

CMP/CMB/CMI/CMF70R210S6ZD

700V, 176mΩ typ., 20A N-Channel Super Junction Power MOSFET

General Description

The 70R210S6ZD is power MOSFET using Cmos's advanced super junction technology that can realize very low on resistance, gate charge and reduced tendency for ringing. As a result, its switching loss is very low, making it optimized for switching applications. Moreover, these user friendly devices offer the advantages of improved ruggedness and remarkable ESD capability by integrated Zener diode, making it an ideal choice for designers.

Features

- Multi-layer Epitaxial Chip Technology
- Zener-integrated
- Low On-Resistance
- 100% avalanche tested
- RoHS Compliant

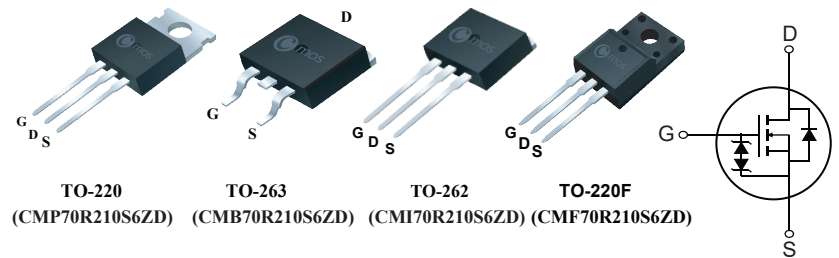
Product Summary

BVDSS	R _{DS(on)} max.	ID
700V	0.2Ω	20A

Applications

- Adapter
- Switching applications
- PFC power supply stages

TO-220/263/262/220F Pin Configuration



Absolute Maximum Ratings

Symbol	Parameter	220/263/262	220F	Units
V _{DS}	Drain-Source Voltage	700		V
V _{GS}	Gate-Source Voltage	±30		V
I _D @T _C =25°C	Continuous Drain Current	20	20*	A
I _D @T _C =100°C	Continuous Drain Current	13	13*	A
I _{DM}	Pulsed Drain Current	80	80*	A
EAS	Single Pulse Avalanche Energy (Note 1)	80		mJ
P _D @T _C =25°C	Total Power Dissipation	250	35	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	220/263/262	220F	Unit
R _{θJA}	Thermal Resistance Junction-ambient Max.	62.5	65	°C/W
R _{θJC}	Thermal Resistance Junction-case Max.	0.50	3.57	°C/W

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Electrical Characteristics (T_J=25°C , unless otherwise noted)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V , I _D =250uA	700	---	---	V
R _{DS(ON)}	Static Drain-Source On-Resistance	V _{GS} =10V , I _D =5.6A	---	176	200	mΩ
V _{GS(th)}	Gate Threshold Voltage	V _{GS} =V _{DS} , I _D =250uA	2.5	---	4.5	V
I _{DSS}	Drain-Source Leakage Current	V _{DS} =700V , V _{GS} =0V	---	---	1	μA
I _{GSS}	Gate-Source Leakage Current	V _{GS} =±30V , V _{DS} =0V	---	---	±10	μA
g _{fs}	Forward Transconductance	V _{DS} =15V , I _D =5A	---	9.4	---	S
R _g	Gate Resistance	V _{DS} =0V , V _{GS} =0V , f=1MHz	---	10	---	Ω
Q _g	Total Gate Charge	I _D = 5.6A	---	33	---	nC
Q _{gs}	Gate-Source Charge	V _{DD} = 400V	---	6.6	---	
Q _{gd}	Gate-Drain Charge	V _{GS} = 10V	---	14	---	
T _{d(on)}	Turn-On Delay Time	V _{DD} = 325V V _{GS} = 10V R _G = 25Ω , I _D = 18A	---	28	---	ns
T _r	Rise Time		---	50	---	
T _{d(off)}	Turn-Off Delay Time		---	106	---	
T _f	Fall Time		---	31	---	
C _{iss}	Input Capacitance	V _{DS} =100V , V _{GS} =0V , f=1MHz	---	1300	---	pF
C _{oss}	Output Capacitance		---	35	---	
C _{rss}	Reverse Transfer Capacitance		---	2	---	

