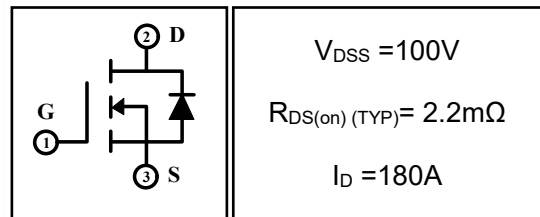


## 180A 100V N-channel Enhancement Mode Power MOSFET

### 1 Description

This N-channel enhancement mode power MOSFET utilizes advanced Split Gate Trench technology, which provides excellent  $R_{DS(on)}$  and low Gate charge at the same time. Which accords with the RoHS standard.

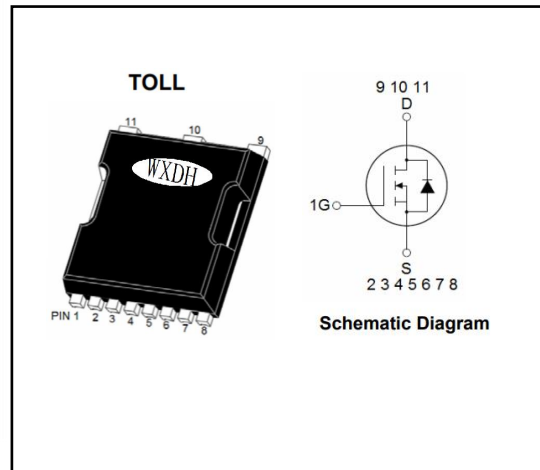


### 2 Features

- Low on resistance
- Low gate charge
- Fast switching
- Low reverse transfer capacitances
- 100% single pulse avalanche energy test
- 100%  $\Delta V_{DS}$  test

### 3 Applications

- Power switching applications
- Power management for inverter systems
- Battery management



### 4 Electrical Characteristics

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

Parameter	Symbol	Rating	Units
Drain-to-Source Voltage	$V_{DSS}$	100	V
Gate-to-Source Voltage	$V_{GSS}$	$\pm 20$	V
Continuous Drain Current	$I_D$	$T_C = 25^\circ C$	180
		$T_C = 100^\circ C$	115
Pulsed Drain Current <sup>(1)</sup>	$I_{DM}$	720	A
Single Pulse Avalanche Energy <sup>(4)</sup>	$E_{AS}$	1720	mJ
Avalanche Current <sup>(4)</sup>	$I_{AS}$	83	A
Power Dissipation	$P_{tot}$	$T_a = 25^\circ C$	2
		$T_C = 25^\circ C$	152
Junction Temperature Range	$T_j$	-55 ~ 150	$^\circ C$
Storage Temperature Range	$T_{stg}$	-55 ~ 150	$^\circ C$

#### 4.2 Thermal Characteristics

Parameter	Symbol	Value			Units
		Min	Typ	Max	
Thermal Resistance, Junction to Case-sink	$R_{thJC}$	--	--	0.82	$^\circ C/W$
Thermal Resistance, Junction to Ambient	$R_{thJA}$	--	--	62	$^\circ C/W$

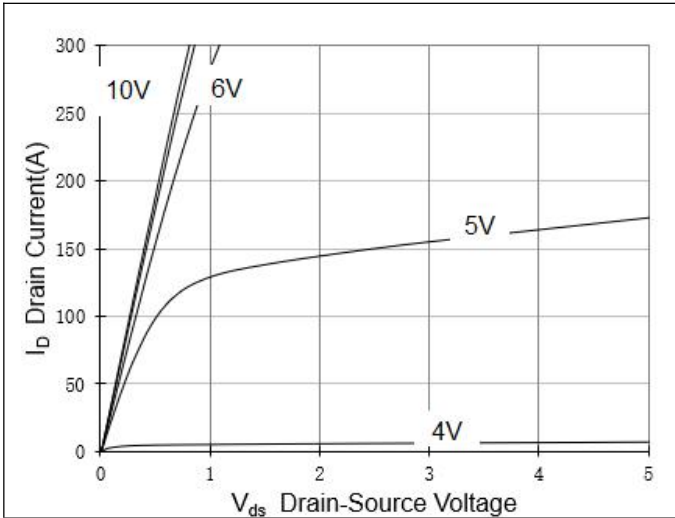
**4.3 Electrical Characteristics** (T<sub>c</sub>=25°C, unless otherwise noted)

