

TOLL Plastic-Encapsulate MOSFETS

Features

- $V_{DS}=40V$
- $I_D=370A$
- $R_{DS(on)}@V_{GS}=10V < 1.2m\Omega$
- Avalanche energy tested
- Fast Switching Speedze
- Improved dv/dt capability, high ruggedness

Drain-source Voltage

40 V

Drain Current

370 Ampere

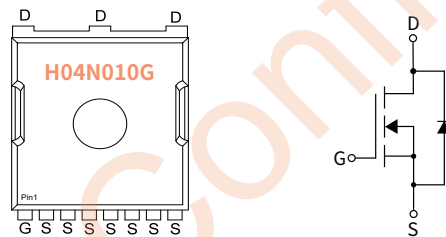
Applications

- PWM Application
- Hard switched and high frequency circuits
- Power management

Mechanical Data

- Case: TOLL
Molding compound meets UL 94V-0 flammability rating, RoHS-compliant,halogen-free
- Terminals: Solder plated, solderable per MIL-STD-750,Method 2026

Function Diagram



Ordering Information

PACKAGE	PACKAGE CODE	UNIT WEIGHT(g)	REEL(pcs)	BOX(pcs)	CARTON(pcs)	DELIVERY MODE
TOLL	R3	0.753	2000	4000	28000	13"

Maximum Ratings (Ta=25°C Unless otherwise specified)

PARAMETER	SYMBOL	UNIT	VALUE
Drain-source Voltage	V_{DS}	V	40
Gate-source Voltage	V_{GS}	V	± 20
Drain Current	I_D	A	370
Pulsed Drain Current ⁽¹⁾	I_{DM}	A	1480
Total Power Dissipation	P_D	W	297
Single pulse avalanche energy ⁽²⁾	EAS	mJ	1681
Junction temperature	T_J	°C	-55 ~+150
Storage temperature	T_{stg}	°C	-55 ~+150
Thermal Resistance Junction-to-Case	$R_{\theta JC}$	°C / W	0.42

● Static Parameter Characteristics (T_j=25°C Unless otherwise specified)

PARAMETER	SYMBOL	Condition	UNIT	Min	Typ	Max
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} = 0V, I _D =250μA	V	40	—	—
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =40V, V _{GS} =0V	μA	—	—	1.0
Gate-Body Leakage Current	I _{GSS}	V _{GS} = ±20V, V _{DS} =0V	nA	—	—	±100
Gate Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D =250μA	V	2	2.9	4
Static Drain-Source On-Resistance ⁽³⁾	R _{DS(ON)}	V _{GS} = 10V, I _D =50A	mΩ	—	0.8	1.2

● Dynamic Parameters

PARAMETER	SYMBOL	Condition	UNIT	Min	Typ	Max
Input Capacitance	C _{iss}	V _{DS} =25V, V _{GS} =0V, f=1MHZ	pF	—	7250	—
Output Capacitance	C _{oss}			—	3498	—
Reverse Transfer Capacitance	C _{rss}			—	255	—

● Switching Parameters

PARAMETER	SYMBOL	Condition	UNIT	Min	Typ	Max
Turn-on Delay Time	t _{D(on)}	V _{GS} =10V, V _{DD} =20V, I _D =50A, R _{GEN} =6Ω	nS	—	42	—
Turn-on Rise Time	t _r		nS	—	136	—
Turn-off Delay Time	t _{D(off)}		nS	—	77	—
Turn-off fall Time	t _f		nS	—	82	—
Total Gate Charge	Q _g	V _{DS} =20V, I _D =50A V _{GS} =10V	nC	—	135.6	—
Gate-Source Charge	Q _{gs}		nC	—	38	—
Gate-Drain Charge	Q _{gd}		nC	—	42	—

● Driian-Source Diode Characteristics

PARAMETER	SYMBOL	Condition	UNIT	Min	Typ	Max
Diode Forward Voltage	V _{SD}	I _S =370A, V _{GS} =0V	V	—	—	1.2
Maximum Body-Diode Continuous Current	I _S	—	A	—	—	370
Reverse Recovery Time	T _{rr}	I _S =370A, di/dt=100A/us, T _J =25°C	nS	—	57	—
Reverse Recovery Charge	Q _{rr}		nC	—	183	—

