CMPG80R670/CMBG80R670/CMIG80R670/CMFG80R670

800V, 630mΩ typ., 6A N-Channel Silicon Carbide Power MOSFET

General Description

This silicon carbide Power MOSFET device has been developed using Cmos's advanced Sic MOSFET technology.The device features a very low $R_{DS(on)}$ over the entire temperature range combined with low capacitances and very high switching operations,which improve application performance in frequency, energy efficiency, system size and weight reduction.

Product Summary

BVDSS	$R_{DS(on)}$ Typ.	ID
800V	630mΩ	6A

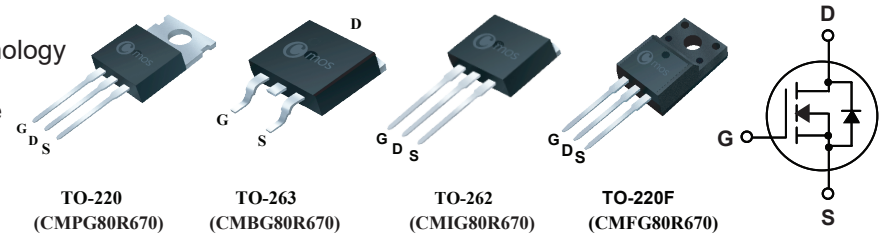
Applications

- Switch Mode Power Supplies
- Battery Chargers

Features

- Wide Bandgap SiC MOSFET Technology
- Easy to Parallel and Simple to Drive
- Low On-Resistance with High Blocking Voltage
- RoHS Compliant

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



TO-220 (CMPG80R670) | TO-263 (CMBG80R670) | TO-262 (CMIG80R670) | TO-220F (CMFG80R670)

Absolute Maximum Ratings

Symbol	Parameter	220/263/262	220F	Units
V_{DS}	Drain-Source Voltage	800		V
V_{GS}	Absolute maximum values	-10/+22		V
V_{GSop}	Recommended operational values	0/+18		V
I_D@T_C=25℃	Continuous Drain Current	6	6*	A
I_D@T_C=100℃	Continuous Drain Current	4	4*	A
I_{DM}	Pulsed Drain Current	12	12*	A
EAS	Single Pulse Avalanche Energy (Note 1)	50		mJ
P_D@T_C=25℃	Total Power Dissipation	60	30	W
T_{STG}	Storage Temperature Range	-55 to 175		℃
T_J	Operating Junction Temperature Range	-55 to 175		℃

* Drain current limited by maximum junction temperature.

Thermal Data

Symbol	Parameter	220/263/262	220F	Unit
$R_{\theta JA}$	Thermal Resistance Junction-ambient Max.	40	40	℃/W
$R_{\theta JC}$	Thermal Resistance Junction-case Max.	2.08	4.17	℃/W

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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=500μA	800	---	---	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance	V_{GS}=18V , I_D=1.8A	---	0.63	0.75	Ω
		V_{GS}=18V , I_D=1.8A , T_J=175℃	---	0.62	---	
		V_{GS}=15V , I_D=1.8A	---	0.93	---	
		V_{GS}=15V , I_D=1.8A , T_J=175℃	---	0.78	---	
$V_{GS(th)}$	Gate Threshold Voltage	V_{GS}=V_{DS} , I_D =0.65mA (tested after V_{GS}=V_{DS} ,1ms pulse)	2.7	3.6	5.0	V
I_{DSS}	Drain-Source Leakage Current	V_{DS}=800V , V_{GS} =0V	---	---	10	μA
I_{GSS}	Gate-Source Leakage Current	V_{GS}=-10V to 22V , V_{DS} =0V	---	---	±250	nA
R_g	Gate Resistance	V_{DS}=0V , V_{GS}=0V , f=1MHz	---	7	---	Ω
Q_g	Total Gate Charge	V_{DS} =500V , I_D=2A V_{GS}=0V to 15V	---	18	---	nC
Q_{gs}	Gate-Source Charge		---	7	---	
Q_{gd}	Gate-Drain Charge		---	7	---	
$T_{d(on)}$	Turn-On Delay Time	V_{DS} =500V I_D =2A V_{GS}=0V to 18V R_G =2Ω	---	13	---	ns
T_r	Rise Time		---	37	---	
$T_{d(off)}$	Turn-Off Delay Time		---	24	---	
T_f	Fall Time		---	108	---	
C_{iss}	Input Capacitance	V_{DS}=100V , V_{GS}=0V , f=1MHz	---	130	---	pF
C_{oss}	Output Capacitance		---	30	---	
C_{rss}	Reverse Transfer Capacitance		---	7.7	---	

