Advanced Power Electronics Corp.

P-CHANNEL ENHANCEMENT MODE

POWER MOSFET

▼ **Lower Gate Charge**

▼ **Simple Drive Requirement**

▼ **Fast Switching Characteristic**
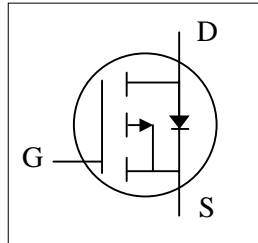
BV_{DSS}	-80V
$R_{DS(ON)}$	180mΩ
I_D	-11.2A

TO-252(H)

TO-251(J)

Description

The TO-252 package is universally preferred for all commercial-industrial surface mount applications and suited for low voltage applications such as DC/DC converters. The through-hole version (AP9585J) is available for low-profile applications.
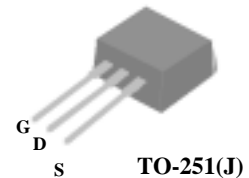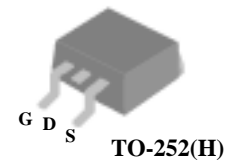
Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	-80	V
V_{GS}	Gate-Source Voltage	±25	V
I_D@T_C=25℃	Continuous Drain Current, V_{GS} @ 10V	-11.2	A
I_D@T_C=100℃	Continuous Drain Current, V_{GS} @ 10V	-7.1	A
I_{DM}	Pulsed Drain Current[1]	30	A
P_D@T_C=25℃	Total Power Dissipation	44.6	W
	Linear Derating Factor	0.36	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	Thermal Resistance Junction-case	Max.	2.8	℃/W
Rthj-a	Thermal Resistance Junction-ambient	Max.	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	-80	-	-	V
ΔBV$_{DSS}$/ΔT$_j$	Breakdown Voltage Temperature Coefficient	Reference to 25℃, I$_D$=-1mA	-	-0.07	-	V/℃
R$_{DS(ON)}$	Static Drain-Source On-Resistance[2]	V$_{GS}$=-10V, I$_D$=-10A	-	-	180	mΩ
		V$_{GS}$=-4.5V, I$_D$=-6A	-	-	200	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$_D$=-6A	-	10	-	S
I$_{DSS}$	Drain-Source Leakage Current (T$_j$=25°C)	V$_{DS}$=-80V, V$_{GS}$=0V	-	-	-1	uA
	Drain-Source Leakage Current (T$_j$=150°C)	V$_{DS}$=-64V, V$_{GS}$=0V	-	-	-25	uA
I$_{GSS}$	Gate-Source Leakage	V$_{GS}$= ±25V	-	-	±100	nA
Q$_g$	Total Gate Charge[2]	I$_D$=-6A	-	19	30	nC
Q$_{gs}$	Gate-Source Charge	V$_{DS}$=-64V	-	5	-	nC
Q$_{gd}$	Gate-Drain ("Miller") Charge	V$_{GS}$=-4.5V	-	7	-	nC
t$_{d(on)}$	Turn-on Delay Time[2]	V$_{DS}$=-40V	-	10	-	ns
t$_r$	Rise Time	I$_D$=-6A	-	15	-	ns
t$_{d(off)}$	Turn-off Delay Time	R$_G$=3.3Ω,V$_{GS}$=-10V	-	64	-	ns
t$_f$	Fall Time	R$_D$=6.7Ω	-	56	-	ns
C$_{iss}$	Input Capacitance	V$_{GS}$=0V	-	1740	2780	pF
C$_{oss}$	Output Capacitance	V$_{DS}$=-25V	-	140	-	pF
C$_{rss}$	Reverse Transfer Capacitance	f=1.0MHz	-	90	-	pF

Source-Drain Diode

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
V$_{SD}$	Forward On Voltage[2]	I$_S$=-6A, V$_{GS}$=0V	-	-	-1.2	V
t$_{rr}$	Reverse Recovery Time[2]	I$_S$=-6A, V$_{GS}$=0V,	-	86	-	ns
Q$_{rr}$	Reverse Recovery Charge	dI/dt=-100A/µs	-	364	-	nC

Notes:

1.Pulse width limited by safe operating area.
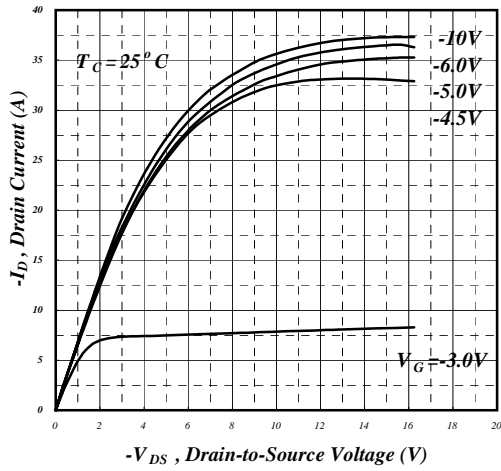
2.Pulse width ≤300us , duty cycle ≤2%.
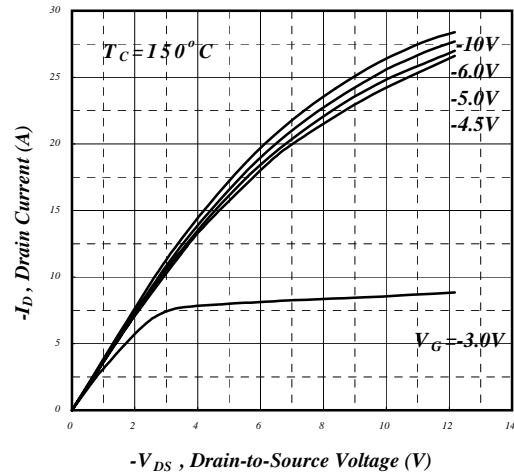
Fig 1. Typical Output Characteristics

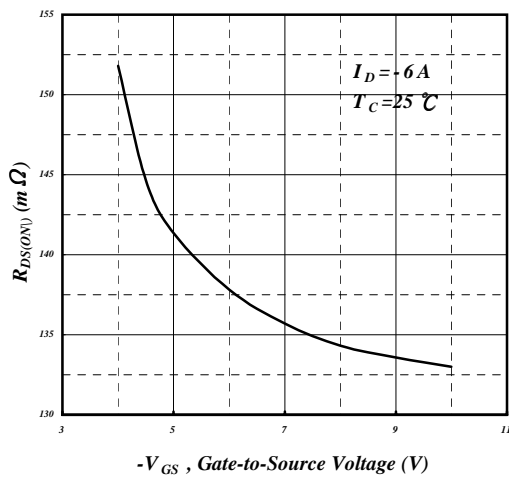**Fig 2. Typical Output Characteristics**

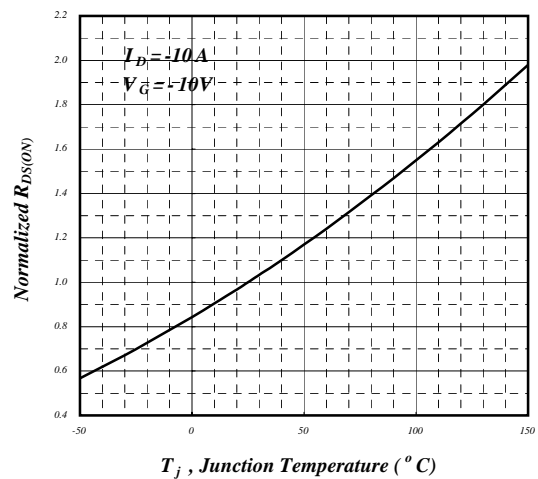**Fig 3. On-Resistance v.s. Gate Voltage**

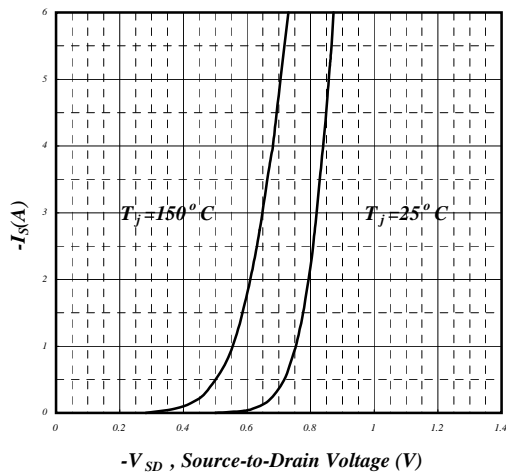**Fig 4. Normalized On-Resistance**
v.s. Junction Temperature

Fig 5. Forward Characteristic of
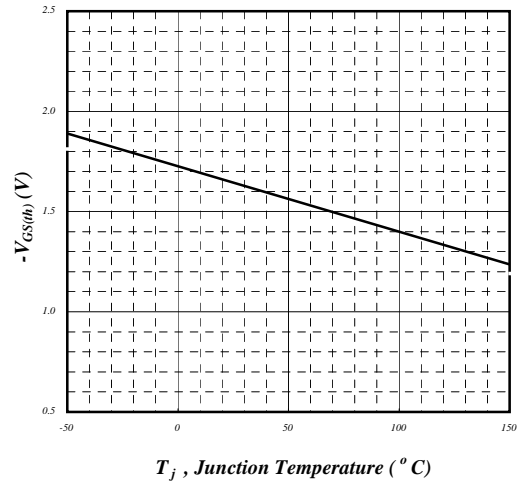**Reverse Diode**

