CMP4N65/CMB4N65/CMF4N65

650V N-Channel MOSFET

General Description

The 4N65 have been fabricated using an advanced high voltage MOSFET process that is designed to deliver high levels of performance and robustness in popular AC-DC applications.

Product Summary

BVDSS	$R_{DS(on)}$ max.	ID
650V	3Ω	4A

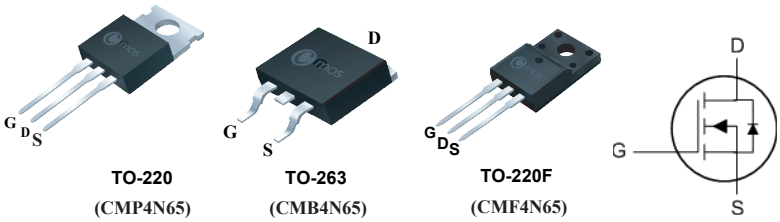
Features

- 4.0A, 650V, RDS (on) = 3 Ω @VGS = 10 V
- 100% Avalanche Tested
- Improved dv/dt capability

Applications

- Power Supply
- PFC
- Ballast

TO-220/263/220F Pin Configuration



TO-220 (CMP4N65) TO-263 (CMB4N65) TO-220F (CMF4N65)

Absolute Maximum Ratings

T_C = 25°C unless otherwise noted

Symbol	Parameter	220/263	220F	Units
V_{DSS}	Drain-Source Voltage	650		V
I_D	Drain Current - Continuous (T_C = 25°C) [1]	4	4*	A
	- Continuous (T_C = 100°C) [1]	2.6	2.6*	A
I_{DM}	Drain Current - Pulsed [2]	12	12*	A
V_{GSS}	Gate-Source Voltage	± 30		V
I_{AR}	Avalanche Current	4	4*	A
P_D	Power Dissipation (T_C = 25°C) [3]	100	33	W
T_J, T_{STG}	Operating and Storage Temperature Range	-25 to +150		°C
T_L	Maximum lead temperature for soldering purposes, 1/8 from case for 5 seconds	300		°C

* Drain current limited by maximum junction temperature

Thermal Characteristics

Symbol	Parameter	220/263	220F	Units
$R_{\theta JC}$	Thermal Resistance, Junction-to-Case Max. [1]	1.2	3.5	°C/W
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient Max. (Steady State) [1]	62	62	°C/W