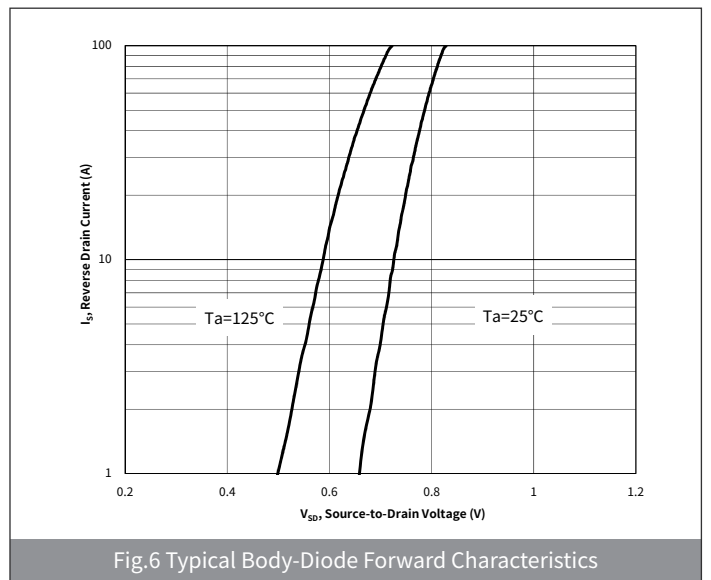
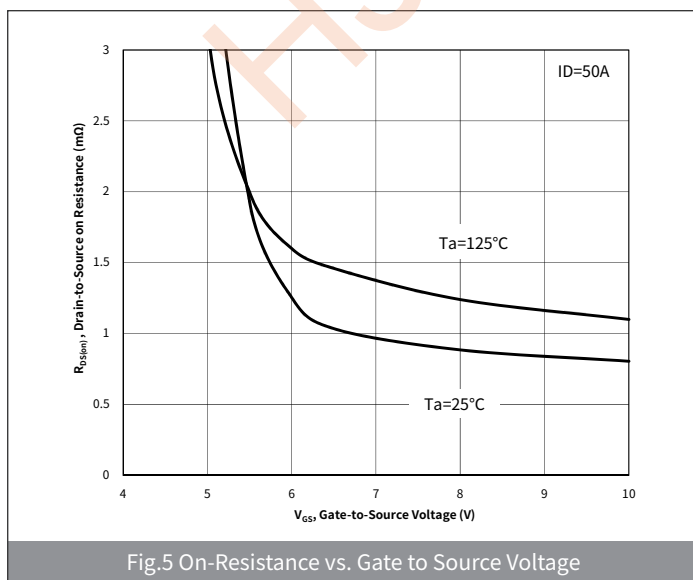
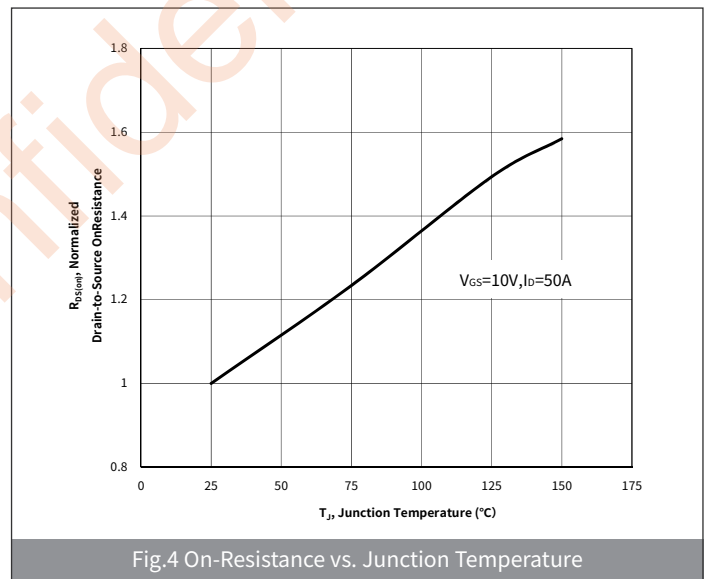
