CMC3606

30V, 21mΩ typ., 4.5A N-Channel MOSFET and -30V, 52mΩ typ., -3.2A P-Channel MOSFET

General Description

The CMC3606 is the highest performance trench N-ch and P-ch MOSFETs with high cell density , which provide excellent RDSON and gate charge for most of the synchronous buck converter applications .

Product Summary

	BVDSS	$R_{DS(on)}$ max.	ID
N-Channel	30V	28mΩ	4.5A
P-Channel	-30V	60mΩ	-3.2A

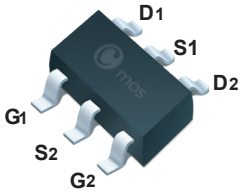
Applications

- Synchronous Rectification.
- High Current, High Speed Switching.
- Protable equipment application

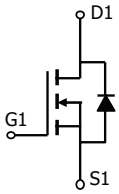
Features

- Low On-Resistance
- Improved dv/dt capability
- Fast switching
- RoHS Compliant

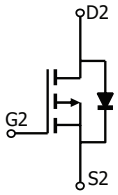
TSOP-6 Pin Configuration



TSOP-6



N-channel



P-channel

Type	Package	Marking
CMC3606	TSOP-6	3606

Absolute Maximum Ratings

Symbol	Parameter	Max N-channel	Max P-channel	Units
V_{DS}	Drain-Source Voltage	30	-30	V
V_{GS}	Gate-Source Voltage	±20	±12	V
I_D@T_A=25℃	Continuous Drain Current	4.5	-3.2	A
I_D@T_A=70 ℃	Continuous Drain Current	3.2	-2.3	A
I_{DM}	Pulsed Drain Current	18	-12.8	A
P_D@T_A=25℃	Power Dissipation	1.14	1.25	W
T_{STG}	Storage Temperature Range	-55 to 150		℃
T_J	Operating Junction Temperature Range	-55 to 150		℃

Thermal Characteristics: N-channel

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Maximum Junction-to-Ambient	---	110	℃/W
$R_{\theta Jc}$	Maximum Junction-to-Case	---	80	℃/W

30V, 21mΩ typ., 4.5A N-Channel MOSFET and -30V, 52mΩ typ., -3.2A P-Channel MOSFET

Thermal Characteristics: P-channel

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Maximum Junction-to-Ambient	---	100	℃/W
$R_{\theta JC}$	Maximum Junction-to-Case	---	70	℃/W

N-channel 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	30	---	---	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance	V_{GS}=10V , I_D=10A	---	21	28	mΩ
		V_{GS}=4.5V , I_D=5A	---	36	55	
$V_{GS(th)}$	Gate Threshold Voltage	V_{GS}=V_{DS} , I_D = 250μA	1	---	3	V
I_{DSS}	Drain-Source Leakage Current	V_{DS}=30V , V_{GS}=0V	---	---	1	uA
		V_{DS}=24V , V_{GS}=0V , T_J=125℃	---	---	10	
I_{GSS}	Gate-Source Leakage Current	V_{GS} = ±20V	---	---	±100	nA
gfs	Forward Transconductance	V_{DS}=5V, I_D=10A	---	10	---	S
Q_g	Total Gate Charge	V_{DS}=15V , I_D=8A V_{GS}=4.5V	---	4.2	---	nC
Q_{gs}	Gate-Source Charge		---	1	---	
Q_{gd}	Gate-Drain Charge		---	2.5	---	
$T_{d(on)}$	Turn-On Delay Time	V_{DD}=15V , V_{GS}=10V , R_G=6Ω I_D=1A	---	3	---	ns
T_r	Rise Time		---	8	---	
$T_{d(off)}$	Turn-Off Delay Time		---	18	---	
T_f	Fall Time		---	5	---	
C_{iss}	Input Capacitance	V_{DS}= 25V, V_{GS}=0V , f=1MHz	---	650	---	pF
C_{oss}	Output Capacitance		---	60	---	
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	---	---	4.5	A
$I_{S,pulse}$	Diode pulse current		---	---	18	A
V_{SD}	Diode Forward Voltage	V_{GS}=0V , I_F=1A , Tj=25℃	---	0.75	1	V

30V, 21mΩ typ., 4.5A N-Channel MOSFET and -30V, 52mΩ typ., -3.2A P-Channel MOSFET

