SEMICONDUCTOR

D260N04G3 Series

260A 40V N-Channel Enhancement Mode Power MOSFET

Genaral Description

These N-channel enhancement mode power mosfets Used advanced trench 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)	Qg(Typ)
40V	1.5 @ 10V,90A	260	193nc

Features

- Fast switching
- Low gate charge and input capacitance
- 100% avalanche tested
- Rohs compliant

TO-220
D260N04G3

TO-263
D260N04DG3

Mechanical Data

- Case:TO-220,TO-263Package

Application

- Motor control and drive
- Battery management
- UPS (Uninterrupible Power Supplies)

Ordering Information

Part No.	Package Type	Package	Quality(box)
D260N04G3	TO-220	Tube	1000
D260N04DG3	TO-263	Tape & Reel	800

Pin Definition:

1. Gate
2. Drain
3. Source

Block Diagram

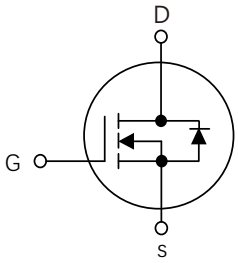


Table1 Absolute Maximum Ratings (Tc=25℃, unless otherwise specified)

Parameters		Symbol	D260N04G3 D260N04DG3	Unit
Drain-Source Voltage		V_{DS}	40	V
Gate-Source Voltage		V_{GS}	±20	V
Contionous Drain Current	Tc=25°C(Silicon limited)	I_D	260	A
	Tc=25°C(Package limited)		180	
	Tc=100°C(Silicon limited)		170	
Pulsed Drain Current (Note 1)		I_{DM}	720	A
Single Pulse Avalanche Energy(Note 2)		EAS	1600	mJ
Power Dissipation	Ta=25°C	P_D	2.3	W
	Tc=25°C		227	W
Operating Junction and Storage Temperature		T_J/T_{STG}	-55 ~ +150	℃

Table 2.Thermal Characteristics

Parameters	Symbol	D260N04G3 D260N04DG3	Unit
Thermal resistance Junction to Ambient	$R_{\theta JA}$	65.0	℃/W
Thermal resistance Junction to Case	$R_{\theta JC}$	0.55	℃/W

Table 3. Electrical Chatacteristics (T_J=25℃,unless otherwise specified)

Parameters		Symbol	Test Conditions	Min	Typ	Max	Unit
Off Characteristics							
Drain-Source Breakdown Voltage		BV_{DSS}	V_{GS}=0V,I_D=250μA	40			V
Drain-Source Leakage Current		I_{DSS}	V_{DS}=40V,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 3)							
Gate Threshold Voltage		$V_{GS(TH)}$	V_{DS}=V_{GS},I_D=250μA	2.0	3.0	4.0	V
Static Drain-Source On-State Resistance		$R_{DS(ON)}$	V_{GS}=10V,I_D=90A		1.5	1.8	mΩ
Dynamic Characteristics(Note 5)							
Input Capacitance		C_{ISS}	V_{DS}=20V,V_{GS}=0V,f=1MHz		12601		pF
Output Capacitance		C_{OSS}			1204		pF
Reverse Transfer Capacitance		C_{RSS}			935		pF
Switching Characteristics (Note 4)							
Turn-On Delay Time		td(on)	V_{DD}=20V,I_D=90A, V_{GS}=10V,R_G=3Ω		27		ns
Turn-On Rise Time		tr			78		ns
Turn-Off Delay Time		td(off)			159		ns
Turn-Off Fall Time		tf			85		ns
Total Gate Charge		Q_G	V_{DS}=20V,I_D=90A, V_{GS}=10V		193		nC
Gate-Source Charge		Q_{GS}			76		nC
Gate-Drain Charge		Q_{GD}			33		nC
Drain-Source Diode Characteristics and Maximum Ratings							
Drain-Source Diode Forward Voltage(Note 3)		V_{SD}	V_{GS}=0V,I_S=90A			1.2	V
Maximum Continuous Drain-Source Diode Forward Current(Note 1)		I_S				180	A
Reverse Recovery Time		trr	I_F=90A,dI$_F$/dt=100A/μs	-	43	-	ns
Reverse Recovery Charge		Q_{RR}		-	57	-	nC

