

CMSC25NP06



60V, 36mΩ typ., 25A N-Channel MOSFET and -60V, 74mΩ typ., -15A P-Channel MOSFET

General Description

The CMSC25NP06 uses advanced trench technology MOSFETs to provide excellent RDS(ON) and low gate charge. The complementary MOSFETs may be used in Battery protection and other Switching Application.

Features

- N Channel+P Channel
- Low On-Resistance
- Surface Mount Package
- 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	25	-15	A
$I_D@T_C=100^{\circ}C$	Continuous Drain Current	17	-10	A
I_{DM}	Pulsed Drain Current	100	-60	A
EAS	Single Pulse Avalanche Energy ¹	20	27	mJ
$P_D@T_C=25^{\circ}C$	Power Dissipation	35	30	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	---	3.57	°C/W

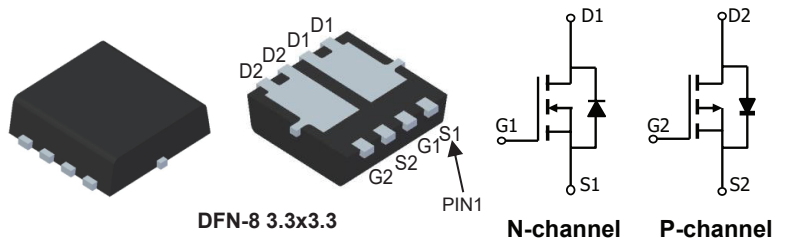
Product Summary

	BVDSS	R _{DS(on)} max.	ID
N-Channel	60V	42mΩ	25A
P-Channel	-60V	84mΩ	-15A

Applications

- Load switch
- Battery protection

DFN-8 3.3X3.3 Dual Pin Configuration



Type	Package	Marking
CMSC25NP06	DFN-8 3.3X3.3 Dual	25NP06

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	---	4.17	°C/W

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	$V_{GS}=10V$, $I_D=10A$	---	36	42	mΩ
		$V_{GS}=4.5V$, $I_D=5A$	---	40	48	
$V_{GS(th)}$	Gate Threshold Voltage	$V_{GS}=V_{DS}$, $I_D=250\mu A$	1	---	3	V
I_{DSS}	Drain-Source Leakage Current	$V_{DS}=60V$, $V_{GS}=0V$, $T_J=25^{\circ}\text{C}$	---	---	1	μA
I_{GSS}	Gate-Source Leakage Current	$V_{GS}=\pm 20V$, $V_{DS}=0V$	---	---	±100	nA
g_{fs}	Forward Transconductance	$V_{DS}=5V$, $I_D=4.5A$	---	19	---	S
R_g	Gate Resistance	$V_{DS}=0V$, $V_{GS}=0V$, $f=1\text{MHz}$	---	1.5	---	Ω
Q_g	Total Gate Charge	$V_{DD}=48V$, $I_D=5.5A$ $V_{GS}=10V$	---	15	---	nC
Q_{gs}	Gate-Source Charge		---	2.2	---	
Q_{gd}	Gate-Drain Charge		---	4.3	---	
$T_{d(on)}$	Turn-On Delay Time	$V_{DD}=48V$, $V_{GS}=10V$, $R_G=2.5\Omega$ $I_D=5.5A$	---	7	---	ns
T_r	Rise Time		---	13	---	
$T_{d(off)}$	Turn-Off Delay Time		---	18	---	
T_f	Fall Time		---	2.5	---	
C_{iss}	Input Capacitance	$V_{DS}=25V$, $V_{GS}=0V$, $f=1\text{MHz}$	---	620	---	pF
C_{oss}	Output Capacitance		---	40	---	
C_{rss}	Reverse Transfer Capacitance		---	30	---	

