

General Description

These N-channel enhancement mode power mosfets Used advanced trench technology design, provided excellent $R_{DS(on)}$ and low gate charge. Which accords with the RoHS standard.

Features

- Fast switching
- Low on-resistance
- Low gate charge and input capacitance
- 100% avalanche tested

Mechanical Data

- Case:TO-220, ITO-220, TO-263, TO-263-7L Package

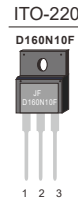
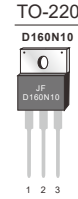
Application

- AC-DC switching power supply
- UPS power supply
- Power tool

Ordering Information

Part No.	Package Type	Package	Quality(box)
D160N10	TO-220	Tube	1000
D160N10F	ITO-220	Tube	1000
D160N10D	TO-263	Tape & Reel	800
D160N10D7	TO-263-7L	Tape & Reel	800

Product Summary			
V_{DS}	$R_{DS(on)}$ (mΩ) Max	I_D (A)	Q_g (Typ)
100V	4.5 @ 10V	160	72nc



Block Diagram

Pin Definition:
 1. Gate
 2. Drain
 3/4/5/6/7. Source

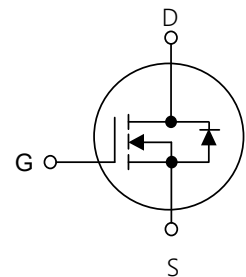


Table1 Absolute Maximum Ratings ($T_c=25^\circ\text{C}$, unless otherwise specified)

Parameter	Symbol	D160N10/D160N10D D160N10D7	D160N10F	Unit
Drain-Source Voltage	V_{DS}	100		V
Gate-Source Voltage	V_{GS}	± 20		V
Continuous Drain Current	I_D	$T_c=25^\circ\text{C}$	160*	A
		$T_c=100^\circ\text{C}$	100*	
Pulsed Drain Current (Note 1)	I_{DM}	480		A
Single Pulse Avalanche Energy(Note 2)	E_{AS}	702		mJ
Avalanche Current(Note 1)	I_{AR}	53		A
Power Dissipation $T_c=25^\circ\text{C}$	P_D	227	41.6	W
Operating Junction and Storage Temperature	T_J/T_{STG}	-55~+150		$^\circ\text{C}$

* limited by maximum junction temperature

Table 2. Thermal Characteristics

Parameter	Symbol	D160N10/D160N10D/ D160N10D7	D160N10F	Unit
Thermal resistance Junction to Ambient	$R_{\theta JA}$	62	62	$^{\circ}C/W$
Thermal resistance Junction to Case	$R_{\theta JC}$	0.5	3.0	$^{\circ}C/W$

Table 3. Electrical Characteristics (T_J=25°C, unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Off Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_D=250\mu A$	100	-	-	V
Drain-Source Leakage Current	I_{DSS}	$V_{DS}=100V, V_{GS}=0V$	-	-	1	μA
Gate-Source Leakage Current	Forward	$V_{GS}=20V, V_{DS}=0V$	-	-	100	nA
	Reverse	$V_{GS}=-20V, V_{DS}=0V$	-	-	-100	nA
On Characteristics(Note 3)						
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	2.0	-	4.0	V
Static Drain-Source On-State Resistance	D160N10F	$V_{GS}=10V, I_D=20A$	-	4.0	4.5	m Ω
	D160N10/D160N10D/ D160N10D7	$V_{GS}=10V, I_D=30A$	-	3.7	4.5	
Dynamic Characteristics(Note 4)						
Input Capacitance	C_{iss}	$V_{DS}=50V, V_{GS}=0V, f=1MHz$	-	4725	-	pF
Output Capacitance	C_{oss}		-	609	-	pF
Reverse Transfer Capacitance	C_{rss}		-	14	-	pF
Gate Resistance	R_G	$V_{DD}=0V, V_{GS}=0V, f=1MHz$	-	1.0	-	Ω
Switching Characteristics (Note 4)						
Turn-On Delay Time	$t_d(on)$	$V_{DD}=50V, I_D=20A$ $V_{GS}=10V, R_G=3.0\Omega,$	-	35	-	ns
Turn-On Rise Time	t_r		-	18	-	ns
Turn-Off Delay Time	$t_d(off)$		-	45	-	ns
Turn-Off Fall Time	t_f		-	55	-	ns
Total Gate Charge	Q_G	$V_{DD}=50V, I_D=20A,$ $V_{GS}=10V$	-	72	-	nC
Gate-Source Charge	Q_{GS}		-	28	-	nC
Gate-Drain Charge	Q_{GD}		-	15	-	nC
Drain-Source Diode Characteristics and Maximum Ratings						
Drain-Source Diode Forward Voltage	V_{SD}	$V_{GS}=0V, I_S=50A$	-	-	1.3	V
Maximum Continuous Drain-Source Diode Forward Current	D160N10F	I_S	-	-	70	A
	D160N10/D160N10D/ D160N10D7		-	-	160	
Reverse Recovery Time	t_{rr}	$V_{GS}=0V, I_F=30A$	-	70	-	ns
Reverse Recovery Charge	Q_{RR}	$dI_F/dt=100A/\mu s$ (Note 1)	-	170	-	nC