Parameter	Symbol	Test Condition	Value			Units
			Min	Typ	Max	
<b>Off Characteristics</b>						
Drain-to-Source Breakdown Voltage	BV <sub>DSS</sub>	I <sub>D</sub> =250μA, V <sub>GS</sub> =0V, T <sub>C</sub> =25°C	100	--	--	V
Drain-to-Source Leakage Current	I <sub>DSS</sub>	V <sub>DS</sub> =100V, V <sub>GS</sub> =0V, T <sub>C</sub> =25°C	--	--	1	μA
		V <sub>DS</sub> =100V, V <sub>GS</sub> =0V, T <sub>C</sub> =125°C	--	--	100	μA
Gate-to-Source Leakage Current	I <sub>GSS</sub>	V <sub>GS</sub> =±20V, V <sub>DS</sub> =0V	--	--	±100	nA
<b>On Characteristics</b>						
Gate Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250μA	2	3	4	V
Drain-to-Source on-state Resistance	R <sub>DS(on)</sub>	V <sub>GS</sub> =10V, I <sub>D</sub> =80A	--	2.2	2.55	mΩ
<b>Dynamic Characteristics</b>						
Input Capacitance	C <sub>iss</sub>	V <sub>GS</sub> =0V, V <sub>DS</sub> =50V, f=1.0MHz	--	12711	--	pF
Output Capacitance	C <sub>oss</sub>		--	1245	--	
Reverse Transfer Capacitance	C <sub>rss</sub>		--	25	--	
Gate Resisitance	R <sub>G</sub>	V <sub>DD</sub> =0V, V <sub>GS</sub> =0V, F=1MHz	--	3.1	--	Ω
<b>Switching Characteristics</b>						
Turn-on Delay Time	t <sub>d(on)</sub>	I <sub>D</sub> =100A, V <sub>DD</sub> =50V, V <sub>GS</sub> =10V, R <sub>GEN</sub> =2.5Ω	--	39.5	--	nS
Turn-on Rise Time	t <sub>r</sub>		--	123	--	
Turn-off Delay Time	t <sub>d(off)</sub>		--	104.8	--	
Turn-off Fall Time	t <sub>f</sub>		--	109.8	--	
Total Gate Charge	Q <sub>g</sub>	I <sub>D</sub> =100A, V <sub>DD</sub> =50V, V <sub>GS</sub> =10V	--	142	--	nC
Gate-to-Source Charge	Q <sub>gs</sub>		--	69	--	
Gate-to-Drain("Miller") Charge	Q <sub>gd</sub>		--	19	--	
<b>Drain-Source Diode Characteristics</b>						
Diode Forward Voltage <sup>(3)</sup>	V <sub>SD</sub>	V <sub>GS</sub> =0V, I <sub>S</sub> =60A	--	--	1.2	V
Diode Forward Current	I <sub>S</sub>		--	--	180	A
Reverse Recovery Time <sup>(3)</sup>	t <sub>rr</sub>	T <sub>J</sub> =25°C, I <sub>F</sub> =100A dI <sub>F</sub> /dt=100A/μS, V <sub>GS</sub> =0V	--	78.8	--	nS
Reverse Recovery Charge <sup>(3)</sup>	Q <sub>rr</sub>		--	143.7	--	nC

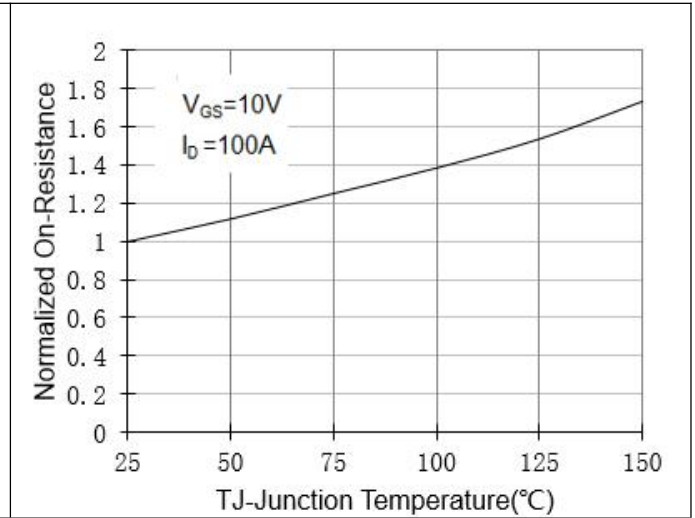
**Notes:**

- 1: Repetitive rating, pulse width limited by maximum junction temperature.
- 2: Surface mounted on FR4 Board, t<sub>s</sub>≤10sec.
- 3: Pulse width ≤ 300μs, duty cycle ≤ 2%.
- 4: L=0.5mH, I<sub>D</sub>=83A, V<sub>DD</sub>=80V, R=25Ω, V<sub>GATE</sub>=100V, Start T<sub>J</sub>=25°C.

