SEMICONDUCTOR

D30P10 Series
30A 100V P-channel Enhancement Mode Power MOSFET

FEATURES

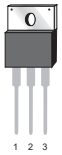
- Fast switching
- Low on-resistance
- Low gate charge
- 100% Single Pulse Avalanche Energy Test

Product Summary			
V_{DS}	$R_{DS(on)}$ (mΩ) Typ	I_D (A)	Qg (Typ)
-100V	35@ -10V	-30	90nc

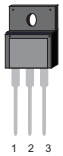
MECHANICAL DATA

- Case:TO-220\ITO-220\TO-263\TO-262\TO-251\TO-252 Package

TO-220 D30P10



ITO-220 D30P10F



TO-263 D30P10D

TO-262 D30P10E

TO-251 D30P10N

TO-252 D30P10M

Ordering Information

Part No.	Package Type	Package	Quality(box)
D30P10	TO-220	Tube	1000
D30P10F	ITO-220	Tube	1000
D30P10D	TO-263	Tape & Reel	800
D30P10E	TO-262	Tube	1000
D30P10M	TO-252	Tape & Reel	2500
D30P10N	TO-251	Tube	1000

Pin Definition:

1. Gate
2. Drain
3. Source

Block Diagram

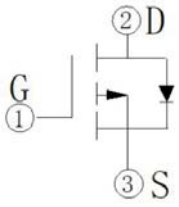


Table1 Absolute Maximum Ratings (T_C=25°C, unless otherwise specified)

Parameter		Symbol	TO-220/TO-263/TO-262 TO-251/TO-252	ITO-220	Unit
Drain-Source Voltage		V_{DS}	-100		V
Gate-Source Voltage		V_{GS}	±20		V
Continuous Drain Current	T_C=25°C	I_D	-30		A
	T_C=100°C		-21		
Pulsed Drain Current (Note 1)		I_{DM}	-120		A
Single Pulse Avalanche Energy(Note 2)		E_{AS}	317		mJ
Avalanche Current(Note 1)		I_{AR}	2		A
Power Dissipation T_C=25°C		P_D	120	48	W
Operating Junction and Storage Temperature		T_J/T_{STG}	-55 ~ +150		°C
Maximum Temperature for soldering		T_L	300		°C

Table 2.Thermal Characteristics

Parameter	Symbol	TO-220/TO-263/TO-262 TO-251/TO-252	ITO-220	Unit
Thermal resistance Junction to Ambient	$R_{\theta JA}$	62	62	°C/W
Thermal resistance Junction to Case	$R_{\theta JC}$	1. 04	2. 6	°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=-250μA	-100	--	--	V
Drain-Source Leakage Current		I_{DSS}	V_{DS}=-100V,V_{GS}=0V	--	--	-1	μA
Gate- Source Leakage Current	Forward	I_{GSS}	V_{GS}=20V,V_{DS}=0V	--	--	100	nA
	Reverse		V_{GS}=-20V,V_{DS}=0V	--	--	-100	nA
On Characteristics(Note 4)							
Gate Threshold Voltage		$V_{GS(TH)}$	V_{DS}=V_{GS},I_D=-250μA	-1	--	-3	V
Static Drain-Source On-State Resistance		$R_{DS(ON)}$	V_{GS}=-10V,I_D=-15A	--	35	51	mΩ
Dynamic Characteristics(Note 5)							
Input Capacitance		C_{ISS}	V_{DS}=-25V,V_{GS}=0V,f=1MHz	--	2700	--	pF
Output Capacitance		C_{OSS}		--	790	--	pF
Reverse Transfer Capacitance		C_{RSS}		--	450	--	pF
Switching Characteristics (Note 5)							
Turn-On Delay Time		$t_{d(on)}$	V_{DD}=-50V,I_D=-15A,V_{GS}=-10V R_G=9.1Ω	--	17	--	ns
Turn-On Rise Time		t_R		--	80	--	ns
Turn-Off Delay Time		$t_{d(off)}$		--	45	--	ns
Turn-Off Fall Time		t_f		--	65	--	ns
Total Gate Charge		Q_G	V_{DD}=-50V,I_D=-15A, V_{GS}=-10V	--	90	--	nC
Gate-Source Charge		Q_{GS}		--	15	--	nC
Gate-Drain Charge		Q_{GD}		--	35	--	nC
Drain-Source Diode Characteristics and Maximum Ratings							
Drain-Source Diode Forward Voltage		V_{SD}	V_{GS}=0V, I_S=-30A	--	--	-1.5	V
Maximum Continuous Drain-Source Diode Forward Current (Note 3)		I_S		--	--	-30	A
Reverse Recovery Time		trr	V_{GS}=0V, I_F=-15A dI$_F$/dt=100A/μs (Note 1)	--	90	--	ns
Reverse Recovery Charge		Q_{RR}		--	70	--	nC

