

85A 150V N-channel Enhancement Mode Power MOSFET

1 Description

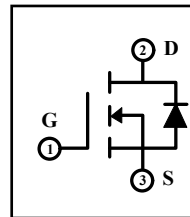
These N-channel enhancement mode power mosfets. used advanced trench process technology design, provided excellent $R_{DS(on)}$ and low gate charge. Which accords with the RoHS standard.

2 Features

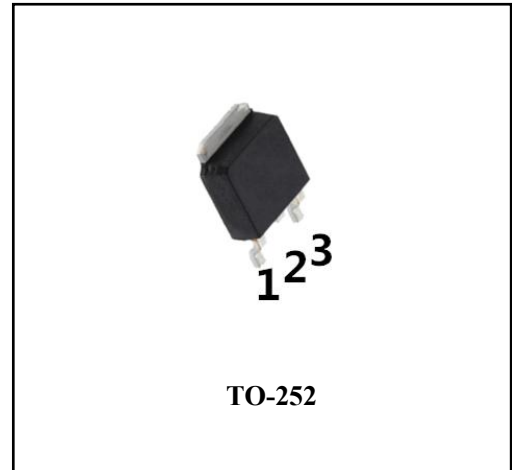
- Low on resistance
- Low gate charge
- High avalanche current
- Fast switching
- Low reverse transfer capacitances
- 100% single pulse avalanche energy test
- 100% ΔV_{DS} test

3 Applications

- Power switching applications
- Motor control and drive
- Battery management
- UPS(Uninterruptible Power Supplies)



$V_{DSS} = 150V$
$R_{DS(on)} (Type) = 13m\Omega$
$I_D = 85A$



4 Electrical Characteristics

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

Parameter	Symbol	Rating	Units	
Drain-Source Voltage	V_{DSS}	150	V	
Gate-Source Voltage	V_{GSS}	± 20	V	
Drain Current(continuous) ⁽³⁾	I_D	85	A	
Drain Current(continuous)(T=100°C) ⁽³⁾	I_D	60	A	
Drain Current(Pulsed) ⁽⁴⁾	I_{DM}	340	A	
Single Pulse Avalanche Energy ⁽⁵⁾	E_{AS}	420	mJ	
Avalanche Current ⁽⁵⁾	I_{AS}	41	A	
Maximum Power Dissipation	$T_a = 25^\circ C$	P_D	1.25	W
	$T_c = 25^\circ C$	P_D	120	W
Operating Junction Temperature Range	T_J	-55~150	°C	
Storage Temperature Range	T_{stg}	-55~150	°C	

4.2 Thermal Characteristics

Parameter	Symbol	Rating	Unit
Thermal Resistance Junction-to-Case	$R_{\theta JC}$	1.04	°C/W
Thermal Resistance Junction-to-Ambient	$R_{\theta JA}$	100	°C/W

4.3 Electrical Characteristics (T_c=25°C, 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	150	--	--	V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =150V, V _{GS} =0V, T _C =25°C	--	--	1	μA
		V _{DS} =120V, V _{GS} =0V, T _C =125°C	--	--	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	2.5	3.8	4.5	V
Drain-Source on-state Resistance	R _{DS(on)}	V _{GS} =10V, I _D =50A	--	13	16	mΩ
Gate Resisitance	R _G	V _{DD} =0V, V _{GS} =0V, f=1MHz	--	1.6	--	Ω
Dynamic Characteristics						
Input Capacitance	C _{iss}	V _{GS} =0V, V _{DS} =75V, f=1MHz	--	3980	--	pF
Output Capacitance	C _{oss}		--	800	--	
Reverse Transfer Capacitance	C _{rss}		--	20	--	
Switching Characteristics						
Turn-on Delay Time	t _{d(on)}	I _D =20A, V _{DS} =75V, V _{GS} =10V, R _{GEN} =3.0Ω	--	21	--	nS
Turn-on Rise Time	t _r		--	23	--	
Turn-off Delay Time	t _{d(off)}		--	36	--	
Turn-off Fall Time	t _f		--	29	--	
Total Gate Charge	Q _g	I _D =20A, V _{DS} =75V, V _{GS} =10V	--	54	--	nC
Gate-to-Source Charge	Q _{gs}		--	22	--	
Gate-to-Drain("Miller") Charge	Q _{gd}		--	5.2	--	
Drain-Source Diode Characteristics						
Diode Forward Voltage ⁽³⁾	V _{SD}	V _{GS} =0V, I _S =30A	--	0.9	1.3	V
Diode Forward Current	I _S		--	--	85	A
Reverse Recovery Time ⁽³⁾	t _{rr}	T _J =25°C, I _F =20A, dI _F /dt=100A/μS, V _{GS} =0V	--	320	--	nS
Reverse Recovery Charge ⁽³⁾	Q _{rr}		--	101	--	nC

