CMSA609B

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

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.

Product Summary

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

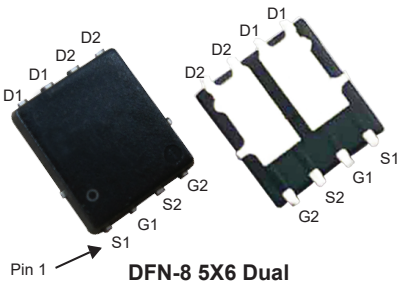
Applications

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

Features

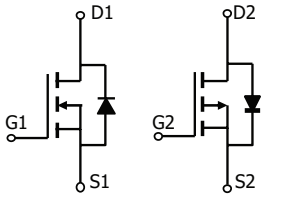
- Low On-Resistance
- 100% avalanche tested
- RoHS Compliant

DFN-8 5X6 Dual Pin Configuration



DFN-8 5X6 Dual

CMSA609B



N-channel P-channel

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℃	Continuous Drain Current	20	-18	A
I_D@T_C=100℃	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℃	Power Dissipation	25	30	W
T_{STG}	Storage Temperature Range	-55 to 150		℃
T_J	Operating Junction Temperature Range	-55 to 150		℃

Thermal Characteristics: N-channel

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

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

Thermal Characteristics: P-channel

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction-ambient(Steady-State)	---	50	℃/W
$R_{\theta JC}$	Thermal Resistance Junction-case(Steady-State)	---	4.16	℃/W

N-channel 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=250μA	40	---	---	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 =250μA	1	---	3.0	V
I_{DSS}	Drain-Source Leakage Current	V_{DS}=40V , V_{GS}=0V , T_J=25℃	---	---	1	uA
		V_{DS}=40V , V_{GS}=0V , T_J=55℃	---	---	5	
I_{GSS}	Gate-Source Leakage Current	V_{GS} = ±20V , V_{DS}=0V	---	---	±100	nA
gfs	Forward Transconductance	V_{DS}=5 V , I_D=12A	---	16	---	S
R_g	Gate Resistance	V_{DS}=0 V , V_{GS}=0V , f=1MHz	---	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=3.3Ω 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=1MHz	---	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℃	---	0.86	1.2	V

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

P Channel 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=-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
gfs	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℃	---	-0.94	-1.2	V

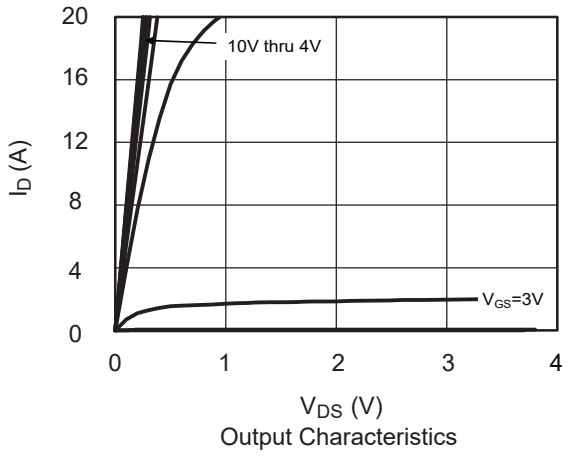
Note:

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.

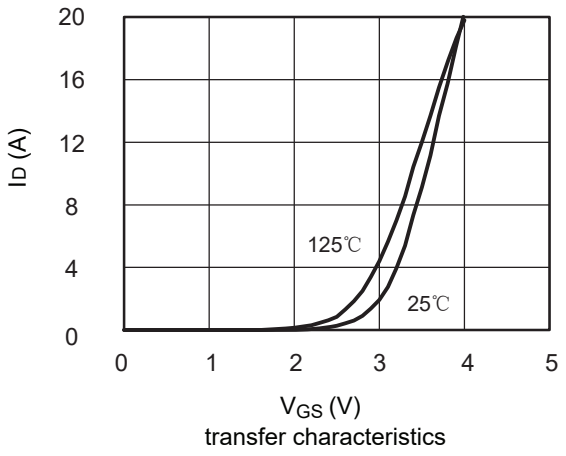
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40V, 14mΩ typ., 20A N-Channe MOSFET and -40V, 44mΩ typ., -18A P-Channe MOSFET