Notes : 1 Repetitive Rating:Pulse width limited by maximum junction temperature
2 L=0.5mH I_D=-35.6A,V_{DD}=-50V,V_{GATE}=-100V,Starting T_J=25°C
3 Surface mounted on FR4 Board,t≤10sec
4 Pulse Test: Pulse width ≤300μS, Duty cycle≤2%
5 Guaranteed by design,not subject to production

Typical characteristics Diagrams

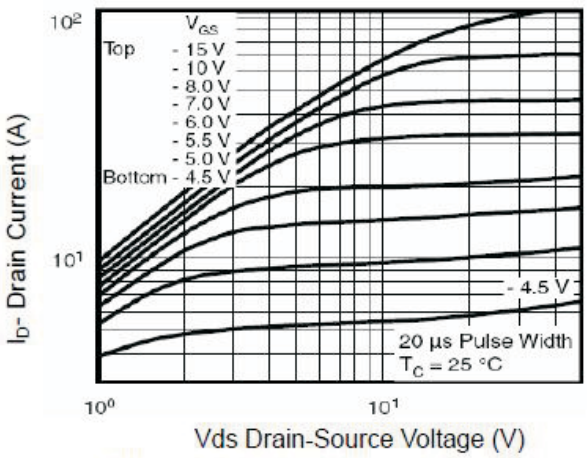


Figure 1 Output Characteristics