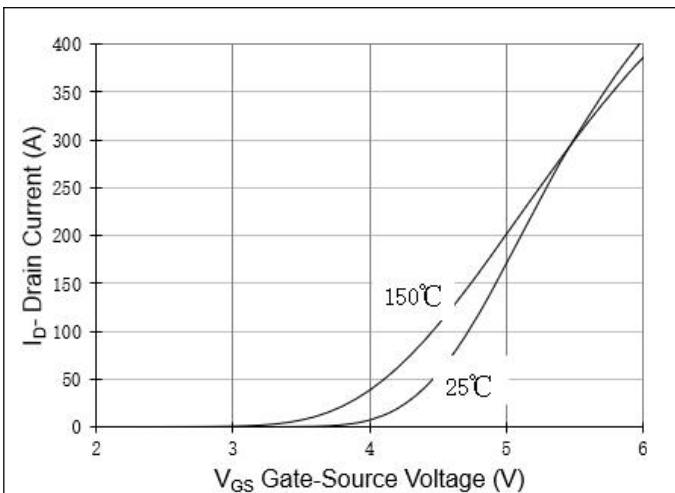
**5 Typical characteristics diagrams**



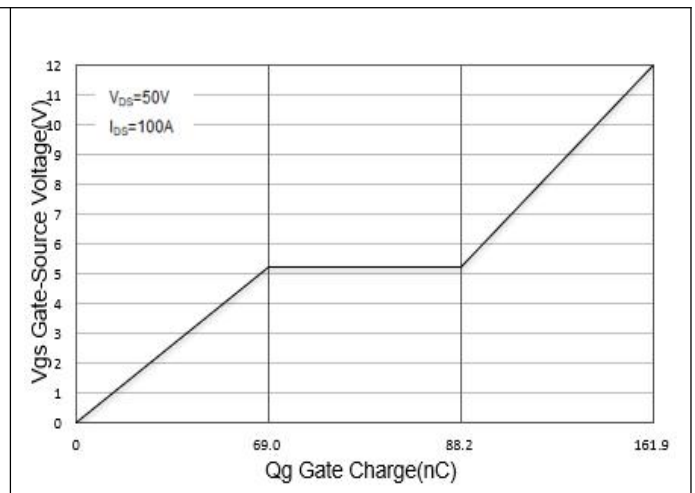
**Figure 1 Output Characteristics**



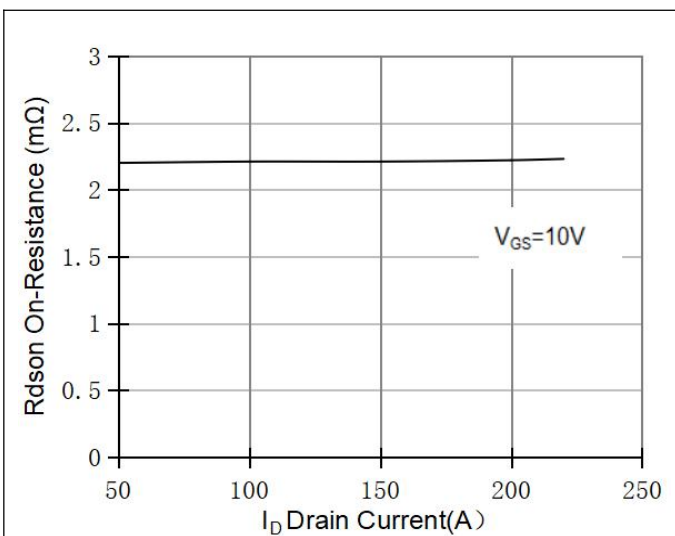
**Figure 2 Rdson-Junction Temperature**



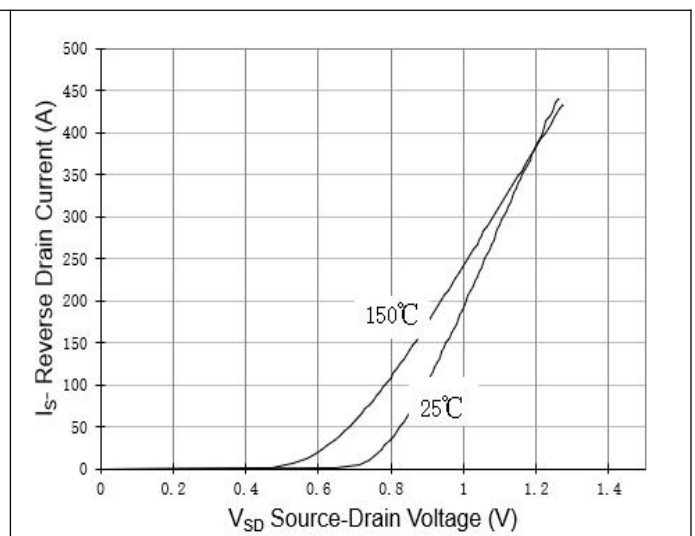
