

General Description

The 20N60 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. These parts can be adopted quickly into new and existing offline power supply designs.

Features

- Fast switching
- 100% avalanche tested
- RoHS Compliant

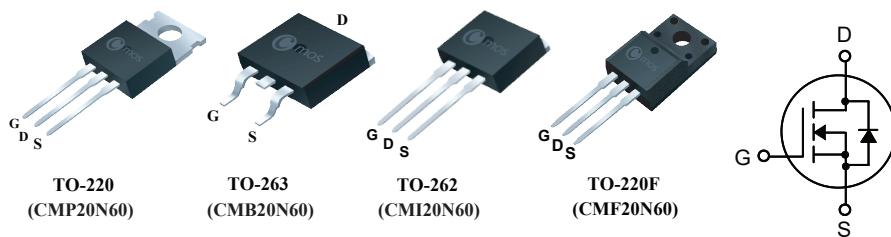
Product Summary

BVDSS	R _{DS(on)} max.	ID
600V	0.37Ω	20A

Applications

- Charger
- Adaptor
- Power Supply

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



Absolute Maximum Ratings

Symbol	Parameter	220/263/262	220F	Units
V _{DS}	Drain-Source Voltage	600		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	11.5	11.5*	A
I _{DM}	Pulsed Drain Current (Note 1)	80	80*	A
EAS	Single Pulse Avalanche Energy (Note 2)	880		mJ
P _D @T _C =25°C	Total Power Dissipation	400	45	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 (Note 3,4)	65	65	°C/W
R _{θJC}	Thermal Resistance Junction-case	0.3	2.5	°C/W

Electrical Characteristics ($T_J=25^{\circ}\text{C}$, unless otherwise noted)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V$, $I_D=250\mu A$	600	---	---	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance	$V_{GS}=10V$, $I_D=9A$	---	---	0.37	Ω
$V_{GS(th)}$	Gate Threshold Voltage	$V_{GS}=V_{DS}$, $I_D=250\mu A$	2	---	4	V
I_{DSS}	Drain-Source Leakage Current	$V_{DS}=600V$, $V_{GS}=0V$	---	---	1	μA
		$V_{DS}=480V$, $T_C=125^{\circ}\text{C}$	---	---	10	
I_{GSS}	Gate-Source Leakage Current	$V_{GS}=\pm 30V$, $V_{DS}=0V$	---	---	± 100	nA
g_{fs}	Forward Transconductance	$V_{DS}=10V$, $I_D=15A$	---	30	---	S
Q_g	Total Gate Charge	$I_D=20A$	---	56	---	nC
Q_{gs}	Gate-Source Charge	$V_{DS}=480V$	---	22	---	
Q_{gd}	Gate-Drain Charge	$V_{GS}=10V$	---	20	---	
$T_{d(on)}$	Turn-On Delay Time	$V_{DS}=300V$ $V_{GS}=10V$ $I_D=18A$ $R_G=25\Omega$	---	200	---	ns
T_r	Rise Time		---	145	---	
$T_{d(off)}$	Turn-Off Delay Time		---	430	---	
T_f	Fall Time		---	80	---	
C_{iss}	Input Capacitance	$V_{DS}=25V$, $V_{GS}=0V$, $f=1\text{MHz}$	---	4000	---	pF
C_{oss}	Output Capacitance		---	260	---	
C_{rss}	Reverse Transfer Capacitance		---	24	---	

Diode Characteristics

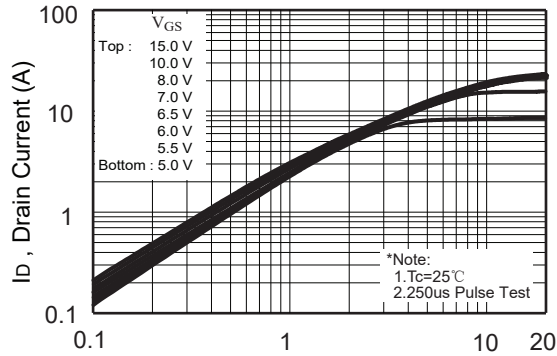
Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I_S	Continuous Source Current	$V_G=V_D=0V$, Force Current	---	---	20	A
I_{SM}	Pulsed Source Current		---	---	80	A
t_{rr}	Reverse Recovery Time	$I_F=20A$ $dI/dt=100A/\mu s$	---	435	---	ns
Q_{rr}	Reverse Recovery Charge		---	4.1	---	nC
V_{SD}	Diode Forward Voltage	$V_{GS}=0V$, $I_S=15A$	---	---	1.2	V

