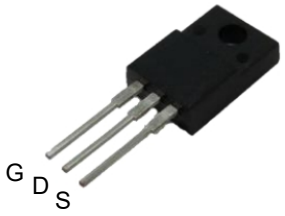
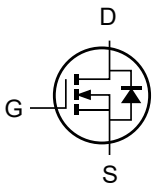
700V N-Channel Power MOSFET

MPR6N70CTF
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		700	V
V_{GS}	Gate-Source voltage		±30	V
I_D	Continuous drain current	T_C=25°C	7	A
		T_C=100°C	4	A
I_{DM}	Pulse drain current tested ①		28	A
E_{AS}	Avalanche energy, single pulsed ②		198	mJ
P_D	Power Dissipation		63	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 EAS condition: TJ = 25°C, VDD = 50V, VG = 10V, L= 10mH, IAS = 6.3A

Thermal Characteristics

Symbol	Parameter	Typical	Unit
$R_{\theta JC}$	Thermal Resistance, Junction-to-Case	1.98	°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	700	--	--	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=650V,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	--	4	V
$R_{DS(on)}$	Drain-Source On-State Resistance	V_{GS}=10V, I_D=3.5A	--	1.1	1.2	Ω
Dynamic Electrical Characteristics @ T_j = 25°C (unless otherwise stated)						
C_{iss}	Input Capacitance	V_{DS}=25V, V_{GS}=0V, f=1MHz	--	1148	--	pF
C_{oss}	Output Capacitance		--	106	--	pF
C_{rss}	Reverse Transfer Capacitance		--	12	--	pF
Q_g	Total Gate Charge	V_{DS}=520V, I_D=7A , V_{GS}=10V	--	22	--	nC
Q_{gs}	Gate-Source Charge		--	4.3	--	nC
Q_{gd}	Gate-Drain Charge		--	13	--	nC

Switching Characteristics

Td(on)	Turn-on Delay Time	V_{DD}=325V, I_D=7A, R_G=25Ω, Tj=25°C	--	15	--	ns
Tr	Turn-on Rise Time		--	18	--	ns
Td(off)	Turn-Off Delay Time		--	80	--	ns
Tf	Turn-Off Fall Time		--	35	--	ns

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

I_S	Maximum Continuous Drain to Source Diode Forward Current		--	--	7	A
I_{SM}	Pulsed Diode Forward Current		--	--	28	A
V_{SD}	Forward on voltage	I_{SD}=7A,V_{GS}=0V	--	--	1.4	V
Trr	Reverse Recovery Time	I_S=7A, V_{GS}=0V di/dt=100A/μs	--	300	--	ns
Qrr	Reverse Recovery Charge		--	4.1	--	μC