Notes:

- 1: Repetitive rating, pulse width limited by maximum junction temperature.
- 2: Surface mounted on FR4 Board, t_s≤10sec.
- 3: Pulse width ≤ 300μs, duty cycle ≤ 2%.
- 4: L=0.5mH, I_D=41A, V_{DD}=80V, V_{GS}=10V, V_{GATE}=150V, Start T_J=25°C.

5 Typical characteristics diagrams

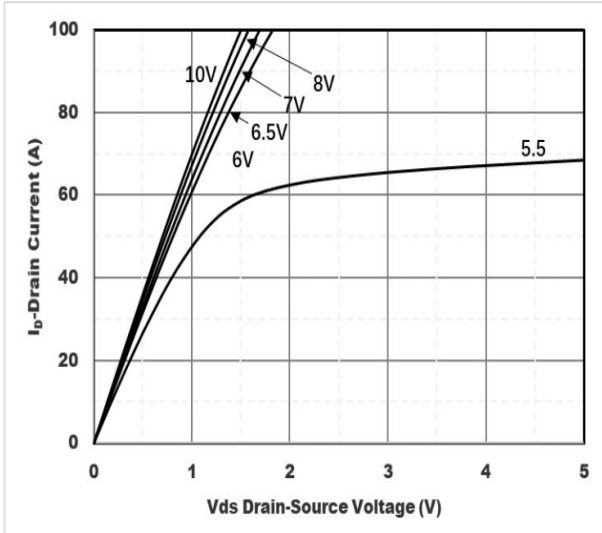


Figure1. Output Characteristics

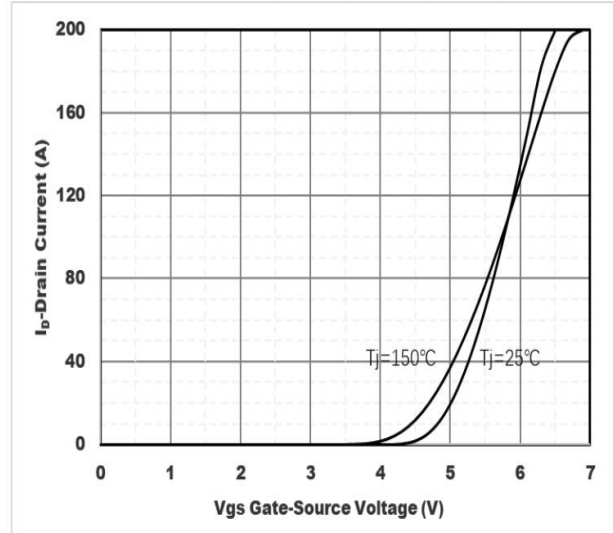


Figure2. Transfer Characteristics

