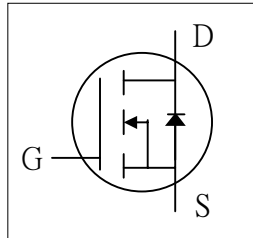




- ▼ 100% Avalanche Test
- ▼ Fast Switching Characteristic
- ▼ Simple Drive Requirement

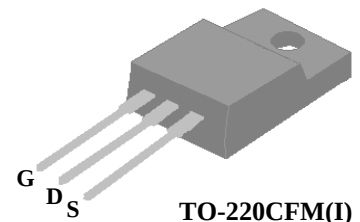


BV_{DSS}	650V
$R_{DS(ON)}$	$2.4\ \Omega$
I_D	4A

Description

Advanced Power MOSFETs from APEC provide the designer with the best combination of fast switching, ruggedized device design, low on-resistance and cost-effectiveness.

The TO-220CFM isolation package is widely preferred for all commercial-industrial through hole applications.



Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	650	V
V_{GS}	Gate-Source Voltage	± 30	V
$I_D@T_C=25^\circ\text{C}$	Continuous Drain Current, V_{GS} @ 10V	4	A
$I_D@T_C=100^\circ\text{C}$	Continuous Drain Current, V_{GS} @ 10V	2.5	A
I_{DM}	Pulsed Drain Current ¹	15	A
$P_D@T_C=25^\circ\text{C}$	Total Power Dissipation	33	W
	Linear Derating Factor	0.26	W/ $^\circ\text{C}$
E_{AS}	Single Pulse Avalanche Energy ²	8	mJ
I_{AR}	Avalanche Current	4	A
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	Maximum Thermal Resistance, Junction-case	3.8	$^\circ\text{C}/\text{W}$
Rthj-a	Maximum Thermal Resistance, Junction-ambient	65	$^\circ\text{C}/\text{W}$

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	650	-	-	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 ³	V _{GS} =10V, I _D =2A	-	-	2.4	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 =2A	-	2.5	-	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	-	-	500	uA
I _{GSS}	Gate-Source Leakage	V _{GS} =±30V, V _{DS} =0V	-	-	±100	nA
Q _g	Total Gate Charge ³	I _D =4A	-	16.7	-	nC
Q _{gs}	Gate-Source Charge	V _{DS} =480V	-	4.1	-	nC
Q _{gd}	Gate-Drain ("Miller") Charge	V _{GS} =10V	-	4.9	-	nC
t _{d(on)}	Turn-on Delay Time ³	V _{DD} =300V	-	11	-	ns
t _r	Rise Time	I _D =4A	-	8.3	-	ns
t _{d(off)}	Turn-off Delay Time	R _G =10Ω, V _{GS} =10V	-	23.8	-	ns
t _f	Fall Time	R _D =75Ω	-	8.2	-	ns
C _{iss}	Input Capacitance	V _{GS} =0V	-	950	-	pF
C _{oss}	Output Capacitance	V _{DS} =25V	-	65	-	pF
C _{rss}	Reverse Transfer Capacitance	f=1.0MHz	-	6	-	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	-	-	4	A
I _{SM}	Pulsed Source Current (Body Diode) ¹		-	-	15	A
V _{SD}	Forward On Voltage ³	T _J =25°C, I _S =4A, V _{GS} =0V	-	-	1.5	V

Notes:

- 1.Pulse width limited by max. junction temperature.
- 2.Starting T_J=25°C, V_{DD}=50V, L=1mH, R_G=25Ω, I_{AS}=4A.
- 3.Pulse test

THIS PRODUCT IS SENSITIVE TO ELECTROSTATIC DISCHARGE, PLEASE HANDLE WITH CAUTION.

USE OF THIS PRODUCT AS A CRITICAL COMPONENT IN LIFE SUPPORT OR OTHER SIMILAR SYSTEMS IS NOT AUTHORIZED.

