

### General Description

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

### Features

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

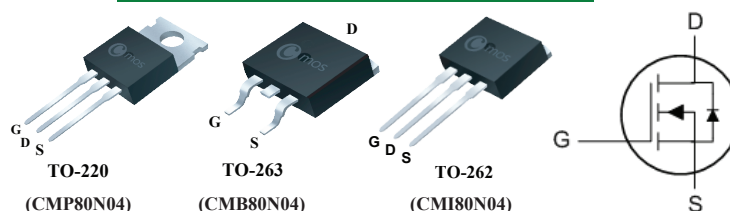
### Product Summary

BVDSS	RDS(on)	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	$\pm 20$	V
$I_D@T_C=25^\circ\text{C}$	Continuous Drain Current <sup>1</sup>	80	A
$I_D@T_C=100^\circ\text{C}$	Continuous Drain Current <sup>1</sup>	50	A
$I_{DM}$	Pulsed Drain Current <sup>2</sup>	250	A
EAS	Single Pulse Avalanche Energy <sup>3</sup>	360	mJ
$I_{AS}$	Avalanche Current	80	A
$P_D@T_C=25^\circ\text{C}$	Total Power Dissipation	115	W
$T_{STG}$	Storage Temperature Range	-55 to 175	$^\circ\text{C}$
$T_J$	Operating Junction Temperature Range	-55 to 175	$^\circ\text{C}$

### Thermal Data

Symbol	Parameter	Value	Unit
$R_{\theta JA}$	Thermal Resistance Junction-ambient <sup>1</sup>	62	$^\circ\text{C/W}$
$R_{\theta JC}$	Thermal Resistance Junction-case	1.3	$^\circ\text{C/W}$

## N-Channel Enhancement Mode Field Effect Transistor

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

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
$BV_{DSS}$	Drain-Source Breakdown Voltage	$V_{GS}=0V$ , $I_D=250\mu A$	40	---	---	V
$\Delta BV_{DSS}/\Delta T_J$	BVDSS Temperature Coefficient	Reference to $25^\circ\text{C}$ , $I_D=1mA$	---	0.035	---	V/ $^\circ\text{C}$
$R_{DS(ON)}$	Static Drain-Source On-Resistance <sup>2</sup>	$V_{GS}=10V$ , $I_D=80A$	---	3.5	4.8	$m\Omega$
		$V_{GS}=4.5V$ , $I_D=80A$	---	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	$\mu A$
		$V_{DS}=40V$ , $V_{GS}=0V$ , $T_J=125^\circ\text{C}$	---	---	100	
$I_{GSS}$	Gate-Source Leakage Current	$V_{GS}=\pm 20V$ , $V_{DS}=0V$	---	---	$\pm 100$	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	---	$\Omega$
$Q_g$	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 <sup>1</sup>	$V_G=V_D=0V$ , Force Current	---	---	80	A
$I_{SM}$	Pulsed Source Current <sup>2</sup>		---	---	250	A
$V_{SD}$	Diode Forward Voltage <sup>2</sup>	$V_{GS}=0V$ , $I_S=80A$ , $T_J=25^\circ\text{C}$	---	---	1.3	V

Note :

1.The data tested by surface mounted on a 1 inch<sup>2</sup> FR-4 board with 20Z 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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