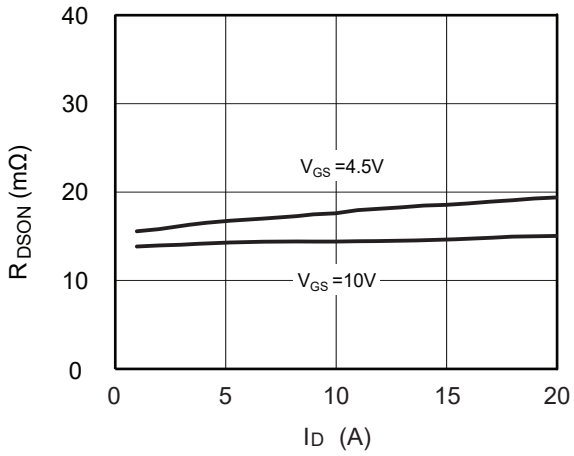
N-Channel:Typical Characteristics



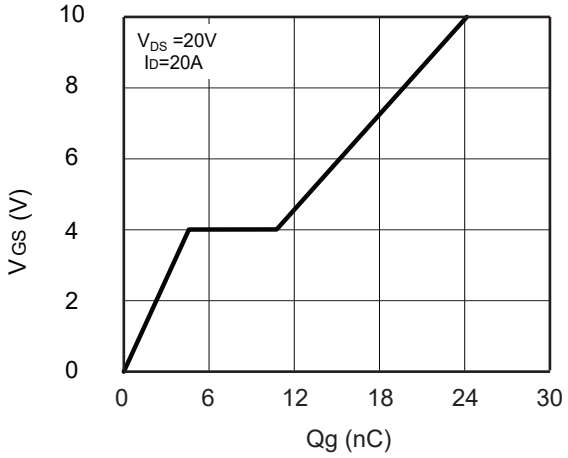
Output Characteristics



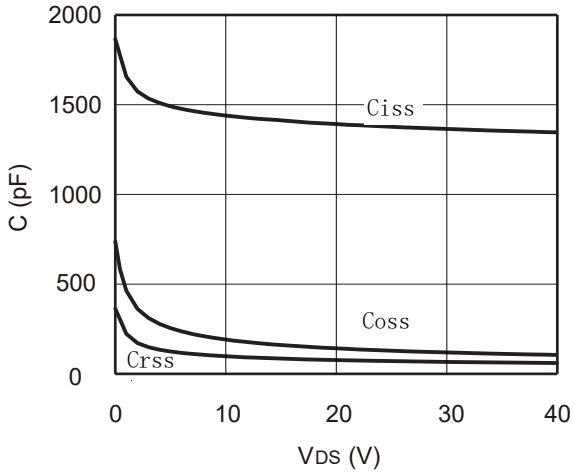
transfer characteristics



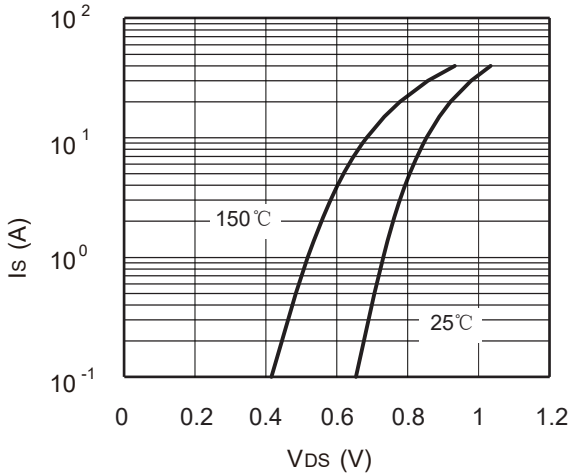
drain-source on-resistance



Gate charge vs gate-source voltage



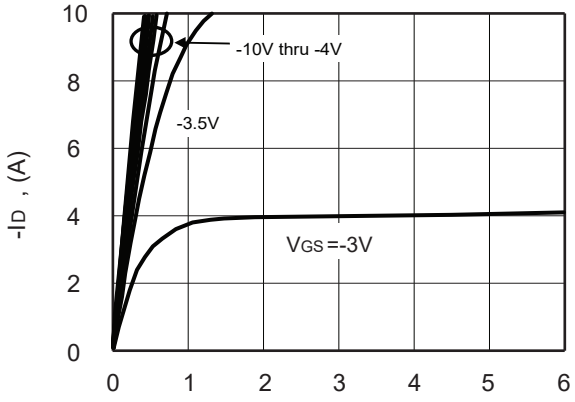
