

General Description

The CMD609 uses advanced trench technology MOSFETs to provide excellent RDS(ON) and low gate charge.

The complementary MOSFETs may be used in H-bridge, Inverters and other applications.

Features

- 40V 12A RDS(ON)≤21mΩ @ VGS=10V
RDS(ON)≤25mΩ @ VGS=4.5V
- -40V -12A RDS(ON)≤32mΩ @ VGS=10V
RDS(ON)≤40mΩ @ VGS=4.5V
- High Density Cell Design For Ultra Low On Resistance

Absolute Maximum Ratings

Symbol	Parameter	Max n-channel	Max p-channel	Units
V _{DS}	Drain-Source Voltage	40	-40	V
V _{GS}	Gate-Source Voltage	±20	±20	V
I _D @T _C =25°C	Continuous Drain Current	12	-12	A
I _{DM}	Pulsed Drain Current	36	-36	A
E _{AR}	Repetitive Avalanche Energy	9.8	20	mJ
P _D	Power Dissipation (T _C = 25°C)	27	30	W
T _{STG}	Storage Temperature Range	-55 to 175	-55 to 175	°C
T _J	Operating Junction Temperature Range	-55 to 175	-55 to 175	°C

Thermal Characteristics: n-channel

Symbol	Parameter	Typ.	Max.	Unit
R _{θJA}	Maximum Junction-to-Ambient	---	60	°C/W
R _{θJC}	Maximum Junction-to-Case	---	5.5	°C/W

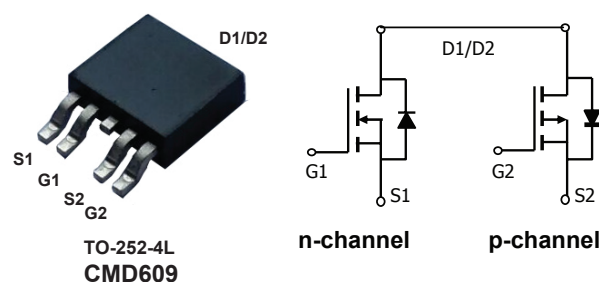
Product Summary

	BVDSS	RDS(ON)	ID
N-Channel	40V	21mΩ	12A
P-Channel	-40V	32mΩ	-12A

Applications

- Power Management
- Load Switch
- DC/DC Converter

TO-252-4L Pin Configuration



N- and P-Channel Enhancement Mode MOSFET

Thermal Characteristics: p-channel

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Maximum Junction-to-Ambient	---	60	$^{\circ}\text{C}/\text{W}$
$R_{\theta JC}$	Maximum Junction-to-Case	---	5	$^{\circ}\text{C}/\text{W}$

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

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0\text{V}$, $I_D=250\mu\text{A}$	40	---	---	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance	$V_{GS}=10\text{V}$, $I_D=12\text{A}$	---	---	21	m Ω
		$V_{GS}=4.5\text{V}$, $I_D=8\text{A}$	---	---	25	
$V_{GS(th)}$	Gate Threshold Voltage	$V_{GS}=V_{DS}$, $I_D=250\mu\text{A}$	1	---	2.5	V
I_{DSS}	Drain-Source Leakage Current	$V_{DS}=40\text{V}$, $V_{GS}=0\text{V}$	---	---	1	μA
I_{GSS}	Gate-Source Leakage Current	$V_{GS}=\pm 20\text{V}$, $V_{DS}=0\text{V}$	---	---	± 100	nA
g_{fs}	Forward Transconductance	$V_{DS}=5\text{V}$, $I_D=12\text{A}$	---	17	---	S
R_g	Gate Resistance	$V_{DS}=0\text{V}$, $V_{GS}=0\text{V}$, $f=1\text{MHz}$	---	3	---	Ω
Q_g	Total Gate Charge	$V_{DS}=20\text{V}$, $V_{GS}=4.5\text{V}$, $I_D=12\text{A}$	---	18	---	nC
Q_{gs}	Gate-Source Charge		---	3	---	
Q_{gd}	Gate-Drain Charge		---	5	---	
$T_{d(on)}$	Turn-On Delay Time	$V_{DS}=20\text{V}$, $V_{GS}=10\text{V}$, $R_L=1.4\Omega$ $R_{GEN}=3\Omega$,	---	6.5	---	ns
T_r	Rise Time		---	4	---	
$T_{d(off)}$	Turn-Off Delay Time		---	16	---	
T_f	Fall Time		---	6.5	---	
C_{iss}	Input Capacitance	$V_{DS}=20\text{V}$, $V_{GS}=0\text{V}$, $f=1\text{MHz}$	---	1200	---	pF
C_{oss}	Output Capacitance		---	85	---	
C_{rss}	Reverse Transfer Capacitance		---	45	---	