Notes: 1 Repetitive Rating:Pulse width limited by maximum junction temperature
2 V_{DD}=20V,V_{GATE}=20V,L=0.5mH,Starting T_J=25°C
3 Pulse Test: Pulse width ≤300μS,Duty cycle≤2%
4 Guaranteed by design,not subject to production

Typical Characteristics Diagrams

Figure 1.Output Characteristics

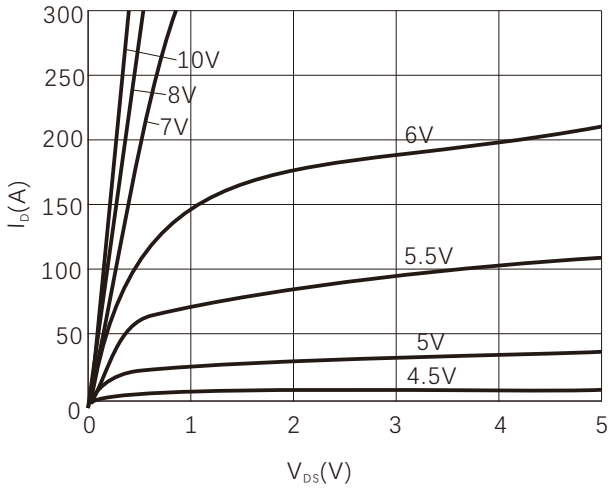


