CMSA3606

N&P-Channel Enhancement Mode MOSFET

General Description

The CMSA3606 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	RDSON	ID
N-Channel	30V	21mΩ	25A
P-Channel	-30V	38mΩ	-20A

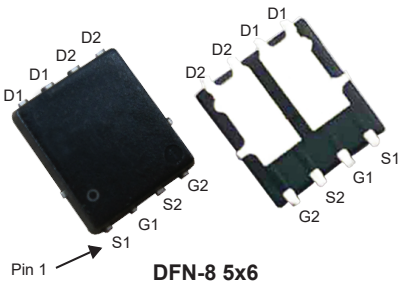
Applications

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

Features

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

DFN-8 5x6 Pin Configuration



DFN-8 5x6
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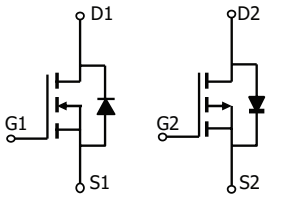

N-channel P-channel

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	±20	V
I_D@T_C=25℃	Continuous Drain Current	25	-20	A
I_D@T_C=100℃	Continuous Drain Current	17.5	-14	A
I_{DM}	Pulsed Drain Current	75	-60	A
EAS	Single Pulse Avalanche Energy [1]	33	33	mJ
P_D@T_C=25℃	Power Dissipation	20		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 (Steady-State) [2, 3]	---	70	℃/W
$R_{\theta JC}$	Maximum Junction-to-Case (Steady-State)	---	12	℃/W

Thermal Characteristics: P-channel

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Maximum Junction-to-Ambient (Steady-State)	---	65	℃/W
$R_{\theta JC}$	Maximum Junction-to-Case (Steady-State)	---	6	℃/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	---	16.5	21	mΩ
		V_{GS}=4.5V , I_D=5A	---	29	43	
$V_{GS(th)}$	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	---	9	---	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	---	---	25	A
$I_{S,pulse}$	Diode pulse current		---	---	75	A
V_{SD}	Diode Forward Voltage	V_{GS}=0V , I_F=1A , Tj=25℃	---	---	1	V

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=-250μA	-30	---	---	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance	V_{GS}=-10V , I_D=-10A	---	32	38	mΩ
		V_{GS}=-4.5V , I_D=-5A	---	50	75	
$V_{GS(th)}$	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 , V_{DS}=0V	---	---	±100	nA
gfs	Forward Transconductance	V_{DS}= -5V , I_D=-10A	---	9	---	S
Q_g	Total Gate Charge	V_{DS}=-15V, V_{GS}=-4.5V, I_D=-3A	---	6	---	nC
Q_{gs}	Gate-Source Charge		---	2	---	
Q_{gd}	Gate-Drain Charge		---	2.2	---	
$T_{d(on)}$	Turn-On Delay Time	V_{DD}=-15V , V_{GS}=-10V, I_D =-1A R_G=6Ω	---	4.5	---	ns
T_r	Rise Time		---	12	---	
$T_{d(off)}$	Turn-Off Delay Time		---	30	---	
T_f	Fall Time		---	7	---	
C_{iss}	Input Capacitance	V_{DS}=-25V , V_{GS}=0V , f=1MHz	---	650	---	pF
C_{oss}	Output Capacitance		---	60	---	
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	---	---	-20	A
I_{SM}	Pulsed Source Current		---	---	-60	A
V_{SD}	Diode Forward Voltage	V_{GS}=0V , I_F=-1A ,T_J=25℃	---	---	-1	V

Note:

1. The EAS data shows Max. rating . The N-Channel test condition is V_{DD}=25V , V_{GS}=10V , L=0.3mH , I_{AS}=15A.
   The P-Channel test condition is V_{DD}=-25V , V_{GS}=-10V , L=0.3mH , I_{AS}=-15A.
2. The value of $R_{\theta JA}$ is measured with the device mounted on 1in^2 FR-4 board with 2oz. Copper, in a still air environment with T_A =25℃. The Power dissipation P_{DSM} is based on $R_{\theta JA}$ t≤ 10s and the maximum allowed junction temperature of 150℃. The value in any given application depends on the user's specific board design.
3. The $R_{\theta JA}$ is the sum of the thermal impedance from junction to case $R_{\theta JC}$ and case to ambient.

