

General Description

The CMSA50NP06 uses advanced trench technology MOSFETs to provide excellent RDS(ON).

The complementary MOSFETs may be used in H-bridge, Inverters 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	60	-60	V
V_{GS}	Gate-Source Voltage	±20	±20	V
$I_D@T_C=25^{\circ}C$	Continuous Drain Current	50	-30	A
$I_D@T_C=100^{\circ}C$	Continuous Drain Current	35	-20	A
I_{DM}	Pulsed Drain Current	200	-120	A
EAS	Single Pulse Avalanche Energy ¹	85	100	mJ
$P_D@T_C=25^{\circ}C$	Power Dissipation	70	60	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
$R_{\theta JA}$	Thermal Resistance Junction-ambient	---	50	°C/W
$R_{\theta JC}$	Thermal Resistance Junction-case	---	1.79	°C/W

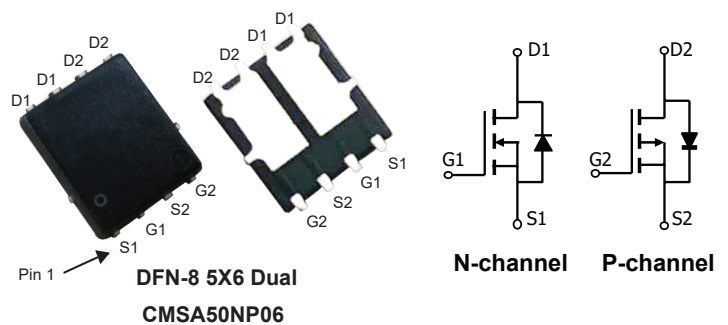
Product Summary

	BVDSS	R _{DS(on)} max.	ID
N-Channel	60V	17mΩ	50A
P-Channel	-60V	39mΩ	-30A

Applications

- DC/DC converter
- Power management
- LCD backlight inverter

DFN-8 5X6 Dual Pin Configuration



Thermal Characteristics: P-channel

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction-ambient	---	50	°C/W
$R_{\theta JC}$	Thermal Resistance Junction-case	---	2.08	°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	$V_{GS}=10V$, $I_D=20A$	---	14	17	mΩ
		$V_{GS}=4.5V$, $I_D=15A$	---	16	20	
$V_{GS(th)}$	Gate Threshold Voltage	$V_{GS}=V_{DS}$, $I_D=250\mu A$	1	---	2.5	V
I_{DSS}	Drain-Source Leakage Current	$V_{DS}=60V$, $V_{GS}=0V$, $T_J=25^\circ\text{C}$	---	---	1	uA
		$V_{DS}=60V$, $V_{GS}=0V$, $T_J=100^\circ\text{C}$	---	---	100	
I_{GSS}	Gate-Source Leakage Current	$V_{GS}=\pm 20V$, $V_{DS}=0V$	---	---	± 100	nA
g_{fs}	Forward Transconductance	$V_{DS}=5V$, $I_D=20A$	---	26	---	S
R_g	Gate Resistance	$V_{DS}=0V$, $V_{GS}=0V$, $f=1\text{MHz}$	---	2.4	---	Ω
Q_g	Total Gate Charge	$V_{DS}=30V$, $V_{GS}=10V$, $I_D=40A$	---	34	---	nC
Q_{gs}	Gate-Source Charge		---	6	---	
Q_{gd}	Gate-Drain Charge		---	8.5	---	
$T_{d(on)}$	Turn-On Delay Time	$V_{DD}=30V$, $V_{GEN}=10V$, $R_G=1\Omega$ $I_D=40A$, $R_L=0.75\Omega$	---	8	---	ns
T_r	Rise Time		---	13	---	
$T_{d(off)}$	Turn-Off Delay Time		---	22	---	
T_f	Fall Time		---	10	---	
C_{iss}	Input Capacitance	$V_{DS}=25V$, $V_{GS}=0V$, $f=1\text{MHz}$	---	2500	---	pF
C_{oss}	Output Capacitance		---	120	---	
C_{rss}	Reverse Transfer Capacitance		---	100	---	

