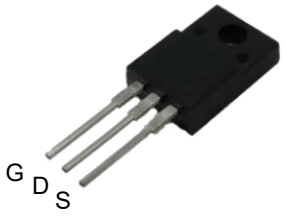
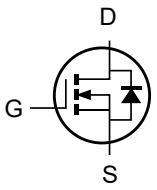
MPR11N45CTF

10-Jun-2022

450V N-Channel Power MOSFET

MPR11N45CTF
TO-220F





Features

- Low gate charge
- Low Ciss
- Fast switching
- 100% avalanche tested
- Improved dv/dt capability

Application

- Power factor correction（PFC）
- Switched mode power supplies（SMPS）
- Uninterruptible Power Supply（UPS）
- AC to DC Converters
- Telecom, Solar

Maximum ratings, at T_A =25°C, unless otherwise specified

Symbol	Parameter	Rating	Unit
$V_{(BR)DSS}$	Drain-Source breakdown voltage	450	V
V_{GS}	Gate-Source voltage	±30	V
I_D	Continuous drain current	11	A
I_{DM}	Pulse drain current tested ①	40	A
I_S	Continuous Diode Forward Current	10	A
E_{AS}	Avalanche energy, single pulsed ②	580	mJ
dv/dt	Reverse Diode dV/dt ③	5	V/ns
P_D	Power Dissipation	40	W
T_{STG},T_J	Storage and Junction Temperature Range	-55 to 150	°C

NOTE: ① Repetitive rating; pulse width limited by max junction temperature.
② L=10mH,I_{AS}=10.8A ,starling T_J=25℃.
③ I_{SD}=10A,dI/dt≤100A/us,V_{DD}≤BV_{DSS},starting T_J=25℃,Pulse width≤300us;duty cycle≤2%

Thermal Characteristics

Symbol	Parameter	Typical	Unit
$R_{\theta JC}$	Thermal Resistance, Junction-to-Case	3.13	°C/W

Electrical Characteristics

Symbol	Parameter	Condition	Min.	Typ.	Max.	Unit
Static Electrical Characteristics @ T_j=25°C (unless otherwise stated)						
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	V_{GS}=0V, I_D=250μA	450	--	--	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=450V,V_{GS}=0V	--	--	1	μA
I_{GSS}	Gate-Body Leakage Current	V_{GS}=±30V,V_{DS}=0V	--	--	±100	nA
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS},I_D=250μA	2.0	--	4.0	V
$R_{DS(on)}$	Drain-Source On-State Resistance	V_{GS}=10V, I_D=5A	--	0.5	0.75	Ω
g_{fs}	Forward Transconductance	V_{DS}=15V, I_D=5A	--	10	--	S
Dynamic Electrical Characteristics @ T_j = 25°C (unless otherwise stated)						
C_{iss}	Input Capacitance	V_{DS}=25V, V_{GS}=0V, f=1MHz	--	1620	--	pF
C_{oss}	Output Capacitance		--	154	--	pF
C_{rss}	Reverse Transfer Capacitance		--	8.4	--	pF
Q_g	Total Gate Charge	V_{DS}=400V, I_D=10A , V_{GS}=10V	--	32	--	nC
Q_{gs}	Gate-Source Charge		--	7.9	--	nC
Q_{gd}	Gate-Drain Charge		--	12	--	nC

Switching Characteristics

Td(on)	Turn-on Delay Time	V_{DD}=250V, I_D=10A, R_G=10Ω,	--	26	--	ns
Tr	Turn-on Rise Time		--	20	--	ns
Td(off)	Turn-Off Delay Time		--	52	--	ns
Tf	Turn-Off Fall Time		--	21	--	ns

Source- Drain Diode Characteristics@ T_j = 25°C (unless otherwise stated)

I_{SM}	Pulsed Diode Forward Current		--	--	40	A
V_{SD}	Forward on voltage	I_S=10A,V_{GS}=0V	--	--	1.5	V
Trr	Reverse Recovery Time	I_S=10A,V_{GS}=0V di/dt=100A/μs	--	411	--	ns
Qrr	Reverse Recovery Charge		--	2.588	--	uC

