

General Description

The CMSA609 uses advanced trench technology to provide excellent RDS(ON) and low gate charge.

This device is suitable for use in inverter and other applications.

Features

- 30V, 20A, RDS(ON) = 17mΩ @VGS = 10V
-30V, -18A, RDS(ON) = 42mΩ @VGS = -10V
- Surface mount package
- Extremely low on-resistance RDS(on)
- RoHS Compliant

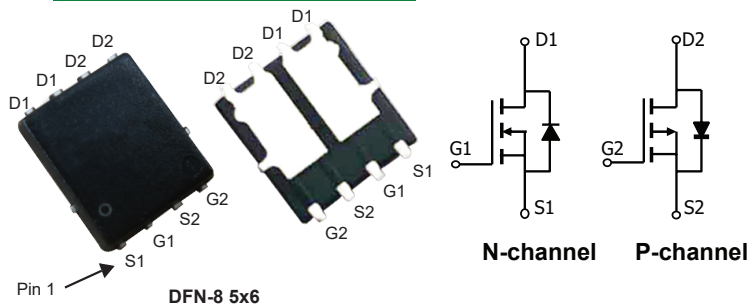
Product Summary

	BVDSS	RDS(ON)	ID
N-Channel	40V	17mΩ	20A
P-Channel	-40V	42mΩ	-18A

Applications

- Synchronous Rectification.
- High Current, High Speed Switching.
- Portable equipment application

DFN-8 5x6 Pin Configuration



Type	Package	Marking
CMSA609	DFN- 8 5*6	CMSA609

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	20	-18	A
I _D @T _C =100°C	Continuous Drain Current	16	-15	A
I _{DM}	Pulsed Drain Current	60	-54	A
P _D @T _C =25°C	Power Dissipation	25	30	W
T _{STG}	Storage Temperature Range	-55 to 150		°C
T _J	Operating Junction Temperature Range	-55 to 150		°C

Thermal Characteristics: N-channel

Symbol	Parameter	Typ.	Max.	Unit
R _{θJA}	Maximum Junction-to-Ambient (Steady-State)	---	62	°C/W
R _{θJC}	Maximum Junction-to-Case (Steady-State)	---	5	°C/W

Thermal Characteristics: P-channel

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Maximum Junction-to-Ambient (Steady-State)	---	62	$^{\circ}\text{C}/\text{W}$
$R_{\theta JC}$	Maximum Junction-to-Case (Steady-State)	---	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	$V_{GS}=10\text{V}$, $I_D=20\text{A}$	---	---	17	$\text{m}\Omega$
		$V_{GS}=4.5\text{V}$, $I_D=4.5\text{A}$	---	---	20	
$V_{GS(th)}$	Gate Threshold Voltage	$V_{GS}=V_{DS}$, $I_D = 250\mu\text{A}$	1	---	3	V
I_{DSS}	Drain-Source Leakage Current	$V_{DS}=40\text{V}$, $V_{GS}=0\text{V}$	---	---	1	μA
		$V_{DS}=40\text{V}$, $V_{GS}=0\text{V}$, $T_J=55^{\circ}\text{C}$	---	---	5	
I_{GSS}	Gate-Source Leakage Current	$V_{GS} = \pm 20\text{V}$	---	---	± 100	nA
g_{fs}	Forward Transconductance	$V_{DS}=5\text{V}$, $I_D=12\text{A}$	---	15	---	S
R_g	Gate Resistance	$V_{DS}=0\text{V}$, $V_{GS}=0\text{V}$, $f=1\text{MHz}$	---	18	---	Ω
Q_g	Total Gate Charge	$V_{DS}=32\text{V}$, $I_D=15\text{A}$ $V_{GS}=4.5\text{V}$	---	11	---	nC
Q_{gs}	Gate-Source Charge		---	2.6	---	
Q_{gd}	Gate-Drain Charge		---	5	---	
$T_{d(on)}$	Turn-On Delay Time	$V_{DD}=20\text{V}$, $V_{GS}=10\text{V}$, $R_{GEN}=3.3\Omega$ $I_D=15\text{A}$	---	3	---	ns
T_r	Rise Time		---	13	---	
$T_{d(off)}$	Turn-Off Delay Time		---	22	---	
T_f	Fall Time		---	7	---	
C_{iss}	Input Capacitance	$V_{DS}=15\text{V}$, $V_{GS}=0\text{V}$, $f=1\text{MHz}$	---	1200	---	pF
C_{oss}	Output Capacitance		---	107	---	
C_{rss}	Reverse Transfer Capacitance		---	76	---	

Diode Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I_S	Diode continuous forward current	$V_G=V_D=0\text{V}$, Force Current	---	---	20	A
$I_{S,pulse}$	Diode pulse current		---	---	60	A
V_{SD}	Diode Forward Voltage	$V_{GS}=0\text{V}$, $I_F=12\text{A}$, $T_J=25^{\circ}\text{C}$	---	---	1	V

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	---	---	42	mΩ
		V _{GS} =-4.5V, I _D =-8A	---	---	55	
V _{GS(th)}	Gate Threshold Voltage	V _{GS} =V _{DS} , I _D =-250μA	-1	---	-3	V
I _{DSS}	Drain-Source Leakage Current	V _{DS} =-40V, V _{GS} =0V	---	---	-1	μA
		V _{DS} =-40V, V _{GS} =0V, T _J =25°C	---	---	-5	
I _{GSS}	Gate-Source Leakage Current	V _{GS} =±20V, V _{DS} =0V	---	---	±100	nA
g _{fs}	Forward Transconductance	V _{DS} =-5V, I _D =-12A	---	13	---	S
R _g	Gate Resistance	V _{DS} =0V, V _{GS} =0V, f=1MHz	---	20	---	Ω
Q _g	Total Gate Charge	V _{DS} =-20V, V _{GS} =-4.5V, I _D =-12A	---	10	---	nC
Q _{gs}	Gate-Source Charge		---	3	---	
Q _{gd}	Gate-Drain Charge		---	3.5	---	
T _{d(on)}	Turn-On Delay Time	V _{DS} =-15V, V _{GS} =-10V, I _D =-1A R _{GEN} =3.3Ω	---	20	---	ns
T _r	Rise Time		---	13	---	
T _{d(off)}	Turn-Off Delay Time		---	47	---	
T _f	Fall Time		---	4.5	---	
C _{iss}	Input Capacitance	V _{DS} =-15V, V _{GS} =0V, f=1MHz	---	1300	---	pF
C _{oss}	Output Capacitance		---	108	---	
C _{rss}	Reverse Transfer Capacitance		---	80	---	

Diode Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I _S	Continuous Source Current	V _G =V _D =0V, Force Current	---	---	-18	A
I _{SM}	Pulsed Source Current		---	---	-54	A
V _{SD}	Diode Forward Voltage	V _{GS} =0V, I _F =-12A, T _J =25°C	---	---	-1	V

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