

TOLL Plastic-Encapsulate MOSFETS

Features

- VDS=120V
- ID=300A
- RDS(on)@VGS=10V < 2.5mΩ
- Low Gate Charge and Rdson
- Fast Switching Speedze
- Advanced Split Gate Trench Technology

Drain-source Voltage
120 V
Drain Current
300 Ampere

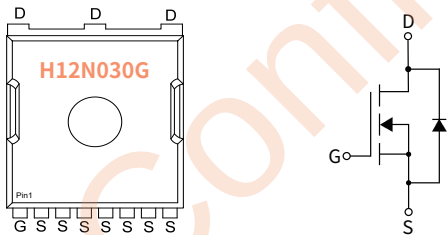
Applications

- High Speed Power switching
- DC-DC Converter
- 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

Table with 7 columns: PACKAGE, PACKAGE CODE, UNIT WEIGHT(g), REEL(pcs), BOX(pcs), CARTON(pcs), DELIVERY MODE. Row 1: TOLL, R3, 0.753, 2000, 4000, 28000, 13"

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

Table with 4 columns: PARAMETER, SYMBOL, UNIT, VALUE. Rows include: Drain-source Voltage (VDS, V, 120), Gate-source Voltage (VGS, V, ±20), Drain Current (ID, A, 300), Pulsed Drain Current (IDM, A, 1200), Total Power Dissipation (PD, W, 320), Single pulse avalanche energy (EAS, mJ, 1056), Junction temperature (TJ, °C, -55 ~+150), Storage temperature (Tstg, °C, -55 ~+150), Thermal Resistance Junction-to-Case (RθJC, °C / W, 0.39).

● 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	120	—	—
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =120V, 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	2.5	3.3	4.5
Static Drain-Source On-Resistance ⁽³⁾	R _{DS(ON)}	V _{GS} = 10V, I _D =50A	mΩ	—	1.9	2.5

● Dynamic Parameters

PARAMETER	SYMBOL	Condition	UNIT	Min	Typ	Max
Input Capacitance	C _{iss}	V _{DS} =60V, V _{GS} =0V, f=1MHZ	pF	—	9563	—
Output Capacitance	C _{oss}			—	1221	—
Reverse Transfer Capacitance	C _{rss}			—	180	—

● Switching Parameters

PARAMETER	SYMBOL	Condition	UNIT	Min	Typ	Max
Turn-on Delay Time	t _{D(on)}	V _{GS} =10V, V _{DD} =60V, I _D =75A, R _{GEN} =1.6Ω	nS	—	20	—
Turn-on Rise Time	t _r		nS	—	23	—
Turn-off Delay Time	t _{D(off)}		nS	—	65	—
Turn-off fall Time	t _f		nS	—	25	—
Total Gate Charge	Q _g	V _{DS} =60V, I _D =75A V _{GS} =10V	nC	—	175	—
Gate-Source Charge	Q _{gs}		nC	—	47.5	—
Gate-Drain Charge	Q _{gd}		nC	—	48.5	—

● Drian-Source Diode Characteristics

PARAMETER	SYMBOL	Condition	UNIT	Min	Typ	Max
Diode Forward Voltage	V _{SD}	I _S =300A, V _{GS} =0V	V	—	—	1.2
Maximum Body-Diode Continuous Current	I _S	—	A	—	—	300
Reverse Recovery Time	V _{rr}	I _S =100A, di/dt=100A/us, T _J =25°C	nS	—	112	—
Reverse Recovery Charge	Q _{rr}		nC	—	289	—

Note :

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

(2) EAS condition : T_j=25°C ,V_{DD}=50V,V_G=10V,L=0.5mH,I_{AS}=65A,R_g=25Ω.