Typical Characteristics

Figure1: Output Characteristics

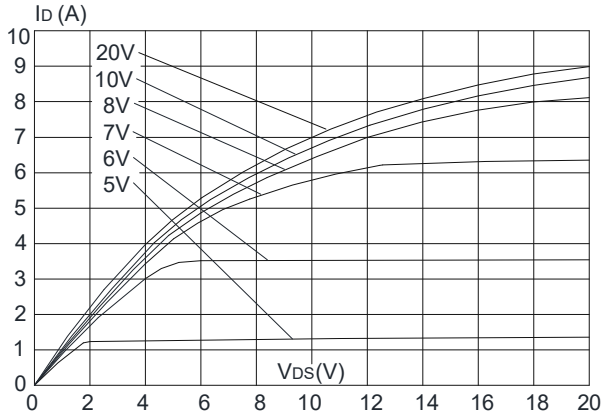


Figure 2: Typical Transfer Characteristics

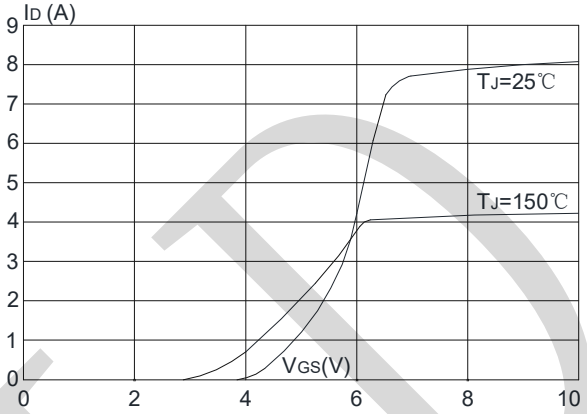


Figure 3: On-resistance vs. Drain Current

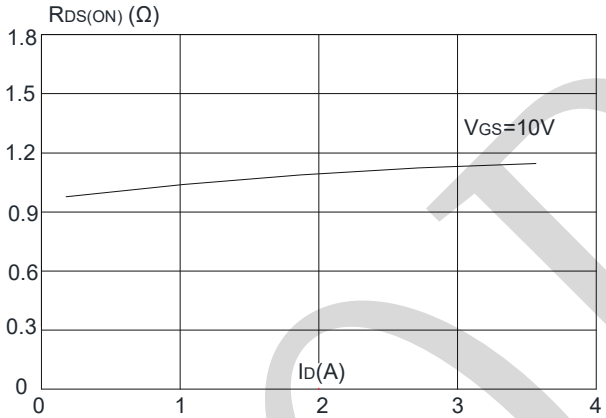


Figure 4: Body Diode Characteristics

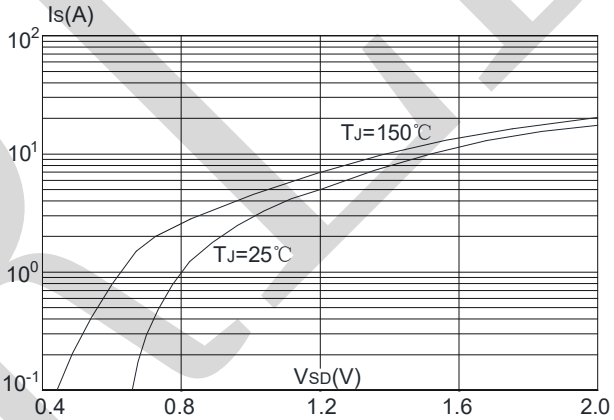


Figure 5: Gate Charge Characteristics

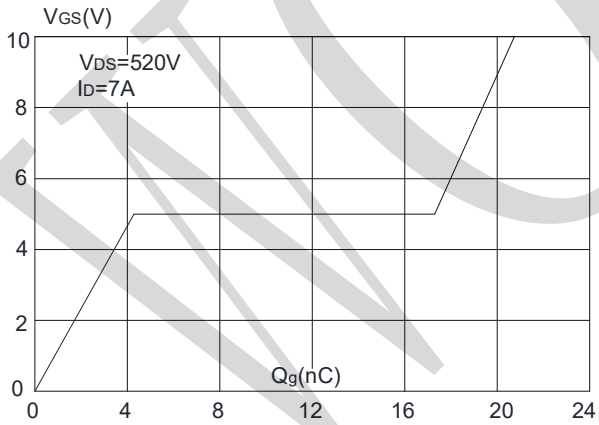
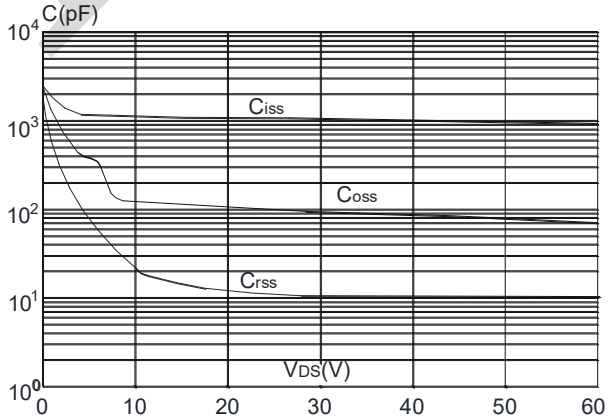