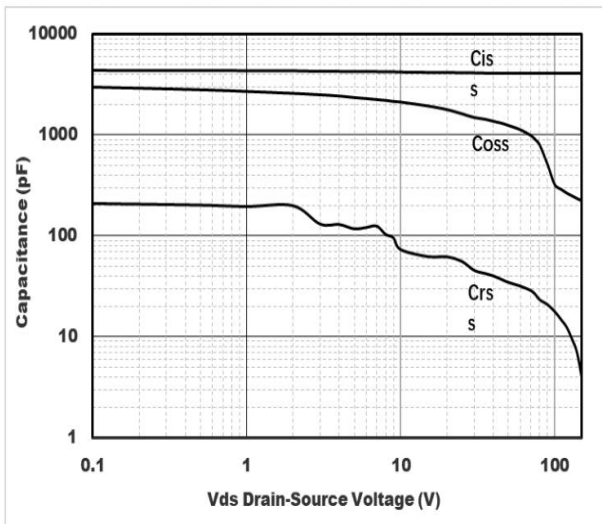


Figure3. Capacitance Characteristics

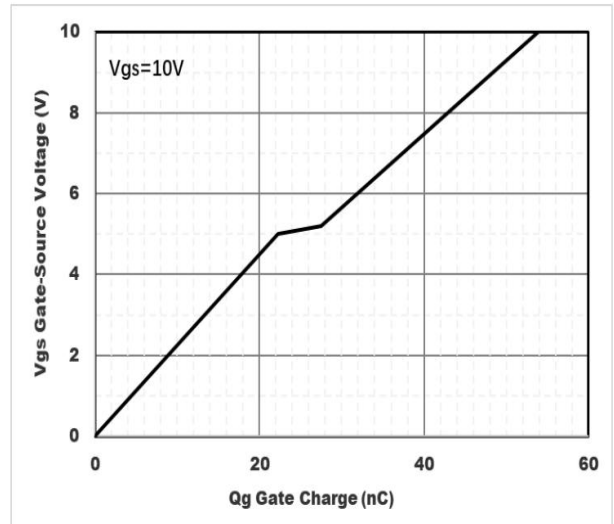


Figure4. Gate Charge

5 Typical characteristics diagrams(continues)

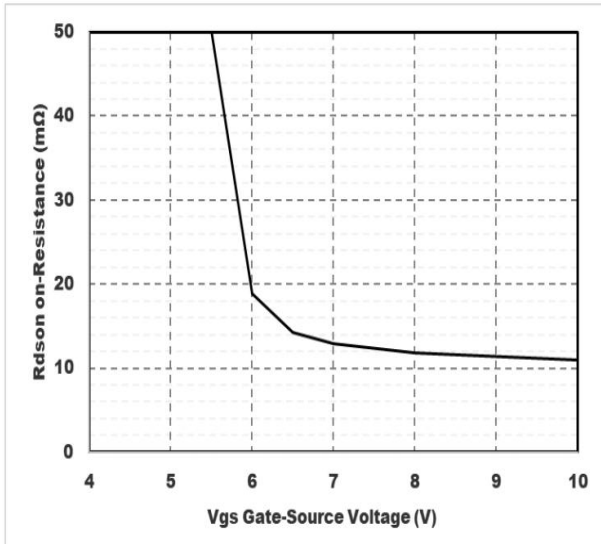


Figure5. : On-Resistance vs. Gate to Source Voltage

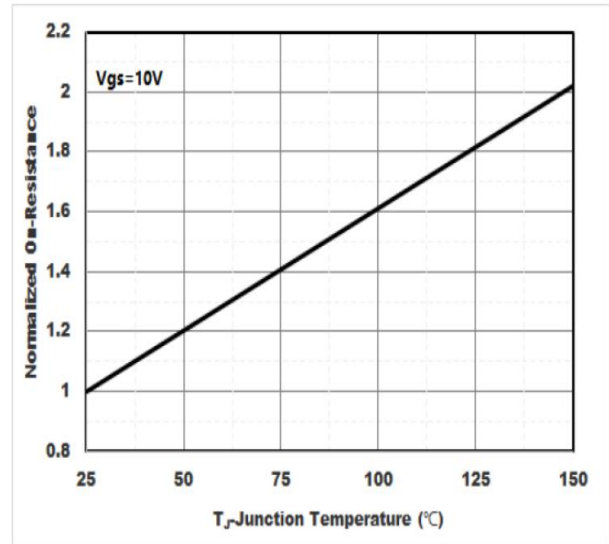
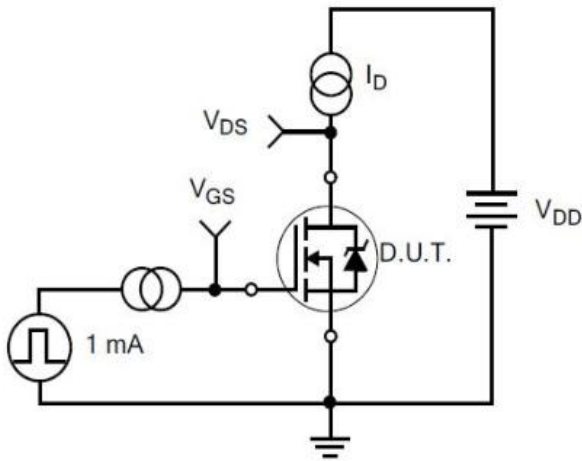
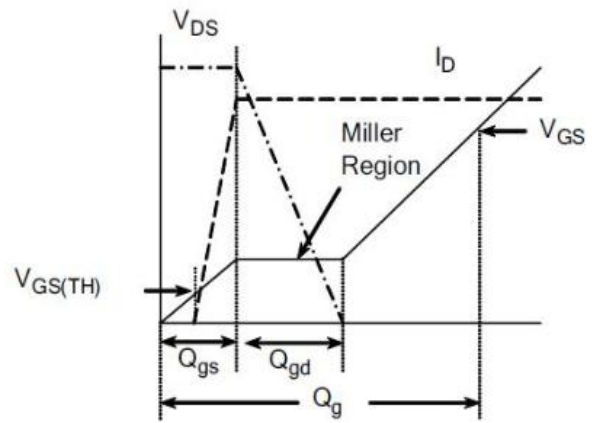


