

CMD40NP06

60V, 14mΩ typ., 40A N-Channel MOSFET and -60V, 33mΩ typ., -26A P-Channel MOSFET

General Description

The CMD40NP06 uses advanced trench technology MOSFETs to provide excellent RDS(ON). The complementary MOSFETs may be used in H-bridge, Inverters and other applications.

Features

- Dual N- and P-Channel MOSFET
- Low On-Resistance
- 100% avalanche tested
- RoHS Compliant

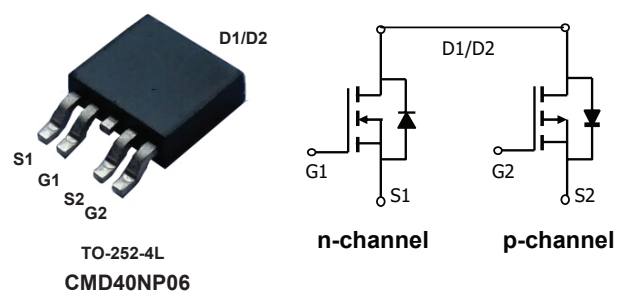
Product Summary

	BVDSS	RDS(on) max.	ID
N-Channel	60V	18mΩ	40A
P-Channel	-60V	38mΩ	-26A

Applications

- Power Management
- Load Switch
- DC/DC Converter

TO-252-4L Pin Configuration



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	40	-26	A
$I_D@T_C=70^{\circ}C$	Continuous Drain Current	28	-16	A
I_{DM}	Pulsed Drain Current	160	-104	A
EAS	Single Pulse Avalanche Energy ¹	115	144	mJ
$P_D@T_C=25^{\circ}C$	Power Dissipation	75	50	W
T_{STG}	Storage Temperature Range	-55 to 150	-55 to 150	°C
T_J	Operating Junction Temperature Range	-55 to 150	-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

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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	---	2.5	°C/W

N Channel Electrical Characteristics (T_J=25°C unless otherwise noted)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V$, $I_D=250\mu A$	60	---	---	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance	$V_{GS}=10V$, $I_D=20A$	---	14	18	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	---	3	V
I_{DSS}	Drain-Source Leakage Current	$V_{DS}=60V$, $V_{GS}=0V$	---	---	1	uA
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
Q_g	Total Gate Charge	$V_{DS}=48V$, $V_{GS}=4.5V$, $I_D=40A$	---	27	---	nC
Q_{gs}	Gate-Source Charge		---	7	---	
Q_{gd}	Gate-Drain Charge		---	10	---	
$T_{d(on)}$	Turn-On Delay Time	$V_{DS}=30V$, $V_{GS}=4.5V$, $I_D=25A$ $R_G=4.7\Omega$	---	20	---	ns
T_r	Rise Time		---	100	---	
$T_{d(off)}$	Turn-Off Delay Time		---	40	---	
T_f	Fall Time		---	20	---	
C_{iss}	Input Capacitance	$V_{DS}=25V$, $V_{GS}=0V$, $f=1MHz$	---	2500	---	pF
C_{oss}	Output Capacitance		---	125	---	
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	---	---	40	A
I_{SM}	Pulsed Source Current		---	---	160	A
V_{SD}	Diode Forward Voltage	$V_{GS}=0V$, $I_F=20A$, $T_J=25^\circ C$	---	0.89	1.2	V

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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	38	mΩ
		V _{GS} =-4.5V, I _D =-15A	---	38	47	
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	---	25	---	S
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 _{DS} =-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	---	1500	---	pF
C _{oss}	Output Capacitance		---	140	---	
C _{rss}	Reverse Transfer Capacitance		---	5	---	

Diode Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I _S	Continuous Source Current	V _G =V _D =0V, Force Current	---	---	-26	A
I _{SM}	Pulsed Source Current		---	---	-104	A
V _{SD}	Diode Forward Voltage	V _{GS} =0V, I _F =-20A, T _J =25°C	---	-0.97	-1.2	V

Note:

- The EAS data shows Max. rating. The N-Channel test condition is V_{DD}=30V, V_{GS}=10V, L=0.5mH, I_{AS}=21.5A.
The P-Channel test condition is V_{DD}=-30V, V_{GS}=-10V, L=0.5mH, I_{AS}=-24A.