Figure 2. Transfer Characteristics

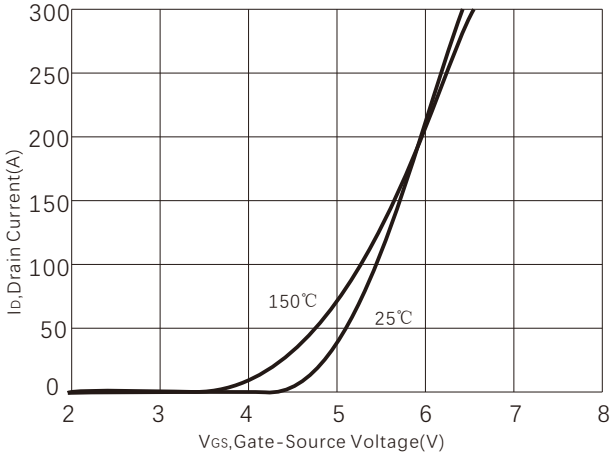


Figure3.Normalized $R_{DS(ON)}$ vs Temperature

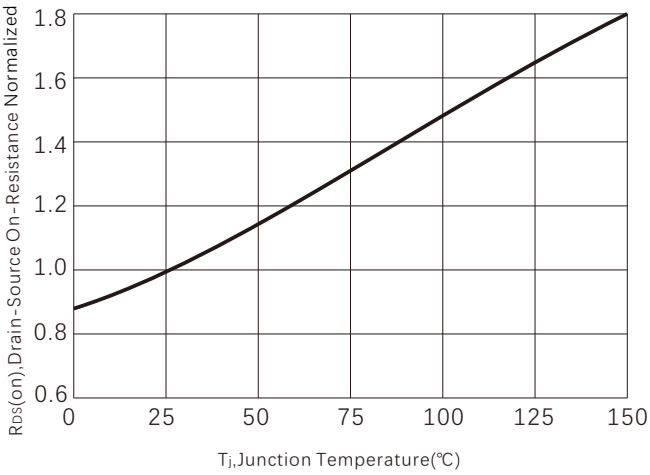


Figure 4. Capacitance

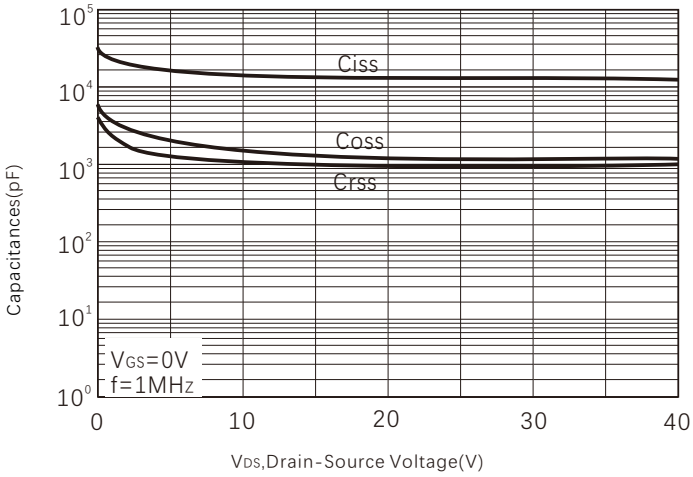


Figure 5.Gate charge

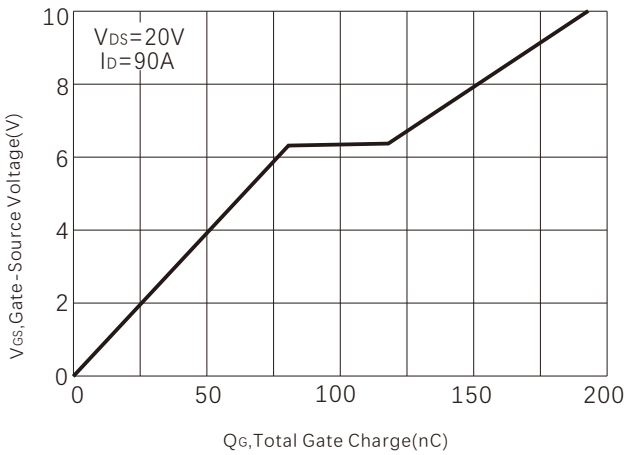


Figure 6.Source-Drain Diode Forward Voltage