Figure6. Normalized On-Resistance

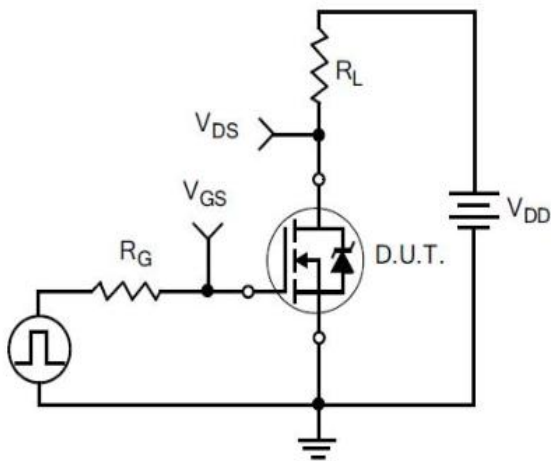
6 Typical Test Circuit and Waveform



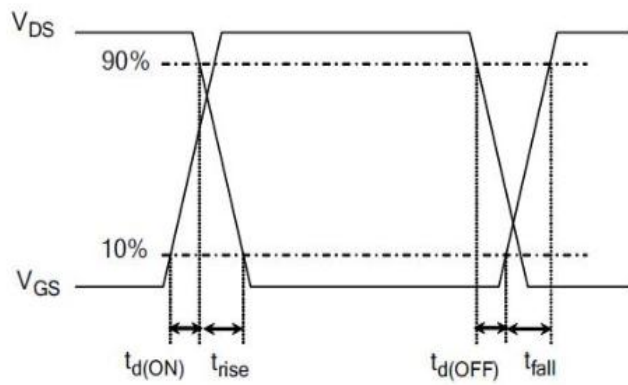
1) Gate Charge Test Circuit



2) . Gate Charge Waveform

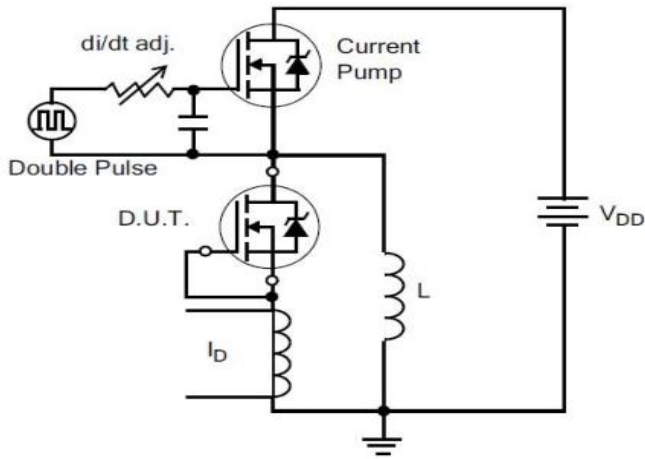


3) Resistive Switching Test Circuit

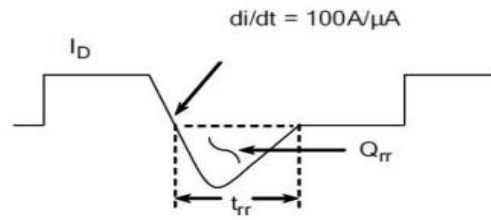


4) Resistive Switching Waveforms

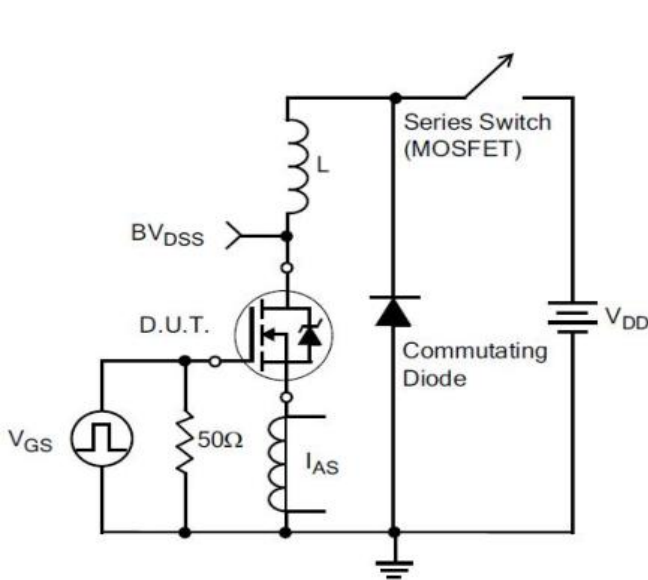
6 Typical Test Circuit and Waveform(continues)