**Figure 3 Transfer Characteristics**



**Figure 4 Gate Charge**

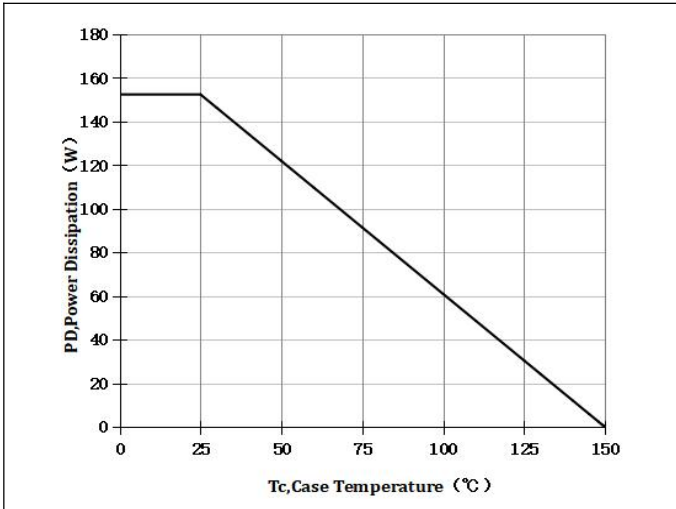


**Figure 5 Rdson-Drain Current**

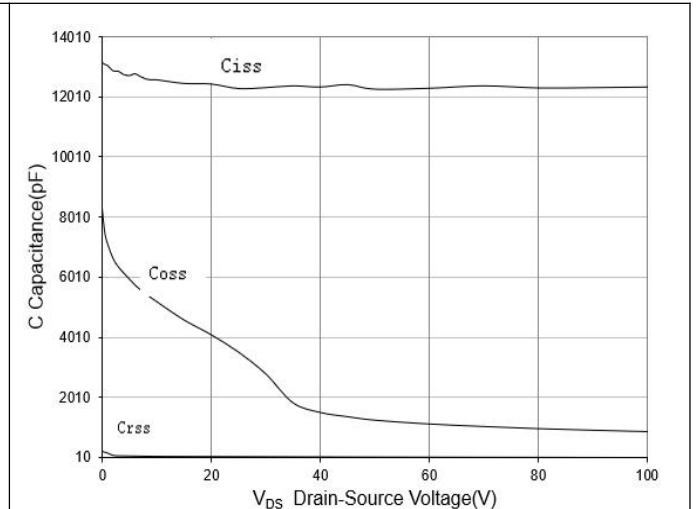


**Figure 6 Source-Drain Diode Forward**

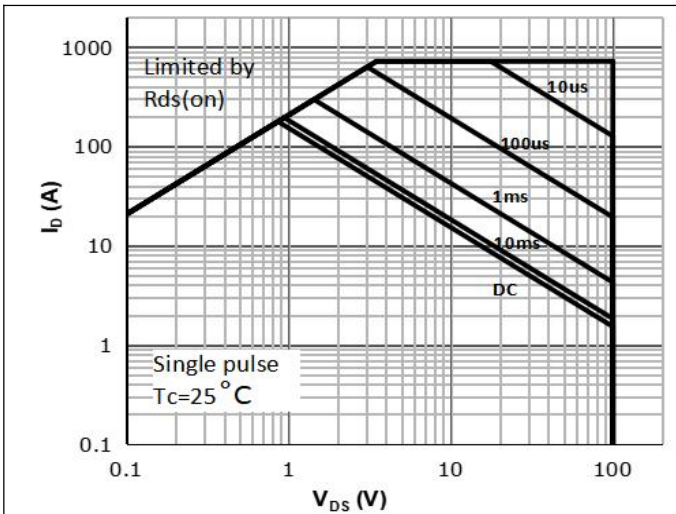
**5 Typical characteristics diagrams(continues)**



