

General Description

These N-channel enhanced VDMOSFETS Used advanced SGT technology design, provided excellent Rdson and low gate charge. Which accords with the RoHS standard.

Product Summary			
V _{DS}	R _{DS(on)} (mΩ) Typ	I _D (A)	Q _g (Typ)
80V	5.4 @ 10V	110	57nc

Features

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

Mechanical Data

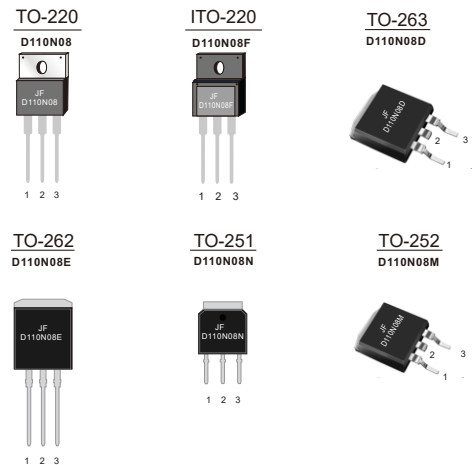
- Case:TO-220,ITO-220,TO-263,TO-262,TO-251,TO-252 Package

Application

- Switching applications

Ordering Information

Part No.	Package Type	Package	Quality(box)
D110N08	TO-220	Tube	1000
D110N08F	ITO-220	Tube	1000
D110N08D	TO-263	Tape & Reel	800
D110N08E	TO-262	Tube	1000
D110N08N	TO-251	Tube	1000
D110N08M	TO-252	Tape & Reel	3000



Block Diagram

Pin Definition:

1. Gate
2. Drain
3. Source

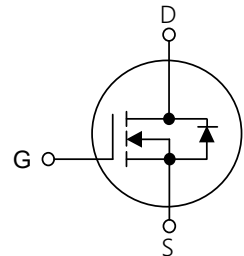


Table1 Absolute Maximum Ratings (T_C=25°C, unless otherwise specified)

Parameter	Symbol	D110N08/D110N08D/D110N08E D110N08M/D110N08N		D110N08F	Unit
Drain-Source Voltage	V _{DS}	80			V
Gate-Source Voltage	V _{GS}	±20			V
Continuous Drain Current	I _D	T _C =25°C	110	110 *	A
		T _C =100°C	81	81 *	
Pulsed Drain Current (Note 1)	I _{DM}	320			A
Single Pulse Avalanche Energy (Note 2)	E _{AS}	576			mJ
Avalanche Current (Note 1)	I _{AR}	48			A
Power Dissipation T _C =25°C	P _D	145	35		W
Operating Junction and Storage Temperature	T _J /T _{STG}	-55~+175			°C

※ limited by maximum junction temperature

Table 2. Thermal Characteristics

Parameter	Symbol	D110N08/D110N08D/ D110N08M/D110N08N D110N08E	D110N85F	Unit
Thermal resistance Junction to Ambient	$R_{\theta JA}$	75	75	$^{\circ}C/W$
Thermal resistance Junction to Case	$R_{\theta JC}$	1.03	4.29	$^{\circ}C/W$

Table 3. Electrical Characteristics ($T_J=25^{\circ}C$, unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Off Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_D=250\mu A$	80	-	-	V
Drain-Source Leakage Current	I_{DSS}	$V_{DS}=80V, V_{GS}=0V$	-	-	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 4)						
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	2.0	3.0	4.0	V
Static Drain-Source On-State Resistance	$R_{DS(ON)}$	$V_{GS}=10V, I_D=40A$	-	5.4	6.5	m Ω
Dynamic Characteristics(Note 5)						
Input Capacitance	C_{ISS}	$V_{DS}=30V, V_{GS}=0V, f=1MHz$	-	4018	-	pF
Output Capacitance	C_{OSS}		-	1225	-	pF
Reverse Transfer Capacitance	C_{RSS}		-	52	-	pF
Switching Characteristics (Note 5)						
Turn-On Delay Time	$t_d(on)$	$V_{DS}=30V, I_D=60A,$ $V_{GS}=10V, R_G=4.7\Omega$	-	30	-	ns
Turn-On Rise Time	t_R		-	17	-	ns
Turn-Off Delay Time	$t_d(off)$		-	52	-	ns
Turn-Off Fall Time	t_f		-	20	-	ns
Total Gate Charge	Q_G	$V_{DD}=30V, I_D=60A,$ $V_{GS}=10V$	-	57	-	nC
Gate-Source Charge	Q_{GS}		-	22	-	nC
Gate-Drain Charge	Q_{GD}		-	9.2	-	nC
Drain-Source Diode Characteristics and Maximum Ratings						
Drain-Source Diode Forward Voltage	V_{SD}	$V_{GS}=0V, I_S=50A$	-	0.95	1.4	V
Maximum Continuous Drain-Source Diode Forward Current	I_S		-	-	60	A
Reverse Recovery Time	t_{rr}	$V_{GS}=0V, I_F=50A$	-	70	-	ns
Reverse Recovery Charge	Q_{RR}	$di_F/dt=100A/\mu s$ (Note 1)	-	102	-	nC

