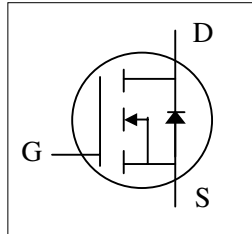




- ▼ 100% Avalanche Test
- ▼ Fast Switching Characteristic
- ▼ Simple Drive Requirement

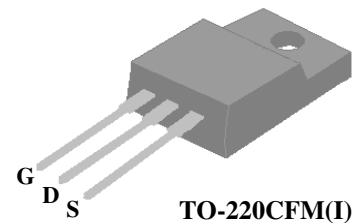


BV_{DSS}	600V
$R_{DS(ON)}$	1 Ω
I_D	7A

Description

AP3987 series are specially designed as main switching devices for universal 90~265VAC off-line AC/DC converter applications.

TO-220CFM type provide high blocking voltage to overcome voltage surge and sag in the toughest power system with the best combination of fast switching, ruggedized design and cost-effectiveness.



Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	600	V
V_{GS}	Gate-Source Voltage	± 30	V
$I_D @ T_C = 25^\circ C$	Continuous Drain Current, $V_{GS} @ 10V$	7	A
$I_D @ T_C = 100^\circ C$	Continuous Drain Current, $V_{GS} @ 10V$	4.4	A
I_{DM}	Pulsed Drain Current ¹	28	A
$P_D @ T_C = 25^\circ C$	Total Power Dissipation	37	W
E_{AS}	Single Pulse Avalanche Energy ²	27	mJ
I_{AR}	Avalanche Current	7	A
T_{STG}	Storage Temperature Range	-55 to 150	$^\circ C$
T_J	Operating Junction Temperature Range	-55 to 150	$^\circ C$

Thermal Data

Symbol	Parameter	Value	Units
Rthj-c	Maximum Thermal Resistance, Junction-case	3.4	$^\circ C/W$
Rthj-a	Maximum Thermal Resistance, Junction-ambient	65	$^\circ C/W$



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
R _{DS(ON)}	Static Drain-Source On-Resistance	V _{GS} =10V, I _D =5A	-	-	1	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 =5A	-	5	-	S
I _{DSS}	Drain-Source Leakage Current	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 =7A	-	55	90	nC
Q _{gs}	Gate-Source Charge	V _{DS} =480V	-	9	-	nC
Q _{gd}	Gate-Drain ("Miller") Charge	V _{GS} =10V	-	16	-	nC
t _{d(on)}	Turn-on Delay Time ³	V _{DD} =300V	-	15	-	ns
t _r	Rise Time	I _D =7A	-	15	-	ns
t _{d(off)}	Turn-off Delay Time	R _G =10Ω, V _{GS} =10V	-	100	-	ns
t _f	Fall Time	R _D =43Ω	-	32	-	ns
C _{iss}	Input Capacitance	V _{GS} =0V	-	2750	4400	pF
C _{oss}	Output Capacitance	V _{DS} =25V	-	160	-	pF
C _{rss}	Reverse Transfer Capacitance	f=1.0MHz	-	6	-	pF

Source-Drain Diode

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
V _{SD}	Forward On Voltage ³	I _S =7A, V _{GS} =0V	-	-	1.5	V
trr	Reverse Recovery Time ³	I _S =7A, V _{GS} =0V,	-	530	-	ns
Q _{rr}	Reverse Recovery Charge	dI/dt=100A/μs	-	8.6	-	μC

Notes:

- 1.Pulse width limited by max. junction temperature.
- 2.Starting T_j=25°C , V_{DD}=50V , L=1mH , R_G=25Ω
- 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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APEC RESERVES THE RIGHT TO MAKE CHANGES WITHOUT FURTHER NOTICE TO ANY PRODUCTS HEREIN TO IMPROVE RELIABILITY, FUNCTION OR DESIGN.

