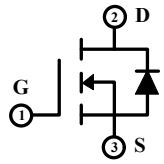
90A 80V N-channel Enhancement Mode Power MOSFET

1 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.



V_{DSS} = 80V

$R_{DS(on)\ (Type)}$= 6.5mΩ

I_D = 90A

2 Features

- Fast switching
- High avalanche current
- Low on resistance
- Low gate charge
- Low reverse transfer capacitances
- 100% single pulse avalanche energy test
- 100% ΔV_{DS} test

TO-252B

3 Applications

- Power switching applications
- DC-DC converters
- UPS power supply

4 Electrical Characteristics

4.1 Absolute Maximum Ratings (Tc=25℃,unless otherwise noted)

Parameter		Symbol	Value	Units
Drain-Source Voltage		V_{DSS}	80	V
Gate-Source Voltage		V_{GSS}	±20	V
Drain Current(continuous)		I_D	90	A
Drain Current(continuous)(T=100℃)		I_D	63	A
Drain Current(Pulsed)(1)		I_{DM}	320	A
Avalanche Current(4)		I_{AS}	49	A
Single Pulse Avalanche Energy(4)		E_{AS}	600	mJ
Maximum Power Dissipation	T_a=25℃	P_D	2	W
	T_c=25℃	P_D	145	W
Operating Junction Temperature Range		T_J	-55～175	℃
Storage Temperature Range		T_{stg}	-55～175	℃
High Temperature(tin solder)		T_L	300	℃

4.2 Thermal Characteristics

Parameter	Symbol	Value	Unit
Thermal Resistance Junction-to-Case	$R_{\theta JC}$	1.03	℃/W
Thermal Resistance Junction-to-Ambient	$R_{\theta JA}$	75	℃/W

4.3 Electrical Characteristics (Tc=25℃,unless otherwise noted)

Parameter	Symbol	Test Condition	Value			Units
			Min	Typ	Max	
Off Characteristics						
Drain-source Breakdown Voltage	V_{DSS}	I_D=250μA,V_{GS}=0V	80	85	--	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=80V,V_{GS}=0V,T_C=25℃	--	--	1	μA
		V_{DS}=64V,V_{GS}=0V,T_C=125℃	--	--	100	μA
Gate-to-Body Leakage Current	I_{GSS}	V_{GS}=±20V,V_{DS}=0V	--	--	±100	nA
On Characteristics						
Gate threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS},I_D=250μA	2	3	4	V
Drain-Source on-state Resistance	$R_{DS(on)}$	V_{GS}=10V,I_D=40A	--	6.5	8	mΩ
Gate Resisitance	R_G	V_{DD}=0V,V_{GS}=0V,f=1MHz	--	1.2	--	Ω
Dynamic Characteristics						
Input Capacitance	C_{iss}	V_{GS}=0V,V_{DS}=30V,f=1MHz	--	5639	--	pF
Output Capacitance	C_{oss}		--	292	--	
Reverse Transfer Capacitance	C_{rss}		--	154	--	
Switching Characteristics						
Turn-on Delay Time	$t_{d(on)}$	I_D=40A, V_{DD}=40V, V_{GS}=10V, R_{GEN}=6Ω	--	37.8	--	nS
Turn-on Rise Time	t_r		--	115	--	
Turn-off Delay Time	$t_{d(off)}$		--	95	--	
Turn-off Fall Time	t_f		--	91	--	
Total Gate Charge	Q_g	I_D=40A, V_{DS}=40V, V_{GS}=10V	--	111	--	nC
Gate-to-Source Charge	Q_{gs}		--	36.4	--	
Gate-to-Drain(“Miller”) Charge	Q_{gd}		--	33	--	
Drain-Source Diode Characteristics						
Diode Forward Voltage[3]	V_{SD}	V_{GS}=0V,I_S=30A	--	--	1.3	V
Diode Forward Current	I_S		--	--	90	A
Reverse Recovery Time[3]	t_{rr}	T_J=25℃,I_F=50A, dI_F/dt=100A/μS,V_{GS}=0V	--	45	--	nS
Reverse Recovery Charge[3]	Q_{rr}		--	72	--	nC

Notes：

1: Repetitive rating, pulse width limited by maximum junction temperature.

2: Surface mounted on FR4 Board, t≤10sec.

3: Pulse width ≤ 300μs, duty cycle ≤ 2%.