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

● Ratings And Characteristics Curves ($T_a=25^\circ\text{C}$ Unless otherwise specified)

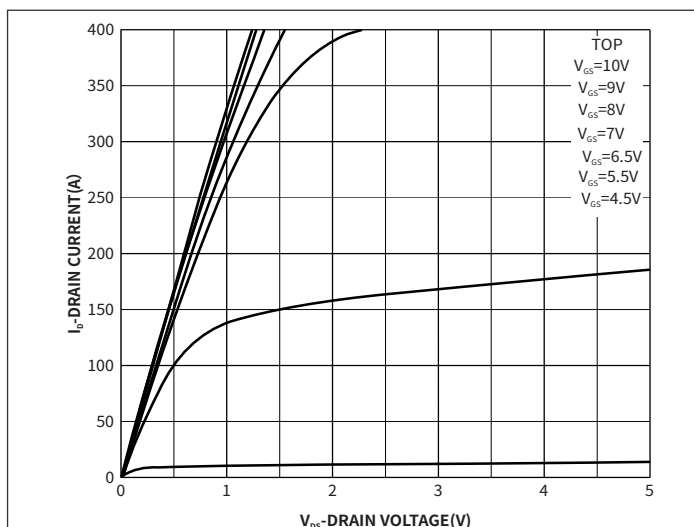


Fig.1 Output Characteristics

