

### General Description

The 100N04 is N-ch MOSFETs with extreme high cell density, which provide excellent R<sub>DS(on)</sub> and gate charge for most of the synchronous buck converter applications.

### Features

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

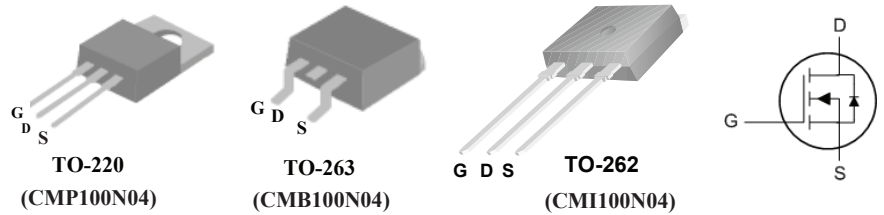
### Product Summary

BVDSS	R <sub>DS(on)</sub>	I <sub>D</sub>
40V	< 3.8mΩ	100A

### Applications

- HIGH CURRENT, HIGH SPEED SWITCHING
- DC-DC & DC-AC CONVERTERS
- MOTOR CONTROL, AUDIO AMPLIFIERS
- SOLENOID AND RELAY DRIVERS
- AUTOMOTIVE ENVIRONMENT

### TO220 / TO263 / TO-262 Pin Configuration



### Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
V <sub>DS</sub>	Drain-Source Voltage	40	V
V <sub>GS</sub>	Gate-Source Voltage	±20	V
I <sub>D</sub> @T <sub>C</sub> =25°C	Continuous Drain Current <sup>1</sup>	100	A
I <sub>D</sub> @T <sub>C</sub> =100°C	Continuous Drain Current <sup>1</sup>	56	A
I <sub>DM</sub>	Pulsed Drain Current <sup>2</sup>	320	A
EAS	Single Pulse Avalanche Energy <sup>3</sup>	480	mJ
I <sub>AS</sub>	Avalanche Current	56	A
P <sub>D</sub>	Total Power Dissipation	260	W
T <sub>STG</sub>	Storage Temperature Range	-65 to 175	°C
T <sub>J</sub>	Operating Junction Temperature Range	-65 to 175	°C

### Thermal Data

Symbol	Parameter	Typ.	Max.	Unit
R <sub>θJA</sub>	Thermal Resistance Junction-ambient <sup>1</sup>	---	62.5	°C/W
R <sub>θJC</sub>	Thermal Resistance Junction-case	---	0.7	°C/W

### Electrical Characteristics (T<sub>J</sub>=25 °C, unless otherwise noted)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV <sub>DSS</sub>	Drain-Source Breakdown Voltage	V <sub>GS</sub> =0V, I <sub>D</sub> =250uA	40	---	---	V
ΔBV <sub>DSS</sub> /ΔT <sub>J</sub>	BVDSS Temperature Coefficient	Reference to 25 °C, I <sub>D</sub> =1mA	---	0.035	---	V/°C
R <sub>DS(ON)</sub>	Static Drain-Source On-Resistance <sup>2</sup>	V <sub>GS</sub> =10V, I <sub>D</sub> =40A	---	3.4	3.8	mΩ
		V <sub>GS</sub> =4.5V, I <sub>D</sub> =40A	---	4.2	5.2	
V <sub>GS(th)</sub>	Gate Threshold Voltage	V <sub>GS</sub> =V <sub>DS</sub> , I <sub>D</sub> =250uA	1	---	3	V
I <sub>DSS</sub>	Drain-Source Leakage Current	V <sub>DS</sub> =30V, V <sub>GS</sub> =0V	---	---	1	uA
		V <sub>DS</sub> =30V, V <sub>GS</sub> =0V, TC=125°C	---	---	10	
I <sub>GSS</sub>	Gate-Source Leakage Current	V <sub>GS</sub> =±20V, V <sub>DS</sub> =0V	---	---	±100	nA
g <sub>fs</sub>	Forward Transconductance	V <sub>DS</sub> >I <sub>D(on)</sub> × R <sub>DS(on)max</sub> , I <sub>D</sub> =15A	---	50	---	S
R <sub>g</sub>	Gate Resistance	V <sub>DS</sub> =0V, V <sub>GS</sub> =0V, f=1MHz	---	---	4.7	Ω
Q <sub>g</sub>	Total Gate Charge	I <sub>D</sub> =100A	---	84	114	nC
Q <sub>gs</sub>	Gate-Source Charge	V <sub>DD</sub> =24V	---	21	---	
Q <sub>gd</sub>	Gate-Drain Charge	V <sub>GS</sub> =4.5V	---	36	---	
T <sub>d(on)</sub>	Turn-On Delay Time	V <sub>DD</sub> =15V	---	40	---	ns
T <sub>r</sub>	Rise Time	I <sub>D</sub> =40A	---	112	---	
T <sub>d(off)</sub>	Turn-Off Delay Time	R <sub>G</sub> =4.7	---	144	---	
T <sub>f</sub>	Fall Time	V <sub>GS</sub> =4.5V	---	85	---	
C <sub>iss</sub>	Input Capacitance	V <sub>DS</sub> =25V, V <sub>GS</sub> =0V, f=1MHz	---	---	5600	pF
C <sub>oss</sub>	Output Capacitance		---	---	1300	
C <sub>rss</sub>	Reverse Transfer Capacitance		---	---	490	

### Diode Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I <sub>S</sub>	Continuous Source Current <sup>1</sup>	V <sub>G</sub> =V <sub>D</sub> =0V, Force Current	---	---	100	A
I <sub>SM</sub>	Pulsed Source Current <sup>2</sup>		---	---	320	A
V <sub>SD</sub>	Diode Forward Voltage <sup>2</sup>	V <sub>GS</sub> =0V, I <sub>S</sub> =100A, T <sub>J</sub> =25°C	---	---	1.5	V

Note :

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

2.The data tested by pulsed, pulse width ≤ 300us, duty cycle ≤ 2%

3.The EAS data shows Max. rating. The test condition is V<sub>DD</sub>=25V, V<sub>GS</sub>=10V, L=0.1mH, I<sub>AS</sub>=56A