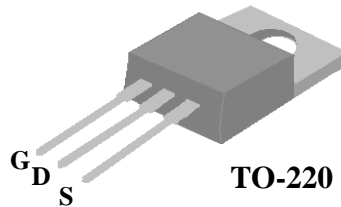**Pb Free Plating Product**

Advanced Power Electronics Corp.

N-CHANNEL ENHANCEMENT MODE

POWER MOSFET

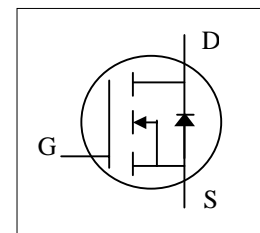▼ **Dynamic dv/dt Rating**

▼ **Repetitive Avalanche Rated**

▼ **Fast Switching**

▼ **Simple Drive Requirement**

▼ **RoHS Compliant**

BV_{DSS}	600V
$R_{DS(ON)}$	8 Ω
I_D	1.6A

G D S   **TO-220**

Description

The TO-220 package is universally preferred for all commercial-industrial applications.   The device is suited for DC-DC ,DC-AC converters for telecom, industrial and consumer environment.

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	1.6	A
I_D@T_C=100℃	Continuous Drain Current, V_{GS} @ 10V	1	A
I_{DM}	Pulsed Drain Current[1]	6	A
P_D@T_C=25℃	Total Power Dissipation	39	W
	Linear Derating Factor	0.31	W/℃
E_{AS}	Single Pulse Avalanche Energy[2]	13	mJ
I_{AR}	Avalanche Current	1.6	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	Thermal Resistance Junction-case	Max.	3.2	℃/W
Rthj-a	Thermal Resistance Junction-ambient	Max.	62	℃/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
$\triangle$BV$_{DSS}$/$\triangle$T$_j$	Breakdown Voltage Temperature Coefficient	Reference to 25℃, I$_D$=1mA	-	0.6	-	V/℃
R$_{DS(ON)}$	Static Drain-Source On-Resistance	V$_{GS}$=10V, I$_D$=0.8A	-	7.2	8	Ω
V$_{GS(th)}$	Gate Threshold Voltage	V$_{DS}$=V$_{GS}$, I$_D$=250uA	2	-	4	V
g$_{fs}$	Forward Transconductance	V$_{DS}$=50V, I$_D$=0.8A	-	0.8	-	S
I$_{DSS}$	Drain-Source Leakage Current (T$_j$=25°C)	V$_{DS}$=600V, V$_{GS}$=0V	-	-	10	uA
	Drain-Source Leakage Current (T$_j$=150°C)	V$_{DS}$=480V, V$_{GS}$=0V	-	-	100	uA
I$_{GSS}$	Gate-Source Leakage	V$_{GS}$=±30V	-	-	±100	nA
Q$_g$	Total Gate Charge[3]	I$_D$=1.6A	-	7.7	-	nC
Q$_{gs}$	Gate-Source Charge	V$_{DS}$=480V	-	1.5	-	nC
Q$_{gd}$	Gate-Drain ("Miller") Charge	V$_{GS}$=10V	-	2.6	-	nC
t$_{d(on)}$	Turn-on Delay Time[3]	V$_{DD}$=300V	-	8	-	ns
t$_r$	Rise Time	I$_D$=1.6A	-	5	-	ns
t$_{d(off)}$	Turn-off Delay Time	R$_G$=10Ω,V$_{GS}$=10V	-	14	-	ns
t$_f$	Fall Time	R$_D$=187.5Ω	-	7	-	ns
C$_{iss}$	Input Capacitance	V$_{GS}$=0V	-	286	-	pF
C$_{oss}$	Output Capacitance	V$_{DS}$=25V	-	25	-	pF
C$_{rss}$	Reverse Transfer Capacitance	f=1.0MHz	-	5	-	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$_S$=1.5V	-	-	1.6	A
I$_{SM}$	Pulsed Source Current (Body Diode)[1]		-	-	6	A
V$_{SD}$	Forward On Voltage[3]	T$_j$=25℃, I$_S$=1.6A, V$_{GS}$=0V	-	-	1.5	V

Notes:

1.Pulse width limited by safe operating area.

2.Starting T$_j$=25°C , V$_{DD}$=50V , L=10mH , R$_G$=25Ω , I$_{AS}$=1.6A.