Capacitance Characteristics



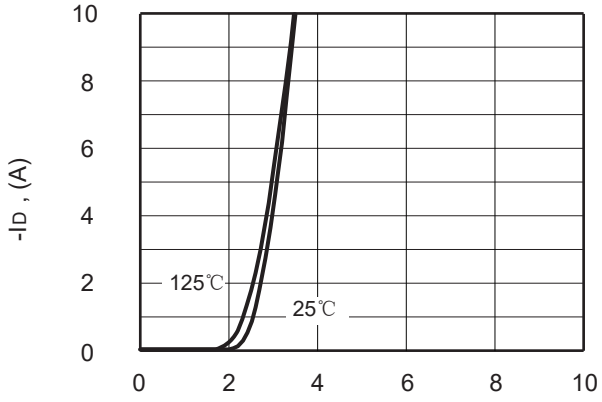
Body-Diode Characteristics

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

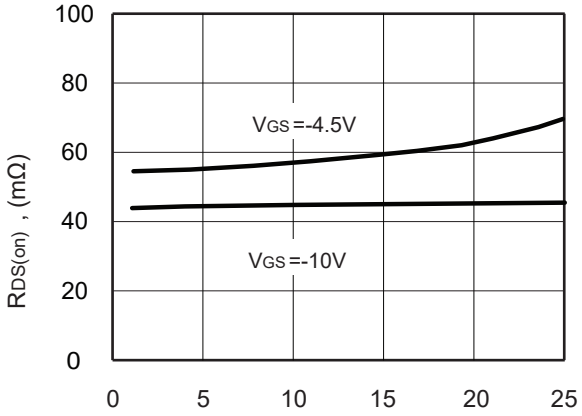
P-Channel:Typical Characteristics



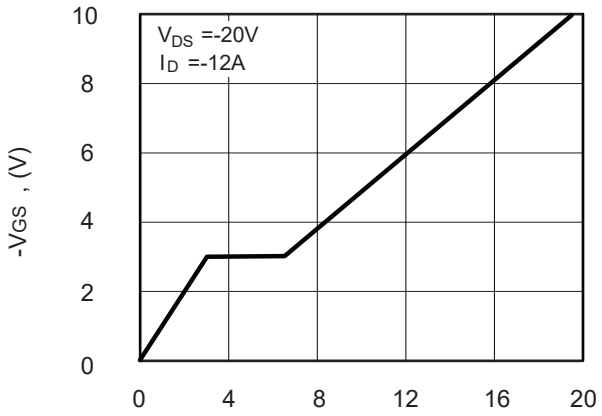
Output Characteristics



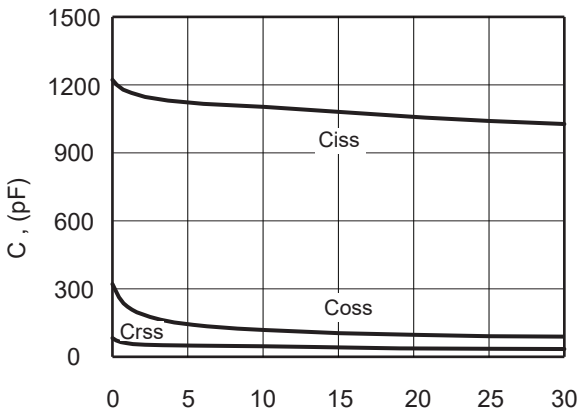
transfer characteristics