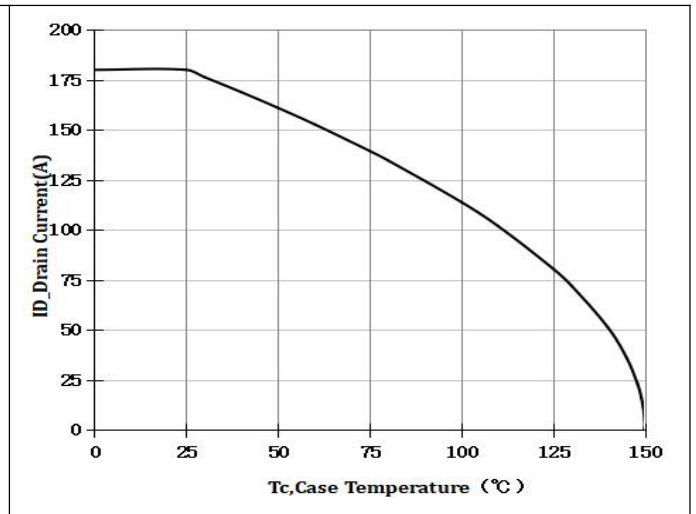
**Figure 7 Power De-rating**



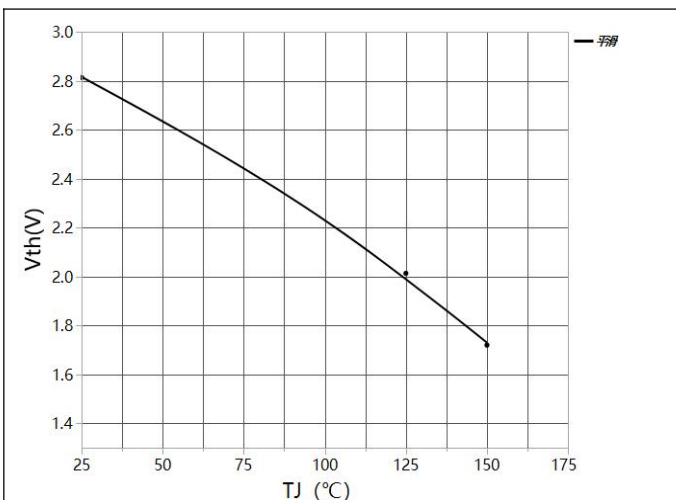
**Figure 8 Capacitance vs Vds**



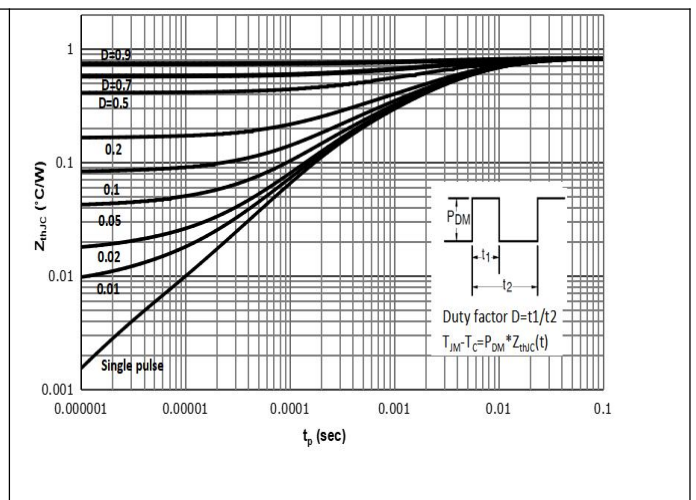
**Figure 9 Safe Operation Area**



**Figure 10 Current De-rating**

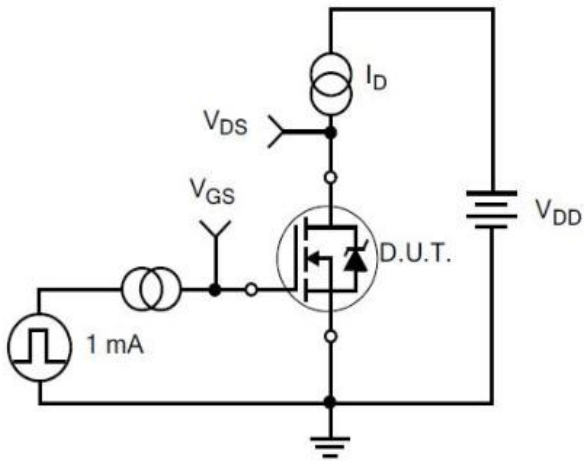


**Figure 11 gate threshold voltage**

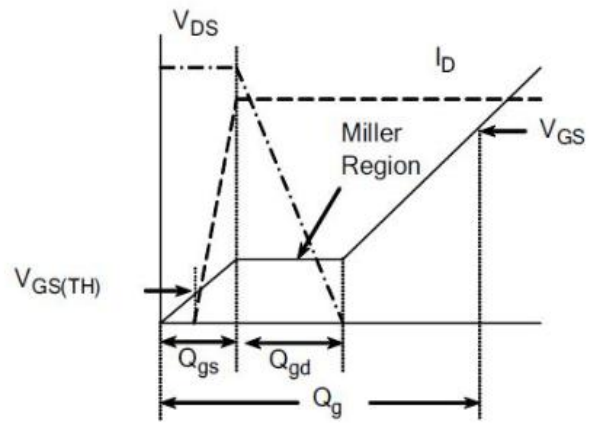


**Figure 12 Normalized Maximum Transient Thermal Impedance**

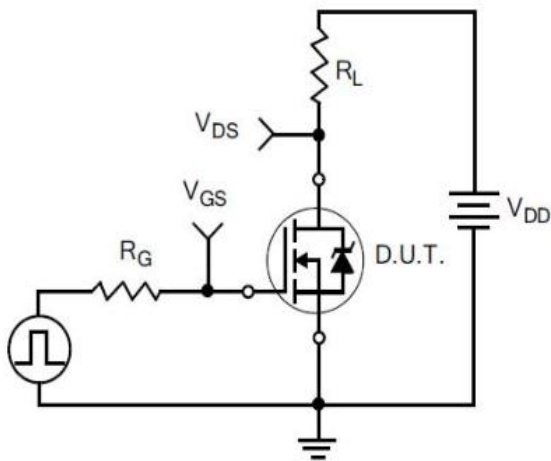