Typical Characteristics

Fig 1. Typical Output Characteristics

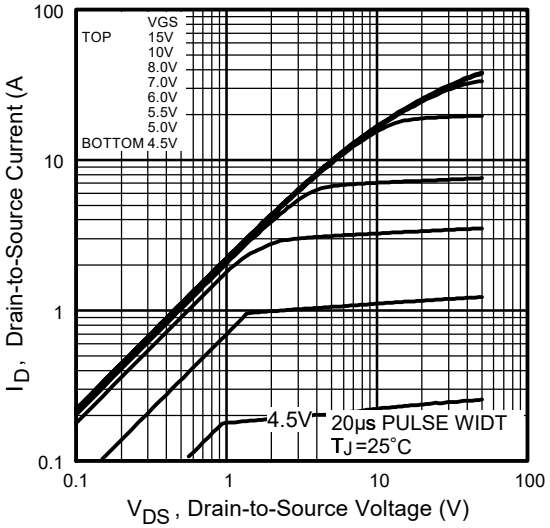


Fig 2. Typical Output Characteristics

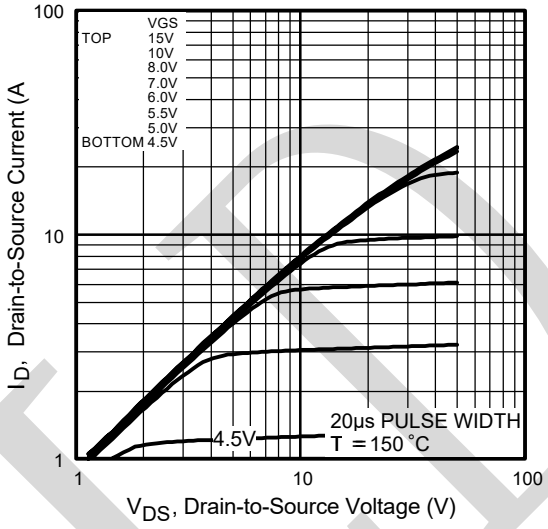


Fig 3. Typical Transfer Characteristics

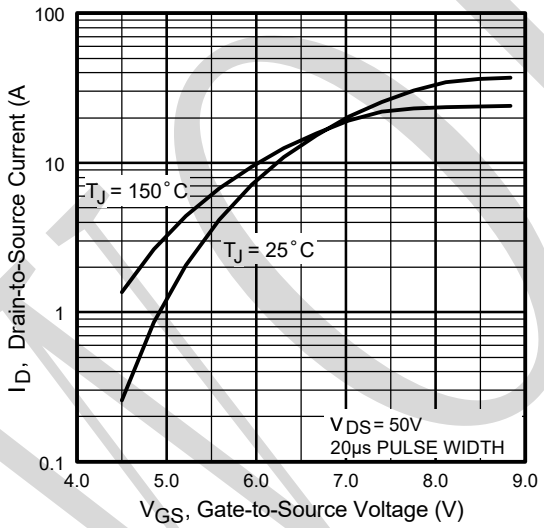
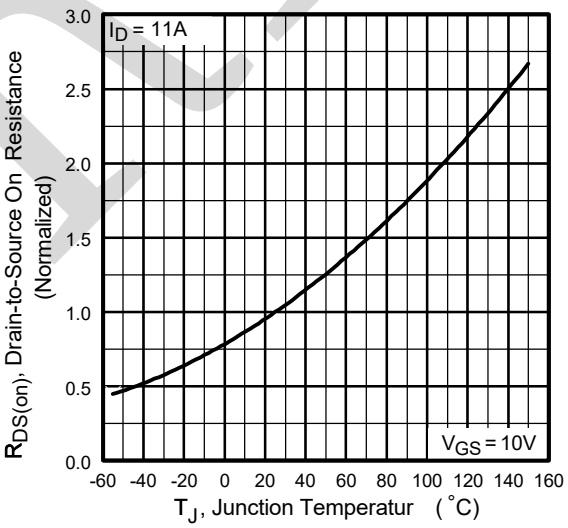


