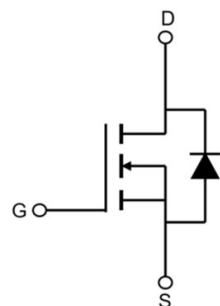
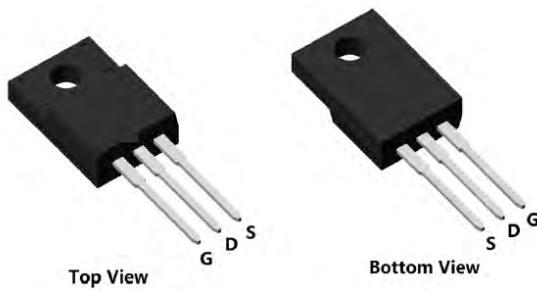


## 650V N-Channel Power MOSFET

**MPR20N65CTF**  
**TO-220F**



$V_{DS}$	650	V
$R_{DS(on),TYP}@ V_{GS}=10\text{ V}$	0.42	$\Omega$
$I_D$	20	A

### Features

- 1、Low on – resistance
- 2、Package TO-220F
- 3、TrenchFET Power MOSFET

### Applications

- 1、Power factor correction.
- 2、Switched mode power supplies
- 3、LED driver.

**Maximum ratings, at  $T_A = 25^\circ\text{C}$ , unless otherwise specified**

Symbol	Parameter		Rating	Unit
$V(BR)DSS$	Drain-Source breakdown voltage		650	V
$V_{GS}$	Gate-Source voltage		$\pm 30$	V
$I_S$	Diode continuous forward current	$T_C = 25^\circ\text{C}$	20	A
$I_D$	Continuous drain current @ $V_{GS}=10\text{V}$	$T_C = 25^\circ\text{C}$	20	A
		$T_C = 100^\circ\text{C}$	12.5	A
$I_{DM}$	Pulse drain current tested ①	$T_C = 25^\circ\text{C}$	80	A
$E_{AS}$	Avalanche energy, single pulsed ②		720	mJ
$P_D$	Power Dissipation	$T_C = 25^\circ\text{C}$	45	W
	Derating Factor above $25^\circ\text{C}$		0.36	$\text{W}/^\circ\text{C}$
$T_{STG,TJ}$	Storage and Junction Temperature Range		-55 to +150	$^\circ\text{C}$

## Thermal Characteristics

Symbol	Parameter	Typical	Unit
R <sub>θJC</sub>	Thermal Resistance, Junction-to-Case	2.78	°C/W
R <sub>θJA</sub>	Thermal Resistance, Junction-to-Ambient	62.5	°C/W

## Electrical Characteristics

Symbol	Parameter	Condition	Min.	Typ.	Max.	Unit
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### Static Electrical Characteristics @ T<sub>j</sub>=25°C (unless otherwise stated)

V(BR)DSS	Drain-Source Breakdown Voltage	V <sub>GS</sub> =0V, I <sub>D</sub> =250μA	650	--	--	V
I <sub>DSS</sub>	Zero Gate Voltage Drain Current	V <sub>DS</sub> =650V, V <sub>GS</sub> =0V	--	--	1	μA
I <sub>GSS</sub>	Gate-Body Leakage Current	V <sub>GS</sub> =±30V, V <sub>DS</sub> =0V	--	--	±100	nA
V <sub>GS(th)</sub>	Gate Threshold Voltage	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250μA	2.0	--	4.0	V
R <sub>DSS(on)</sub>	Drain-Source On-State Resistance ④	V <sub>GS</sub> =10V, I <sub>D</sub> =10A	--	0.42	0.50	Ω

### Dynamic Electrical Characteristics @ T<sub>j</sub> = 25°C (unless otherwise stated)

C <sub>iss</sub>	Input Capacitance	V <sub>DS</sub> =25V, V <sub>GS</sub> =0V, f=1MHz	--	2962	--	pF
C <sub>oss</sub>	Output Capacitance		--	266	--	pF
C <sub>rss</sub>	Reverse Transfer Capacitance		--	18	--	pF
Q <sub>g</sub>	Total Gate Charge	V <sub>DS</sub> =520V, I <sub>D</sub> =10A , V <sub>GS</sub> =0 to 10V	--	58.3	--	nC
Q <sub>gs</sub>	Gate-Source Charge		--	16.7	--	nC
Q <sub>gd</sub>	Gate-Drain Charge		--	19.3	--	nC