4: L=0.5mH,I_D=49A,V_{DD}=64V,V_{GS}=10V,Start T_J=25℃.

5 Typical characteristics diagrams

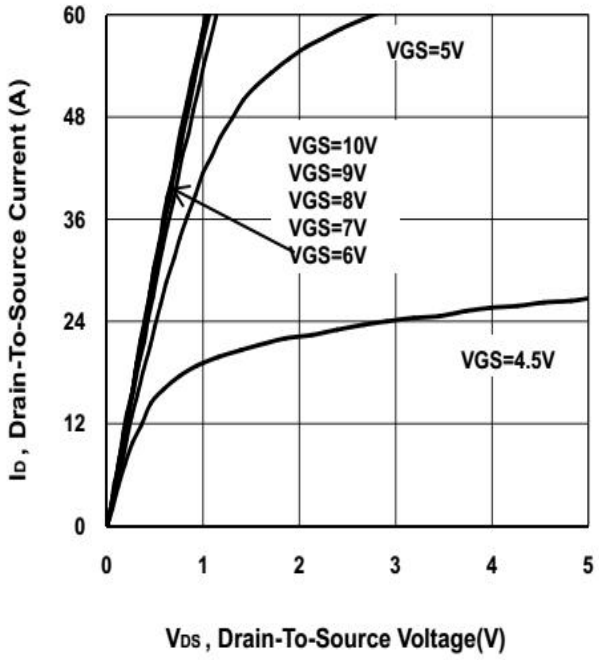


Fig 1. Output Characteristics

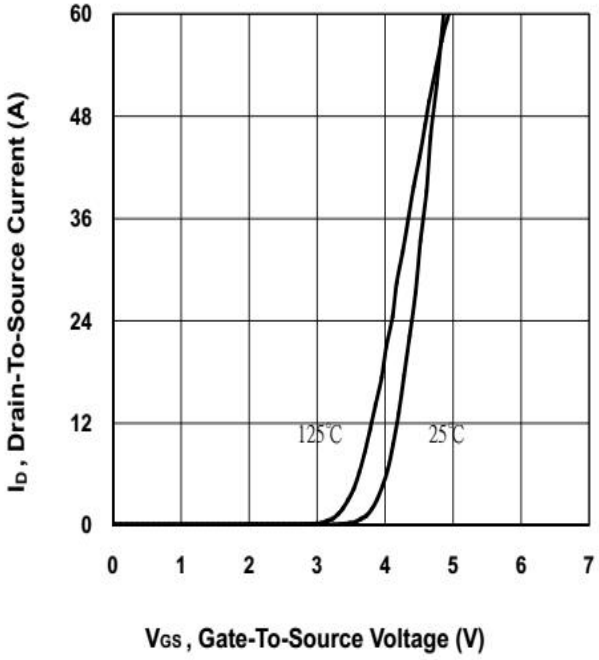


Fig 2. Transfer Characteristics