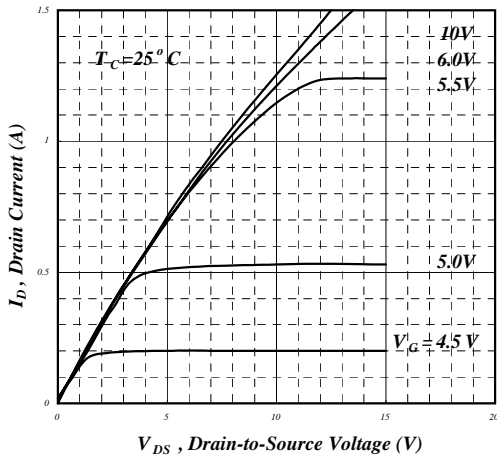3.Pulse width ≤300us , duty cycle ≤2%.

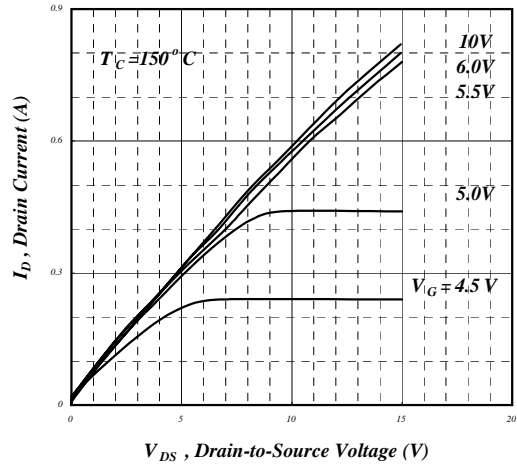**Fig 1. Typical Output Characteristics**
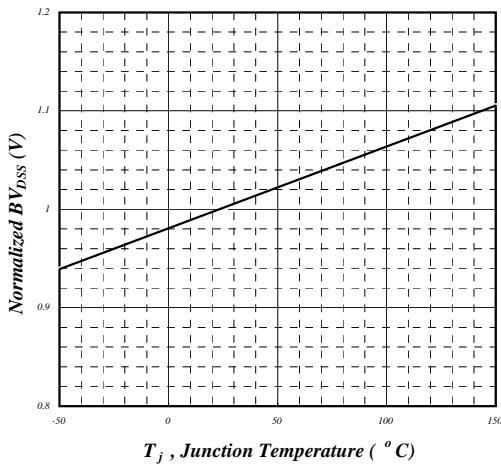
Fig 2. Typical Output Characteristics

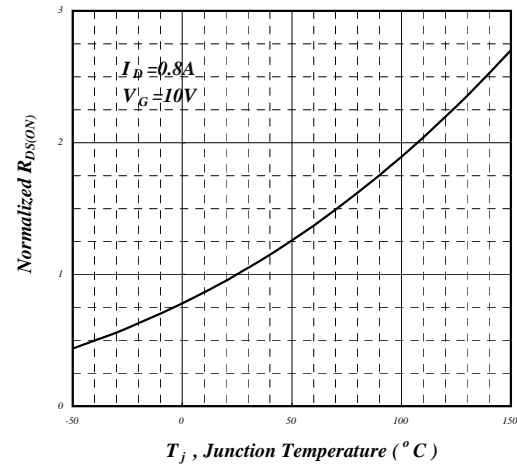**Fig 3. Normalized BV$_{DSS}$ v.s. Junction Temperature**

Fig 4. Normalized On-Resistance v.s. Junction Temperature
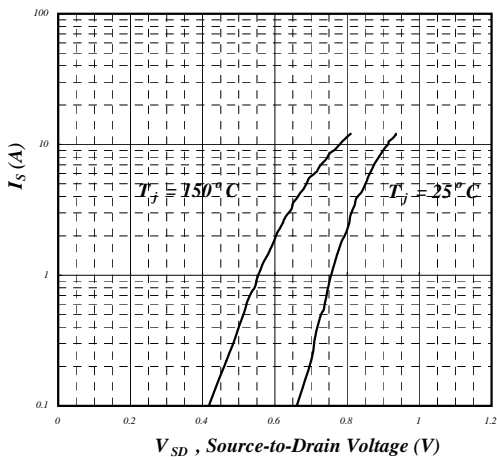
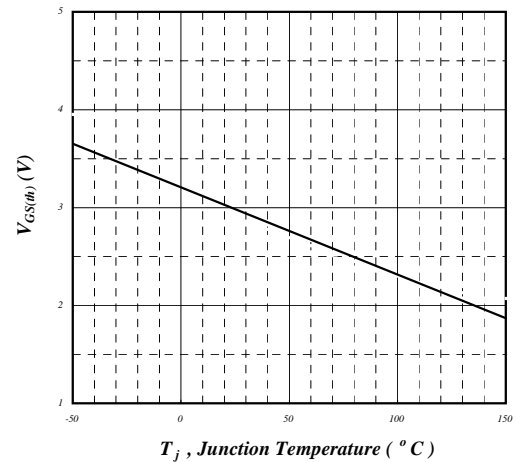**Fig 5. Forward Characteristic of Reverse Diode**

