CMP16N25/CMB16N25/CMF16N25

250V N-Channel MOSFET

General Description

These N-Channel enhancement mode power field effect transistors uses advanced trench Technology, which provides low on-state resistance, high switching performance and excellent quality. These devices are well suited for high efficiency switching DC/DC converters, switch mode power supplies, DC-AC converters for uninterrupted power supplies and motor controls.

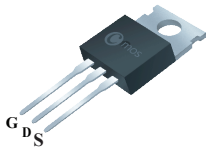
Product Summary

BVDSS	RDSON	ID
250V	0.245Ω	16A

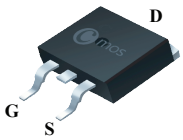
Applications

- Switch mode power supplies (SMPS)
- PWM Motor Controls
- DC-DC converters

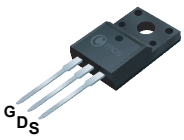
TO-220/263/220F Pin Configuration



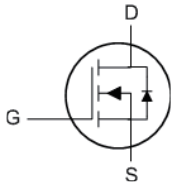
TO-220
(CMP16N25)



TO-263
(CMB16N25)



TO-220F
(CMF16N25)



Features

- 16A, 250V, RDS(on) = 0.245Ω @VGS =10 V
- 100% avalanche tested
- Fast Switching
- Improved dv/dt capability

Absolute Maximum Ratings

Symbol	Parameter	220/263	220F	Units
V_{DS}	Drain-Source Voltage	250		V
V_{GS}	Gate-Source Voltage	±30		V
I_D@T_C=25°C	Continuous Drain Current	16	16*	A
I_D@T_C=100°C	Continuous Drain Current	10	10*	A
I_{DM}	Pulsed Drain Current(Note 1)	50	50*	A
EAS	Single Pulse Avalanche Energy(Note 2)	360		mJ
dv/dt	Peak Diode Recovery dv/dt (Note 3)	5.5		V/ns
P_D@T_C=25°C	Total Power Dissipation	140	45	W
T_{STG}	Storage Temperature Range	-55 to 150		°C
T_J	Operating Junction Temperature Range	-55 to 150		°C

* Drain current limited by maximum junction temperature.

Thermal Data

Symbol	Parameter	220/263	220F	Unit
$R_{\theta JA}$	Thermal Resistance Junction-ambient	62.5	62.5	°C/W
$R_{\theta JC}$	Thermal Resistance Junction-case	0.9	2.89	°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	250	---	---	V
$\triangle BV_{DSS}/\triangle T_J$	BVDSS Temperature Coefficient	Reference to 25℃ , I_D=250uA	---	0.31	---	V/℃
$R_{DS(ON)}$	Static Drain-Source On-Resistance	V_{GS}=10V , I_D= 8A	---	---	0.245	Ω
$V_{GS(th)}$	Gate Threshold Voltage	V_{GS}=V_{DS} , I_D =250uA	2	---	4	V
I_{DSS}	Drain-Source Leakage Current	V_{DS}=250V, V_{GS}=0V	---	---	10	uA
		V_{DS}=200V , V_{GS}=0V , TC=125℃	---	---	100	
I_{GSS}	Gate-Source Leakage Current	V_{GS}=±30V , V_{DS}=0V	---	---	±100	nA
gfs	Forward Transconductance	V_{DS}=15V , I_D=8A (Note 4)	---	11	---	S
Q_g	Total Gate Charge	I_D=16A V_{DS}=200V V_{GS}=10V (Note 4, 5)	---	40	52	nC
Q_{gs}	Gate-Source Charge		---	5.5	---	
Q_{gd}	Gate-Drain Charge		---	23	---	
$T_{d(on)}$	Turn-On Delay Time	V_{DD}=125V I_D=16A R_G=25Ω (Note 4, 5)	---	15	---	ns
T_r	Rise Time		---	130	---	
$T_{d(off)}$	Turn-Off Delay Time		---	135	---	
T_f	Fall Time		---	105	---	
C_{iss}	Input Capacitance	V_{DS}=25V , V_{GS}=0V , f=1MHz	---	4200	---	pF
C_{oss}	Output Capacitance		---	170	---	
C_{rss}	Reverse Transfer Capacitance		---	70	---	

Diode Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I_S	Continuous Source Current	V_G=V_D=0V , Force Current	---	---	16	A
I_{SM}	Pulsed Source Current		---	---	50	A
V_{SD}	Diode Forward Voltage	V_{GS}=0V , I_S=15A , T_J=25℃	---	---	1.5	V
t_{rr}	Reverse Recovery Time	V_{GS} =0V, I_S=16A , T_j =25℃ di_F/dt=100A/μs	---	260	---	ns
Q_{rr}	Reverse Recovery Charge		---	2.47	---	μC

Note :

1. Repetitive Rating : Pulse width limited by maximum junction temperature
2. L = 1mH, I_{AS} = 27A, V_{DD} =50V, Starting T_J = 25°C
3. I_{SD} ≤16A,di /dt ≤ 300A/μs, V_{DD} ≤ BV_{DSS}, Starting T_J = 25°C
4. Pulse Test Pulsewidth ≤ 300μs, Duty cycle ≤ 2%
5. Essentially independent of operating temperature

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