P Channel Electrical Characteristics (TJ=25℃ unless otherwise noted)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V , I_D=-250uA	-30	---	---	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance	V_{GS}=-10V , I_D=-10A	---	52	60	mΩ
		V_{GS}=-4.5V , I_D=-5A	---	60	68	
$V_{GS(th)}$	Gate Threshold Voltage	V_{GS}=V_{DS} , I_D =-250 uA	-0.5	---	-1.5	V
I_{DSS}	Drain-Source Leakage Current	V_{DS}=-24V , V_{GS}=0V	---	---	-1	uA
I_{GSS}	Gate-Source Leakage Current	V_{GS} = ±12V , V_{DS}=0V	---	---	±100	nA
gfs	Forward Transconductance	V_{DS}=-5 V , I_D=-3A	---	12	---	S
Q_g	Total Gate Charge	I_D=-5.5A V_{DS}=-15V V_{GS}=-10V	---	15	---	nC
Q_{gs}	Gate-Source Charge		---	2	---	
Q_{gd}	Gate-Drain Charge		---	3	---	
$T_{d(on)}$	Turn-On Delay Time	V_{DD}=-15V I_D=-1A R_G=6Ω V_{GS}=-10V	---	10	---	ns
T_r	Rise Time		---	15	---	
$T_{d(off)}$	Turn-Off Delay Time		---	30	---	
T_f	Fall Time		---	7	---	
C_{iss}	Input Capacitance	V_{DS}=-25V , V_{GS}=0V , f=1MHz	---	750	---	pF
C_{oss}	Output Capacitance		---	40	---	
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	---	---	-3.2	A
I_{SM}	Pulsed Source Current		---	---	-12.8	A
V_{SD}	Diode Forward Voltage	V_{GS}=0V , I_F=-1A ,T_J=25℃	---	-0.76	-1.2	V

Note:

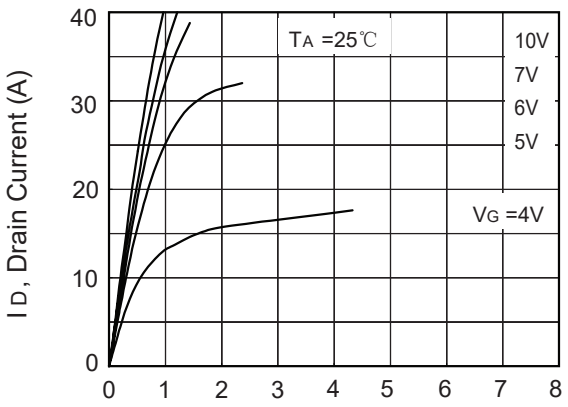
This product has been designed and qualified for the counsumer market.

Cmos assumes no liability for customers' product design or applications.

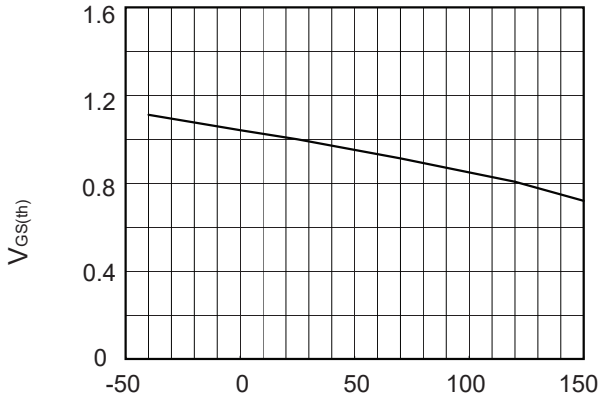
Cmos reserver the right to improve product design ,functions and reliability wihtout notice.

30V, 21mΩ typ., 4.5A N-Channel MOSFET and -30V, 52mΩ typ., -3.2A P-Channel MOSFET