Notes:

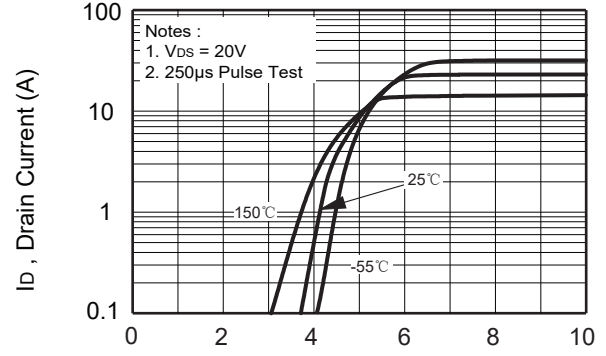
1. Repetitive Rating : Pulse width limited by maximum junction temperature.
2. $L=4.4\text{mH}$, $I_{AS}=20A$, $V_{DD}=50V$, $R_G=25\Omega$, Starting $T_J=25^{\circ}\text{C}$.
3. The value of $R_{\theta JA}$ is measured with the device in a still air environment with $T_A=25^{\circ}\text{C}$.
4. The $R_{\theta JA}$ is the sum of the thermal impedance from junction to case $R_{\theta JC}$ and case to ambient.

This product has been designed and qualified for the consumer market.
Cmos assumes no liability for customers' product design or applications.
Cmos reserves the right to improve product design ,functions and reliability without notice.

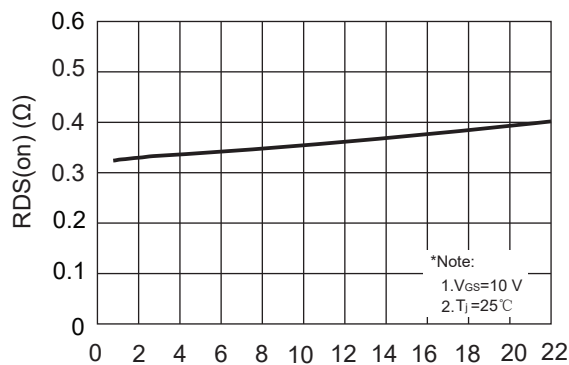
Typical Characteristics



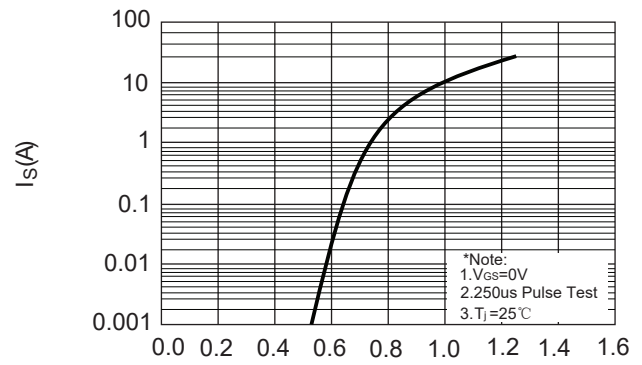
V_{DS} , Drain-to-Source Voltage (V)
Output Characteristics



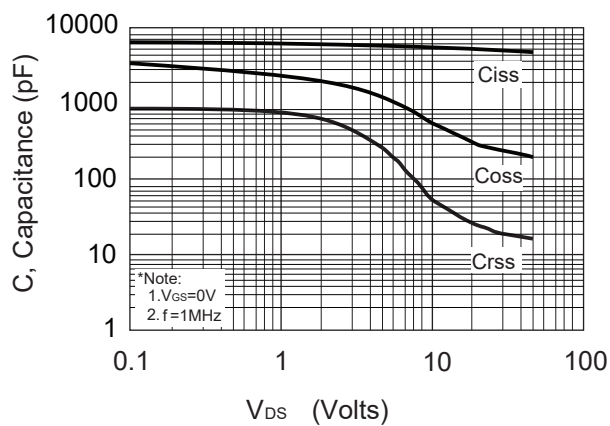
V_{GS} , Gate-to-Source Voltage (V)
Transfer Characteristics