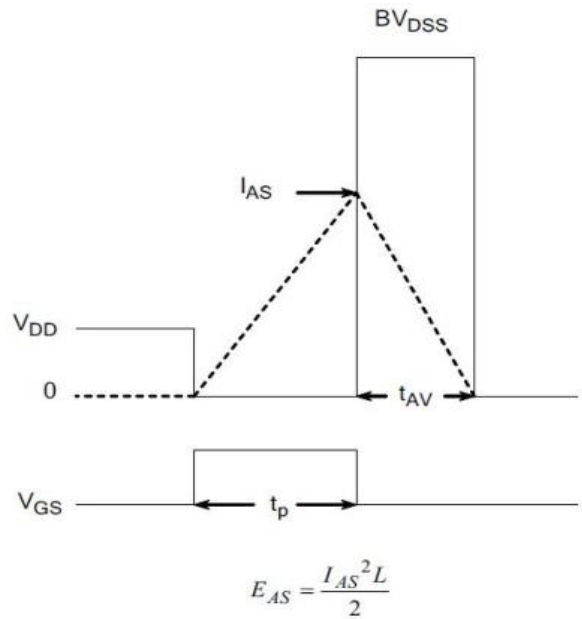
5) Diode Reverse Recovery Test Circuit



6) Diode Reverse Recovery Waveform

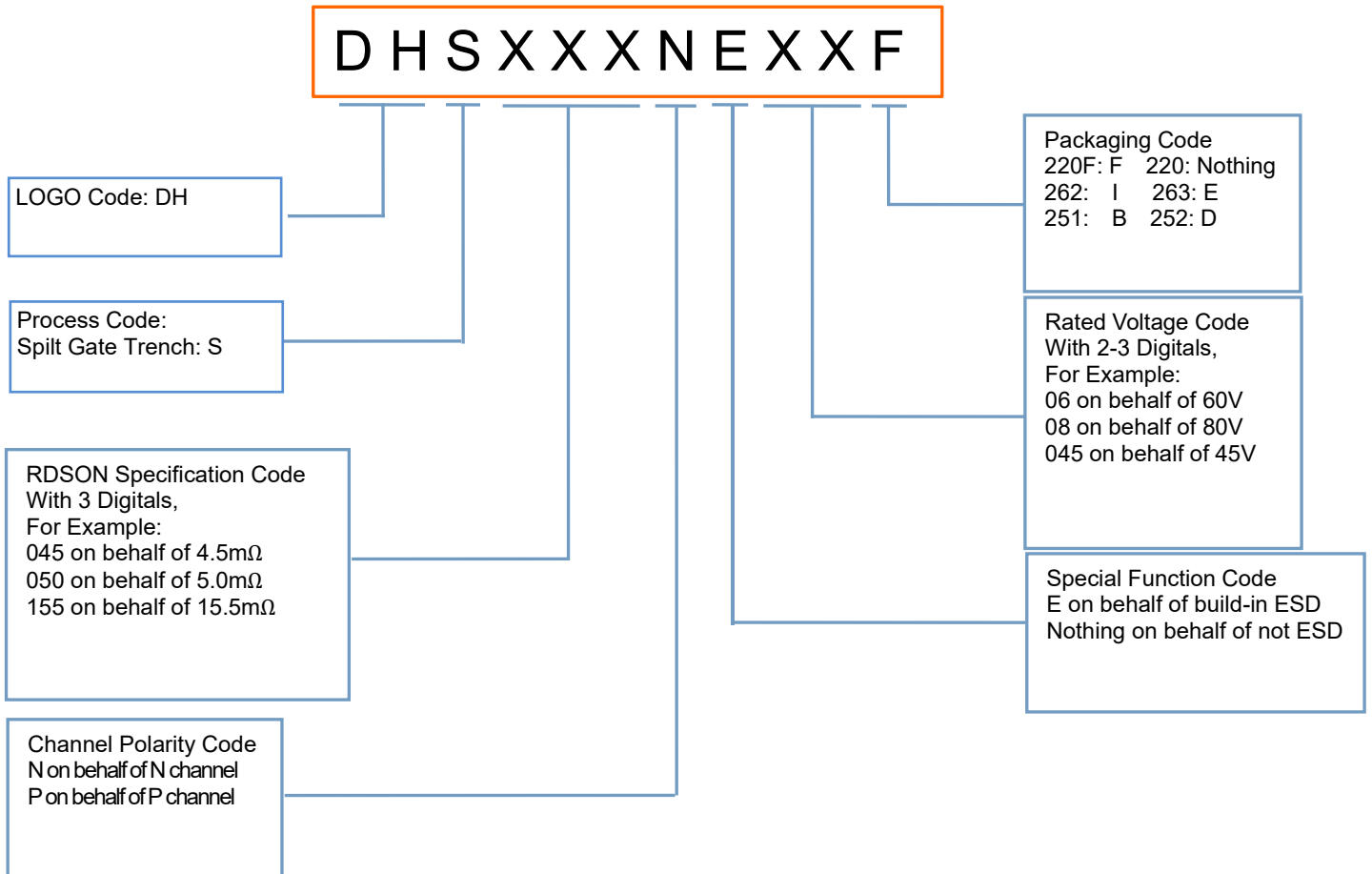


7) . Unclamped Inductive Switching Test Circuit



8) Unclamped Inductive Switching Waveforms

