	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=15A	-	21	-	S
I_{DSS}	Drain-Source Leakage Current	V_{DS}=120V, V_{GS}=0V	-	-	25	uA
I_{GSS}	Gate-Source Leakage	V_{GS}=±20V, V_{DS}=0V	-	-	±100	nA
Q_g	Total Gate Charge	I_D=15A	-	48	77	nC
Q_{gs}	Gate-Source Charge	V_{DS}=120V	-	7.5	-	nC
Q_{gd}	Gate-Drain ("Miller") Charge	V_{GS}=4.5V	-	18	-	nC
$t_{d(on)}$	Turn-on Delay Time	V_{DS}=75V	-	12	-	ns
t_r	Rise Time	I_D=15A	-	30	-	ns
$t_{d(off)}$	Turn-off Delay Time	R_G=3.3Ω	-	33	-	ns
t_f	Fall Time	V_{GS}=10V	-	40	-	ns
C_{iss}	Input Capacitance	V_{GS}=0V	-	2100	3360	pF
C_{oss}	Output Capacitance	V_{DS}=25V	-	125	-	pF
C_{rss}	Reverse Transfer Capacitance	f=1.0MHz	-	100	-	pF
R_g	Gate Resistance	f=1.0MHz	-	1.7	3.4	Ω

Source-Drain Diode

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
V_{SD}	Forward On Voltage[2]	I_S=15A, V_{GS}=0V	-	-	1.3	V
t_{rr}	Reverse Recovery Time	I_S=10A, V_{GS}=0V	-	40	-	ns
Q_{rr}	Reverse Recovery Charge	dI/dt=100A/μs	-	80	-	nC

Notes:

1.Pulse width limited by Max. junction temperature.

2.Pulse test

3.Ensure that the channel temperature does not exceed 150°C

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.
APEC DOES NOT ASSUME ANY LIABILITY ARISING OUT OF THE APPLICATION OR USE OF ANY PRODUCT OR CIRCUIT DESCRIBED HEREIN; NEITHER DOES IT CONVEY ANY LICENSE UNDER ITS PATENT RIGHTS, NOR THE RIGHTS OF OTHERS.
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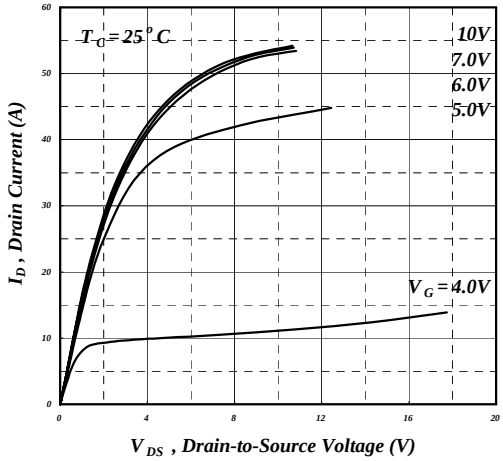


