CMP1404 / CMB1404

N-Channel Enhancement Mode Field Effect Transistor

General Description

The 1404 is a N-channel Power MOSFET. It has specifically been designed to minimize input capacitance and gate charge. The device is therefore suitable in advanced high-efficiency switching applications.

Features

- Advanced Process Technology
- Ultra Low On-Resistance
- Dynamic dv/dt Rating
- 175°C Operating Temperature
- Fast Switching
- Fully Avalanche Rated
- Lead-Free

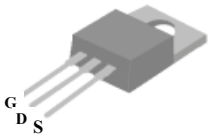
Product Summery

BVDSS	RDSON	ID
40V	5.5mΩ	140A

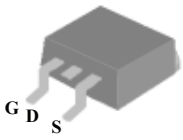
Applications

- LED power controller
- DC-DC & DC-AC converters
- High current, High speed switching
- Solenoid and relay drivers
- Motor control, Audio amplifiers

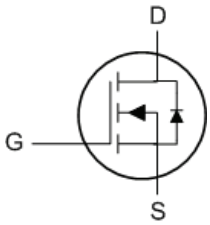
TO220 / TO263 Pin Configuration



TO-220
(CMP1404)



TO-263
(CMB1404)



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°C	Continuous Drain Current	140	A
I_D@T_C=100°C	Continuous Drain Current	99	A
I_{DM}	Pulsed Drain Current[1]	420	A
EAS	Single Pulse Avalanche Energy(Thermally limited) [2]	240	mJ
P_D@T_C=25°C	Total Power Dissipation	200	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 [3]	---	62	°C/W
$R_{\theta JC}$	Thermal Resistance Junction-case	---	1.05	°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	40	---	---	V
$\triangle BV_{DSS}/\triangle T_J$	BVDSS Temperature Coefficient	Reference to 25℃ , I_D=1mA	---	0.032	---	V/℃
$R_{DS(ON)}$	Static Drain-Source On-Resistance	V_{GS}=10V , I_D=75A 4	---	---	5.5	mΩ
$V_{GS(th)}$	Gate Threshold Voltage	V_{GS}=V_{DS} , I_D =250uA	2	---	4	V
I_{DSS}	Drain-Source Leakage Current	V_{DS}=Max rating, V_{GS}=0V	---	---	20	uA
		V_{DS}=Max rating, V_{GS}=0V@125℃	---	---	250	
I_{GSS}	Gate-Source Leakage Current	V_{GS}=±20V , V_{DS}=0V	---	---	±100	nA
Q_g	Total Gate Charge	I_D=75A V_{DS}=32V V_{GS}=10V 4	---	65	---	nC
Q_{gs}	Gate-Source Charge		---	21	---	
Q_{gd}	Gate-Drain Charge		---	30	---	
$T_{d(on)}$	Turn-On Delay Time	V_{DS}=20V I_D=75A R_G=6.8Ω ,V_{GS}=10V 4	---	18	---	ns
T_r	Rise Time		---	148	---	
$T_{d(off)}$	Turn-Off Delay Time		---	42	---	
T_f	Fall Time		---	74	---	
C_{iss}	Input Capacitance	V_{DS}=25V , V_{GS}=0V , f=1MHz	---	3200	---	pF
C_{oss}	Output Capacitance		---	680	---	
C_{rss}	Reverse Transfer Capacitance		---	415	---	

Diode Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I_S	Continuous Source Current	V_G=V_D=0V , Force Current	---	---	75	A
I_{SM}	Pulsed Source Current[1]		---	---	420	A
V_{SD}	Diode Forward Voltage	V_{GS}=0V , I_S=75 A, T_J=25℃ 4	---	---	1.3	V

Note :

1.Repetitive rating; pulse width limited by max. junction temperature.

2.Limited by TJmax, starting TJ = 25°C, L = 0.04mH RG = 25Ω, IAS = 75A, VGS =10V. Part not recommended for use above this value.

3.This is only applied to TO-220AB pakcage.

4.Pulse width ≤ 1.0ms; duty cycle ≤ 2%.