Notes : 1 Repetitive Rating: Pulse width limited by maximum junction temperature

2 $L=0.5mH, I_D=48A, V_{DD}=50V$, Starting $T_J=25^{\circ}C$

4 Pulse Test: Pulse width $\leq 300\mu s$, Duty cycle $\leq 2\%$

5 Guaranteed by design, not subject to production

Typical Characteristics Diagrams

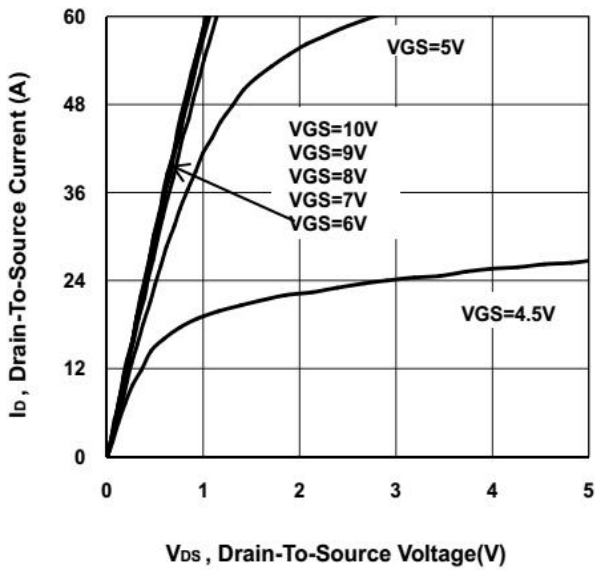


Fig 1. Output Characteristics