Fig 4. Normalized On-Resistance Vs. Temperature



Typical Characteristics

Fig 5. Typical Capacitance Vs. Drain-to-Source Voltage

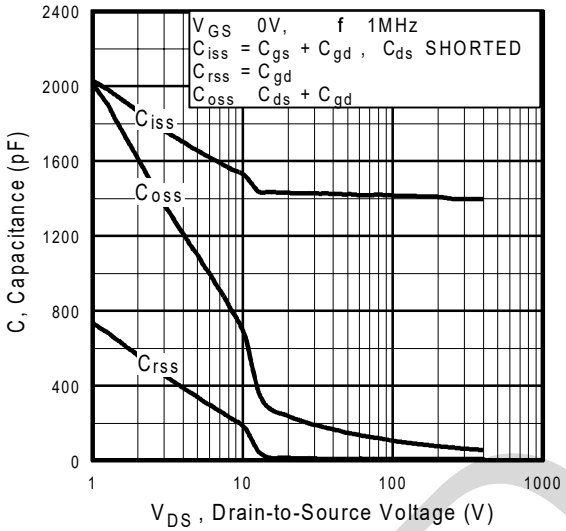


Fig 6. Typical Gate Charge Vs. Gate-to-Source Voltage

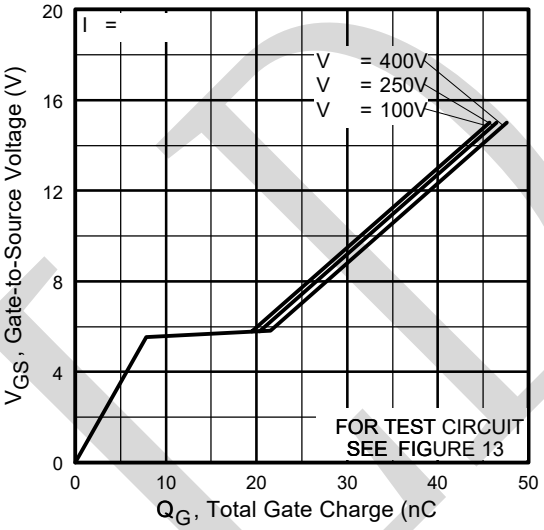


Fig 7. Typical Source-Drain Diode Forward Voltage

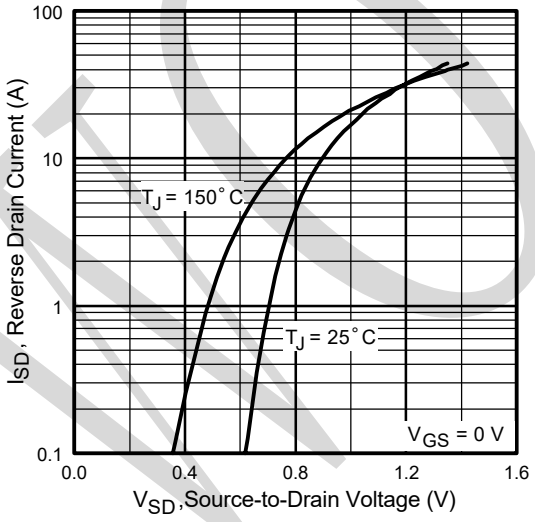
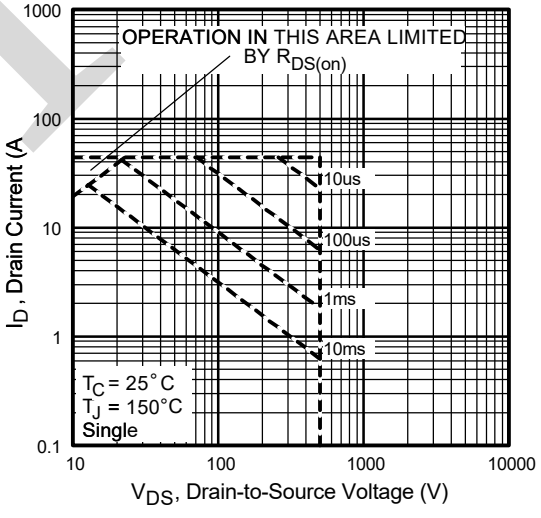