Diode Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I_S	Diode continuous forward current	$V_G=V_D=0V$, Force Current	---	---	25	A
$I_{S,pulse}$	Diode pulse current		---	---	100	A
V_{SD}	Diode Forward Voltage	$V_{GS}=0V$, $I_F=20A$, $T_J=25^{\circ}\text{C}$	---	0.96	1.3	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 =-10A	---	74	84	mΩ
		V _{GS} =-4.5V, I _D =-5A	---	93	110	
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	μA
		V _{DS} =-60V, V _{GS} =0V, T _J =125°C	---	---	-10	
I _{GSS}	Gate-Source Leakage Current	V _{GS} =±20V, V _{DS} =0V	---	---	±100	nA
g _{fs}	Forward Transconductance	V _{DS} =-5V, I _D =-10A	---	11	---	S
R _g	Gate Resistance	V _{DS} =0V, V _{GS} =0V, f=1MHz	---	12	---	Ω
Q _g	Total Gate Charge	V _{DS} =-30V, V _{GS} =-10V, I _D =-3A	---	19	---	nC
Q _{gs}	Gate-Source Charge		---	3.4	---	
Q _{gd}	Gate-Drain Charge		---	4.4	---	
T _{d(on)}	Turn-On Delay Time	V _{DD} =-30V, V _{GS} =-10V, I _D =-3A R _G =3Ω	---	5	---	ns
T _r	Rise Time		---	23	---	
T _{d(off)}	Turn-Off Delay Time		---	34	---	
T _f	Fall Time		---	42	---	
C _{iss}	Input Capacitance	V _{DS} =-25V, V _{GS} =0V, f=1MHz	---	880	---	pF
C _{oss}	Output Capacitance		---	50	---	
C _{rss}	Reverse Transfer Capacitance		---	40	---	

Diode Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I _S	Continuous Source Current	V _G =V _D =0V, Force Current	---	---	-15	A
I _{SM}	Pulsed Source Current		---	---	-60	A
V _{SD}	Diode Forward Voltage	V _{GS} =0V, I _F =-20A, T _J =25°C	---	-1	-1.3	V

Note:

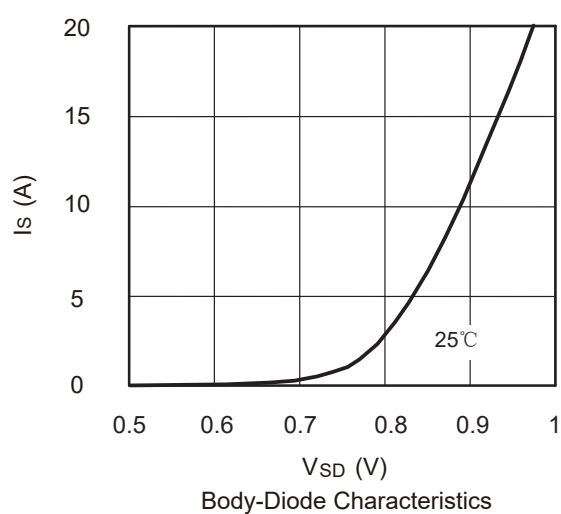
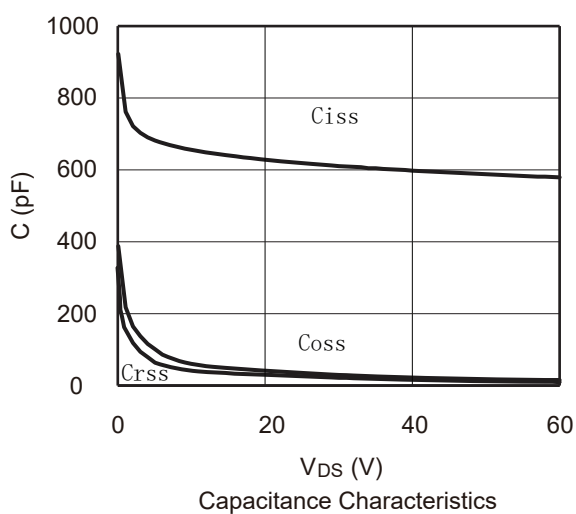
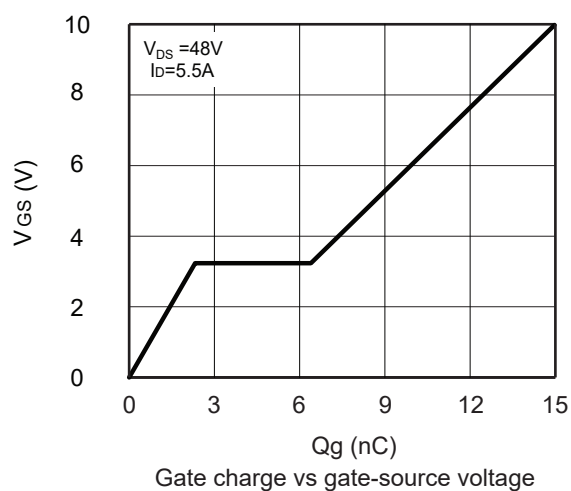
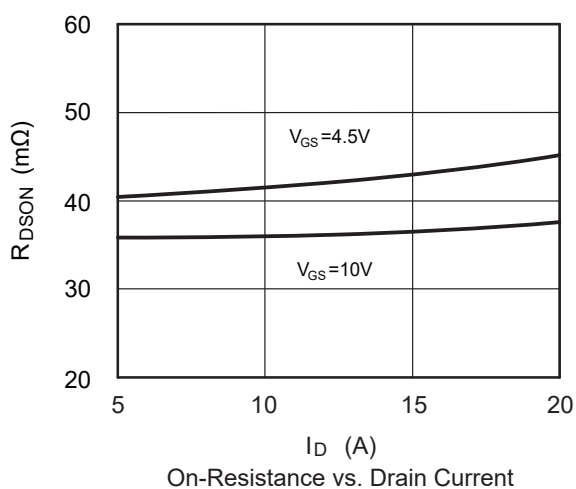
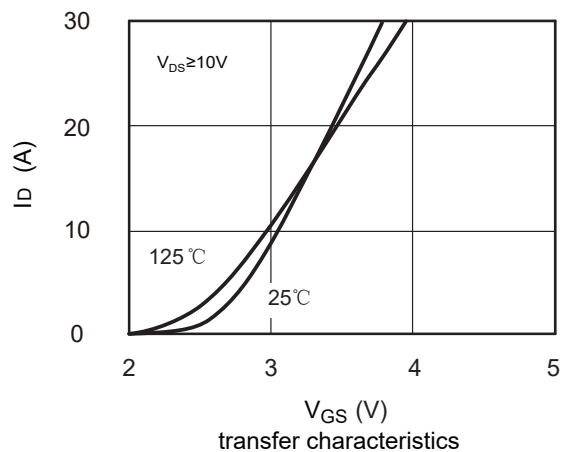
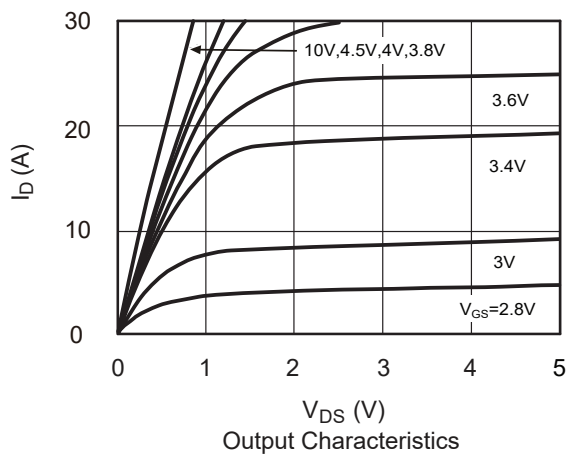
1. The EAS data shows Max. rating . The N-Channel test condition is V_{DD}=35V, V_{GS}=10V, L=0.3mH, I_{AS}=11.5A.The P-Channel test condition is V_{DD}=-35V, V_{GS}=-10V, L=0.3mH, I_{AS}=-13.5A.