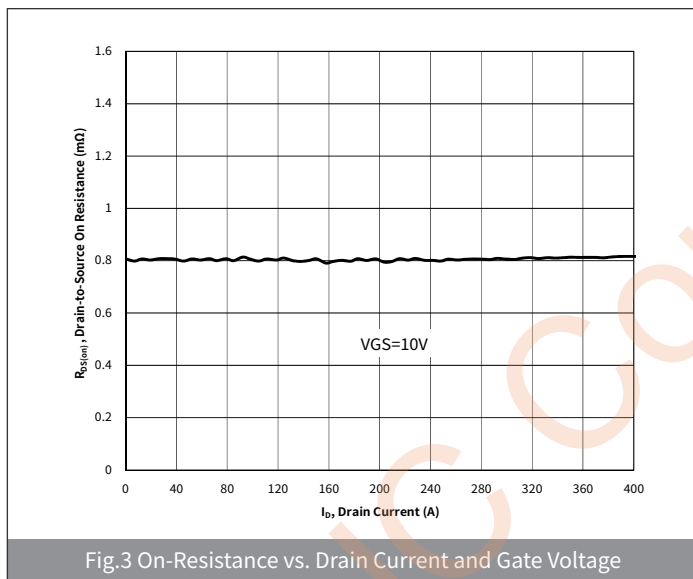
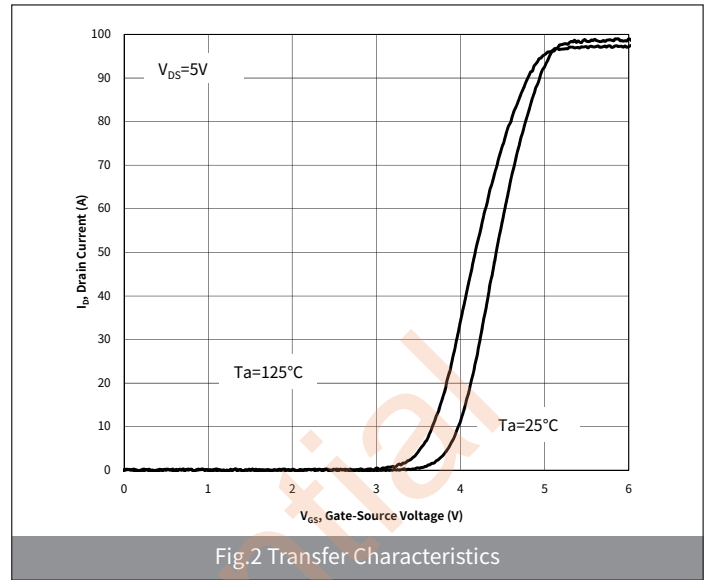
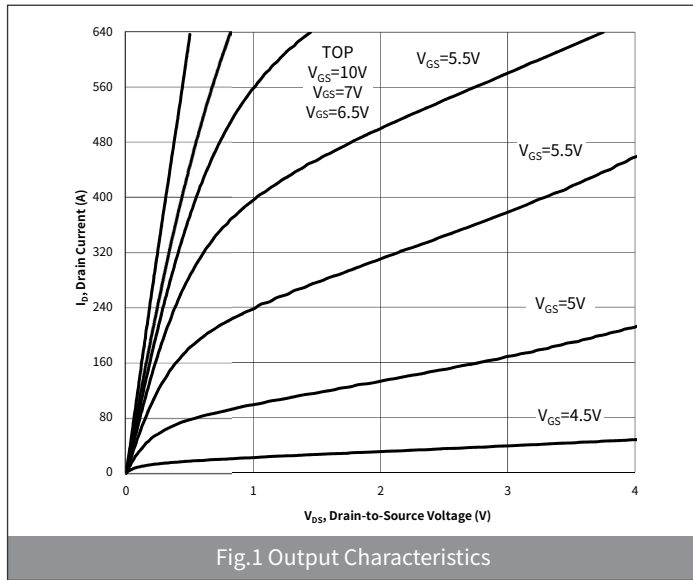
Note :

