CMSC7502

N-Channel Enhancement Mode MOSET

General Description

The CMSC7502 uses advanced trench technology to provide excellent $R_{DS\,(ON)}$, low gate charge and minimize the loss of power conversion applications.

This device is suitable to be used as the low side FET in SMPS, load switching and general purpose.

Features

- N-Channel MOSFET
- Low ON-resistance
- Surface Mount Package
- RoHS Compliant

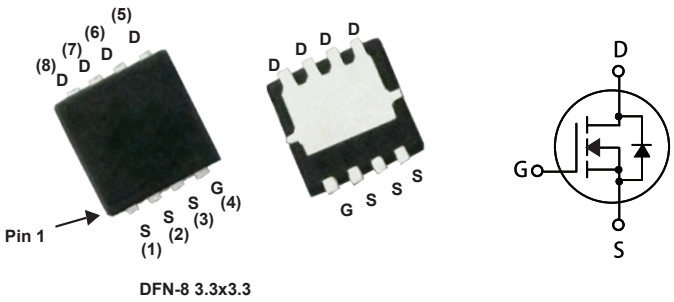
Product Summary

BVDSS	RDSON	ID
30V	5.5mΩ	40A

Applications

- High side in DC - DC Buck Converters
- Notebook battery power management
- Load switch in Notebook

DFN-8 3.3x3.3 Pin Configuration



DFN-8 3.3x3.3

Type	Package	Marking
CMSC7502	DFN-8 3.3*3.3	7502

Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	30	V
V_{GS}	Gate-Source Voltage	±20	V
I_D@T_C=25℃	Continuous Drain Current	40	A
I_D@T_C=100℃	Continuous Drain Current	28	A
I_{DM}	Pulsed Drain Current	160	A
EAS	Single Pulse Avalanche Energy[1]	100	mJ
P_D@T_C=25℃	Total Power Dissipation	45	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(Steady-State) [2,3]	---	75	℃/W
$R_{\theta JC}$	Thermal Resistance Junction-case(Steady-State)	---	4	℃/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=250uA	30	---	---	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance	V_{GS}=10V , I_D=20A	---	4.5	5.5	mΩ
		V_{GS}=6V , I_D=20A	---	6.5	9	
$V_{GS(th)}$	Gate Threshold Voltage	V_{GS}=V_{DS} , I_D = 250μA	1.4	---	3	V
I_{DSS}	Drain-Source Leakage Current	V_{DS}=30V , V_{GS}=0V	---	---	1	uA
I_{GSS}	Gate-Source Leakage Current	V_{GS} = ±20V , V_{DS}=0V	---	---	±100	nA
gfs	Forward Transconductance	V_{DS}=5V , I_D=20A	---	16	---	S
Q_g	Total Gate Charge	V_{DS}=15V , I_D= 20A V_{GS}=10 V	---	16	---	nC
Q_{gs}	Gate-Source Charge		---	5	---	
Q_{gd}	Gate-Drain Charge		---	3.5	---	
$T_{d(on)}$	Turn-On Delay Time	V_{DS} =15V , V_{GS}=10V , R_G =3Ω R_L =0.75Ω	---	8	---	ns
T_r	Rise Time		---	4	---	
$T_{d(off)}$	Turn-Off Delay Time		---	18	---	
T_f	Fall Time		---	5	---	
C_{iss}	Input Capacitance	V_{DS}= 25V, V_{GS}=0V , f=1MHz	---	1000	---	pF
C_{oss}	Output Capacitance		---	400	---	
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	---	---	40	A
$I_{S,pulse}$	Diode pulse current		---	---	160	A
V_{SD}	Diode Forward Voltage	V_{GS}=0V , I_F=20A , Tj=25℃	---	---	1.2	V

Notes:

1. The EAS data shows Max. rating . The test condition is V_{DD}=25V , V_{GS}=10V , L=0.5mH , I_{AS}=20A
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°C. The Power dissipation P_{DSM} is based on $R_{\theta JA}$ t≤ 10s and the maximum allowed junction temperature of 150°C. 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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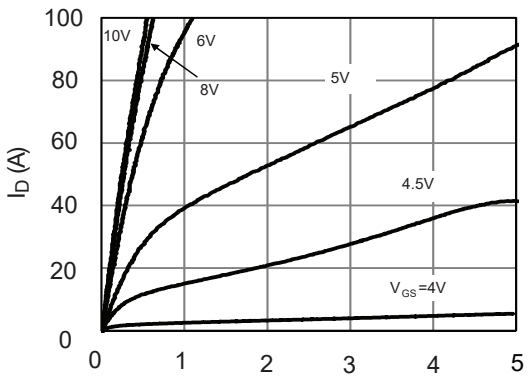
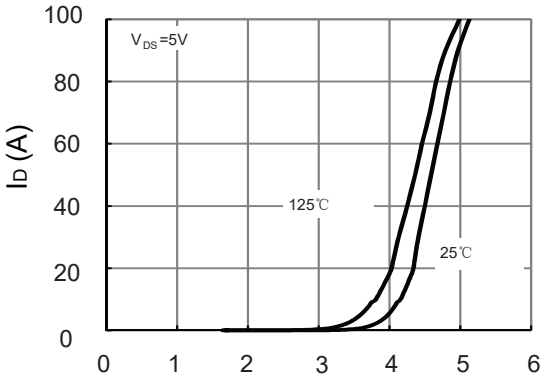
Cmos reserver the right to improve product design ,functions and reliability wihtout notice.

