

General Description

The CMSA609B uses advanced trench technology to provide excellent $R_{DS(ON)}$ and low gate charge.

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

Features

- Low On-Resistance
- 100% avalanche tested
- RoHS Compliant

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
$I_D@T_C=25^{\circ}C$	Continuous Drain Current	20	-18	A
$I_D@T_C=100^{\circ}C$	Continuous Drain Current	16	-15	A
I_{DM}	Pulsed Drain Current	60	-54	A
EAS	Single Pulse Avalanche Energy ¹	25	42	mJ
$P_D@T_C=25^{\circ}C$	Power Dissipation	25	30	W
T_{STG}	Storage Temperature Range	-55 to 150		$^{\circ}C$
T_J	Operating Junction Temperature Range	-55 to 150		$^{\circ}C$

Thermal Characteristics: N-channel

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction-ambient(Steady-State)	---	62	$^{\circ}C/W$
$R_{\theta JC}$	Thermal Resistance Junction-case(Steady-State)	---	5	$^{\circ}C/W$

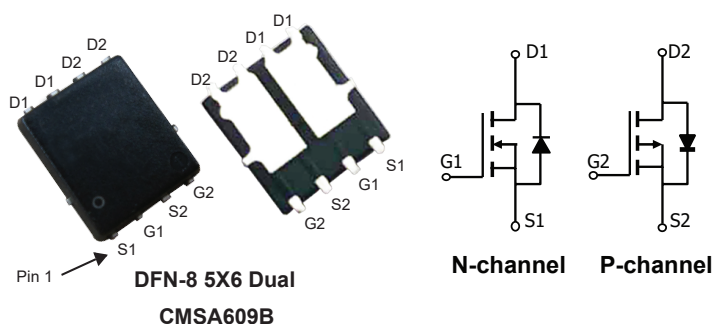
Product Summary

	BVDSS	$R_{DS(on)}$ max.	ID
N-Channel	40V	17mΩ	20A
P-Channel	-40V	50mΩ	-18A

Applications

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

DFN-8 5X6 Dual Pin Configuration



40V, 14mΩ typ., 20A N-Channel MOSFET and -40V, 44mΩ typ., -18A P-Channel MOSFET

Thermal Characteristics: P-channel

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction-ambient(Steady-State)	---	50	°C/W
$R_{\theta JC}$	Thermal Resistance Junction-case(Steady-State)	---	4.16	°C/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	$V_{GS}=0V$, $I_D=250\mu A$	60	---	---	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance	$V_{GS}=10V$, $I_D=12A$	---	14	17	mΩ
		$V_{GS}=4.5V$, $I_D=8A$	---	17	22	
$V_{GS(th)}$	Gate Threshold Voltage	$V_{GS}=V_{DS}$, $I_D=250\mu A$	1	---	3.0	V
I_{DSS}	Drain-Source Leakage Current	$V_{DS}=40V$, $V_{GS}=0V$, $T_J=25^{\circ}\text{C}$	---	---	1	uA
		$V_{DS}=40V$, $V_{GS}=0V$, $T_J=55^{\circ}\text{C}$	---	---	5	
I_{GSS}	Gate-Source Leakage Current	$V_{GS}=\pm 20V$, $V_{DS}=0V$	---	---	±100	nA
g_{fs}	Forward Transconductance	$V_{DS}=5V$, $I_D=12A$	---	16	---	S
R_g	Gate Resistance	$V_{DS}=0V$, $V_{GS}=0V$, $f=1\text{MHz}$	---	5.0	---	Ω
Q_g	Total Gate Charge	$V_{DS}=20V$, $V_{GS}=4.5V$, $I_D=20A$	---	12	---	nC
Q_{gs}	Gate-Source Charge		---	4.5	---	
Q_{gd}	Gate-Drain Charge		---	6.3	---	
$T_{d(on)}$	Turn-On Delay Time	$V_{DD}=20V$, $V_{GS}=10V$, $R_G=3.3\Omega$ $I_D=20A$	---	8	---	ns
T_r	Rise Time		---	38	---	
$T_{d(off)}$	Turn-Off Delay Time		---	20	---	
T_f	Fall Time		---	5	---	
C_{iss}	Input Capacitance	$V_{DS}=25V$, $V_{GS}=0V$, $f=1\text{MHz}$	---	1350	---	pF
C_{oss}	Output Capacitance		---	140	---	
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	---	---	20	A
I_{SM}	Pulsed Source Current		---	---	60	A
V_{SD}	Diode Forward Voltage	$V_{GS}=0V$, $I_S=12A$, $T_J=25^{\circ}\text{C}$	---	0.86	1.2	V