Diode Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I_S	Continuous Source Current	V_G=V_D=0V , Force Current	---	---	6	A
I_{SM}	Pulsed Source Current		---	---	12	A
V_{SD}	Diode Forward Voltage	V_{GS}=0V , I_{SD}=0.9A ,T_J=25℃	---	3.1	---	V
t_{rr}	Reverse Recovery Time	di/dt=465A/μs , V_{GS} =0V V_R =500V , I_{SD} =2A , T_J =25℃	---	11	---	ns
Q_{rr}	Reverse Recovery Charge		---	17	---	nC

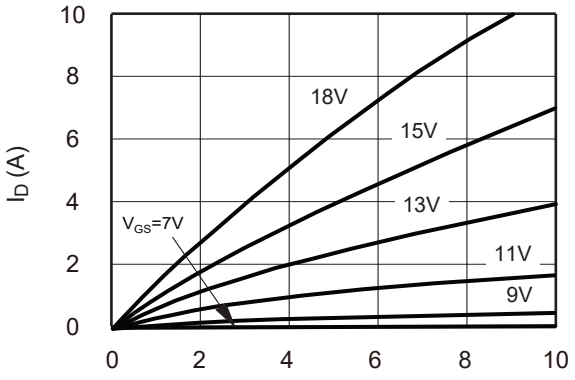
Note :

1.The EAS data shows Max. rating . The test condition is V_{DD}=100V , V_{GS}=10V , L=25mH , I_{AS}=2A.

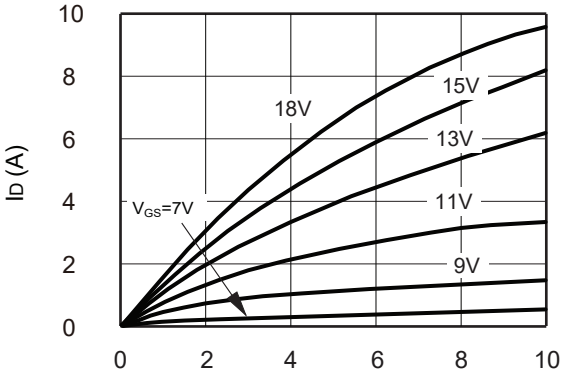
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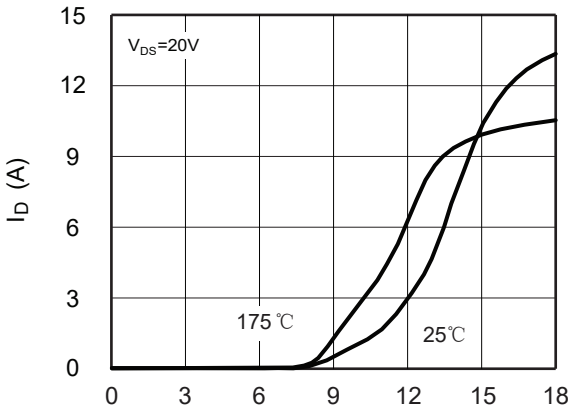
Typical Characteristics



