Advanced Power Electronics Corp.

N-CHANNEL ENHANCEMENT MODE

POWER MOSFET

▼ **100% Avalanche Test**

▼ **Fast Switching Characteristics**

▼ **Simple Drive Requirement**

BV_{DSS}	600V
$R_{DS(ON)}$	12Ω
I_D	1A

Description

The TO-252 package is widely preferred for commercial-industrial surface mount applications and suited for AC/DC converters. The through-hole version (AP01L60J) is available for low-profile applications.

G D S **TO-252(H)**

G D S **TO-251(J)**

Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	600	V
V_{GS}	Gate-Source Voltage	±30	V
$I_D@T_C=25℃$	Continuous Drain Current, V_{GS} @ 10V	1	A
$I_D@T_C=100℃$	Continuous Drain Current, V_{GS} @ 10V	0.8	A
I_{DM}	Pulsed Drain Current[1]	3	A
$P_D@T_C=25℃$	Total Power Dissipation	29	W
	Linear Derating Factor	0.232	W/℃
E_{AS}	Single Pulse Avalanche Energy[2]	0.5	mJ
I_{AR}	Avalanche Current	1	A
E_{AR}	Repetitive Avalanche Energy	0.5	mJ
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	4.3	℃/W
Rthj-a	Maximum Thermal Resistance, Junction-ambient (PCB mount)[4]	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$_D$=1mA	600	-	-	V
ΔBV$_{DSS}$/ΔT$_j$	Breakdown Voltage Temperature Coefficient	Reference to 25℃, I$_D$=1mA	-	0.8	-	V/℃
R$_{DS(ON)}$	Static Drain-Source On-Resistance[3]	V$_{GS}$=10V, I$_D$=0.5A	-	-	12	Ω
V$_{GS(th)}$	Gate Threshold Voltage	V$_{DS}$=V$_{GS}$, I$_D$=250uA	2	-	4	V
g$_{fs}$	Forward Transconductance	V$_{DS}$=10V, I$_D$=0.5A	-	0.8	-	S
I$_{DSS}$	Drain-Source Leakage Current	V$_{DS}$=600V, V$_{GS}$=0V	-	-	10	uA
	Drain-Source Leakage Current (T$_j$=125°C)	V$_{DS}$=480V, V$_{GS}$=0V	-	-	100	uA
I$_{GSS}$	Gate-Source Leakage	V$_{GS}$=±30V, V$_{DS}$=0V	-	-	±100	nA
Q$_g$	Total Gate Charge[3]	I$_D$=1A	-	4.0	-	nC
Q$_{gs}$	Gate-Source Charge	V$_{DS}$=480V	-	1.0	-	nC
Q$_{gd}$	Gate-Drain ("Miller") Charge	V$_{GS}$=10V	-	1.1	-	nC
t$_{d(on)}$	Turn-on Delay Time[3]	V$_{DD}$=300V	-	6.6	-	ns
t$_r$	Rise Time	I$_D$=1A	-	5.0	-	ns
t$_{d(off)}$	Turn-off Delay Time	R$_G$=3.3Ω,V$_{GS}$=10V	-	11.7	-	ns
t$_f$	Fall Time	R$_D$=300Ω	-	9.2	-	ns
C$_{iss}$	Input Capacitance	V$_{GS}$=0V	-	170	-	pF
C$_{oss}$	Output Capacitance	V$_{DS}$=25V	-	30.7	-	pF
C$_{rss}$	Reverse Transfer Capacitance	f=1.0MHz	-	5.1	-	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	-	-	1	A
I$_{SM}$	Pulsed Source Current (Body Diode)[1]		-	-	5	A
V$_{SD}$	Forward On Voltage[3]	T$_j$=25℃, I$_S$=1A, V$_{GS}$=0V	-	-	1.2	V

Notes:

1.Pulse width limited by Max. junction temperature.

2.Starting T$_j$=25°C , V$_{DD}$=50V , L=1.0mH , R$_G$=25Ω , I$_{AS}$=1.0A.