Electrical Characteristic

T_C = 25°C unless otherwise noted

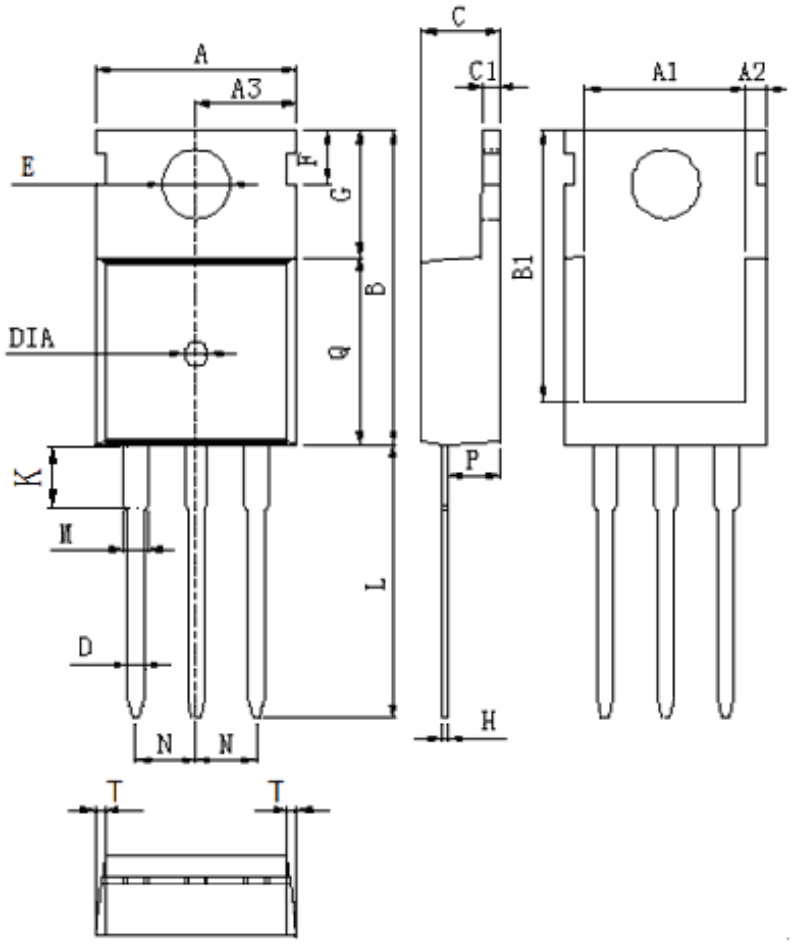
Symbol	Parameter	Test Conditions	Min	Typ	Max	Units
Off Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS} = 0 V, I_D = 250 μA	650	--	--	V
$\triangle BV_{DSS}$ / $\triangle T_J$	Breakdown Voltage Temperature Coefficient	I_D = 1mA , Referenced to 25°C	--	0.69	--	V/°C
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS} = 650 V, V_{GS} = 0 V	--	--	10	μA
I_{GSSF}	Gate-Body Leakage Current, Forward	V_{GS} = 30 V, V_{DS} = 0 V	--	--	100	nA
I_{GSSR}	Gate-Body Leakage Current, Reverse	V_{GS} = -30 V, V_{DS} = 0 V	--	--	-100	nA
On Characteristics						
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS} = V_{GS}, I_D = 250 μA	2.0	--	4.0	V
$R_{DS(on)}$	Static Drain-Source On-Resistance	V_{GS} = 10 V, I_D = 2A	--	--	3.0	Ω
g_{FS}	Forward Transconductance	V_{DS} = 15 V, I_D =2 A	--	3	--	S
Dynamic Characteristics						
C_{iss}	Input Capacitance	V_{DS} = 25 V V_{GS} = 0 V f = 1.0 MHz	--	800	--	pF
C_{oss}	Output Capacitance		--	60	--	pF
C_{rss}	Reverse Transfer Capacitance		--	4	--	pF
Switching Characteristics						
$t_{d(on)}$	Turn-On Delay Time	V_{DD} = 300 V , V_{GS}=10V I_D = 1A R_G = 10Ω	--	15	--	ns
t_r	Turn-On Rise Time		--	20	--	ns
$t_{d(off)}$	Turn-Off Delay Time		--	30	--	ns
t_f	Turn-Off Fall Time		--	30	--	ns
Q_g	Total Gate Charge	V_{DS} = 520V I_D = 1A V_{GS} = 10 V	--	18	--	nC
Q_{gs}	Gate-Source Charge		--	5	--	nC
Q_{gd}	Gate-Drain Charge		--	6	--	nC
Drain-Source Diode Characteristics and Maximum Ratings						
I_S	Maximum Continuous Drain-Source Diode Forward Current [1,4]		--	--	4	A
I_{SM}	Maximum Pulsed Drain-Source Diode Forward Current [2,4]		--	--	12	A
V_{SD}	Drain-Source Diode Forward Voltage	V_{GS} = 0 V, I_S = 1A [2]	--	--	1	V
t_{rr}	Reverse Recovery Time	I_F = 1A dI / dt = 100 A/μs	--	200	--	ns
Q_{rr}	Reverse Recovery Charge		--	580	--	nC

Notes:

1.The data tested by surface mounted on a 1 inch2 FR-4 board with 2OZ copper.
2.The data tested by pulsed , pulse width ≦ 300us , duty cycle ≦ 2%.
3.The power dissipation is limited by 150℃ junction temperature.
4.The data is theoretically the same as ID and IDM , in real applications , should be limited by total power dissipation.