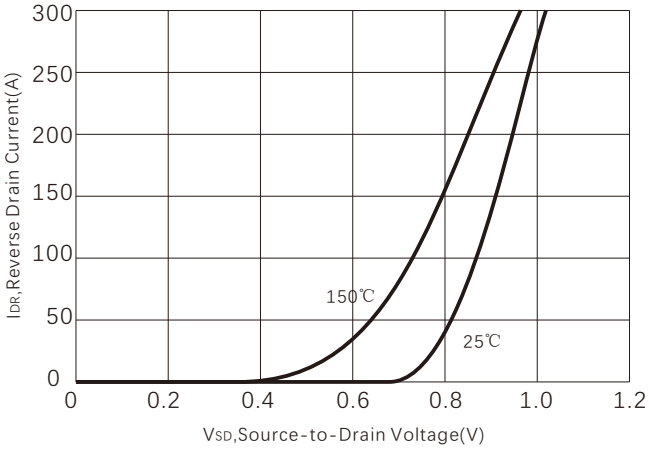


Figure7.Maximum Drain Current vs Temperature

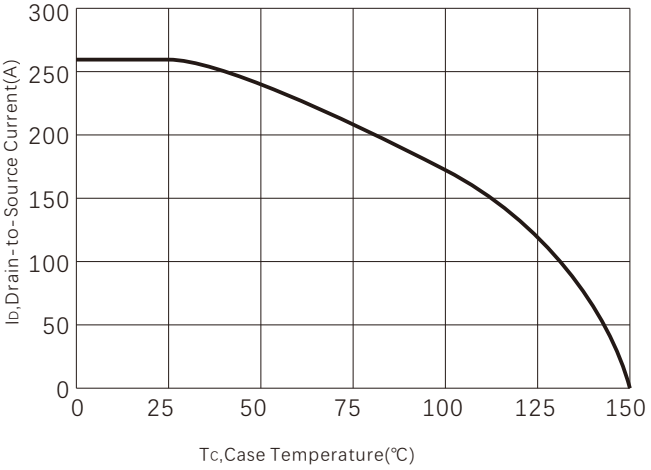


Figure 8. Power dissipation

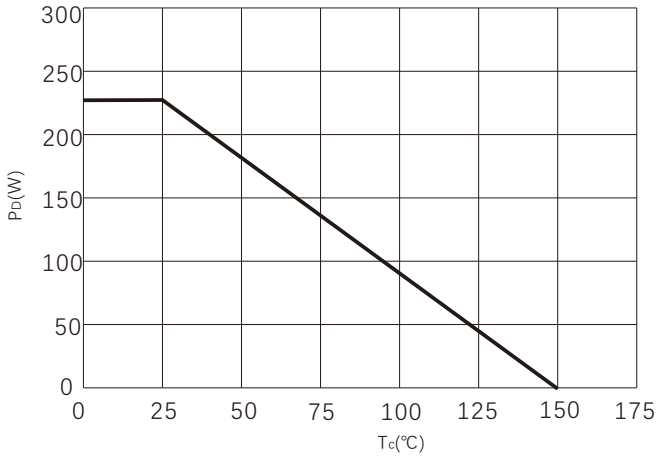


Figure 9. Safe operating area

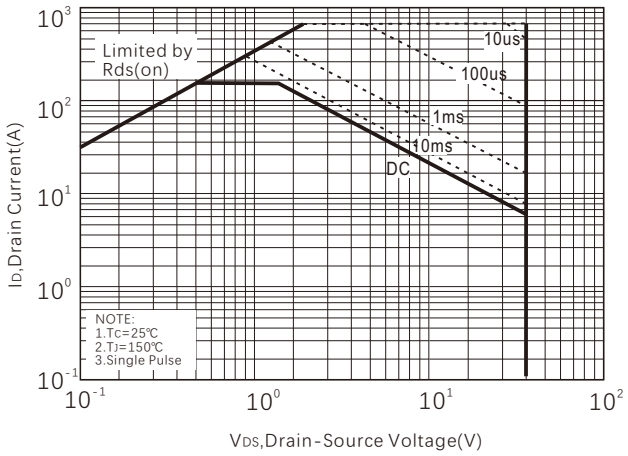
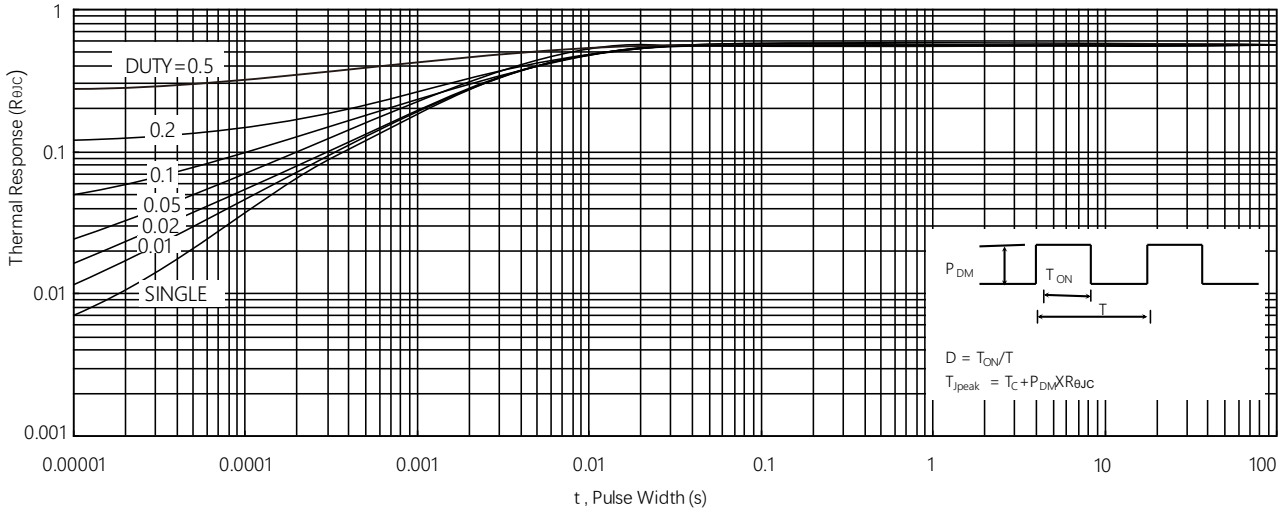
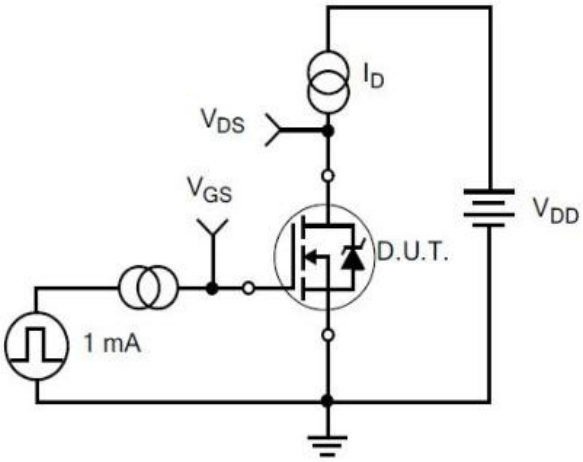