Notes : 1 Repetitive Rating:Pulse width limited by maximum junction temperature
 2The EAS data shows Max. rating . The test condition is $V_{DD}=25V, V_{GS}=10V, L=0.5mH, I_{AS}=53A$
 3 Pulse Test: Pulse width $\leq 300\mu s$, Duty cycle $\leq 2\%$
 4 Guaranteed by design, not subject to production

Typical Characteristics Diagrams

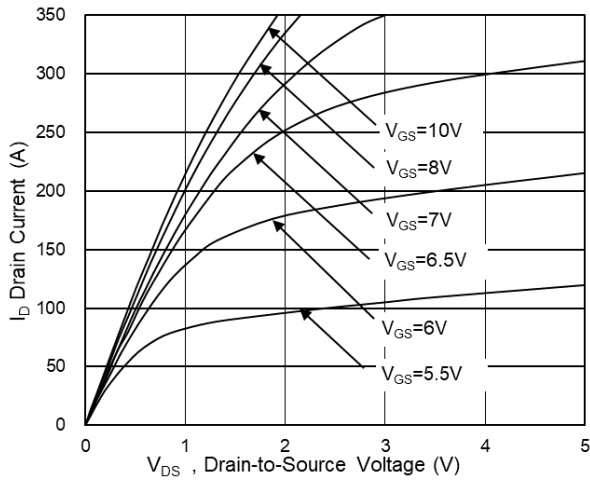


Fig.1 Typical Output Characteristics

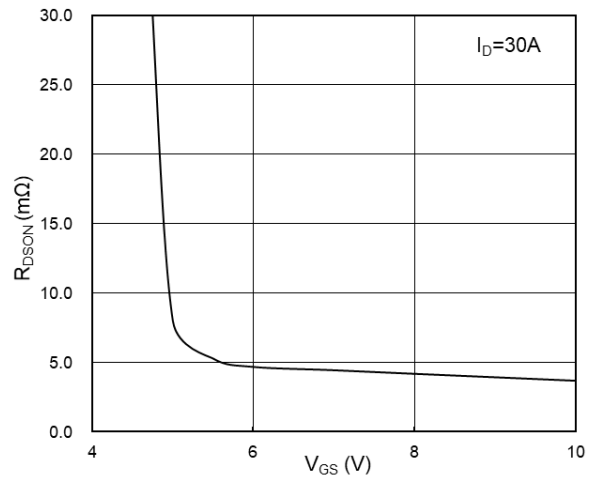


Fig.2 On-Resistance vs G-S Voltage

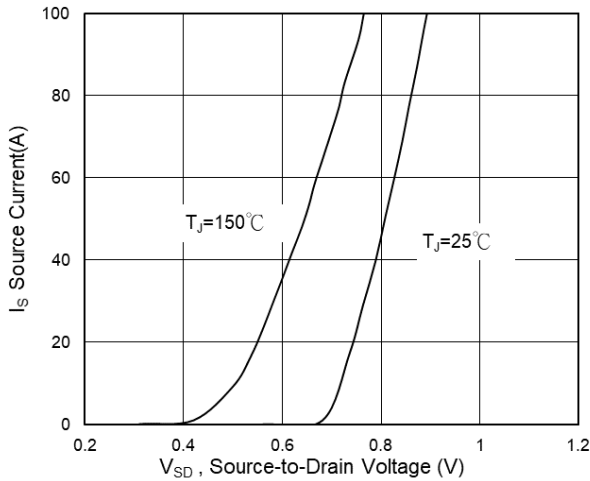


Fig.3 Source Drain Forward Characteristics