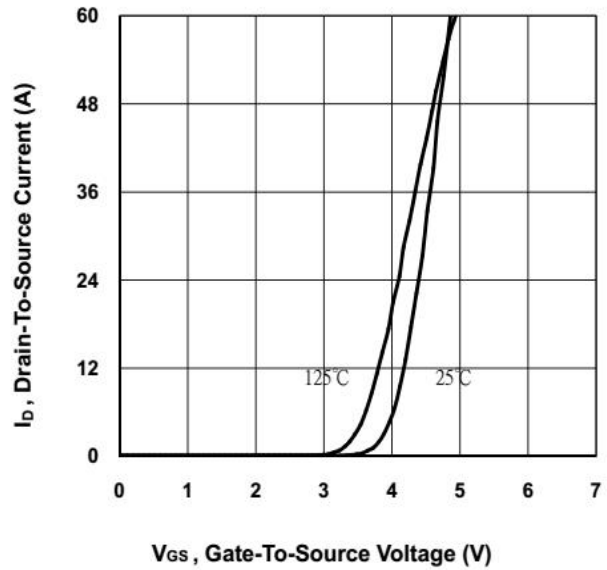


Fig 2. Transfer Characteristics

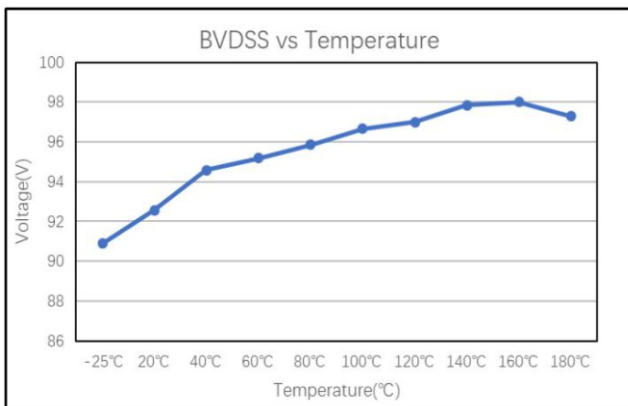


Fig 3. BV_{DSS} Variation with Temperature

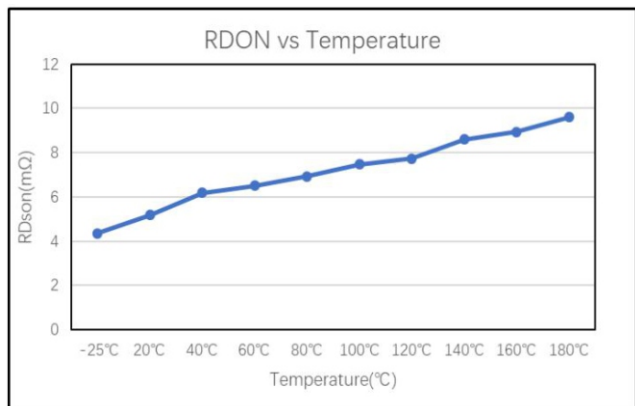


Fig 4. On-resistance Variation with Temperature

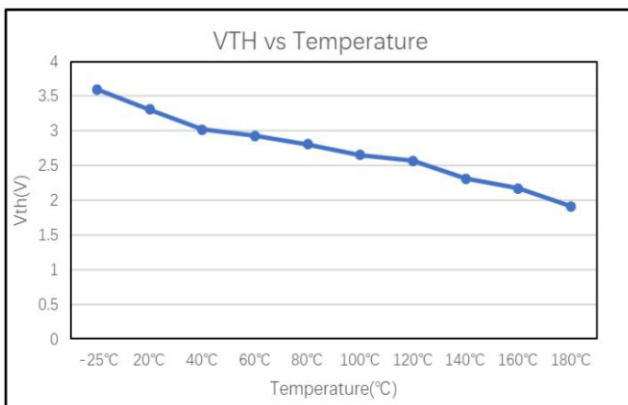


Fig 5. V_{th} Variation with Temperature

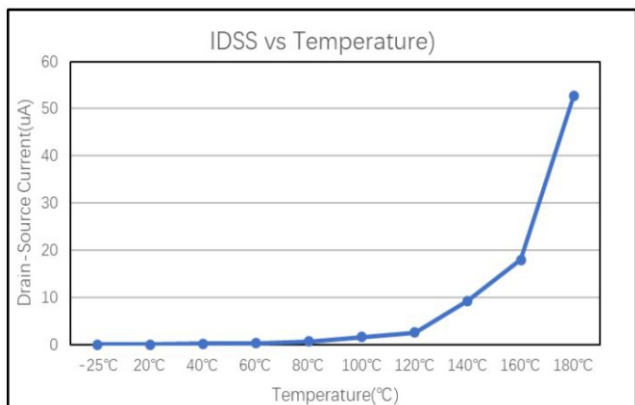