Typical Characteristics

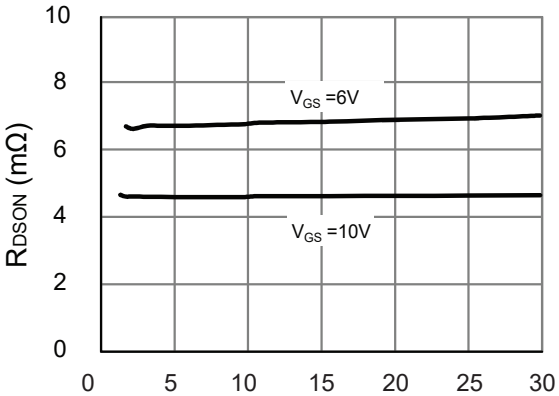


Output Characteristics

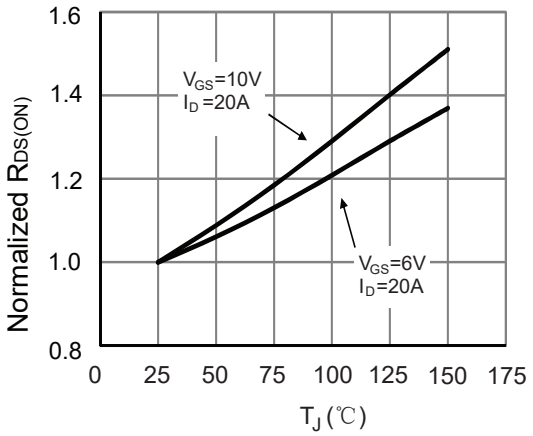
V_{GS} =10V
ID=25A



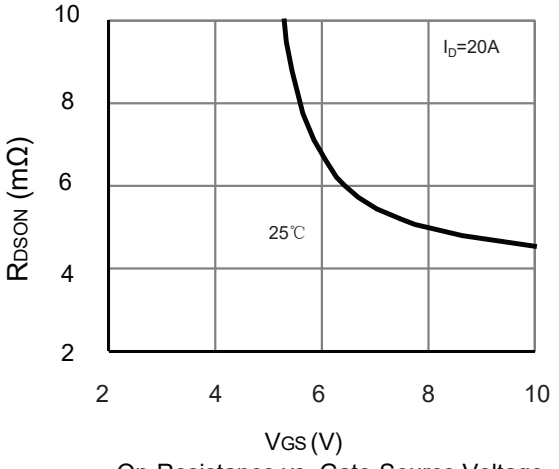
transfer characteristics



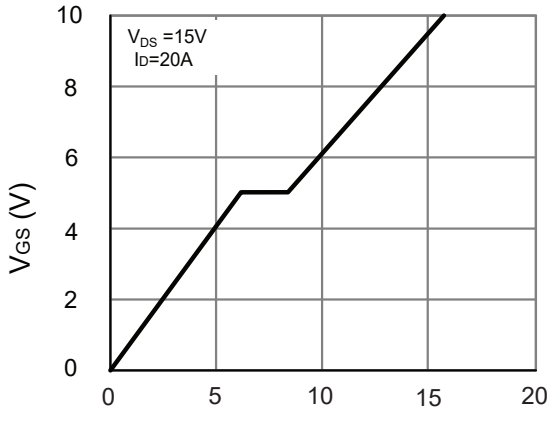
drain-source on-resistance



On-Resistance vs. Junction Temperature

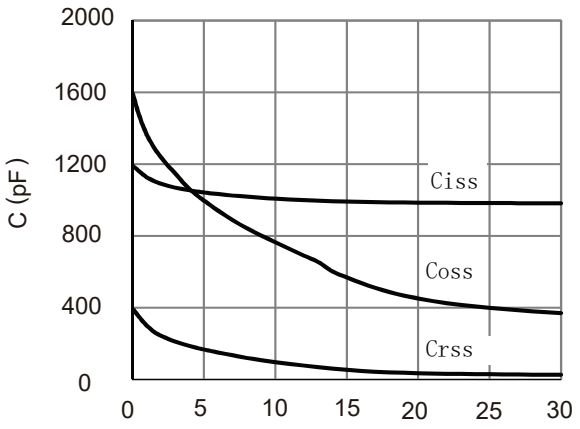


On-Resistance vs. Gate-Source Voltage

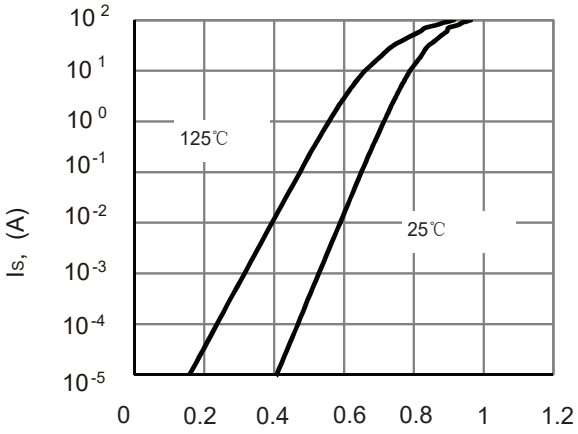


Gate charge vs gate-source voltage

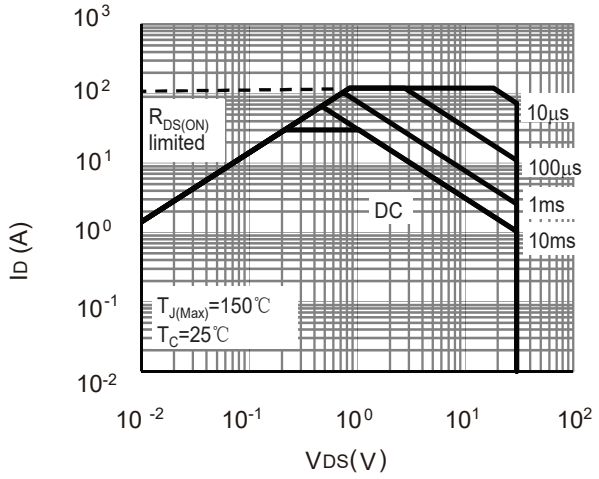
Typical Characteristics



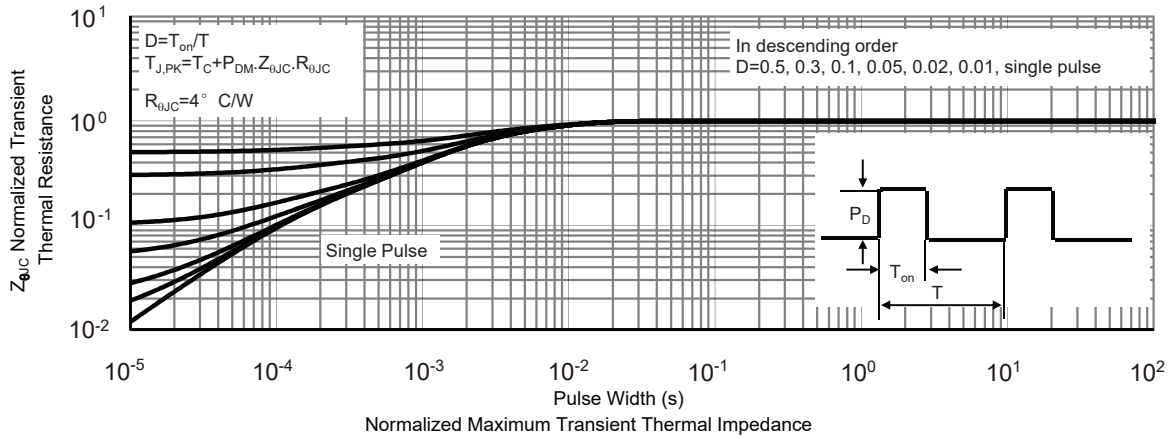
Capacitance Characteristics



Body-Diode Characteristics



Maximum Forward Biased Safe operating area



Normalized Maximum Transient Thermal Impedance