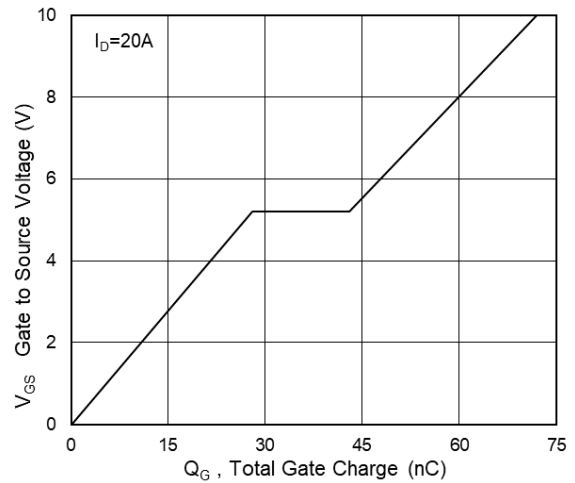


Fig.4 Gate-Charge Characteristics

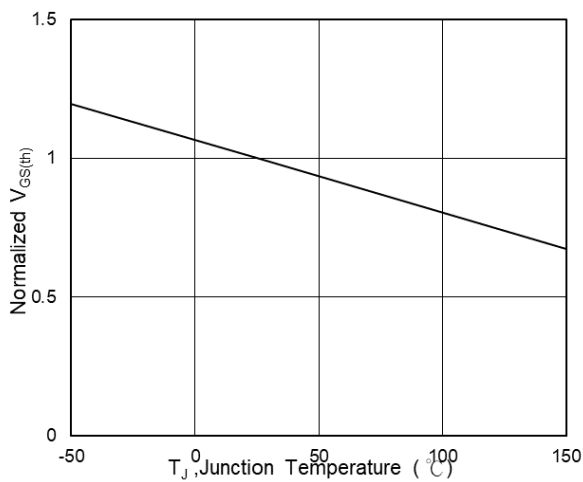


Fig.5 Normalized V_{TH} vs T_J

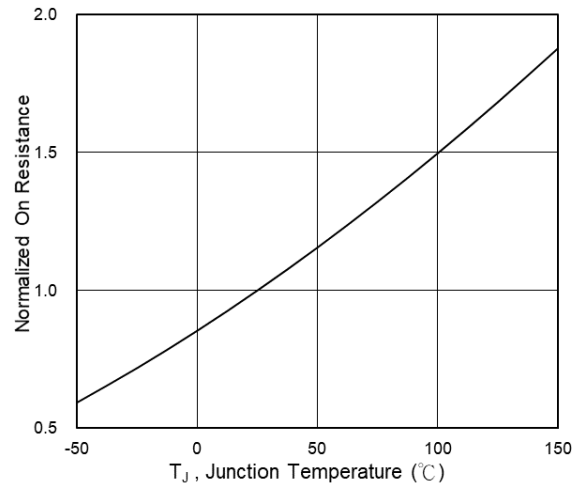


Fig.6 Normalized R_{DSON} vs T_J

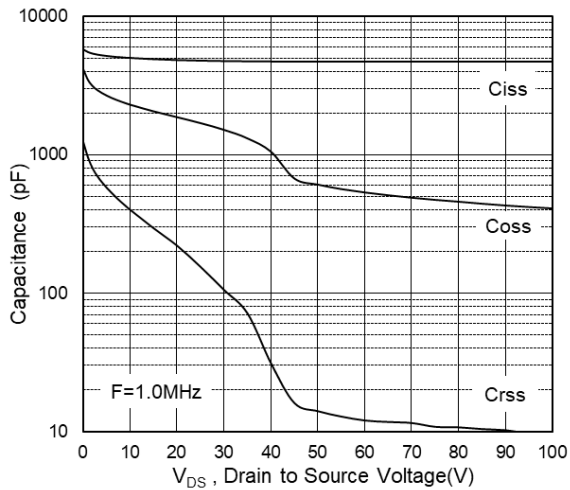


Fig.7 Capacitance

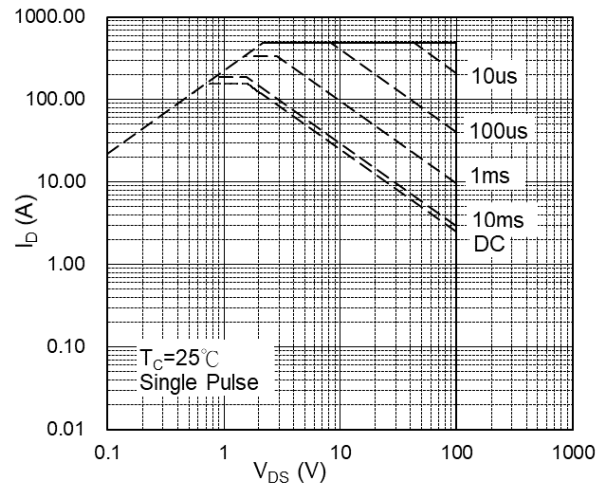