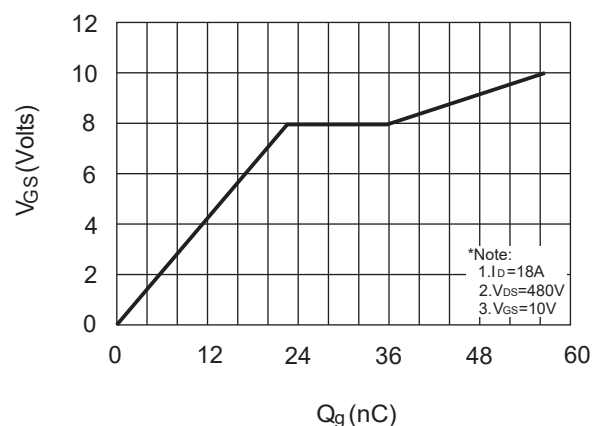
I_D (A)
On-Resistance vs. Drain Current and Gate Voltage



V_{SD} (Volts)
Body-Diode Characteristics

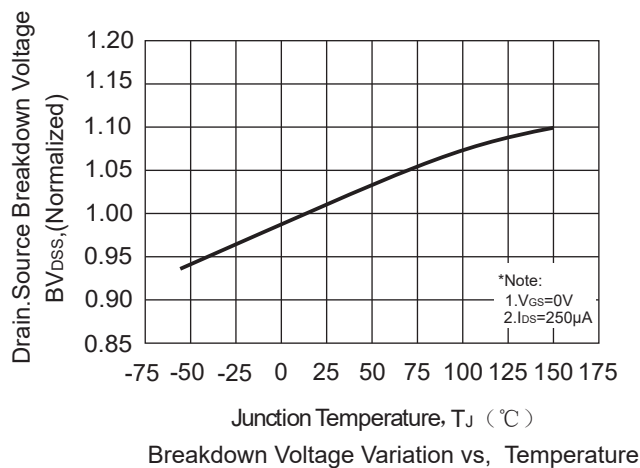
