

General Description

The CMS10NP02 uses advanced trench technology MOSFETs to provide excellent RDS(ON). The complementary MOSFETs may be used to form a level shifted high side switch, and for a host of other applications.

Features

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

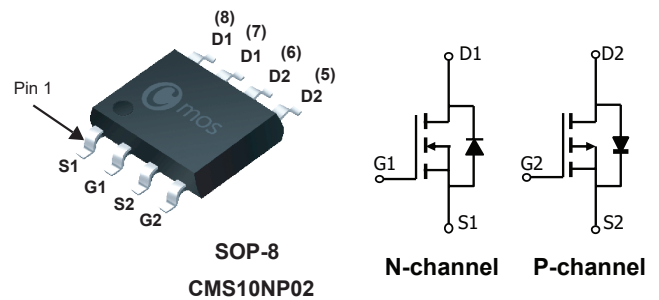
Product Summary

	BVDSS	R _{DS(on)} max.	ID
N-Channel	20V	15mΩ	10A
P-Channel	-20V	33mΩ	-10A

Applications

- Level Shift
- Load Switch

SOP-8 Pin Configuration



Absolute Maximum Ratings

Symbol	Parameter	N-channel	P-channel	Units
V _{DS}	Drain-Source Voltage	20	-20	V
V _{GS}	Gate-Source Voltage	±16	±16	V
I _D @T _A =25°C	Continuous Drain Current	10	-10	A
I _D @T _A =100°C	Continuous Drain Current	7	-7	A
I _{DM}	Pulsed Drain Current	40	-40	A
EAS	Single Pulse Avalanche Energy ¹	25	42	mJ
P _D @T _A =25°C	Power Dissipation	2	2	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}	Thermal Resistance Junction-ambient	---	62.5	°C/W

Thermal Characteristics: P-channel

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction-ambient	---	62.5	°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	$V_{GS}=0V$, $I_D=250\mu A$	20	---	---	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance	$V_{GS}=4.5V$, $I_D=6.5A$	---	13	15	mΩ
		$V_{GS}=2.5V$, $I_D=5.5A$	---	16	20	
$V_{GS(th)}$	Gate Threshold Voltage	$V_{GS}=V_{DS}$, $I_D=250\mu A$	0.3	---	1.1	V
I_{DSS}	Drain-Source Leakage Current	$V_{DS}=16V$, $V_{GS}=0V$, $T_J=25^{\circ}\text{C}$	---	---	1	μA
I_{GSS}	Gate-Source Leakage Current	$V_{GS}=\pm 10V$, $V_{DS}=0V$	---	---	±100	nA
g_{fs}	Forward Transconductance	$V_{DS}=5V$, $I_D=6.5A$	---	14	---	S
R_g	Gate Resistance	$V_{DS}=0V$, $V_{GS}=0V$, $f=1\text{MHz}$	---	1.3	---	Ω
Q_g	Total Gate Charge	$V_{DS}=10V$, $I_D=6A$ $V_{GS}=4.5V$	---	11	---	nC
Q_{gs}	Gate-Source Charge		---	2	---	
Q_{gd}	Gate-Drain Charge		---	3.2	---	
$T_{d(on)}$	Turn-On Delay Time	$V_{DS}=10V$, $V_{GS}=5V$, $R_{GEN}=3\Omega$ $R_L=1.7\Omega$	---	0.3	---	μs
T_r	Rise Time		---	0.6	---	
$T_{d(off)}$	Turn-Off Delay Time		---	7.9	---	
T_f	Fall Time		---	4.4	---	
C_{iss}	Input Capacitance	$V_{DS}=10V$, $V_{GS}=0V$, $f=1\text{MHz}$	---	650	---	pF
C_{oss}	Output Capacitance		---	115	---	
C_{rss}	Reverse Transfer Capacitance		---	110	---	