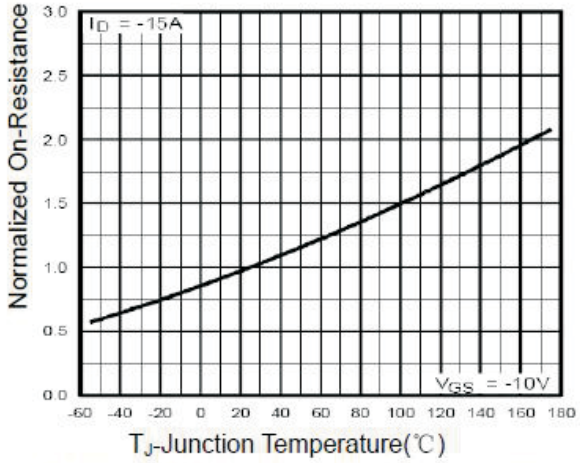


Figure 4 Rdson-JunctionTemperature

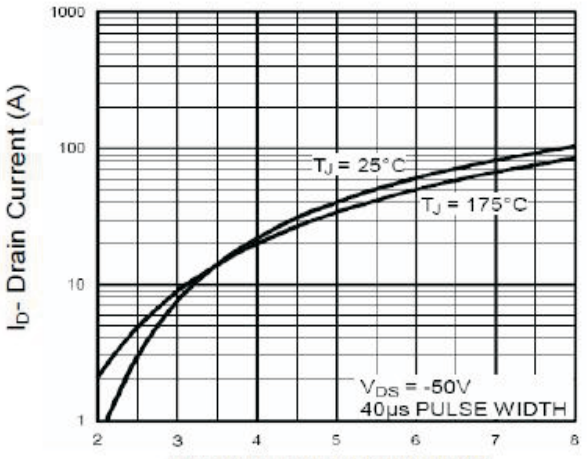


Figure 2 Transfer Characteristics

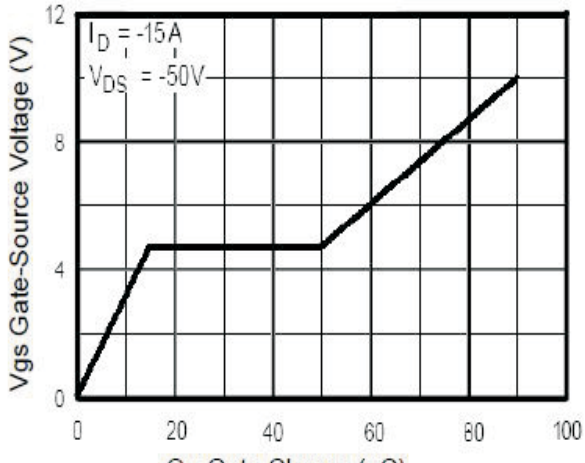


Figure 5 Gate Charge

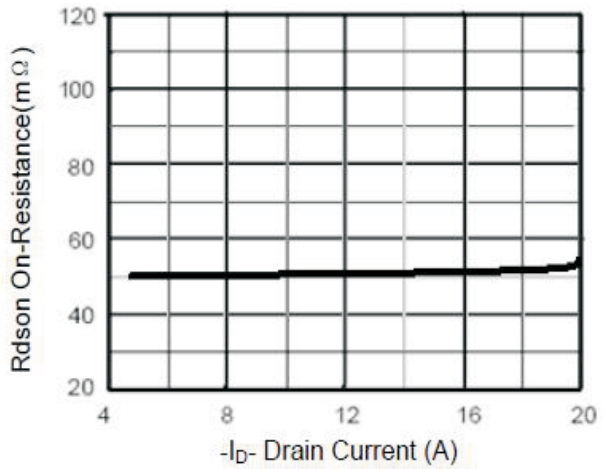


Figure 3 Rdson- Drain Current

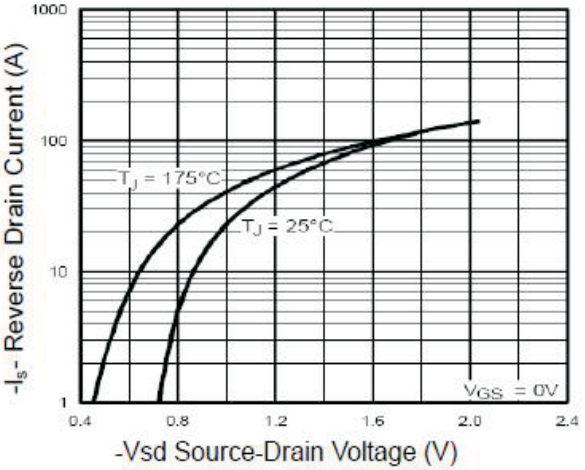


Figure 6 Source- Drain Diode Forward

Typical characteristics Diagrams