Fig 1. Typical Output Characteristics

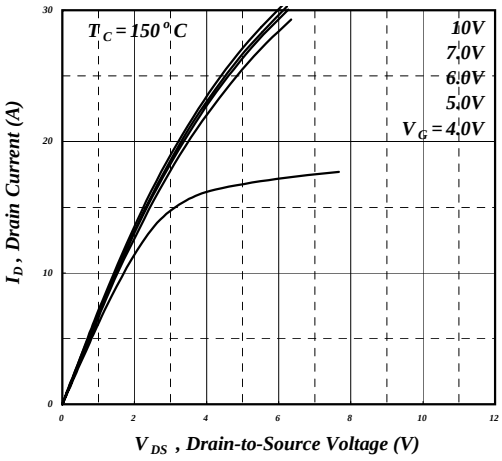


Fig 2. Typical Output Characteristics

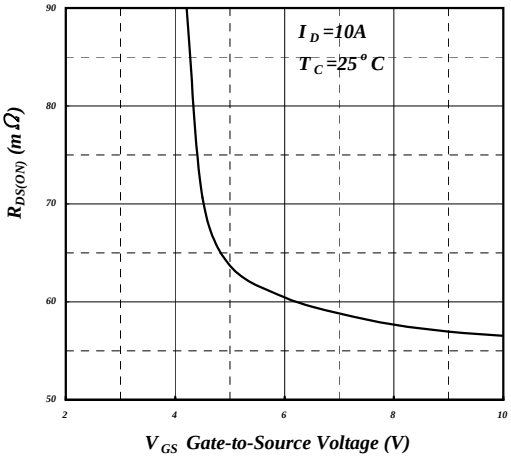


Fig 3. On-Resistance v.s. Gate Voltage

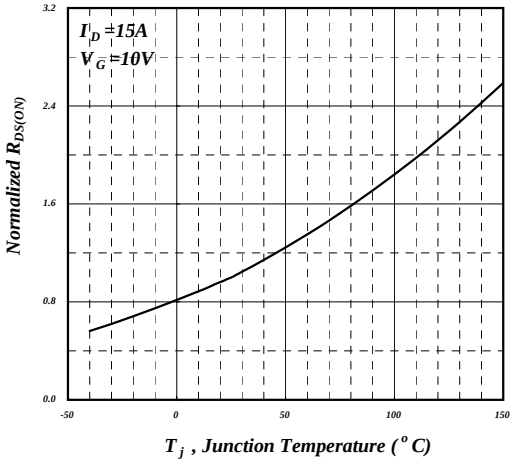


Fig 4. Normalized On-Resistance v.s. Junction Temperature

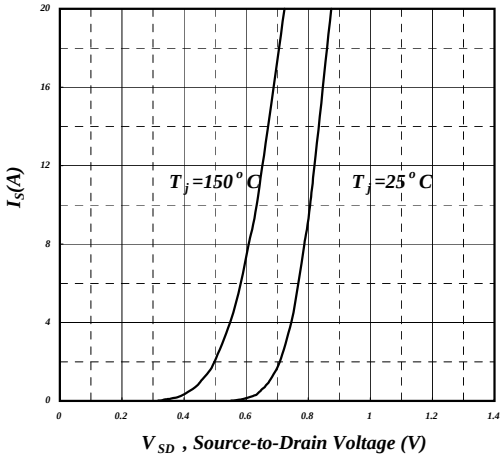


Fig 5. Forward Characteristic of Reverse Diode

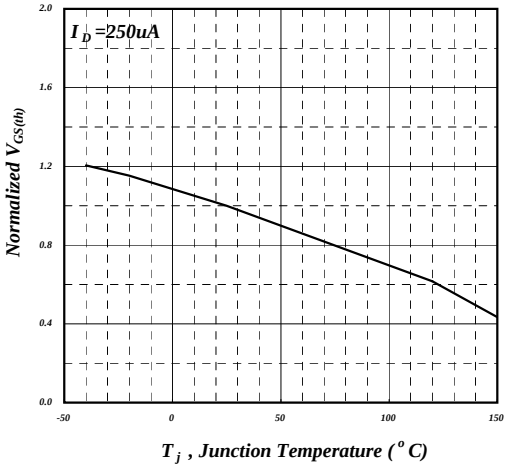


Fig 6. Gate Threshold Voltage v.s. Junction Temperature

