★ Green Device Available
★ Super Low Gate Charge
★ Excellent CdV/dt effect decline
★ Advanced high cell density Trench technology
★ 100% EAS Guaranteed

Product Summary

RoHS

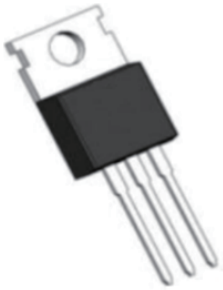
BVDSS	RDSON	ID
150V	9.5mΩ	120A

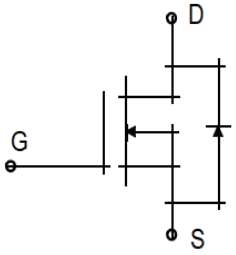
Description

The 120N15T is the high cell density trenched N-ch MOSFETs, which provide excellent RDSON and gate charge for most of the synchronous buck converter applications.

The 120N15T meet the RoHS and Green Product, requirement 100% EAS guaranteed with full function reliability approved.

TO-220 Pin Configuration





Absolute Maximum Ratings

Symbol	Parameter		Value	Unit
V_{DS}	Drain-Source Voltage		150	V
V_{GS}	Gate-Source Voltage		±20	V
I_D	Continuous Drain Current	T_C=25°C	120	A
		T_C=100°C	56	
I_{DM}	Pulsed Drain Current [1]		352	A
EAS	Single Pulse Avalanche Energy [2]		204.8	mJ
P_D	Total Power Dissipation	T_C=25°C	178.6	W
T_J, T_{STG}	Operating Junction and Storage Temperature Range		-55 to 150	°C

Thermal Data

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction-Ambient 1	---	52	℃/W
$R_{\theta JC}$	Thermal Resistance Junction-Case1	---	0.7	℃/W

Electrical Characteristics (T_J =25 °C unless otherwise specified)

Symbol	Parameter		Test Conditions	Min.	Typ.	Max.	Unit
Static Characteristics							
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage		V_{GS} = 0V, I_D = 250μA	150	-	-	V
I_{GSS}	Gate-body Leakage Current		V_{DS} = 0V, V_{GS} = ±20V	-	-	±100	nA
I_{DSS}	Zero Gate Voltage Drain Current	T_J=25°C	V_{DS} = 150V, V_{GS} = 0V	-	-	1	μA
		TJ=100°C		-	-	100	
$V_{GS(th)}$	Gate-Threshold Voltage		V_{DS} = V_{GS}, I_D = 250μA	2	3	4	V
$R_{DS(on)}$	Drain-Source On-Resistance4		V_{GS} = 10V, I_D = 20A	-	9.5	11.5	mΩ
g_{fs}	Forward Transconductance4		V_{DS} = 10V, I_D = 20A	-	69	-	S
Dynamic Characteristics [5]							
C_{iss}	Input Capacitance		V_{DS} = 75V, V_{GS} =0V,f =1MHz	-	3310	-	pF
C_{oss}	Output Capacitance			-	268	-	
C_{rss}	Reverse Transfer Capacitance			-	9.4	-	
R_g	Gate Resistance		f = 1MHz	-	3.2	-	Ω
Switching Characteristics [5]							
Q_g	Total Gate Charge		V_{GS} = 10V, V_{DS} = 75V, I_D= 20A	-	45	-	nC
Q_{gs}	Gate-Source Charge			-	15	-	
Q_{gd}	Gate-Drain Charge			-	8.5	-	
$t_{d(on)}$	Turn-On Delay Time			-	16	-	
t_r	Rise Time		V_{GS}=10V, V_{DD} = 75V, R_G = 3Ω, I_D= 20A	-	12	-	ns
$t_{d(off)}$	Turn-Off Delay Time			-	30	-	
t_f	Fall Time			-	18	-	
t_{rr}	Body Diode Reverse Recovery Time			-	76	-	
Q_{rr}	Body Diode Reverse Recovery Charge		I_F=20A, dI/dt=100A/μs	-	182	-	nC
Drain-Source Body Diode Characteristics							
V_{SD}	Diode Forward Voltage4		I_S = 20A, V_{GS} = 0V	-	-	1.2	V
I_S	Continuous Source	T_C=25°C	-	-	-	120	A

Notes:

1. Repetitive rating, pulse width limited by junction temperature TJ(MAX)=150°C
2. The EAS data shows Max. rating . The test condition is V_{DD}=50V,V_{GS}=10V,L=0.4mH， I_{AS}=32A.
3. The data tested by surface mounted on a 1 inch2 FR-4 board with 2OZ copper, The value in any given application depends on the user's specific board design.
4. The data tested by pulsed , pulse width ≤ 300us , duty cycle ≤ 2%.
5. This value is guaranteed by design hence it is not included in the production test.

