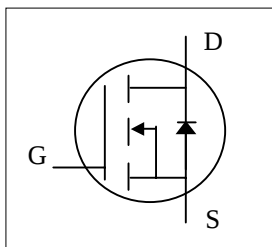



**Advanced Power
Electronics Corp.**
**N-CHANNEL ENHANCEMENT MODE
POWER MOSFET**

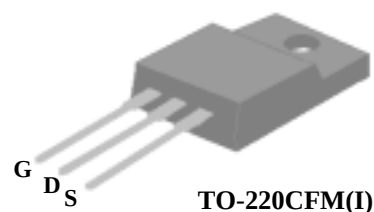
- ▼ Repetitive Avalanche Rated
- ▼ Fast Switching
- ▼ Simple Drive Requirement



BV_{DSS}	600V
$R_{DS(ON)}$	8Ω
I_D	2A

Description

The TO-220CFM package is universally preferred for all commercial-industrial applications. The device is suited for switch mode power supplies, AC-DC converters and high current high speed switching circuits.



Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	600	V
V_{GS}	Gate-Source Voltage	± 30	V
$I_D@T_C=25^\circ\text{C}$	Continuous Drain Current, V_{GS} @ 10V	2	A
$I_D@T_C=100^\circ\text{C}$	Continuous Drain Current, V_{GS} @ 10V	1.26	A
I_{DM}	Pulsed Drain Current ¹	3.6	A
$P_D@T_C=25^\circ\text{C}$	Total Power Dissipation	22	W
	Linear Derating Factor	0.176	W/ $^\circ\text{C}$
E_{AS}	Single Pulse Avalanche Energy ²	80	mJ
I_{AR}	Avalanche Current	2	A
E_{AR}	Repetitive Avalanche Energy	2	mJ
T_{STG}	Storage Temperature Range	-55 to 150	$^\circ\text{C}$
T_J	Operating Junction Temperature Range	-55 to 150	$^\circ\text{C}$

Thermal Data

Symbol	Parameter	Value	Unit
Rthj-c	Thermal Resistance Junction-case Max.	5.7	$^\circ\text{C}/\text{W}$
Rthj-a	Thermal Resistance Junction-ambient Max.	62	$^\circ\text{C}/\text{W}$

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°C, I _D =1mA	-	0.6	-	V/°C
R _{DS(ON)}	Static Drain-Source On-Resistance	V _{GS} =10V, I _D =1A	-	-	8	Ω
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =250uA	2	-	4	V
g _{fs}	Forward Transconductance	V _{DS} =20V, I _D =1A	-	0.2	-	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 =2A	-	14	-	nC
Q _{gs}	Gate-Source Charge	V _{DS} =480V	-	2	-	nC
Q _{gd}	Gate-Drain ("Miller") Charge	V _{GS} =10V	-	8.5	-	nC
t _{d(on)}	Turn-on Delay Time ³	V _{DS} =300V	-	9.5	-	ns
t _r	Rise Time	I _D =2A	-	12	-	ns
t _{d(off)}	Turn-off Delay Time	R _G =10Ω, V _{GS} =10V	-	21	-	ns
t _f	Fall Time	R _D =150Ω	-	9	-	ns
C _{iss}	Input Capacitance	V _{GS} =0V	-	155	-	pF
C _{oss}	Output Capacitance	V _{DS} =25V	-	27	-	pF
C _{rss}	Reverse Transfer Capacitance	f=1.0MHz	-	14	-	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	-	-	2	A
I _{SM}	Pulsed Source Current (Body Diode) ¹		-	-	3.6	A
V _{SD}	Forward On Voltage ³	T _j =25°C, I _S =2A, 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=40mH , R_G=25Ω , I_{AS}=2A.
- 3.Pulse width ≤300us , duty cycle ≤2%.