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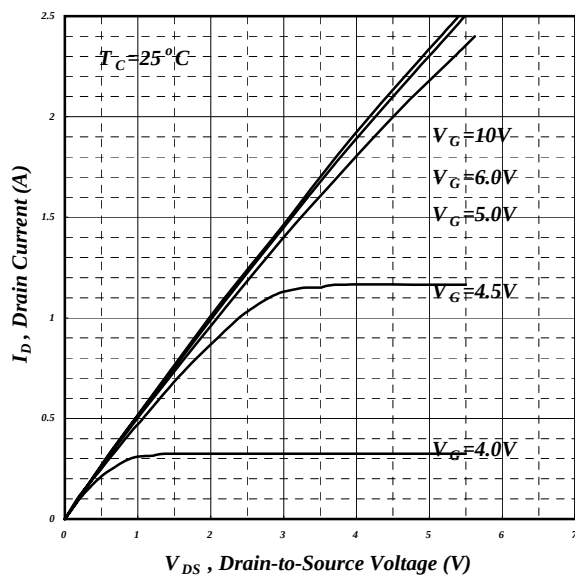


Fig 1. Typical Output Characteristics

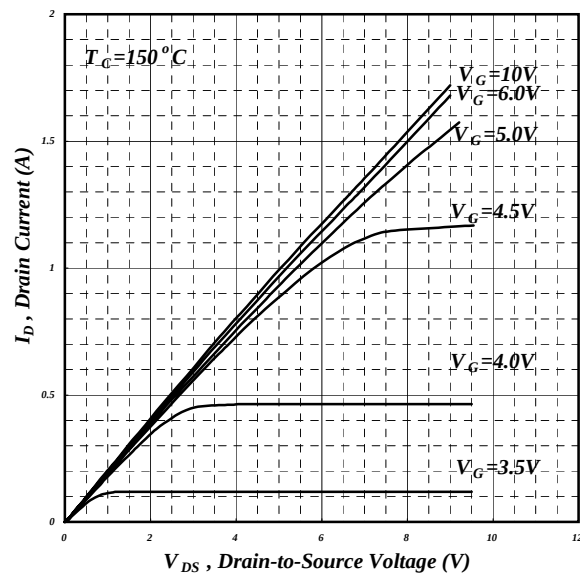


Fig 2. Typical Output Characteristics

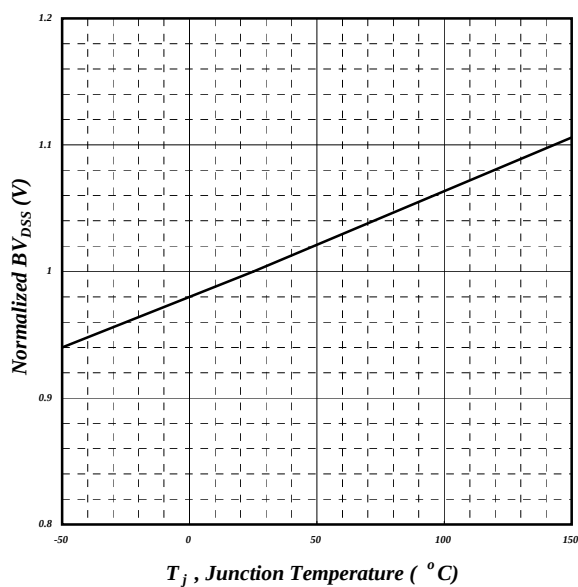


Fig 3. Normalized BV_{DSS} v.s. Junction Temperature