Figure 6: Capacitance Characteristics



Typical Characteristics

Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

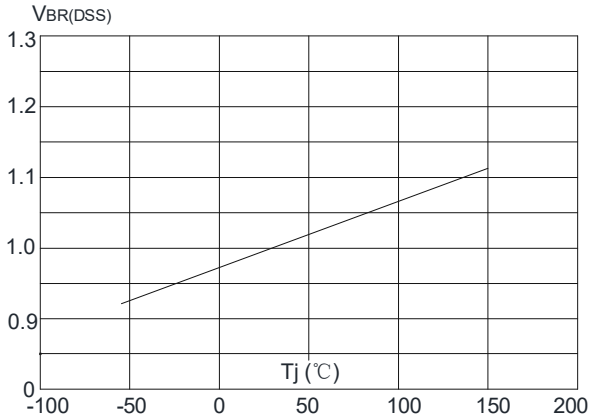


Figure 8: Normalized on Resistance vs. Junction Temperature

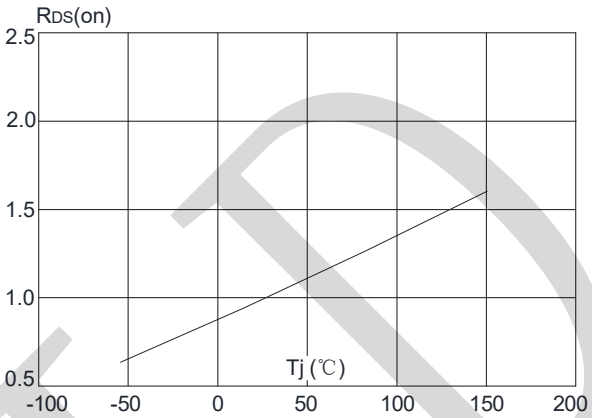


Figure 9: Maximum Safe Operating Area

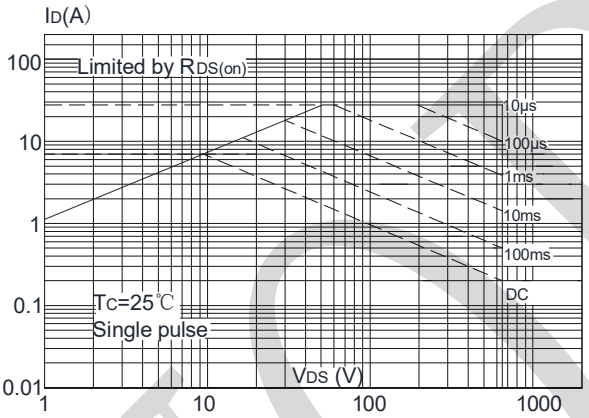


Figure 10: Maximum Continuous Drain Current vs. Case Temperature

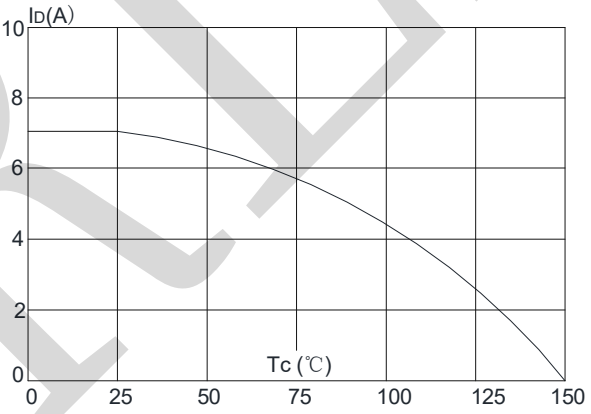
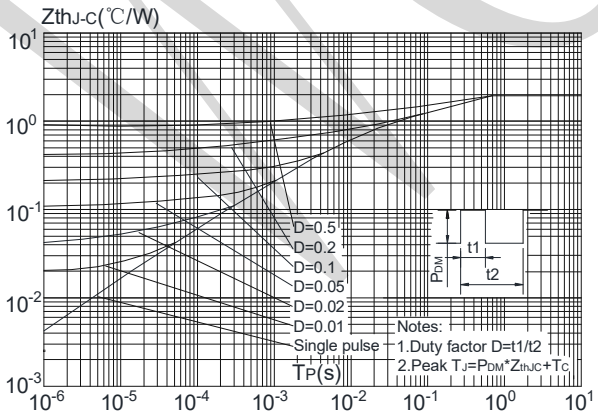
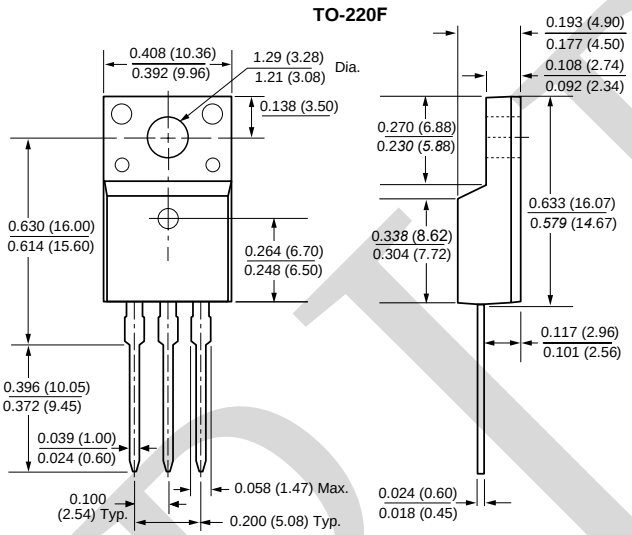


Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Case

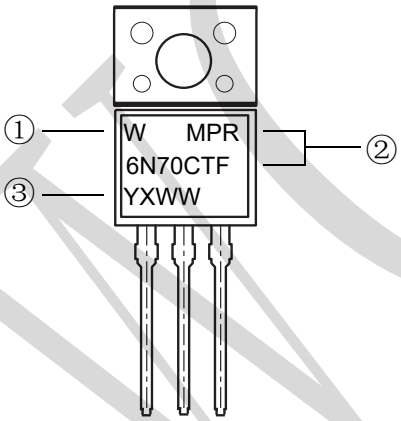


PACKAGE OUTLINE DIMENSIONS

Note:unit mm



Marking Information



①W : Company's trademark

②Product model : MPR6N70CTF

③PDC information：

Y X WW

WW:Week code(01 to 53)

X:Internal identification code

Y:Year code(ex:0=2020)