CMD4003B/CMU4003B

P-Channel 40-V (D-S) MOSFET

General Description

The 4003B uses advanced trench technology to provide excellent RDS(ON). The device well suited for high current applications.

Product Summary

BVDSS	RDSON	ID
-40V	37mΩ	-12A

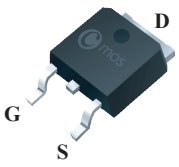
Features

- P-Channel MOSFET
- Fast Switching
- Low ON-resistance
- 100% EAS Guaranteed
- RoHS Compliant

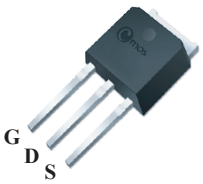
Applications

- DC/DC converters
- Inverter
- Power Supplies

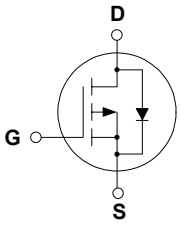
TO-252 / 251 Pin Configuration



TO-252
(CMD4003B)



TO-251
(CMU4003B)



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℃	Continuous Drain Current[1]	-12	A
I_D@T_C=100℃	Continuous Drain Current[2]	-9	A
I_{DM}	Pulsed Drain Current[3]	-36	A
I_{AR}	Avalanche Current [3]	-20	A
P_D@T_C=25℃	Total Power Dissipation [1]	50	W
T_{STG}	Storage Temperature Range	-55 to 175	℃
T_J	Operating Junction Temperature Range	-55 to 175	℃

Thermal Data

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction-ambient[4 5]	---	25	℃/W
$R_{\theta JC}$	Thermal Resistance Junction -Case[4 5]	---	3	℃/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	-40	---	---	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance[2]	V_{GS}=-10V , I_D=-20A	---	---	37	mΩ
		V_{GS}=-4.5V , I_D=-10A	---	---	57	
$V_{GS(th)}$	Gate Threshold Voltage	V_{GS}=V_{DS} , I_D =-250uA	-1	---	-3	V
I_{DSS}	Drain-Source Leakage Current	V_{DS}=-32V, V_{GS}=0V , T_J=25℃	---	---	-1	uA
		V_{DS}=-32V, V_{GS}=0V , T_J=55 ℃	---	---	-5	
I_{GSS}	Gate-Source Leakage Current	V_{GS} = ±20V , V_{DS}=0V	---	---	±100	nA
gfs	Forward Transconductance	V_{DS}=-5V , I_D=-12A	---	19	---	S
R_g	Gate Resistance	V_{DS}=0V , V_{GS}=0V , f=1MHz	---	14	---	Ω
Q_g	Total Gate Charge	V_{DS}=-20V, V_{GS}=-10V , I_D=-12A	---	17	---	nC
Q_{gs}	Gate-Source Charge		---	4	---	
Q_{gd}	Gate-Drain Charge		---	3.5	---	
$T_{d(on)}$	Turn-On Delay Time	V_{DS}=-20V, V_{GS}=-10V, R_L=1.6Ω R_{GEN}=3Ω	---	6.2	---	ns
T_r	Rise Time		---	8.5	---	
$T_{d(off)}$	Turn-Off Delay Time		---	45	---	
T_f	Fall Time		---	41.2	---	
C_{iss}	Input Capacitance	V_{DS}=-20V, V_{GS}=0V , f=1MHz	---	1500	---	pF
C_{oss}	Output Capacitance		---	800	---	
C_{rss}	Reverse Transfer Capacitance		---	400	---	

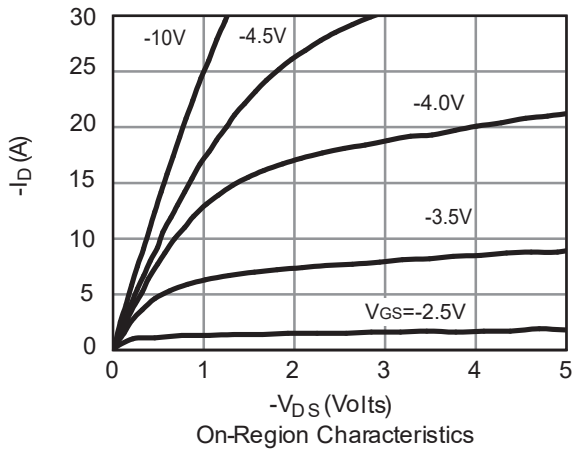
Diode Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I_S	Continuous Source Current	V_G=V_D=0V , Force Current	---	---	-12	A
I_{SM}	Pulsed Source Current		---	---	-36	A
V_{SD}	Diode Forward Voltage	V_{GS}=0V , I_S=-10A ,T_J=25℃	---	---	-1.2	V

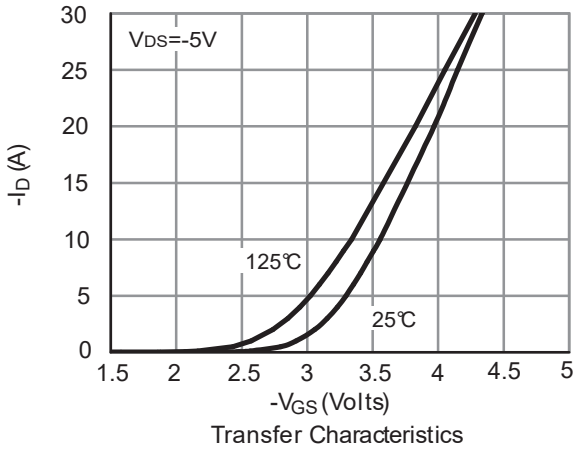
Note :

