Description

EHV6501200RNT N-channel Enhancement Mode Power MOSFET

Features

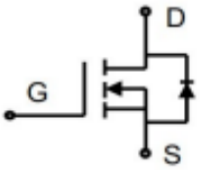
650V,7A
$R_{DS(ON)}$=1.4Ω@V_{GS}=10V
Low Rds(on)
Low gate charge (typ.Q_g=20.7nC)
100% UIS tested
ROHS compliant

Application

Power faction correction
LED Power
Switched mode power supplies

RoHS

TO-220/220F



Schematic Diagram

Package Marking and Ordering Information

Device Marking	Device	OUTLINE	Device Package	TUBE (PCS)	Inner BOX (PCS)	Per Carton (PCS)
EHV65120RNT	EHV65120RNT	TAPING	TO-220/220F	13inch	2500	25000

Absolute Maximum Ratings (T_C=25℃ unless otherwise specified)

Symbol	Parameter		Max.	Units
V_{DSS}	Drain-Source Voltage		650	V
V_{GSS}	Gate-Source Voltage		±30	V
I_D	Continuous Drain Current	T_C=25℃	7	A
		T_C = 100℃	4.3	A
I_{DM}	Pulsed Drain Current		28	A
E_{AS}	Single Pulsed Avalanche Energy		352	mJ
P_D	Power Dissipation	T_C = 25℃	TO-220 100/TO-220F 39	W
$R_{\theta JC}$	Thermal Resistance,Junction to Case		TO-220 1.25 TO-220F 3.2	℃/W
T_J,T_{STG}	Operating and Storage Temperature Range		-55 to +150	℃

Electrical Characteristics (T_J=25℃ unless otherwise specified)

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Units
Off Characteristic						
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	V_{GS}=0V, I_D=250μA	650	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=650V, V_{GS}=0V	-	-	1.0	μA
I_{GSS}	Gate to Body Leakage Current	V_{DS}=0V, V_{GS}=±30V	-	-	±100	nA
On Characteristics						
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS}, I_D=250μA	2.0	-	4.0	V
$R_{DS(on)}$	Static Drain-Source on-Resistance note3	V_{GS}=10V, I_D=3.5A	-	1200	1400	mΩ
Dynamic Characteristics						
C_{iss}	Input Capacitance	V_{DS}=25V, V_{GS}=0V, f=1MHz	-	1090	-	pF
C_{oss}	Output Capacitance		-	111	-	pF
C_{rss}	Reverse Transfer Capacitance		-	6.1	-	pF
Q_g	Total Gate Charge	V_{DD}=520V, I_D=7A, V_{GS}=10V	-	20.7	-	nC
Q_{gs}	Gate-Source Charge		-	5.7	-	nC
Q_{gd}	Gate-Drain(“Miller”) Charge		-	7.2	-	nC
Switching Characteristics						
$t_{d(on)}$	Turn-on Delay Time	V_{DD}=325V, I_D=7A, R_{GEN}=10Ω	-	12.2	-	ns
t_r	Turn-on Rise Time		-	33.4	-	ns
$t_{d(off)}$	Turn-off Delay Time		-	53.6	-	ns
t_f	Turn-off Fall Time		-	15	-	ns
Drain-Source Diode Characteristics and Maximum Ratings						
V_{SD}	Drain to Source Diode Forward Voltage	V_{GS}=0V, I_S=7A	-	0.85	1.5	V
trr	Body Diode Reverse Recovery Time	V_R=325V I_F=7A,dI/dt=100A/μs	-	373.2	-	ns
Qrr	Body Diode Reverse Recovery Charge		-	2.1	-	uC
Irrm	Peak Reverse Recovery Current			15.7		A