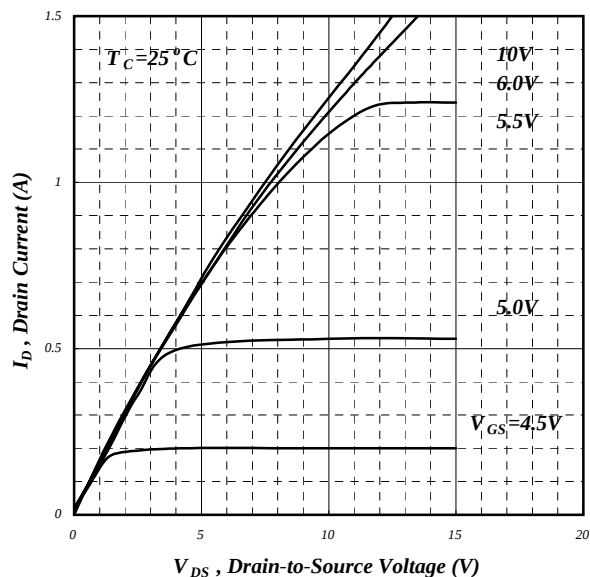


Fig 1. Typical Output Characteristics

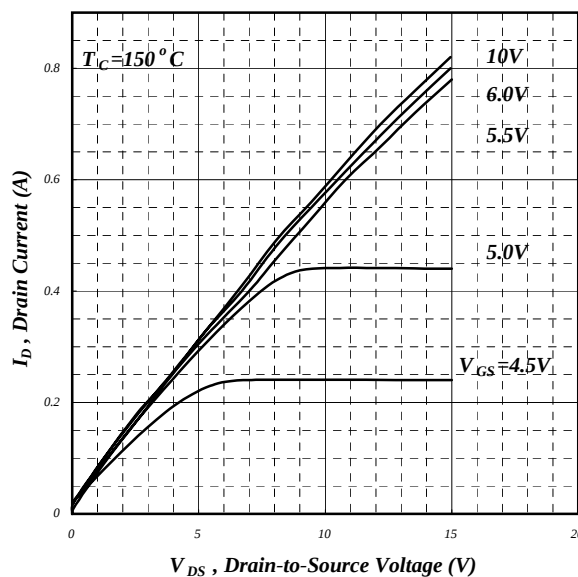


Fig 2. Typical Output Characteristics

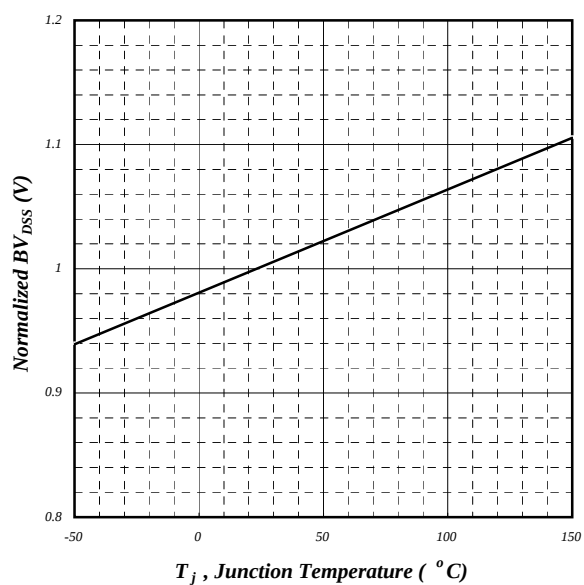


Fig 3. Normalized BV_{DSS} v.s. Junction Temperature

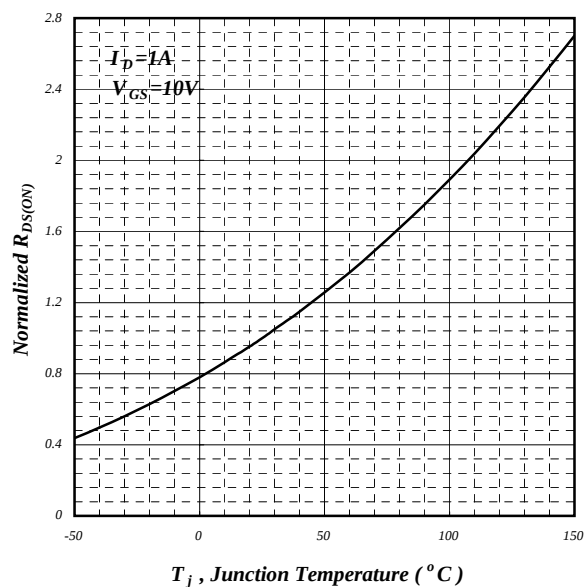


