

### General Description

These miniature surface mount MOSFETs utilize a high cell density trench process to provide low RDS(on) and to ensure minimal power loss and heat dissipation. Typical applications are DC-DC converters and power management in portable and battery-powered products such as computers, printers, PCMCIA cards, cellular and cordless telephones.

### Features

- Advanced high cell density Trench technology
- Fast switching speed
- Lower On-resistance
- 100% EAS Guaranteed
- Simple Drive Requirement

### Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
$V_{DS}$	Drain-Source Voltage	-30	V
$V_{GS}$	Gate-Source Voltage	$\pm 20$	V
$I_D@T_C=25^\circ C$	Continuous Drain Current	-50	A
$I_{DM}$	Pulsed Drain Current <sup>1</sup>	-150	A
EAS	Single Pulse Avalanche Energy	115	mJ
$I_{AS}$	Single Pulse Avalanche Current	-50	A
$P_D@T_C=25^\circ C$	Total Power Dissipation	60	W
$T_{STG}$	Storage Temperature Range	-55 to 175	$^\circ C$
$T_J$	Operating Junction Temperature Range	-55 to 175	$^\circ C$

### Thermal Data

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Junction-to-Ambient <sup>2</sup>	---	50	$^\circ C/W$
$R_{\theta JC}$	Junction-to-Case (Drain)	---	1.1	$^\circ C/W$

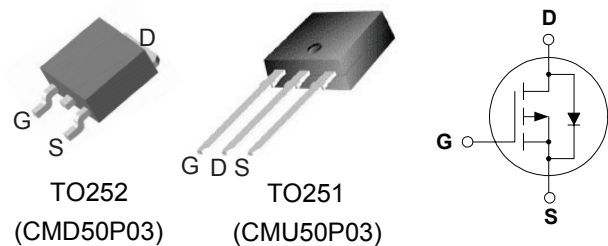
### Product Summary

BVDSS	RDSON	ID
-30V	8m $\Omega$	-50A

### Applications

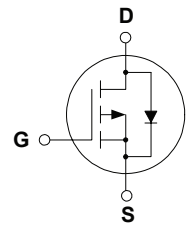
- DC-DC Converters
- Desktop PCs
- LED controller

### TO252 / TO251 Pin Configuration



TO252  
(CMD50P03)

TO251  
(CMU50P03)



**Electrical Characteristics (T<sub>J</sub>=25 °C, unless otherwise noted)**

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV <sub>DSS</sub>	Drain-Source Breakdown Voltage	V <sub>GS</sub> =0V, I <sub>D</sub> =-250uA	-30	---	---	V
R <sub>DS(ON)</sub>	Static Drain-Source On-Resistance <sup>1</sup>	V <sub>GS</sub> =-10V, I <sub>D</sub> =-20A	---	---	8	mΩ
		V <sub>GS</sub> =-4.5V, I <sub>D</sub> =-15A	---	---	12	
V <sub>GS(th)</sub>	Gate Threshold Voltage	V <sub>GS</sub> =V <sub>DS</sub> , I <sub>D</sub> =-250uA	-1	---	-3	V
I <sub>DSS</sub>	Drain-Source Leakage Current	V <sub>DS</sub> =-30V, V <sub>GS</sub> =0V, T <sub>J</sub> =25°C	---	---	-1	uA
		V <sub>DS</sub> =-30V, V <sub>GS</sub> =0V, T <sub>J</sub> =125 °C	---	---	-50	
I <sub>GSS</sub>	Gate-Source Leakage Current	V <sub>GS</sub> =±20V, V <sub>DS</sub> =0V	---	---	±100	nA
g <sub>fs</sub>	Forward Transconductance	V <sub>DS</sub> =-15V, I <sub>D</sub> =-20A	---	52	---	S
Q <sub>g</sub>	Total Gate Charge	V <sub>DS</sub> =-24V, I <sub>D</sub> =-50A V <sub>GS</sub> =0 to -10V	---	45	---	nC
Q <sub>gs</sub>	Gate-Source Charge		---	6.5	---	
Q <sub>gd</sub>	Gate-Drain Charge		---	10	---	
T <sub>d(on)</sub>	Turn-On Delay Time	V <sub>DD</sub> =-15V, V <sub>GS</sub> =-10V, R <sub>G</sub> =3.5Ω I <sub>D</sub> =-50A	---	11	---	ns
T <sub>r</sub>	Rise Time		---	9	---	
T <sub>d(off)</sub>	Turn-Off Delay Time		---	54	---	
T <sub>f</sub>	Fall Time		---	20	---	
C <sub>iss</sub>	Input Capacitance	V <sub>DS</sub> =-25V, V <sub>GS</sub> =0V, f=1MHz	---	3900	---	pF
C <sub>oss</sub>	Output Capacitance		---	750	---	
C <sub>rss</sub>	Reverse Transfer Capacitance		---	500	---	

**Diode Characteristics**

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I <sub>S</sub>	Continuous Source Current	V <sub>G</sub> =V <sub>D</sub> =0V, Force Current	---	---	-50	A
I <sub>SM</sub>	Pulsed Source Current <sup>1</sup>		---	---	-150	A
V <sub>SD</sub>	Diode Forward Voltage	V <sub>GS</sub> =0V, I <sub>F</sub> =-30A	---	---	-1.5	V

Notes

1. Pulse test; pulse width ≤ 300μs, duty cycle ≤ 2%.
2. When mounted on 1" square PCB (FR-4 material).