

General Description

These P-Channel enhancement mode power field effect transistors use advanced trench technology and design to provide excellent RDS(ON) . This device is suitable for use as a load switch and battery protection applications.

Features

- Low On-Resistance
- 100% avalanche tested
- RoHS Compliant

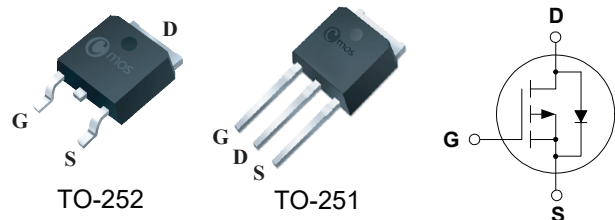
Product Summary

BVDSS	R _{DS(on)} max.	ID
-40V	7.3mΩ	-85A

Applications

- DC-DC Converters
- Load Switches

TO-252 / 251 Pin Configuration



Type	Package	Marking
CMD85P04	TO-252	CMD85P04
CMU85P04	TO-251	CMU85P04

Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
V _{DS}	Drain-Source Voltage	-40	V
V _{GS}	Gate-Source Voltage	±20	V
I _D @T _C =25°C	Continuous Drain Current	-85	A
I _D @T _C =100°C	Continuous Drain Current	-59	A
I _{DM}	Pulsed Drain Current	-340	A
EAS	Single Pulse Avalanche Energy ¹	528	mJ
P _D @T _C =25°C	Total Power Dissipation	88	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(minimal footprint)	---	62	°C/W
R _{θJC}	Thermal Resistance Junction-case	---	1.42	°C/W

Electrical Characteristics ($T_J=25^{\circ}\text{C}$, unless otherwise noted)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV_{DS}	Drain-Source Breakdown Voltage	$V_{GS}=0V$, $I_D=-250\mu A$	-40	---	---	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance	$V_{GS}=-10V$, $I_D=-20A$	---	6.4	7.3	mΩ
		$V_{GS}=-4.5V$, $I_D=-15A$	---	7.5	8.5	
$V_{GS(th)}$	Gate Threshold Voltage	$V_{GS}=V_{DS}$, $I_D=-250\mu A$	-1.0	---	-2.5	V
I_{DSS}	Drain-Source Leakage Current	$V_{DS}=-32V$, $V_{GS}=0V$, $T_J=25^{\circ}\text{C}$	---	---	-1	μA
I_{GSS}	Gate-Source Leakage Current	$V_{GS}=\pm 20V$, $V_{DS}=0V$	---	---	±100	nA
g_{fs}	Forward Transconductance	$V_{DS}=-5V$, $I_D=-10A$	---	43	---	S
R_g	Gate Resistance	$V_{DS}=0V$, $V_{GS}=0V$, $f=1\text{MHz}$	---	23	---	Ω
Q_g	Total Gate Charge	$V_{DD}=-32V$, $I_D=-85A$ $V_{GS}=0V$ to $-10V$	---	80	---	nC
Q_{gs}	Gate-Source Charge		---	20	---	
Q_{gd}	Gate-Drain Charge		---	13	---	
$T_{d(on)}$	Turn-On Delay Time	$V_{DD}=-20V$, $V_{GS}=-10V$, $R_G=3.5\Omega$ $I_D=-85A$	---	17	---	ns
T_r	Rise Time		---	10	---	
$T_{d(off)}$	Turn-Off Delay Time		---	62	---	
T_f	Fall Time		---	40	---	
C_{iss}	Input Capacitance	$V_{DS}=-25V$, $V_{GS}=0V$, $f=1\text{MHz}$	---	4700	---	pF
C_{oss}	Output Capacitance		---	420	---	
C_{rss}	Reverse Transfer Capacitance		---	280	---	

Diode Characteristics

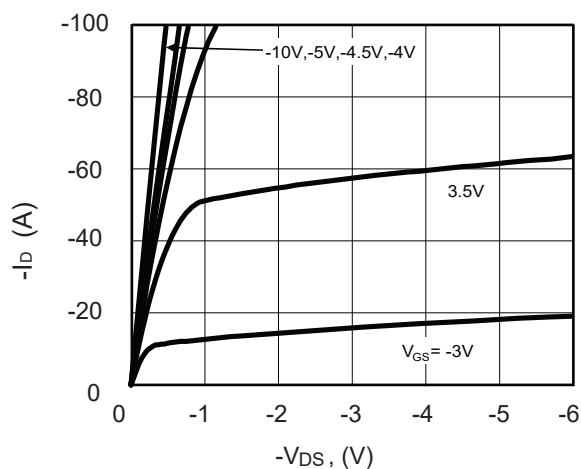
Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I_S	Continuous Source Current	$V_G=V_D=0V$, Force Current	---	---	-85	A
I_{SM}	Pulsed Source Current		---	---	-340	A
V_{SD}	Diode Forward Voltage	$V_{GS}=0V$, $I_F=-15A$	---	-0.81	-1.3	V

Note :