(1)Repetitive Rating: Pulse width limited by maximum junction temperature.

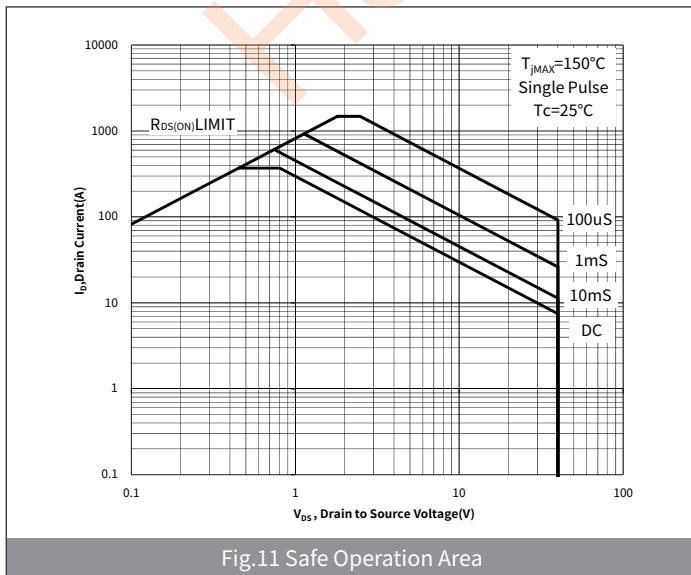
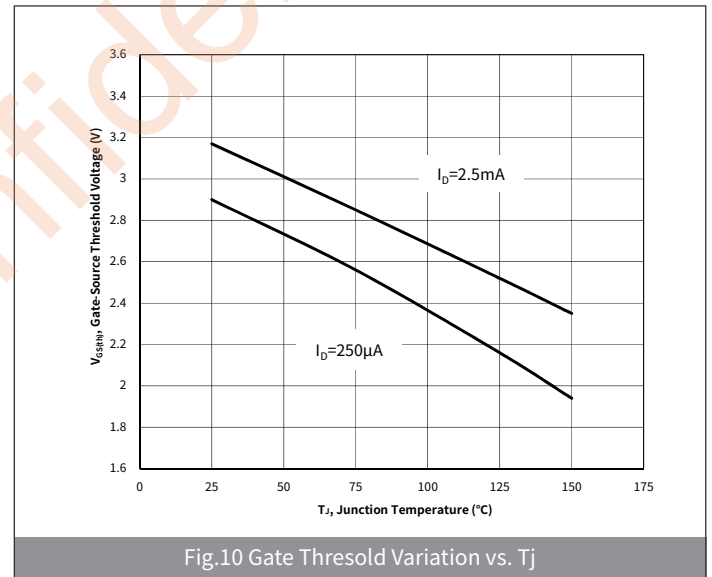
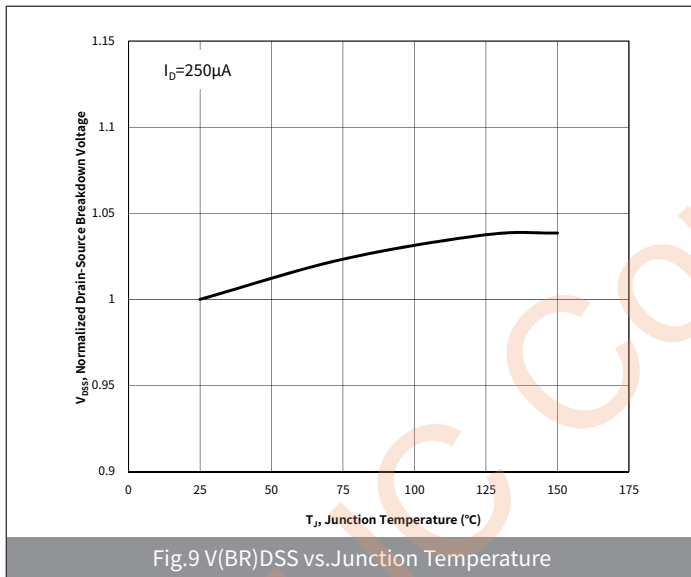
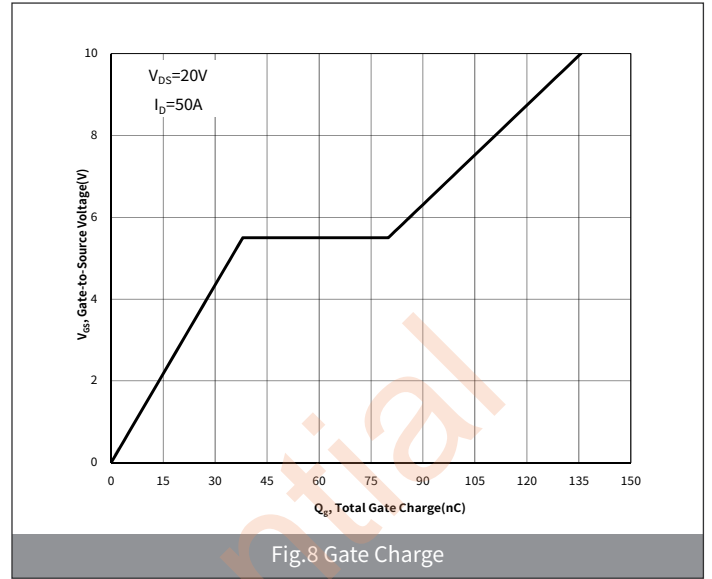
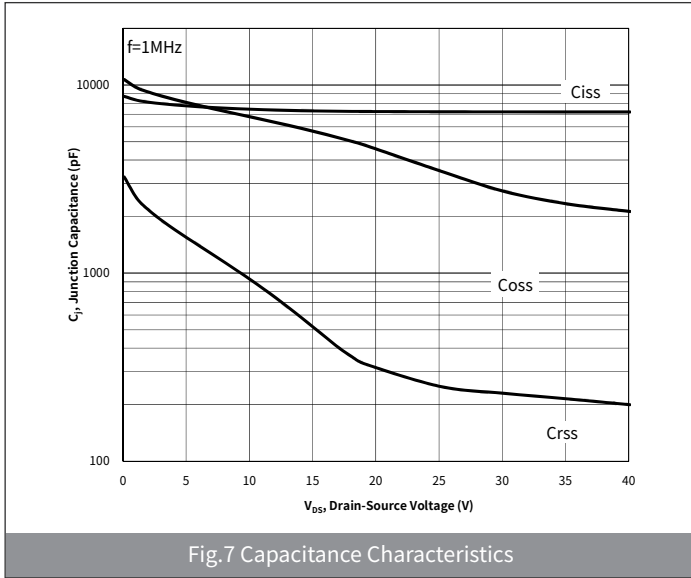
(2)EAS condition : T_j=25°C ,V_{DD}=20V,V_G=10V,L=0.5mH,I_{AS}=82A,R_g=25Ω.

