CMSA039N10

100V, 3.2mΩ typ ., 130A N-Channel MOSFET

General Description

The CMSA039N10 uses advanced SGT technology to provide excellent RDS(ON).This technology has been optimized to minimize on-state resistance and yet maintain superior switching performance.

Product Summary

BVDSS	$R_{DS(on)}$ max.	ID
100V	3.6mΩ	130A

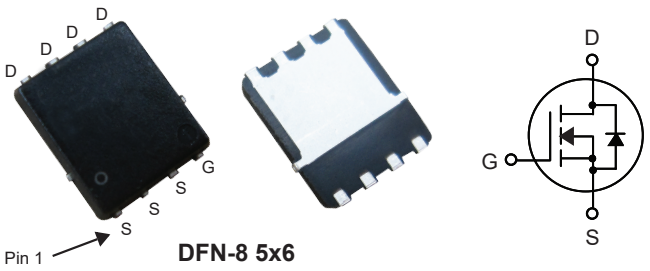
Applications

- Motor Drive
- Solar

Features

- Low On-Resistance
- 100% avalanche tested
- Small Footprint (5x6 mm) for Compact Design
- RoHS Compliant

DFN-8 5x6 Pin Configuration



DFN-8 5x6

Type	Package	Marking
CMSA039N10	DFN-8 5x6	CMSA039N10

Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	100	V
V_{GS}	Gate-Source Voltage	±20	V
I_D@T_C=25℃	Continuous Drain Current	130	A
I_D@T_C=100℃	Continuous Drain Current	85	A
I_{DM}	Pulsed Drain Current	520	A
EAS	Single Pulse Avalanche Energy[1]	1058	mJ
P_D@T_C=25℃	Total Power Dissipation	180	W
T_{STG}	Storage Temperature Range	-55 to 150	℃
T_J	Operating Junction Temperature Range	-55 to 150	℃

Thermal Data

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction-ambient[2]	---	43	℃/W
$R_{\theta JC}$	Thermal Resistance Junction-case	---	0.69	℃/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	100	---	---	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance	V_{GS}=10V , I_D=20A	---	3.2	3.6	mΩ
$V_{GS(th)}$	Gate Threshold Voltage	V_{GS}=V_{DS} , I_D =250uA	2.0	---	4.0	V
I_{DSS}	Drain-Source Leakage Current	V_{DS}=100V , V_{GS} =0V	---	---	1	uA
I_{GSS}	Gate-Source Leakage Current	V_{GS} =±20V , V_{DS}=0V	---	---	±100	nA
gfs	Forward Transconductance	V_{DS}=10V , I_D=20A	---	34	---	S
R_g	Gate Resistance	V_{DS}=0V , V_{GS}=0V , f=1MHz	---	1.7	---	Ω
Q_g	Total Gate Charge	I_D=20A V_{DD}=50V V_{GS}=10V (note 3)	---	68	---	nC
Q_{gs}	Gate-Source Charge		---	19	---	
Q_{gd}	Gate-Drain Charge		---	15	---	
$T_{d(on)}$	Turn-On Delay Time	V_{DD}=50V V_{GS}=10V R_G = 3Ω I_D =20A (note 3)	---	10	---	ns
T_r	Rise Time		---	17	---	
$T_{d(off)}$	Turn-Off Delay Time		---	44	---	
T_f	Fall Time		---	23	---	
C_{iss}	Input Capacitance	V_{DS}=25V , V_{GS}=0V , f=1MHz	---	5000	---	pF
C_{oss}	Output Capacitance		---	2100	---	
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	---	---	130	A
I_{SM}	Pulsed Source Current		---	---	520	A
V_{SD}	Diode Forward Voltage	V_{GS}=0V , I_S=20A	---	0.79	1.4	V
t_{rr}	Reverse Recovery Time	I_S =20A , T_J =25℃ di/dt =100A/μs (note 3)	---	62	---	ns
Q_{rr}	Reverse Recovery Charge		---	130	---	nC

Note :

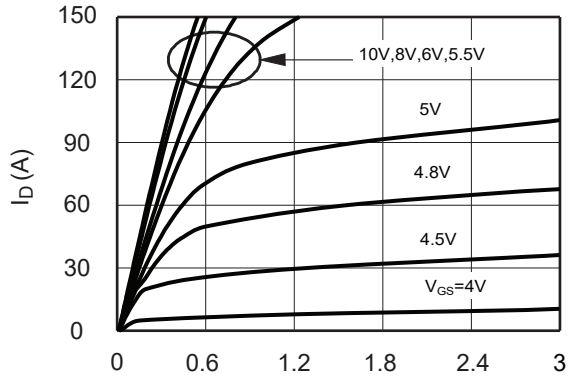
1.The EAS data shows Max. rating . The test condition is V_{DD}=50V , V_{GS}=10V , L=1mH , I_{AS}=46A.