Fig 6. I_{DSS} Variation with Temperature

Typical Characteristics Diagrams

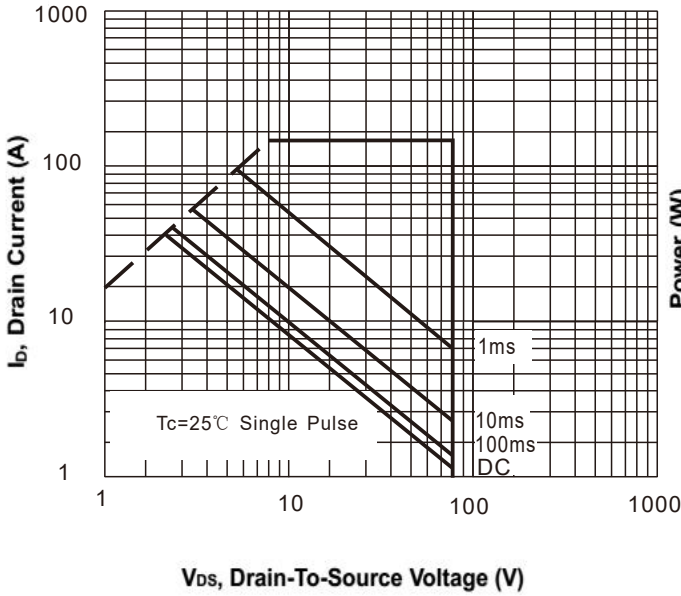


Fig 7. Safe Operating Area

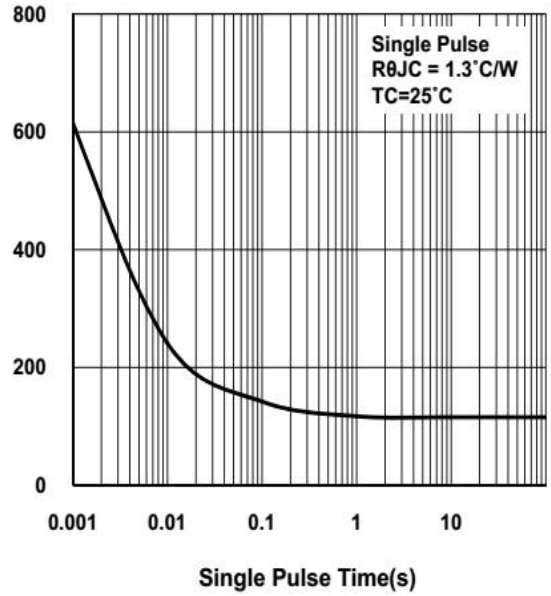


Fig 8. Single Pulse Maximum Power Dissipation

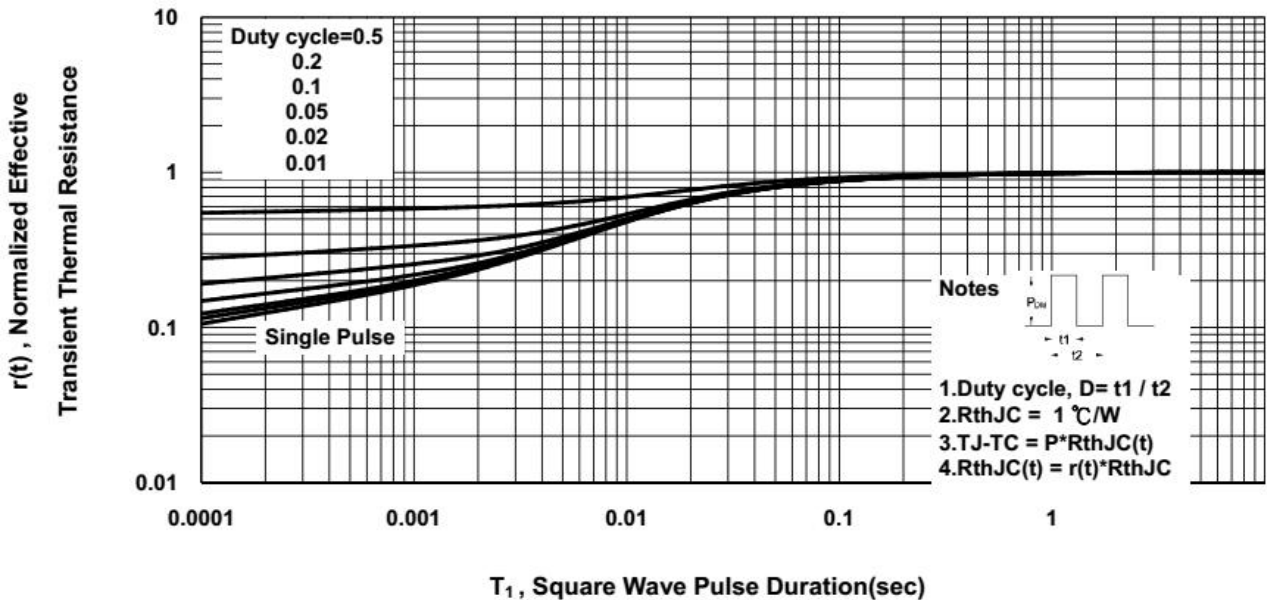
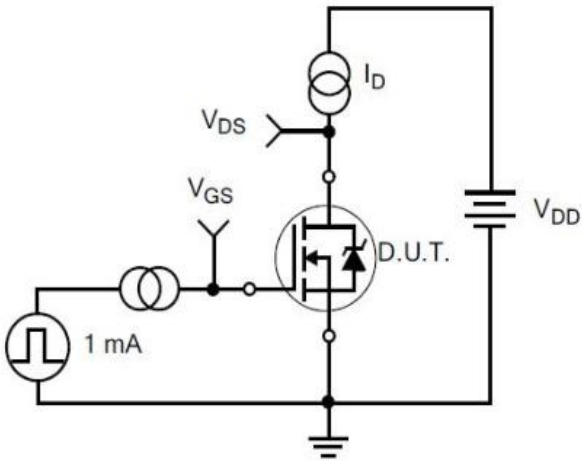
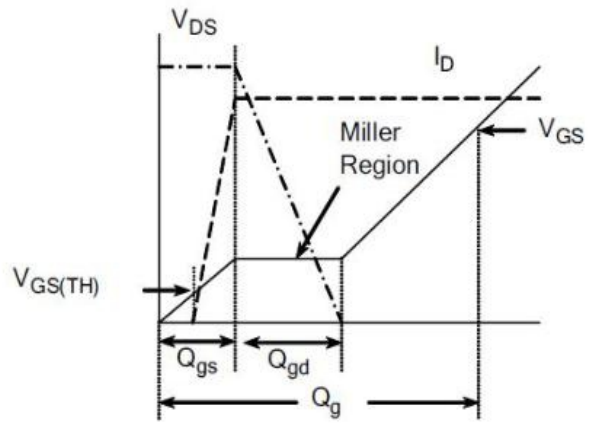