Package Dimension

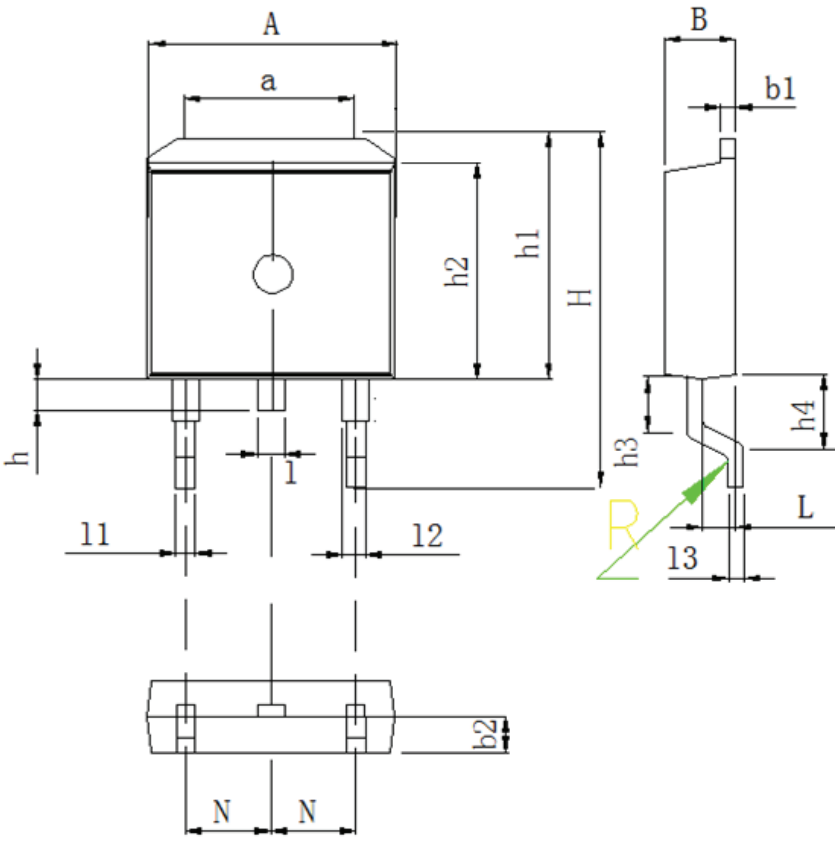
TO-220 Unit :mm



DIM	MILLIMETERS
A	10.0±0.3
A1	8.64±0.2
A2	1.15±0.1
A3	5.0±0.2
B	15.8±0.4
B1	13.2±0.3
C	4.56±0.1
C1	1.3±0.2
D	0.8±0.2
E	3.6±0.2
F	2.95±0.3
G	6.5±0.3
H	0.5±0.1
K	3.1±0.2
L	13.2±0.4
M	1.25±0.1
N	2.54±0.1
P	2.4±0.3
Q	9.0±0.3
T	W:0.35
DIA	⊙1.5(deep 0.2)

Package Dimension

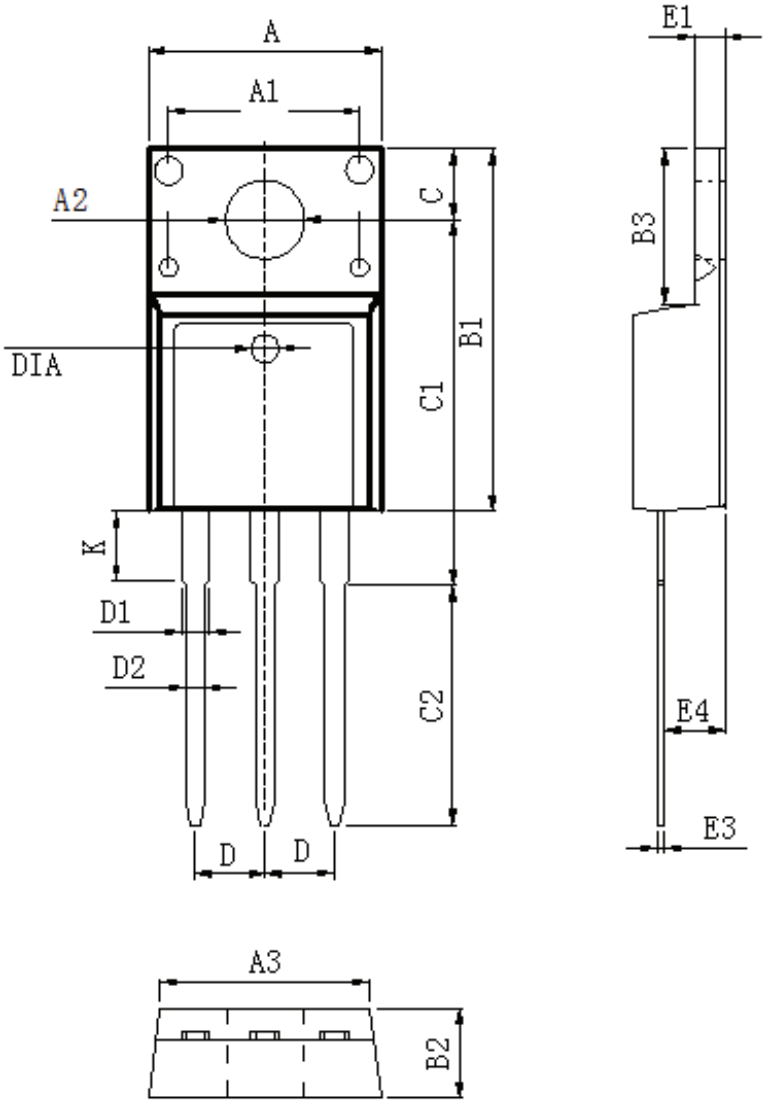
TO-263 Unit :mm



DIM	MILLIMETERS
A	9.8±0.2
a	7.4±0.4
B	4.5±0.2
b1	1.3±0.05
b2	2.4±0.2
H	15.5±0.3
h	1.54±0.2
h1	10.5±0.2
h2	9.2±0.1
h3	1.54±0.2
h4	2.7±0.2
L	2.4±0.2
l	1.3±0.1
l1	0.8±0.1
l2	1.3±0.1
l3	0.5±0.1
N	2.54±0.1
R	0.5R±0.05

Package Dimension

TO-220F Unit :mm



DIM	MILLIMETERS
A	10.16±0.3
A1	7.00±0.1
A2	3.3±0.2
A3	9.5±0.2
B1	15.87±0.3
B2	4.7±0.2
B3	6.68±0.4
C	3.3±0.2
C1	12.57±0.3
C2	10.02±0.5
D	2.54±0.05
D1	1.28±0.2
D2	0.8±0.1
K	3.1±0.3
E1	2.54±0.1
E3	0.5±0.1
E4	2.76±0.2
DIA	⊙1.5(deep 0.2)