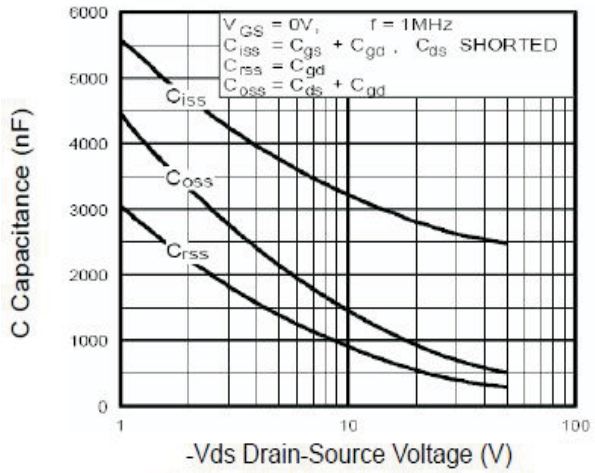


Figure 7 Capacitance vs Vds

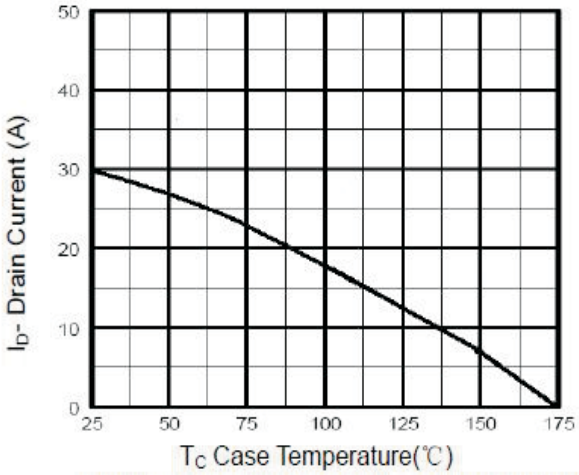


Figure 9 Drain Current vs Case Temperature

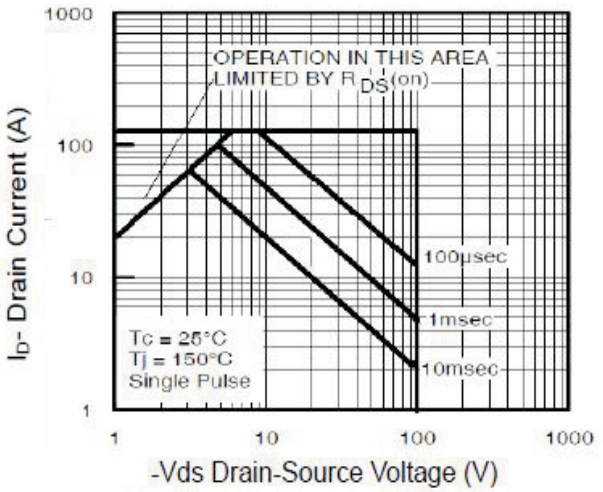


Figure 8 Safe Operation Area

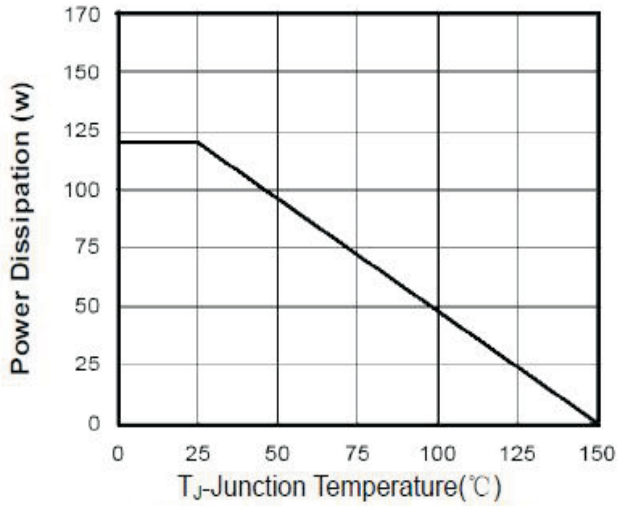


Figure 10 Power De-rating

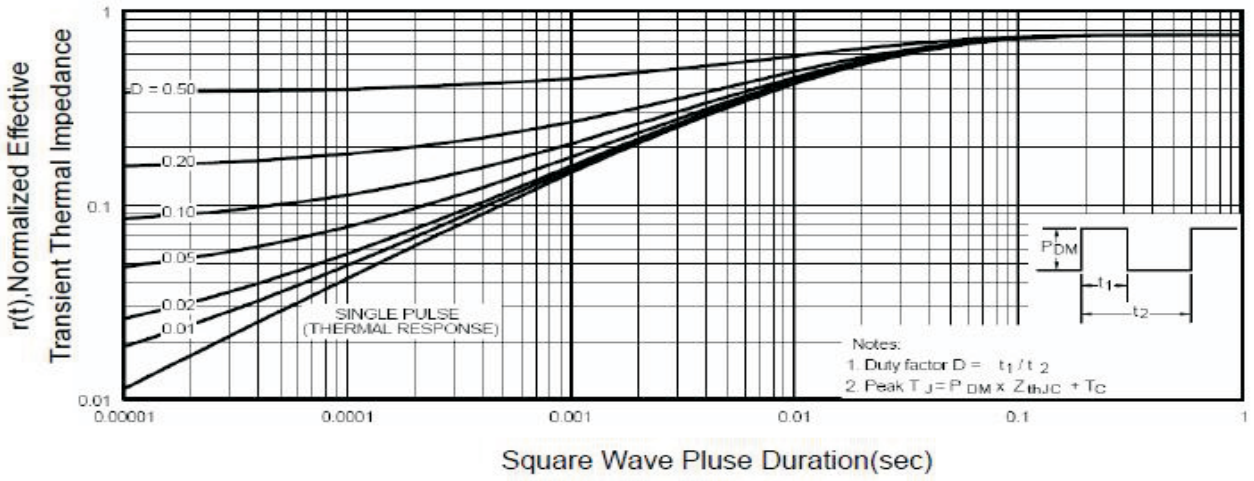
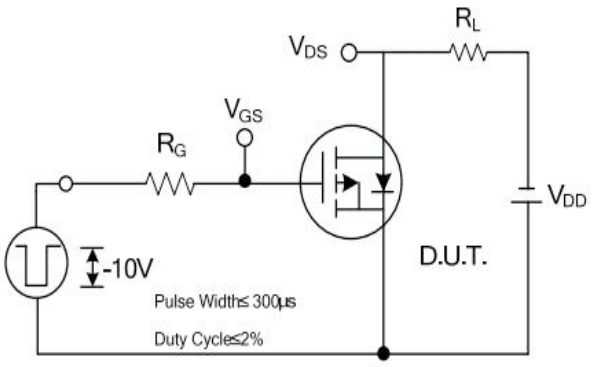
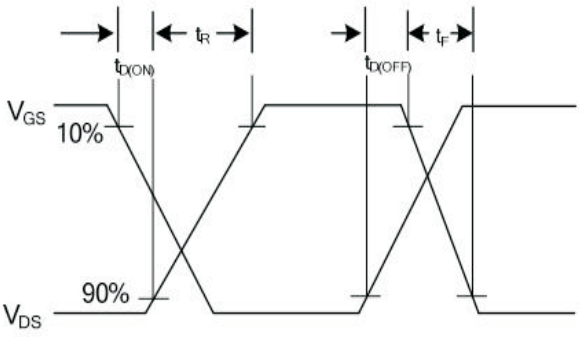