Fig 9. T_1 , Transient Thermal Response Curve

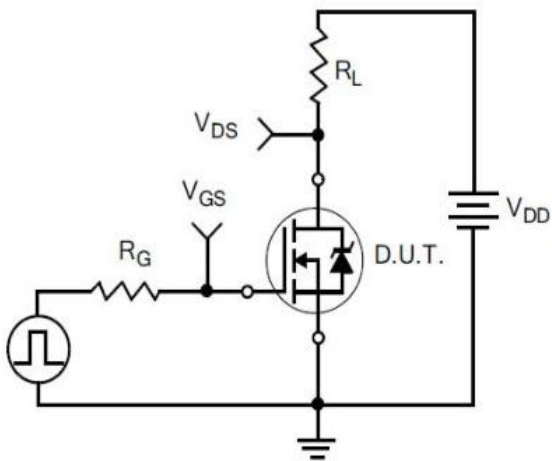
Typical Test Circuit



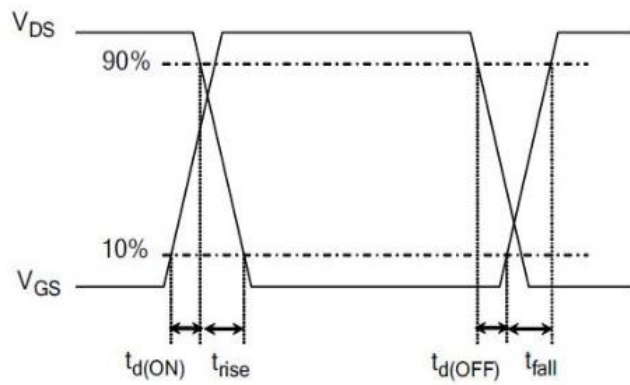
1) Gate Charge Test Circuit



2) Gate Charge Waveform

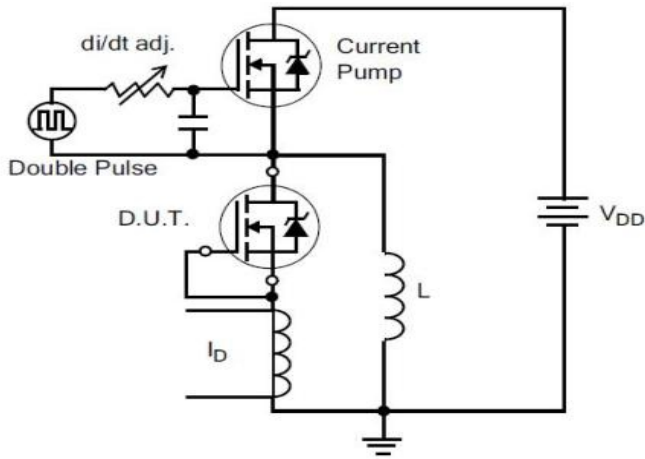