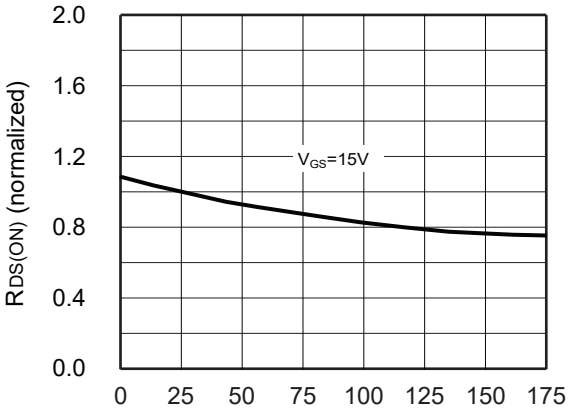
Output Characteristics Tj=25℃



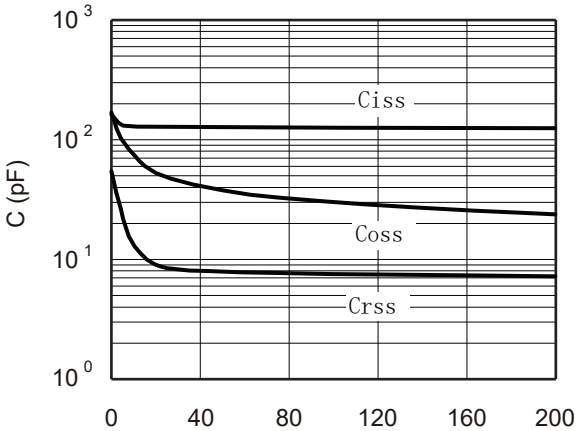
Output Characteristics Tj=175℃



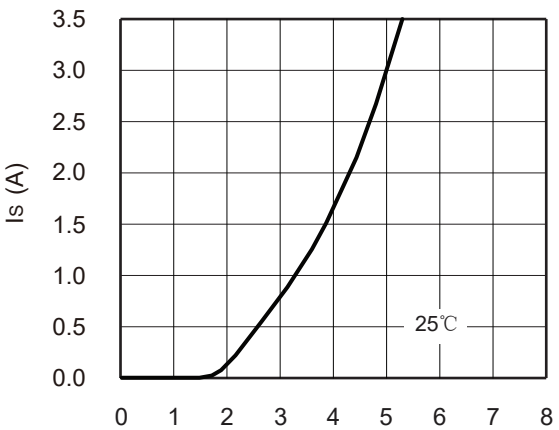
Transfer Characteristics



On-Resistance vs. temperature

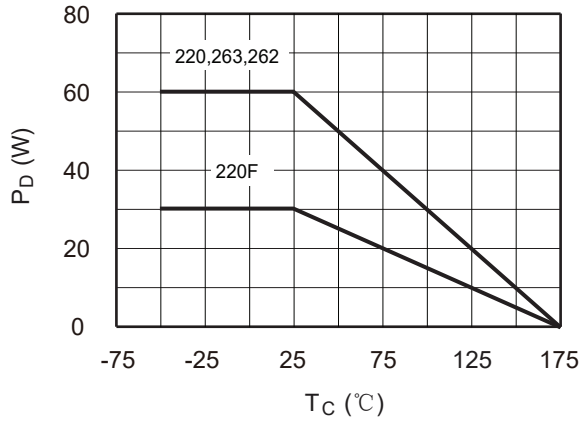


Capacitance Characteristics