Figure 11 Normalized Maximum Transient Thermal Impedance

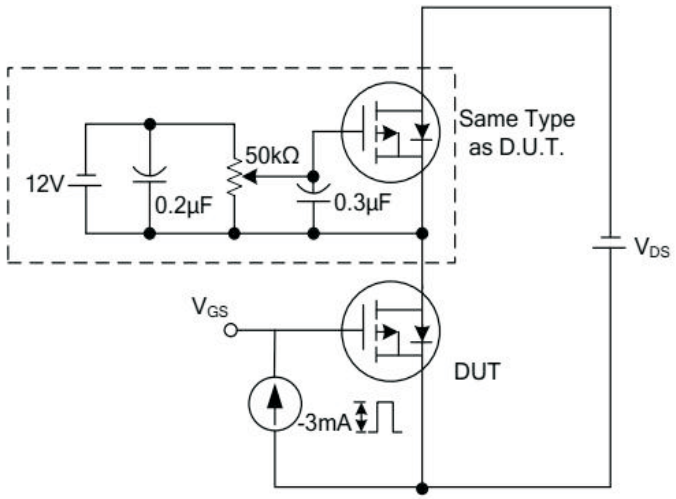
Typical Test Circuit and Waveform



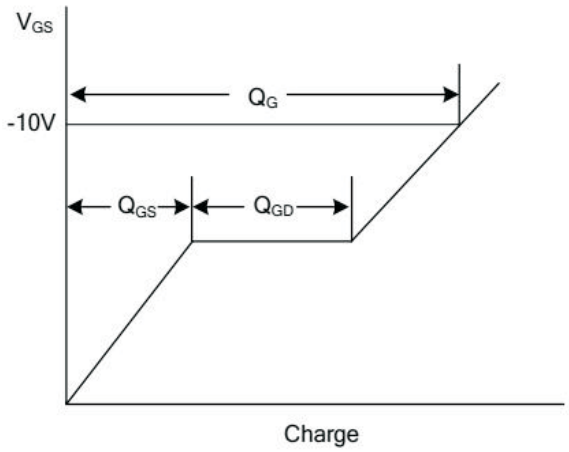
Switching Test Circuit



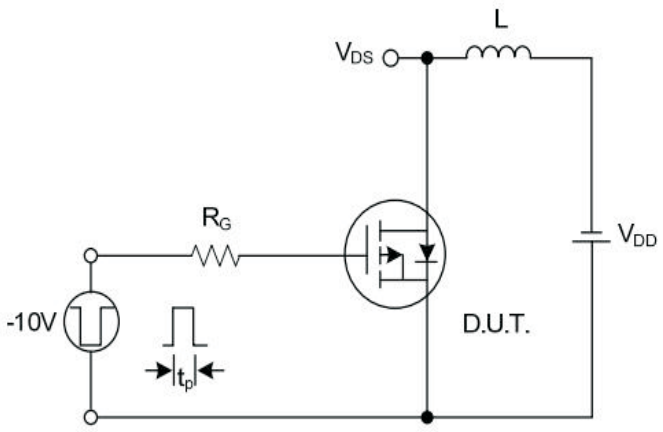
Switching Waveforms



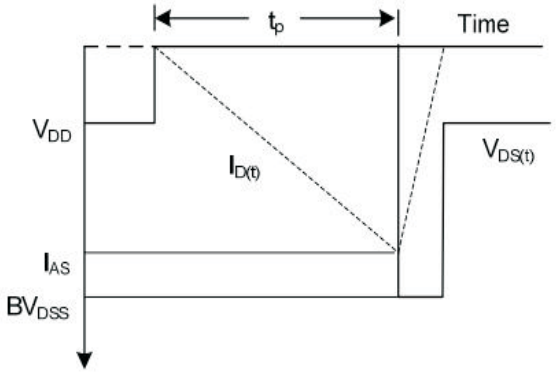
Gate Charge Test Circuit



Gate Charge Waveform

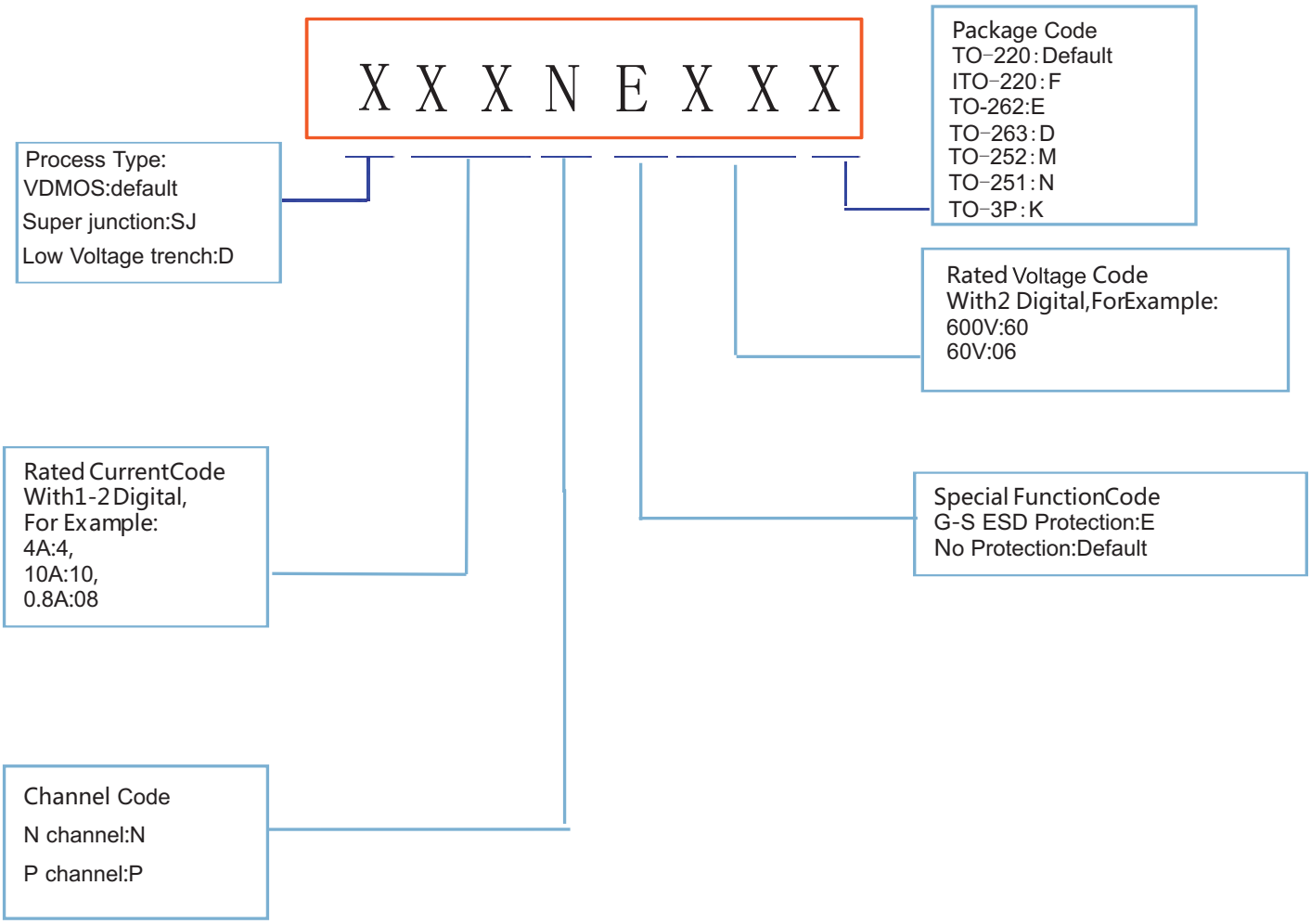


