CMSA1402

20V, 3.7mΩ typ., 50A N-Channel MOSET

General Description

The CMSA1402 uses advanced process technology and design to provide excellent RDS(ON). This device is suitable for use as a Battery protection or in other Switching application.

Product Summary

BVDSS	$R_{DS(on)}$ max.	ID
20V	4.3mΩ	50A

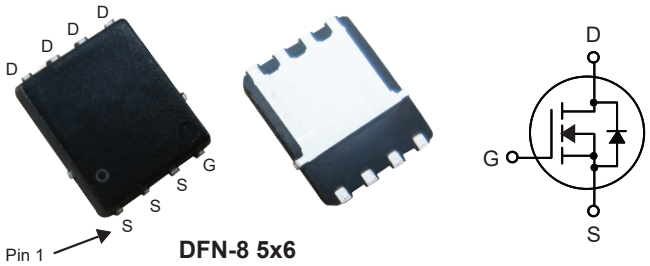
Applications

- DC/DC Converters in Computing, Servers, and POL
- Battery protection switch

Features

- Low On-Resistance
- 100% avalanche tested
- Simple Drive Requirements
- Surface Mount Package
- RoHS Compliant

DFN-8 5x6 Pin Configuration



Type	Package	Marking
CMSA1402	DFN-8 5x6	CMSA1402

Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	20	V
V_{GS}	Gate-Source Voltage	±12	V
I_D@T_C=25℃	Continuous Drain Current	50	A
I_D@T_C=100℃	Continuous Drain Current	35	A
I_{DM}	Pulsed Drain Current	200	A
EAS	Single Pulse Avalanche Energy [1]	115	mJ
P_D@T_C=25℃	Total Power Dissipation	50	W
T_{STG}	Storage Temperature Range	-55 to 150	℃
T_J	Operating Junction Temperature Range	-55 to 150	℃

Thermal Data

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction-ambient	---	60	℃/W
$R_{\theta JC}$	Thermal Resistance Junction-case	---	2.5	℃/W

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=250μA	20	---	---	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance	V_{GS}=10V , I_D=20A	---	3.7	4.3	mΩ
		V_{GS}= 4.5V, I_D=20A	---	4.1	5	
		V_{GS}= 2.5V, I_D=10A	---	5.4	7	
$V_{GS(th)}$	Gate Threshold Voltage	V_{GS}=V_{DS} , I_D = 250μA	0.5	---	1.5	V
I_{DSS}	Drain-Source Leakage Current	V_{DS}=20V , V_{GS}=0V	---	---	1	μA
I_{GSS}	Gate-Source Leakage Current	V_{GS} = ±12V	---	---	±100	nA
gfs	Forward Transconductance	V_{DS}=5V, I_D=30A	---	42	---	S
Q_g	Total Gate Charge	V_{DD}=10V , I_D=20A V_{GS}=4.5V	---	31	---	nC
Q_{gs}	Gate-Source Charge		---	5.2	---	
Q_{gd}	Gate-Drain Charge		---	8	---	
$T_{d(on)}$	Turn-On Delay Time	V_{DD}=10V , V_{GS}=10V , R_{GEN}=3Ω R_L=0.5Ω	---	8	---	ns
T_r	Rise Time		---	15	---	
$T_{d(off)}$	Turn-Off Delay Time		---	72	---	
T_f	Fall Time		---	21	---	
C_{iss}	Input Capacitance	V_{DS}= 20V, V_{GS}=0V , f=1MHz	---	2200	---	pF
C_{oss}	Output Capacitance		---	310	---	
C_{rss}	Reverse Transfer Capacitance		---	250	---	

Diode Characteristics

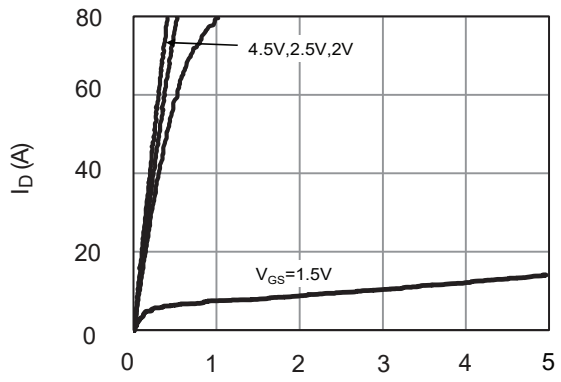
Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I_S	Diode continuous forward current	V_G=V_D=0V , Force Current	---	---	50	A
$I_{S,pulse}$	Diode pulse current		---	---	200	A
V_{SD}	Diode Forward Voltage	V_{GS}=0V , I_F=20A , Tj=25℃	---	0.85	1.2	V

