

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_{DS(on)} 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 _{DS}	Drain-Source Voltage	30	V
V _{GS}	Gate-Source Voltage	±20	V
I _D @T _C =25°C	Continuous Drain Current ¹	80	A
I _D @T _C =100°C	Continuous Drain Current ¹	55	A
I _{DM}	Pulsed Drain Current ²	180	A
EAS	Single Pulse Avalanche Energy ³	290	mJ
I _{AS}	Avalanche Current	48	A
P _D @T _C =25°C	Total Power Dissipation	70	W
T _{STG}	Storage Temperature Range	-55 to 175	°C
T _J	Operating Junction Temperature Range	-55 to 175	°C

Thermal Data

Symbol	Parameter	Typ.	Max.	Unit
R _{θJA}	Thermal Resistance Junction-ambient ¹	---	62	°C/W
R _{θJC}	Thermal Resistance Junction -Case ¹	---	2.8	°C/W

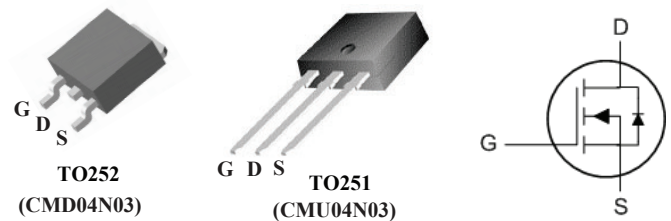
Product Summary

BVDSS	R _{DS(on)}	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_J=25 °C, unless otherwise noted)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =1000uA	30	---	---	V
ΔBV _{DSS} /ΔT _J	BVDSS Temperature Coefficient	Reference to 25 °C, I _D =1mA	---	0.0964	---	V/°C
R _{DS(ON)}	Static Drain-Source On-Resistance ²	V _{GS} =10V, I _D =55A	---	3.5	4.1	mΩ
		V _{GS} =4.5V, I _D =55A	---	5.1	6.4	
V _{GS(th)}	Gate Threshold Voltage	V _{GS} =V _{DS} , I _D =60uA	1	---	3	V
ΔV _{GS(th)}	V _{GS(th)} Temperature Coefficient		---	-6.16	---	mV/°C
I _{DSS}	Drain-Source Leakage Current	V _{DS} =25V, V _{GS} =0V, T _J =25°C	---	---	1	uA
		V _{DS} =25V, V _{GS} =0V, T _J =125°C	---	---	100	
I _{GSS}	Gate-Source Leakage Current	V _{GS} =±20V, V _{DS} =0V	---	---	±100	nA
g _{fs}	Forward Transconductance	V _{DS} =5V, I _D =30A	---	22	---	S
R _g	Gate Resistance	V _{DS} =0V, V _{GS} =0V, f=1MHz	---	1.1	---	Ω
Q _g	Total Gate Charge	V _{DS} =15V, V _{GS} =4.5V, I _D =40A	---	24	---	nC
Q _{gs}	Gate-Source Charge		---	10	---	
Q _{gd}	Gate-Drain Charge		---	7.2	---	
T _{d(on)}	Turn-On Delay Time	V _{DD} =15V, V _{GS} =10V, R _G =3.3Ω I _D =5A	---	9	---	ns
T _r	Rise Time		---	22	---	
T _{d(off)}	Turn-Off Delay Time		---	28	---	
T _f	Fall Time		---	18	---	
C _{iss}	Input Capacitance	V _{DS} =15V, V _{GS} =0V, f=1MHz	---	2510	---	pF
C _{oss}	Output Capacitance		---	322	---	
C _{rss}	Reverse Transfer Capacitance		---	245	---	

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		---	---	180	A
V _{SD}	Diode Forward Voltage ²	V _{GS} =0V, I _S =1A, T _J =25°C	---	---	1.2	V

Note :

- 1.The data tested by surface mounted on a 1 inch²FR-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_{DD}=25V,V_{GS}=10V,L=0.1mH,I_{AS}=48A