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

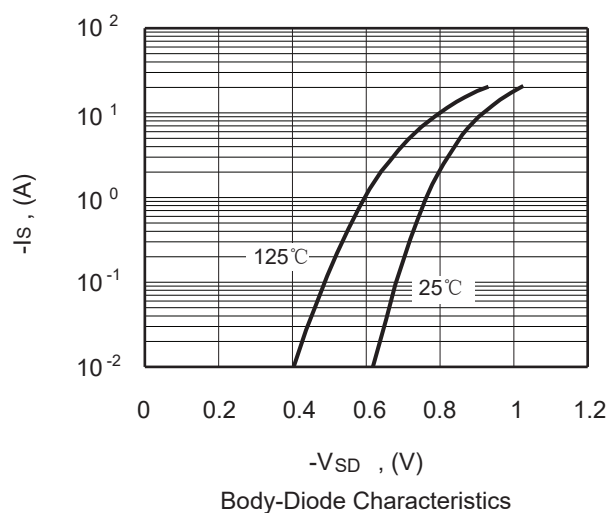
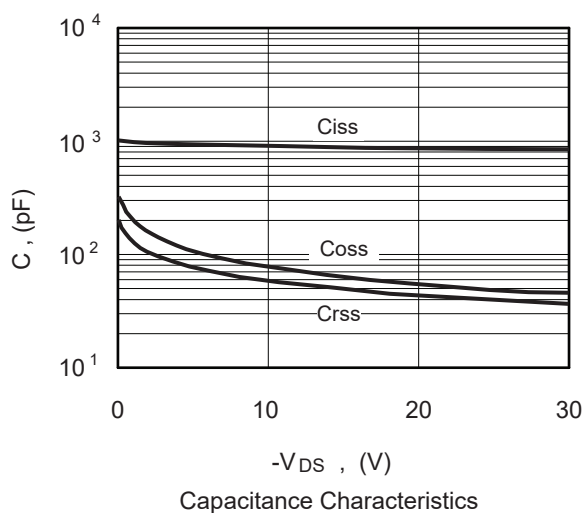
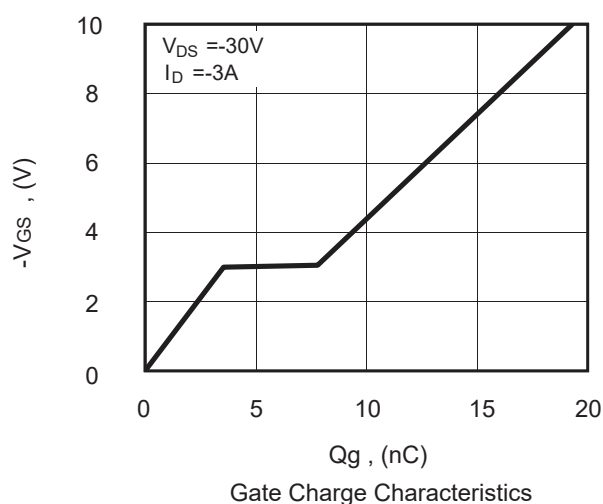
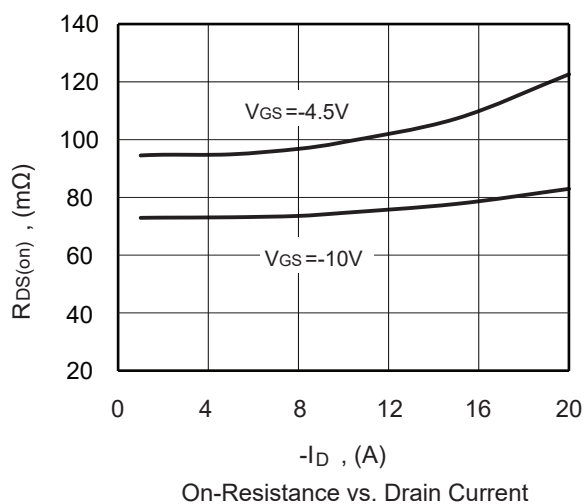
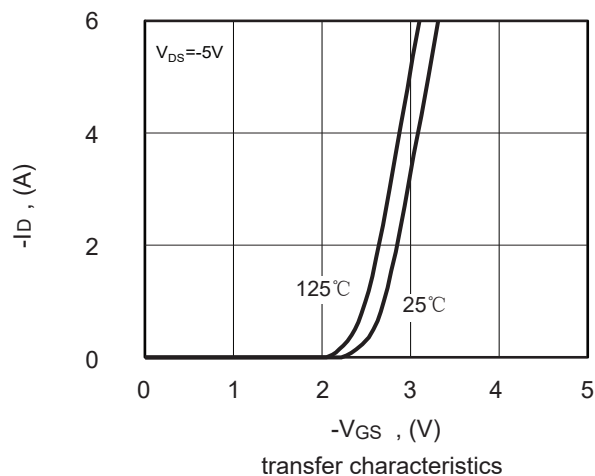
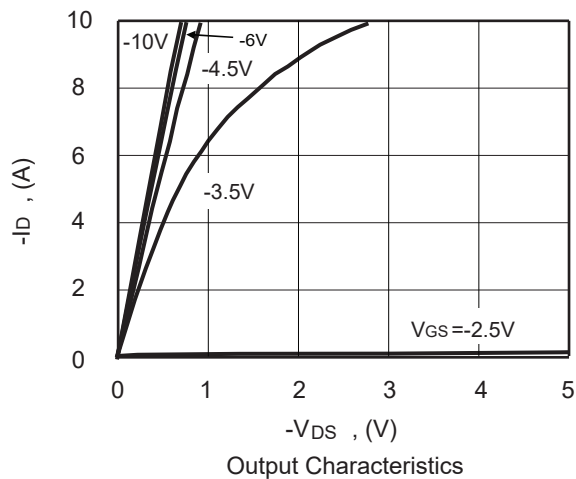
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Cmos reserves the right to improve product design, functions and reliability without notice. Please refer to the latest version of specification.