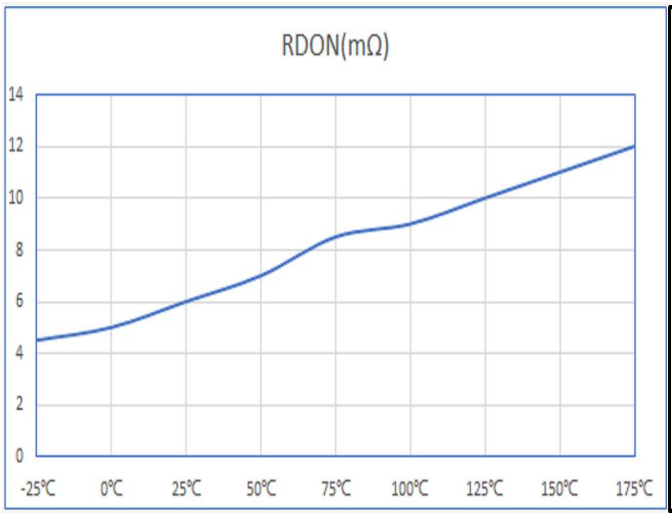


Fig 3. RDSON vs Junction Temperature

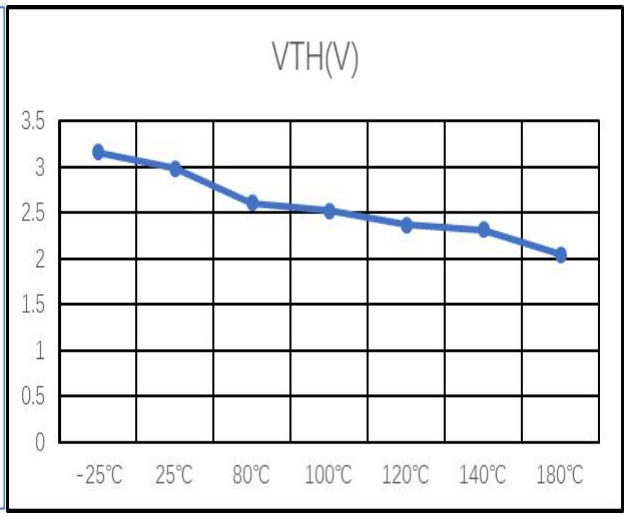


Fig 4. VTH vs Junction Temperature

5 Typical characteristics diagrams(continues)

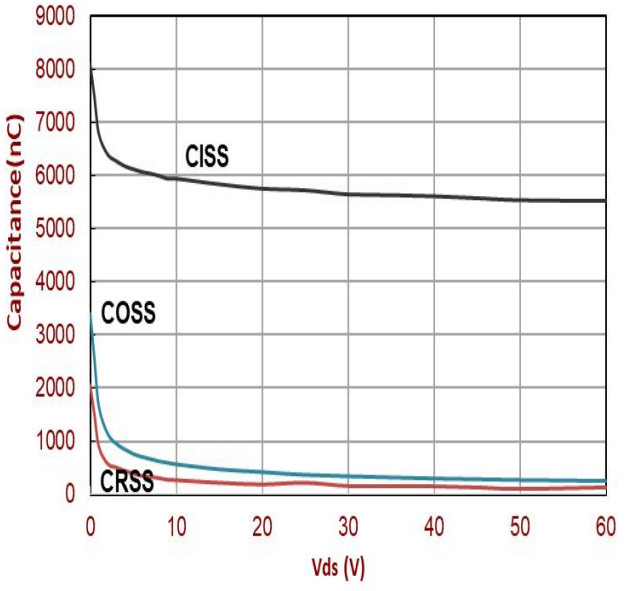


Fig 5. Capacitances vs Vds