40V, 14mΩ typ., 20A N-Channel MOSFET and -40V, 44mΩ typ., -18A P-Channel 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	---	44	50	mΩ
		V _{GS} =-4.5V, I _D =-8A	---	56	64	
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	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	---	14	---	S
R _g	Gate Resistance	V _{DS} =0V, V _{GS} =0V, f=1MHz	---	49	---	Ω
Q _g	Total Gate Charge	V _{DS} =-20V, V _{GS} =-4.5V, I _D =-12A	---	9.3	---	nC
Q _{gs}	Gate-Source Charge		---	3	---	
Q _{gd}	Gate-Drain Charge		---	3.5	---	
T _{d(on)}	Turn-On Delay Time	V _{DD} =-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} =-25V, V _{GS} =0V, f=1MHz	---	1050	---	pF
C _{oss}	Output Capacitance		---	90	---	
C _{rss}	Reverse Transfer Capacitance		---	50	---	

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	---	-0.94	-1.2	V

Note:

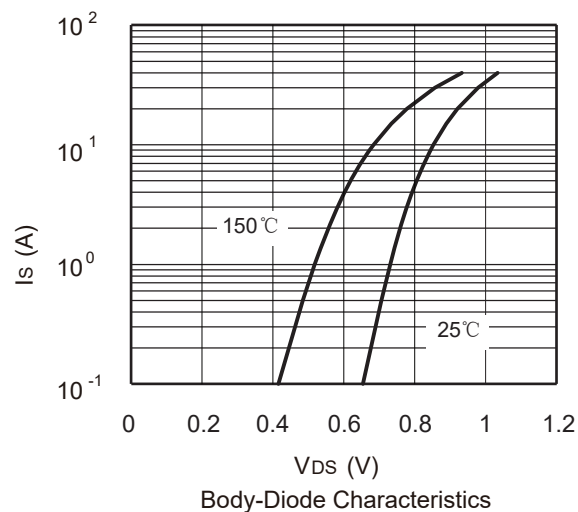
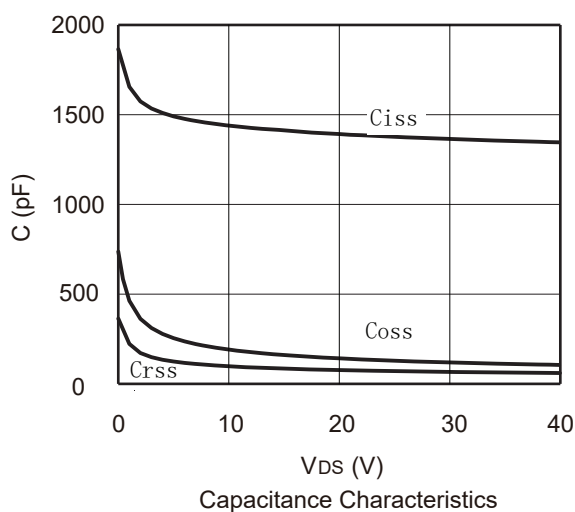
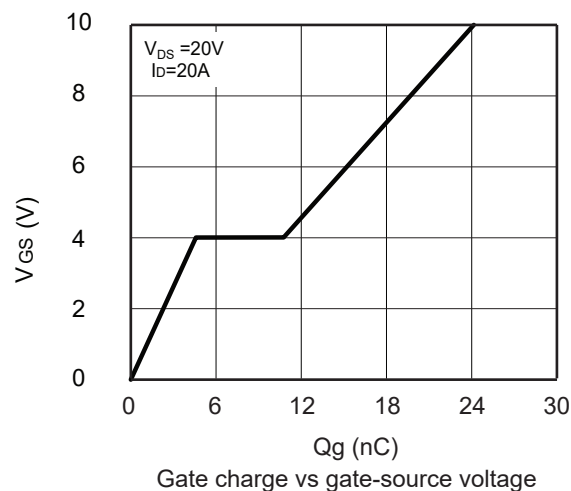
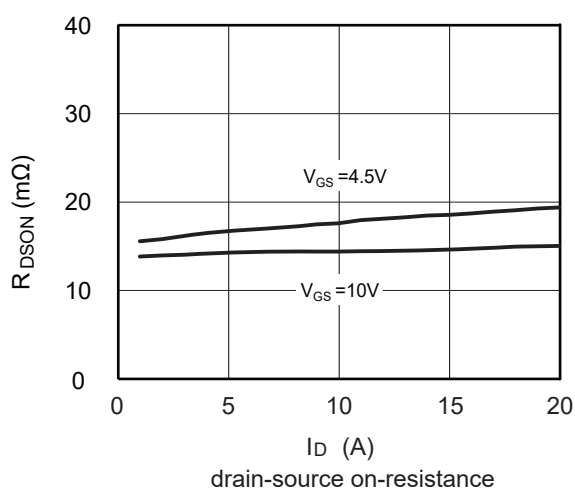
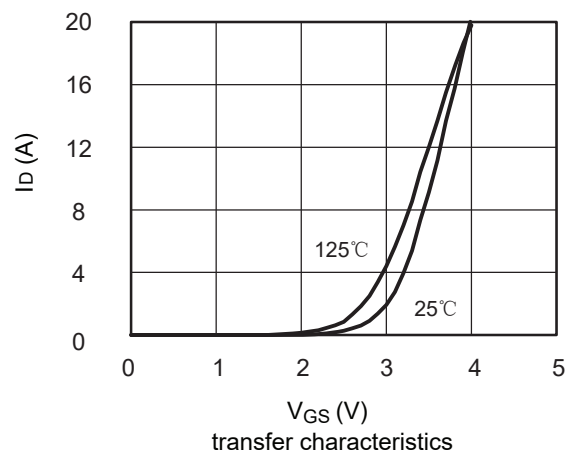
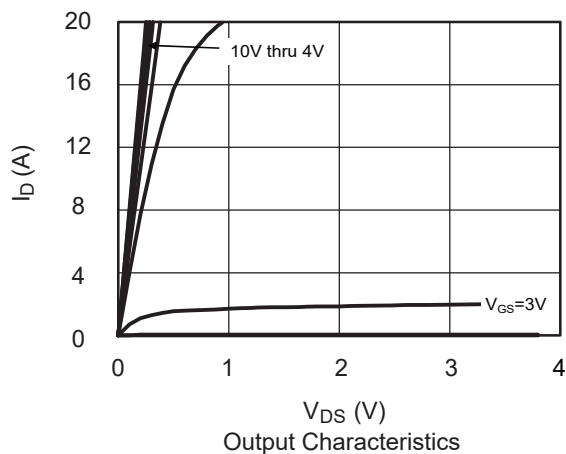
1. The EAS data shows Max. rating. The N-Channel test condition is V_{DD}=30V, V_{GS}=10V, L=0.5mH, I_{AS}=10A.
The P-Channel test condition is V_{DD}=-30V, V_{GS}=-10V, L=0.5mH, I_{AS}=-13A.