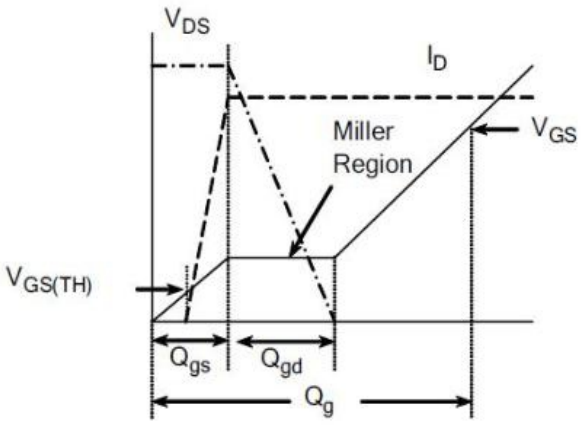
Figure 10. Maximum Transient Thermal Impedance



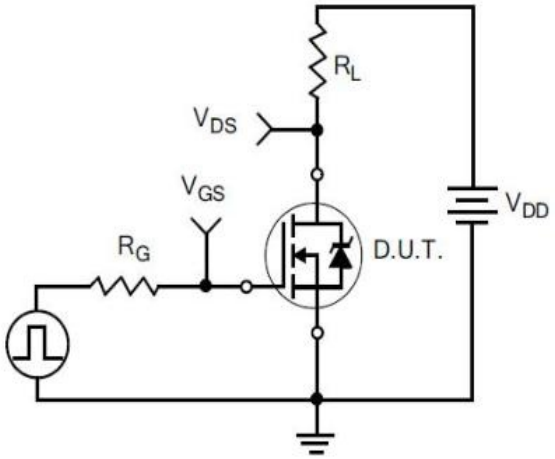
Typical Test Circuit



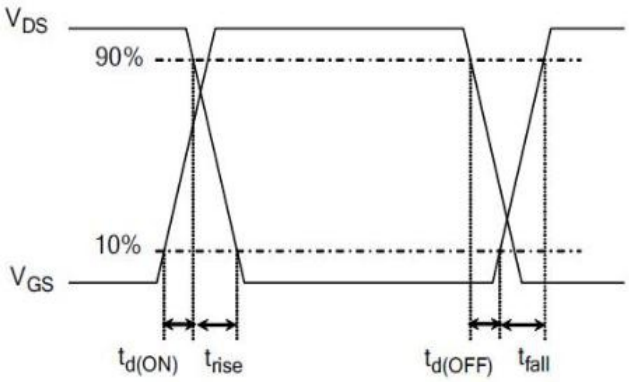
1) Gate Charge Test Circuit



2) . Gate Charge Waveform

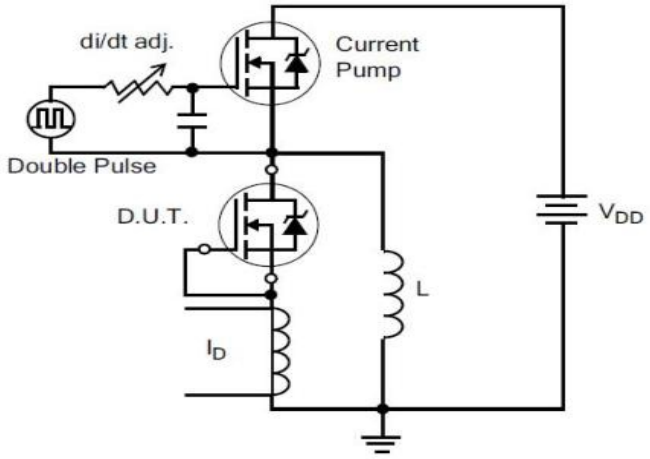


3) Resistive Switching Test Circuit

