

General Description

The CMSC90P03 combines advanced trench MOSFET technology with a low resistance package to provide extremely low RDS(ON).

This device is ideal for load switch and battery protection applications.

Features

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

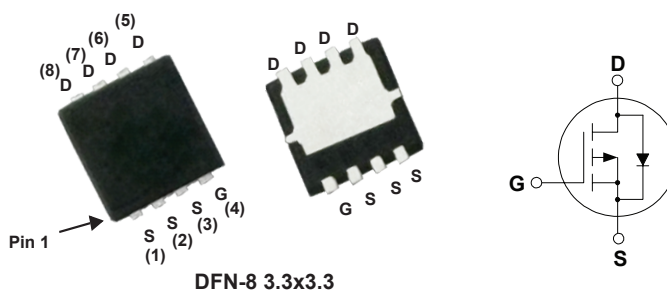
Product Summary

BVDSS	R _{DS(on)} max.	ID
-30V	8.4mΩ	-50A

Applications

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

DFN-8 3.3x3.3 Pin Configuration



Type	Package	Marking
CMSC90P03	DFN-8 3.3x3.3	90P03

Absolute Maximum Ratings (T_A=25 °C Unless Otherwise Noted)

Symbol	Parameter	Rating	Units
V _{DS}	Drain-Source Voltage	-30	V
V _{GS}	Gate-Source Voltage	±20	V
I _D @T _C =25°C	Continuous Drain Current	-50	A
I _D @T _C =100°C	Continuous Drain Current	-35	A
I _{DM}	Pulsed Drain Current	-150	A
EAS	Single Pulse Avalanche Energy ¹	81	mJ
P _D @T _C =25°C	Total Power Dissipation	40	W
T _{STG}	Storage Temperature Range	-55 to 150	°C
T _J	Operating Junction Temperature Range	-55 to 150	°C

Thermal Data

Symbol	Parameter	Typ.	Max.	Unit
R _{θJA}	Thermal Resistance Junction-ambient	---	62	°C/W
R _{θJC}	Thermal Resistance Junction-case	---	3.13	°C/W

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	$V_{GS}=-10V$, $I_D=-28A$	---	7.4	8.4	mΩ
		$V_{GS}=-4.5V$, $I_D=-20A$	---	10.4	12	
$V_{GS(th)}$	Gate Threshold Voltage	$V_{GS}=V_{DS}$, $I_D = -250\mu A$	-1	---	-2.5	V
I_{DSS}	Drain-Source Leakage Current	$V_{DS}=-24V$, $V_{GS}=0V$	---	---	-1	uA
I_{GSS}	Gate-Source Leakage Current	$V_{GS} = \pm 20V$, $V_{DS}=0V$	---	---	± 100	nA
g_{fs}	Forward Transconductance	$V_{DS}=-10V$, $I_D=-20A$	---	18	---	S
R_g	Gate Resistance	$V_{DS}=0V$, $V_{GS}=0V$, $f=1\text{MHz}$	---	24	---	Ω
Q_g	Total Gate Charge	$V_{DS}=-24V$, $I_D=-20A$ $V_{GS}=-10V$	---	58	---	nC
Q_{gs}	Gate-Source Charge		---	7	---	
Q_{gd}	Gate-Drain Charge		---	16	---	
$T_{d(on)}$	Turn-On Delay Time	$V_{DD}=-15V$, $V_{GEN}=-10V$, $I_D=-10A$ $R_G=4.7\Omega$	---	7	---	ns
T_r	Rise Time		---	14	---	
$T_{d(off)}$	Turn-Off Delay Time		---	86	---	
T_f	Fall Time		---	252	---	
C_{iss}	Input Capacitance	$V_{DS}=-25V$, $V_{GS}=0V$, $f=1\text{MHz}$	---	2200	---	pF
C_{oss}	Output Capacitance		---	255	---	
C_{rss}	Reverse Transfer Capacitance		---	190	---	

Diode Characteristics

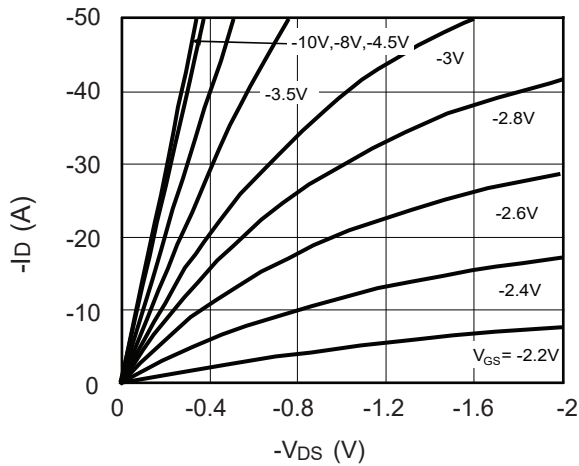
Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I_S	Continuous Source Current	$V_G=V_D=0V$, Force Current	---	---	-50	A
I_{SM}	Pulsed Source Current		---	---	-150	A
V_{SD}	Diode Forward Voltage	$V_{GS}=0V$, $I_S=-28A$, $T_J=25^{\circ}\text{C}$	---	-0.89	-1.3	V

Note :