Diode Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I _S	Continuous Source Current	V _G =V _D =0V , Force Current	---	---	20	A
I _{SM}	Pulsed Source Current		---	---	80	A
V _{SD}	Diode Forward Voltage	V _{GS} =0V , I _S =5.6A , T _J =25°C	---	0.81	1.4	V
t _{rr}	Reverse Recovery Time	di/dt = 100A/μs	---	242	---	ns
Q _{rr}	Reverse Recovery Charge	V _{DD} =400V , I _{SD} =5.6A	---	2.4	---	μC

Note :

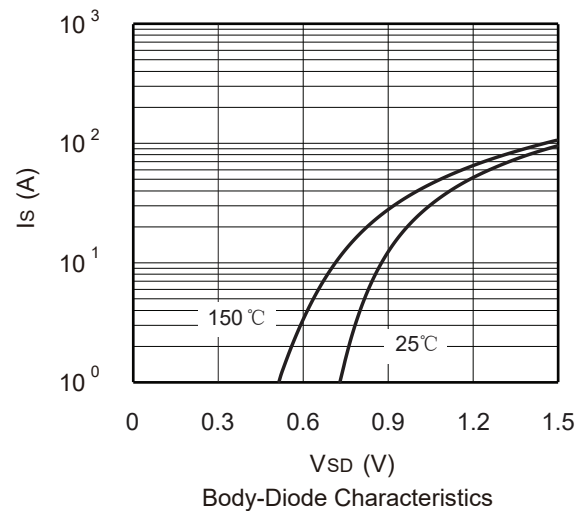
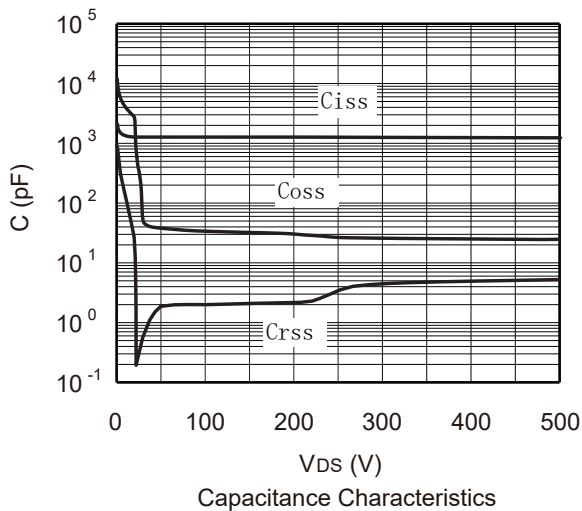
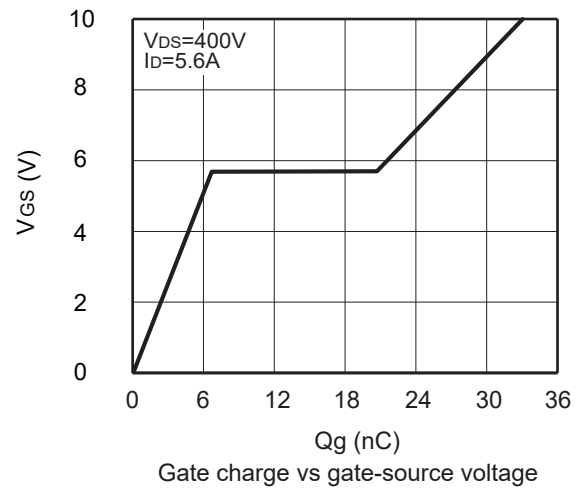
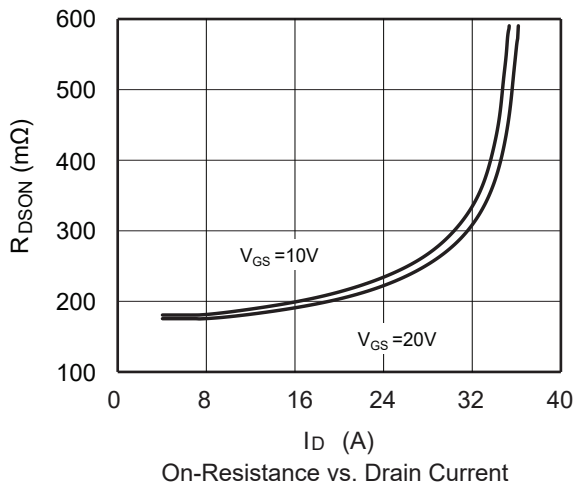
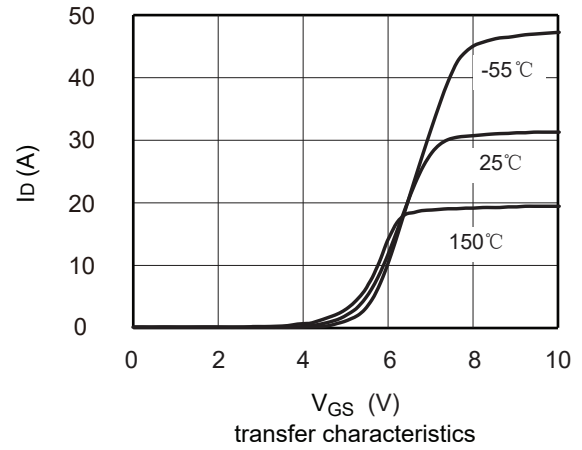
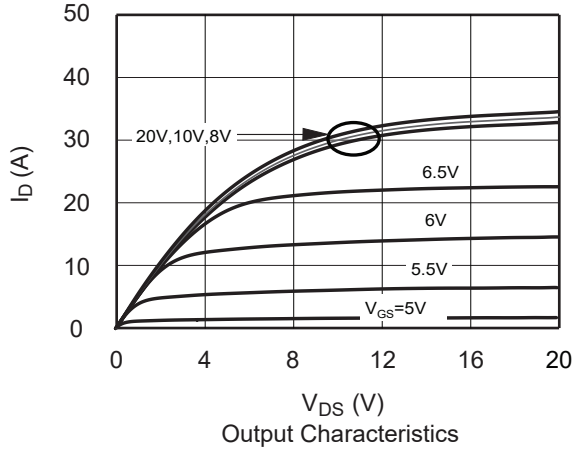
1.The EAS data shows Max. rating . The test condition is V_{DD}=100V , V_{GS}=10V , L=40mH , I_{AS}=2A.