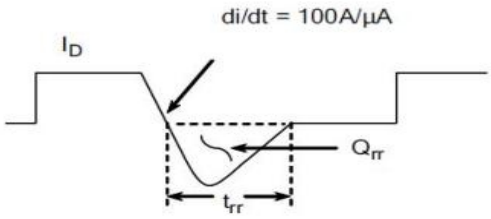


4) Resistive Switching Waveforms

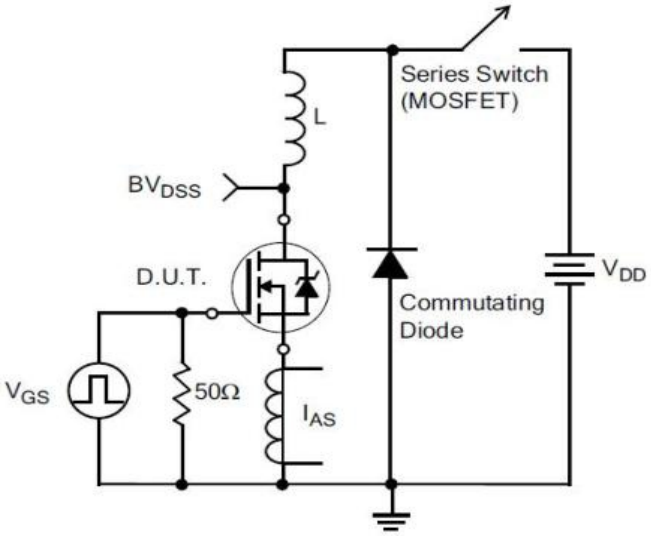
Typical Test Circuit



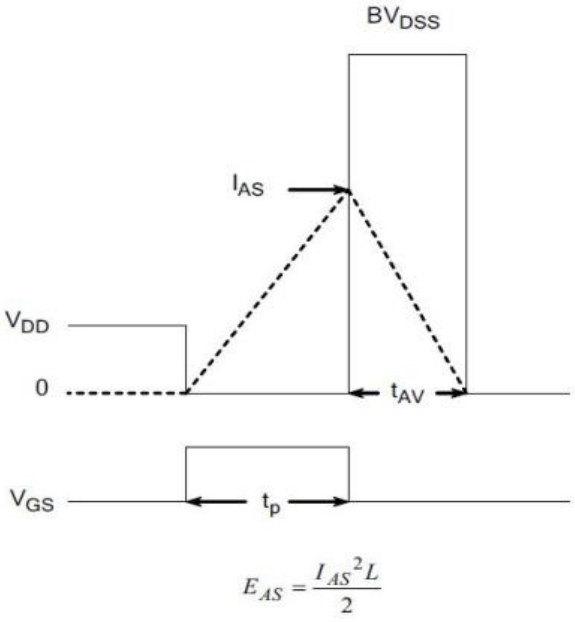
5) Diode Reverse Recovery Test Circuit



6) Diode Reverse Recovery Waveform



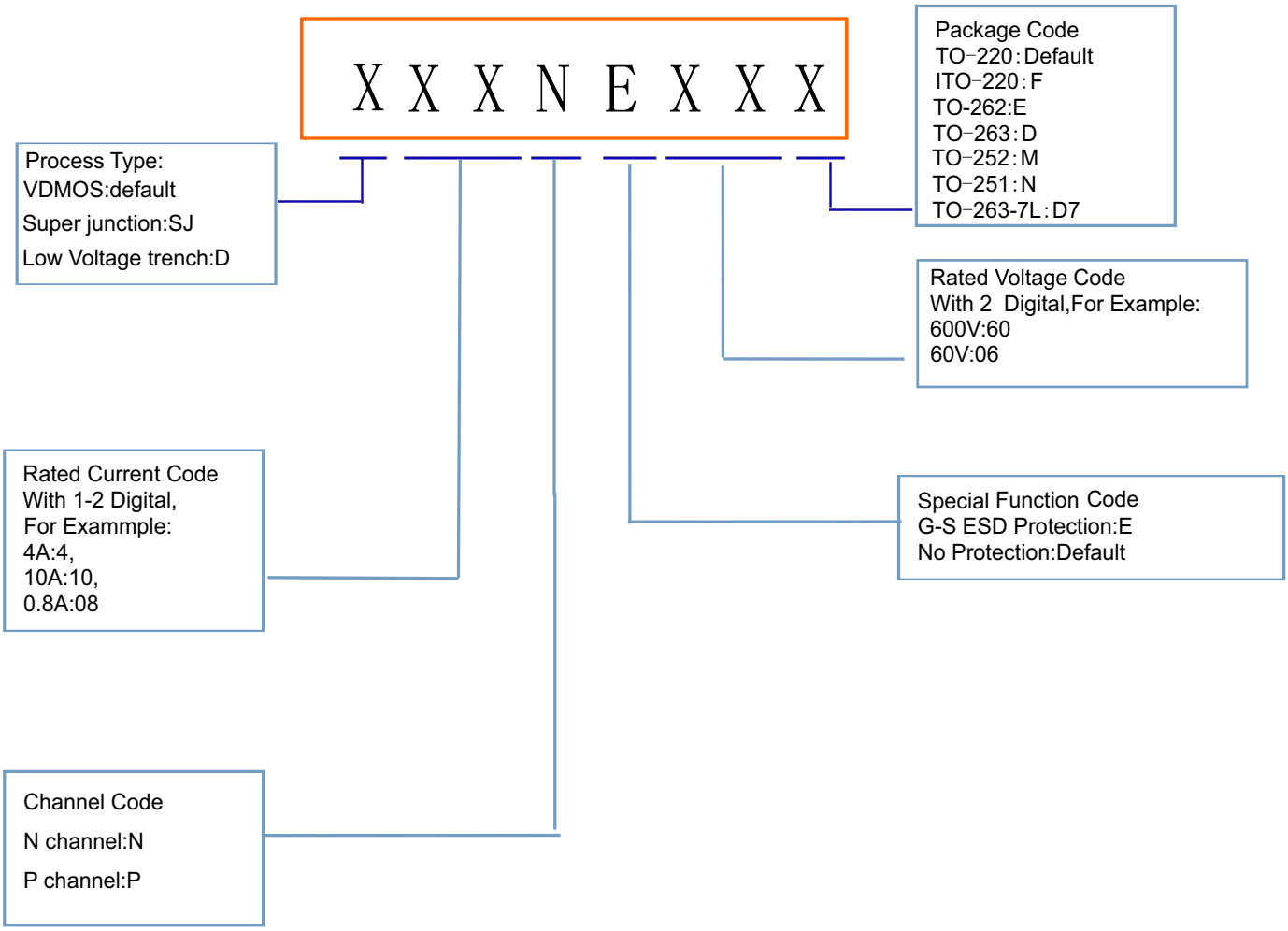
7) . Unclamped Inductive Switching Test Circuit