Fig 4. Normalized On-Resistance v.s. Junction Temperature

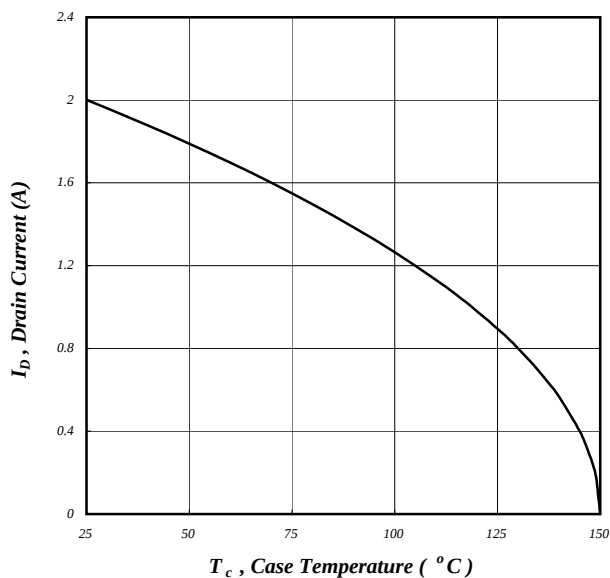


Fig 5. Maximum Drain Current v.s. Case Temperature

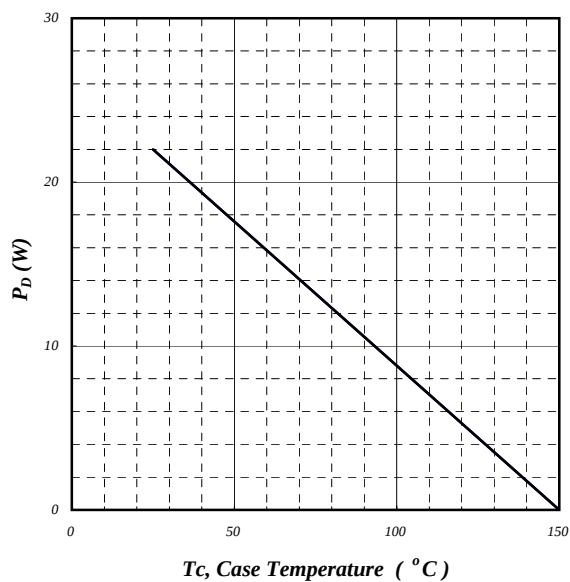


Fig 6. Typical Power Dissipation

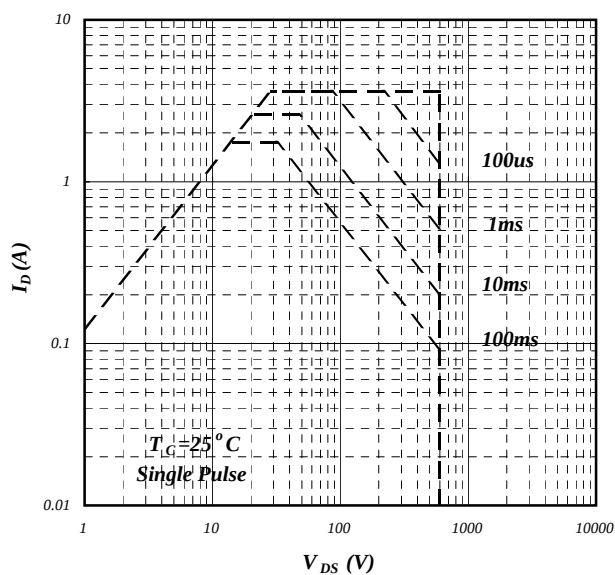