Typical Performance Characteristics

Figure1: Output Characteristics

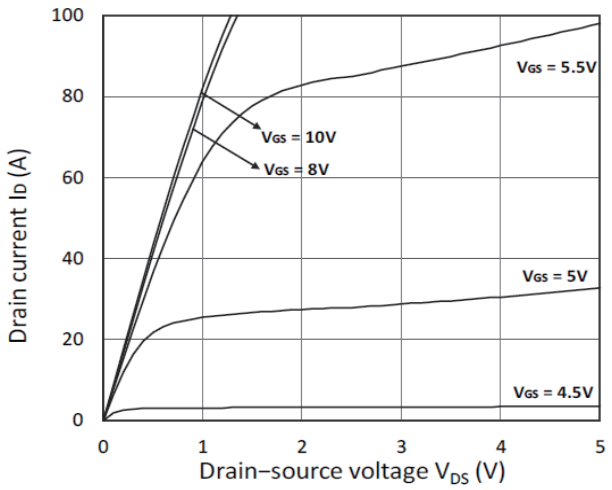


Figure 2: Typical Transfer Characteristics

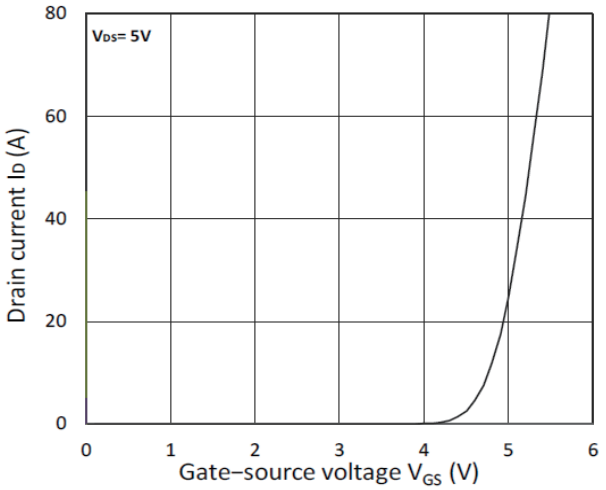


Figure 3:Forward Characteristics of Reve