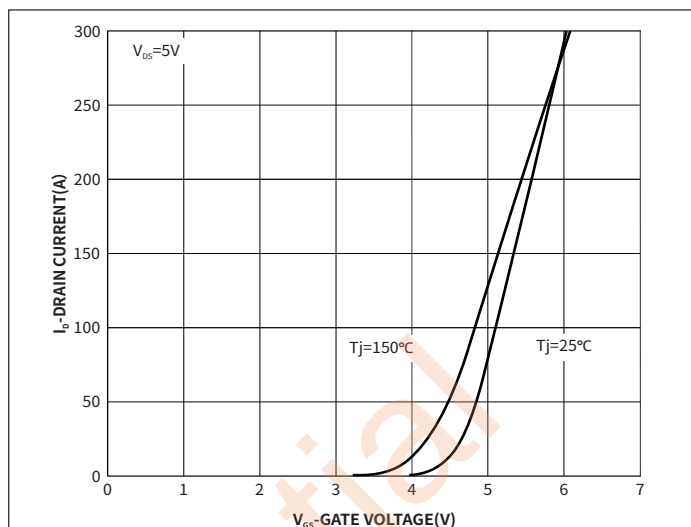


Fig.2 Transfer Characteristics

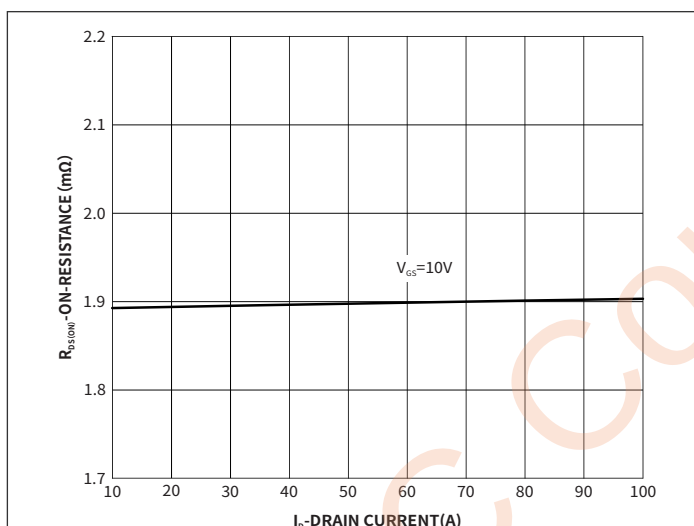


Fig.3 On-Resistance vs. Drain Current and Gate Voltage