7 Product Names Rules

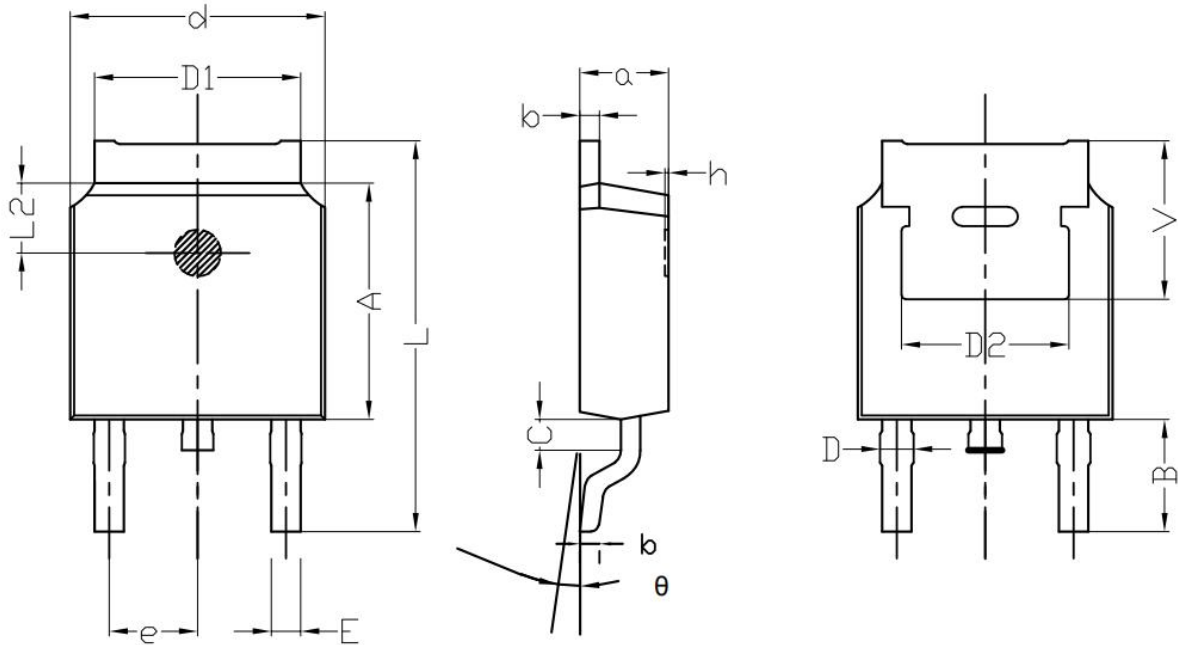


8 Product Specifications and Packaging Models

Product Model	Package Type	Mark Name	RoHS	Package	Quantity
DHS110N15D	TO-252	DHS110N15D	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
2022.07.19	1.0	Original	