CMI8972

20V N-Channel MOSFET

General Description

The 8972 is N-ch MOSFETs with extreme high cell density , which provide excellent RDSON and gate charge for most of the synchronous buck converter applications.

Product Summary

BVDSS	RDSON	ID
20V	4mΩ	80A

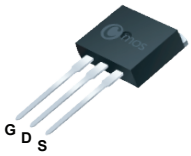
Applications

- DC/DC converter
- Motor drives
- Power Management in Note book

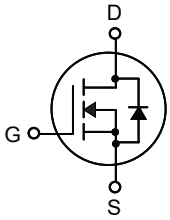
Features

- Simple Drive Requirement
- Reliable and Rugged
- Low On-Resistance

TO-262 Pin Configuration



TO-262
(CMI8972)



Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	20	V
V_{GS}	Gate-Source Voltage	±20	V
I_D@T_C=25℃	Continuous Drain Current	80	A
I_{DM}	Pulsed Drain Current[1]	320	A
EAS	Single Pulse Avalanche Energy[2]	45	mJ
P_D	Total Power Dissipation	100	W
T_{STG}	Storage Temperature Range	-55 to 150	℃
T_J	Operating Junction Temperature Range	150	℃

Thermal Data

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction-ambient	---	2.5	℃/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	20	---	---	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance	V_{GS}=10V , I_D=30A	2.8	3.5	4	mΩ
		V_{GS}=4.5V , I_D=15A	---	---	6	
$V_{GS(th)}$	Gate Threshold Voltage	V_{GS}=V_{DS} , I_D =250uA	0.75	0.9	1.5	V
I_{DSS}	Drain-Source Leakage Current	V_{DS}=16V , V_{GS}=0V	---	---	1	uA
		V_{DS}=16V , V_{GS}=0V ,TC=85℃	---	---	30	
I_{GSS}	Gate-Source Leakage Current	V_{GS}= ±20V , V_{DS}=0V	---	---	±100	nA
gfs	Forward Transconductance	V_{DS}=10V , I_D=20A	---	35	---	S
R_g	Gate Resistance	V_{DS}=0V , V_{GS}=0V , f=1MHz	---	3	---	Ω
Q_g	Total Gate Charge	I_D=50A V_{DS}=10V V_{GS}=4.5V	---	32	---	nC
Q_{gs}	Gate-Source Charge		---	15	---	
Q_{gd}	Gate-Drain Charge		---	7	---	
$T_{d(on)}$	Turn-On Delay Time	V_{DD}=10V I_D=50A R_G=1Ω V_{GEN}=10V	---	20	---	ns
T_r	Rise Time		---	15	---	
$T_{d(off)}$	Turn-Off Delay Time		---	45	---	
T_f	Fall Time		---	12	---	
C_{iss}	Input Capacitance	V_{DS}=15V , V_{GS}=0V , f=1MHz	---	2500	---	pF
C_{oss}	Output Capacitance		---	800	---	
C_{rss}	Reverse Transfer Capacitance		---	120	---	

Diode Characteristics

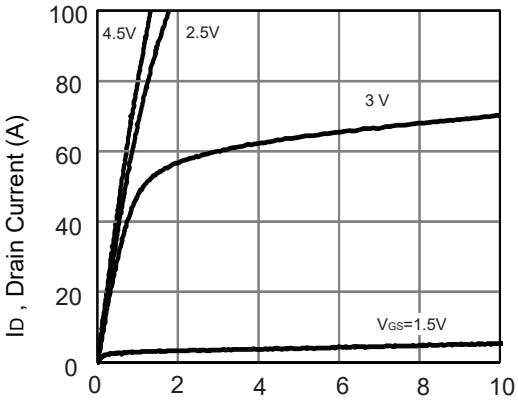
Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I_S	Continuous Source Current	V_G=V_D=0V , Force Current	---	---	80	A
I_{SM}	Pulsed Source Current[1]		---	---	320	A
V_{SD}	Diode Forward Voltage[1]	V_{GS}=0V , I_{SD}=20A, T_J=25℃	---	---	1.1	V