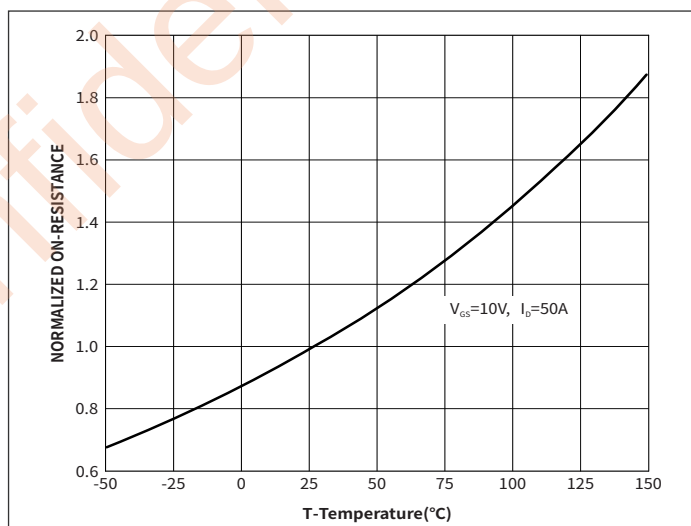


Fig.4 On-Resistance vs. Junction Temperature

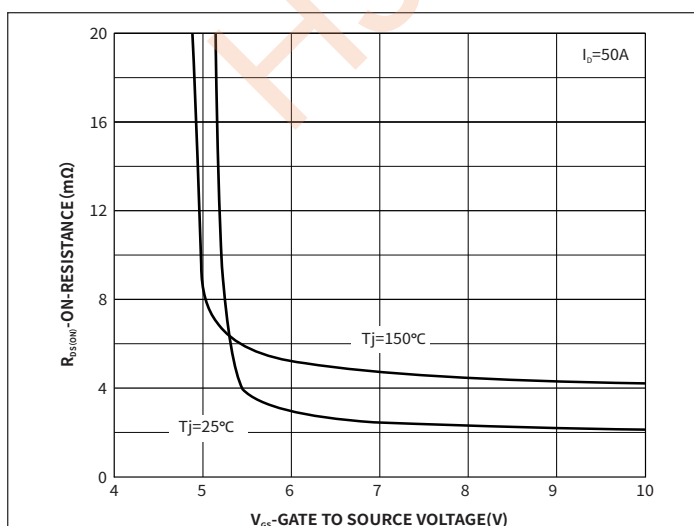


Fig.5 On-Resistance vs. Gate to Source Voltage

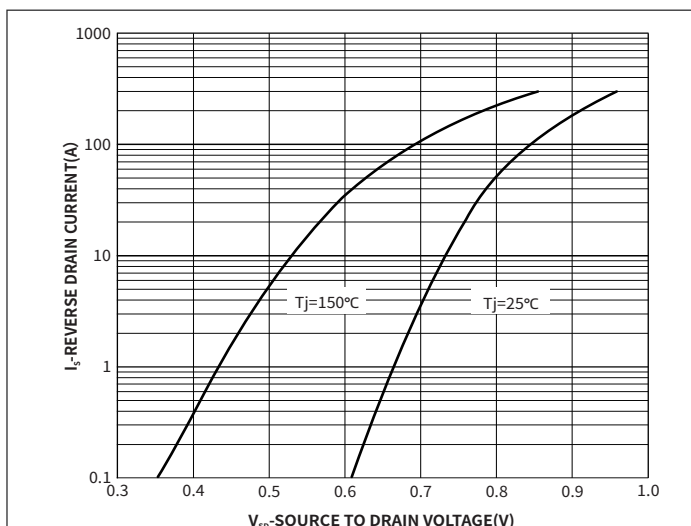