Fig 7. Maximum Safe Operating Area

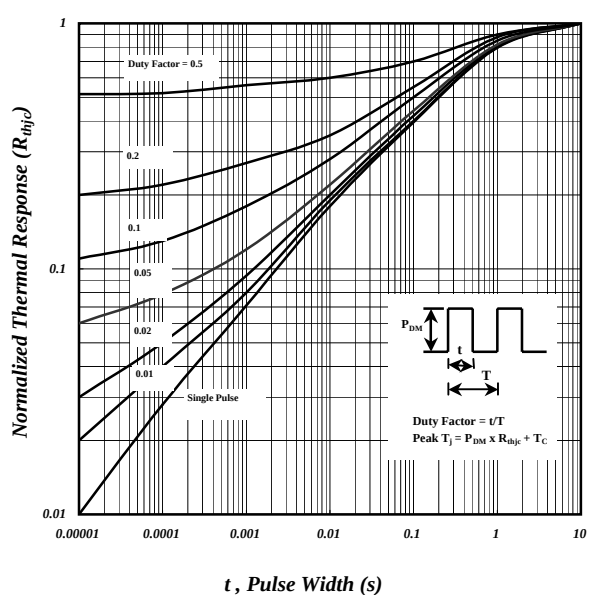
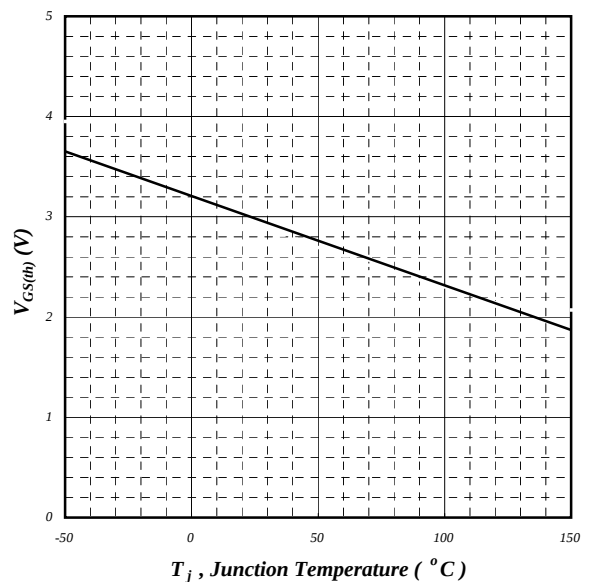
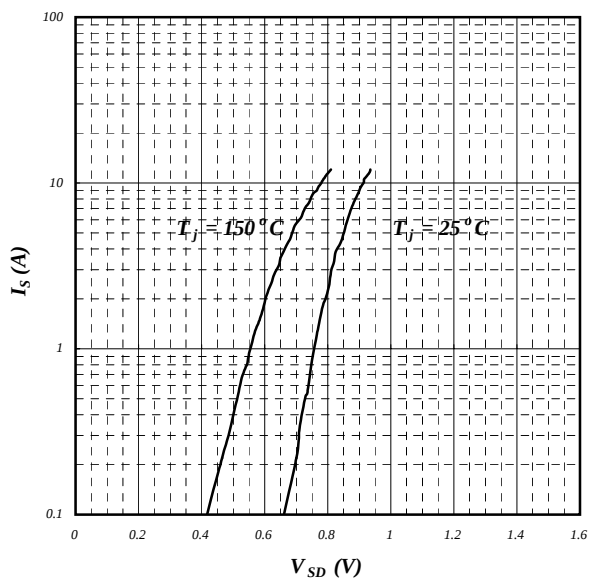
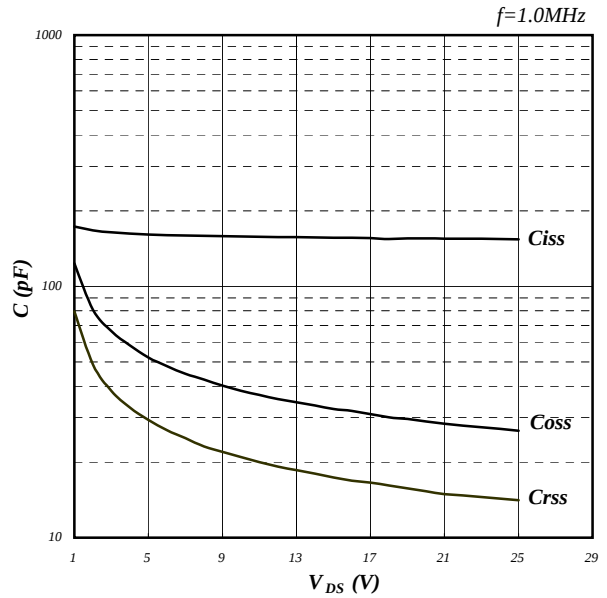
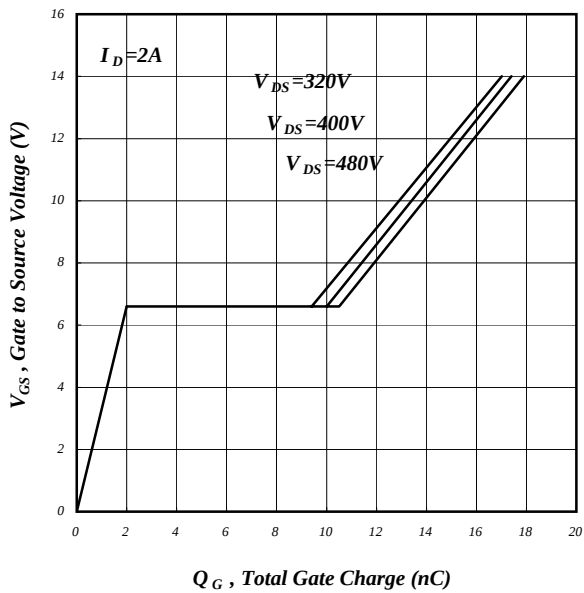
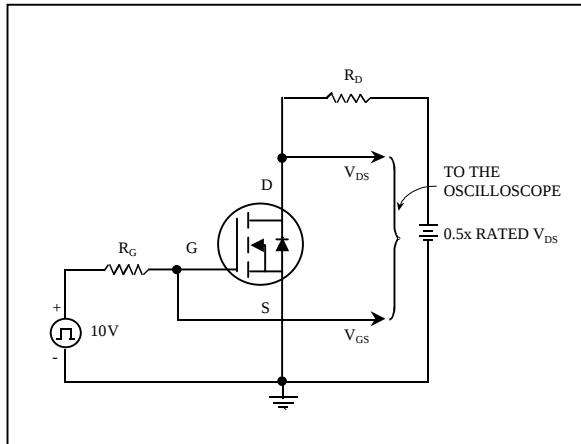