3.Pulse test

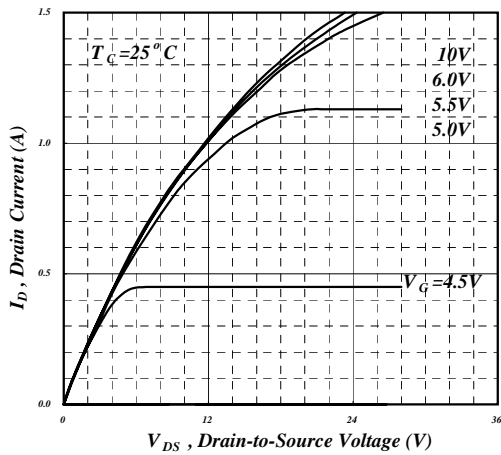4.Surface mounted on 1 in^2 copper pad of FR4 board

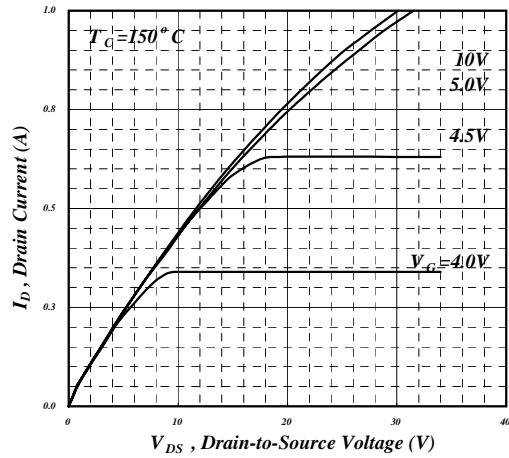**Fig 1. Typical Output Characteristics**

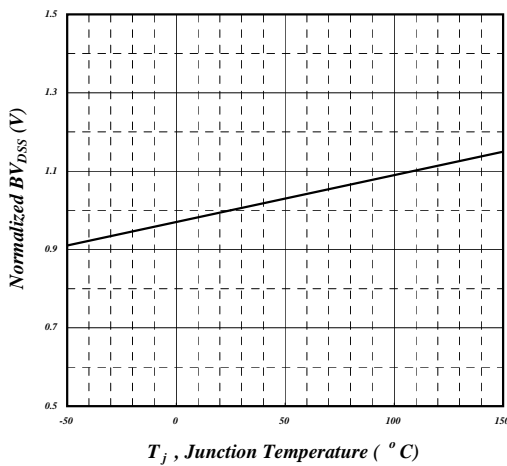**Fig 2. Typical Output Characteristics**

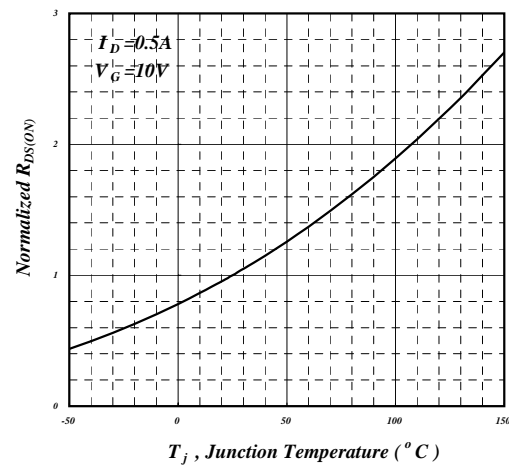**Fig 3. Normalized BV$_{DSS}$ v.s. Junction Temperature**

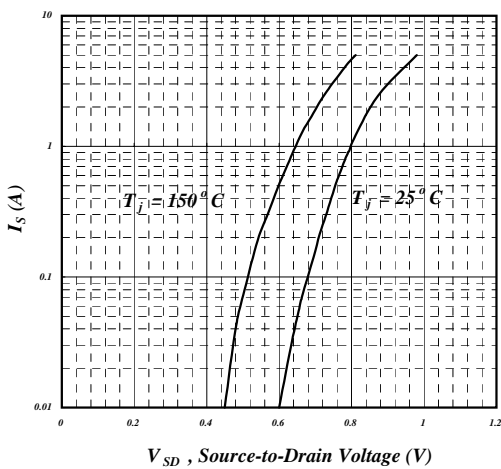**Fig 4. Normalized On-Resistance v.s. Junction Temperature**

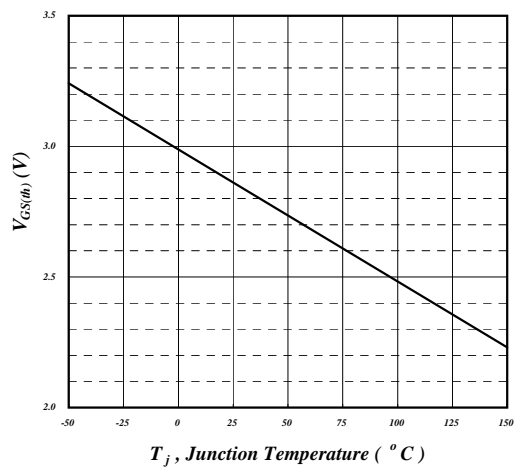**Fig 5. Forward Characteristic of Reverse Diode**