This product has been designed and qualified for the counsumer market.

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Cmos reserver the right to improve product design ,functions and reliability wihtout notice.Please refer to the latest version of specification.

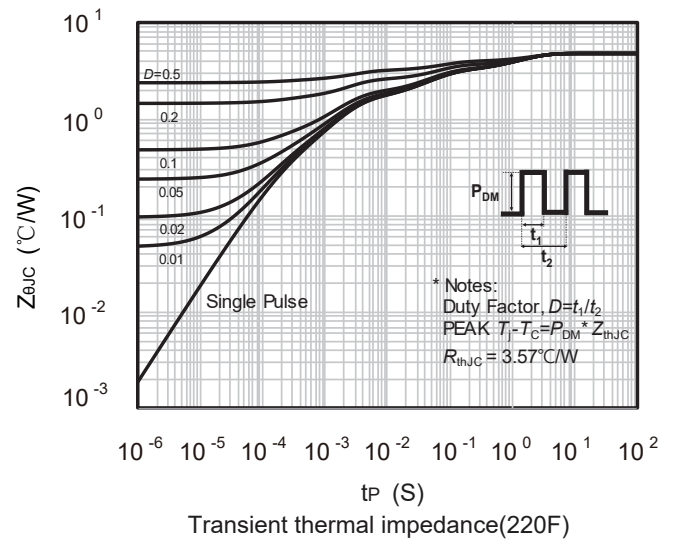
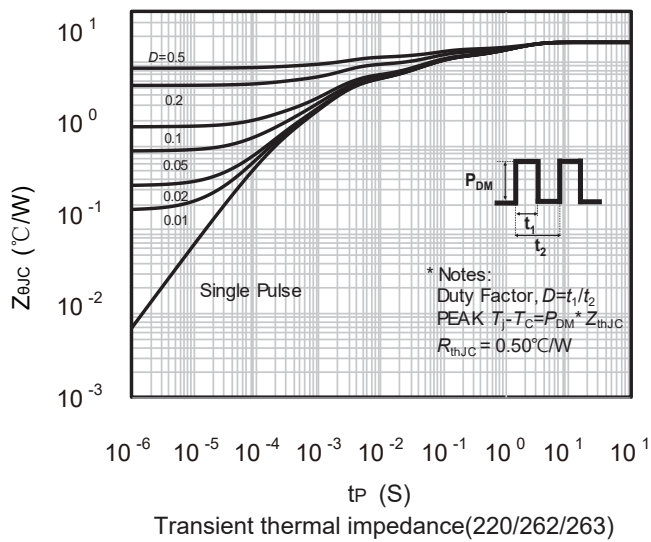
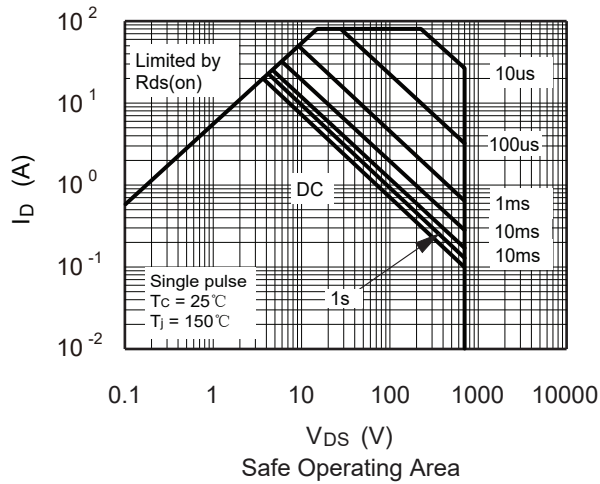
Typical Characteristics