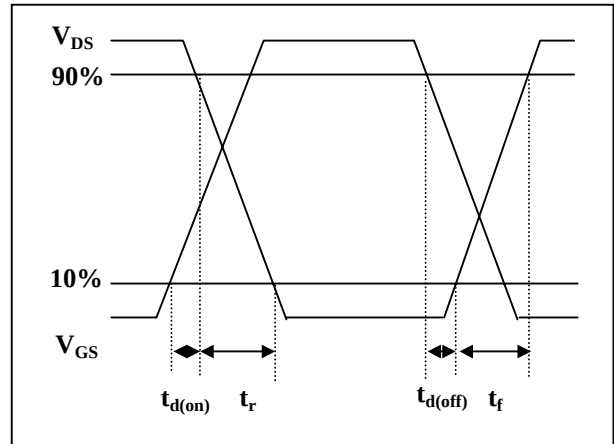
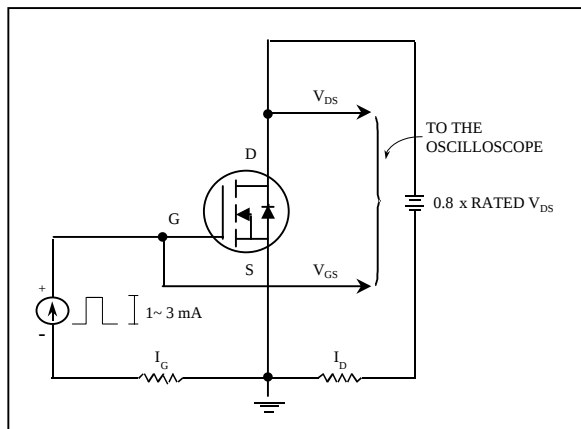
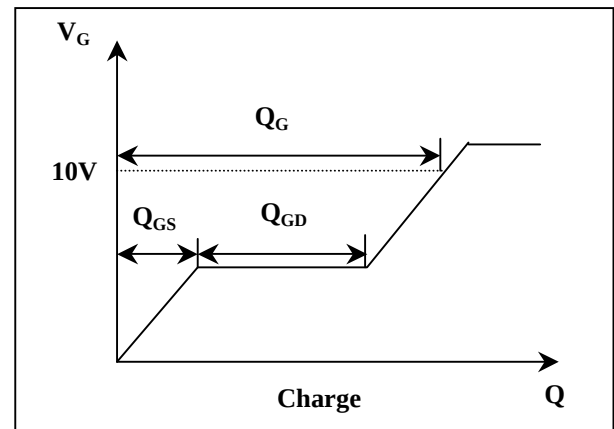


Fig 8. Effective Transient Thermal Impedance



**Fig 13. Switching Time Circuit****Fig 14. Switching Time Waveform****Fig 15. Gate Charge Circuit****Fig 16. Gate Charge Waveform**