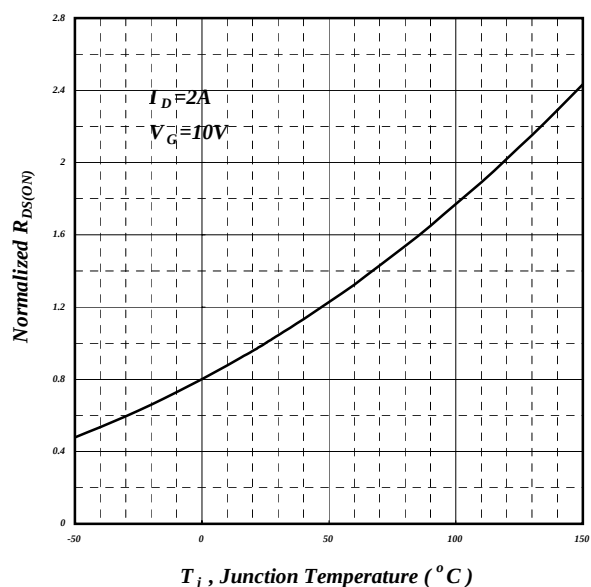


Fig 4. Normalized On-Resistance v.s. Junction Temperature

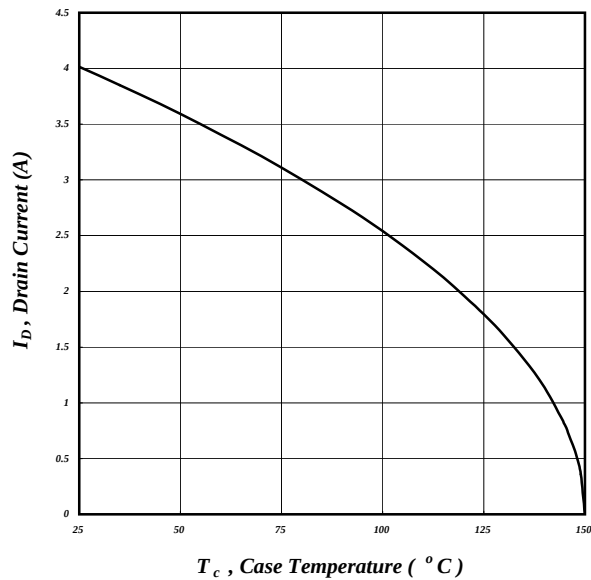


Fig 5. Maximum Drain Current vs. Case Temperature

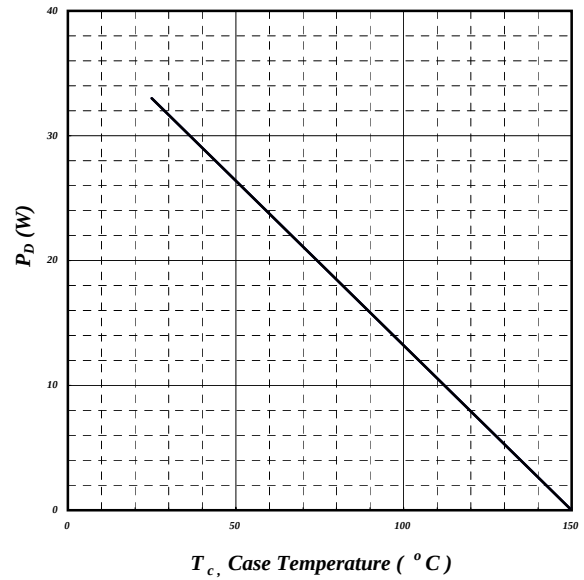


Fig 6. Typical Power Dissipation