Typical Performance Characteristics

Electrical Characteristics Diagrams

Figure 1. Typical Output Characteristics

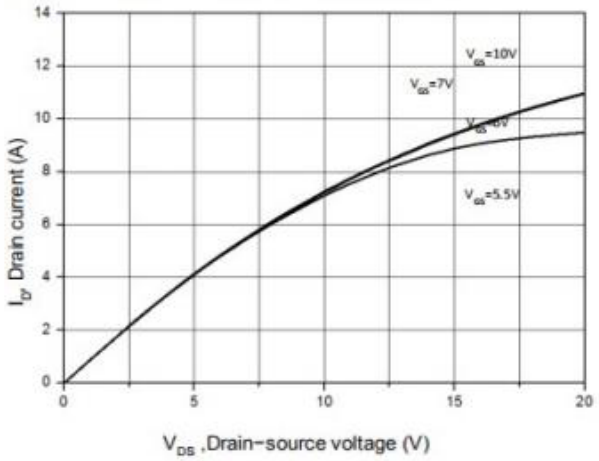


Figure 2. Transfer Characteristics

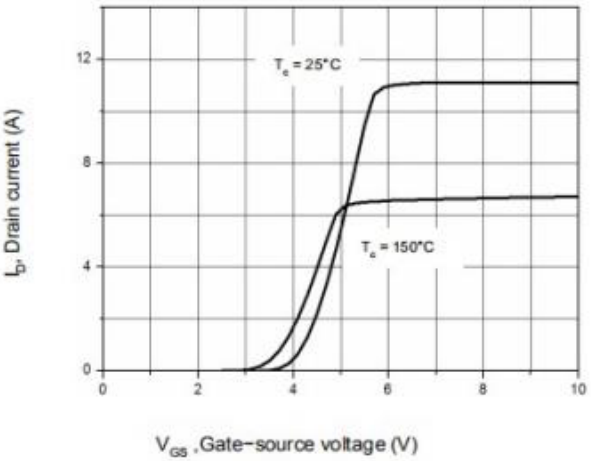


Figure 3. On-Resistance Variation vs. Drain Current

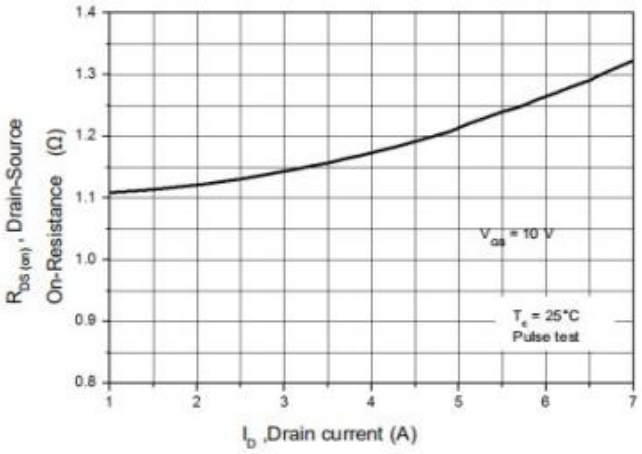


Figure 4. Threshold Voltage vs. Temperature