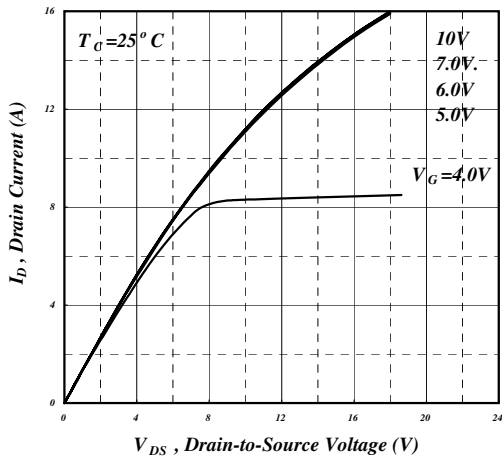


Fig 1. Typical Output Characteristics

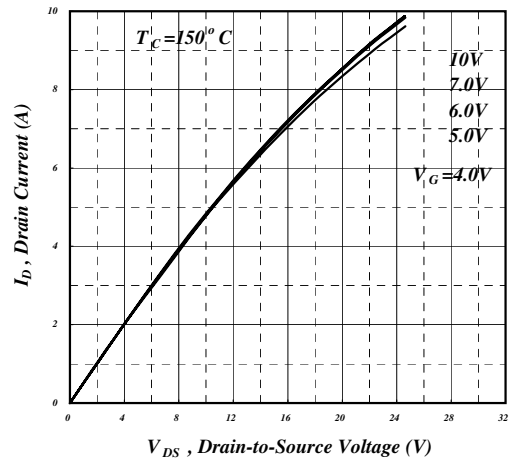


Fig 2. Typical Output Characteristics

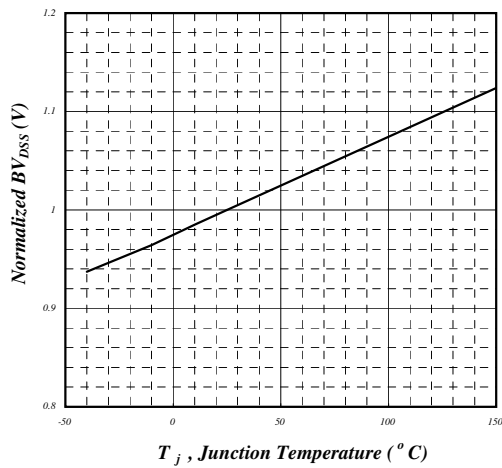


Fig 3. Normalized BV_{DSS} v.s. Junction Temperature

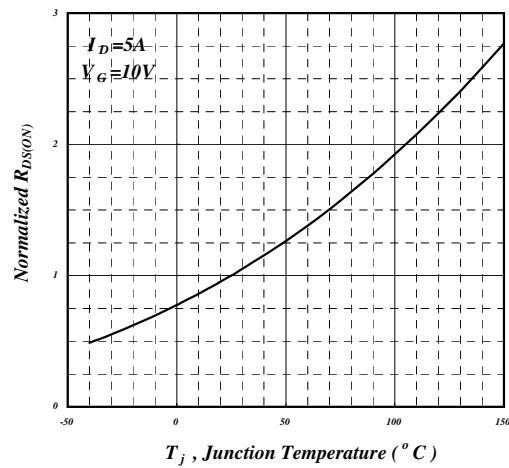


Fig 4. Normalized On-Resistance v.s. Junction Temperature

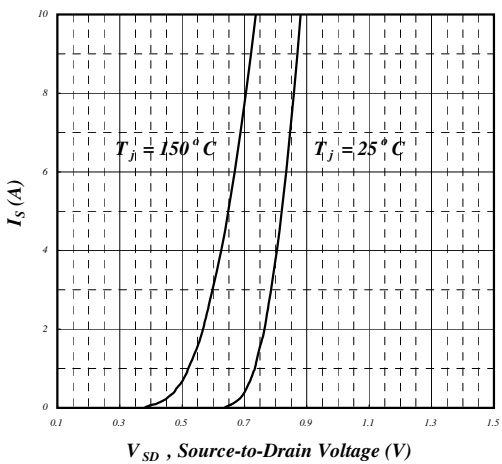