2. Device mounted on FR-4 substrate PC board with 2oz copper in 1inch square cooling area.

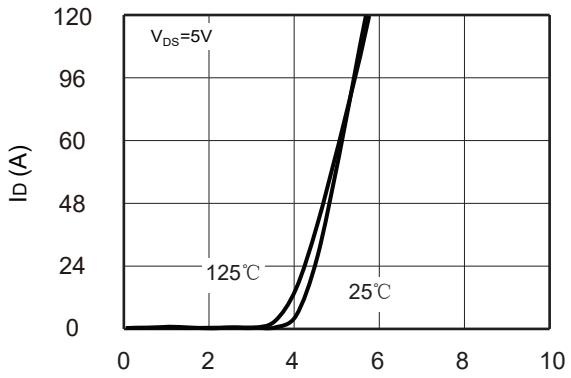
3. Defined by design, not subject to production.

This product has been designed and qualified for the counsumer market.
Cmos assumes no liability for customers' product design or applications.
Cmos reserver the right to improve product design ,functions and reliability wihtout notice.Please refer to the latest version of specification.

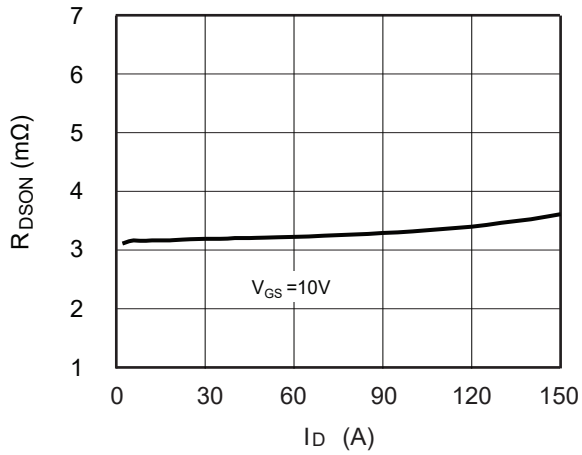
Typical Characteristics



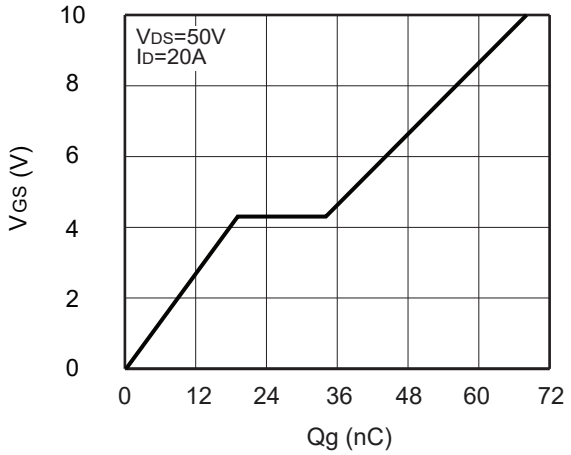
Output Characteristics