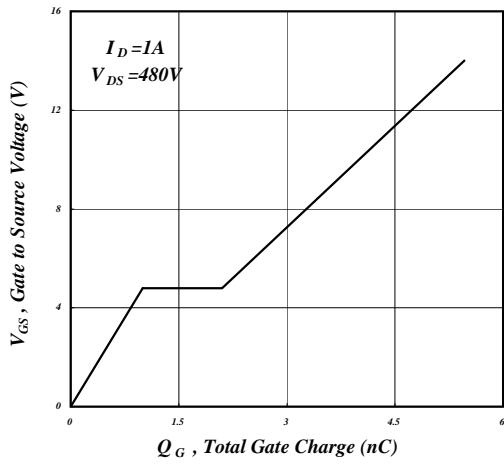**Fig 6. Gate Threshold Voltage v.s. Junction Temperature**
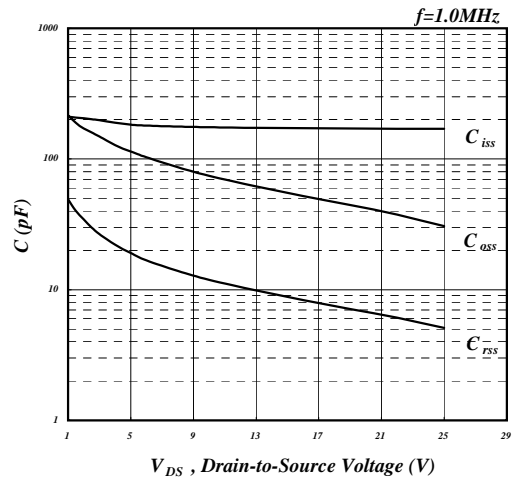
Fig 7. Gate Charge Characteristics

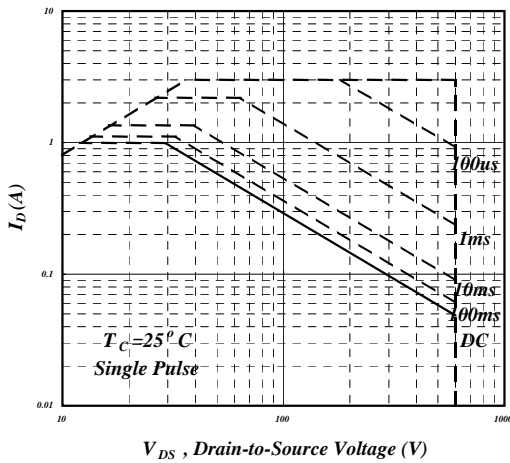Fig 8. Typical Capacitance Characteristics
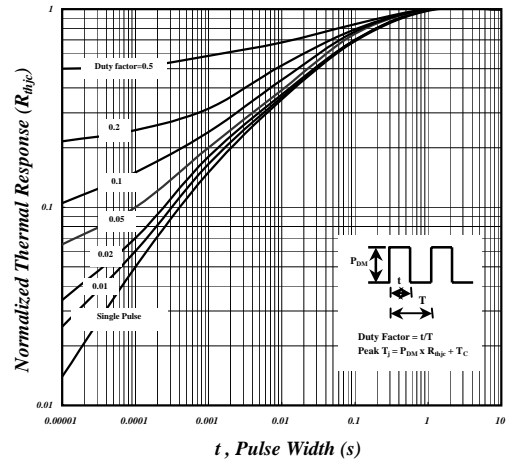

Fig 9. Maximum Safe Operating Area
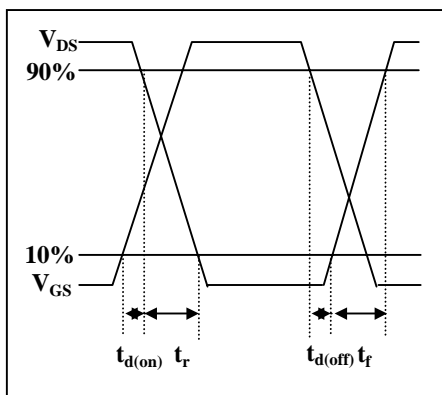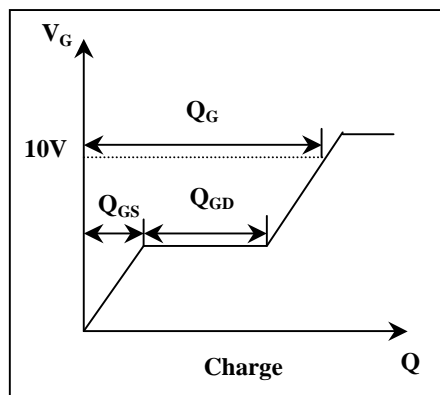

Fig 10. Effective Transient Thermal Impedance

Fig 11. Switching Time Waveform

Fig 12. Gate Charge Waveform