

CMD1402/CMU1402

20V, 4.1mΩ typ., 50A N-Channel MOSFET

General Description

The 1402 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

- Simple Drive Requirements
- Low On-Resistance
- RoHS Compliant

Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	20	V
V_{GS}	Gate-Source Voltage	±12	V
$I_D@T_C=25^\circ C$	Continuous Drain Current	50	A
$I_D@T_C=100^\circ C$	Continuous Drain Current	19	A
I_{DM}	Pulsed Drain Current ¹	200	A
EAS	Avalanche energy ⁴	210	mJ
$P_D@T_C=25^\circ C$	Total Power Dissipation	55	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
$R_{\theta JA}$	Thermal Resistance Junction-ambient	---	60	°C/W
$R_{\theta JC}$	Thermal Resistance Junction -Case	---	2.27	°C/W

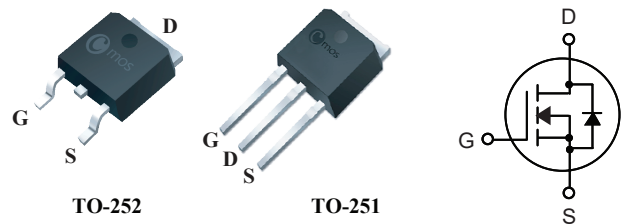
Product Summary

BVDSS	RDS(on) max.	ID
20V	5.5mΩ	50A

Applications

- Server
- DC/DC converter
- Motor drives

TO-252/251 Pin Configuration



Type	Package	Marking
CMD1402	TO-252	CMD1402
CMU1402	TO-251	CMU1402

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

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	20	---	---	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance	$V_{GS}=4.5V, I_D=20A$	---	4.1	5.5	mΩ
		$V_{GS}=2.5V, I_D=10A$	---	5.4	9	
$V_{GS(th)}$	Gate Threshold Voltage	$V_{GS}=V_{DS}, I_D=250\mu A$	0.5	---	1.2	V
I_{DSS}	Drain-Source Leakage Current	$V_{DS}=16V, V_{GS}=0V, T_J=25^\circ\text{C}$	---	---	1	uA
		$V_{DS}=16V, V_{GS}=0V, T_J=55^\circ\text{C}$	---	---	5	
I_{GSS}	Gate-Source Leakage Current	$V_{GS}=\pm 12V, V_{DS}=0V$	---	---	± 100	nA
g_{fs}	Forward Transconductance ²	$V_{DS}=5V, I_D=18A$	---	42	---	S
Q_g	Total Gate Charge ($V_{GS}=4.5V$)	$V_{DS}=10V, V_{GS}=10V, I_D=20A$	---	36	---	nC
Q_{gs}	Gate-Source Charge		---	9	---	
Q_{gd}	Gate-Drain Charge		---	12	---	
$T_{d(on)}$	Turn-On Delay Time ³	$V_{DS}=10V, V_{GS}=5V, R_{GS}=3.3\Omega$ $I_D \cong 18A$	---	8	---	ns
T_r	Rise Time ³		---	85	---	
$T_{d(off)}$	Turn-Off Delay Time ³		---	20	---	
T_f	Fall Time ³		---	25	---	
C_{iss}	Input Capacitance	$V_{DS}=10V, V_{GS}=0V, f=1\text{MHz}$	---	2250	---	pF
C_{oss}	Output Capacitance		---	450	---	
C_{riss}	Reverse Transfer Capacitance		---	210	---	

Diode Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
V_{SD}	Diode Forward Voltage ²	$V_{GS}=0V, I_S=20A$	---	0.85	1.2	V

Note :

- 1.Pulse width limited by maximum junction temperature.
- 2.Pulse test : Pulse Width ≤ 300 usec, Duty Cycles $\leq 2\%$.
- 3.Independent of operating temperature.
- 4.The EAS data shows Max. rating . The test condition is $V_{DD}=25V, V_{GS}=10V, L=0.5\text{mH}, I_D=29A$

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Typical Characteristics