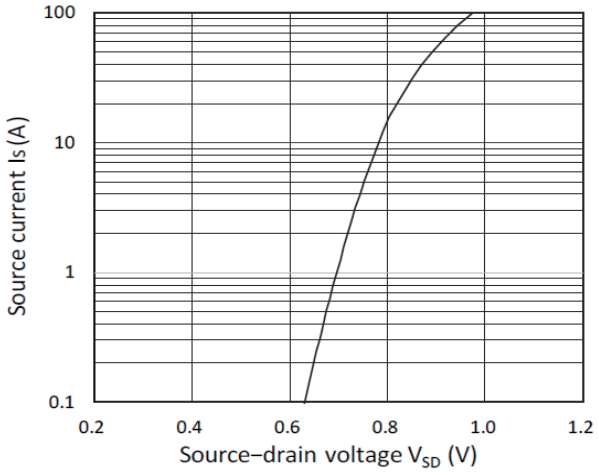


Figure 4: RDS(ON) vs. VGS

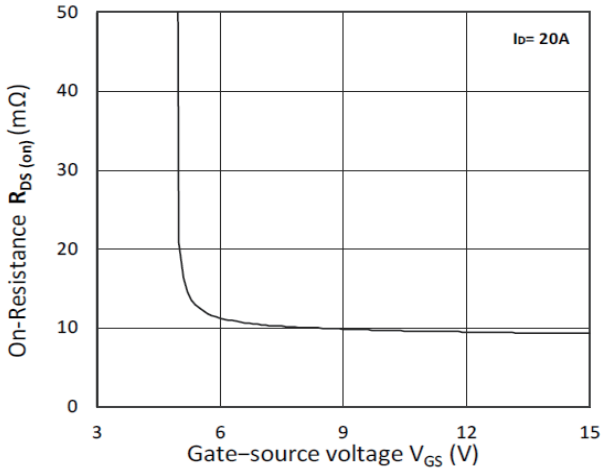


Figure 5: RDS(ON) vs. ID

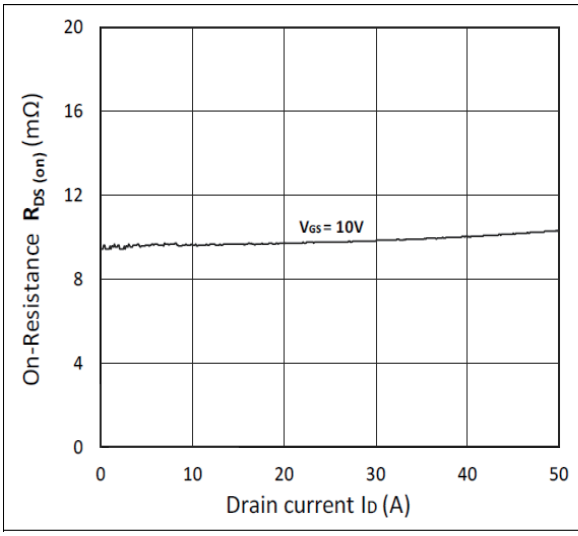
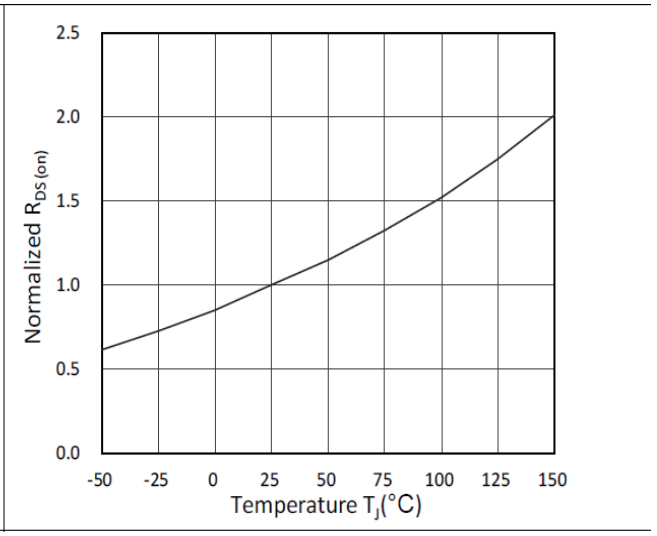