Note :

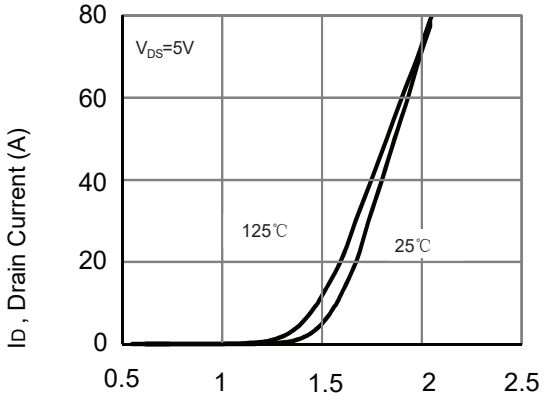
1.The data tested by pulsed , pulse width≤300us , duty cycle≤2%

2.The test condition is V_{DD}=10V,V_{GS}=10V,L=0.1mH,I_{AS}=30A

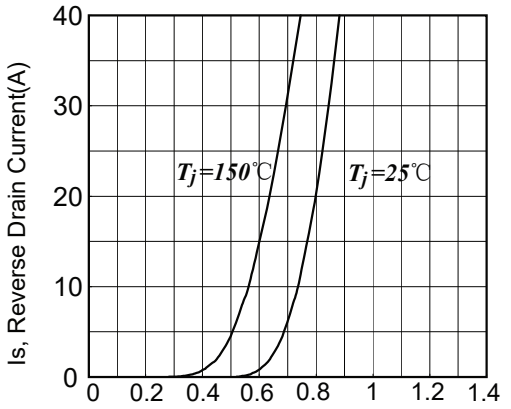
Typical Characteristics



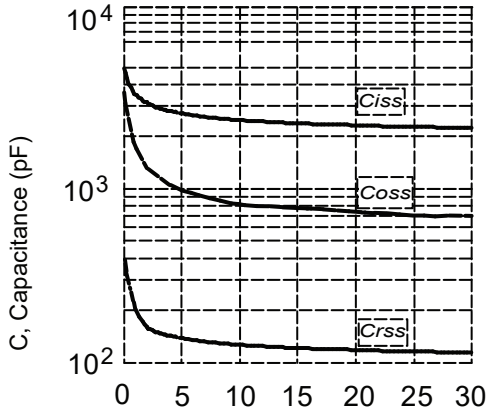
Output Characteristics



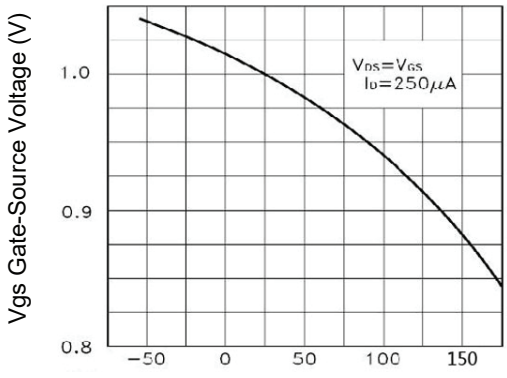
Transfer Characteristics



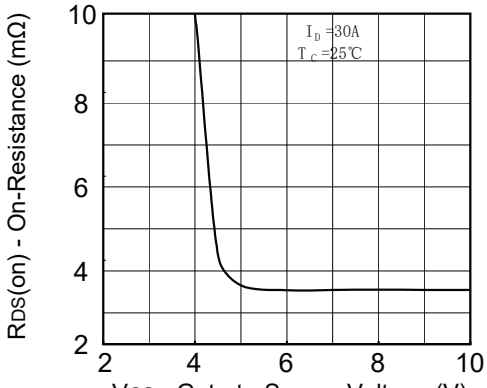
Forward Characteristic of Reverse Diode



Capacitance Characteristics



Gate Thereshold Voltage vs Temperature



On-Resistance vs. Gate-to-Source Voltage