Fig 6. Gate Threshold Voltage v.s.
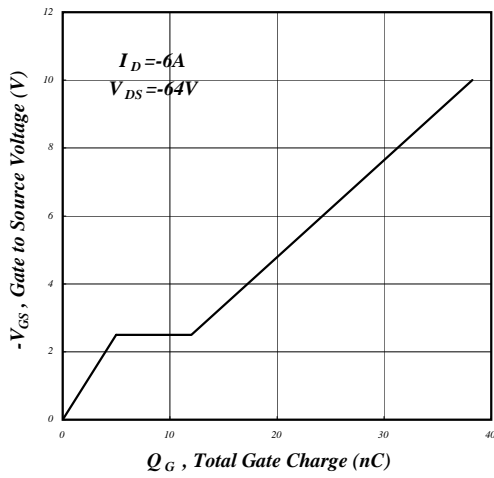**Junction Temperature**
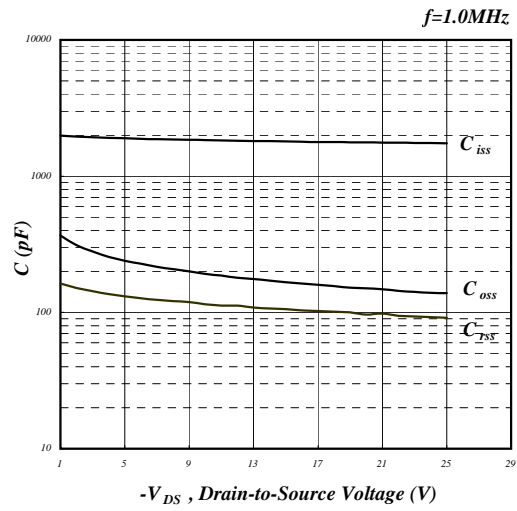
Fig 7. Gate Charge Characteristics

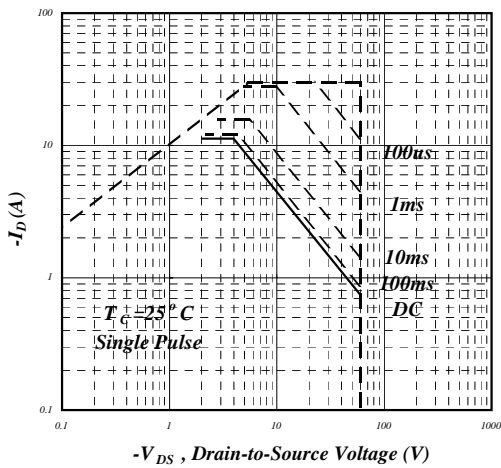Fig 8. Typical Capacitance Characteristics

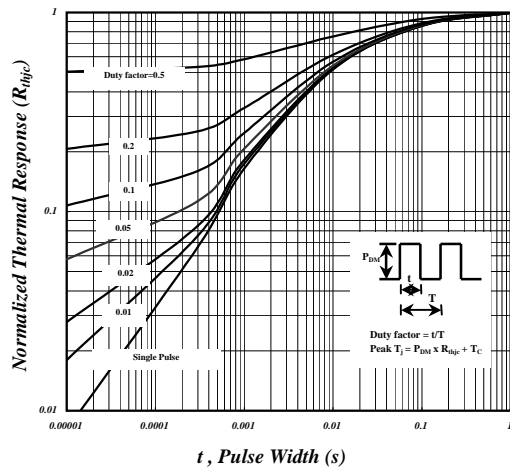
Fig 9. Maximum Safe Operating Area
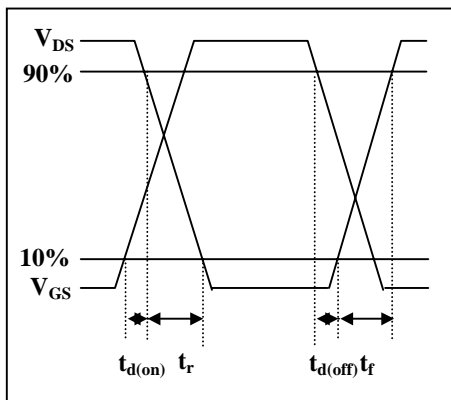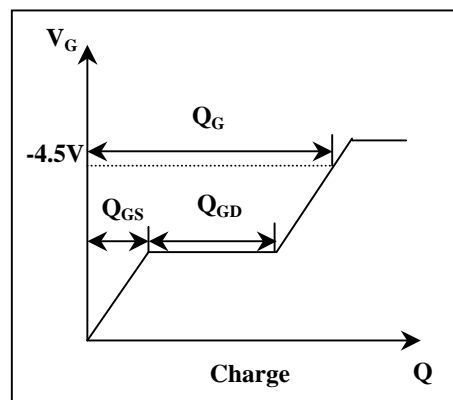

Fig 10. Effective Transient Thermal Impedance

Fig 11. Switching Time Waveform

Fig 12. Gate Charge Waveform