

General Description

These N-Channel enhancement mode power field effect transistors 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 efficiency switched mode power supplies, active power factor correction, electronic lamp ballasts based on half bridge topology.

Features

- Originative New Design
- 100% avalanche tested
- Very Low Intrinsic Capacitances
- Fast switching
- Improved dv/dt capability
- 4A, 600V, $R_{DS(on)} = 2.5\Omega$ @ $V_{GS} = 10V$

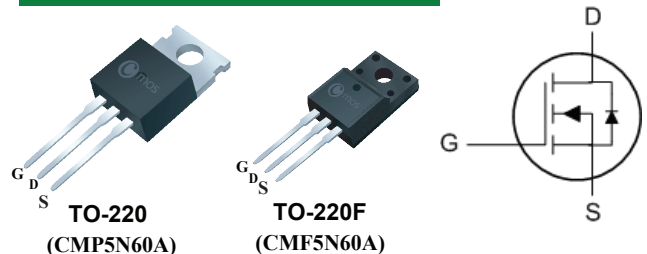
Product Summary

BVDSS	RDS(on)	ID
600V	2.5 Ω	4A

Applications

- Charger
- Adaptor
- Power Supply
- Electrodeless lamp

TO-220/220F Pin Configuration



Absolute Maximum Ratings

$T_C = 25^\circ\text{C}$ unless otherwise noted

Symbol	Parameter	CMP5N60A/CMF5N60A		Units
V_{DSS}	Drain-Source Voltage	600		V
I_D	Drain Current - Continuous ($T_C = 25^\circ\text{C}$)	4	4*	A
		2.5	2.5*	A
I_{DM}	Drain Current - Pulsed	12	12*	A
V_{GSS}	Gate-Source Voltage	± 30		V
E_{AS}	Single Pulsed Avalanche Energy	210		mJ
I_{AR}	Avalanche Current	4		A
E_{AR}	Repetitive Avalanche Energy	10		mJ
dv/dt	Peak Diode Recovery dv/dt	4.5		V/ns
P_D	Power Dissipation ($T_C = 25^\circ\text{C}$)	100	33	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	CMP5N60A	CMF5N60A	Units
$R_{\theta JC}$	Thermal Resistance, Junction-to-Case	1.25	3.79	$^\circ\text{C/W}$
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient	62.5	62.5	$^\circ\text{C/W}$

Electrical Characteristic $T_C = 25^\circ\text{C}$ unless otherwise noted

Symbol	Parameter	Test Conditions	Min	Typ	Max	Units
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Off Characteristics

BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS} = 0\text{ V}, I_D = 250\text{ }\mu\text{A}$	600	--	--	V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS} = 600\text{ V}, V_{GS} = 0\text{ V}$	--	--	1	μA
		$V_{DS} = 480\text{ V}, T_C = 125^\circ\text{C}$	--	--	10	
I_{GSSF}	Gate-Body Leakage Current, Forward	$V_{GS} = 30\text{ V}, V_{DS} = 0\text{ V}$	--	--	100	nA
I_{GSSR}	Gate-Body Leakage Current, Reverse	$V_{GS} = -30\text{ V}, V_{DS} = 0\text{ V}$	--	--	-100	nA

On Characteristics

$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS} = V_{GS}, I_D = 250\text{ }\mu\text{A}$	2.0	--	4.0	V
$R_{DS(on)}$	Static Drain-Source On-Resistance	$V_{GS} = 10\text{ V}, I_D = 2\text{ A}$	--	1.85	2.5	Ω
g_{FS}	Forward Transconductance	$V_{DS} = 40\text{ V}, I_D = 2\text{ A}$	--	6	--	S

Dynamic Characteristics

C_{iss}	Input Capacitance	$V_{DS} = 25\text{ V}, V_{GS} = 0\text{ V},$ $f = 1.0\text{ MHz}$	--	550	--	pF
C_{oss}	Output Capacitance		--	56	--	pF
C_{rss}	Reverse Transfer Capacitance		--	6	--	pF

Switching Characteristics

$t_{d(on)}$	Turn-On Delay Time	$V_{DD} = 300\text{ V}, I_D = 4\text{ A}$ $R_G = 25\Omega$	--	25	--	ns
t_r	Turn-On Rise Time		--	60	--	ns
$t_{d(off)}$	Turn-Off Delay Time		--	90	--	ns
t_f	Turn-Off Fall Time		--	100	--	ns
Q_g	Total Gate Charge	$V_{DS} = 480\text{ V}, I_D = 4\text{ A}$ $V_{GS} = 10\text{ V}$	--	13	18	nC
Q_{gs}	Gate-Source Charge		--	2.8	--	nC
Q_{gd}	Gate-Drain Charge		--	5.8	--	nC

Drain-Source Diode Characteristics and Maximum Ratings

I_S	Maximum Continuous Drain-Source Diode Forward Current		--	--	4	A
I_{SM}	Maximum Pulsed Drain-Source Diode Forward Current		--	--	12	A
V_{SD}	Drain-Source Diode Forward Voltage	$V_{GS} = 0\text{ V}, I_S = 4\text{ A}$	--	--	1.4	V
t_{rr}	Reverse Recovery Time	$V_{GS} = 0\text{ V}, I_S = 4\text{ A}$ $di_F / dt = 100\text{ A}/\mu\text{s}$	--	330	--	ns
Q_{rr}	Reverse Recovery Charge		--	2.2	--	μC