This product has been designed and qualified for the consumer market.

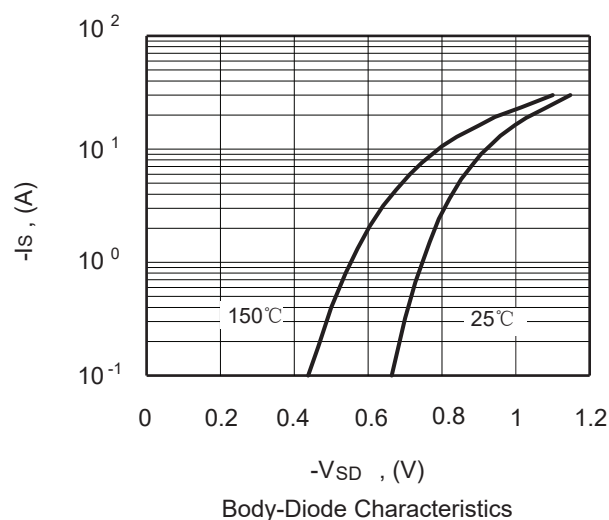
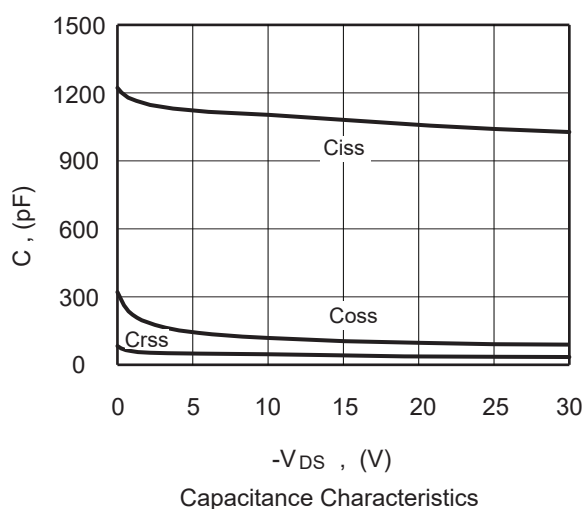
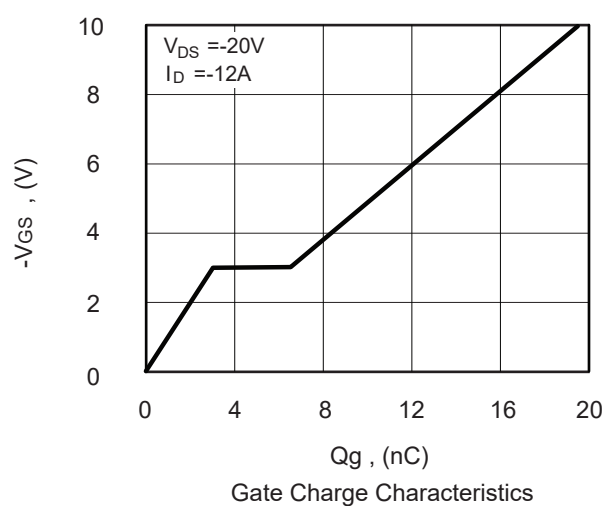
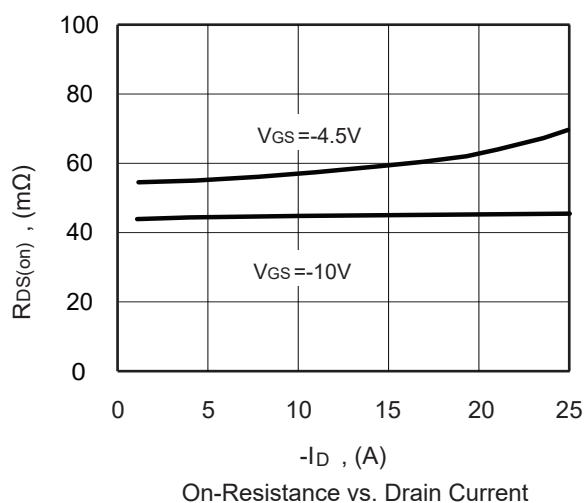
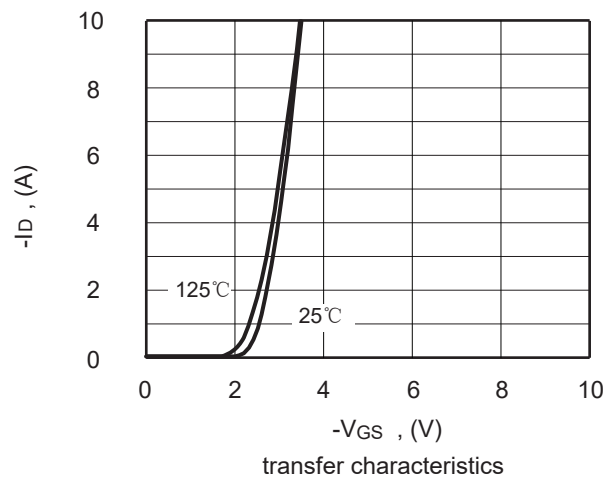
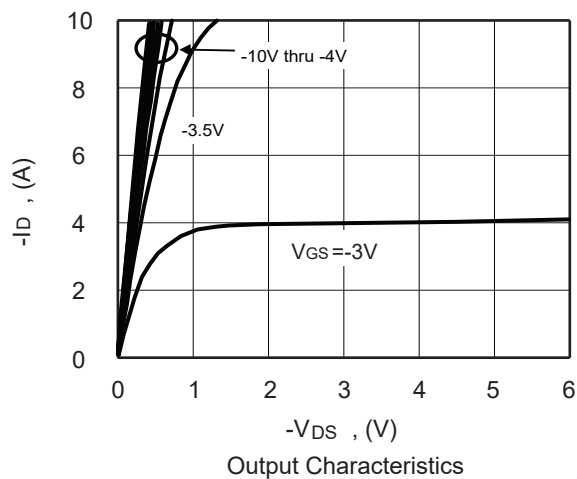
Cmos assumes no liability for customers' product design or applications.

Cmos reserves the right to improve product design, functions and reliability without notice. Please refer to the latest version of specification.