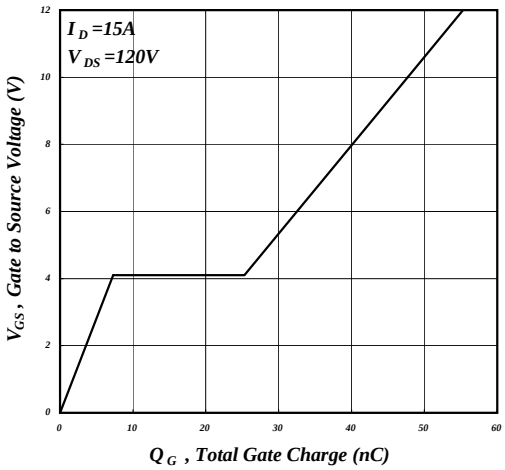


Fig 7. Gate Charge Characteristics

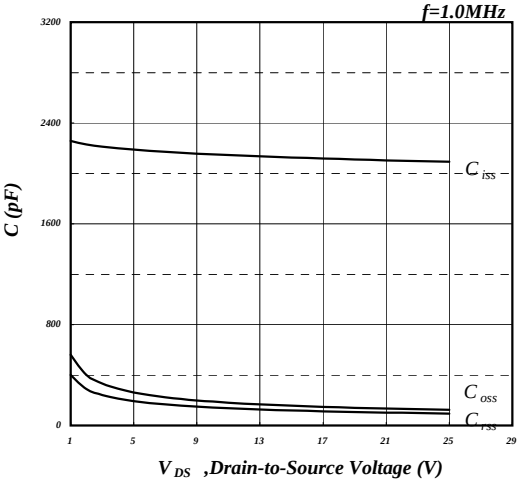


Fig 8. Typical Capacitance Characteristics

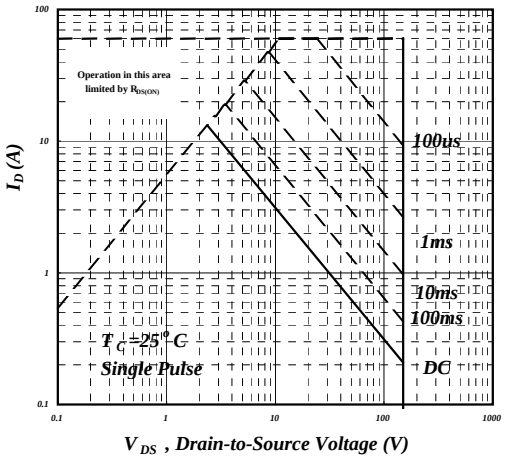


Fig 9. Maximum Safe Operating Area

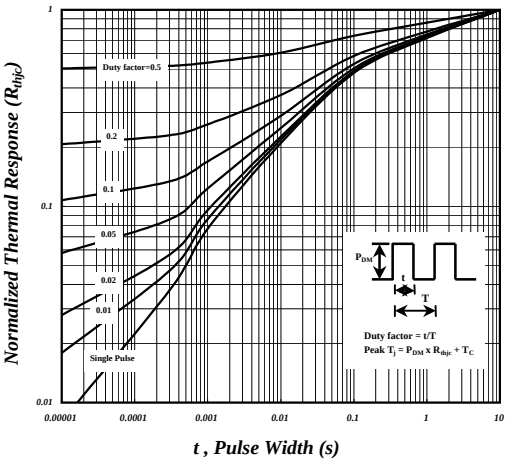


Fig 10. Effective Transient Thermal Impedance

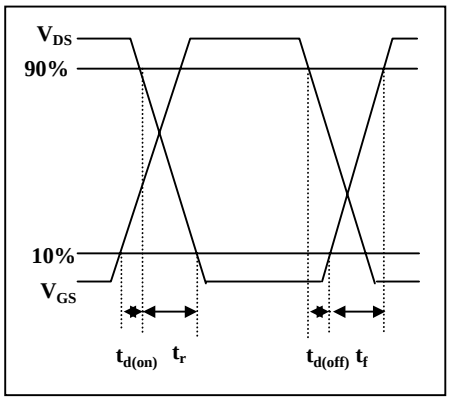


Fig 11. Switching Time Waveform

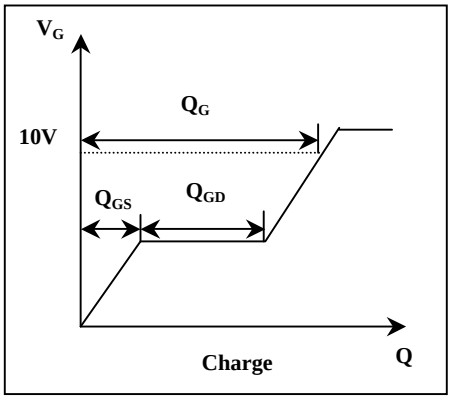


Fig 12. Gate Charge Waveform