1. The power dissipation P_D is based on $T_{J(MAX)}$=175℃, using junction-to-case thermal resistance, and is more useful in setting the upper dissipation limit for cases where additional heatsinking is used.
2. The maximum current rating is limited by bond-wires.
3. Repetitive rating, pulse width limited by junction temperature $T_{J(MAX)}$ =175℃.
4. The value of $R_{\theta JA}$ is measured with the device in a still air environment with T_A =25℃. The power dissipation P_{DSM} and current rating I_{DSM} are based on $T_{J(MAX)}$=150℃, using t ≤ 10s junction-to-ambient thermal resistance.
5. These tests are performed with the device mounted on 1 in^2 FR-4 board with 2oz. Copper, in a still air environment with T_A=25℃.

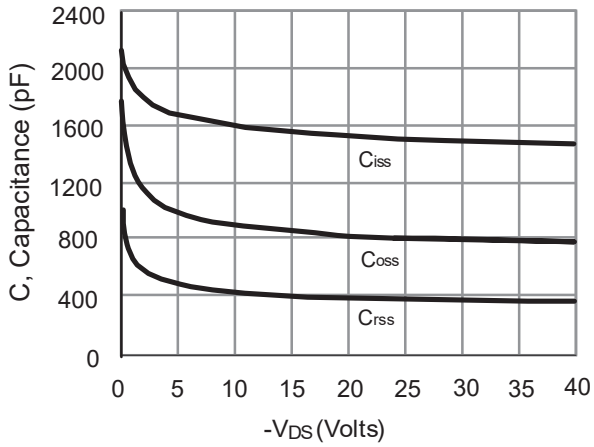
Typical Characteristics



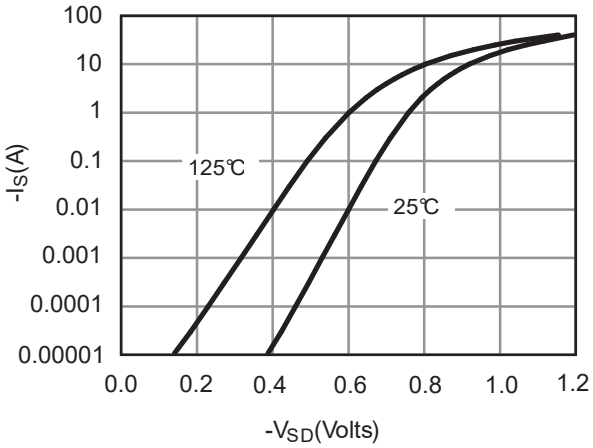
On-Region Characteristics



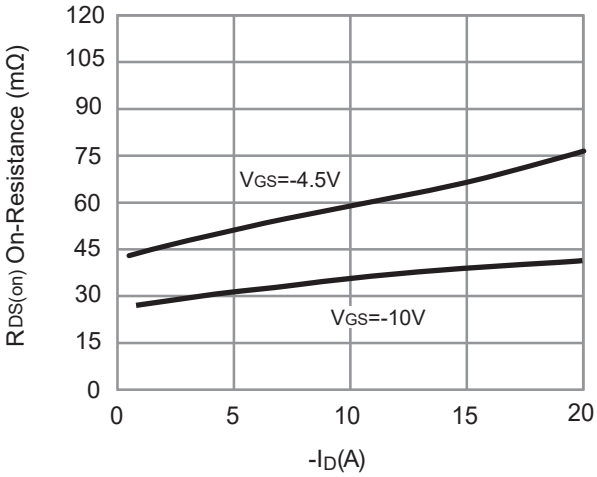
Transfer Characteristics



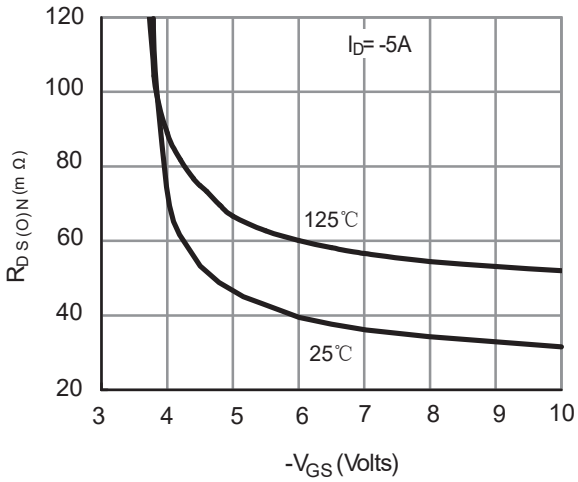
Capacitance Characteristics



Body-Diode Characteristics



On-Resistancevs. Drain Current andGate Voltage



On-Resistance vs. Gate-Source Voltage