Diode Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I_S	Continuous Source Current	$V_G=V_D=0\text{V}$, Force Current	---	---	12	A
I_{SM}	Pulsed Source Current		---	---	36	A
t_{rr}	Body Diode Reverse Recovery Time	$I_F=12\text{A}$, $di/dt=100\text{A}/\mu\text{s}$	---	18	---	ns
Q_{rr}	Body Diode Reverse Recovery Charge		---	10	---	nC
V_{SD}	Diode Forward Voltage	$V_{GS}=0\text{V}$, $I_S=1\text{A}$	---	---	1.2	V

N- and P-Channel Enhancement Mode MOSFET
P Channel 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 =-250μA	-40	---	---	V
R _{DS(ON)}	Static Drain-Source On-Resistance	V _{GS} =-10V , I _D =-12A	---	---	32	mΩ
		V _{GS} =-4.5V , I _D =-8A	---	---	40	
V _{GS(th)}	Gate Threshold Voltage	V _{GS} =V _{DS} , I _D =-250μA	-1	---	-2	V
I _{DSS}	Drain-Source Leakage Current	V _{DS} =-40V , V _{GS} =0V	---	---	-1	uA
I _{GSS}	Gate-Source Leakage Current	V _{GS} = ±20V , V _{DS} =0V	---	---	±100	nA
g _{fs}	Forward Transconductance	V _{DS} =-5V , I _D =-12A	---	18	---	S
R _g	Gate Resistance	V _{DS} =0V , V _{GS} =0V , f=1MHz	---	16	---	Ω
Q _g	Total Gate Charge (10V)	V _{DS} =-20V , V _{GS} =-10V , I _D =-12A	---	16	---	nC
Q _{gs}	Gate-Source Charge		---	4	---	
Q _{gd}	Gate-Drain Charge		---	3.5	---	
T _{d(on)}	Turn-On Delay Time	V _{DS} =-20V , V _{GS} =-10V , R _L =1.4Ω R _{GEN} =3Ω ,	---	6.5	---	ns
T _r	Rise Time		---	8.5	---	
T _{d(off)}	Turn-Off Delay Time		---	45	---	
T _f	Fall Time		---	41	---	
C _{iss}	Input Capacitance	V _{DS} =-20V , V _{GS} =0V , f=1MHz	---	1300	---	pF
C _{oss}	Output Capacitance		---	100	---	
C _{rss}	Reverse Transfer Capacitance		---	70	---	

Diode Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I _S	Continuous Source Current	V _G =V _D =0V , Force Current	---	---	-12	A
I _{SM}	Pulsed Source Current		---	---	-36	A
t _{rr}	Body Diode Reverse Recovery Time	I _F =-12A , di/dt=100A/μs	---	21	---	ns
Q _{rr}	Body Diode Reverse Recovery Charge		---	14	---	nC
V _{SD}	Diode Forward Voltage	V _{GS} =0V , I _S =-12A	---	---	1.5	V

This product has been designed and qualified for the consumer market.
Cmos assumes no liability for customers' product design or applications.
Cmos reserves the right to improve product design ,functions and reliability without notice.