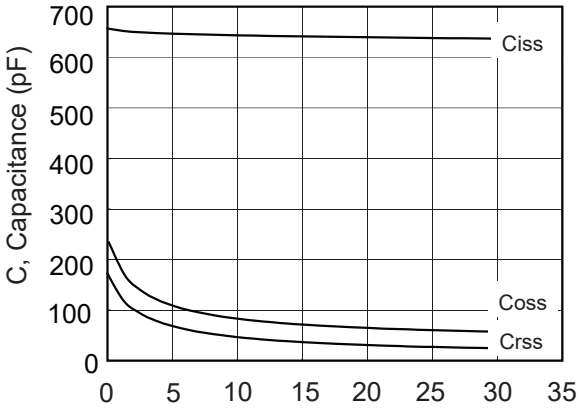
N-Channel:Typical Characteristics



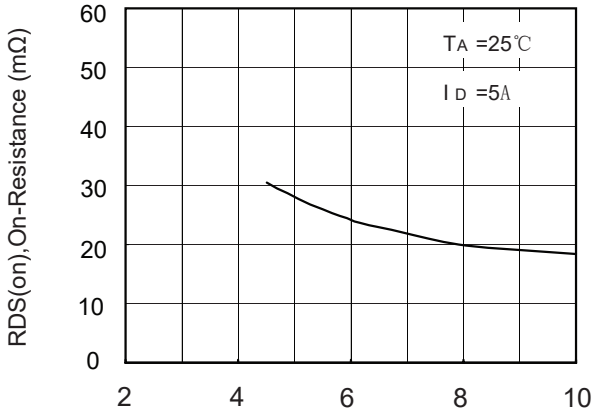
Output Characteristics



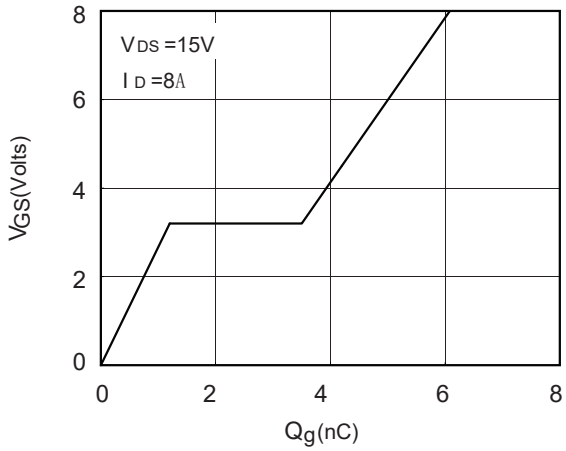
Gate Threshold Voltage v.s.Junction Temperature



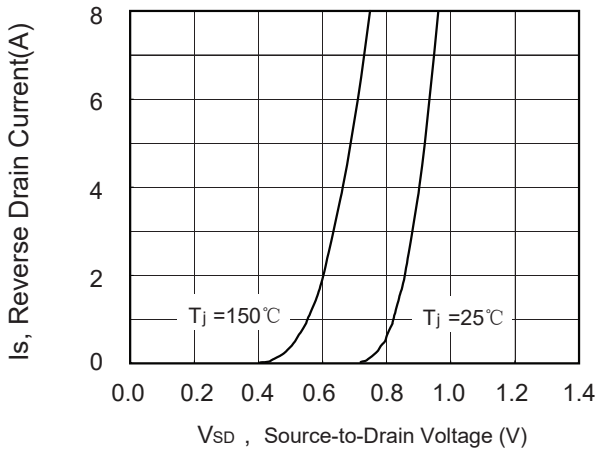
Capacitance Characteristics



On-Resistance vs. Gate Voltage

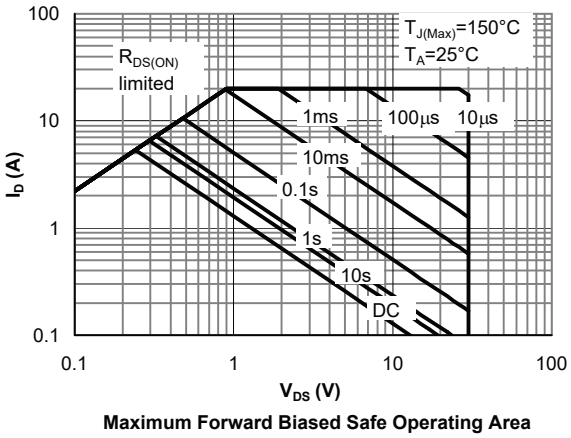


Gate Charge Characteristics



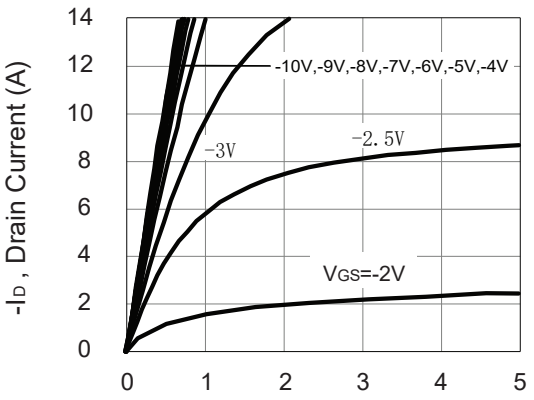
Body-Diode Characteristics

30V, 21mΩ typ., 4.5A N-Channel MOSFET and -30V, 52mΩ typ., -3.2A P-Channel MOSFET