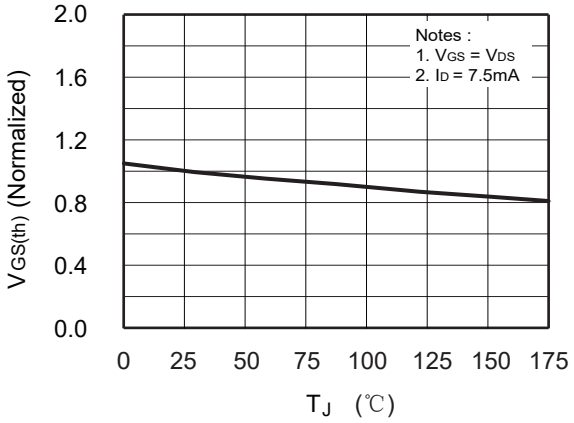


Body-Diode Characteristics

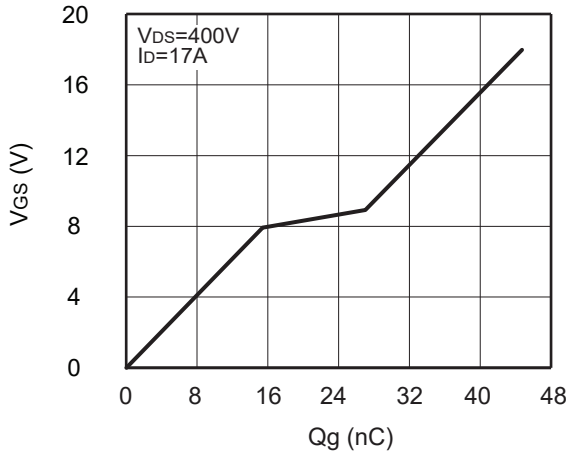
Typical Characteristics



Maximum total power dissipation



Threshold Voltage vs. Junction Temperatur

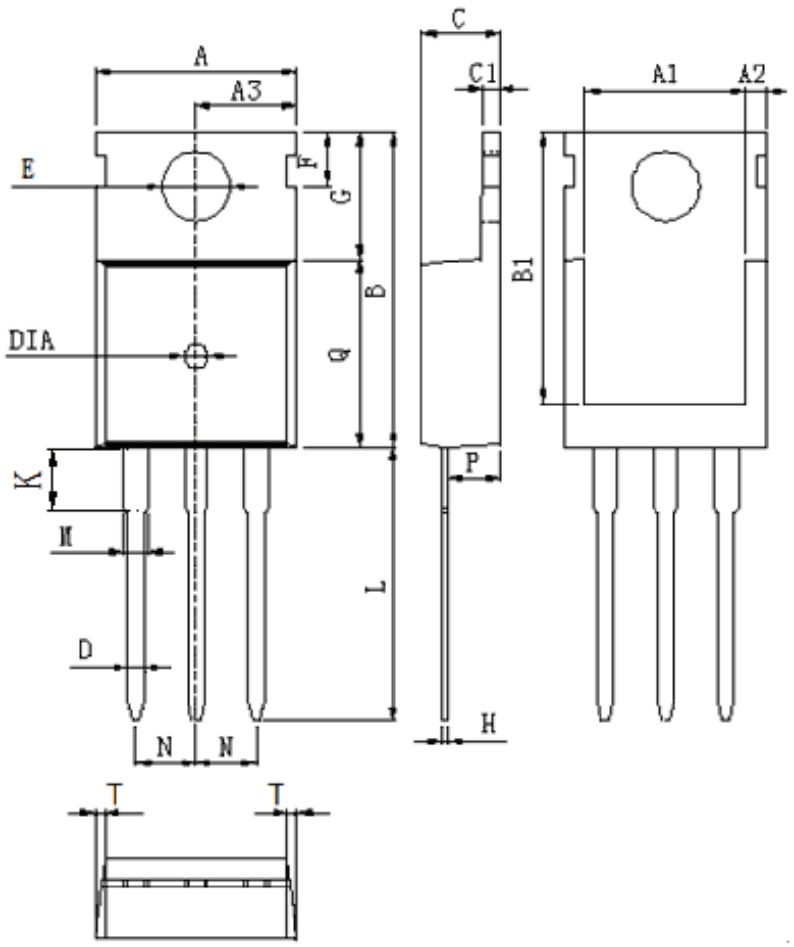


Gate charge vs gate-source voltage

800V, 630mΩ typ., 6A N-Channel Silicon Carbide Power MOSFET