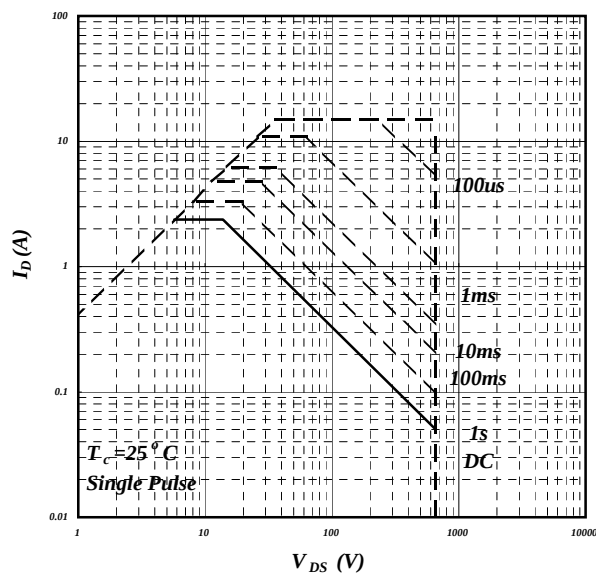


Fig 7. Maximum Safe Operating Area

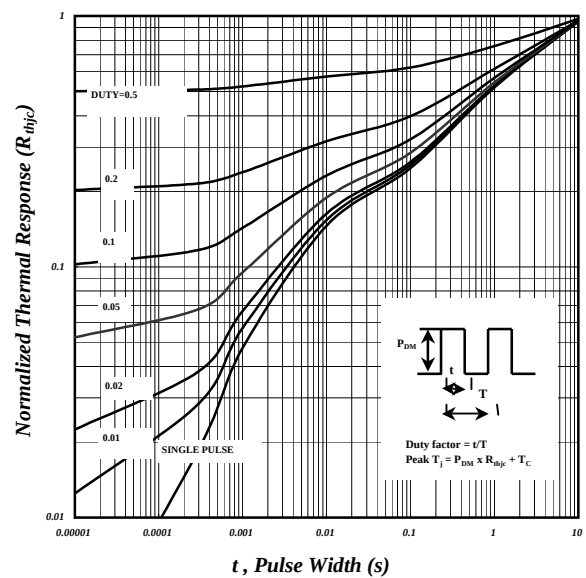
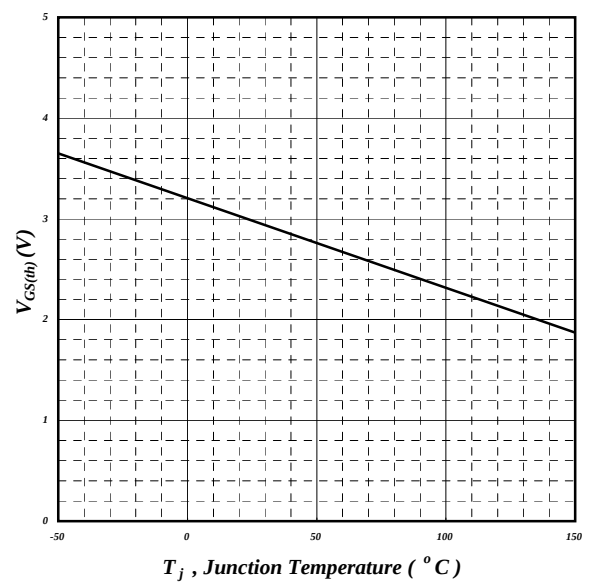
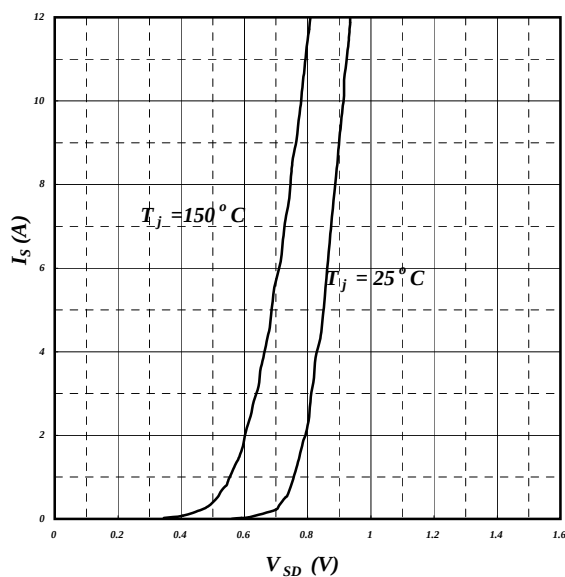
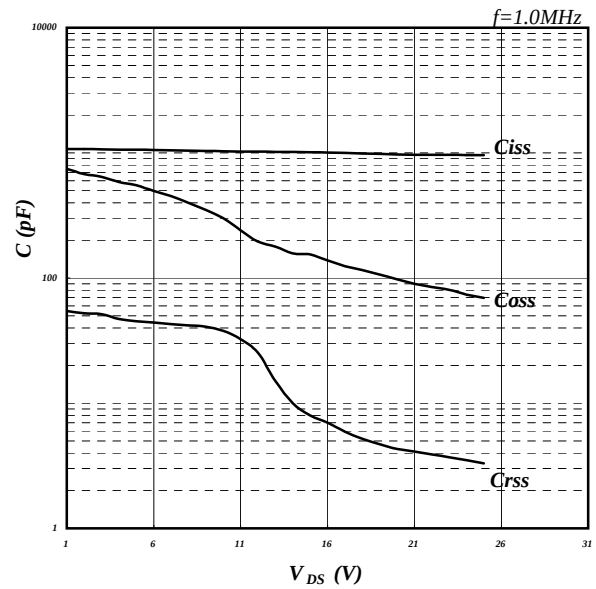
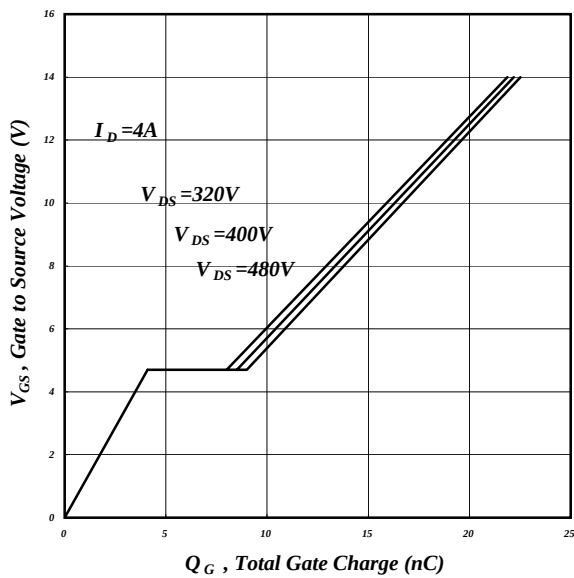