**6 Typical Test Circuit and Waveform**



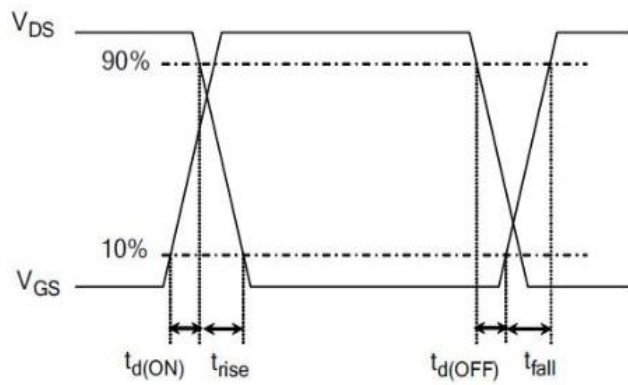
1) Gate Charge Test Circuit



2) . Gate Charge Waveform

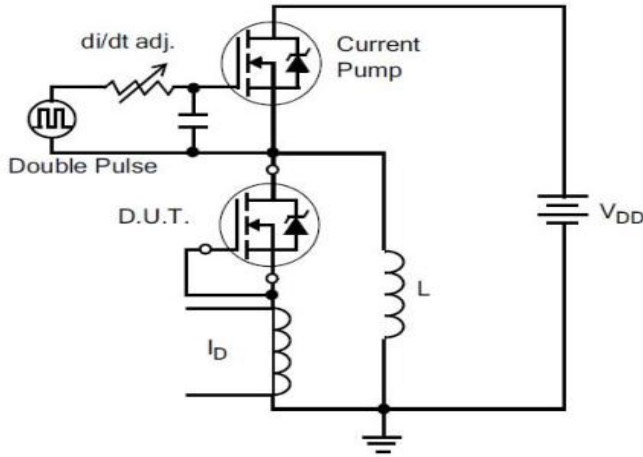


3) Resistive Switching Test Circuit

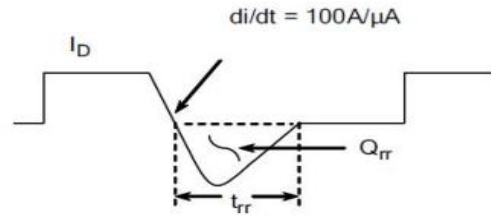


4) Resistive Switching Waveforms

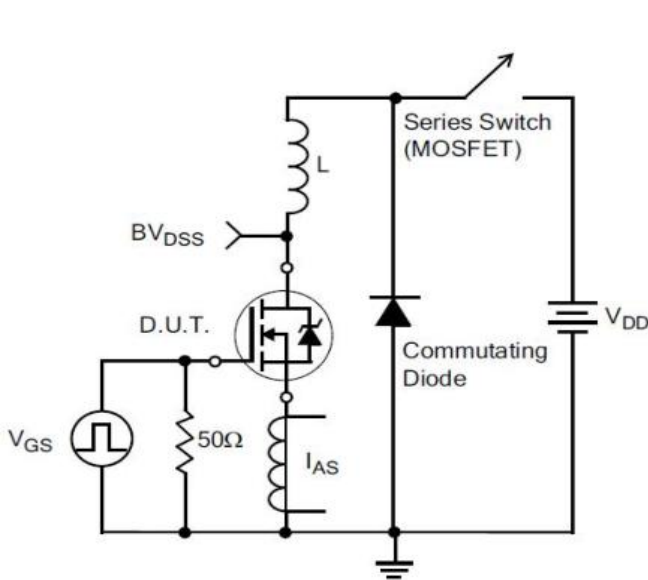
**6 Typical Test Circuit and Waveform(continues)**