Fig.8 Safe Operating Area

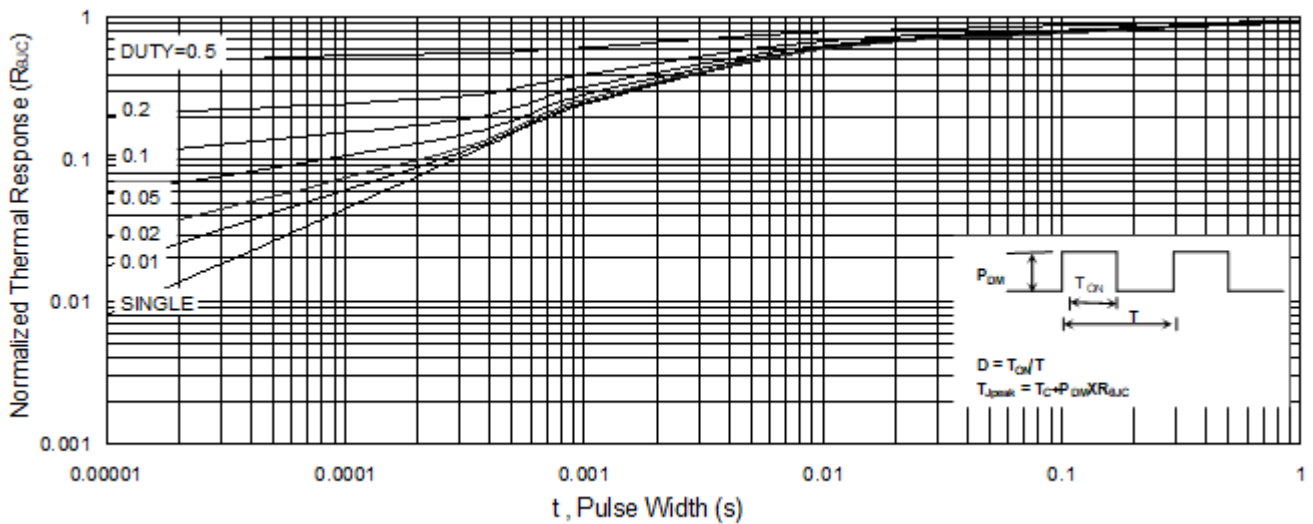


Fig.9 Normalized Maximum Transient Thermal Impedance

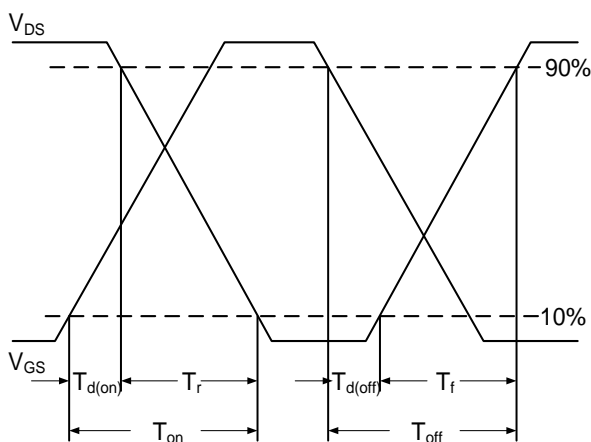


Fig.10 Switching Time Waveform

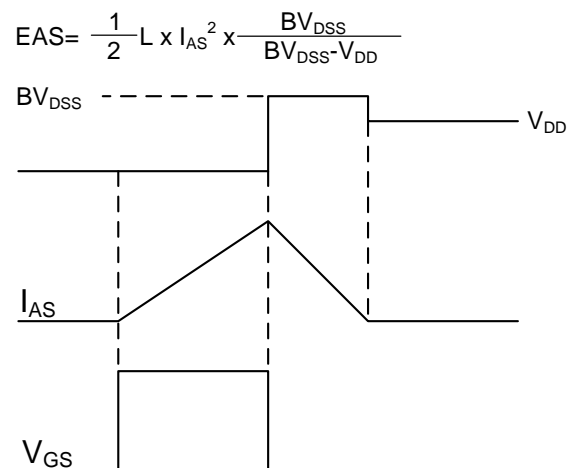
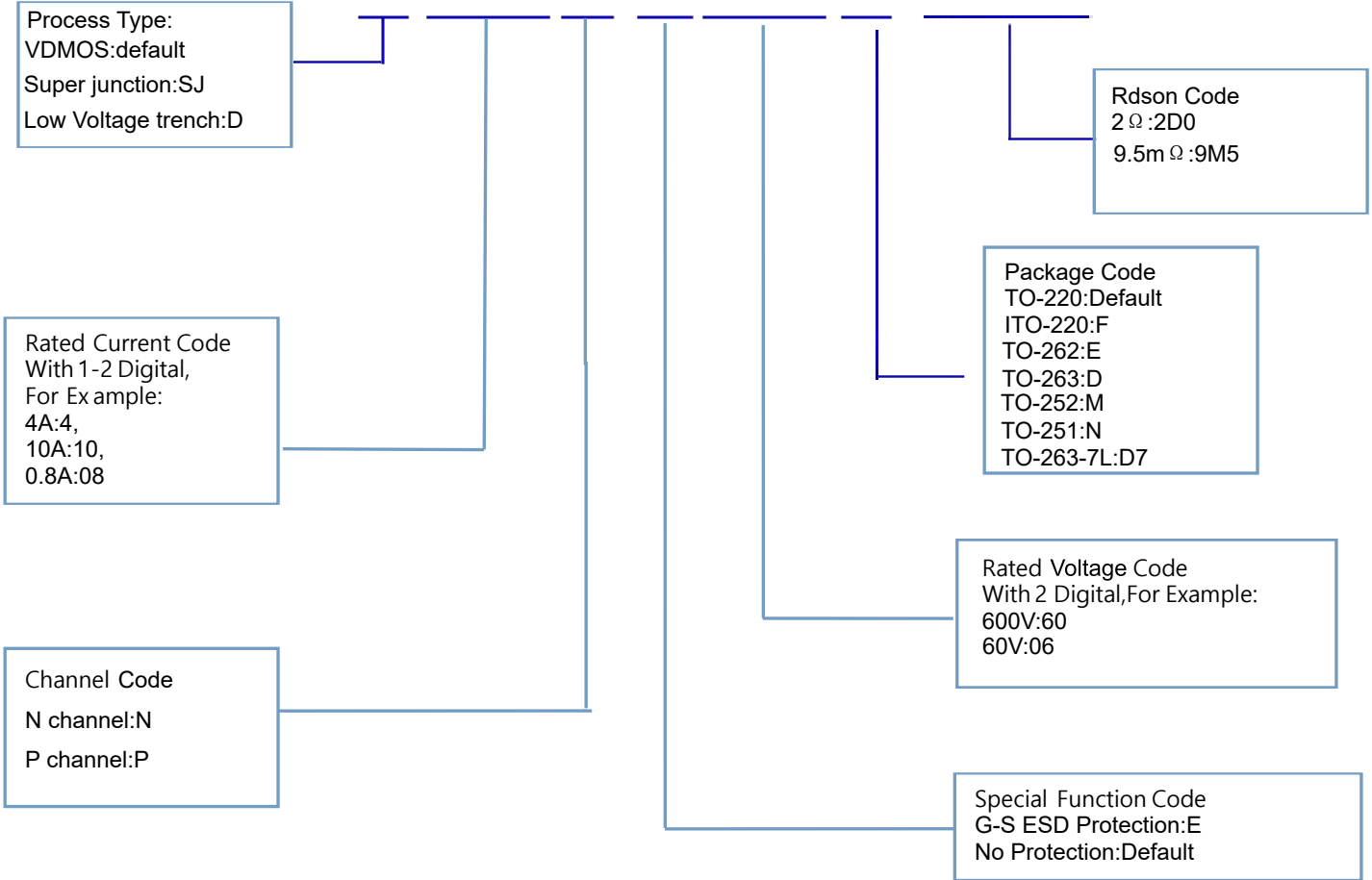