Diode Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I_S	Continuous Source Current	$V_G=V_D=0V$, Force Current	---	---	50	A
I_{SM}	Pulsed Source Current		---	---	200	A
V_{SD}	Diode Forward Voltage	$V_{GS}=0V$, $I_S=20A$, $T_J=25^\circ\text{C}$	---	0.90	1.2	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	-60	---	---	V
R _{DS(ON)}	Static Drain-Source On-Resistance	V _{GS} =-10V, I _D =-20A	---	33	39	mΩ
		V _{GS} =-4.5V, I _D =-15A	---	40	49	
V _{GS(th)}	Gate Threshold Voltage	V _{GS} =V _{DS} , I _D =-250μA	-1	---	-3	V
I _{DSS}	Drain-Source Leakage Current	V _{DS} =-60V, 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 =-20A	---	21	---	S
R _g	Gate Resistance	V _{DS} =0V, V _{GS} =0V, f=1MHz	---	130	---	Ω
Q _g	Total Gate Charge	V _{DS} =-30V, V _{GS} =-10V, I _D =-20A	---	32	---	nC
Q _{gs}	Gate-Source Charge		---	6	---	
Q _{gd}	Gate-Drain Charge		---	5.5	---	
T _{d(on)}	Turn-On Delay Time	V _{DD} =-30V, V _{GS} =-10V, I _D =-20A R _{GEN} =3Ω	---	15	---	ns
T _r	Rise Time		---	4	---	
T _{d(off)}	Turn-Off Delay Time		---	47	---	
T _f	Fall Time		---	11	---	
C _{iss}	Input Capacitance	V _{DS} =-25V, V _{GS} =0V, f=1MHz	---	2400	---	pF
C _{oss}	Output Capacitance		---	130	---	
C _{rss}	Reverse Transfer Capacitance		---	35	---	

Diode Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I _S	Continuous Source Current	V _G =V _D =0V, Force Current	---	---	-30	A
I _{SM}	Pulsed Source Current		---	---	-120	A
V _{SD}	Diode Forward Voltage	V _{GS} =0V, I _F =-20A, T _J =25°C	---	-0.97	-1.2	V

Note:

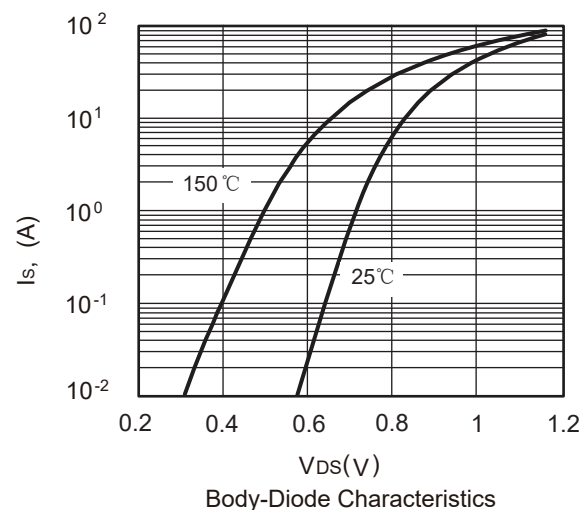
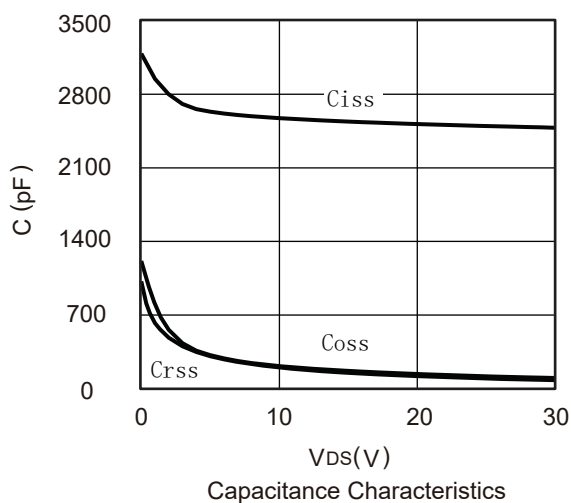
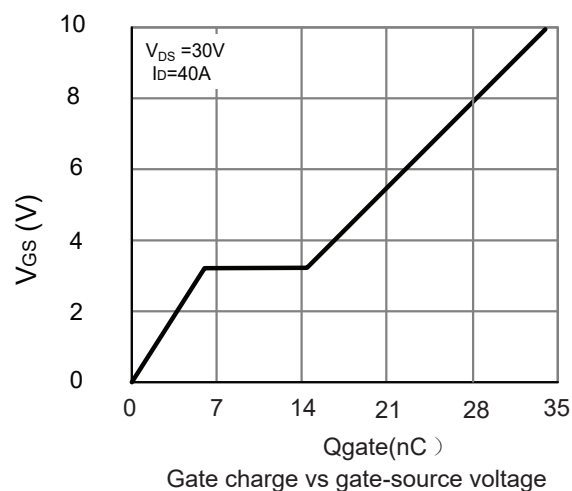
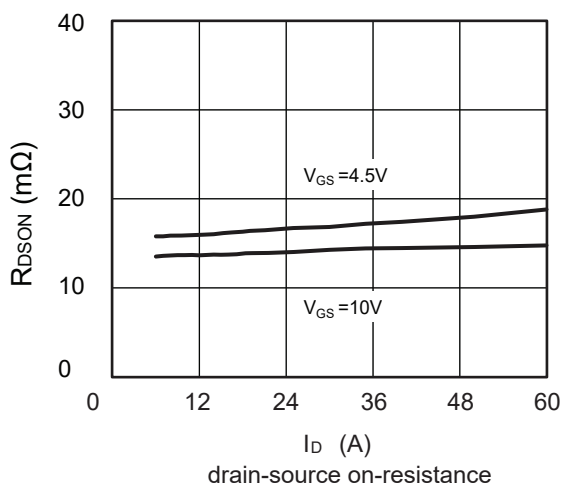
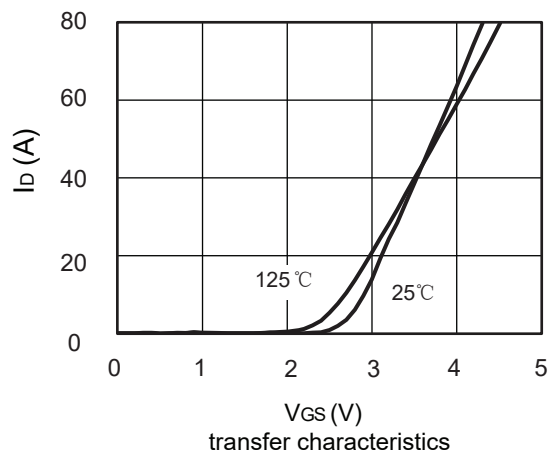
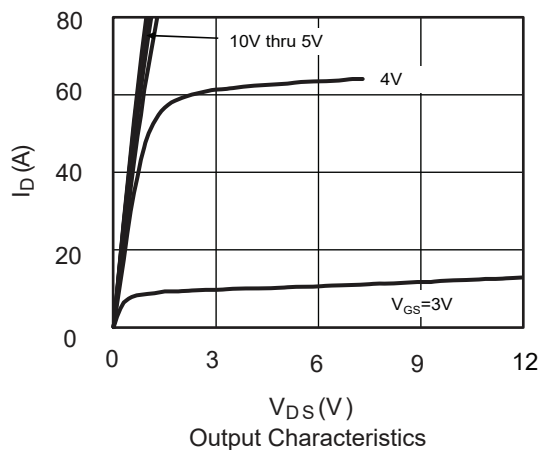
1. The EAS data shows Max. rating. The N-Channel test condition is V_{DD}=35V, V_{GS}=10V, L=0.5mH, I_{AS}=18.5A.
The P-Channel test condition is V_{DD}=-35V, V_{GS}=-10V, L=0.5mH, I_{AS}=-20A.

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

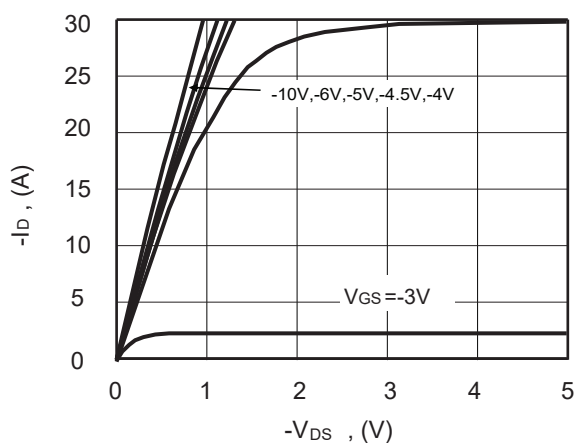
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Cmos reserves the right to improve product design, functions and reliability without notice. Please refer to the latest version of specification.