3) Resistive Switching Test Circuit

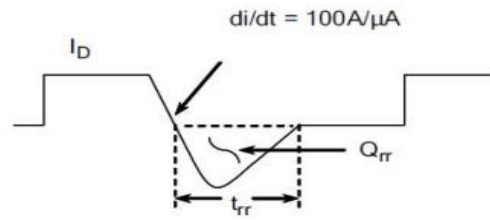


4) Resistive Switching Waveforms

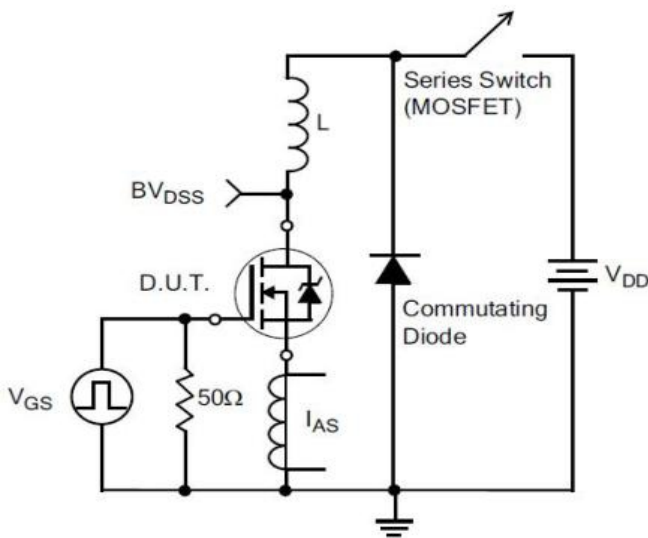
Typical Test Circuit



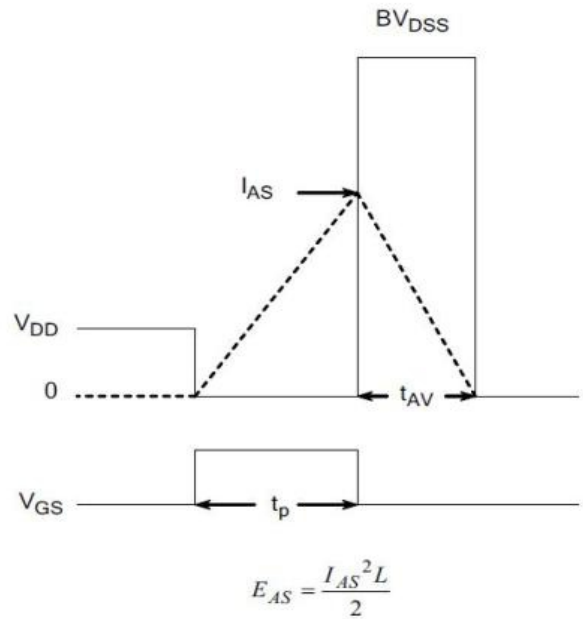