(3)Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2%.

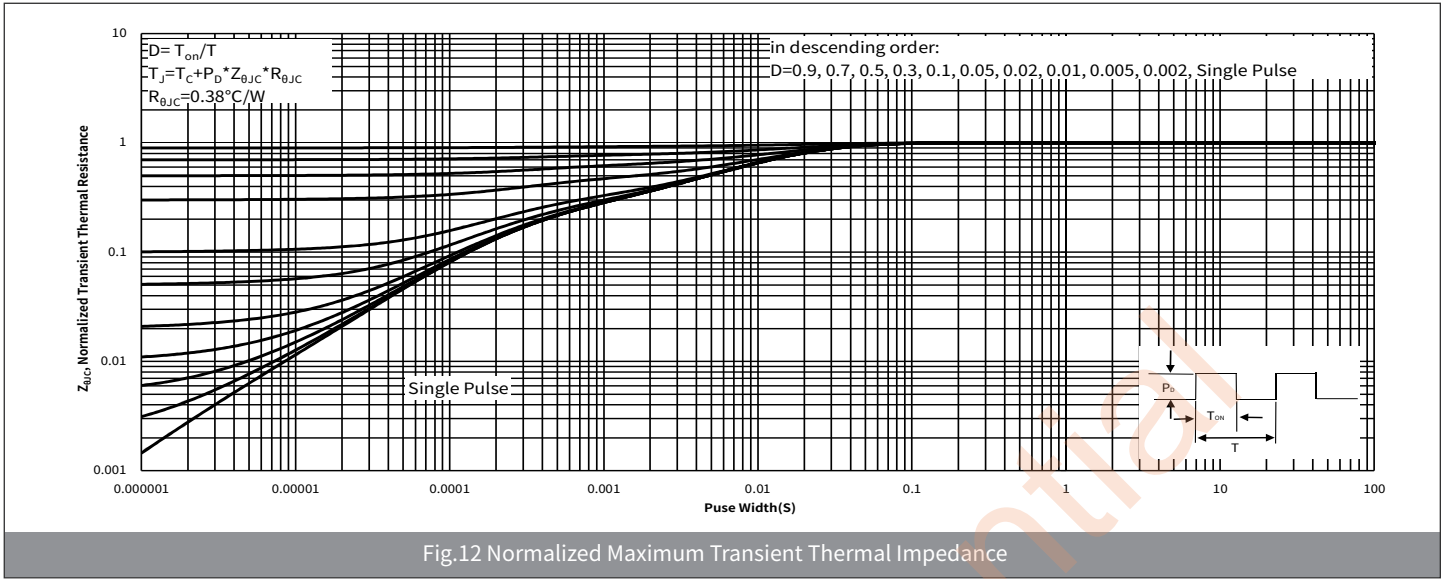
● Ratings And Characteristics Curves (Ta=25°C Unless otherwise specified)