Fig.11 Unclamped Inductive Switching Waveform

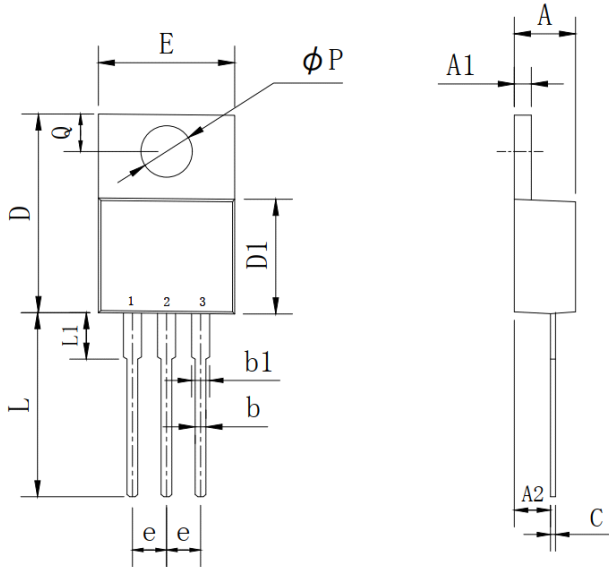
Product Names Rules

X X X N E X X X-X X X



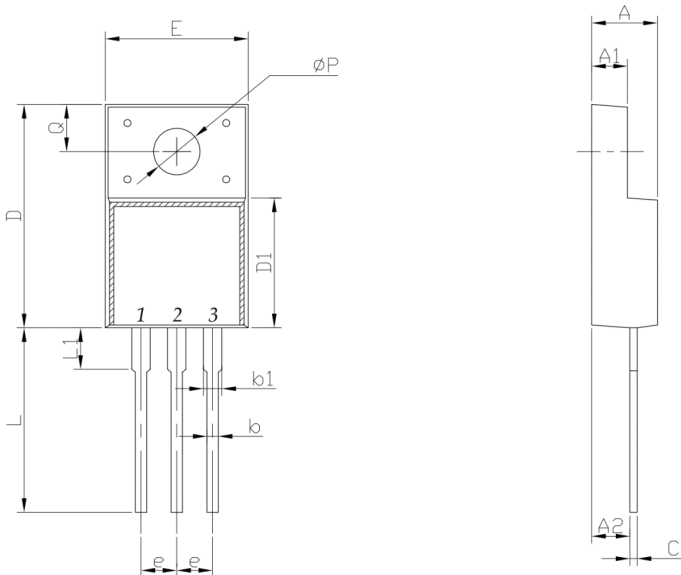
Dimensions

TO-220 PACKAGE OUTLINE DIMENSIONS



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	MIN	MAX	MIN	MAX
A	4.25	4.87	0.167	0.192
A1	1.07	1.47	0.042	0.058
A2	2.03	2.92	0.080	0.115
b	0.51	1.11	0.020	0.044
b1	0.97	1.6	0.038	0.063
C	0.3	0.7	0.012	0.028
D	14.6	15.9	0.575	0.626
D1	8.04	9.3	0.317	0.366
E	9.57	10.57	0.377	0.416
e	2.34	2.74	0.092	0.108
L	12.58	14.3	0.495	0.563
L1	2.8	4.2	0.110	0.165
P	3.4	4.14	0.134	0.163
Q	2.45	3	0.096	0.118

