

CMSA3811A

30V, 10.5mΩ typ., 16A N-Channel MOSFET and -30V, 45mΩ typ., -15A P-Channel MOSFET

General Description

The CMSA3811A uses advanced trench technology to provide excellent RDS(ON) and low gate charge.

This device is suitable for use in a wide range of power applications.

Features

- Trench Power MOSFET
- Low On-Resistance
- Surface mount package
- RoHS Compliant

Absolute Maximum Ratings

Symbol	Parameter	N-channel	P-channel	Units
V_{DS}	Drain-Source Voltage	30	-30	V
V_{GS}	Gate-Source Voltage	±20	±20	V
$I_D@T_C=25^{\circ}C$	Continuous Drain Current	16	-15	A
$I_D@T_C=100^{\circ}C$	Continuous Drain Current	10	-10	A
I_{DM}	Pulsed Drain Current	48	-45	A
EAS	Single Pulse Avalanche Energy (Note 1)	42	56	mJ
$P_D@T_C=25^{\circ}C$	Total Power Dissipation	15	15	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
$R_{\theta JA}$	Maximum Junction-to-Ambient (Steady-State)	---	70	°C/W
$R_{\theta JC}$	Maximum Junction-to-Case (Steady-State)	---	8.33	°C/W

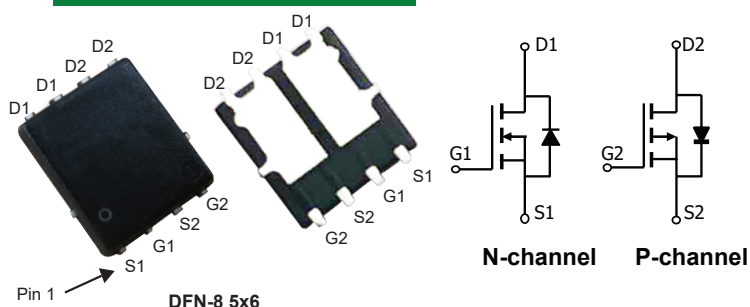
Product Summary

	BVDSS	R _{DS(on)} max.	ID
N-Channel	30V	12mΩ	16A
P-Channel	-30V	58mΩ	-15A

Applications

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

DFN-8 5x6 Pin Configuration



Type	Package	Marking
CMSA3811A	DFN- 8 5x6	CMSA3811A

30V, 10.5mΩ typ., 16A N-Channel MOSFET and -30V, 45mΩ typ., -15A P-Channel MOSFET
Thermal Characteristics: P-channel

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Maximum Junction-to-Ambient (Steady-State)	---	70	°C/W
$R_{\theta JC}$	Maximum Junction-to-Case (Steady-State)	---	8.33	°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	$V_{GS}=0V$, $I_D=250\mu A$	30	---	---	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance	$V_{GS}=10V$, $I_D=15A$	---	10.5	12	mΩ
		$V_{GS}=4.5V$, $I_D=10A$	---	15	21	
$V_{GS(th)}$	Gate Threshold Voltage	$V_{GS}=V_{DS}$, $I_D = 250\mu A$	1	---	3	V
I_{DSS}	Drain-Source Leakage Current	$V_{DS}=30V$, $V_{GS}=0V$	---	---	1	uA
		$V_{DS}=30V$, $V_{GS}=0V$, $T_J=55^{\circ}\text{C}$	---	---	5	
I_{GSS}	Gate-Source Leakage Current	$V_{GS} = \pm 20V$, $V_{DS}=0V$	---	---	± 100	nA
g_{fs}	Forward Transconductance	$V_{DS}=10V$, $I_D = 10A$	---	13	---	S
Q_g	Total Gate Charge	$V_{DS}=15V$, $I_D = 12A$ $V_{GS}=10V$	---	15	---	nC
Q_{gs}	Gate-Source Charge		---	2.5	---	
Q_{gd}	Gate-Drain Charge		---	3	---	
$T_{d(on)}$	Turn-On Delay Time	$V_{DS}=15V$, $V_{GS}=10V$, $R_{GEN}=3\Omega$ $R_L=1.25\Omega$	---	5	---	ns
T_r	Rise Time		---	10	---	
$T_{d(off)}$	Turn-Off Delay Time		---	16	---	
T_f	Fall Time		---	6	---	
C_{iss}	Input Capacitance	$V_{DS}= 25V$, $V_{GS}=0V$, $f=1\text{MHz}$	---	980	---	pF
C_{oss}	Output Capacitance		---	110	---	
C_{rss}	Reverse Transfer Capacitance		---	90	---	