CMP/CMB/CMI/CMF70R210S6ZD

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Characteristics



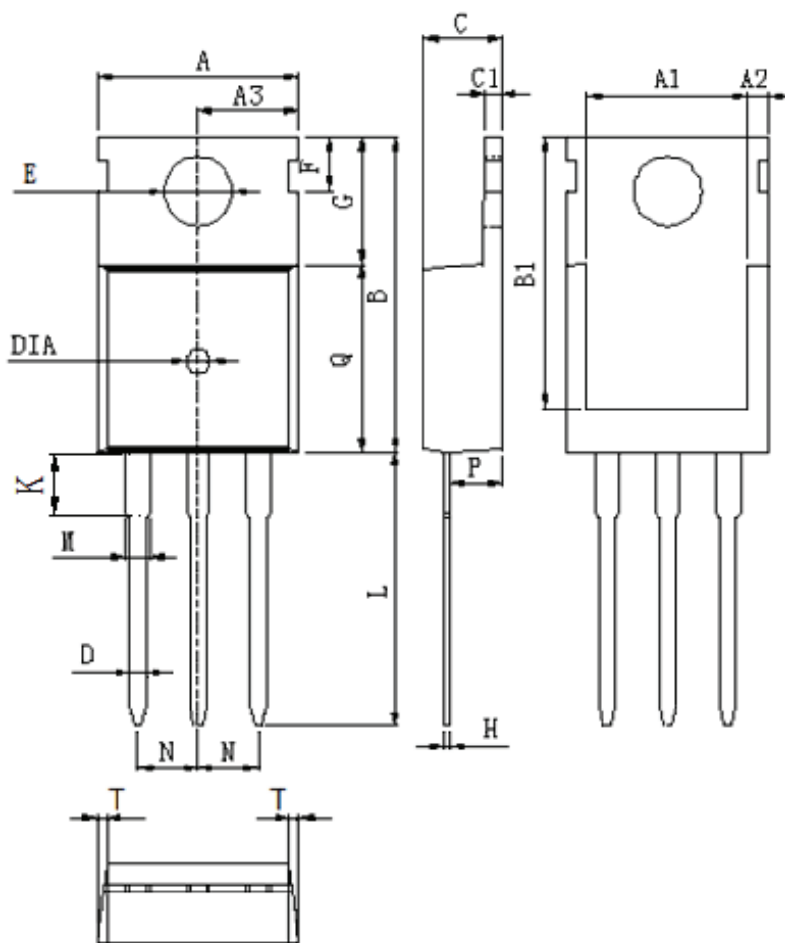
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700V, 176mΩ typ., 20A N-Channel Super Junction Power MOSFET

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)