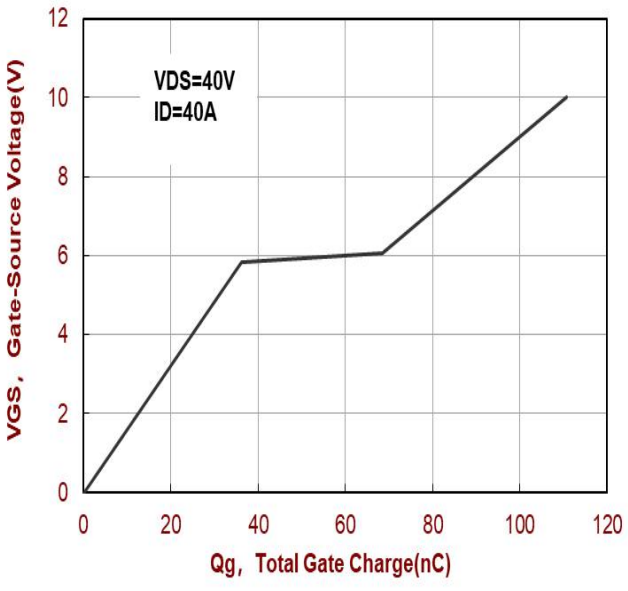


Fig 6. Gate Charge

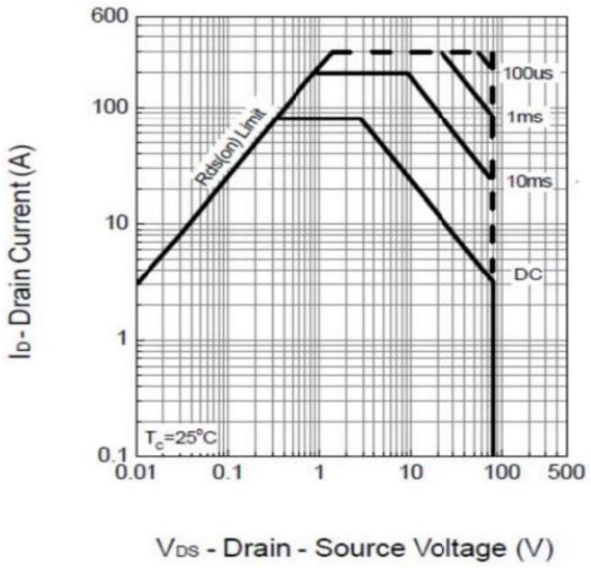


Fig 7. Safe Operation Area

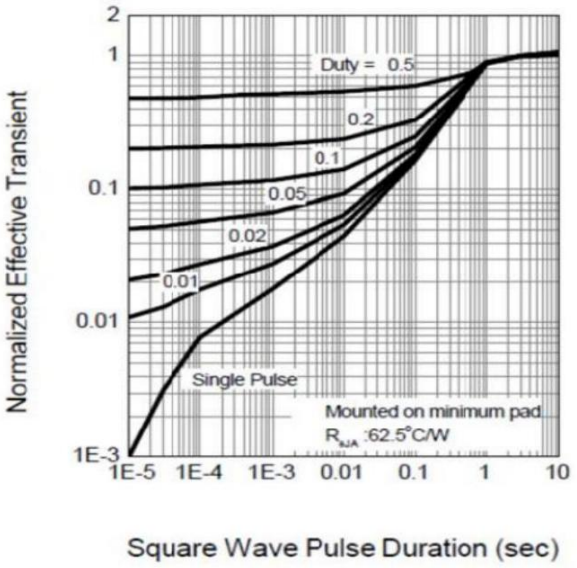
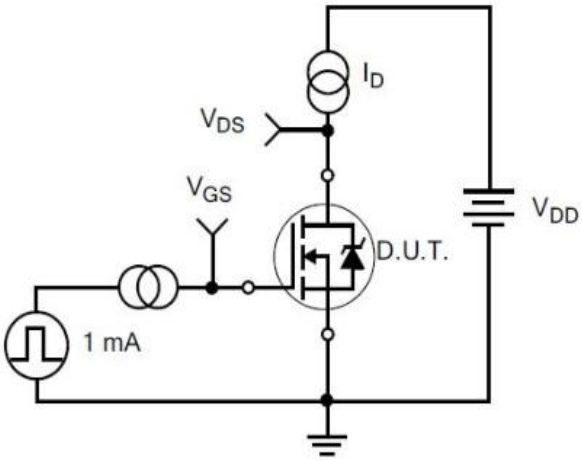
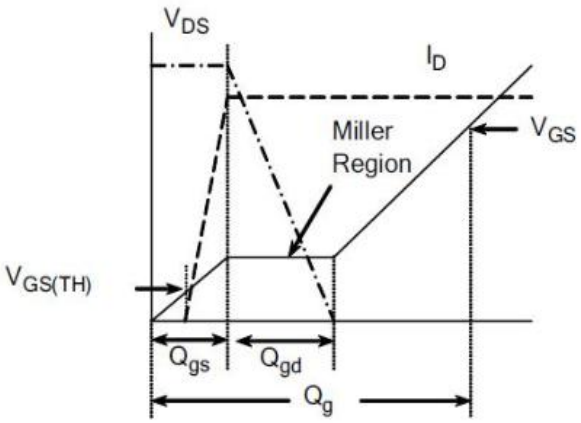


