

General Description

These N-Channel enhancement mode power field effect transistor are produced using advanced technology which has been especially tailored to minimize on-state resistance, provide superior switching performance, and withstand high energy pulse in the avalanche and commutation mode. These devices are well suited for high efficient switched mode power supplies and active power factor correction.

Features

- 100% avalanche tested
- Fast Switching
- Improved dv/dt capability

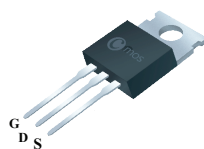
Product Summary

BVDSS	RDSON	ID
500V	85mΩ	42A

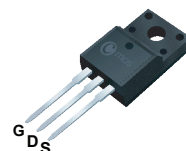
Applications

- Switching regulators
- UPS (Uninterruptible Power Supply)
- DC-DC converters

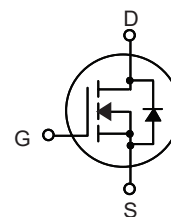
TO-220/220F Pin Configuration



TO-220
(CMP42N50)



TO-220F
(CMF42N50)



Absolute Maximum Ratings

Symbol	Parameter	CMP42N50/CMF42N50		Units
V_{DS}	Drain-Source Voltage	500		V
V_{GS}	Gate-Source Voltage	±30		V
$I_D@T_C=25^{\circ}\text{C}$	Continuous Drain Current	42	42*	A
$I_D@T_C=100^{\circ}\text{C}$	Continuous Drain Current	20	20*	A
I_{DM}	Pulsed Drain Current ¹	126	126*	A
EAS	Single Pulse Avalanche Energy ²	450		mJ
$P_D@T_C=25^{\circ}\text{C}$	Total Power Dissipation	250	38	W
T_{STG}	Storage Temperature Range	-55 to 150		°C
T_J	Operating Junction Temperature Range	-55 to 150		°C

* Drain current limited by maximum junction temperature.

Thermal Data

Symbol	Parameter	CMP42N50	CMF42N50	Unit
$R_{\theta JA}$	Thermal Resistance Junction-ambient	65	65	°C/W
$R_{\theta JC}$	Thermal Resistance Junction-case	0.35	2.5	°C/W

Electrical Characteristics ($T_J=25^{\circ}\text{C}$, unless otherwise noted)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V$, $I_D=250\mu A$	500	---	---	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance	$V_{GS}=10V$, $I_D=20A$	---	---	85	$m\Omega$
$V_{GS(th)}$	Gate Threshold Voltage	$V_{GS}=V_{DS}$, $I_D=250\mu A$	2	---	4.5	V
I_{DSS}	Drain-Source Leakage Current	$V_{DS}=500V$, $V_{GS}=0V$	---	---	1	μA
		$V_{DS}=400V$, $V_{GS}=0V$, $T_C=150^{\circ}\text{C}$	---	10	---	
I_{GSS}	Gate-Source Leakage Current	$V_{GS}=\pm 30V$, $V_{DS}=0V$	---	---	± 100	nA
g_{fs}	Forward Transconductance	$V_{DS}=10V$, $I_D=20A$	---	30	---	S
R_g	Gate Resistance	$V_{DS}=0V$, $V_{GS}=0V$, $f=1\text{MHz}$	---	3	---	Ω
Q_g	Total Gate Charge	$I_D=14.5A$	---	27	---	nC
Q_{gs}	Gate-Source Charge	$V_{DS}=400V$	---	6	---	
Q_{gd}	Gate-Drain Charge	$V_{GS}=10V$ (Note 3, 4)	---	10	---	
$T_{d(on)}$	Turn-On Delay Time	$V_{GS}=10V$	---	30	---	ns
T_r	Rise Time	$V_{DS}=400V$	---	44	---	
$T_{d(off)}$	Turn-Off Delay Time	$I_D=14.5A$	---	105	---	
T_f	Fall Time	$R_G=25\Omega$ (Note 3, 4)	---	35	---	
C_{iss}	Input Capacitance	$V_{DS}=25V$, $V_{GS}=0V$, $f=1\text{MHz}$	---	3500	---	pF
C_{oss}	Output Capacitance		---	90	---	
C_{rss}	Reverse Transfer Capacitance		---	2.5	---	

Diode Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I_S	Continuous Source Current	$V_G=V_D=0V$, Force Current	---	---	42	A
I_{SM}	Pulsed Source Current		---	---	126	A
V_{SD}	Diode Forward Voltage	$V_{GS}=0V$, $I_S=20A$, $T_J=25^{\circ}\text{C}$	---	---	1.4	V

Note :

1.Repetitive Rating: Pulse width limited by maximum junction temperature

2.L = 5mH , $I_{AS} = 13.5A$, $V_{DD} = 50V$, $R_G = 25\Omega$, Starting $T_J = 25^{\circ}\text{C}$ 3.Pulse Test: Pulse width $\leq 300\mu s$, Duty Cycles $\leq 2\%$

4.Essentially Independent of Operating Temperature Typical Characteristics

This product has been designed and qualified for the consumer market.

Cmos assumes no liability for customers' product design or applications.

Cmos reserves the right to improve product design ,functions and reliability without notice.