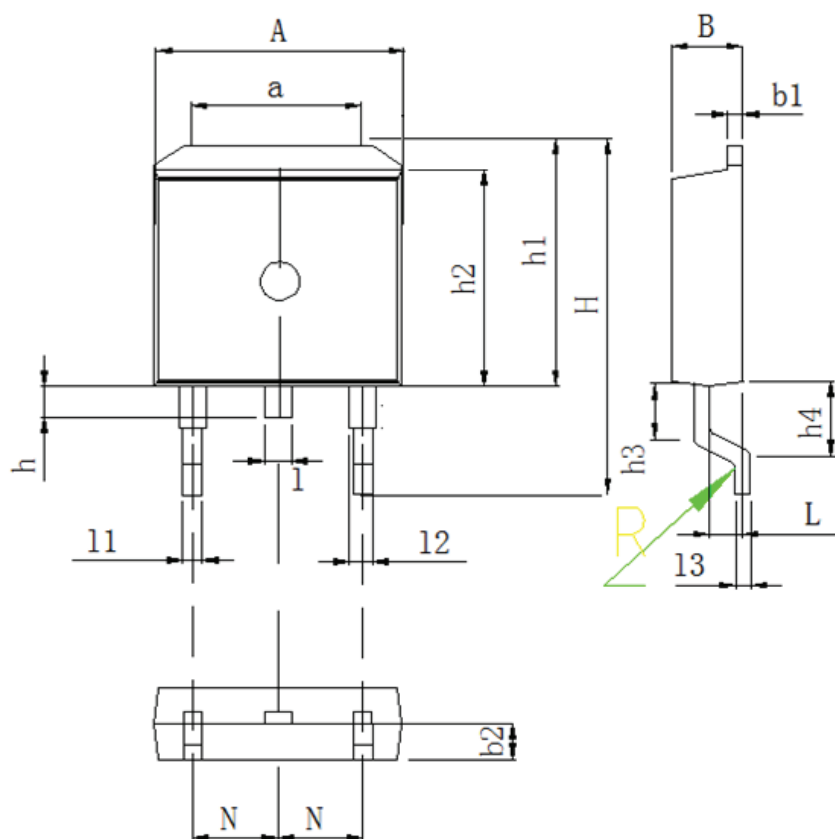
CMP/CMB/CMI/CMF70R210S6ZD

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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
1	1.3 ± 0.1
11	0.8 ± 0.1
12	1.3 ± 0.1
13	0.5 ± 0.1
N	2.54 ± 0.1
R	$0.5R \pm 0.05$

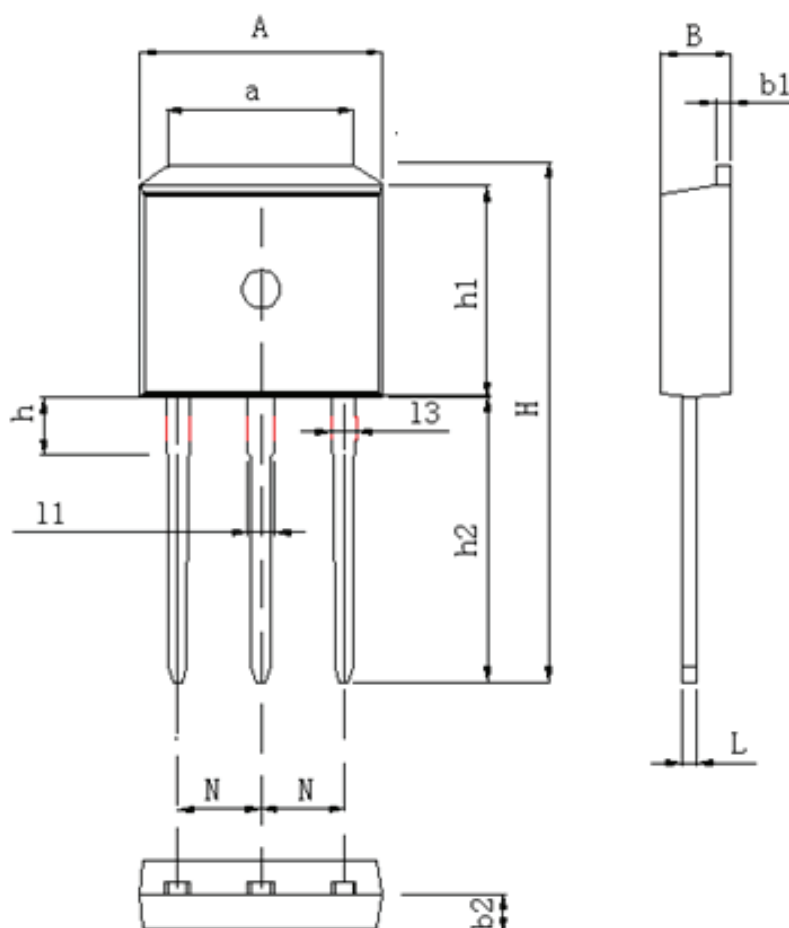
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Package Dimension