Diode Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I_S	Diode continuous forward current	$V_G=V_D=0V$, Force Current	---	---	10	A
$I_{S,pulse}$	Diode pulse current		---	---	40	A
V_{SD}	Diode Forward Voltage	$V_{GS}=0V$, $I_F=1A$, $T_J=25^{\circ}\text{C}$	---	0.74	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	-20	---	---	V
R _{DS(ON)}	Static Drain-Source On-Resistance	V _{GS} =-4.5V, I _D =-6.5A	---	28	33	mΩ
		V _{GS} =-2.5V, I _D =-5.5A	---	43	55	
V _{GS(th)}	Gate Threshold Voltage	V _{GS} =V _{DS} , I _D =-250μA	-0.5	---	-1.5	V
I _{DSS}	Drain-Source Leakage Current	V _{DS} =-16V, V _{GS} =0V	---	---	-1	uA
I _{GSS}	Gate-Source Leakage Current	V _{GS} =±10V, V _{DS} =0V	---	---	±100	nA
g _{fs}	Forward Transconductance	V _{DS} =-5V, I _D =-6.5A	---	14	---	S
R _g	Gate Resistance	V _{DS} =0V, V _{GS} =0V, f=1MHz	---	15	---	Ω
Q _g	Total Gate Charge	V _{DS} =-16V, V _{GS} =-4.5V, I _D =-6A	---	11	---	nC
Q _{gs}	Gate-Source Charge		---	2	---	
Q _{gd}	Gate-Drain Charge		---	4	---	
T _{d(on)}	Turn-On Delay Time	V _{DD} =-10V, V _{GS} =-4.5V, I _D =-3A R _G =10Ω	---	25	---	ns
T _r	Rise Time		---	110	---	
T _{d(off)}	Turn-Off Delay Time		---	130	---	
T _f	Fall Time		---	140	---	
C _{iss}	Input Capacitance	V _{DS} =-10V, V _{GS} =0V, f=1MHz	---	1000	---	pF
C _{oss}	Output Capacitance		---	140	---	
C _{rss}	Reverse Transfer Capacitance		---	135	---	

Diode Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I _S	Continuous Source Current	V _G =V _D =0V, Force Current	---	---	-10	A
I _{SM}	Pulsed Source Current		---	---	-40	A
V _{SD}	Diode Forward Voltage	V _{GS} =0V, I _F =-1A, T _J =25°C	---	-0.77	-1.2	V

Note:

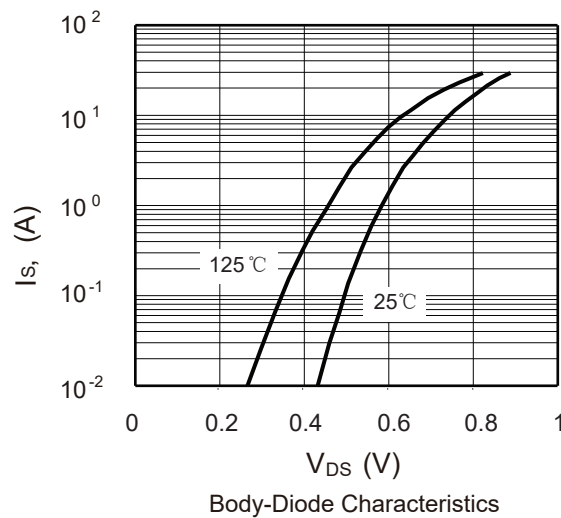
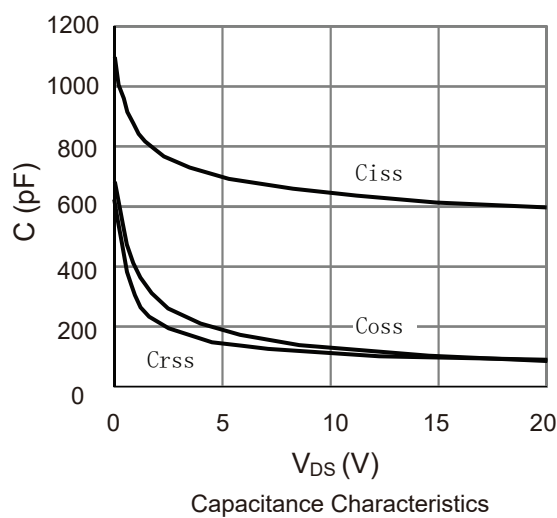
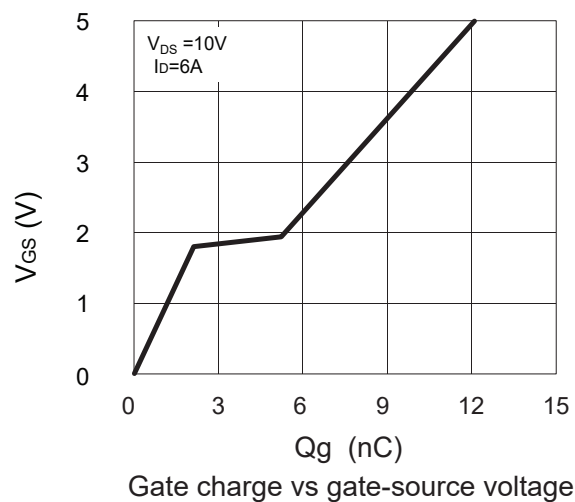
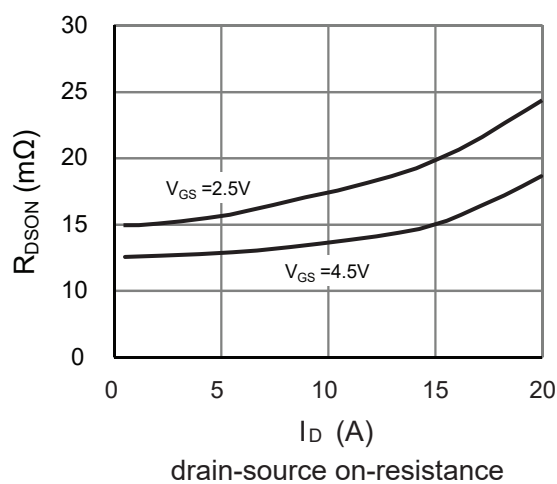
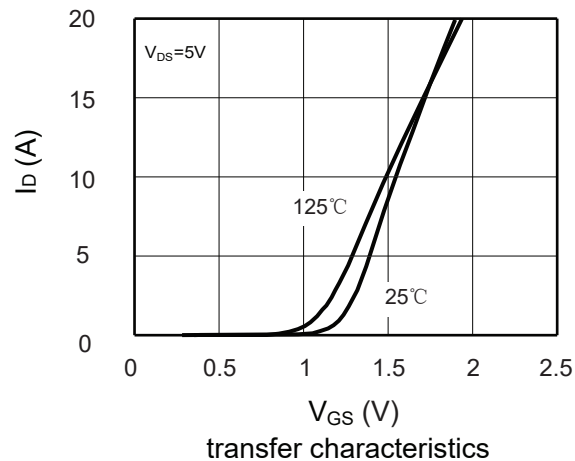
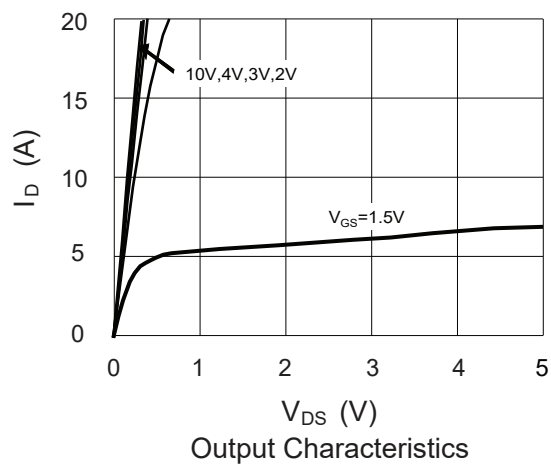
1. The EAS data shows Max. rating. The N-Channel test condition is V_{DD}=15V, V_{GS}=10V, L=0.5mH, I_{AS}=10A.
The P-Channel test condition is V_{DD}=-15V, V_{GS}=-10V, L=0.5mH, I_{AS}=-13A.

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.

N-Channel: Typical Characteristics



P-Channel: Typical Characteristics