Package Dimension

TO-220 Unit :mm

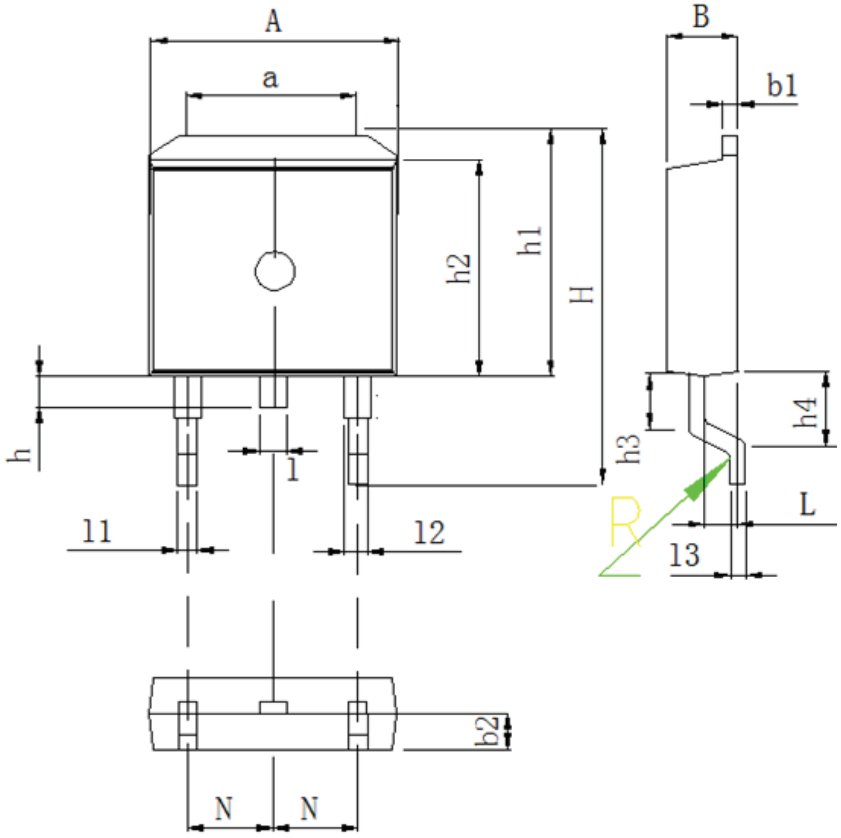


DIM	MILLIMETERS
A	10.0±0.3
A1	8.64±0.2
A2	1.15±0.1
A3	5.0±0.2
B	15.8±0.4
B1	13.2±0.3
C	4.56±0.1
C1	1.3±0.2
D	0.8±0.2
E	3.6±0.2
F	2.95±0.3
G	6.5±0.3
H	0.5±0.1
K	3.1±0.2
L	13.2±0.4
M	1.25±0.1
N	2.54±0.1
P	2.4±0.3
Q	9.0±0.3
T	W:0.35
DIA	⊙1.5(deep 0.2)