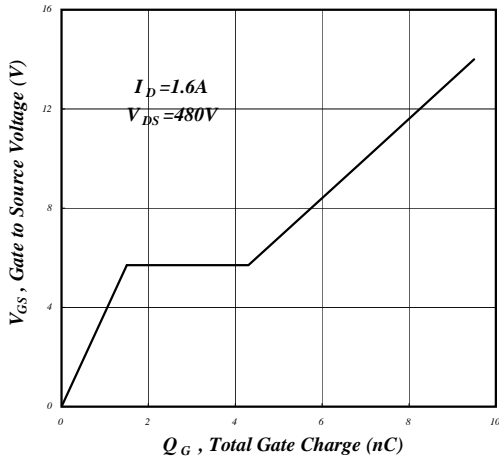**Fig 6. Gate Threshold Voltage v.s. Junction Temperature**
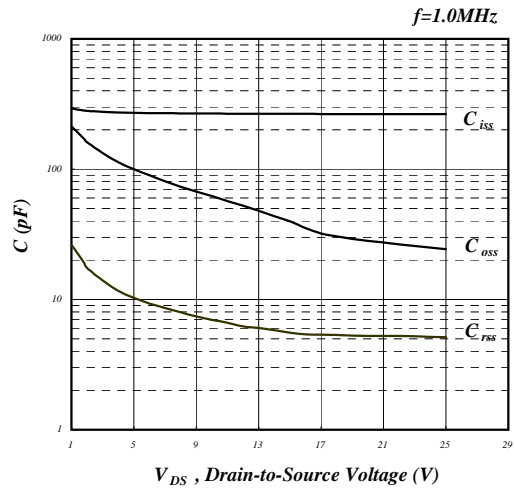
Fig 7. Gate Charge Characteristics
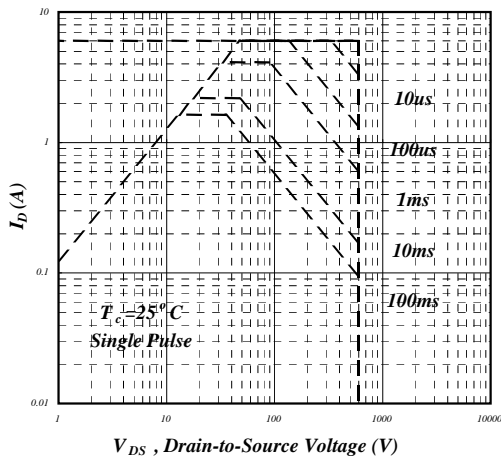
Fig 8. Typical Capacitance Characteristics
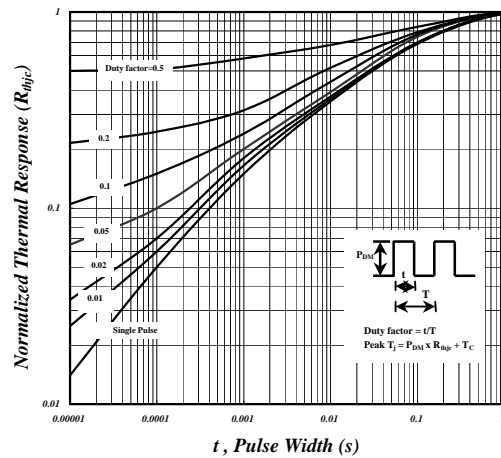
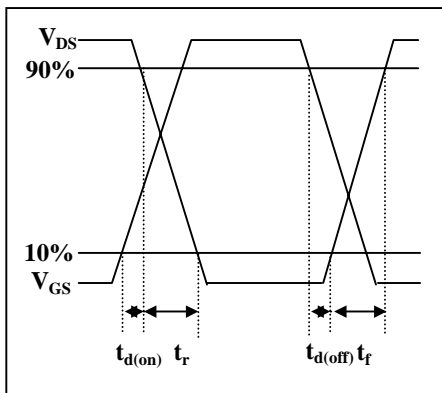Fig 9. Maximum Safe Operating Area
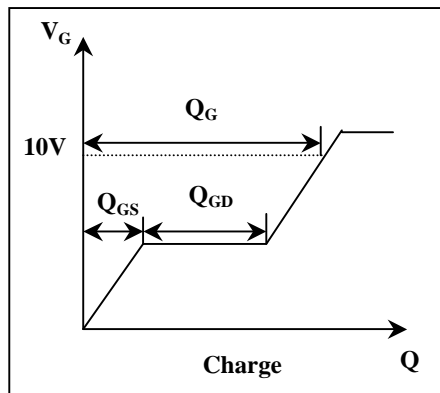
Fig 10. Effective Transient Thermal Impedance

Fig 11. Switching Time Waveform

Fig 12. Gate Charge Waveform