

## N-Ch 30V Fast Switching MOSFETs

### General Description

The 04N03 is the highest performance trench 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.

The 04N03L meet the RoHS and Green Product requirement, 100% EAS guaranteed with full function reliability approved.

### Features

- Advanced high cell density Trench technology
- Super Low Gate Charge
- Excellent CdV/dt effect decline
- 100% EAS Guaranteed
- Green Device Available

### Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
V <sub>DS</sub>	Drain-Source Voltage	30	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>	80	A
I <sub>D</sub> @T <sub>C</sub> =100°C	Continuous Drain Current <sup>1</sup>	55	A
I <sub>DM</sub>	Pulsed Drain Current <sup>2</sup>	180	A
EAS	Single Pulse Avalanche Energy <sup>3</sup>	290	mJ
I <sub>AS</sub>	Avalanche Current	48	A
P <sub>D</sub> @T <sub>C</sub> =25°C	Total Power Dissipation	70	W
T <sub>STG</sub>	Storage Temperature Range	-55 to 175	°C
T <sub>J</sub>	Operating Junction Temperature Range	-55 to 175	°C

### Thermal Data

Symbol	Parameter	Typ.	Max.	Unit
R <sub>θJA</sub>	Thermal Resistance Junction-ambient <sup>1</sup>	---	62	°C/W
R <sub>θJC</sub>	Thermal Resistance Junction -Case <sup>1</sup>	---	2.8	°C/W

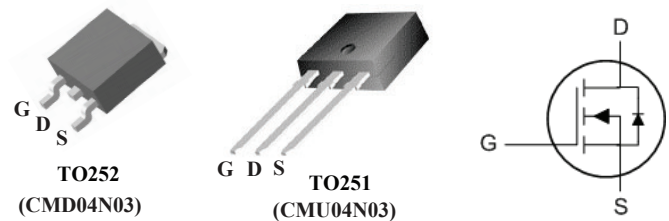
### Product Summary

BVDSS	R <sub>DS(on)</sub>	ID
30V	4.1mΩ	80A

### Applications

- High Frequency Point-of-Load Synchronous Buck Converter for MB/NB/UMPC/VGA
- Networking DC-DC Power System
- Load Switch

### TO252 / TO251 Pin Configuration



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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> =1000uA	30	---	---	V
ΔBV <sub>DSS</sub> /ΔT <sub>J</sub>	BVDSS Temperature Coefficient	Reference to 25 °C, I <sub>D</sub> =1mA	---	0.0964	---	V/°C
R <sub>DS(ON)</sub>	Static Drain-Source On-Resistance <sup>2</sup>	V <sub>GS</sub> =10V, I <sub>D</sub> =55A	---	3.5	4.1	mΩ
		V <sub>GS</sub> =4.5V, I <sub>D</sub> =55A	---	5.1	6.4	
V <sub>GS(th)</sub>	Gate Threshold Voltage	V <sub>GS</sub> =V <sub>DS</sub> , I <sub>D</sub> =60uA	1	---	3	V
ΔV <sub>GS(th)</sub>	V <sub>GS(th)</sub> Temperature Coefficient		---	-6.16	---	mV/°C
I <sub>DSS</sub>	Drain-Source Leakage Current	V <sub>DS</sub> =25V, V <sub>GS</sub> =0V, T <sub>J</sub> =25°C	---	---	1	uA
		V <sub>DS</sub> =25V, V <sub>GS</sub> =0V, T <sub>J</sub> =125°C	---	---	100	
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> =5V, I <sub>D</sub> =30A	---	22	---	S
R <sub>g</sub>	Gate Resistance	V <sub>DS</sub> =0V, V <sub>GS</sub> =0V, f=1MHz	---	1.1	---	Ω
Q <sub>g</sub>	Total Gate Charge	V <sub>DS</sub> =15V, V <sub>GS</sub> =4.5V, I <sub>D</sub> =40A	---	24	---	nC
Q <sub>gs</sub>	Gate-Source Charge		---	10	---	
Q <sub>gd</sub>	Gate-Drain Charge		---	7.2	---	
T <sub>d(on)</sub>	Turn-On Delay Time	V <sub>DD</sub> =15V, V <sub>GS</sub> =10V, R <sub>G</sub> =3.3Ω I <sub>D</sub> =5A	---	9	---	ns
T <sub>r</sub>	Rise Time		---	22	---	
T <sub>d(off)</sub>	Turn-Off Delay Time		---	28	---	
T <sub>f</sub>	Fall Time		---	18	---	
C <sub>iss</sub>	Input Capacitance	V <sub>DS</sub> =15V, V <sub>GS</sub> =0V, f=1MHz	---	2510	---	pF
C <sub>oss</sub>	Output Capacitance		---	322	---	
C <sub>rss</sub>	Reverse Transfer Capacitance		---	245	---	

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	---	---	80	A
I <sub>SM</sub>	Pulsed Source Current <sup>2</sup>		---	---	180	A
V <sub>SD</sub>	Diode Forward Voltage <sup>2</sup>	V <sub>GS</sub> =0V, I <sub>S</sub> =1A, T <sub>J</sub> =25°C	---	---	1.2	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 ≤ 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>=48A