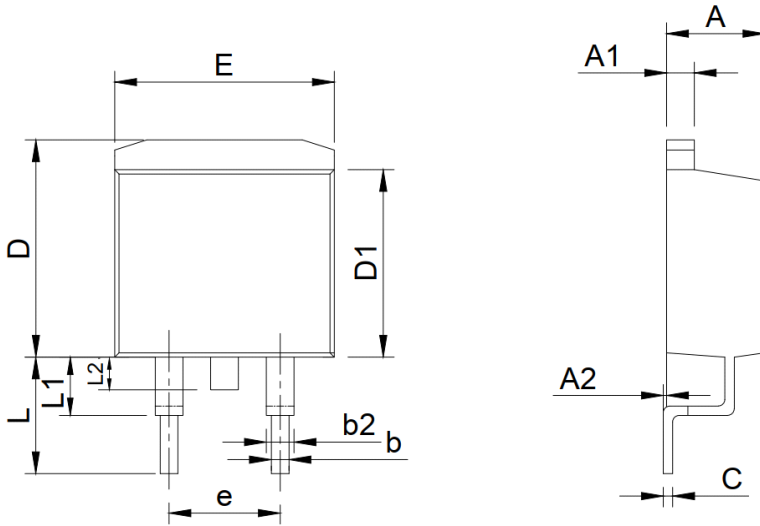
ITO-220 PACKAGE OUTLINE DIMENSIONS



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	MIN	MAX	MIN	MAX
A	4.24	4.9	0.167	0.193
A1	2.3	2.92	0.091	0.115
A2	2.61	2.81	0.103	0.111
b	0.3	1	0.012	0.039
b1	0.9	1.55	0.035	0.061
C	0.3	0.7	0.012	0.028
D	14.5	16.36	0.571	0.644
D1	8.8	9.41	0.346	0.370
E	9.5	10.5	0.374	0.413
e	2.3	2.75	0.091	0.108
L	12.6	14	0.496	0.551
L1	2.45	4.3	0.096	0.169
P	2.9	3.8	0.114	0.150
Q	2.5	3.55	0.098	0.140

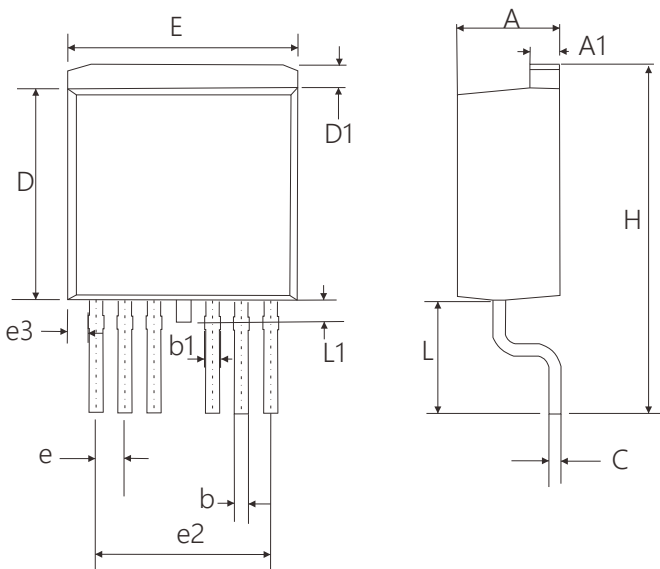
Dimensions

TO-263 PACKAGE OUTLINE DIMENSIONS



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	MIN	MAX	MIN	MAX
A	4.25	4.87	0.167	0.192
A1	1.07	1.47	0.042	0.058
A2	0	0.25	0.000	0.010
b	0.61	1.01	0.024	0.040
b1	1.2	1.34	0.047	0.053
C	0.3	0.6	0.012	0.024
D	9.48	10.84	0.373	0.427
D1	8.49	9.3	0.334	0.366
E	9.7	10.31	0.382	0.406
e	4.88	5.28	0.192	0.208
L	4.46	5.85	0.176	0.230
L1	1.33	2.33	0.052	0.092
L2	0	2.2	0.000	0.087

TO-263-7L PACKAGE OUTLINE DIMENSIONS



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	MIN	MAX	MIN	MAX
A	4.25	4.75	0.167	0.187
A1	1.2	1.4	0.047	0.055
b	0.5	0.7	0.020	0.028
b1	0.5	0.9	0.020	0.035
C	0.4	0.6	0.016	0.024
D	9.05	9.45	0.356	0.372
D1	0.7	1.3	0.028	0.051
E	9.8	10.2	0.386	0.402
e	1.07	1.47	0.042	0.058
e2	7.32	7.92	0.288	0.312
e3	0.64	1.04	0.025	0.041
H	14.65	15.65	0.577	0.616
L	4.47	5.47	0.176	0.215
L1	0.90	1.50	0.035	0.059

Friendship Reminder

- JiNan JingHeng (hereinafter referred to as JH) reserves the right to make changes to this document and its products and specifications at anytime without notice.
- Customers should obtain and confirm the latest product information and specifications before final design, purchase or use.
- JH makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does JH assume any liability for application assistance or customer product design.
- JH does not warrant or accept any liability with products which are purchased or used for any unintended or unauthorized application.
- No license is granted by implication or otherwise under any intellectual property rights of JH.
- JH's products are not authorized for use as critical components in life support devices or systems without express written approval of JH.