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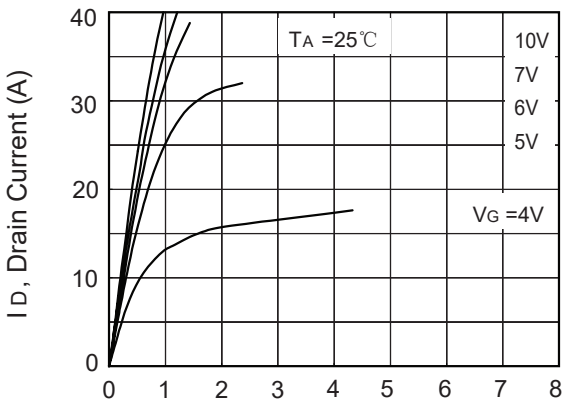
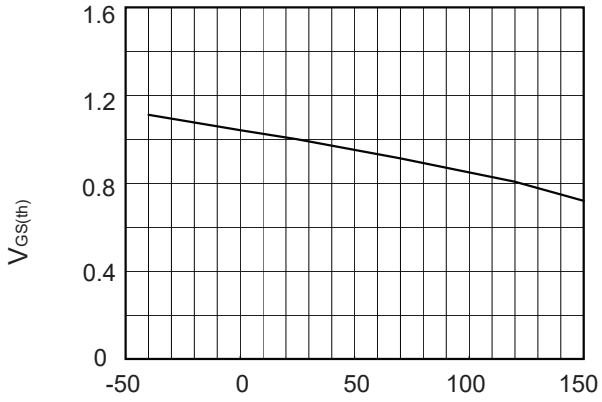
Cmos reserver the right to improve product design ,functions and reliability wihtout notice.

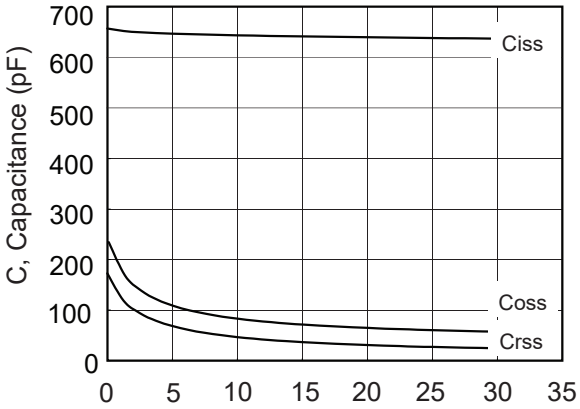
N-Channel:Typical Characteristics



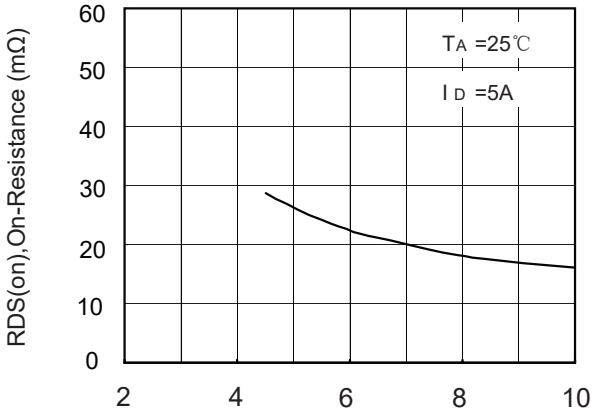
Output Characteristics



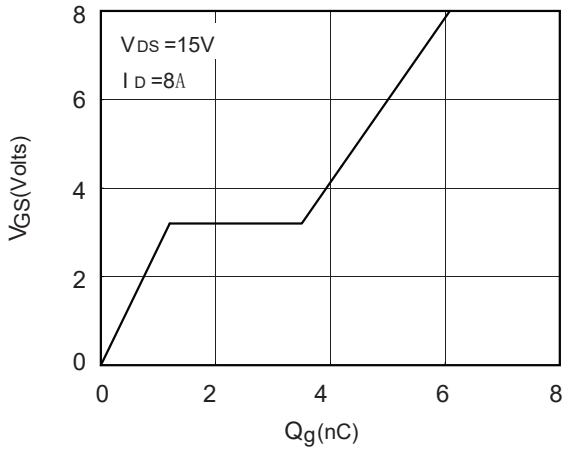
Gate Threshold Voltage v.s.Junction Temperature