Fig 8. Maximum Safe Operating Area



Typical Characteristics

Fig 9. Maximum Drain Current Vs. Case Temperature

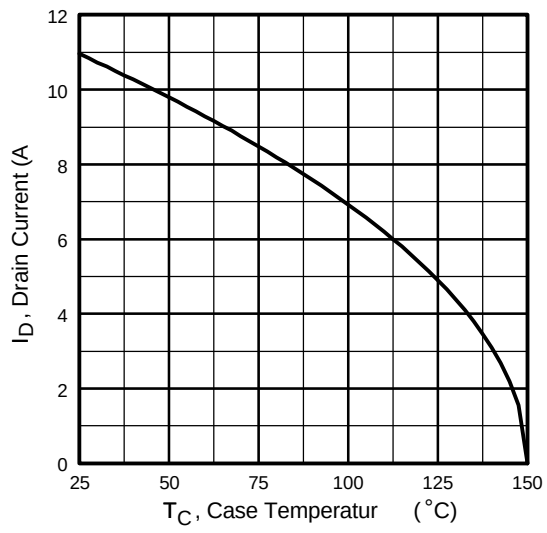


Fig 10. Maximum Avalanche Energy Vs. Drain Current

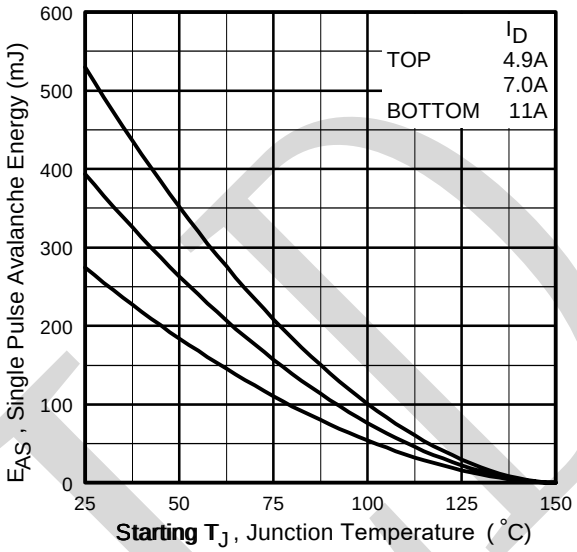
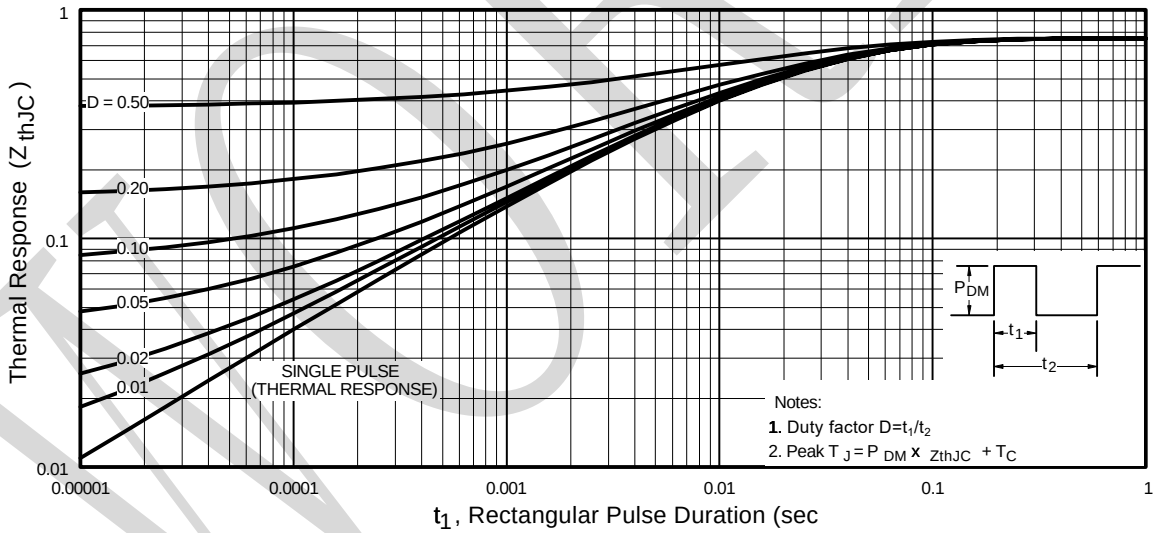


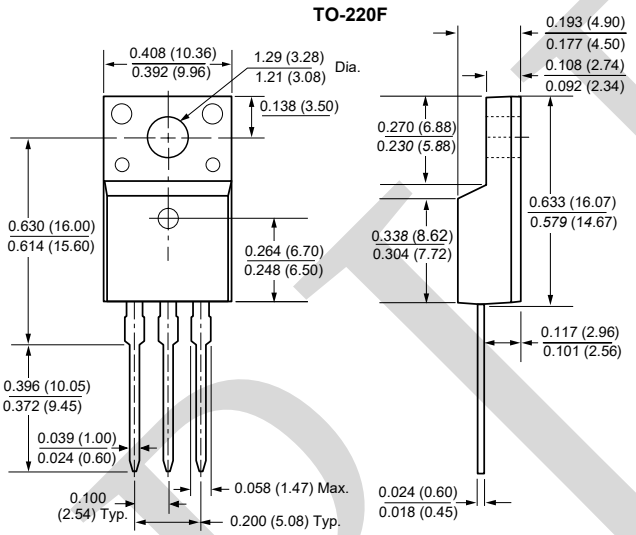
Fig 11. Maximum Effective Transient Thermal Impedance, Junction-to-Case



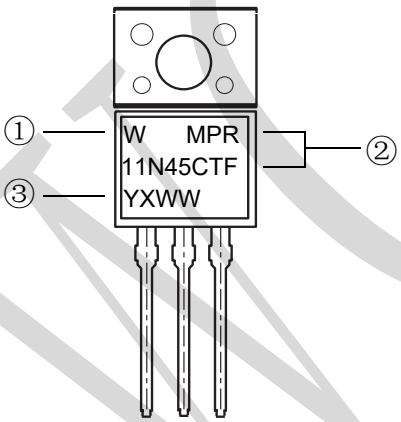
PACKAGE OUTLINE DIMENSIONS

TO-220F Package Information

Note:unit mm



Marking Information



① W : Company's trademark

② Product model : MPR11N45CTF

③ PDC information：

Y X WW

WW:Week code(01 to 53)

X:Internal identification code

Y:Year code(ex:0=2020)