

General Description

The 80N04 is N-ch MOSFET with extreme high cell density, which provide excellent RDSON and gate charge for most of the synchronous buck converter applications.

Features

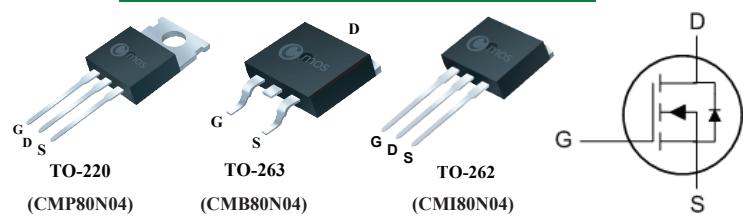
- Simple Drive Requirement
- Fast Switching
- Low On-Resistance

Product Summary

BVDSS	RDSON	ID
40V	4.8mΩ	80A

Applications

- LED POWER CONTROLLER
- DC-DC & DC-AC CONVERTERS
- HIGH CURRENT, HIGH SPEED SWITCHING
- SOLENOID AND RELAY DRIVERS
- MOTOR CONTROL, AUDIO AMPLIFIERS

TO-220/263/262 Pin Configuration**Absolute Maximum Ratings**

Symbol	Parameter	Value	Units
V_{DS}	Drain-Source Voltage	40	V
V_{GS}	Gate-Source Voltage	± 20	V
$I_D @ T_C = 25^\circ C$	Continuous Drain Current ¹	80	A
$I_D @ T_C = 100^\circ C$	Continuous Drain Current ¹	50	A
I_{DM}	Pulsed Drain Current ²	250	A
EAS	Single Pulse Avalanche Energy ³	360	mJ
I_{AS}	Avalanche Current	80	A
$P_D @ T_C = 25^\circ C$	Total Power Dissipation	115	W
T_{STG}	Storage Temperature Range	-55 to 175	°C
T_J	Operating Junction Temperature Range	-55 to 175	°C

Thermal Data

Symbol	Parameter	Value	Unit
$R_{\theta JA}$	Thermal Resistance Junction-ambient ¹	62	°C/W
$R_{\theta JC}$	Thermal Resistance Junction-case	1.3	°C/W

N-Channel Enhancement Mode Field Effect Transistor

Electrical Characteristics ($T_J=25$ °C, unless otherwise noted)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	40	---	---	V
$\Delta BV_{DSS}/\Delta T_J$	BVDSS Temperature Coefficient	Reference to 25°C, $I_D=1mA$	---	0.035	---	V/°C
$R_{DS(ON)}$	Static Drain-Source On-Resistance ²	$V_{GS}=10V, I_D=80A$	---	3.5	4.8	mΩ
		$V_{GS}=4.5V, I_D=80A$	---	5.0	8	
$V_{GS(th)}$	Gate Threshold Voltage	$V_{GS}=V_{DS}, I_D=250\mu A$	1	---	3	V
I_{DSS}	Drain-Source Leakage Current	$V_{DS}=40V, V_{GS}=0V$	---	---	1	uA
		$V_{DS}=40V, V_{GS}=0V, T_J=125$ °C	---	---	100	
I_{GSS}	Gate-Source Leakage Current	$V_{GS}=\pm 20V, V_{DS}=0V$	---	---	± 100	nA
g_{fs}	Forward Transconductance	$V_{DS}=10V, I_D=15A$	---	30	---	S
R_g	Gate Resistance	$V_{DS}=0V, V_{GS}=0V, f=1MHz$	---	1.5	---	Ω
Q_g	Total Gate Charge	$I_D=80A$	---	56	---	nC
Q_{gs}	Gate-Source Charge	$V_{DS}=32V$	---	20	---	
Q_{gd}	Gate-Drain Charge	$V_{GS}=5V$	---	15	---	
$T_{d(on)}$	Turn-On Delay Time	$V_{DS}=20V$	---	35	---	ns
T_r	Rise Time	$I_D=80A$	---	82	---	
$T_{d(off)}$	Turn-Off Delay Time	$R_G=3.3\Omega$	---	85	---	
T_f	Fall Time	$V_{GS}=10V$	---	30	---	
C_{iss}	Input Capacitance	$V_{DS}=25V, V_{GS}=0V, f=1MHz$	---	3850	---	pF
C_{oss}	Output Capacitance		---	815	---	
C_{rss}	Reverse Transfer Capacitance		---	326	---	

Diode Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I_s	Continuous Source Current ¹	$V_G=V_D=0V$, Force Current	---	---	80	A
I_{SM}	Pulsed Source Current ²		---	---	250	A
V_{SD}	Diode Forward Voltage ²	$V_{GS}=0V, I_s=80A, T_J=25$ °C	---	---	1.3	V

Note :

- 1.The data tested by surface mounted on a 1 inch² FR-4 board with 2OZ copper.
- 2.The data tested by pulsed , pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$
- 3.The EAS data shows Max. rating . The test condition is $V_{DD}=25V, V_{GS}=10V, L=0.5mH, I_{AS}=40A$

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