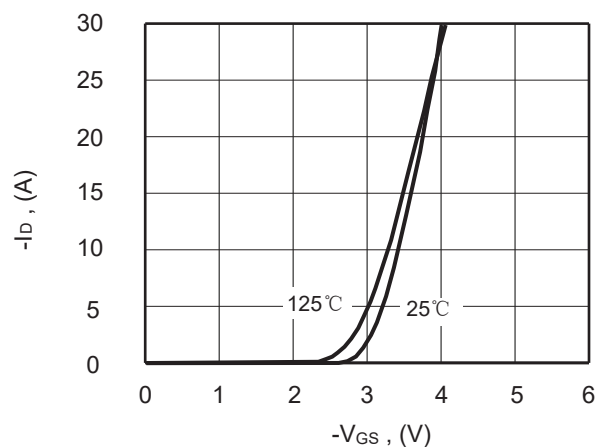
N-Channel: Typical Characteristics



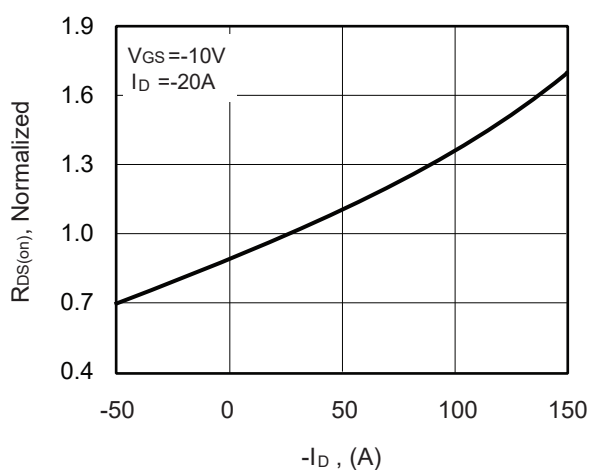
P-Channel: Typical Characteristics



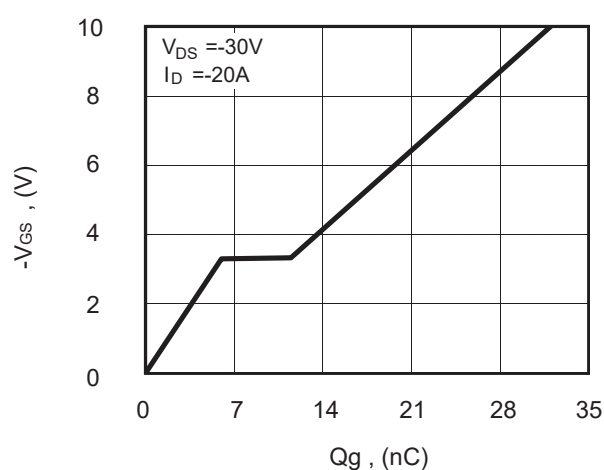
Output Characteristics



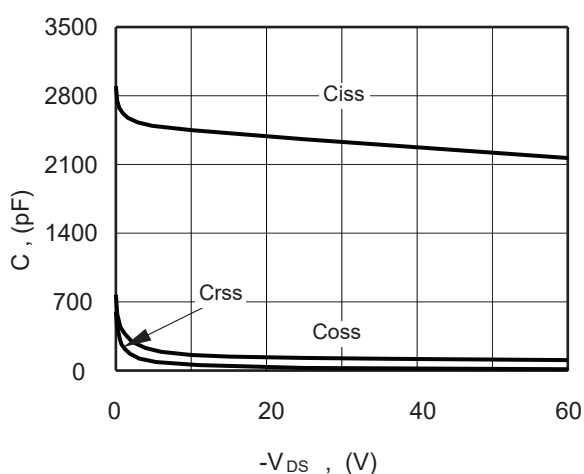
