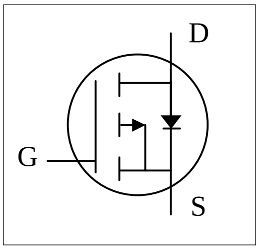
Yixin

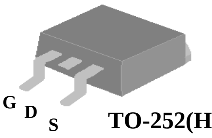
Advanced Power Electronics Corp.

P-CHANNEL ENHANCEMENT MODE POWER MOSFET

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



BV_{DSS}	-40V
$R_{DS(ON)}$	12.3mΩ
I_D	-60A



TO-252(H)

Description

AP6677 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-252 package is widely preferred for all commercial-industrial surface mount applications using infrared reflow technique and suited for high current application due to the low connection resistance.

Absolute Maximum Ratings@T_j=25°C(unless otherwise specified)

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	-40	V
V_{GS}	Gate-Source Voltage	±20	V
I_D@T_C=25℃	Drain Current, V_{GS} @ 10V	-60	A
I_D@T_C=100℃	Drain Current, V_{GS} @ 10V	-38	A
I_{DM}	Pulsed Drain Current[1]	-240	A
P_D@T_C=25℃	Total Power Dissipation	69	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	1.8	℃/W
Rthj-a	Maximum Thermal Resistance, Junction-ambient (PCB mount)[3]	62.5	℃/W

Electrical Characteristics@T_j=25^{o}C(unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V, I_D=-250uA	-40	-	-	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance^2	V_{GS}=-10V, I_D=-30A	-	-	12.3	mΩ
		V_{GS}=-4.5V, I_D=-20A	-	-	18	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=-30A	-	46	-	S
I_{DSS}	Drain-Source Leakage Current	V_{DS}=-32V, V_{GS}=0V	-	-	-25	uA
I_{GSS}	Gate-Source Leakage	V_{GS}= $\pm$20V, V_{DS}=0V	-	-	$\pm$100	nA
Q_g	Total Gate Charge	I_D=-30A	-	44	70	nC
Q_{gs}	Gate-Source Charge	V_{DS}=-32V	-	6	-	nC
Q_{gd}	Gate-Drain ("Miller") Charge	V_{GS}=-4.5V	-	28	-	nC
$t_{d(on)}$	Turn-on Delay Time	V_{DS}=-20V	-	11	-	ns
t_r	Rise Time	I_D=-30A	-	60	-	ns
$t_{d(off)}$	Turn-off Delay Time	R_G=3.3Ω	-	60	-	ns
t_f	Fall Time	V_{GS}=-10V	-	120	-	ns
C_{iss}	Input Capacitance	V_{GS}=0V	-	3160	5050	pF
C_{oss}	Output Capacitance	V_{DS}=-25V	-	560	-	pF
C_{rss}	Reverse Transfer Capacitance	f=1.0MHz	-	380	-	pF

Source-Drain Diode

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
V_{SD}	Forward On Voltage^2	I_S=-30A, V_{GS}=0V	-	-	-1.2	V
t_{rr}	Reverse Recovery Time	I_S=-10A, V_{GS}=0V,	-	42	-	ns
Q_{rr}	Reverse Recovery Charge	dI/dt=-100A/μs	-	46	-	nC

Notes:

1.Pulse width limited by Max. junction temperature.