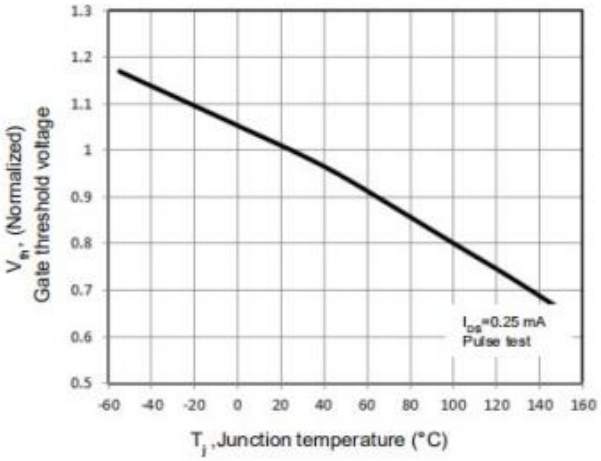


Figure 5. Breakdown Voltage vs. Temperature

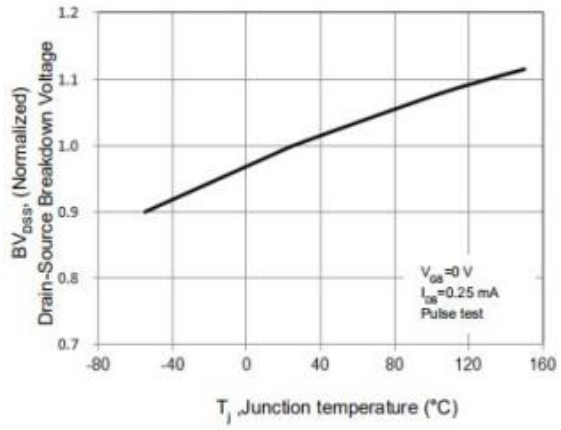


Figure 6. On-Resistance vs. Temperature

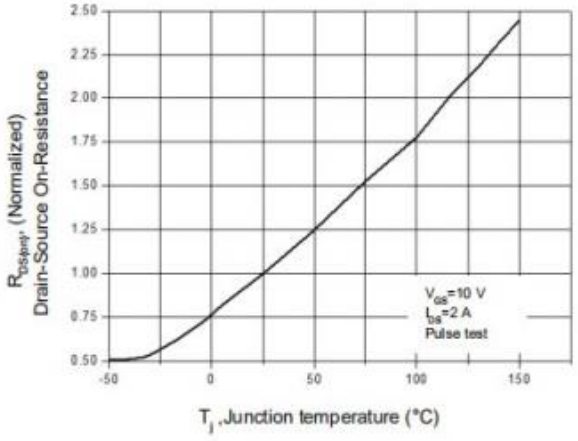


Figure 7. Capacitance Characteristics

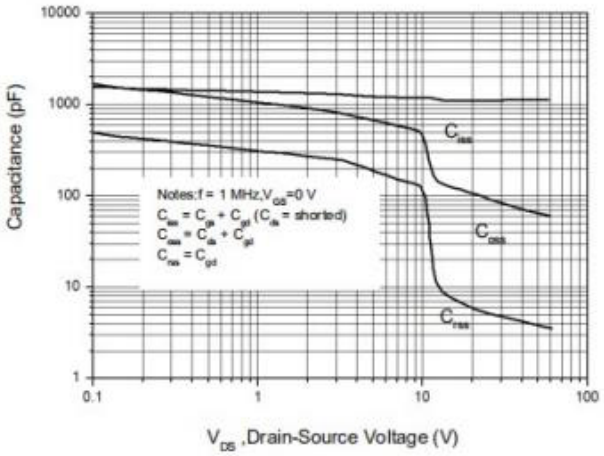


Figure 8. Gate Charge Characterist

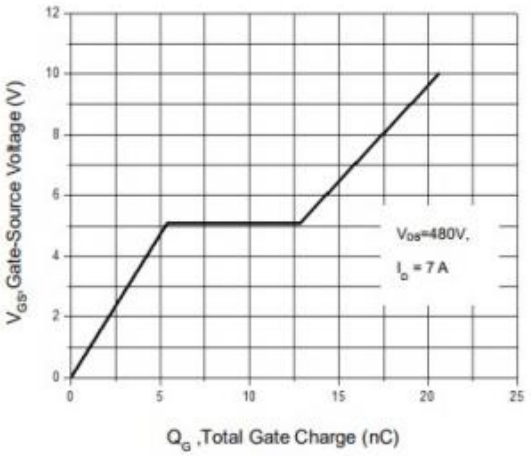