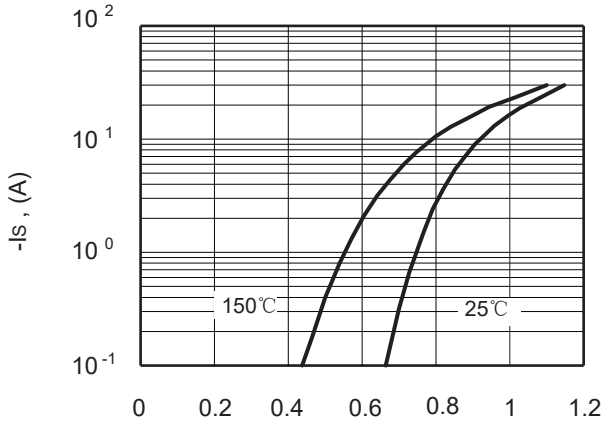
On-Resistance vs. Drain Current



Gate Charge Characteristics



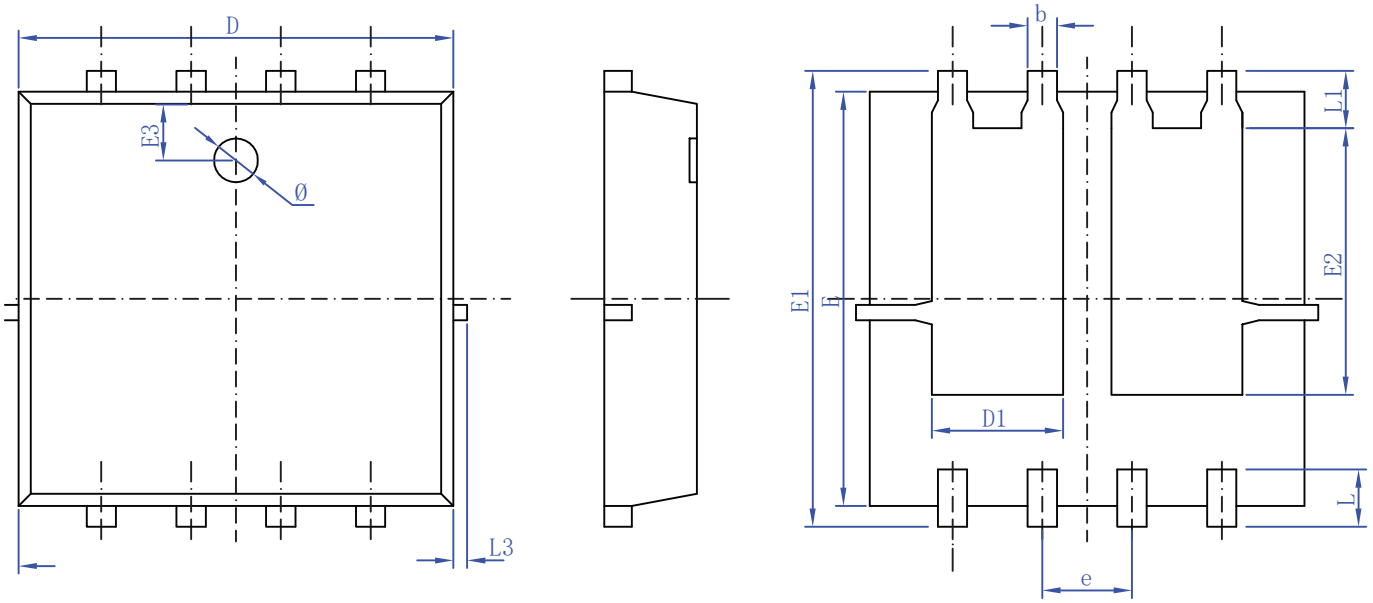
Capacitance Characteristics

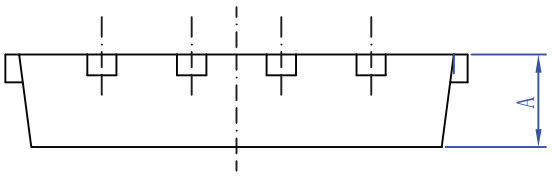


Body-Diode Characteristics

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
Ø	1.000	1.400	1.200
L2	0~0.100		
L3	0~0.100		