$$E_{AS} = \frac{I_{AS}^2 L}{2}$$

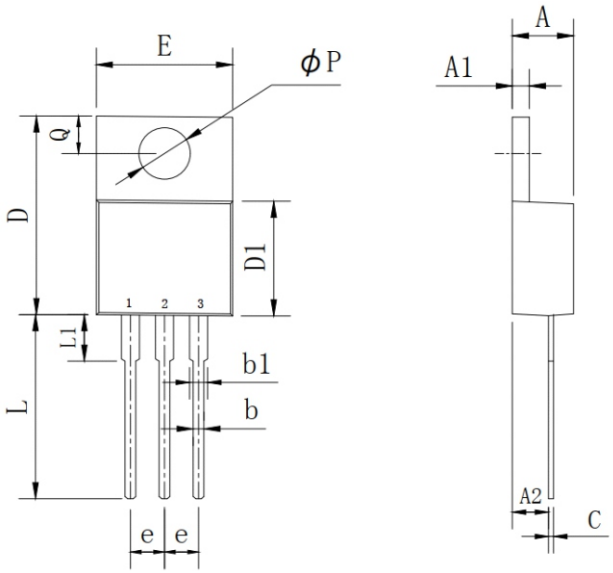
8) Unclamped Inductive Switching Waveforms

Product Names Rules



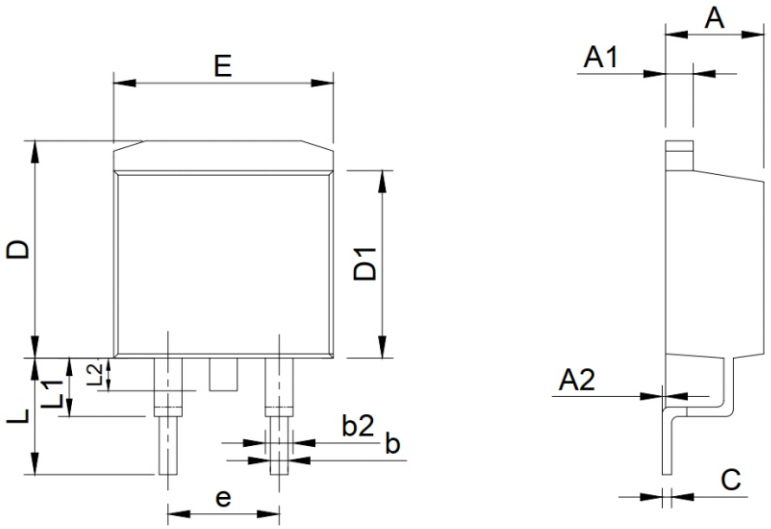
Dimensions

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

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

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