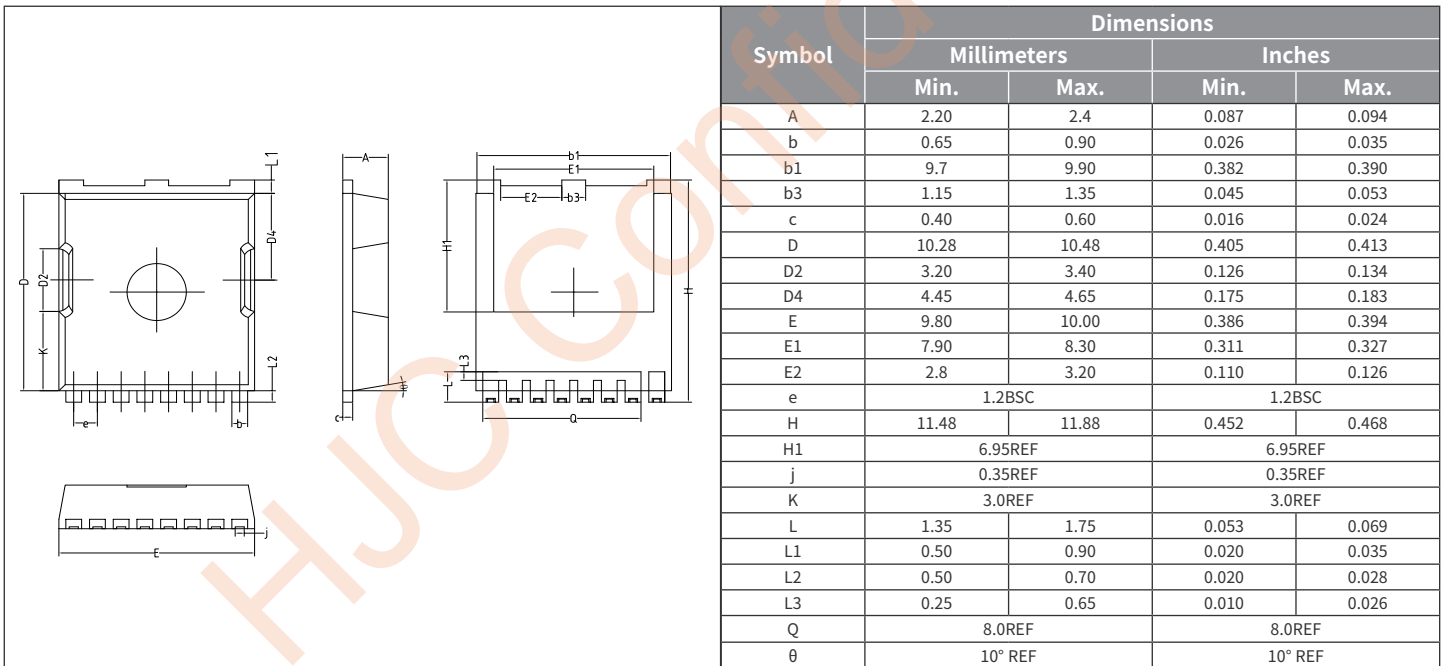
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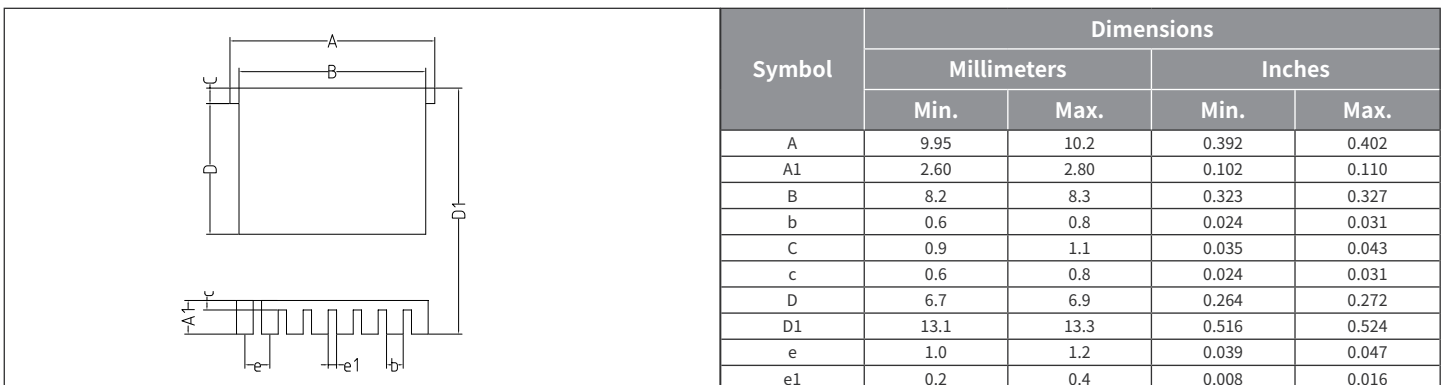
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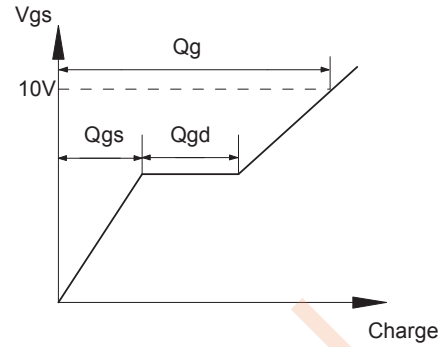
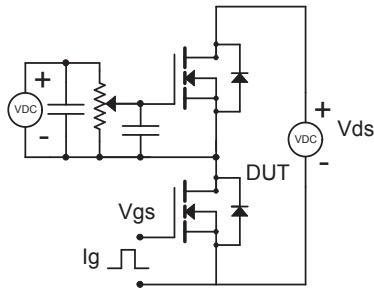
● Package Outline Dimensions (TOLL)