800V, 630mΩ typ., 6A N-Channel Silicon Carbide Power MOSFET

Package Dimension

TO-263 Unit :mm

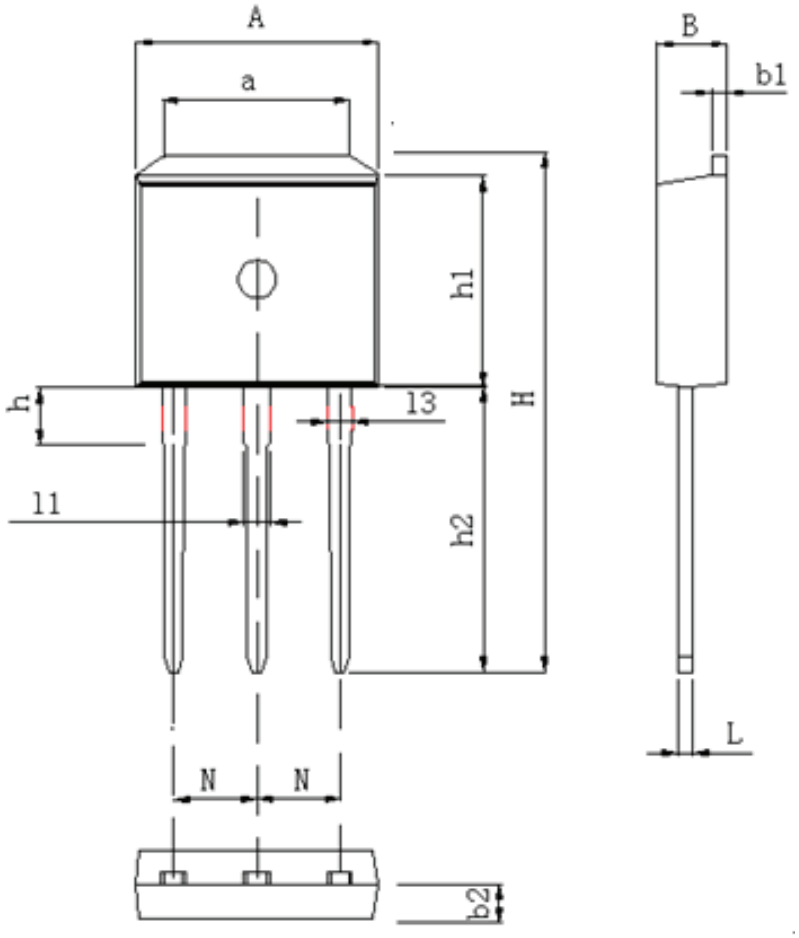


DIM	MILLIMETERS
A	9.8±0.2
a	7.4±0.4
B	4.5±0.2
b1	1.3±0.05
b2	2.4±0.2
H	15.5±0.3
h	1.54±0.2
h1	10.5±0.2
h2	9.2±0.1
h3	1.54±0.2
h4	2.7±0.2
L	2.4±0.2
l	1.3±0.1
l1	0.8±0.1
l2	1.3±0.1
l3	0.5±0.1
N	2.54±0.1
R	0.5R±0.05

800V, 630mΩ typ., 6A N-Channel Silicon Carbide Power MOSFET

Package Dimension

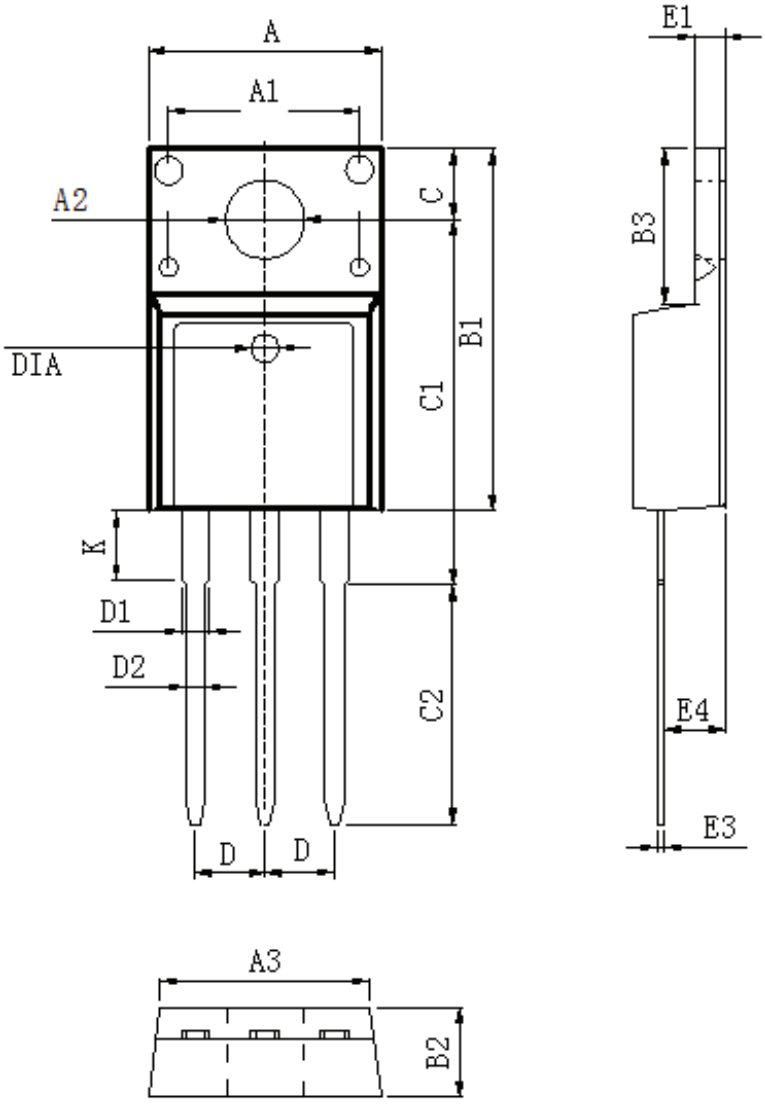
TO-262 Unit :mm



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)