Unclamped Inductive Switching Test Circuit



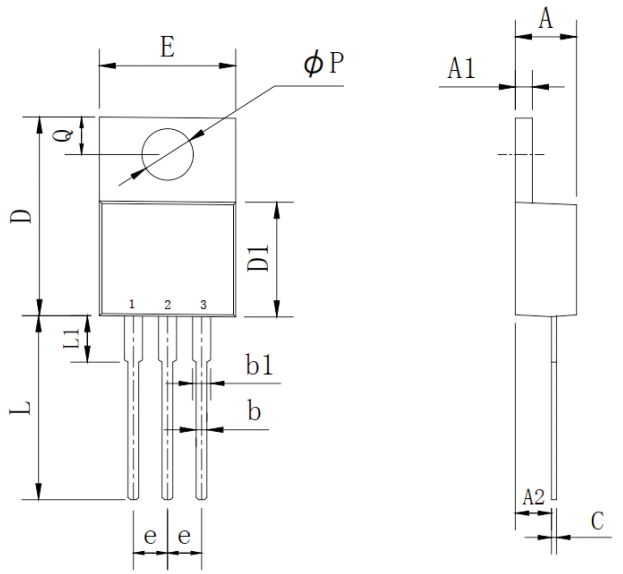
Unclamped Inductive Switching Waveforms

Product Names Rules



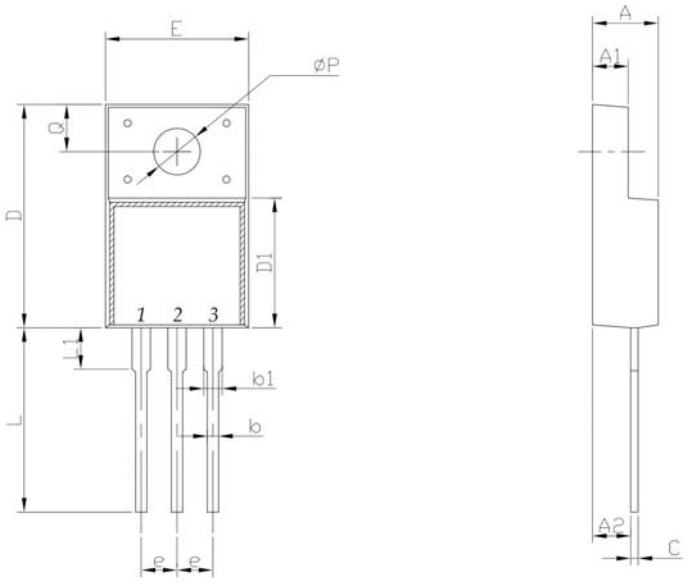
Dimensions

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

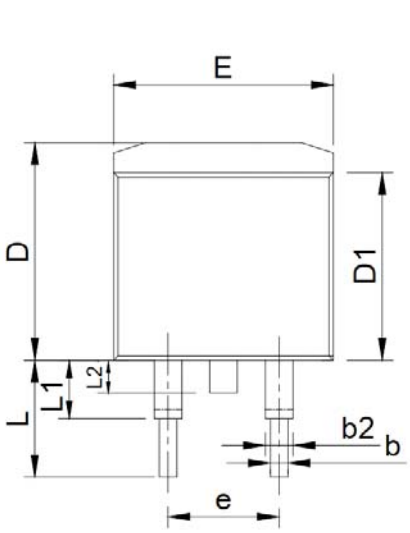
ITO-220 PACKAGE OUTLINE DIMENSIONS

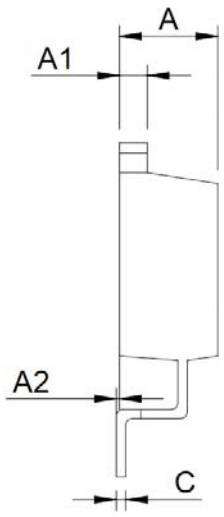


Symbol	Dimensions In Millimeters		Dimensions In Inches	
	MIN	MAX	MIN	MAX
A	4.24	4.9	0.167	0.193
A1	2.3	2.92	0.091	0.115
A2	2.61	2.81	0.103	0.111
b	0.3	1	0.012	0.039
b1	0.9	1.55	0.035	0.061
C	0.3	0.7	0.012	0.028
D	14.5	16.36	0.571	0.644
D1	8.8	9.41	0.346	0.370
E	9.5	10.5	0.374	0.413
e	2.3	2.75	0.091	0.108
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