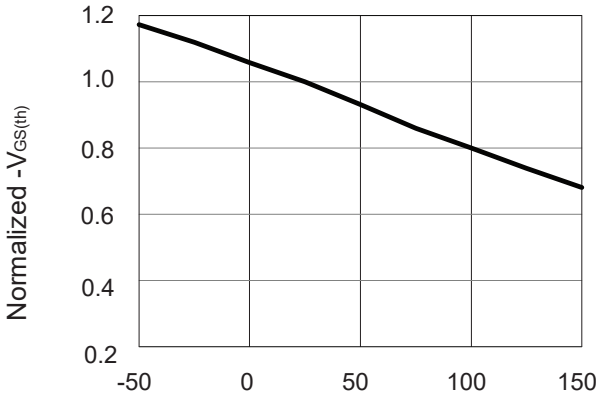


Maximum Forward Biased Safe Operating Area

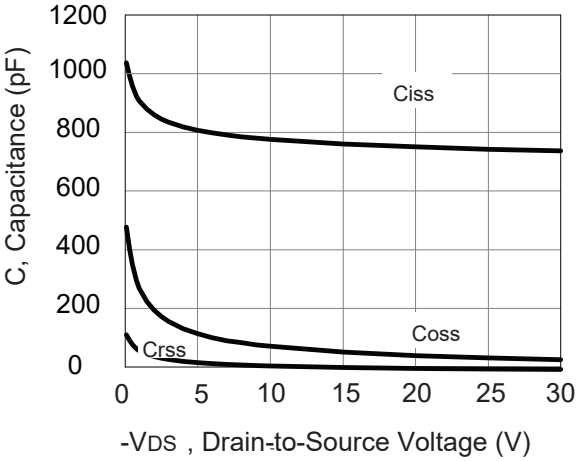
P-Channel:Typical Characteristics



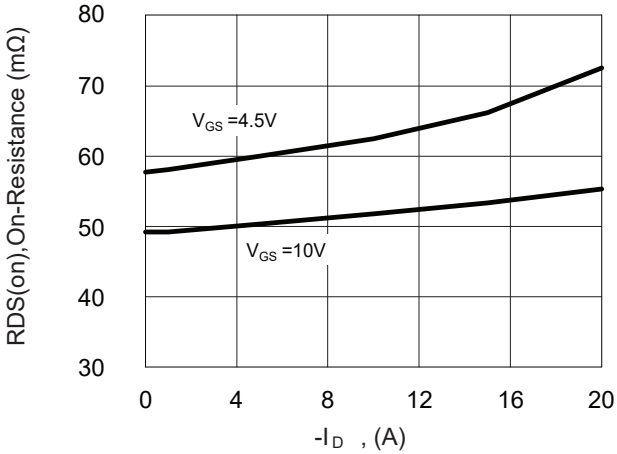
Output Characteristics



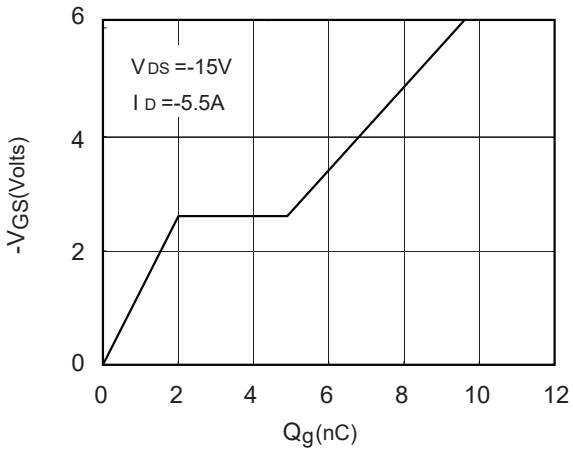
Gate Threshold Voltage v.s.Junction Temperature



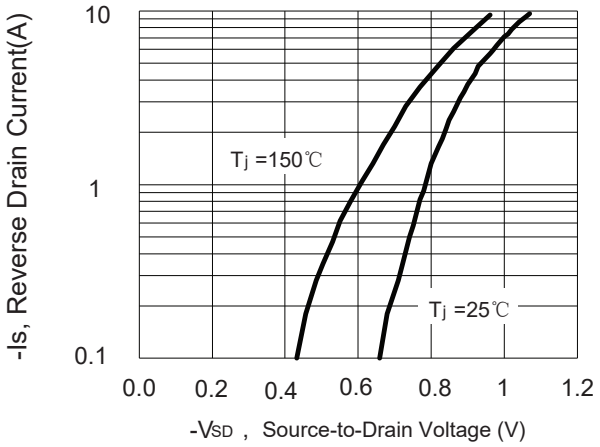
Capacitance Characteristics



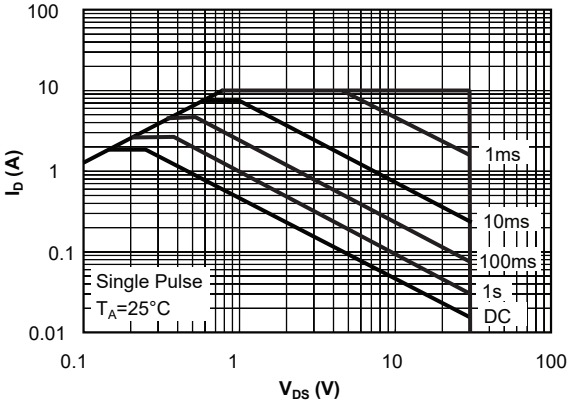
On-Resistance vs. Drain Current



Gate Charge Characteristics



Body-Diode Characteristics



Maximum Forward Biased Safe Operating Area