N-Channel: Typical Characteristics



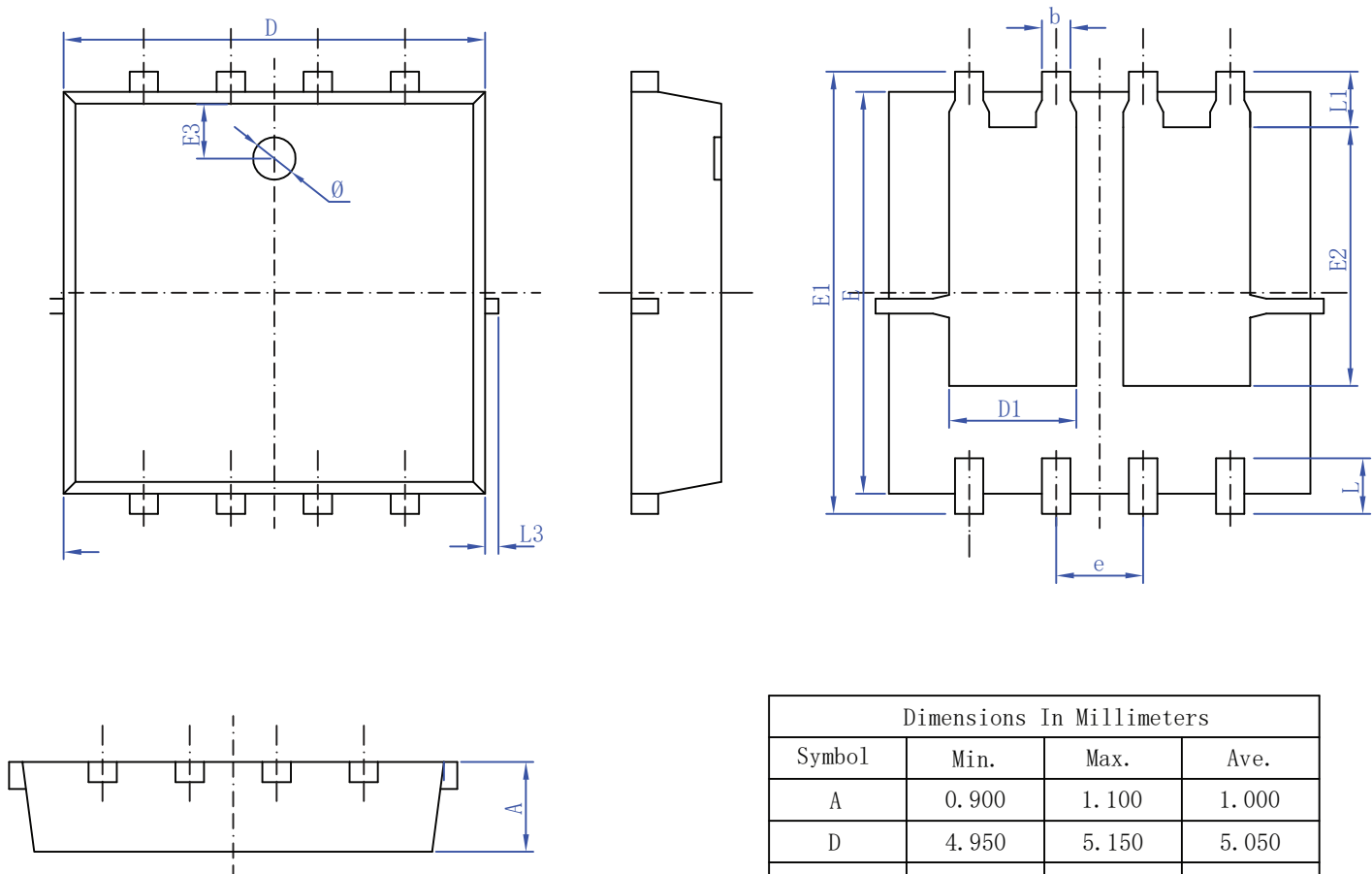
P-Channel: Typical Characteristics



Package Dimension

DFN-8 5X6 Dual

Unit :mm



Dimensions In Millimeters			
Symbol	Min.	Max.	Ave.
A	0.900	1.100	1.000
D	4.950	5.150	5.050
D1	1.505	1.905	1.7050
E	5.750	5.950	5.850
E1	5.950	6.350	6.150
E2	3.300	3.700	3.500
E3	0.900	1.300	1.100
b	0.250	0.350	0.300
e	1.220	1.320	1.270
L	0.585	0.785	0.685
L1	0.525	0.725	0.625
ϕ	1.000	1.400	1.200
L2	0~0.100		
L3	0~0.100		