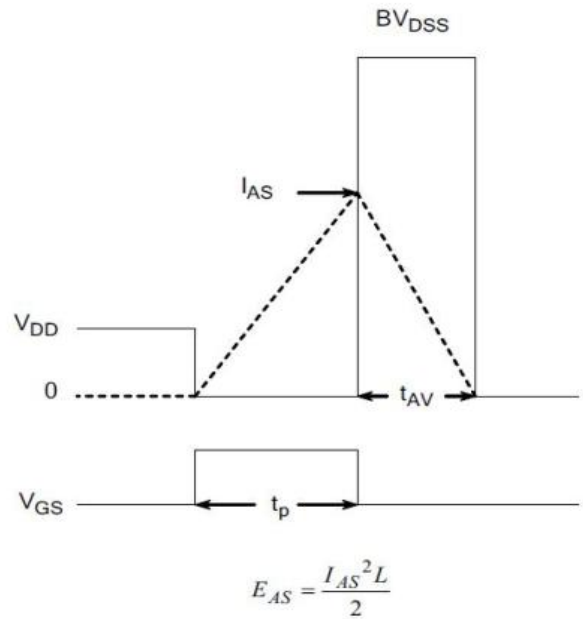
5) Diode Reverse Recovery Test Circuit



6) Diode Reverse Recovery Waveform

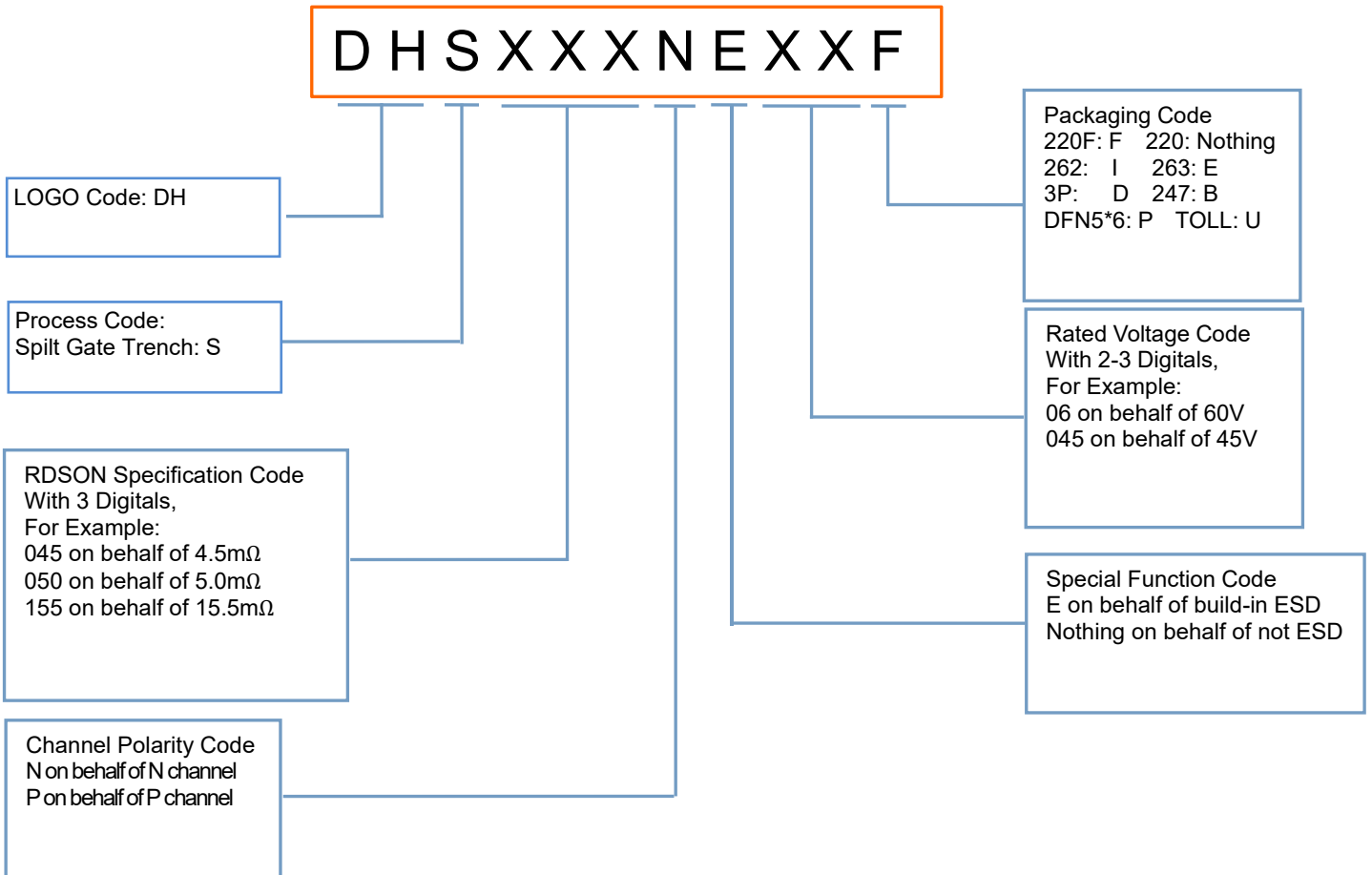


7) . Unclamped Inductive Switching Test Circuit



8) Unclamped Inductive Switching Waveforms

## 7 Product Names Rules

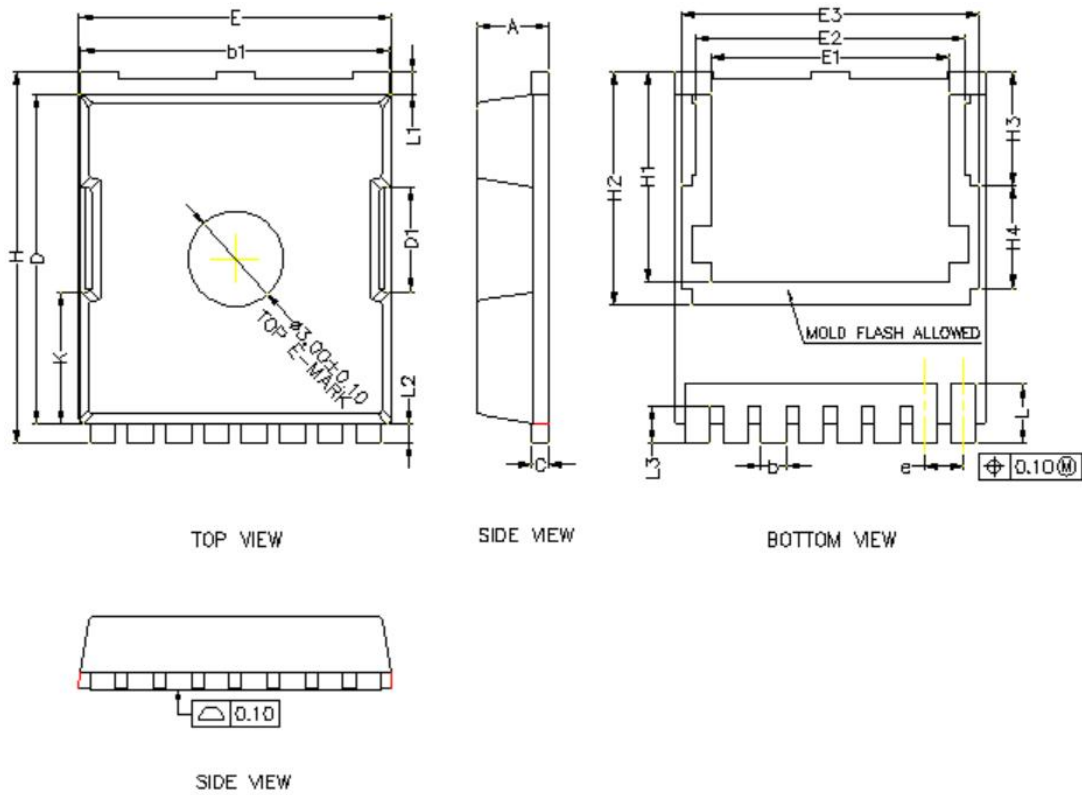


## 8 Product Specifications and Packaging Models

Product Model	Package Type	Mark Name	RoHS	Package	Quantity
DHS025N10U	TOLL	DHS025N10U	Pb-free	Tape & Reel	1800/box

## 9 Dimensions

TOLL:



TOP VIEW

SIDE VIEW

BOTTOM VIEW

SIDE VIEW

COMMON DIMENSIONS  
(UNITS OF MEASURE=MILLIMETER)

SYMBOL	MIN	NOM	MAX
A	2.20	2.30	2.40
b	0.70	0.80	0.90
b1	9.70	9.80	9.90
c	0.40	0.50	0.60
D	10.28	10.43	10.58
D1	3.15	3.30	3.45
E	9.70	9.90	10.10
E1	7.35	7.50	7.65
E2	8.35	8.50	8.65
E3	9.31	9.46	9.61
e	1.10	1.20	1.30
H	11.48	11.73	11.88
H1	6.55	6.65	6.75
H2	7.20	7.35	7.50
H3	3.44	3.59	3.74
H4	3.11	3.26	3.41
K	4.03	4.18	4.33
L	1.60	1.85	2.10
L1	0.55	0.70	0.85
L2	0.45	0.60	0.75
L3	1.00	1.15	1.30



## 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
2021.11.25	1.0	Original	9
2022.03.23	1.0	Modification	9