

### 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

### Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
$V_{DS}$	Drain-Source Voltage	40	V
$V_{GS}$	Gate-Source Voltage	$\pm 20$	V
$I_D@T_C=25^\circ C$	Continuous Drain Current	140	A
$I_D@T_C=100^\circ C$	Continuous Drain Current	99	A
$I_{DM}$	Pulsed Drain Current <sup>1</sup>	420	A
EAS	Single Pulse Avalanche Energy(Thermally limited) <sup>2</sup>	240	mJ
$P_D@T_C=25^\circ C$	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 <sup>3</sup>	---	62	°C/W
$R_{\theta JC}$	Thermal Resistance Junction-case	---	1.05	°C/W

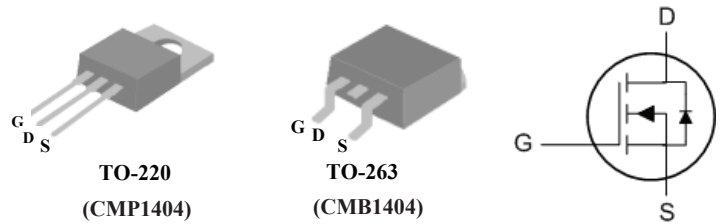
### Product Summary

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



**N-Channel Enhancement Mode Field Effect Transistor**

**Electrical Characteristics (T<sub>J</sub>=25 °C, unless otherwise noted)**

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV <sub>DSS</sub>	Drain-Source Breakdown Voltage	V <sub>GS</sub> =0V, I <sub>D</sub> =250uA	40	---	---	V
ΔBV <sub>DSS</sub> /ΔT <sub>J</sub>	BVDSS Temperature Coefficient	Reference to 25°C, I <sub>D</sub> =1mA	---	0.032	---	V/°C
R <sub>DS(ON)</sub>	Static Drain-Source On-Resistance	V <sub>GS</sub> =10V, I <sub>D</sub> =75A 4	---	---	5.5	mΩ
V <sub>GS(th)</sub>	Gate Threshold Voltage	V <sub>GS</sub> =V <sub>DS</sub> , I <sub>D</sub> =250uA	2	---	4	V
I <sub>DSS</sub>	Drain-Source Leakage Current	V <sub>DS</sub> =Max rating, V <sub>GS</sub> =0V	---	---	20	uA
		V <sub>DS</sub> =Max rating, V <sub>GS</sub> =0V@125°C	---	---	250	
I <sub>GSS</sub>	Gate-Source Leakage Current	V <sub>GS</sub> =±20V, V <sub>DS</sub> =0V	---	---	±100	nA
Q <sub>g</sub>	Total Gate Charge	I <sub>D</sub> =75A V <sub>DS</sub> =32V V <sub>GS</sub> =10V 4	---	65	---	nC
Q <sub>gs</sub>	Gate-Source Charge		---	21	---	
Q <sub>gd</sub>	Gate-Drain Charge		---	30	---	
T <sub>d(on)</sub>	Turn-On Delay Time	V <sub>DS</sub> =20V I <sub>D</sub> =75A R <sub>G</sub> =6.8Ω, V <sub>GS</sub> =10V 4	---	18	---	ns
T <sub>r</sub>	Rise Time		---	148	---	
T <sub>d(off)</sub>	Turn-Off Delay Time		---	42	---	
T <sub>f</sub>	Fall Time		---	74	---	
C <sub>iss</sub>	Input Capacitance	V <sub>DS</sub> =25V, V <sub>GS</sub> =0V, f=1MHz	---	3200	---	pF
C <sub>oss</sub>	Output Capacitance		---	680	---	
C <sub>rss</sub>	Reverse Transfer Capacitance		---	415	---	

**Diode Characteristics**

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I <sub>S</sub>	Continuous Source Current	V <sub>G</sub> =V <sub>D</sub> =0V, Force Current	---	---	75	A
I <sub>SM</sub>	Pulsed Source Current <sup>1</sup>		---	---	420	A
V <sub>SD</sub>	Diode Forward Voltage	V <sub>GS</sub> =0V, I <sub>S</sub> =75 A, T <sub>J</sub> =25°C 4	---	---	1.3	V

Note :

- 1.Repetitive rating; pulse width limited by max. junction temperature.
- 2.Limited by T<sub>Jmax</sub>, starting T<sub>J</sub> = 25°C, L = 0.04mH R<sub>G</sub> = 25Ω, I<sub>AS</sub> = 75A, V<sub>GS</sub> =10V. Part not recommended for use above this value.
- 3.This is only applied to TO-220AB package.
- 4.Pulse width ≤ 1.0ms; duty cycle ≤ 2%.