Fig 8. Effective Transient Thermal Impedance



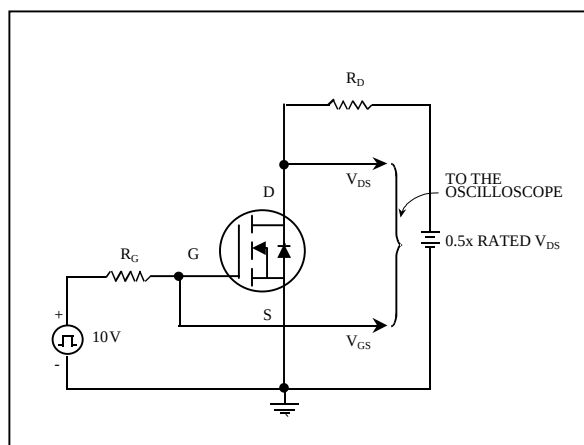


Fig 13. Switching Time Circuit

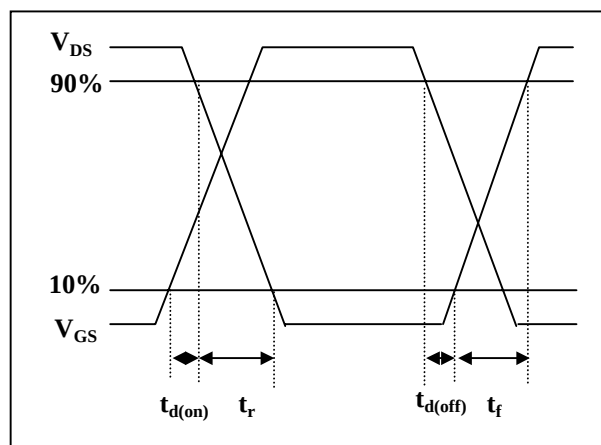


Fig 14. Switching Time Waveform

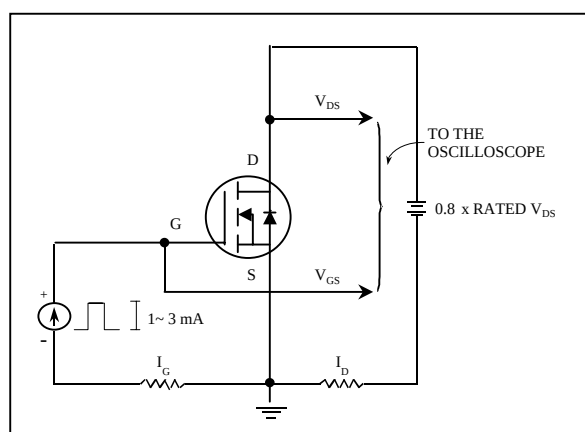


Fig 15. Gate Charge Circuit

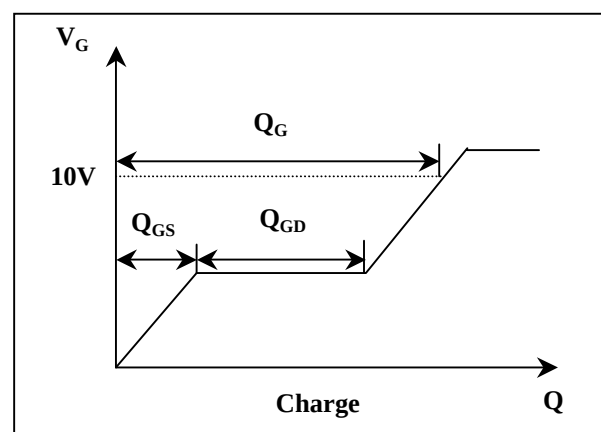


Fig 16. Gate Charge Waveform