5) Diode Reverse Recovery Test Circuit



6) Diode Reverse Recovery Waveform

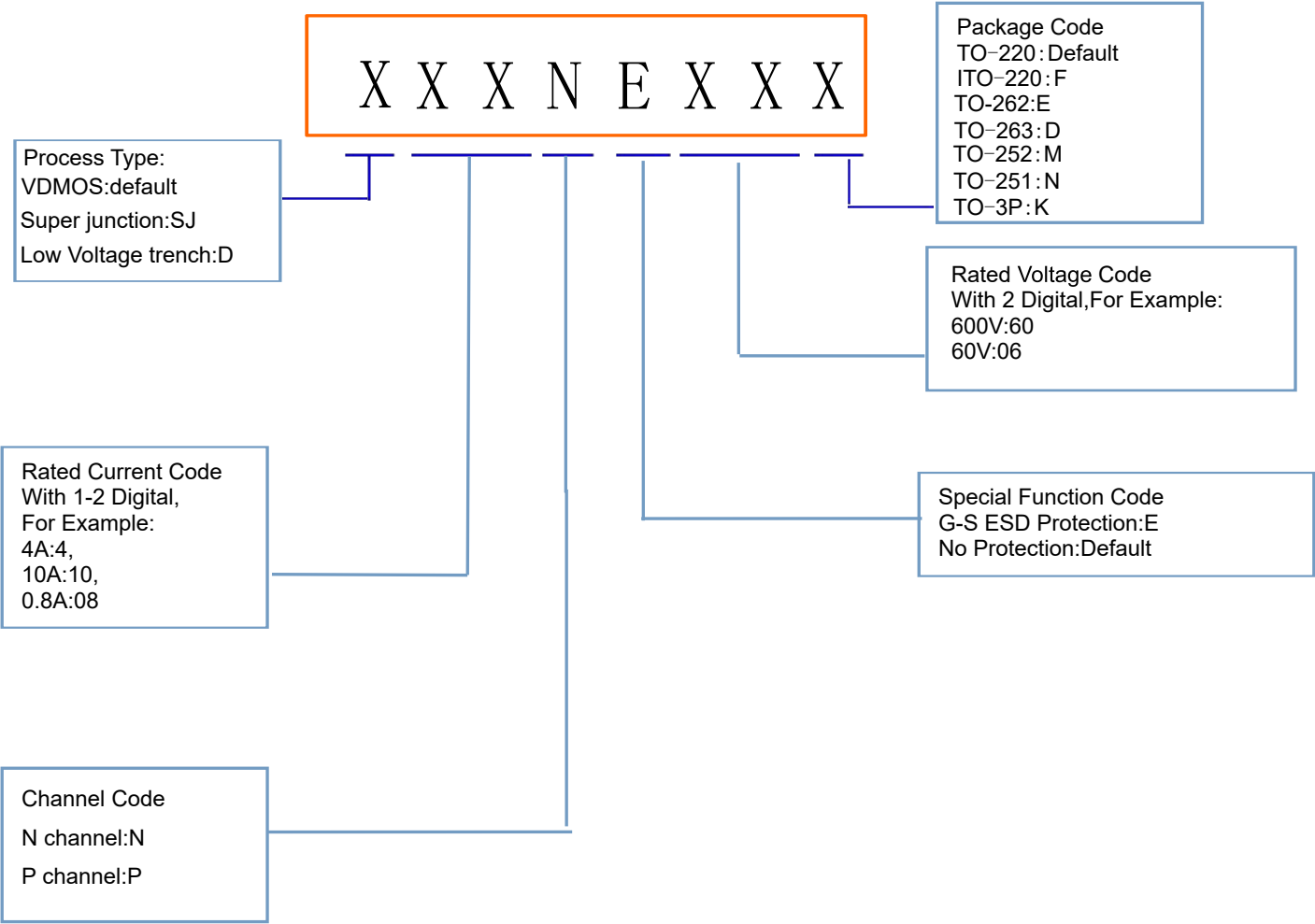


7) . Unclamped Inductive Switching Test Circuit



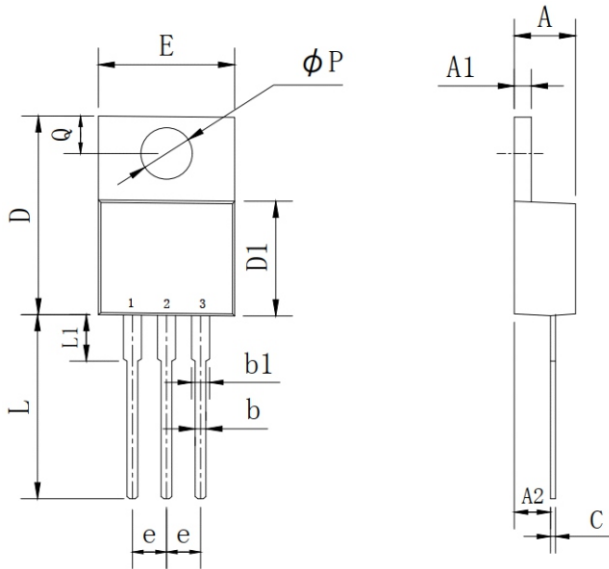
8) Unclamped Inductive Switching Waveforms