Note :

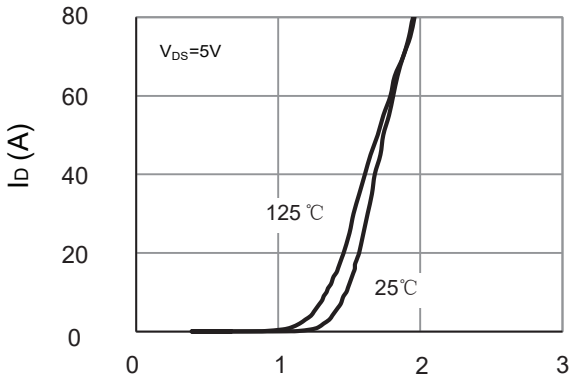
1.The EAS data shows Max. rating . The test condition is V_{DD}=20V , V_{GS}=10V , L=0.5mH , I_{AS}=21.5A

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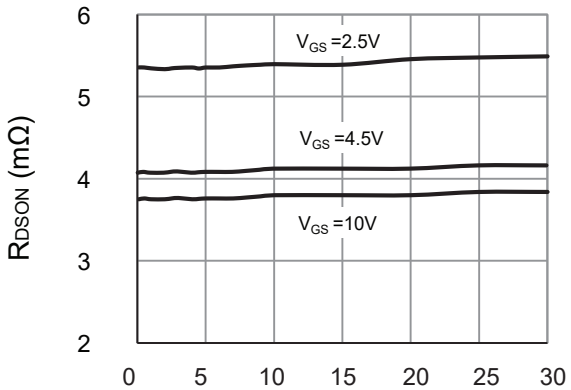
Typical Characteristics



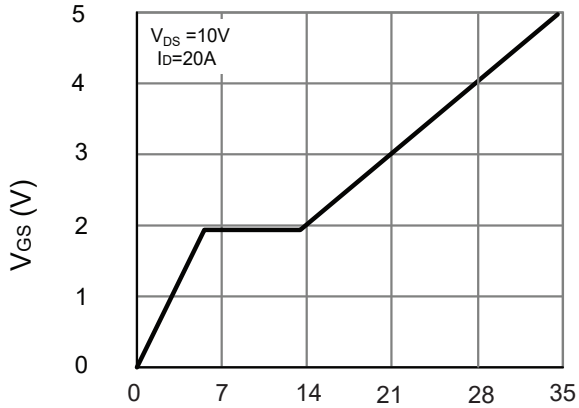
Output Characteristics



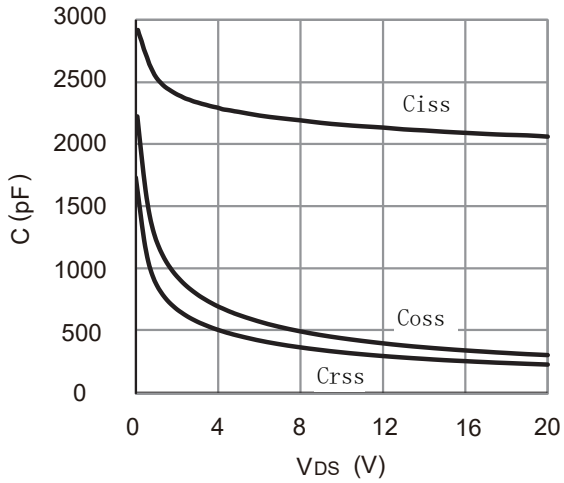
transfer characteristics



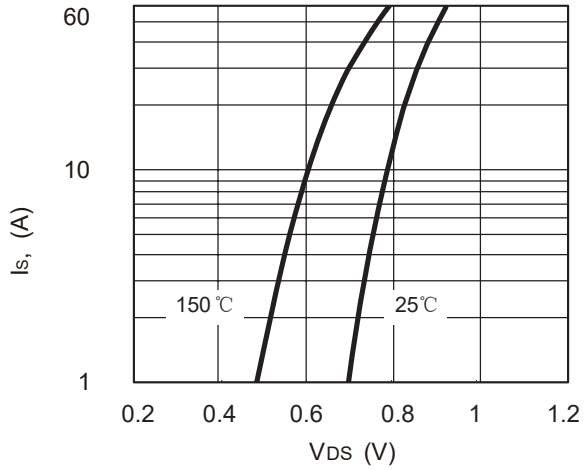
drain-source on-resistance



Gate charge vs gate-source voltage



Capacitance Characteristics



Body-Diode Characteristics