Fig 8. Thermal Transient Impedance

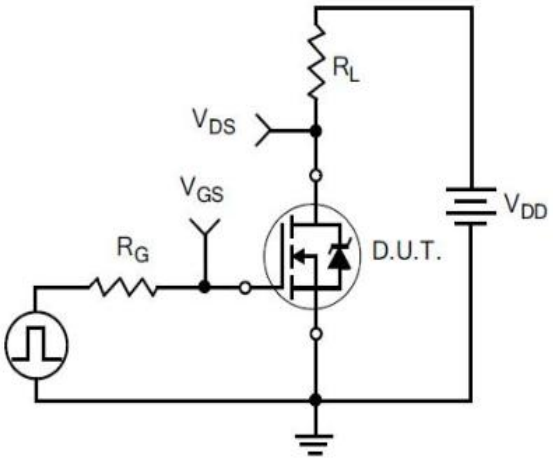
6 Typical Test Circuit and Waveform



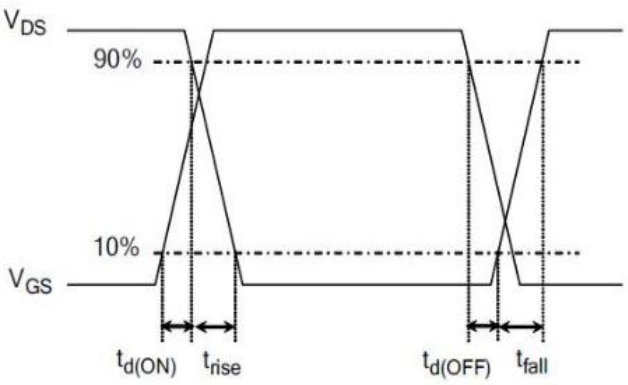
1) Gate Charge Test Circuit



2) . Gate Charge Waveform

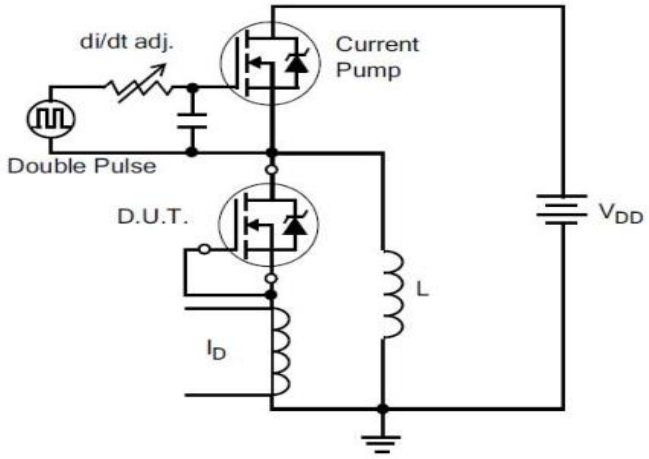


3) Resistive Switching Test Circuit

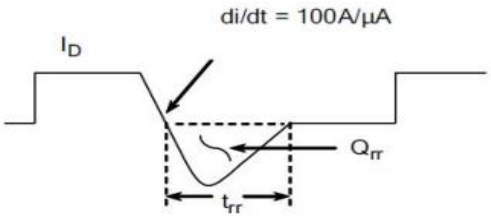


4) Resistive Switching Waveforms

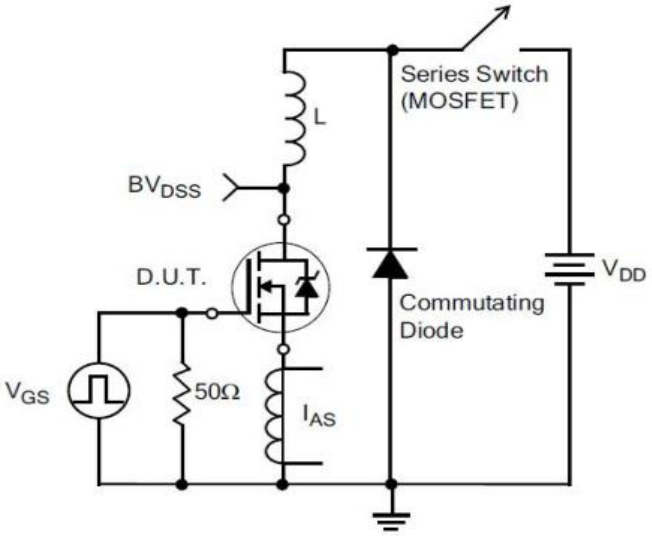
6 Typical Test Circuit and Waveform(continues)