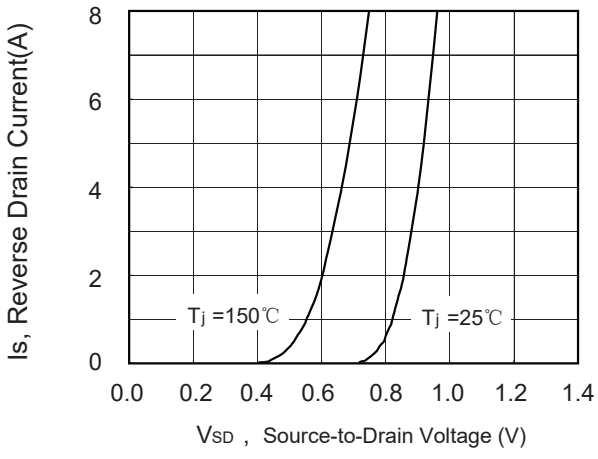
Capacitance Characteristics



On-Resistance vs. Gate Voltage

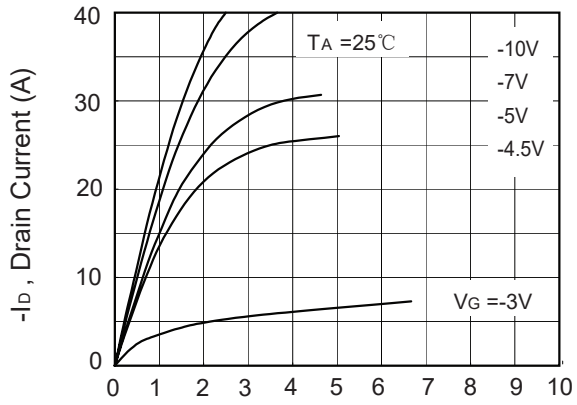


Gate Charge Characteristics

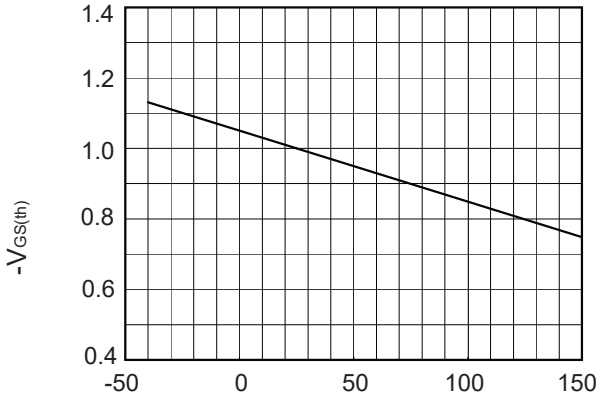


Body-Diode Characteristics

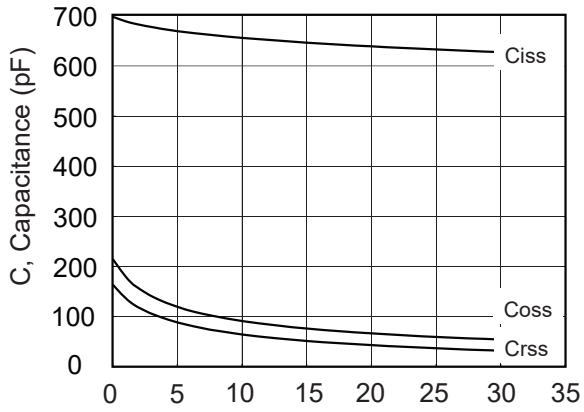
P-Channel:Typical Characteristics



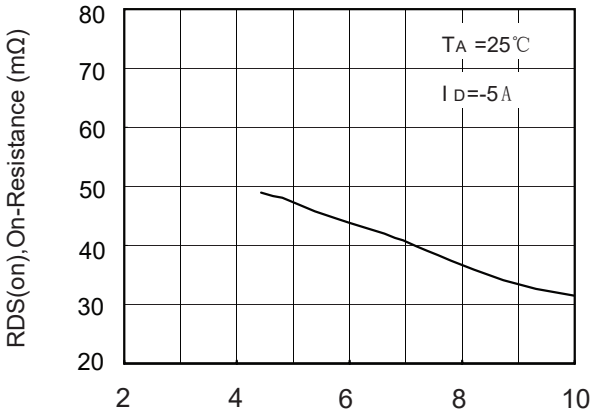
Output Characteristics



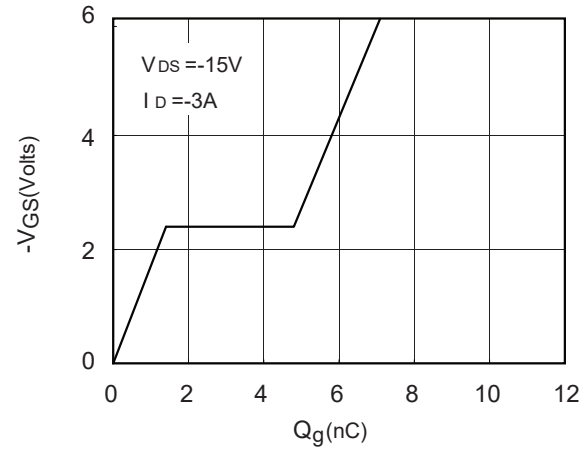
Gate Threshold Voltage v.s.Junction Temperature



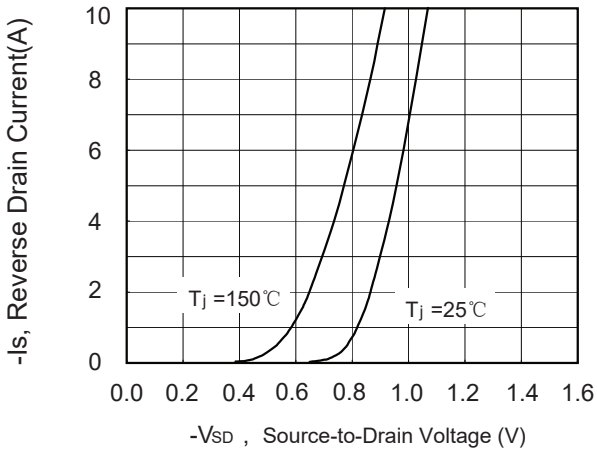
Capacitance Characteristics



On-Resistance vs. Gate Voltage



Gate Charge Characteristics



Body-Diode Characteristics