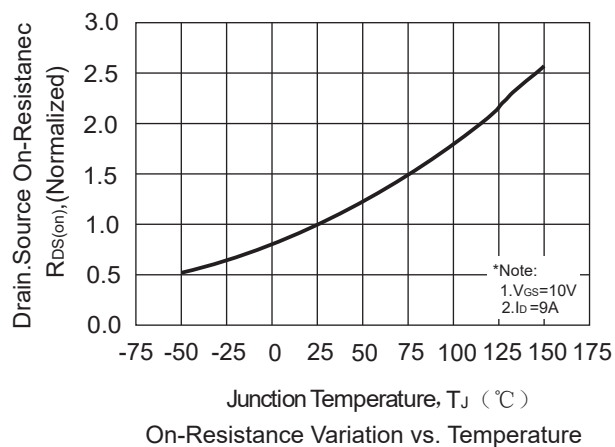
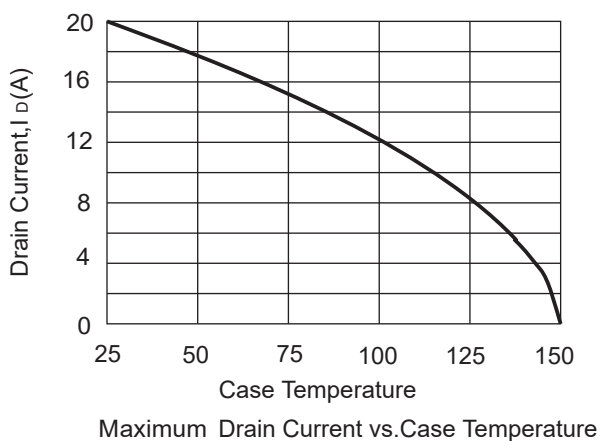
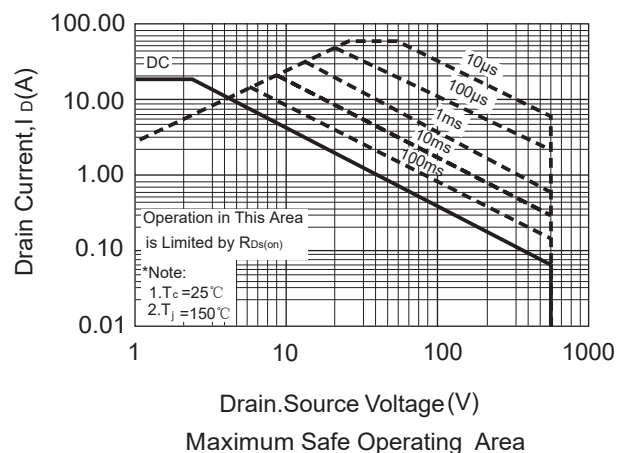
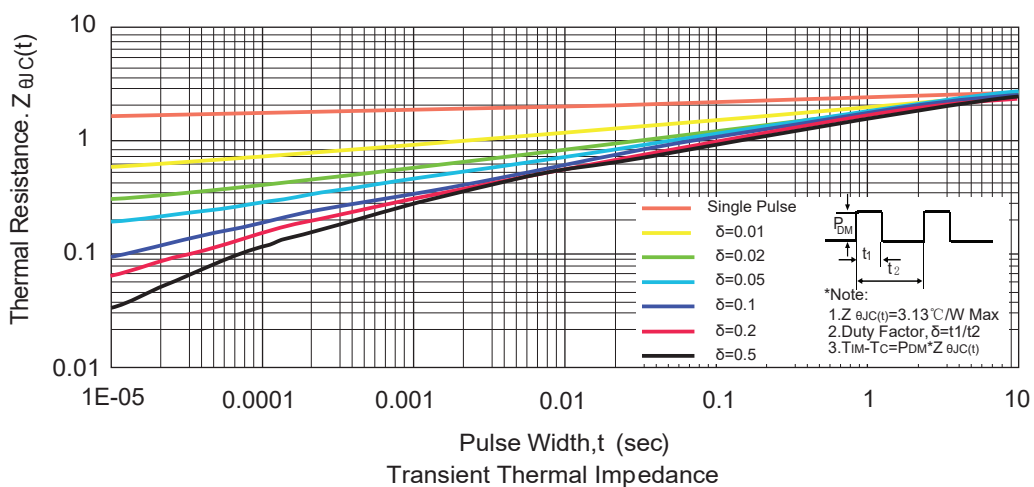