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

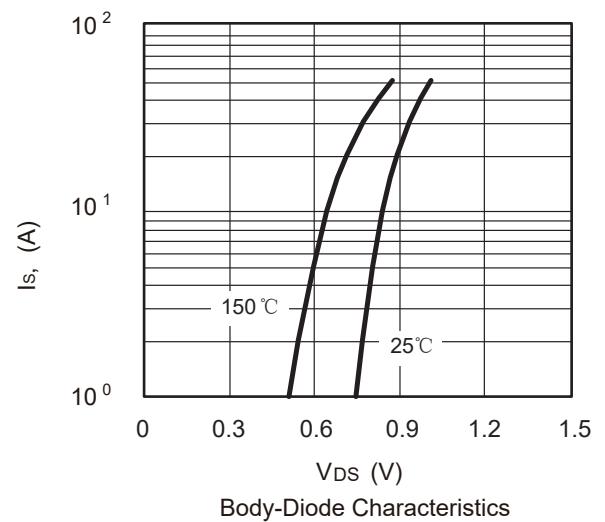
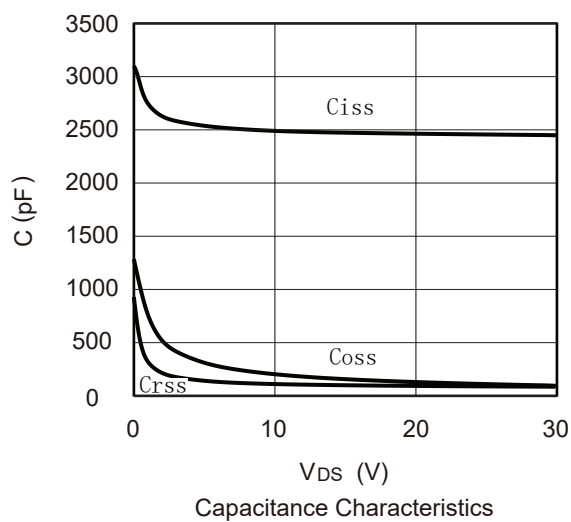
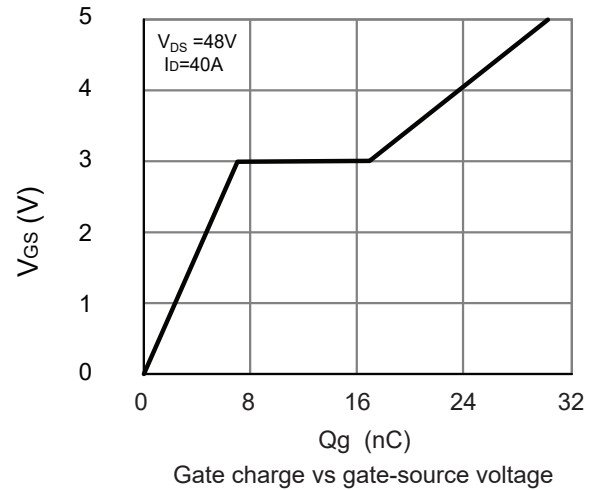
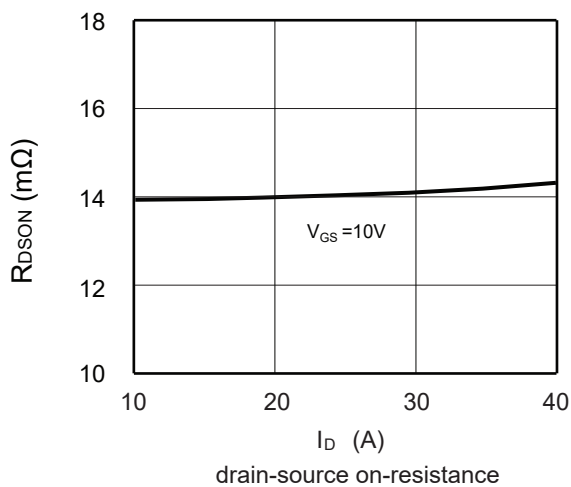
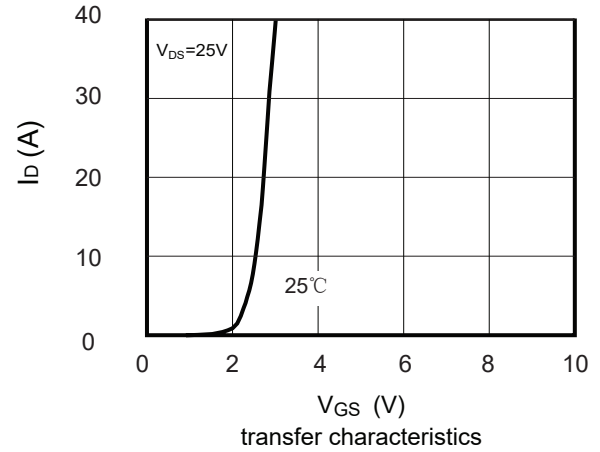
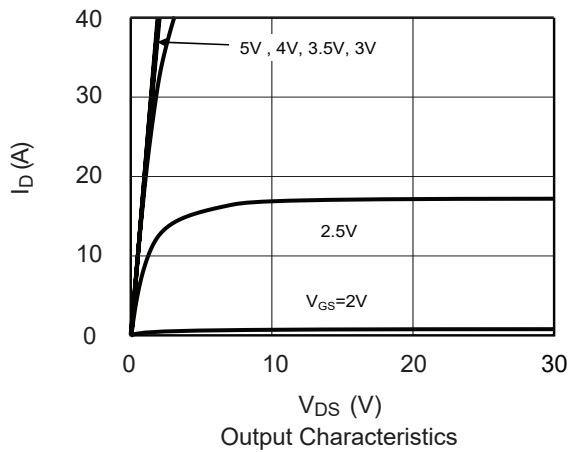
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Cmos reserves the right to improve product design, functions and reliability without notice.

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Typical Characteristics



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