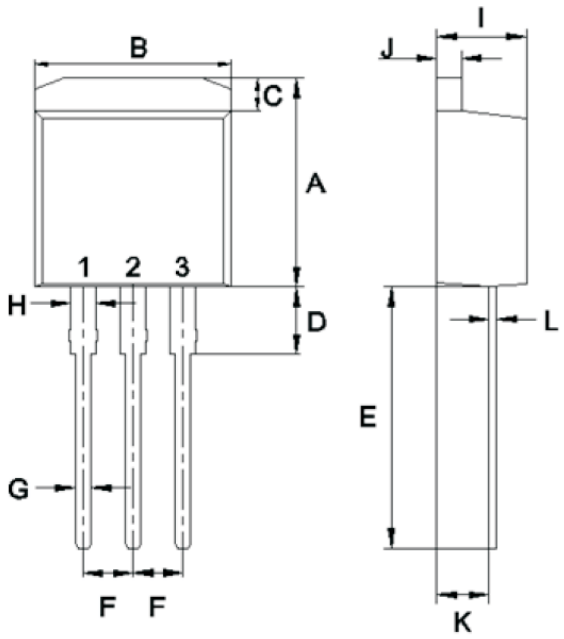
TO-263 PACKAGE OUTLINE DIMENSIONS





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

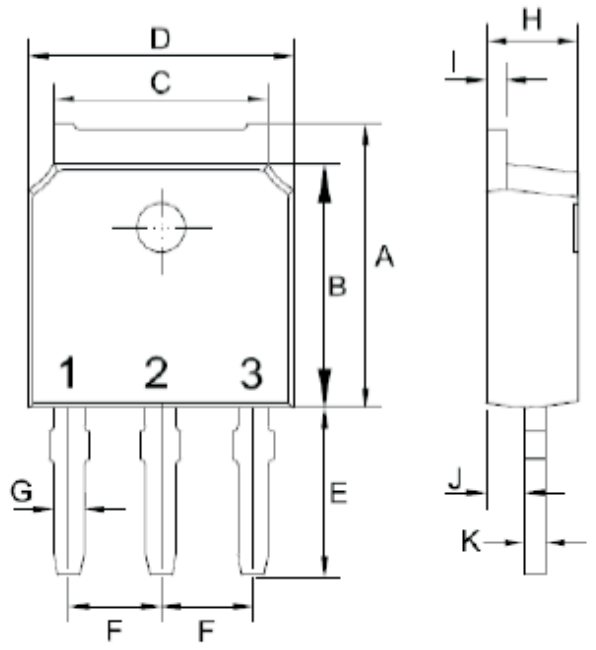
TO-262 PACKAGE OUTLINE DIMENSIONS



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	MIN	MAX	MIN	MAX
A	10.14	11.14	0.399	0.439
B	9.57	10.57	0.377	0.416
C	1.15	1.84	0.045	0.072
D	2.95	3.95	0.116	0.156
E	12.25	13.75	0.482	0.541
F	2.34	2.74	0.092	0.108
G	0.51	1.11	0.020	0.044
H	0.97	1.57	0.038	0.062
I	4.25	4.87	0.167	0.192
J	1.07	1.47	0.042	0.058
K	2.03	2.92	0.080	0.115
L	0.3	0.6	0.012	0.024

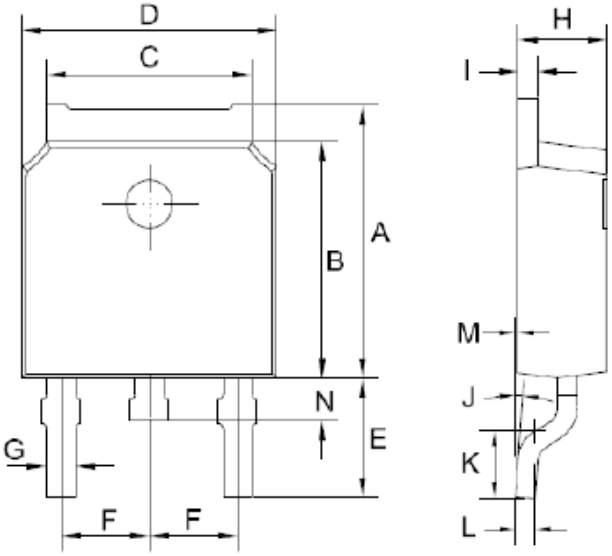
Dimensions

TO-251 PACKAGE OUTLINE DIMENSIONS



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	MIN	MAX	MIN	MAX
A	6.85	7.25	0.270	0.285
B	5.8	6.3	0.228	0.248
C	5	5.53	0.197	0.218
D	6.3	6.8	0.248	0.268
E	3.5	4.35	0.138	0.171
F	2.19	2.39	0.086	0.094
G	0.45	0.85	0.018	0.033
H	2.2	2.4	0.087	0.094
I	0.41	0.61	0.016	0.024
J	0.71	1.31	0.028	0.052
K	0.41	0.61	0.016	0.024

TO-252 PACKAGE OUTLINE DIMENSIONS



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	MIN	MAX	MIN	MAX
A	6.85	7.25	0.270	0.285
B	5.8	6.3	0.228	0.248
C	5	5.53	0.197	0.218
D	6.3	6.8	0.248	0.268
E	2.6	3.3	0.102	0.130
F	2.19	2.39	0.086	0.094
G	0.45	0.85	0.018	0.033
H	2.2	2.4	0.087	0.094
I	0.41	0.61	0.016	0.024
J	0	8	0	8
K	1.45	1.85	0.057	0.073
L	0.41	0.61	0.016	0.024
M	0	0.12	0.000	0.005
N	0.6	1	0.024	0.039

Friendship Reminder

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