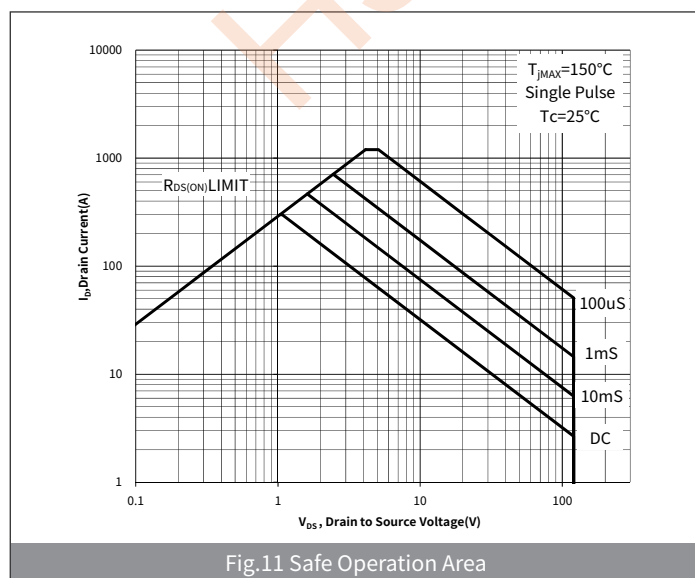
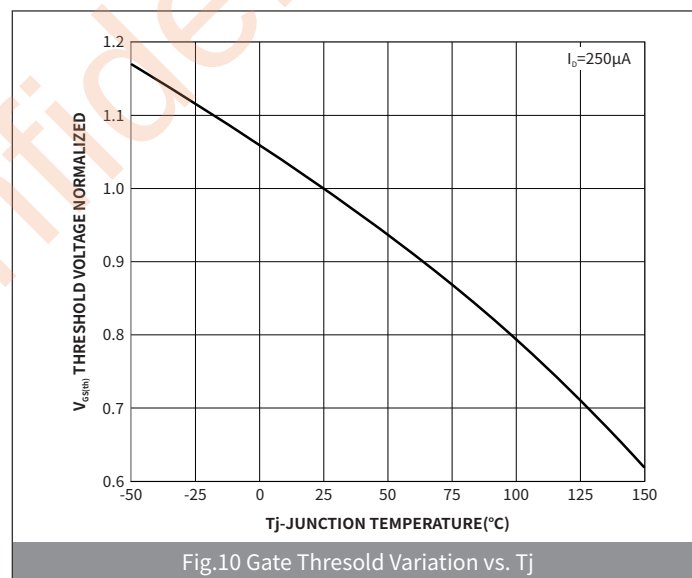
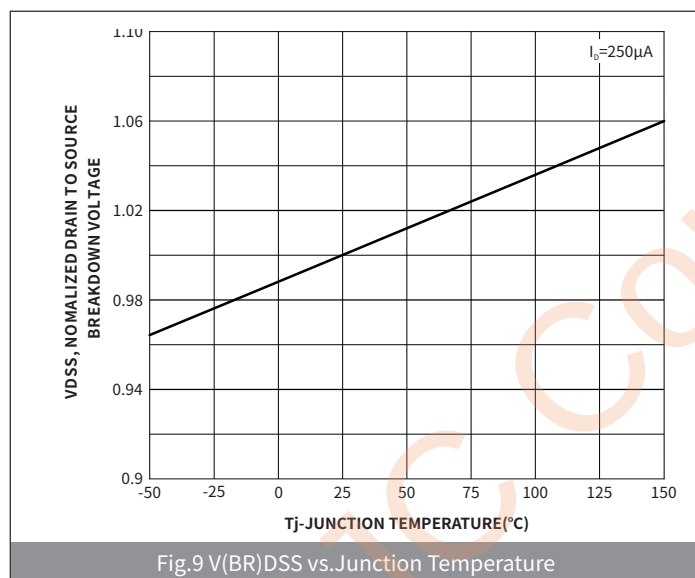
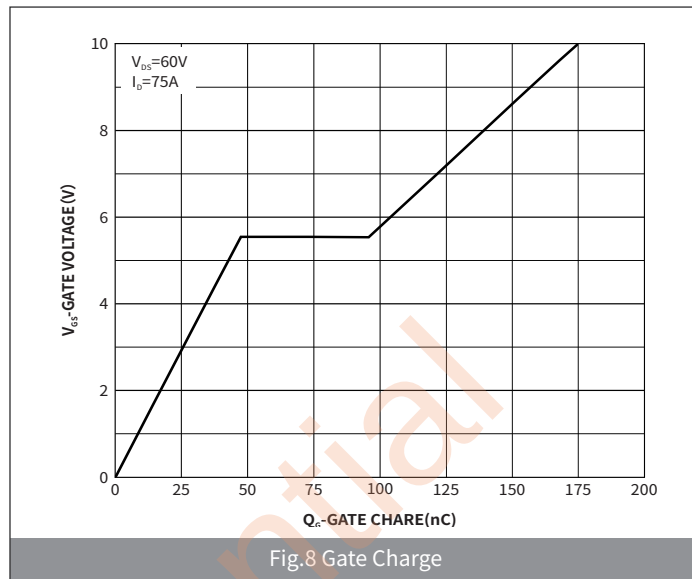
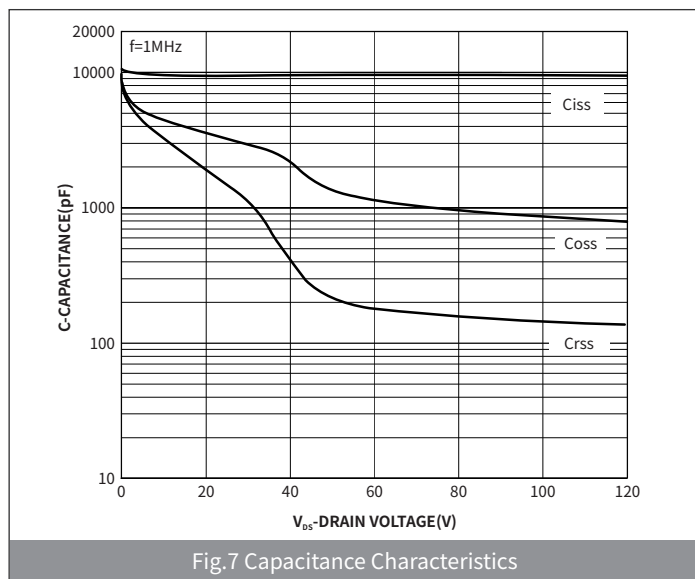