TO-262

Unit :mm



DIM	MILLIMETERS
A	9.98 ± 0.2
a	7.4 ± 0.4
B	4.5 ± 0.2
b1	1.3 ± 0.05
b2	2.4 ± 0.2
H	23.9 ± 0.3
h	3.1 ± 0.2
h1	9.16 ± 0.2
h2	13.2 ± 0.2
L	0.5 ± 0.1
l1	1.3 ± 0.1
l2	0.8 ± 0.1
N	2.45 ± 0.1

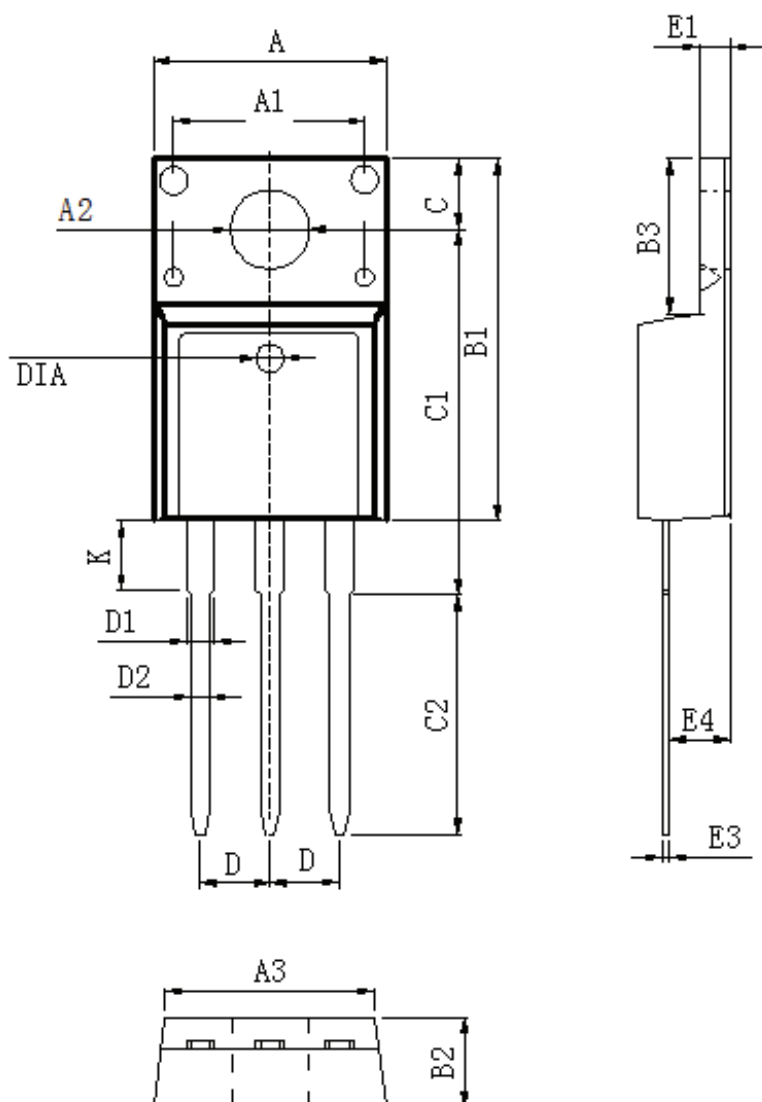
CMP/CMB/CMI/CMF70R210S6ZD

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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	$\odot 1.5$ (deep 0.2)