

General Description

The CMF20N65 uses advanced planar stripe DMOS technology to provide excellent $R_{DS(ON)}$ and superior switching performance, and withstand high energy pulse in the avalanche and commutation mode. These devices are well suited for high efficiency switched mode power supplies, active power factor correction based on half bridge topology.

Features

- Fast switching
- 100% avalanche tested
- Improved dv/dt capability
- RoHS Compliant

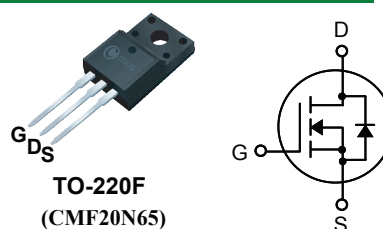
Product Summary

BVDSS	$R_{DS(ON)}$	ID
650V	0.48 Ω	20A

Applications

- Charger
- Adaptor
- Power Supply

TO-220F Pin Configuration



Absolute Maximum Ratings ($T_C=25^\circ\text{C}$ unless otherwise noted)

Symbol	Parameter	Rating	Units
V_{DSS}	Drain-Source Voltage	650	V
I_D	Drain Current - Continuous ($T_C = 25^\circ\text{C}$) - Continuous ($T_C = 100^\circ\text{C}$)	20*	A
		12*	A
I_{DM}	Drain Current - Pulsed	76*	A
V_{GSS}	Gate-Source Voltage	± 30	V
E_{AS}	Single Pulsed Avalanche Energy ²	884	mJ
E_{AR}	Repetitive Avalanche Energy ¹	4	mJ
P_D	Power Dissipation ($T_C = 25^\circ\text{C}$)	40	W
T_J, T_{STG}	Operating and Storage Temperature Range	-55 to +150	$^\circ\text{C}$
T_L	Maximum lead temperature for soldering purposes, 1/8" from case for 5 seconds	300	$^\circ\text{C}$

* Drain current limited by maximum junction temperature

Thermal Characteristics

Symbol	Parameter	Rating	Units
$R_{\theta JC}$	Thermal Resistance, Junction-to-Case	3.13	$^\circ\text{C}/\text{W}$
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient	62.5	$^\circ\text{C}/\text{W}$

Electrical Characteristic (T_C=25°C unless otherwise noted)

Symbol	Parameter	Test Conditions	Min	Typ	Max	Units
Off Characteristics						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} = 0 V, I _D = 250 μA	650	--	--	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} = 650 V, V _{GS} = 0 V	--	--	1	μA
		V _{DS} = 650 V, T _C = 125 °C	--	--	100	
I _{GSSF}	Gate-Body Leakage Current, Forward	V _{GS} = 30 V, V _{DS} = 0 V	--	--	100	nA
I _{GSSR}	Gate-Body Leakage Current, Reverse	V _{GS} = -30 V, V _{DS} = 0 V	--	--	-100	nA
On Characteristics						
V _{GS(th)}	Gate Threshold Voltage	V _{DS} = V _{GS} , I _D = 250 μA	3	--	5	V
R _{DS(on)}	Static Drain-Source on-Resistance	V _{GS} = 10 V, I _D = 10A	--	0.4	0.48	
g _{FS}	Forward Transconductance ³	V _{DS} = 10V, I _D = 10A	--	18	--	S
Dynamic Characteristics						
C _{iss}	Input Capacitance	V _{DS} = 25 V, V _{GS} = 0 V, f = 1.0 MHz	--	5000	--	pF
C _{oss}	Output Capacitance		--	260	--	pF
C _{rss}	Reverse Transfer Capacitance		--	24	--	pF
Switching Characteristics ^{3 4}						
t _{d(on)}	Turn-On Delay Time	V _{DD} = 325 V, I _D = 20A R _G = 25	--	200	--	ns
t _r	Turn-On Rise Time		--	150	--	ns
t _{d(off)}	Turn-Off Delay Time		--	470	--	ns
t _f	Turn-Off Fall Time		--	80	--	ns
Q _g	Total Gate Charge	V _{DS} = 520 V, I _D = 20A V _{GS} = 10 V	--	57	--	nC
Q _{gs}	Gate-Source Charge		--	23	--	nC
Q _{gd}	Gate-Drain Charge		--	13	--	nC
Drain-Source Diode Characteristics and Maximum Ratings						
I _S	Maximum Continuous Drain-Source Diode Forward Current		--	--	20	A
I _{SM}	Maximum Pulsed Drain-Source Diode Forward Current		--	--	72	A
V _{SD}	Drain-Source Diode Forward Voltage	V _{GS} = 0 V, I _S = 20A	--	--	1.4	V
t _{rr}	Reverse Recovery Time ^{3 4}	V _{GS} = 0 V, I _S = 20A	--	435	--	ns
Q _{rr}	Reverse Recovery Charge ^{3 4}	di _F / dt = 100 A/μs	--	4.1	--	μC

Note:

1. Repeated rating: Pulse width limited by safe operating area.
2. L=5mH, I_{AS}=20A, V_{DD}=50V, R_G=25Ω, Starting T_J=25°C.
3. Pulse test: Pulse width≤300us, Duty cycles≤2%.
4. Essentially independent of operating temperature typical characteristics.

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