## Switching Characteristics

Td(on)	Turn-on Delay Time	V <sub>DD</sub> =325V, I <sub>D</sub> =20A, V <sub>GS</sub> =15V, R <sub>G</sub> =10Ω, T <sub>j</sub> =25°C	--	18.8	--	ns
Tr	Turn-on Rise Time		--	43.4	--	ns
Td(off)	Turn-Off Delay Time		--	98.2	--	ns
Tf	Turn-Off Fall Time		--	16.9	--	ns

## Source- Drain Diode Characteristics@ T<sub>j</sub> = 25°C (unless otherwise stated)

I <sub>SM</sub>	Maximum Pulsed Drain to Source Diode Forward Current		--	--	80	A
V <sub>SD</sub>	Forward on voltage		--	--	1.5	V
T <sub>rr</sub>	Reverse Recovery Time	I <sub>F</sub> = 20A, V <sub>R</sub> =325V, di/dt=100A/μs	--	492.8	--	ns
Q <sub>rr</sub>	Reverse Recovery Charge		--	7.46	--	uC
I <sub>rr</sub>	Peak reverse recovery current		--	30.3	--	A

NOTE: ① Repetitive rating; pulse width limited by max junction temperature.

② Limited by T<sub>Jmax</sub>, starting T<sub>J</sub>=25°C, L = 10mH, I<sub>AS</sub> = 12A. Part not recommended for use above this value.

③ The power dissipation P<sub>DSM</sub> is based on R<sub>θJA</sub> and the maximum allowed junction temperature of 150°C.

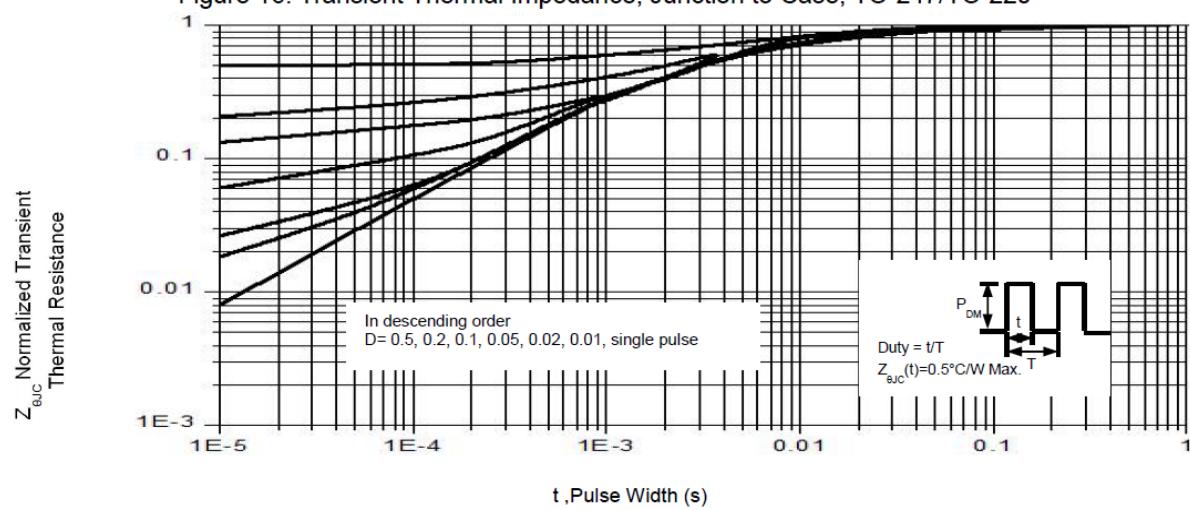
④ Pulse width ≤ 380μs; duty cycle≤ 2%.





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Figure 16. Transient Thermal Impedance, Junction to Case, TO-247/TO-220





**MPR20N65CTF**

10-JUN-2021

## PACKAGE OUTLINE DIMENSIONS

Note: unit mm