Typical Characteristics:N-Channel



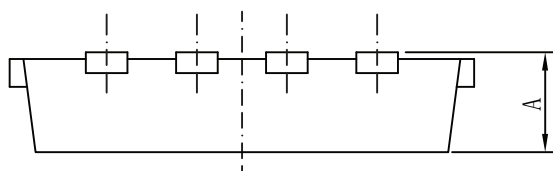
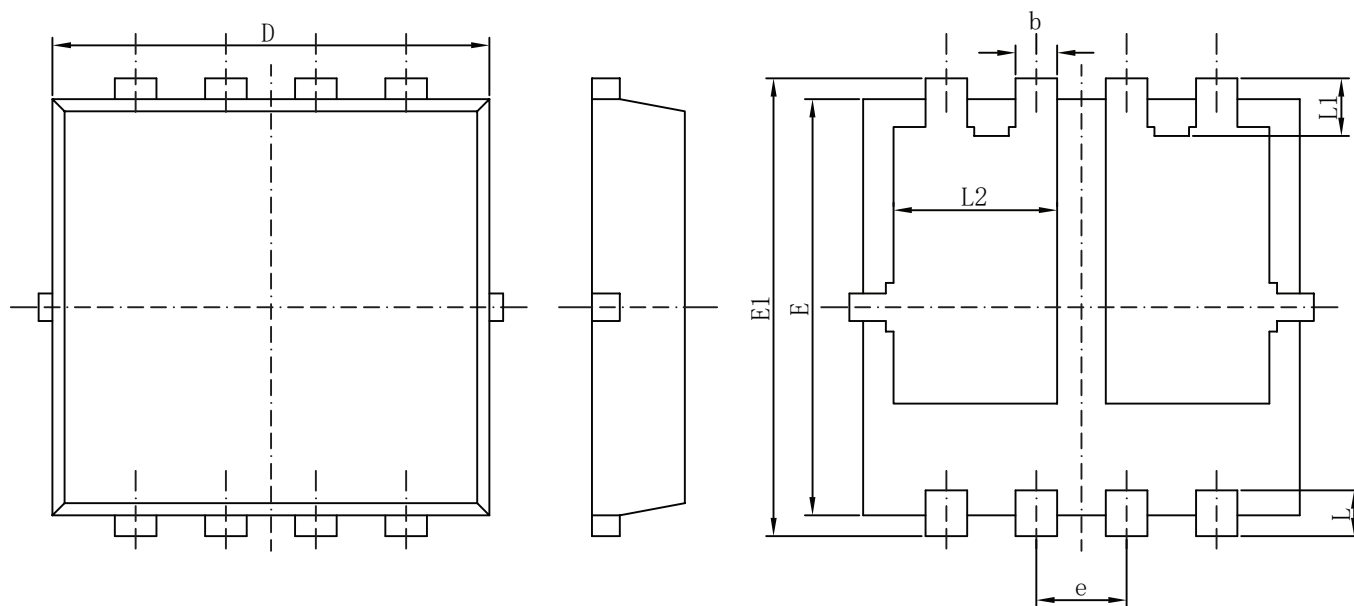
Typical Characteristics:P-Channel



Package Dimension

DFN-8 3.3X3.3 Dual

Unit :mm



注:

1. 未注公差 ± 0.10
2. 塑封体无缺损、缩孔、裂纹、气泡等不良缺陷
3. 标注单位mm

Dimensions In Millimeters			
Symbol	Min.	Max.	Ave.
A	0.700	0.900	0.800
D	3.000	3.200	3.100
E	3.000	3.200	3.100
E1	3.200	3.600	3.400
b	0.200	0.400	0.300
e	0.550	0.750	0.650
L	0.300	0.600	0.450
L1	0.395	0.695	0.545
L2	0.885	1.185	1.035