Figure 9. Maximum Safe Operating Area
TO-220F

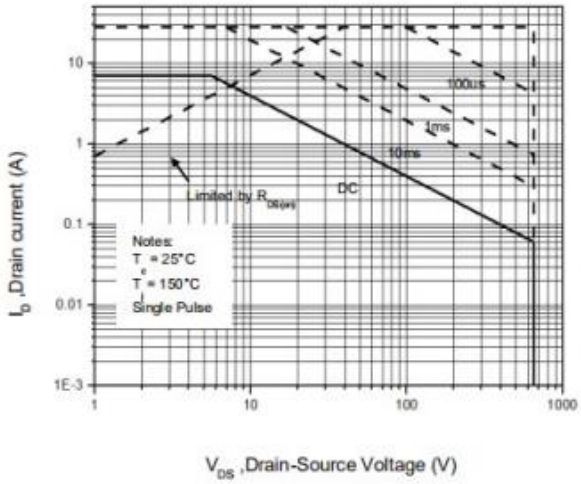


Figure 10. Maximum Safe Operating Area
TO-220

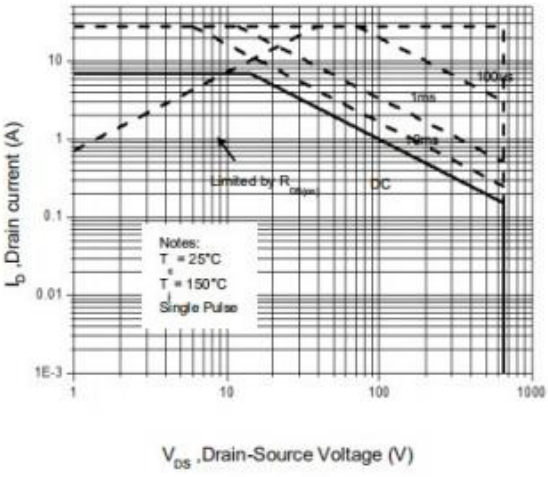


Figure 11. Power Dissipation vs.
Temperature TO-220F

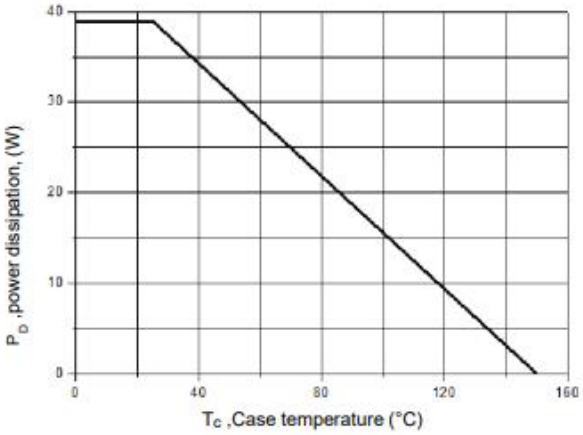


Figure 12. Power Dissipation vs.
Temperature TO-220

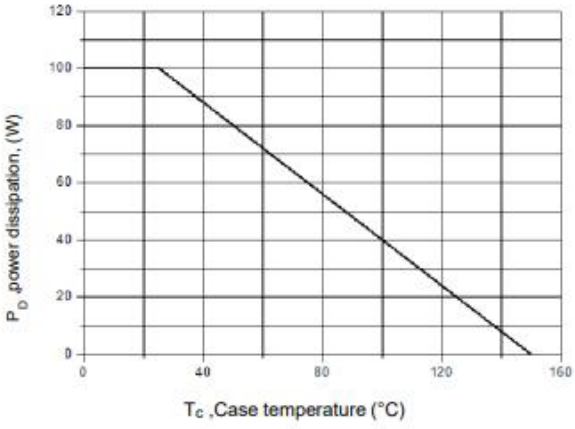