2.Pulse test

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

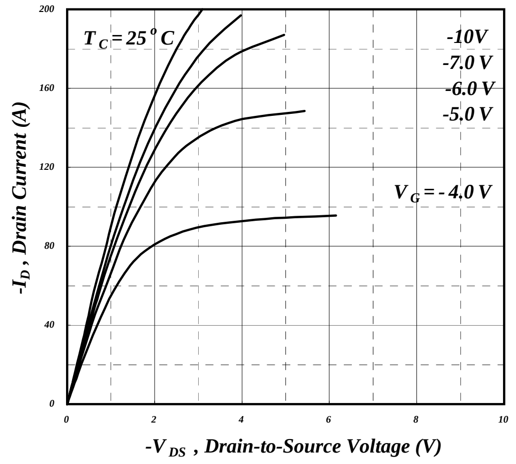


Fig 1. Typical Output Characteristics

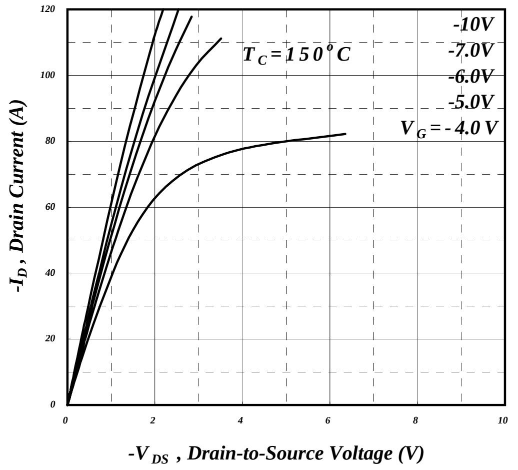


Fig 2. Typical Output Characteristics

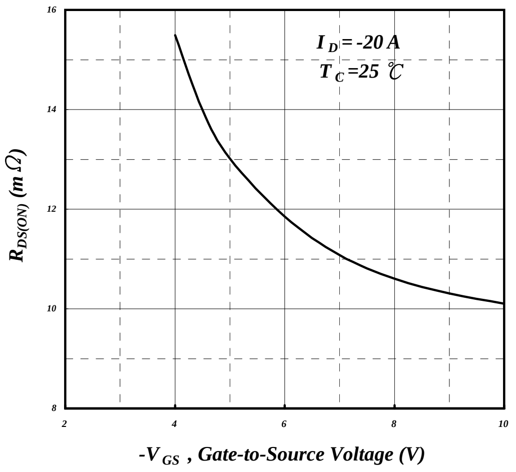


Fig 3. On-Resistance v.s. Gate Voltage

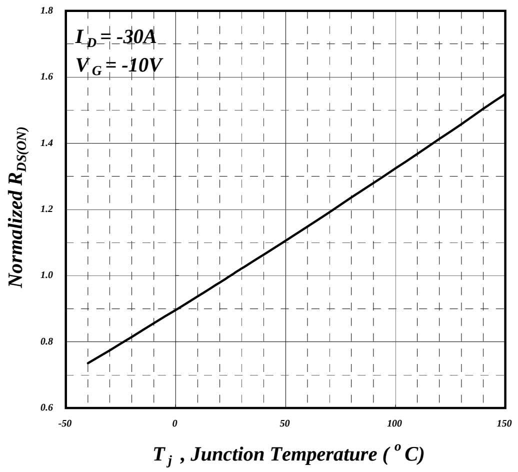


Fig 4. Normalized On-Resistance v.s. Junction Temperature

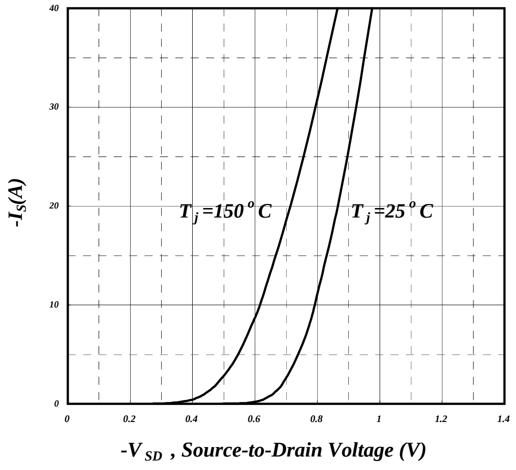


Fig 5. Forward Characteristic of Reverse Diode

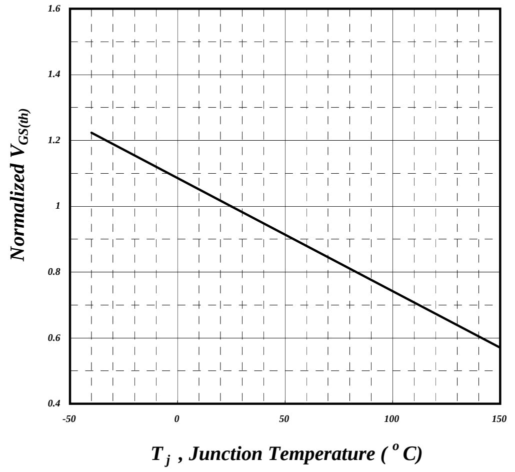