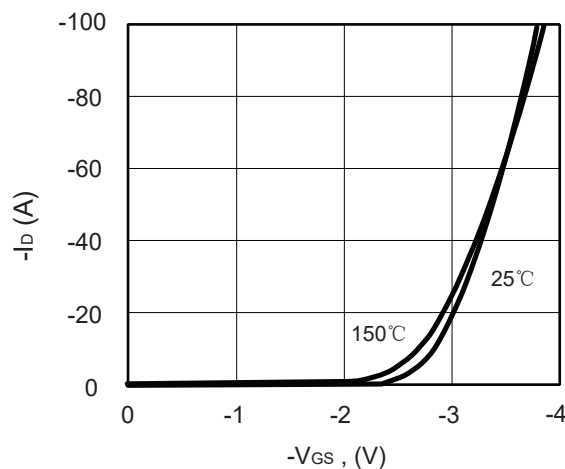
1.The EAS data shows Max. rating . The test condition is $V_{DD}=-30V$, $V_{GS}=-10V$, $L=1\text{mH}$, $I_{AS}=-32.5A$.

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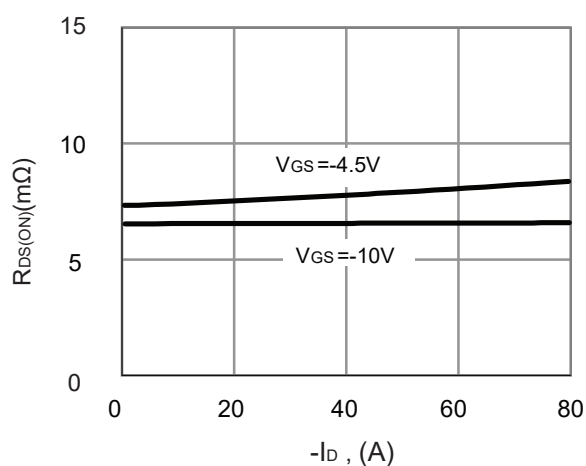
Typical Characteristics



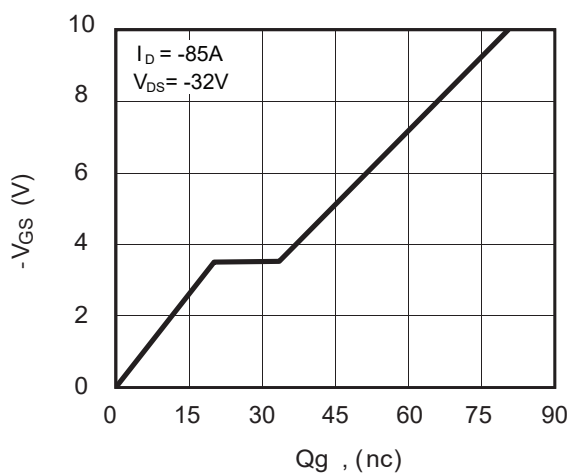
On-Region Characteristics



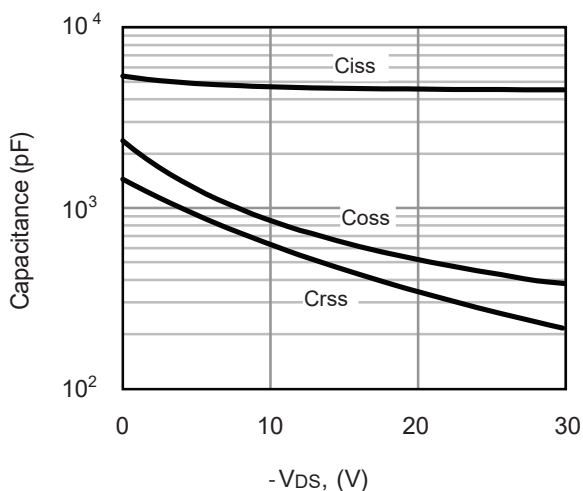
transfer characteristics



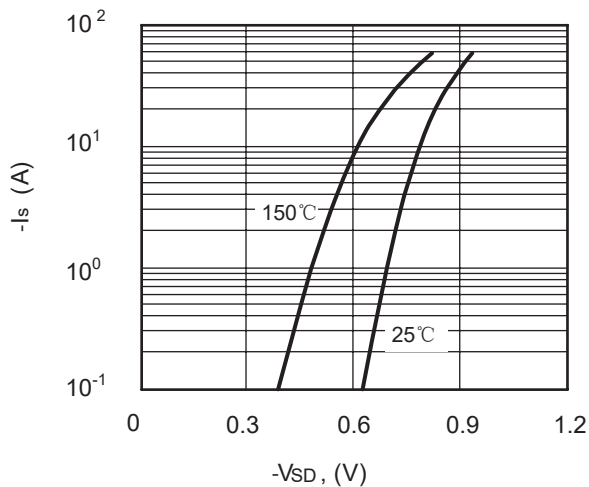
On-Resistance vs. Drain Current



Gate Charge Characteristics



Capacitance Characteristics



Body Diode Forward Voltage Variation with Source Current and Temperature