V_{DS} (Volts)
Capacitance Characteristics



Q_g (nC)
Gate-Charge Characteristics

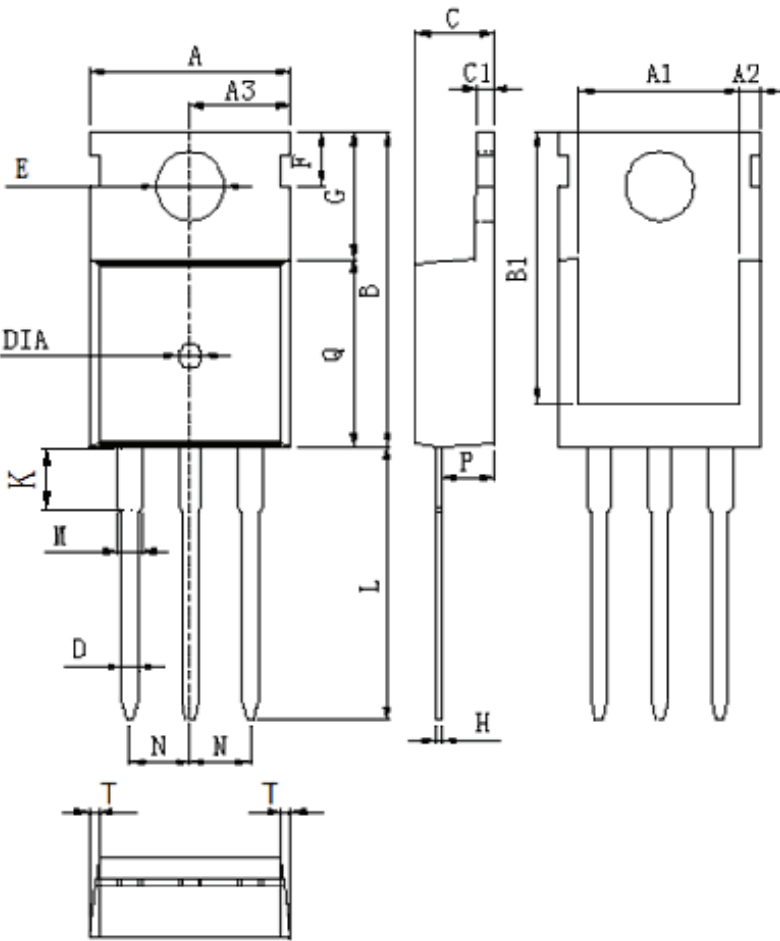
Typical Characteristics



Package Dimension

TO-220

Unit :mm

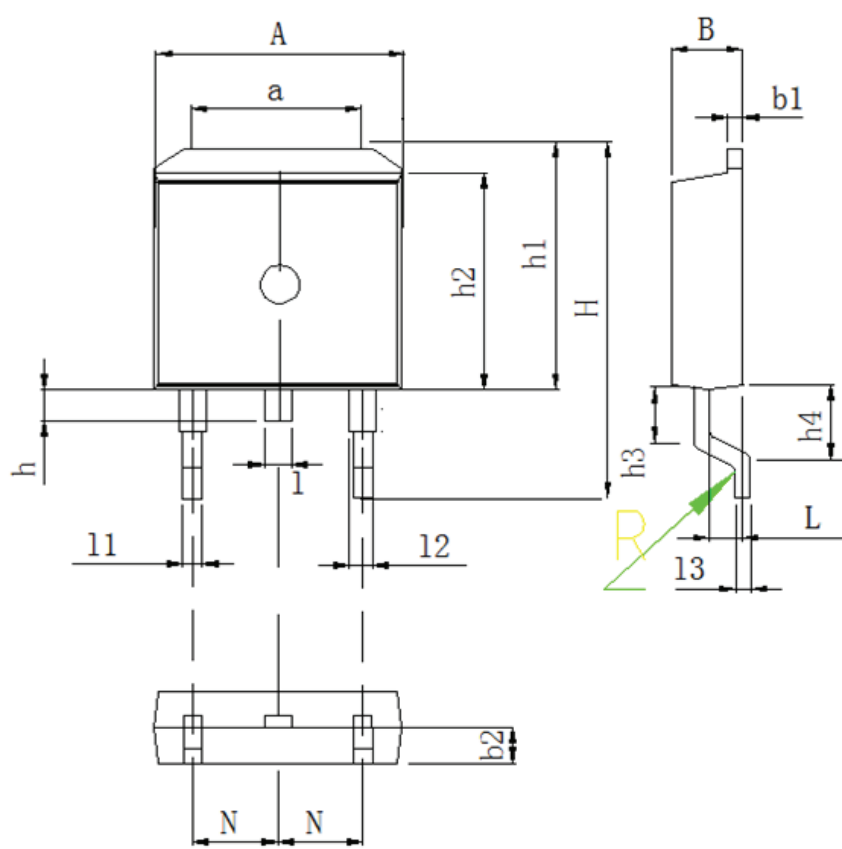


DIM	MILLIMETERS
A	10.0±0.3
A1	8.64±0.2
A2	1.15±0.1
A3	5.0±0.2
B	15.8±0.4
B1	13.2±0.3
C	4.56±0.1
C1	1.3±0.2
D	0.8±0.2
E	3.6±0.2
F	2.95±0.3
G	6.5±0.3
H	0.5±0.1
K	3.1±0.2
L	13.2±0.4
M	1.25±0.1
N	2.54±0.1
P	2.4±0.3
Q	9.0±0.3
T	W:0.35
DIA	⊙1.5 (deep 0.2)