Fig 6. Gate Threshold Voltage v.s. Junction Temperature

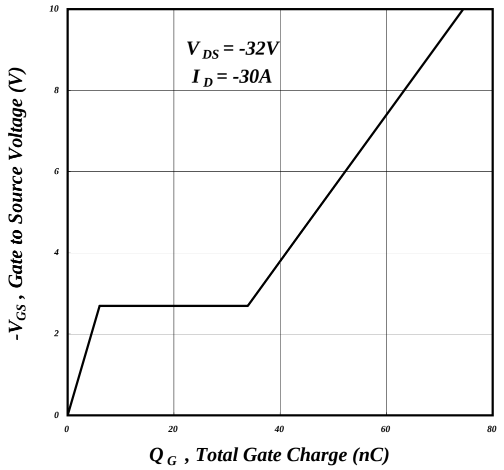


Fig 7. Gate Charge Characteristics

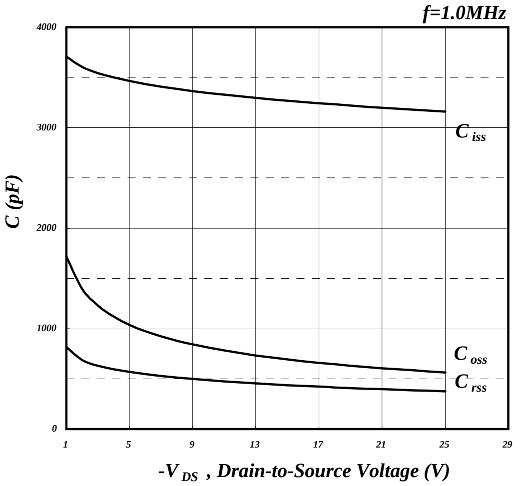


Fig 8. Typical Capacitance Characteristics

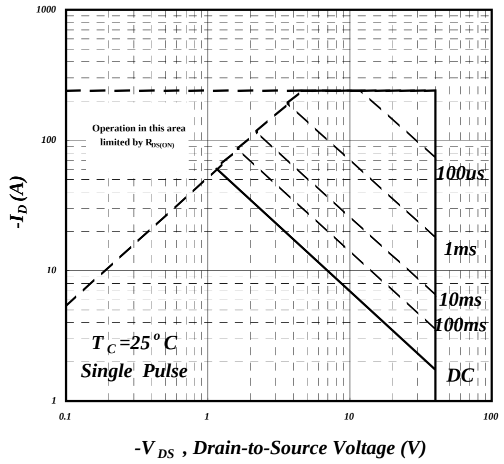


Fig 9. Maximum Safe Operating Area

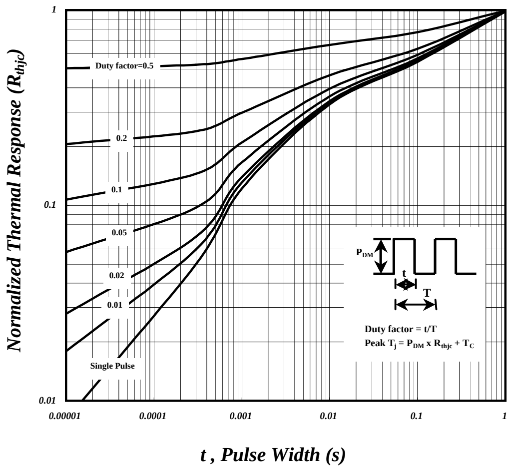
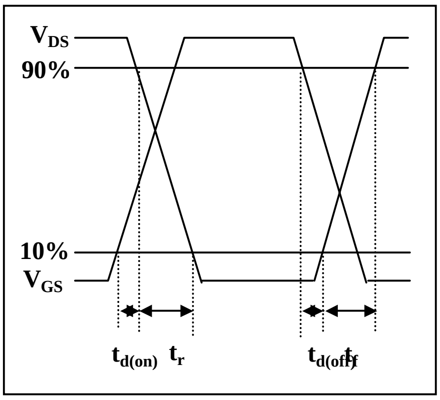


Fig 10. Effective Transient Thermal Impedance



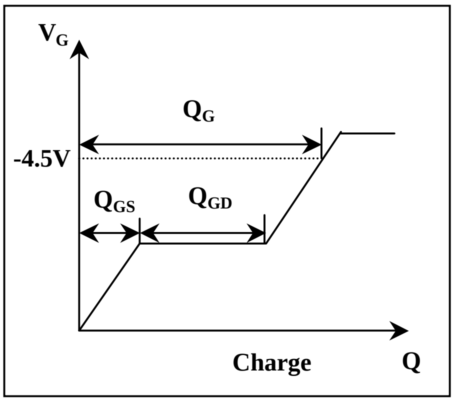


Fig 11. Switching Time Waveform

Fig 12. Gate Charge Waveform

MARKING INFORMATION