

General Description

The 70N06 is extremely high-density N-channel MOSFET, which provides the best RDSON and gate charge for the synchronous buck converter applications.

Features

- Originative New Design
- 100% avalanche tested
- Very Low Intrinsic Capacitances
- Fast switching
- Improved dv/dt capability
- 70A, 60V, RDS(on) = 0.014Ω @VGS = 10 V

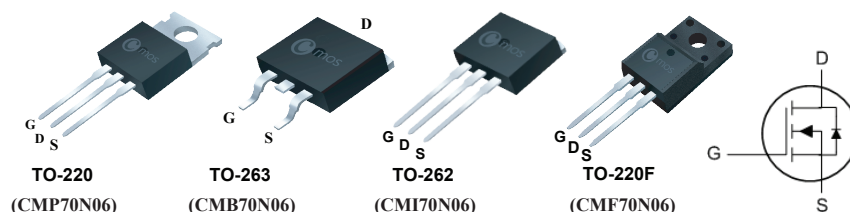
Product Summary

BVDSS	RDSON	ID
60V	0.014Ω	70A

Applications

- DC-DC & DC-AC Converters
- Motor Control, Audio Amplifiers
- High Current, High Speed Switching
- Solenoid And Relay Drivers

TO-220/263/262/220F Pin Configuration



Absolute Maximum Ratings

T_C = 25°C unless otherwise noted

Symbol	Parameter	220/263/262	220F	Units
V _{DSS}	Drain-Source Voltage	60		V
I _D	Drain Current - Continuous (T _C = 25°C)	70	70*	A
	- Continuous (T _C = 100°C)	48	48*	A
I _{DM}	Drain Current - Pulsed	220	220*	A
V _{GSS}	Gate-Source Voltage	±20		V
E _{AS}	Single Pulsed Avalanche Energy	350		mJ
I _{AR}	Avalanche Current	70	70*	A
E _{AR}	Repetitive Avalanche Energy	13.2	3.3	mJ
dv/dt	Peak Diode Recovery dv/dt	7	7	V/ns
P _D	Power Dissipation (T _C = 25°C)	145	40	W
	- Derate above 25°C	0.9	0.35	W/°C
T _J , T _{STG}	Operating and Storage Temperature Range	-55 to +175		°C
T _L	Maximum lead temperature for soldering purposes, 1/8" from case for 5 seconds	300		°C

* Drain current limited by maximum junction temperature

Thermal Characteristics

Symbol	Parameter	220/263/262	220F	Units
R _{θJC}	Thermal Resistance, Junction-to-Case Max.	1.1	3.8	°C/W
R _{θCS}	Thermal Resistance, Case-to-Sink Typ.	---	---	°C/W
R _{θJA}	Thermal Resistance, Junction-to-Ambient Max.	62.5	62.5	°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	$V_{GS} = 0\text{ V}, I_D = 250\text{ }\mu\text{A}$	60	--	--	V
$\Delta BV_{DSS} / \Delta T_J$	Breakdown Voltage Temperature Coefficient	$I_D = 250\text{ }\mu\text{A}$, Referenced to 25°C	--	0.07	--	$V/^\circ\text{C}$
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS} = 60\text{ V}, V_{GS} = 0\text{ V}$	--	--	1	μA
		$V_{DS} = 60\text{ V}, T_C = 150^\circ\text{C}$	--	--	10	
I_{GSSF}	Gate-Body Leakage Current, Forward	$V_{GS} = 20\text{ V}, V_{DS} = 0\text{ V}$	--	--	100	nA
I_{GSSR}	Gate-Body Leakage Current, Reverse	$V_{GS} = -20\text{ V}, V_{DS} = 0\text{ V}$	--	--	-100	nA

On Characteristics

$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS} = V_{GS}, I_D = 250\text{ }\mu\text{A}$	2	--	4	V
$R_{DS(on)}$	Static Drain-Source On-Resistance	$V_{GS} = 10\text{ V}, I_D = 35\text{ A}$	--	0.01	0.014	Ω

Dynamic Characteristics

C_{iss}	Input Capacitance	$V_{DS} = 25\text{ V}, V_{GS} = 0\text{ V},$ $f = 1.0\text{ MHz}$	--	3680	--	pF
C_{oss}	Output Capacitance		--	720	--	pF
C_{rss}	Reverse Transfer Capacitance		--	180	--	pF

Switching Characteristics

$t_{d(on)}$	Turn-On Delay Time	$V_{DD} = 30\text{ V}, I_D = 70\text{ A}$ $R_G = 4.7\text{ }\Omega$	--	35	--	ns
t_r	Turn-On Rise Time		--	68	--	ns
$t_{d(off)}$	Turn-Off Delay Time		--	150	--	ns
t_f	Turn-Off Fall Time		--	30	--	ns
Q_g	Total Gate Charge	$V_{DS} = 48\text{ V}, I_D = 70\text{ A}$ $V_{GS} = 10\text{ V}$	--	78	--	nC
Q_{gs}	Gate-Source Charge		--	25	--	nC
Q_{gd}	Gate-Drain Charge		--	22	--	nC

Drain-Source Diode Characteristics and Maximum Ratings

I _S	Maximum Continuous Drain-Source Diode Forward Current		--	--	70	A
I _{SM}	Maximum Pulsed Drain-Source Diode Forward Current		--	--	220	A
V _{SD}	Drain-Source Diode Forward Voltage	V _{GS} = 0 V, I _S = 70A	--	--	1.5	V
t _{rr}	Reverse Recovery Time	V _{GS} = 0 V, I _S = 70A	--	58	--	ns
Q _{rr}	Reverse Recovery Charge	dI _F / dt = 100 A/μs	--	65	--	μC

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