Diode Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I_S	Diode continuous forward current	$V_G=V_D=0V$, Force Current	---	---	16	A
$I_{S,pulse}$	Diode pulse current		---	---	48	A
V_{SD}	Diode Forward Voltage	$V_{GS}=0V$, $I_F=1A$, $T_J=25^{\circ}\text{C}$	---	0.74	1.2	V

30V, 10.5mΩ typ., 16A N-Channel MOSFET and -30V, 45mΩ typ., -15A P-Channel MOSFET
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	-30	---	---	V
R _{DS(ON)}	Static Drain-Source On-Resistance	V _{GS} =-10V, I _D =-10A	---	45	58	mΩ
		V _{GS} =-4.5V, I _D =-8A	---	52	66	
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	μA
		V _{DS} =-30V, V _{GS} =0V, T _J =25°C	---	---	-5	
I _{GSS}	Gate-Source Leakage Current	V _{GS} =±20V, V _{DS} =0V	---	---	±100	nA
g _{fs}	Forward Transconductance	V _{DS} =-5V, I _D =-10A	---	13	---	S
Q _g	Total Gate Charge	V _{DS} =-24V, V _{GS} =-5V, I _D =-5A	---	13	---	nC
Q _{gs}	Gate-Source Charge		---	5	---	
Q _{gd}	Gate-Drain Charge		---	3	---	
T _{d(on)}	Turn-On Delay Time	V _{DD} =-15V, V _{GS} =-4.5V, I _D =-2.5A R _G =4.7Ω	---	25	---	ns
T _r	Rise Time		---	35	---	
T _{d(off)}	Turn-Off Delay Time		---	125	---	
T _f	Fall Time		---	35	---	
C _{iss}	Input Capacitance	V _{DS} =-25V, V _{GS} =0V, f=1MHz	---	1000	---	pF
C _{oss}	Output Capacitance		---	120	---	
C _{rss}	Reverse Transfer Capacitance		---	55	---	

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		---	---	-45	A
V _{SD}	Diode Forward Voltage	V _{GS} =0V, I _F =-1A, T _J =25°C	---	-0.75	-1.2	V

Note:

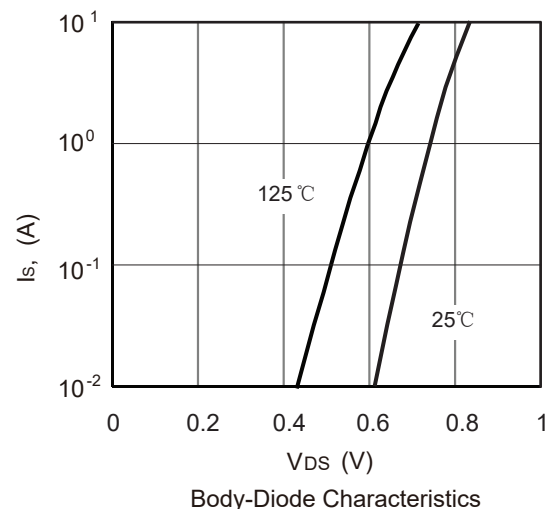
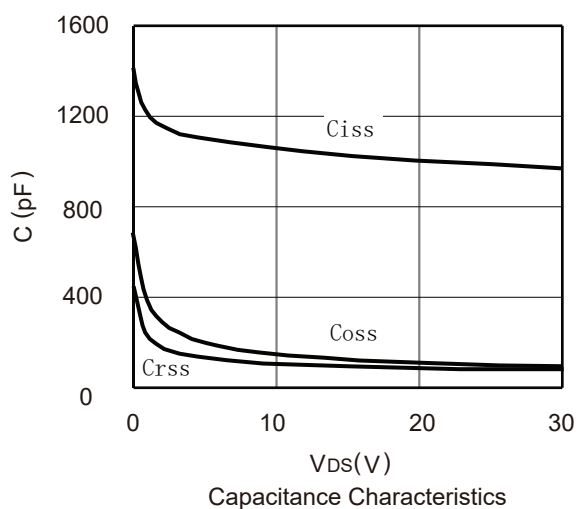
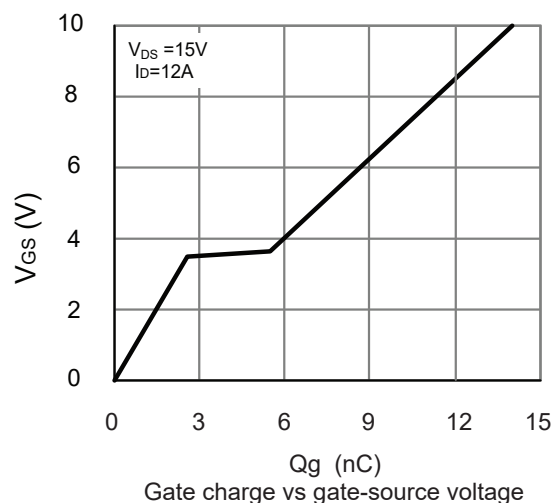
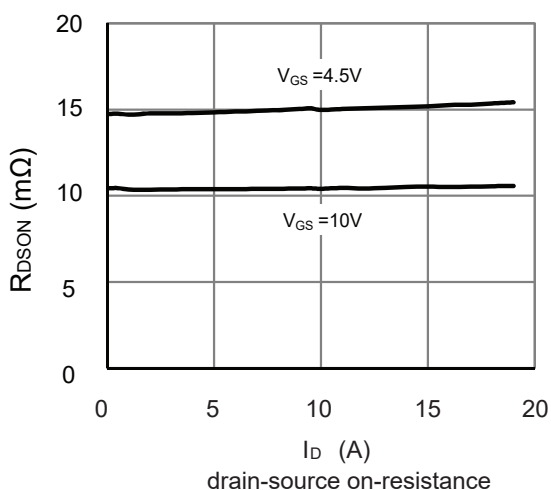
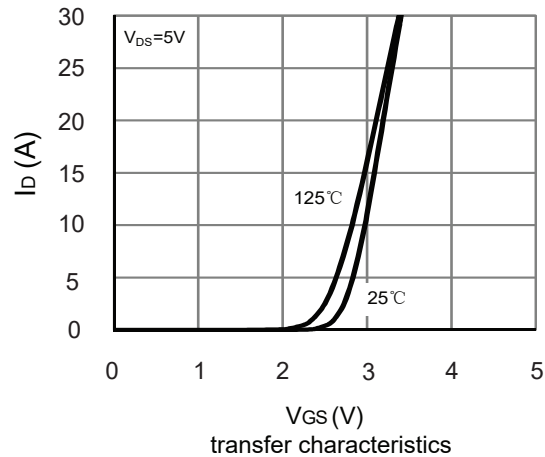
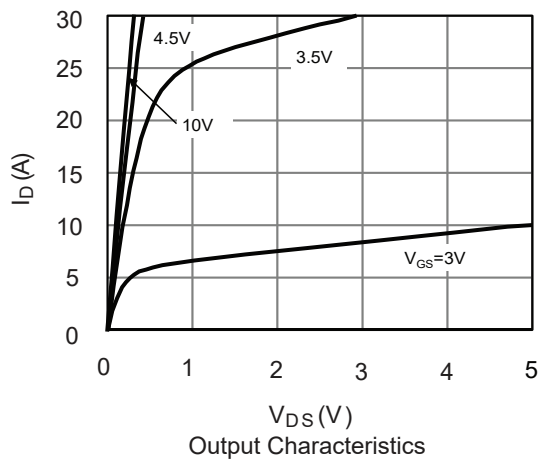
- The EAS data shows Max. rating. The N-Channel test condition is V_{DD}=25V, V_{GS}=10V, L=0.5mH, I_{AS}=13A.
The P-Channel test condition is V_{DD}=-25V, V_{GS}=-10V, L=0.5mH, I_{AS}=-15A.

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

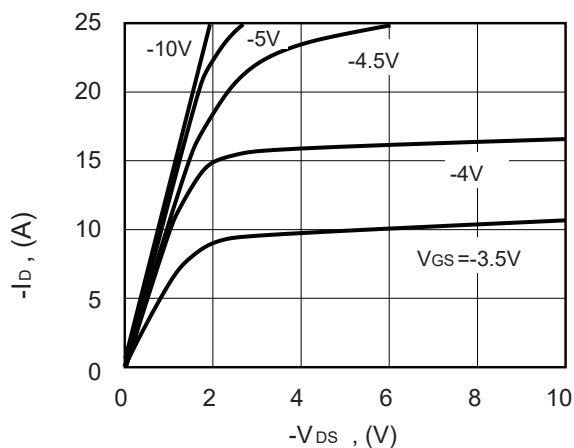
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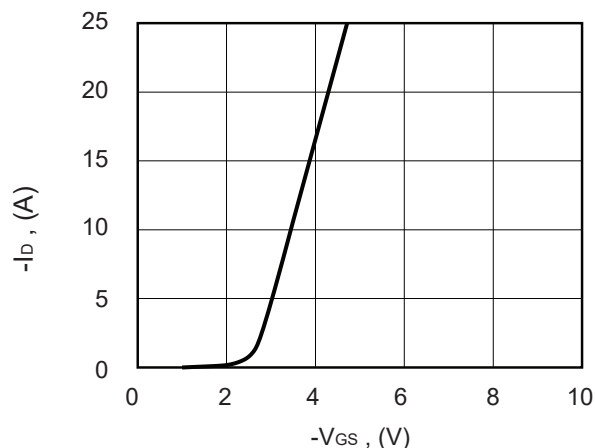
N-Channel: Typical Characteristics



