CMP1405/CMB1405

N-Channel Enhancement Mode Field Effect Transistor

General Description

The 1405 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

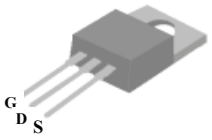
Product Summery

BVDSS	RDSON	ID
55V	5.5mΩ	140A

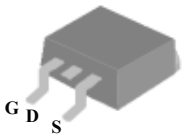
Applications

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

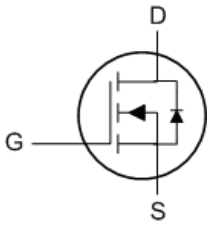
TO220 / TO263 Pin Configuration



TO-220
(CMP1405)



TO-263
(CMB1405)



Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	55	V
V_{GS}	Gate-Source Voltage	±20	V
I_D@T_C=25°C	Continuous Drain Current,VGS @ 10V	140	A
I_D@T_C=100°C	Continuous Drain Current,VGS @ 10V	99	A
I_{DM}	Pulsed Drain Current[1]	420	A
EAS	Single Pulse Avalanche Energy[2]	550	mJ
P_D@T_C=25°C	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
$R_{\theta JA}$	Junction-to-Ambient (PCB mount)[3]	---	40	°C/W
$R_{\theta JC}$	Junction-to-Case	---	0.75	°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	55	---	---	V
$\triangle BV_{DSS}/\triangle T_J$	BVDSS Temperature Coefficient	Reference to 25℃ , I_D=1mA	---	0.057	---	V/℃
$R_{DS(ON)}$	Static Drain-Source On-Resistance	V_{GS}=10V , I_D=101A 4	---	---	5.5	mΩ
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=10V, I_D =250uA	2	---	4	V
I_{DSS}	Drain-Source Leakage Current	V_{DS}=55V, V_{GS}=0V	---	---	20	uA
		V_{DS}=44V, V_{GS}=0V@150℃	---	---	250	
I_{GSS}	Gate-Source Leakage Current	V_{GS}=±20V	---	---	±200	nA
Q_g	Total Gate Charge	I_D=101A	---	160	---	nC
Q_{gs}	Gate-Source Charge	V_{DS}=44V	---	40	---	
Q_{gd}	Gate-Drain Charge	V_{GS}=10V 4	---	58	---	
$T_{d(on)}$	Turn-On Delay Time	V_{DS}=38V	---	18	---	ns
T_r	Rise Time	I_D=110A	---	175	---	
$T_{d(off)}$	Turn-Off Delay Time	R_G=1.1Ω ,V_{GS}=10V 4	---	138	---	
T_f	Fall Time		---	100	---	
C_{iss}	Input Capacitance	V_{DS}=25V , V_{GS}=0V , f=1MHz	---	4800	---	pF
C_{oss}	Output Capacitance		---	1080	---	
C_{rss}	Reverse Transfer Capacitance		---	250	---	

Diode Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I_S	Continuous Source Current	V_G=V_D=0V , Force Current	---	---	140	A
I_{SM}	Pulsed Source Current[1]		---	---	420	A
V_{SD}	Diode Forward Voltage	V_{GS}=0V , I_S=101A , T_J=25℃ 4	---	---	1.3	V

Note :
1.Repetitive rating; pulse width limited by max. junction temperature.
2.Starting TJ = 25℃, L = 0.11mH, RG = 25Ω, IAS = 101A.
3.This is applied to D2Pak, when mounted on 1" square PCB (FR-4 or G-10 Material).
4.Pulse width ≤ 400μs; duty cycle ≤ 2%.