Figure 13. Continuous Drain Current vs. Temperature

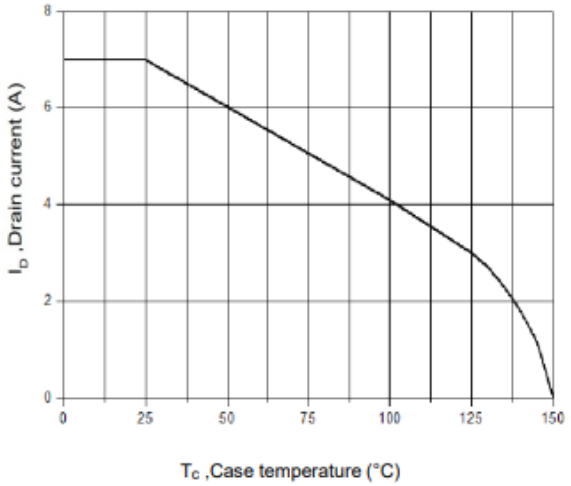


Figure 14. Body Diode Transfer Characteristics

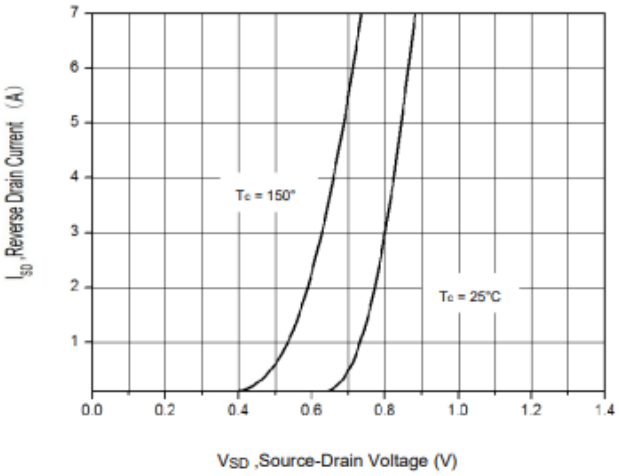


Figure 15 Transient Thermal Impendance,Junction to Case, TO-220F

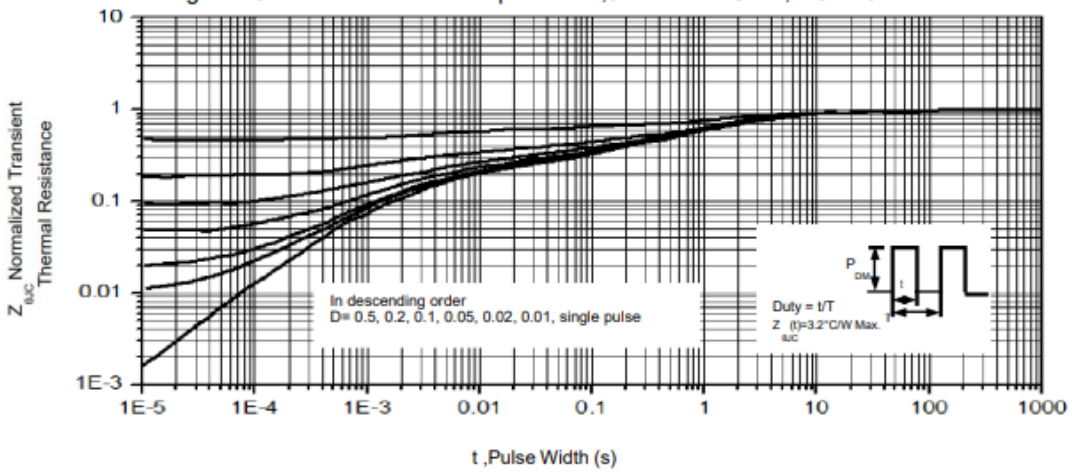
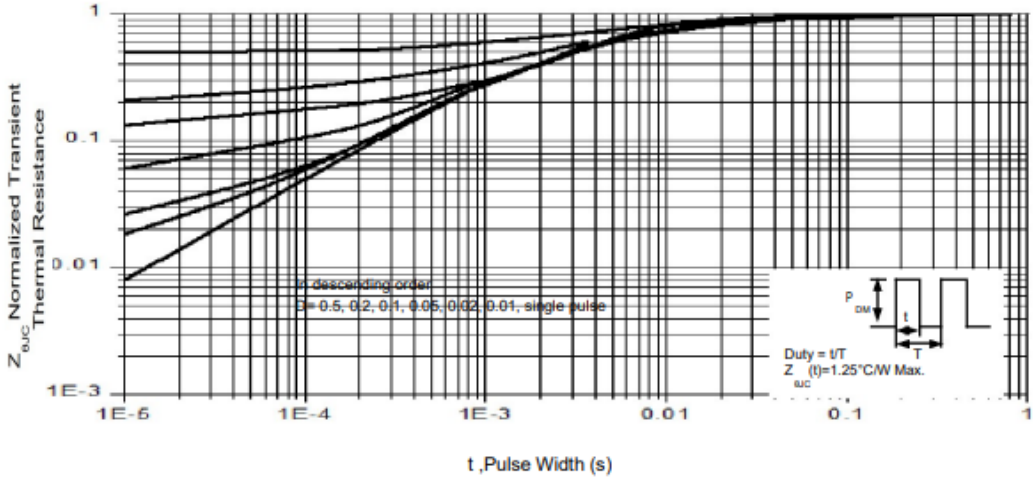
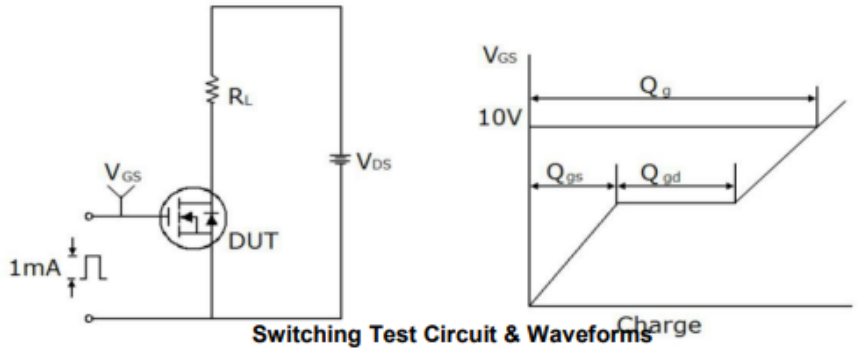