Fig 5. Forward Characteristic of Reverse Diode

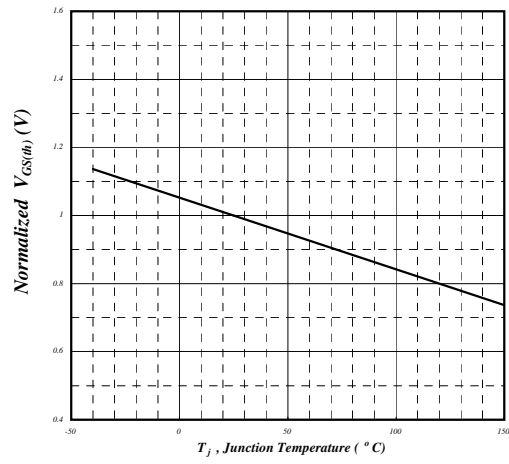


Fig 6. Gate Threshold Voltage v.s. Junction Temperature

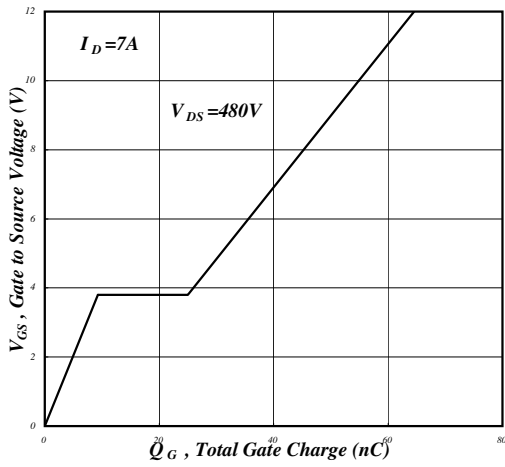


Fig 7. Gate Charge Characteristics

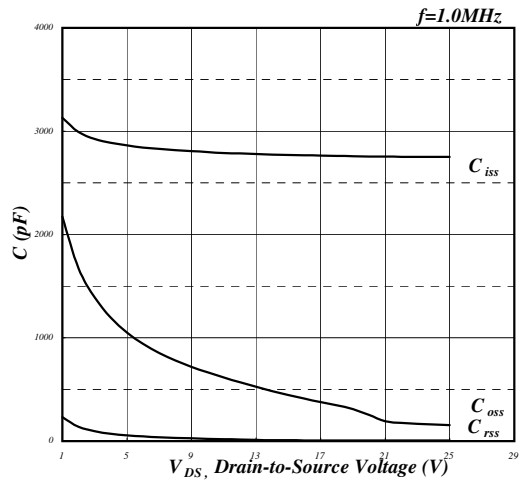


Fig 8. Typical Capacitance Characteristics

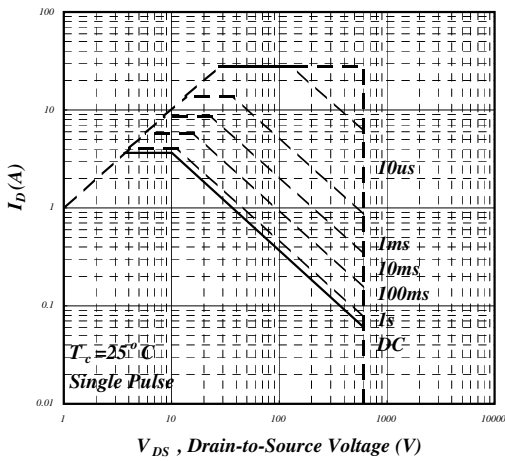


