CMD6015 / CMU6015

150V N-Channel MOSFET

General Description

The 6015 uses trench MOSFET technology that is uniquely optimized to provide the most efficient high frequency switching performance. Both conduction and switching power losses are minimized due to an extremely low combination of RDS(ON), Ciss and Coss.

This device is ideal for boost converters and synchronous rectifiers for consumer, telecom, industrial power supplies and LED backlighting.

Features

- Low On-Resistance
- Simple Drive Requirements
- Fast Switching

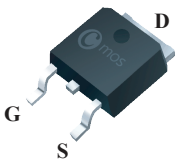
Product Summary

BVDSS	RDSON	ID
150V	0.09Ω	19A

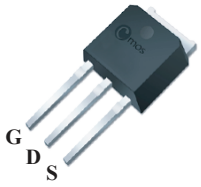
Applications

- PWM Motor Controls
- LED controller
- Power Supplies
- DC-DC & DC-AC Converters

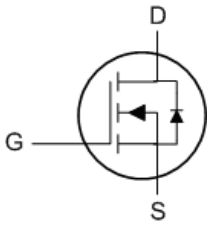
TO-252/251 Pin Configuration



TO-252
(CMD6015)



TO-251
(CMU6015)



Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	150	V
V_{GS}	Gate-Source Voltage	±20	V
I_D@T_C=25°C	Continuous Drain Current	19	A
I_D@T_C=100°C	Continuous Drain Current	13.5	A
I_{DM}	Pulsed Drain Current[C]	35	A
EAS	Single Pulse Avalanche Energy L=0.1mH[C]	4	mJ
I_{AS}	Avalanche Current[C]	9	A
P_D@T_C=25°C	Total Power Dissipation[B]	83	W
T_{STG}	Storage Temperature Range	-55 to 175	°C
T_J	Operating Junction Temperature Range	-55 to 175	°C

Thermal Data

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction-ambient (Steady-State) [A D]	---	50	°C/W
$R_{\theta JC}$	Thermal Resistance Junction -Case	---	1.8	°C/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	150	---	---	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance	V_{GS}=10V , I_D=10A	---	0.07	0.09	Ω
		V_{GS}=4.5V , I_D=8A	---	0.078	0.1	
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS}, I_D=250uA	1.0	2.25	2.8	V
I_{DSS}	Drain-Source Leakage Current	V_{DS}= 150V , V_{GS}=0V , T_J=25℃	---	---	1	uA
		V_{DS}=150V , 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=10A	---	35	---	S
R_g	Gate Resistance	V_{DS}=0V , V_{GS}=0V , f=1MHz	---	2.2	---	Ω
Q_g	Total Gate Charge	V_{DS}=75V , V_{GS}=10V, I_D=10A	---	15.5	22	nC
Q_{gs}	Gate-Source Charge		---	4	---	
Q_{gd}	Gate-Drain Charge		---	1.2	---	
$T_{d(on)}$	Turn-On Delay Time	V_{DS}=75V , V_{GS}=10V , R_{GEN}=3Ω R_L=7.5Ω	---	6.5	---	ns
T_r	Rise Time		---	5	---	
$T_{d(off)}$	Turn-Off Delay Time		---	23	---	
T_f	Fall Time		---	2.5	---	
C_{iss}	Input Capacitance	V_{DS}=75V , V_{GS}=0V , f=1MHz	---	1165	---	pF
C_{oss}	Output Capacitance		---	61.5	---	
C_{rss}	Reverse Transfer Capacitance		---	2.5	---	

Diode Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I_S	Continuous Source Current	V_G=V_D=0V , Force Current	---	---	19	A
I_{SM}	Pulsed Source Current		---	---	35	A
V_{SD}	Diode Forward Voltage	V_{GS}=0V , I_S=1A , T_J=25℃	---	0.72	1	V

Note :
A. The value of RθJA is measured with the device mounted on 1in2 FR-4 board with 2oz. Copper, in a still air environment with TA =25°C. The Power dissipation PDSM is based on R θJA and the maximum allowed junction temperature of 150°C. The value in any given application depends on the user's specific board design, and the maximum temperature of 175°C may be used if the PCB allows it.
B. The power dissipation PD is based on TJ(MAX)=175°C, using junction-to-case thermal resistance, and is more useful in setting the upper dissipation limit for cases where additional heatsinking is used.
C. Repetitive rating, pulse width limited by junction temperature TJ(MAX)=175°C. Ratings are based on low frequency and duty cycles to keep initial TJ =25°C.
D. The RθJA is the sum of the thermal impedance from junction to case RθJC and case to ambient.