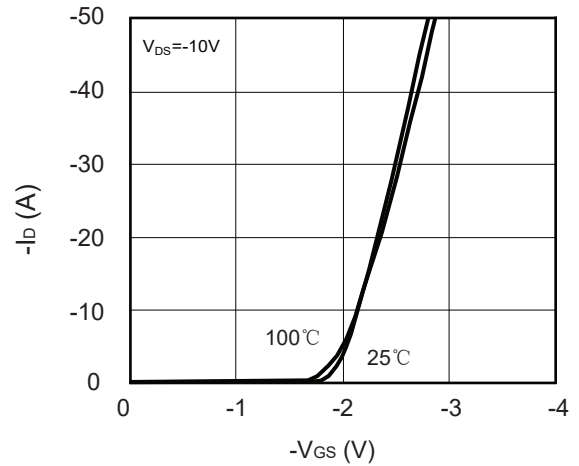
1.The EAS data shows Max. rating . The test condition is $V_{DD}=-25V$, $V_{GS}=-10V$, $L=0.5\text{mH}$, $I_{AS}=-18A$.

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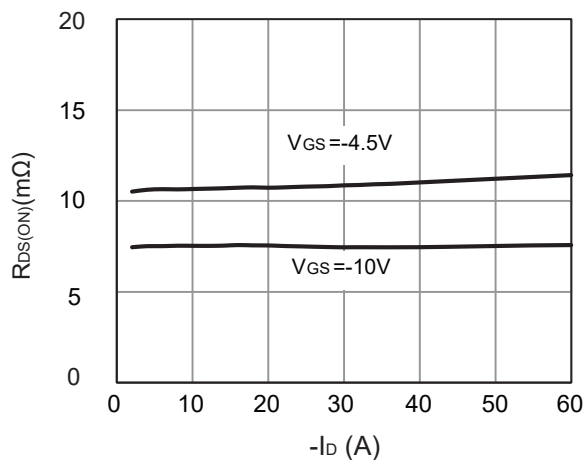
Typical Characteristics



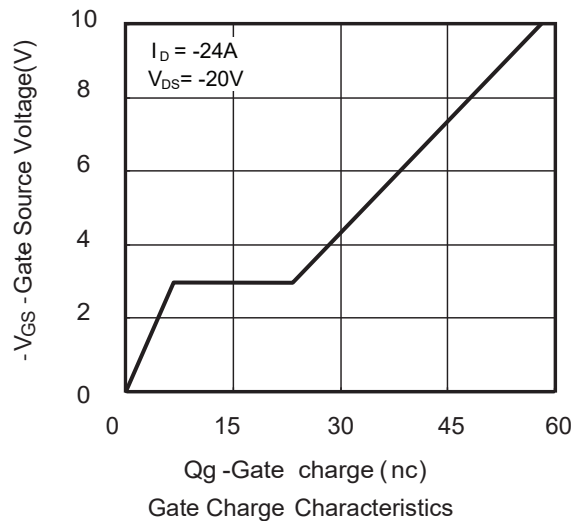
On-Region Characteristics



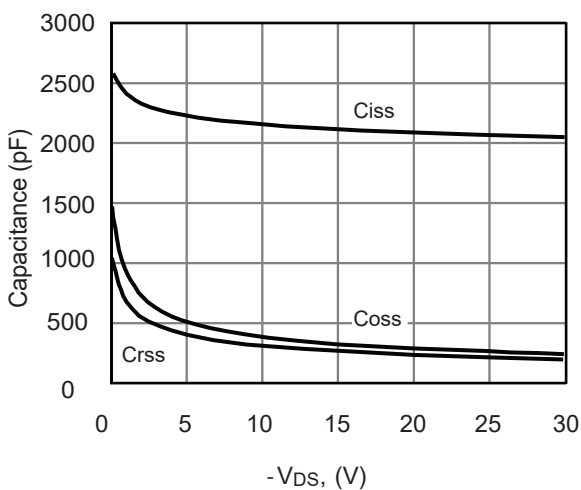
transfer characteristics



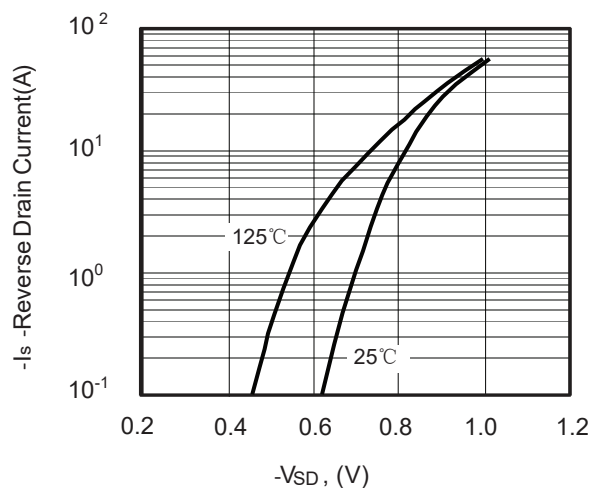
On-Resistance vs. Drain Current



Gate Charge Characteristics



Capacitance Characteristics



Body Diode Forward Voltage Variation with Source Current and Temperature