CMA16N50

500V N-Channel MOSFET

General Description

These N-Channel enhancement mode power field effect transistors are produced using advanced technology which has been especially tailored to minimize on-state resistance, provide superior switching performance,and withstand high energy pulse in the avalanche and commutation mode. These devices are well suited for high efficient switched mode power supplies and active power factor correction.

Product Summary

BVDSS	RDSON	ID
500V	0.37Ω	16A

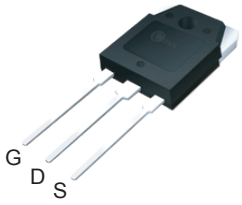
Applications

- DC-DC converters
- Switching regulators
- UPS (Uninterruptible Power Supply)

Features

- 100% avalanche tested
- Fast Switching
- Improved dv/dt capability

TO-3P Pin Configuration



TO-3P
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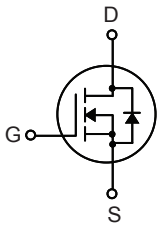

Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	500	V
V_{GS}	Gate-Source Voltage	±30	V
I_D@T_C=25℃	Continuous Drain Current	16	A
I_D@T_C=100℃	Continuous Drain Current	9.6	A
I_{DM}	Pulsed Drain Current[1]	64	A
EAS	Single Pulse Avalanche Energy[2]	960	mJ
P_D@T_C=25℃	Total Power Dissipation	200	W
T_{STG}	Storage Temperature Range	-55 to 150	℃
T_J	Operating Junction Temperature Range	-55 to 150	℃

Thermal Data

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction-ambient	---	40	℃/W
$R_{\theta JC}$	Thermal Resistance Junction-case	---	0.6	℃/W

Electrical Characteristics (T_J=25℃ , unless otherwise noted)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V , I_D=250uA	500	---	---	V
$\triangle BV_{DSS}/\triangle T_J$	BVDSS Temperature Coefficient	Reference to 25℃ , I_D=250uA	---	0.6	---	V/℃
$R_{DS(ON)}$	Static Drain-Source On-Resistance	V_{GS}=10V , I_D=8A	---	---	0.37	Ω
$V_{GS(th)}$	Gate Threshold Voltage	V_{GS}=V_{DS} , I_D =250uA	2	---	4	V
I_{DSS}	Drain-Source Leakage Current	V_{DS}=500V, V_{GS}=0V	---	---	1	uA
		V_{DS}=400V , V_{GS}=0V , TC=125℃	---	---	10	
I_{GSS}	Gate-Source Leakage Current	V_{GS} = ±30V , V_{DS}=0V	---	---	±100	nA
gfs	Forward Transconductance [3]	V_{DS}=20V , I_D=8A	---	15	---	S
Q_g	Total Gate Charge	I_D=16A	---	45	---	nC
Q_{gs}	Gate-Source Charge	V_{DS} =400V	---	12	---	
Q_{gd}	Gate-Drain Charge	V_{GS} =10V (Note 3, 4)	---	20	---	
$T_{d(on)}$	Turn-On Delay Time	V_{DS} =250V	---	50	---	ns
T_r	Rise Time	I_D=16A	---	170	---	
$T_{d(off)}$	Turn-Off Delay Time	R_G=25Ω	---	95	---	
T_f	Fall Time	(Note 3, 4)	---	80	---	
C_{iss}	Input Capacitance	V_{DS}=25V , V_{GS}=0V , f=1MHz	---	4200	---	pF
C_{oss}	Output Capacitance		---	350	---	
C_{rss}	Reverse Transfer Capacitance		---	35	---	

Diode Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I_S	Continuous Source Current	V_G=V_D=0V , Force Current	---	---	16	A
I_{SM}	Pulsed Source Current		---	---	64	A
V_{SD}	Diode Forward Voltage	V_{GS}=0V , I_S=16A , T_J=25℃	---	---	1.4	V

Note :
1.Repetitive Rating: Pulse width limited by maximum junction temperature
2.L = 7.5mH, IAS = 16A, VDD = 50V, RG = 25Ω, Starting TJ = 25℃
3.Pulse Test: Pulse width≤300μs, Duty Cycle≤2%
4.Essentially Independent of Operating Temperature Typical Characteristics