Package Dimension

TO-263

Unit :mm

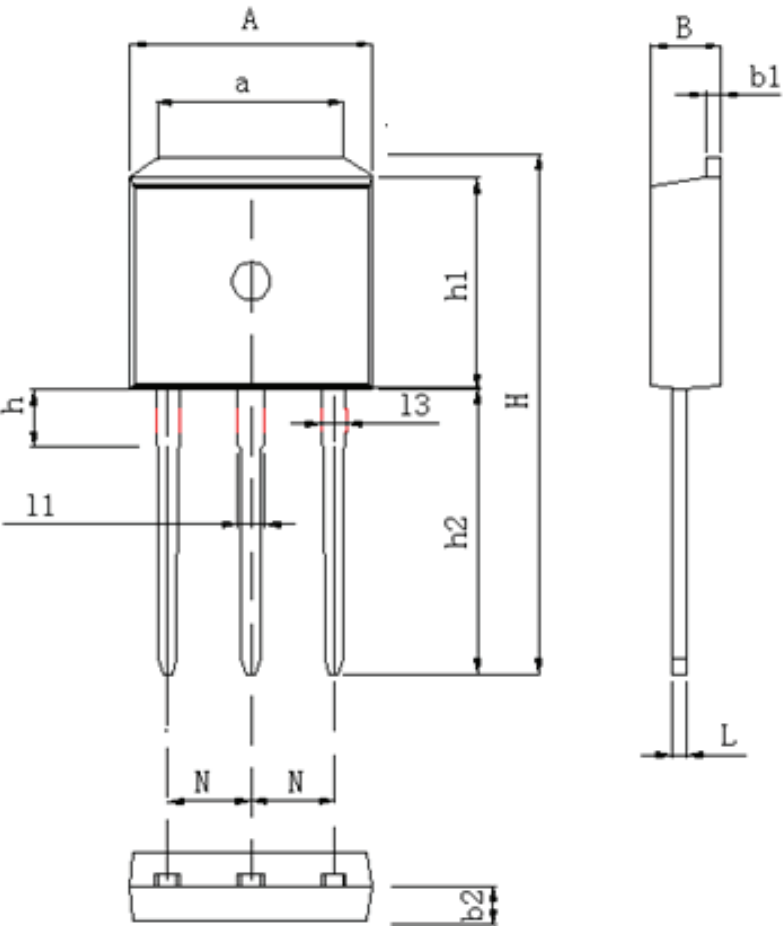


DIM	MILLIMETERS
A	9.8±0.2
a	7.4±0.4
B	4.5±0.2
b1	1.3±0.05
b2	2.4±0.2
H	15.5±0.3
h	1.54±0.2
h1	10.5±0.2
h2	9.2±0.1
h3	1.54±0.2
h4	2.7±0.2
L	2.4±0.2
1	1.3±0.1
11	0.8±0.1
12	1.3±0.1
13	0.5±0.1
N	2.54±0.1
R	0.5R±0.05

Package Dimension

TO-262

Unit :mm

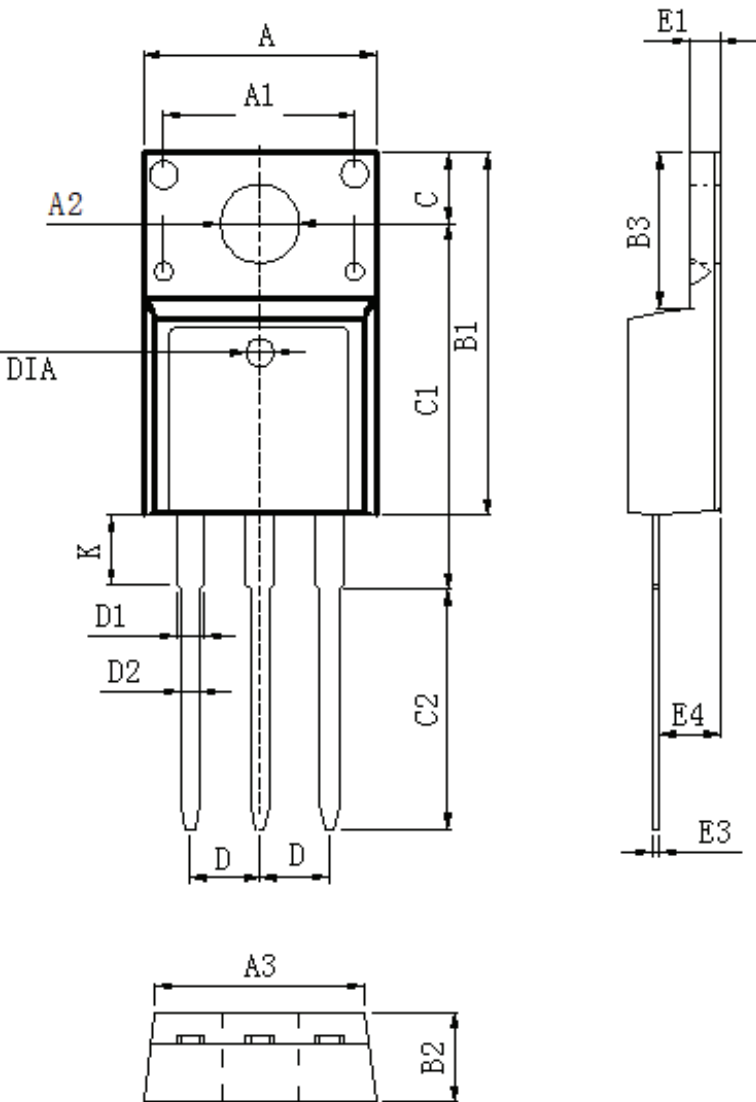


DIM	MILLIMETERS
A	9.98±0.2
a	7.4±0.4
B	4.5±0.2
b1	1.3±0.05
b2	2.4±0.2
H	23.9±0.3
h	3.1±0.2
h1	9.16±0.2
h2	13.2±0.2
L	0.5±0.1
l1	1.3±0.1
l2	0.8±0.1
N	2.45±0.1

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)