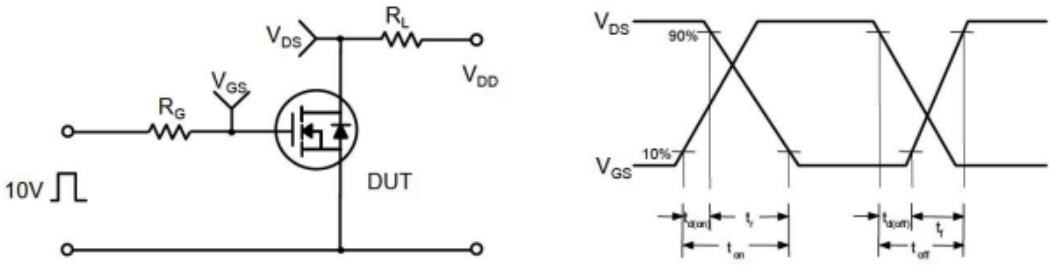
Figure 16. Transient Thermal Impendance,Junction to Case, TO-220



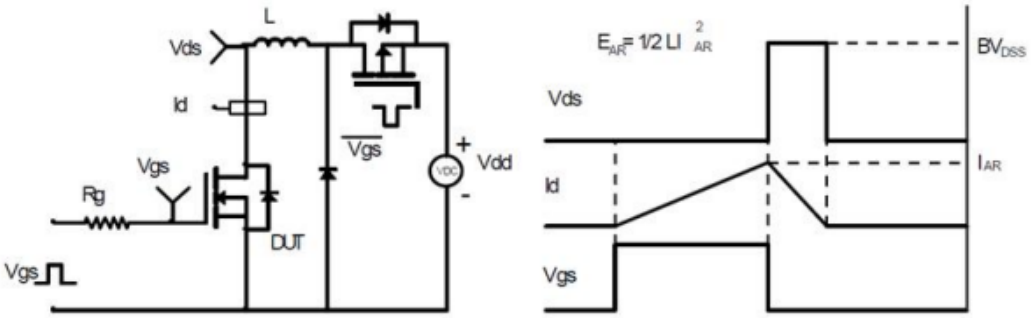
Test Circuit



Switching Test Circuit & Waveforms

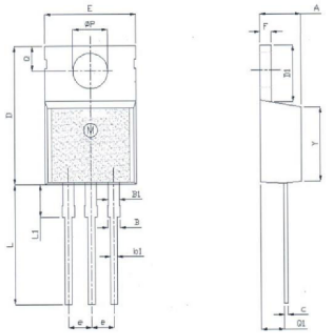


Unclamped Inductive Switching Test Circuit & Waveforms



Package Mechanical Data-TO-220/220F

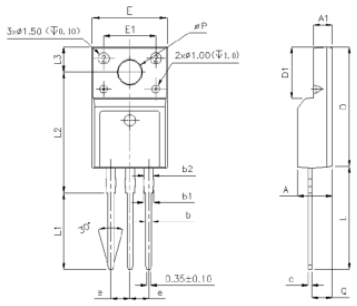
Mechanical Dimensions for TO-220



UNIT：mm

SYMBOL	MIN	NOM	MAX	SYMBOL	MIN	NOM	MAX
A	4		4.8	e	2.44	2.54	2.64
B	1.2		1.4	F	1.1		1.4
B1	1		1.4	L	12.5		14.5
b1	0.75		0.95	L1	3	3.5	4
c	0.4		0.55	ΦP	3.7	3.8	3.9
D	15		16.5	Q	2.5		3
D1	5.9		6.9	Q1	2		2.9
E	9.9		10.7	Y	8.02	8.12	8.22

Mechanical Dimensions for TO-220F



UNIT：mm

SYMBOL	MIN	NOM	MAX	SYMBOL	MIN	NOM	MAX
A	4.5		4.9	E1	6.5	7	7.5
A1	2.3		2.9	e	2.44	2.54	2.64
b	0.65		0.9	L	12.5		14.3
b1	1.1		1.7	L1	9.45		10.05
b2	1.2		1.4	L2	15		16
c	0.35		0.65	L3	3.2		4.4
D	14.5		16.5	ΦP	3		3.3
D1	6.1		6.9	Q	2.5		2.9
E	9.6		10.3				

Product Naming Rules