Figure 6: Normalized RDS(on) vs. Temper



Typical Performance Characteristics

Figure 7: Capacitance Characteristics

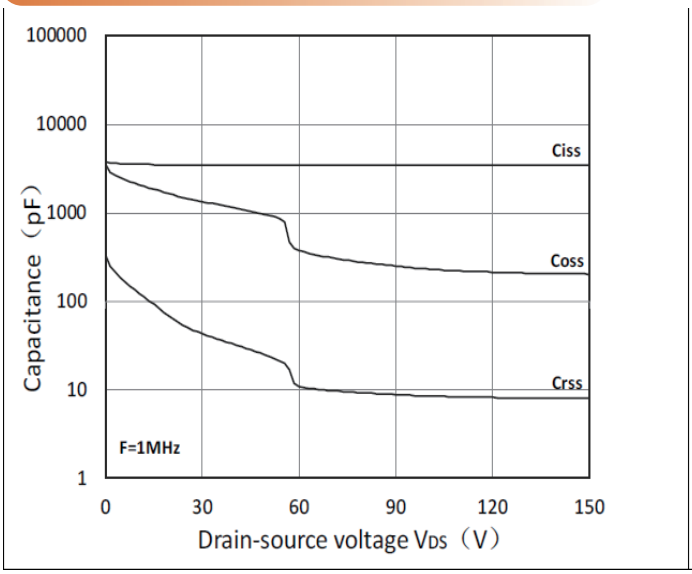


Figure 8: Gate Charge Characteristics

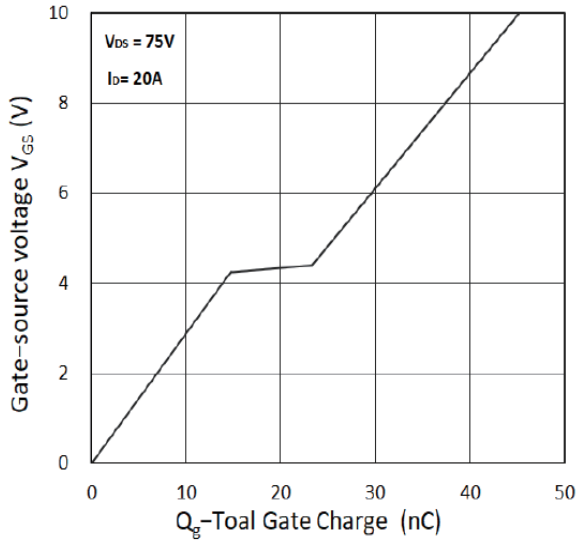
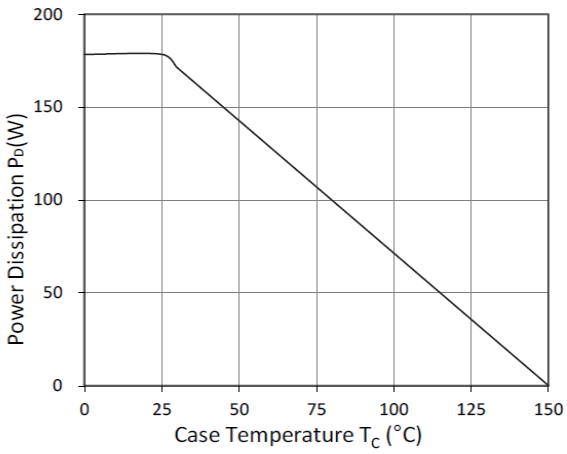


Figure 9: Power Dissipation



FFigure 10: Safe Operating Area

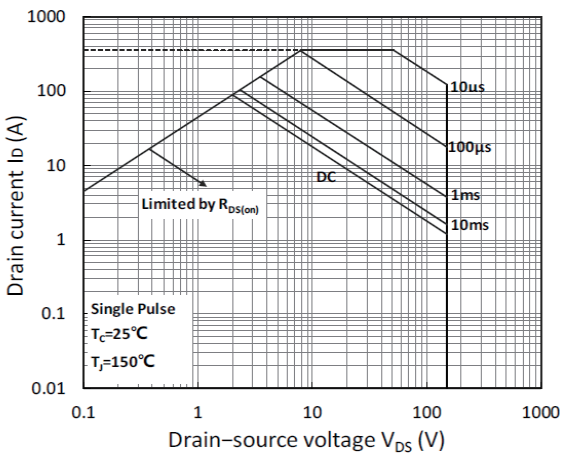
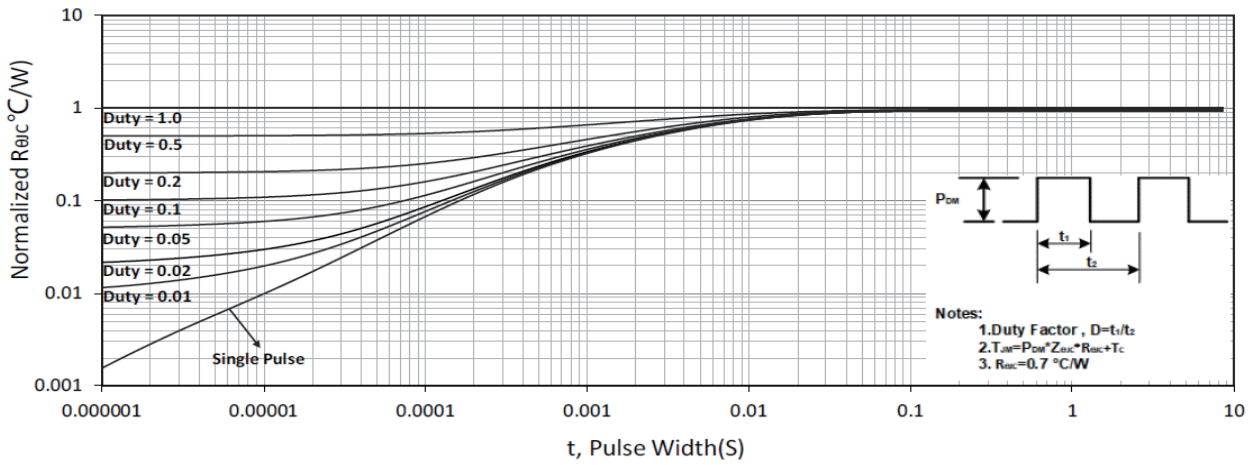