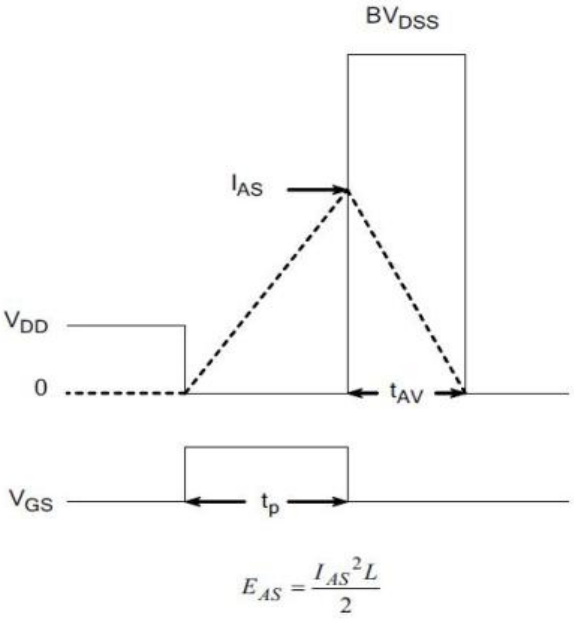
5) Diode Reverse Recovery Test Circuit



6) Diode Reverse Recovery Waveform

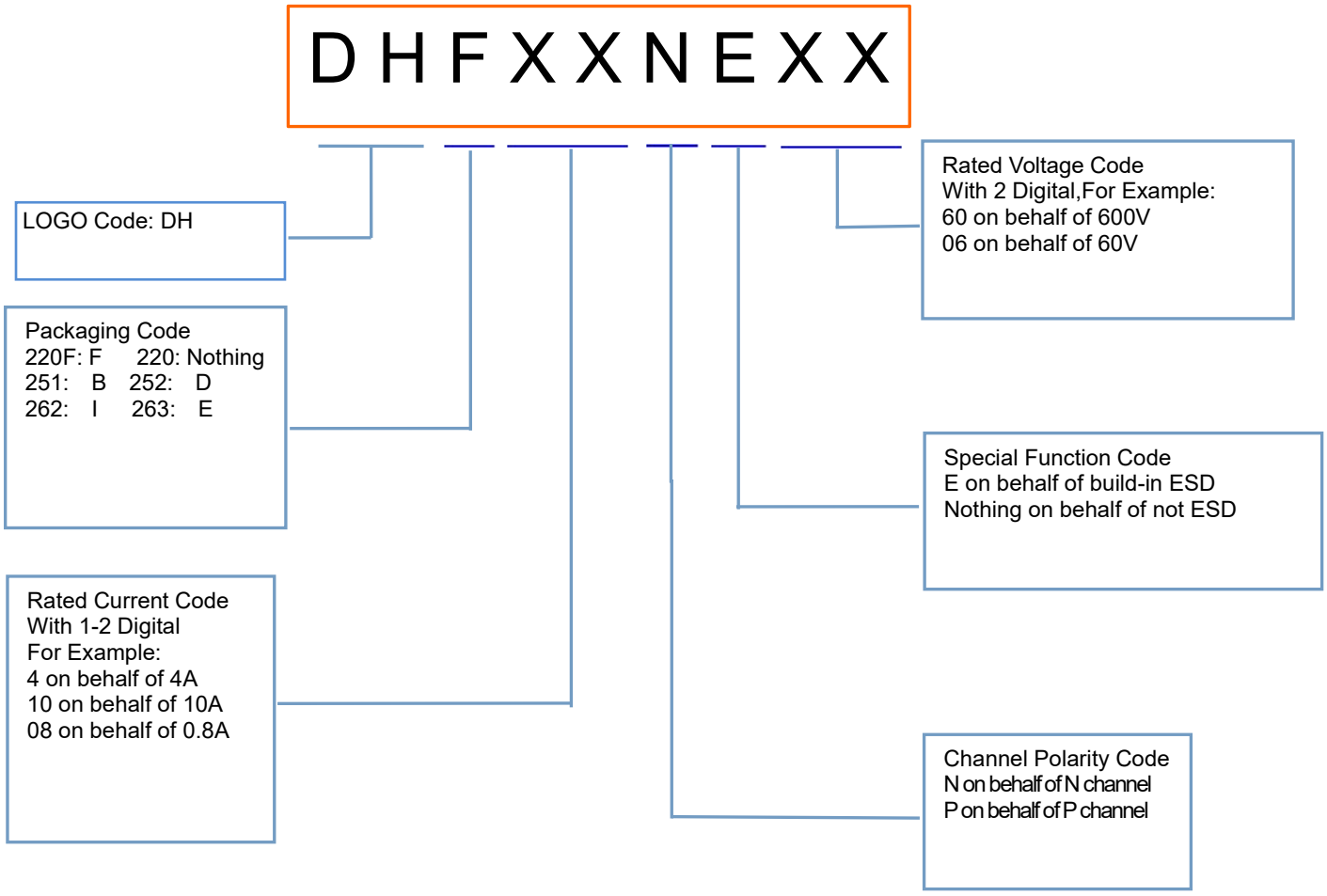


7) . Unclamped Inductive Switching Test Circuit



8) Unclamped Inductive Switching Waveforms

7 Product Names Rules

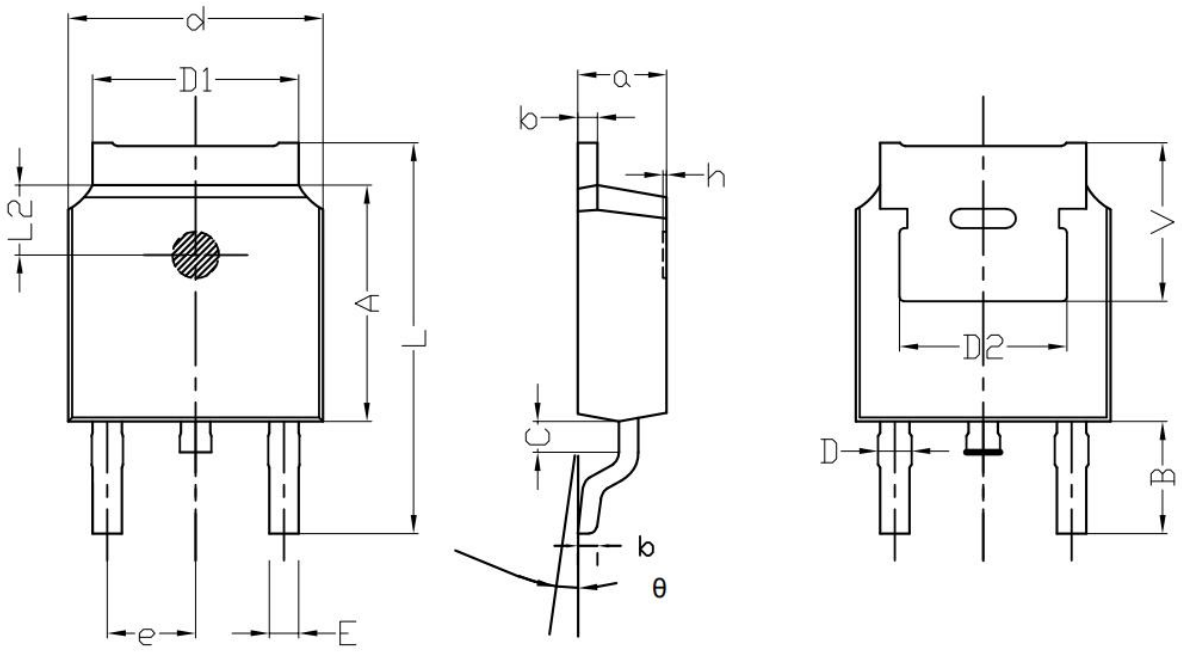


8 Product Specifications and Packaging Models

Product Model	Package Type	Mark Name	Indentification code	RoHS	Package	Quantity
DHD80N08	TO-252	DHD80N08	B22	Pb-free	Tape & Reel	2500/box

9 Dimensions

TO-252B PACKAGE OUTLINE DIMENSIONS



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	min.	max.	min.	max.
a	2.20	2.40	0.087	0.095
b	0.46	0.58	0.018	0.023
c	0.70	0.90	0.028	0.035
D	0.80	1.00	0.032	0.039
d	6.30	6.70	0.248	0.264
D1	5.00	5.50	0.197	0.217
D2	TYP 4.83		TYP 0.190	
A	5.80	6.20	0.228	0.244
e	2.19	2.39	0.086	0.094
L	9.40	10.40	0.370	0.409
B	2.6	3.2	0.102	0.126
L2	1.5	1.8	0.059	0.071
θ	0	8	0	8
h	0	0.3	0	0.012
V	5.25	5.85	0.207	0.230
E	0.6	0.8	0.024	0.032

10 Attentions

- Jiangsu Donghai Semiconductor Technology CO.,LTD. reserves the right to change the specification without prior notice! The customer should obtain the latest version of the information before making the order and verify that the information is complete and up to date.
- It is the responsibility of the purchaser for any failure or failure of any semiconductor product under certain conditions. It is the responsibility of the purchaser to comply with safety standards and to take safety measures in the system design and machine manufacturing of Donghai products in order to avoid potential risk of failure. Injury or property damage.
- Product promotion is endless, our company will be dedicated to provide customers with better products.

11 Appendix

Revision history:

Date	REV.	Description	Page
2020.04.09	1.0	Original	
2022.05.10	2.0	Full page	