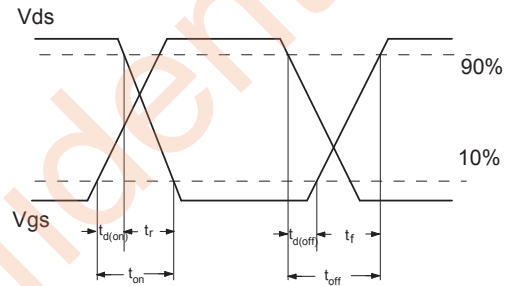
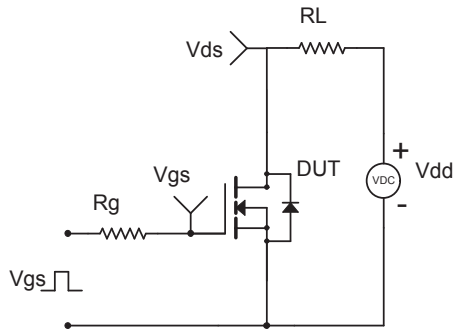
● Suggested Pad Layout



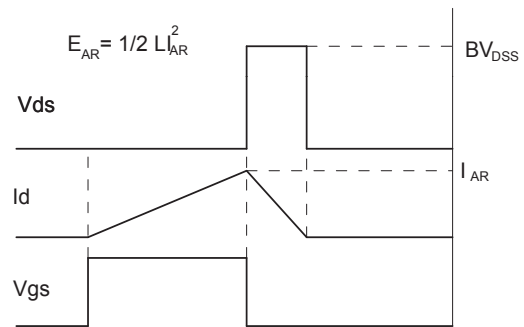
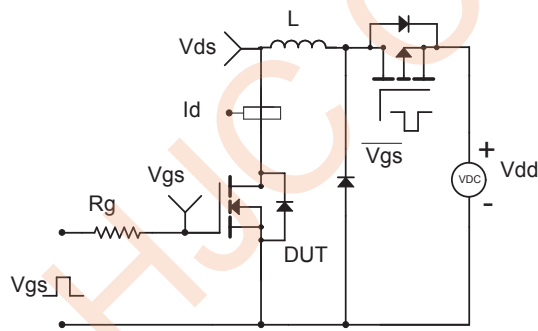
1. Gate Charge Test Circuit & Waveforms



2. Resistive Switching Test Circuit & Waveforms



3. Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



4. Diode Recovery Test Circuit & Waveforms