Figure.11: Normalized Maximum Transie



Test Circuit

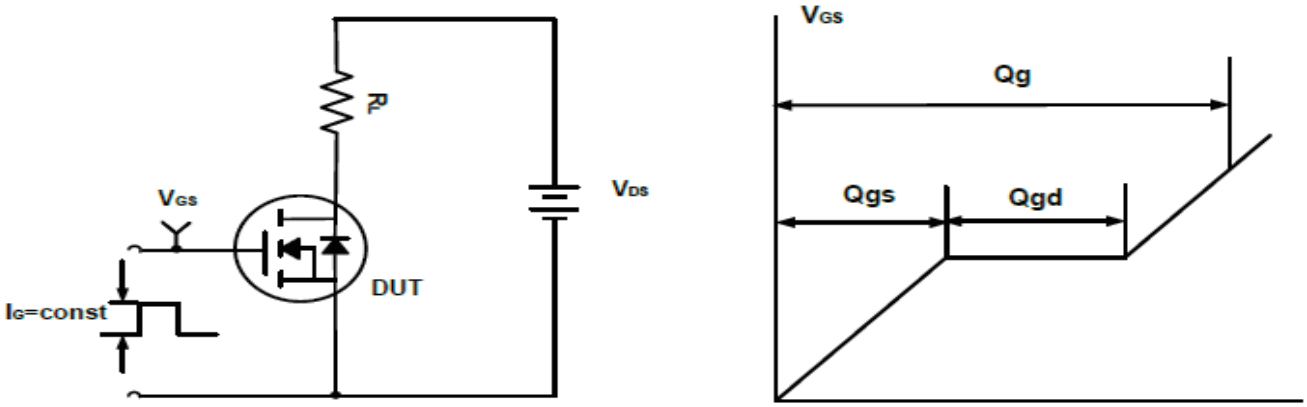


Figure A. Gate Charge Test Circuit & Waveforms

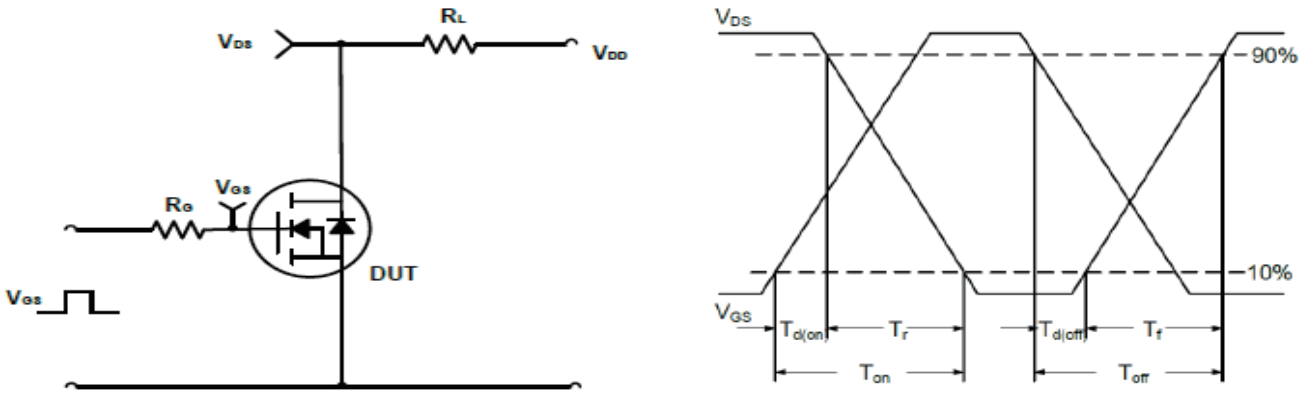


Figure B. Switching Test Circuit & Waveforms

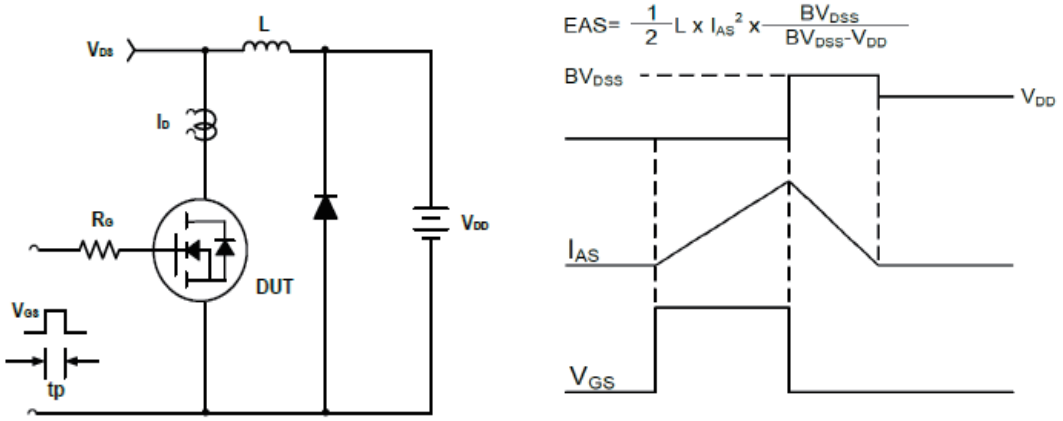
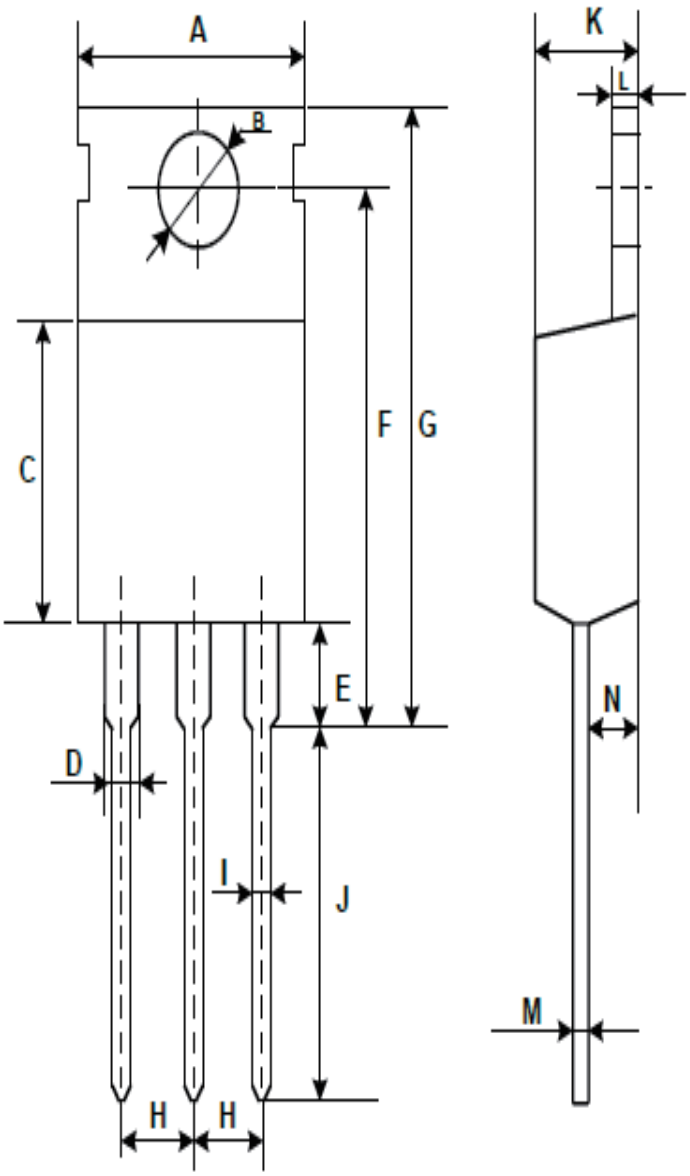


Figure C. Unclamped Inductive Switching Circuit & Waveforms

Mechanical Dimensions for TO-220



OMMON DIMENSIONS

SYMBOL	MM	
	MIN	MAX
A	9.7	10.3
B	3.4	3.8
C	8.8	9.4
D	1.17	1.47
E	2.6	3.5
F	15.1	16.7
G	19.55MAX	
H	2.54REF	
I	0.7	0.95
J	9.35	11
K	4.3	4.77
L	1.2	1.45
M	0.4	0.65
N	2.2	2.6