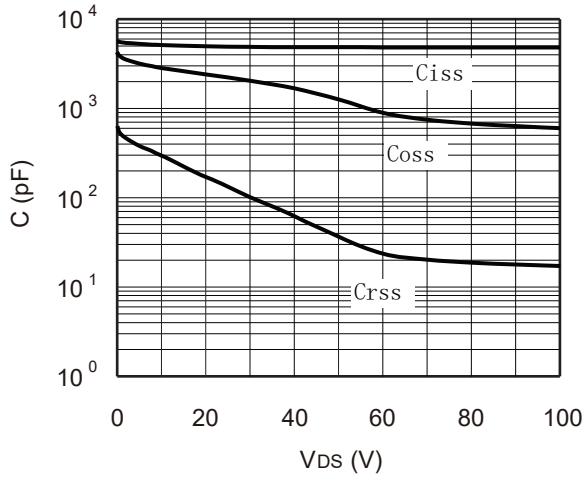
transfer characteristics



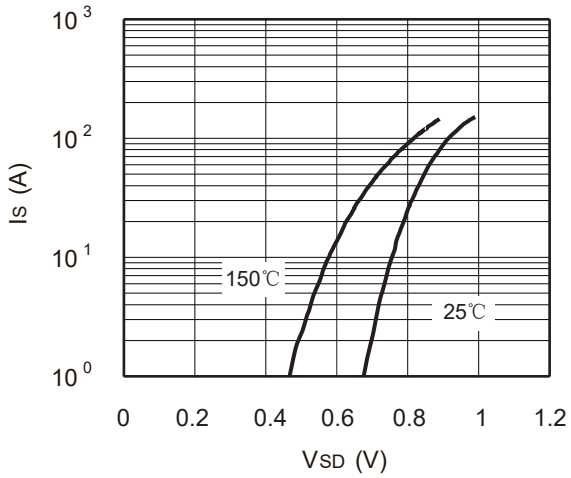
On-Resistance vs. Drain Current



Gate charge vs gate-source voltage

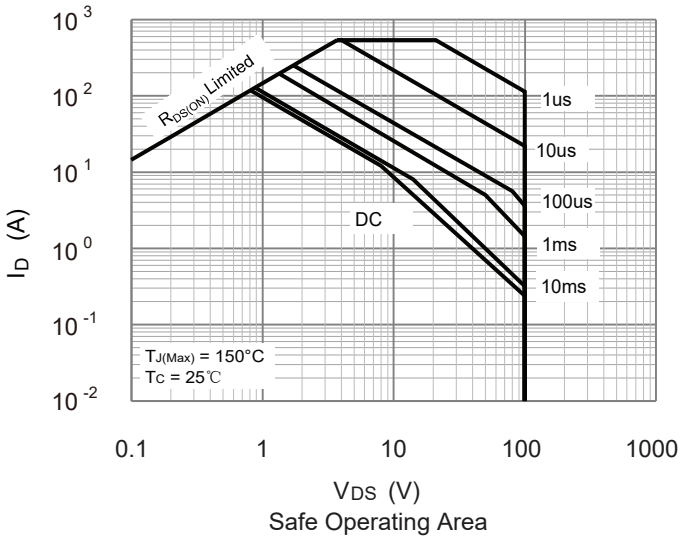


Capacitance Characteristics



Body-Diode Characteristics

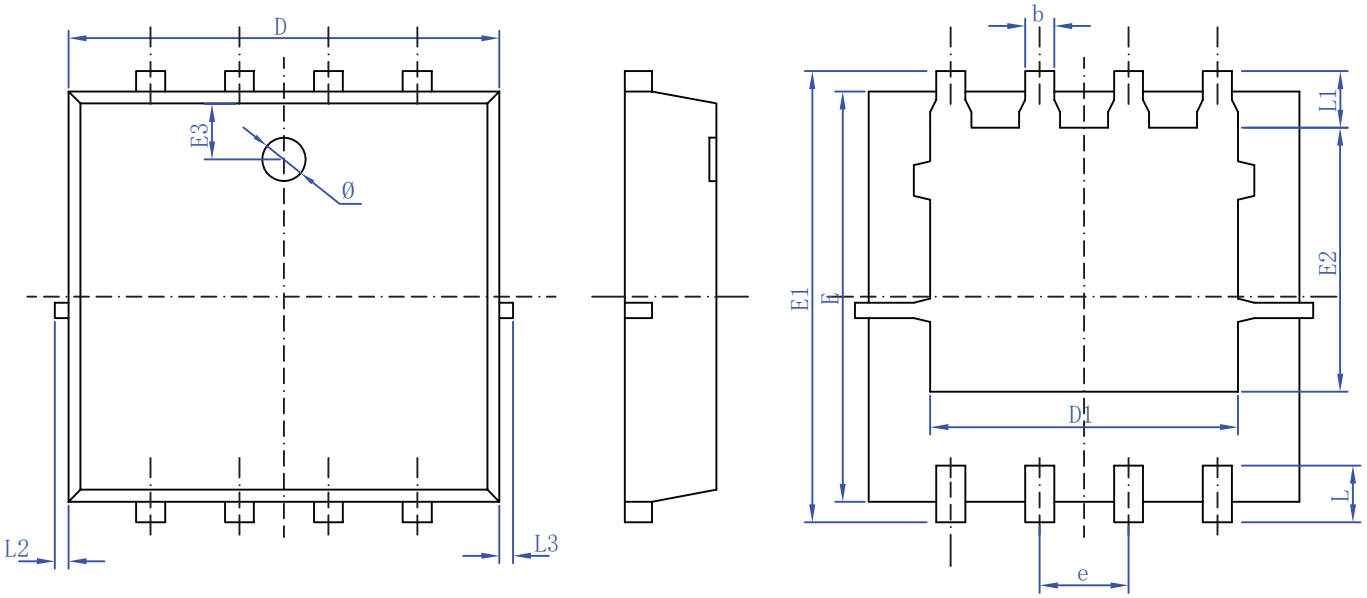
Characteristics

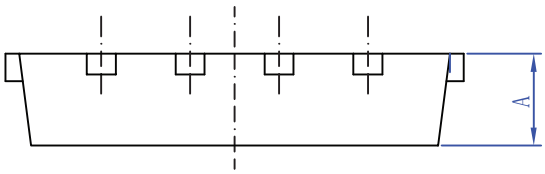


Safe Operating Area

Package Dimension

DFN-8 5x6 Unit :mm





Dimensions In Millimeters			
Symbol	Min.	Max.	Ave.
A	0.900	1.100	1.000
D	4.950	5.150	5.050
D1	3.850	4.250	4.050
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		

注：
1.未注公差±0.05未标注圆角R max=0.25