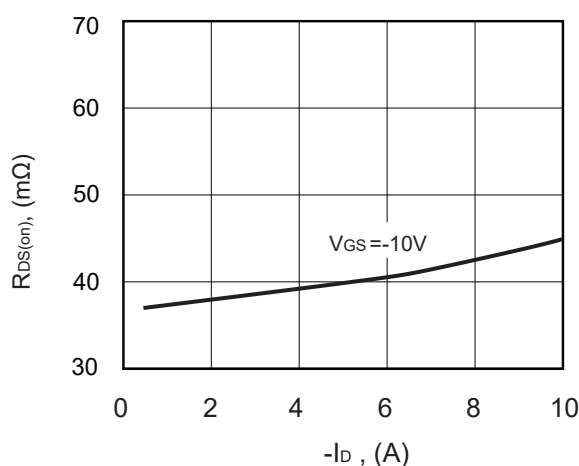
P-Channel: Typical Characteristics



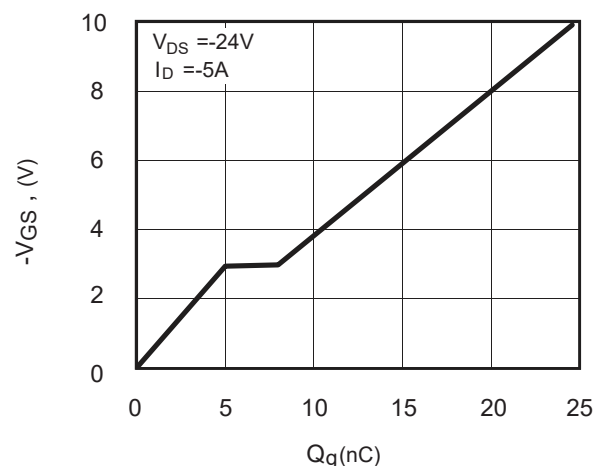
Output Characteristics



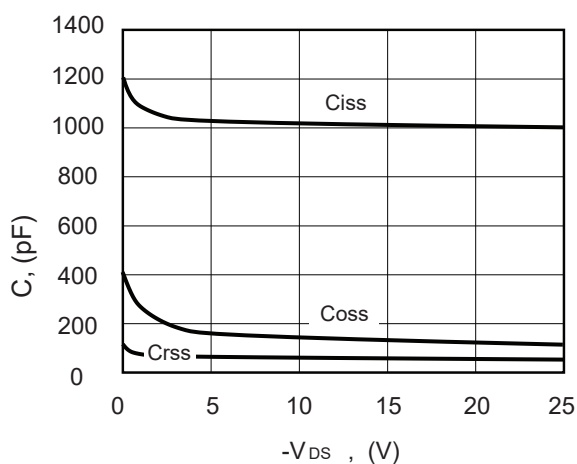
transfer characteristics



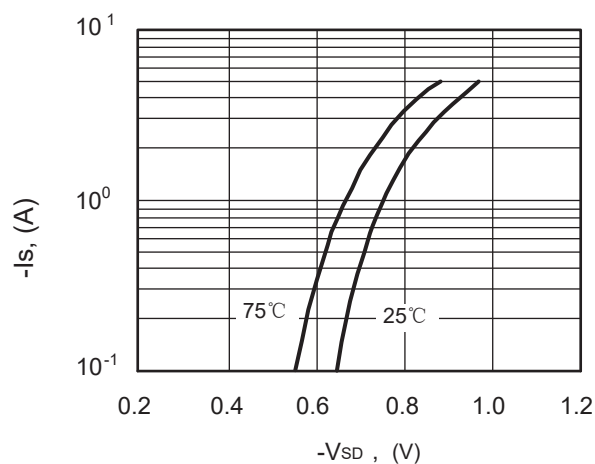
On-Resistance vs. Drain Current



Gate Charge Characteristics



Capacitance Characteristics



Body-Diode Characteristics