Fig 9. Maximum Safe Operating Area

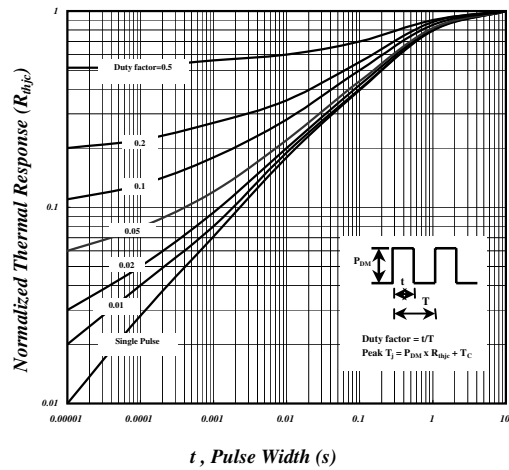


Fig 10. Effective Transient Thermal Impedance

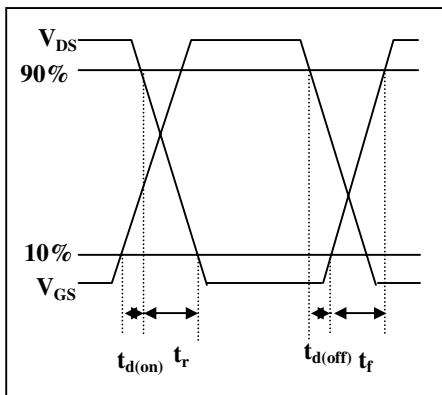


Fig 11. Switching Time Waveform

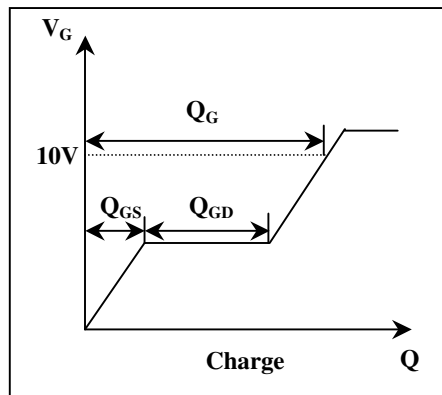
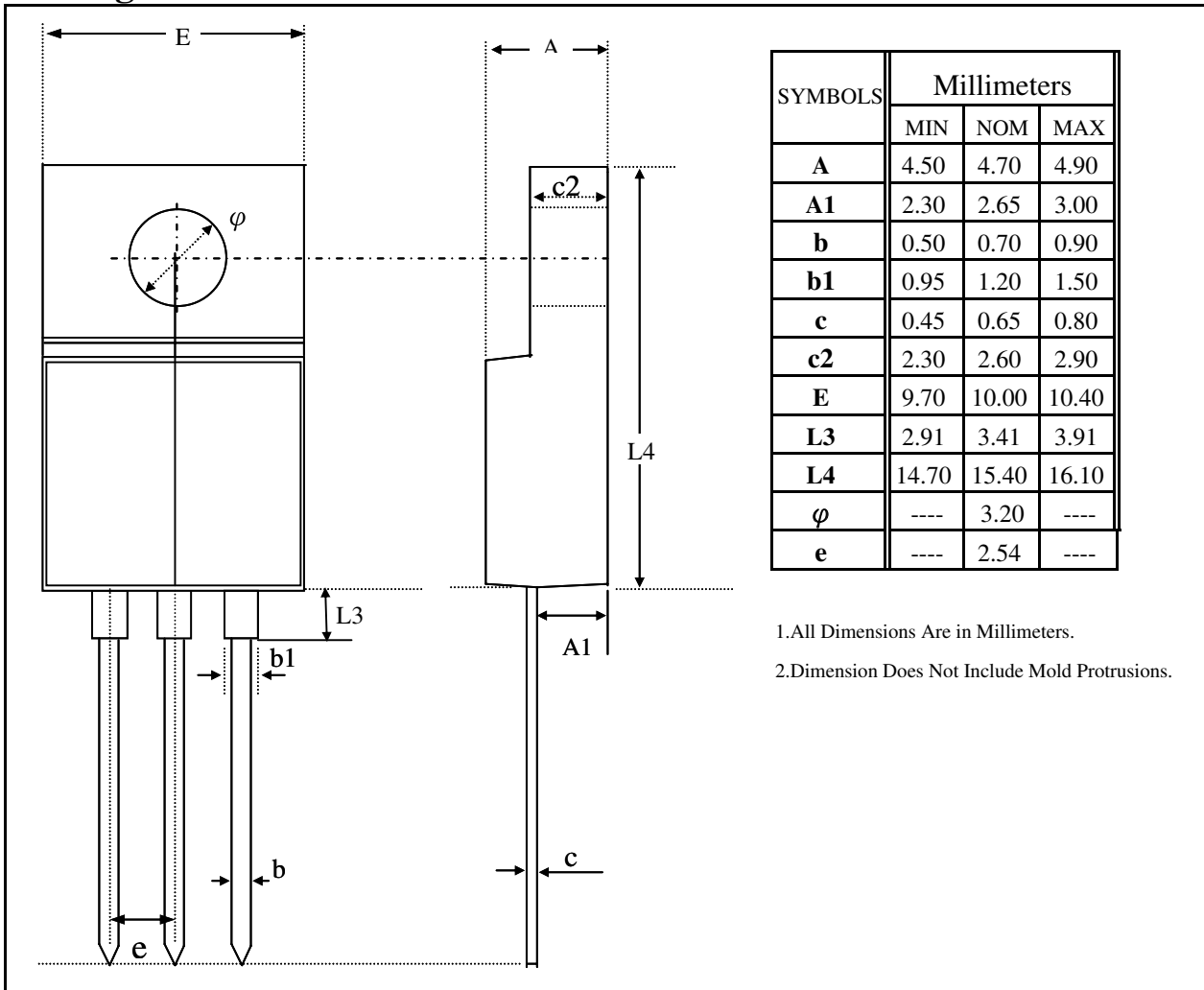


Fig 12. Gate Charge Waveform



Package Outline : TO-220CFM



Part Marking Information & Packing : TO-220CFM

