

General Description

The 04N03 is the highest performance trench N-ch MOSFETs with extreme high cell density , which provide excellent RDSON 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
$I_D @ T_C = 25^\circ C$	Continuous Drain Current ¹	80	A
$I_D @ T_C = 100^\circ C$	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
$P_D @ T_C = 25^\circ C$	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
$R_{\theta JA}$	Thermal Resistance Junction-ambient ¹	---	62	°C/W
$R_{\theta JC}$	Thermal Resistance Junction -Case ¹	---	2.8	°C/W

Product Summery

BVDSS	RDSON	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

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	30	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	55	A
I_{DM}	Pulsed Drain Current ²	180	A
EAS	Single Pulse Avalanche Energy ³	290	mJ
I_{AS}	Avalanche Current	48	A
$P_D @ T_C = 25^\circ C$	Total Power Dissipation	70	W
T_{STG}	Storage Temperature Range	-55 to 175	°C
T_J	Operating Junction Temperature Range	-55 to 175	°C

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

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{\text{GS}}=0\text{V}$, $I_D=1000\mu\text{A}$	30	---	---	V
$\Delta \text{BV}_{\text{DSS}}/\Delta T_J$	BVDSS Temperature Coefficient	Reference to 25°C , $I_D=1\text{mA}$	---	0.0964	---	$\text{V}/^\circ\text{C}$
$R_{\text{DS}(\text{ON})}$	Static Drain-Source On-Resistance ²	$V_{\text{GS}}=10\text{V}$, $I_D=55\text{A}$	---	3.5	4.1	$\text{m}\Omega$
		$V_{\text{GS}}=4.5\text{V}$, $I_D=55\text{A}$	---	5.1	6.4	
$V_{\text{GS}(\text{th})}$	Gate Threshold Voltage	$V_{\text{GS}}=V_{\text{DS}}$, $I_D=60\mu\text{A}$	1	---	3	V
$\Delta V_{\text{GS}(\text{th})}$	$V_{\text{GS}(\text{th})}$ Temperature Coefficient		---	-6.16	---	$\text{mV}/^\circ\text{C}$
I_{DSS}	Drain-Source Leakage Current	$V_{\text{DS}}=25\text{V}$, $V_{\text{GS}}=0\text{V}$, $T_J=25^\circ\text{C}$	---	---	1	μA
		$V_{\text{DS}}=25\text{V}$, $V_{\text{GS}}=0\text{V}$, $T_J=125^\circ\text{C}$	---	---	100	
I_{GSS}	Gate-Source Leakage Current	$V_{\text{GS}}=\pm 20\text{V}$, $V_{\text{DS}}=0\text{V}$	---	---	± 100	nA
g_{fs}	Forward Transconductance	$V_{\text{DS}}=5\text{V}$, $I_D=30\text{A}$	---	22	---	S
R_g	Gate Resistance	$V_{\text{DS}}=0\text{V}$, $V_{\text{GS}}=0\text{V}$, $f=1\text{MHz}$	---	1.1	---	Ω
Q_g	Total Gate Charge	$V_{\text{DS}}=15\text{V}$, $V_{\text{GS}}=4.5\text{V}$, $I_D=40\text{A}$	---	24	---	nC
Q_{gs}	Gate-Source Charge		---	10	---	
Q_{gd}	Gate-Drain Charge		---	7.2	---	
$T_{\text{d}(\text{on})}$	Turn-On Delay Time	$V_{\text{DD}}=15\text{V}$, $V_{\text{GS}}=10\text{V}$, $R_G=3.3\Omega$	---	9	---	ns
T_r	Rise Time		---	22	---	
$T_{\text{d}(\text{off})}$	Turn-Off Delay Time		---	28	---	
T_f	Fall Time		---	18	---	
C_{iss}	Input Capacitance	$V_{\text{DS}}=15\text{V}$, $V_{\text{GS}}=0\text{V}$, $f=1\text{MHz}$	---	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	$V_G=V_D=0\text{V}$, Force Current	---	---	80	A
I_{SM}	Pulsed Source Current ²		---	---	180	A
V_{SD}	Diode Forward Voltage ²	$V_{\text{GS}}=0\text{V}$, $I_S=1\text{A}$, $T_J=25^\circ\text{C}$	---	---	1.2	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 $\leq 300\mu\text{s}$, duty cycle $\leq 2\%$
- 3.The EAS data shows Max. rating . The test condition is $V_{\text{DD}}=25\text{V}$, $V_{\text{GS}}=10\text{V}$, $L=0.1\text{mH}$, $I_{\text{AS}}=48\text{A}$