Product Names Rules



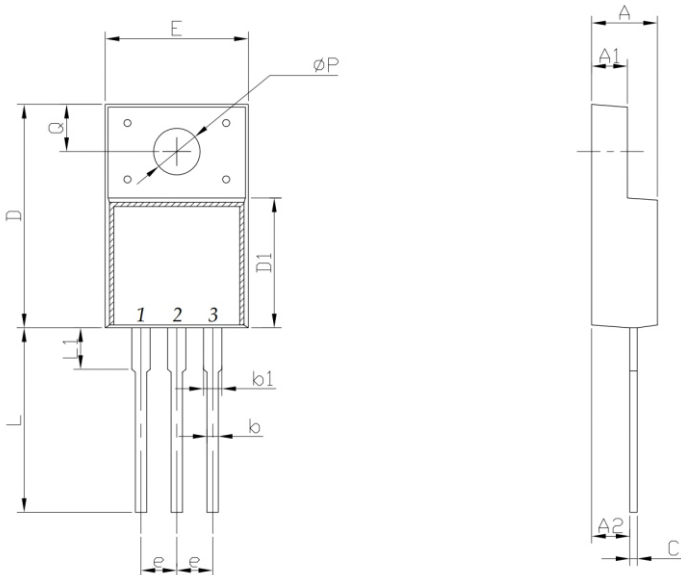
Dimensions

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

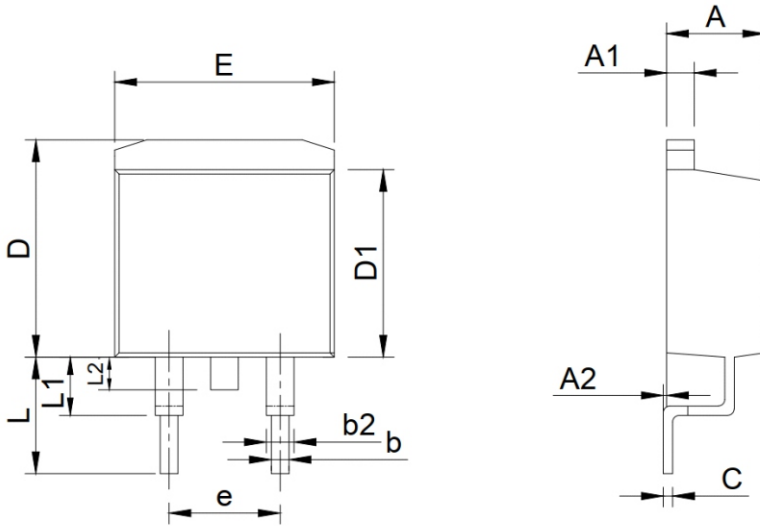
ITO-220 PACKAGE OUTLINE DIMENSIONS



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

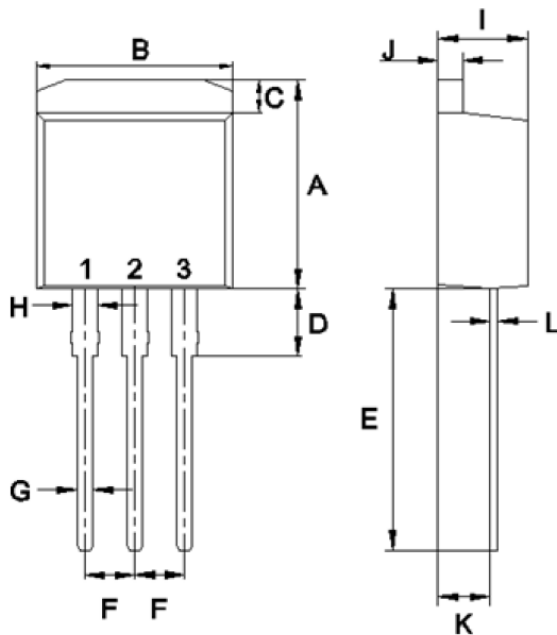
Dimensions

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

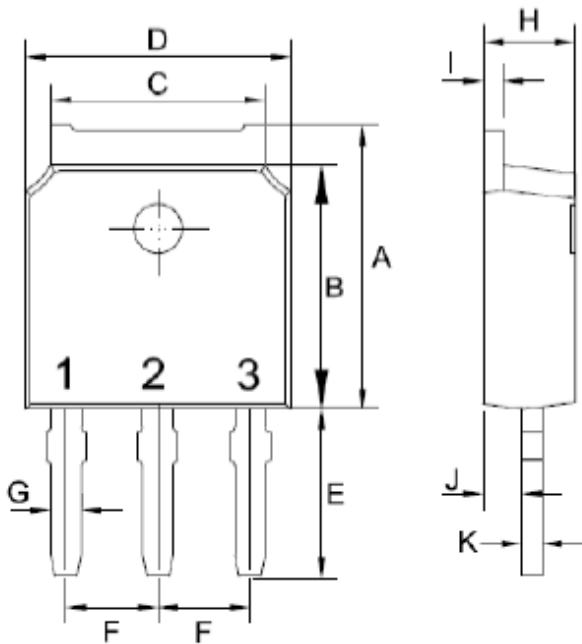
TO-262 PACKAGE OUTLINE DIMENSIONS



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

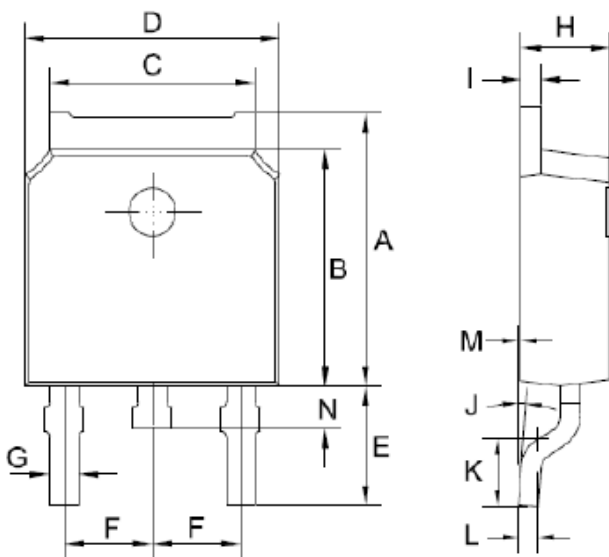
Dimensions

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
P	0.6	1	0.024	0.039

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