transfer characteristics



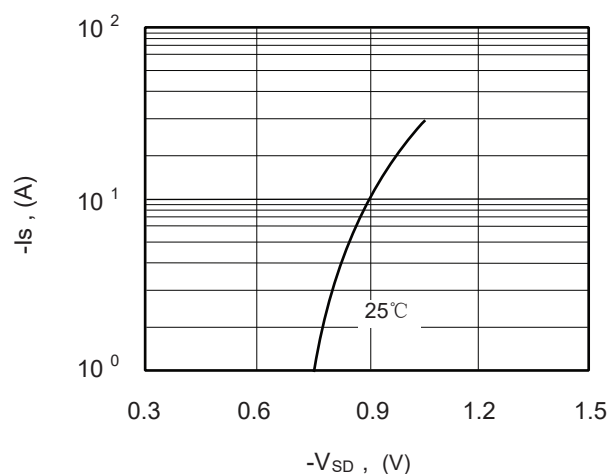
On-Resistance vs. Drain Current



Gate Charge Characteristics



Capacitance Characteristics

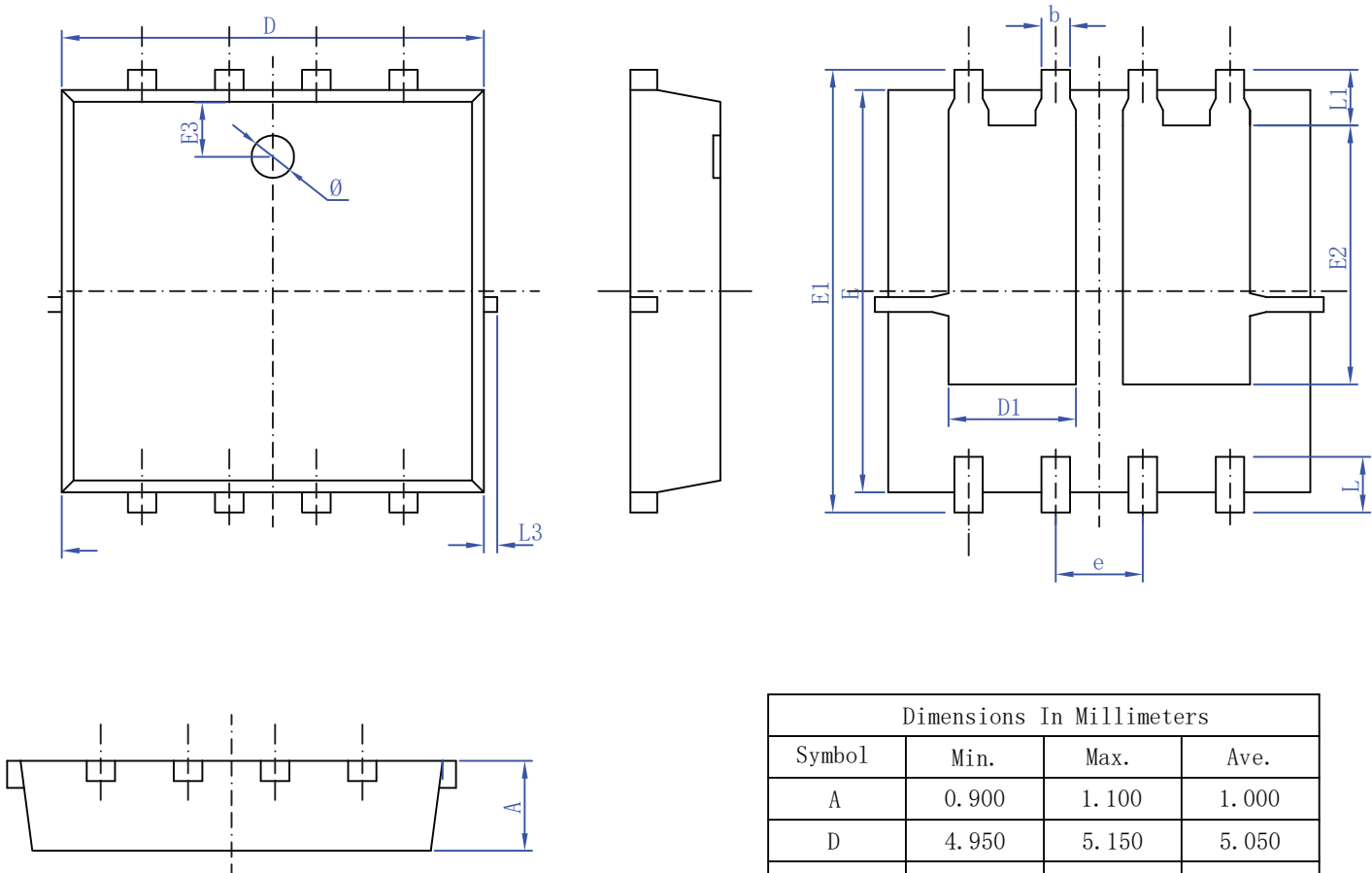


Body-Diode Characteristics

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