Fig.6 Typical Body-Diode Forward Characteristics

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



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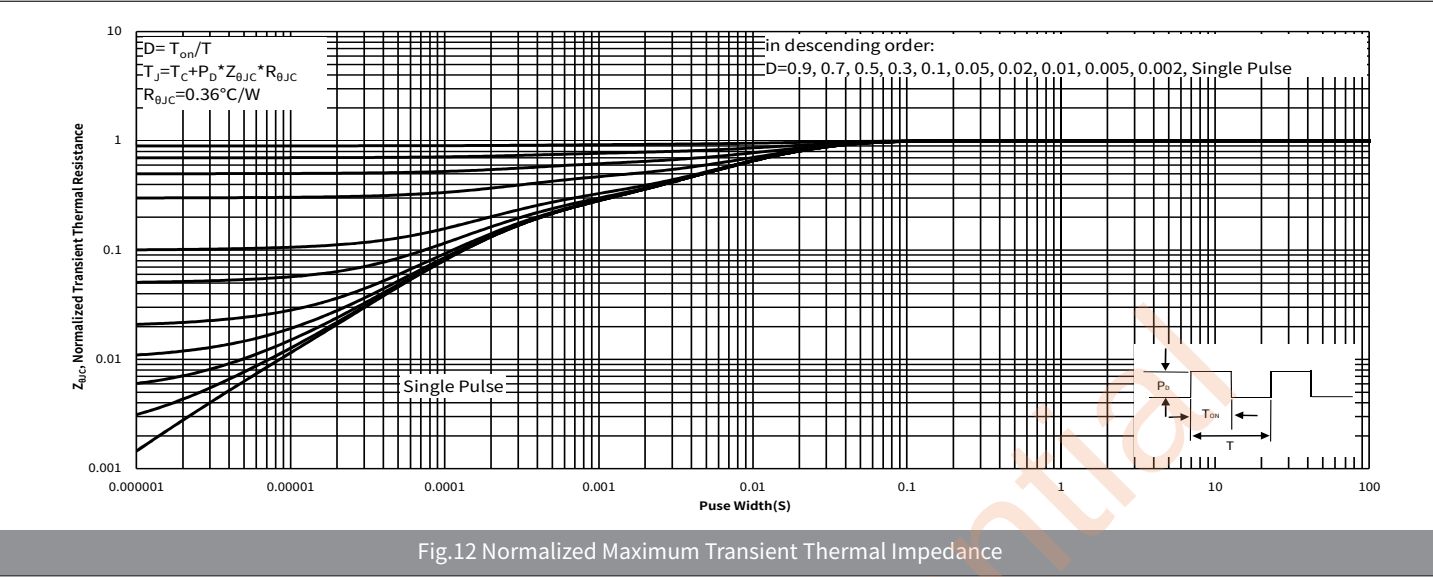
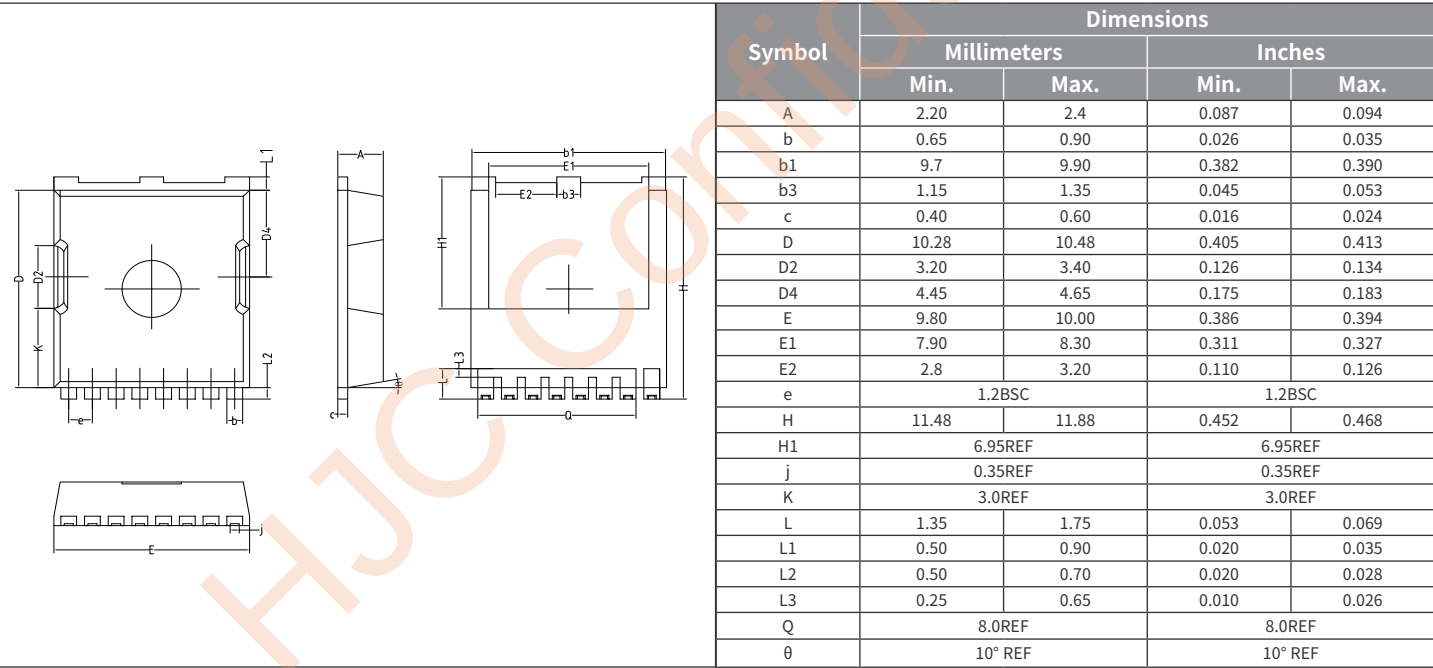
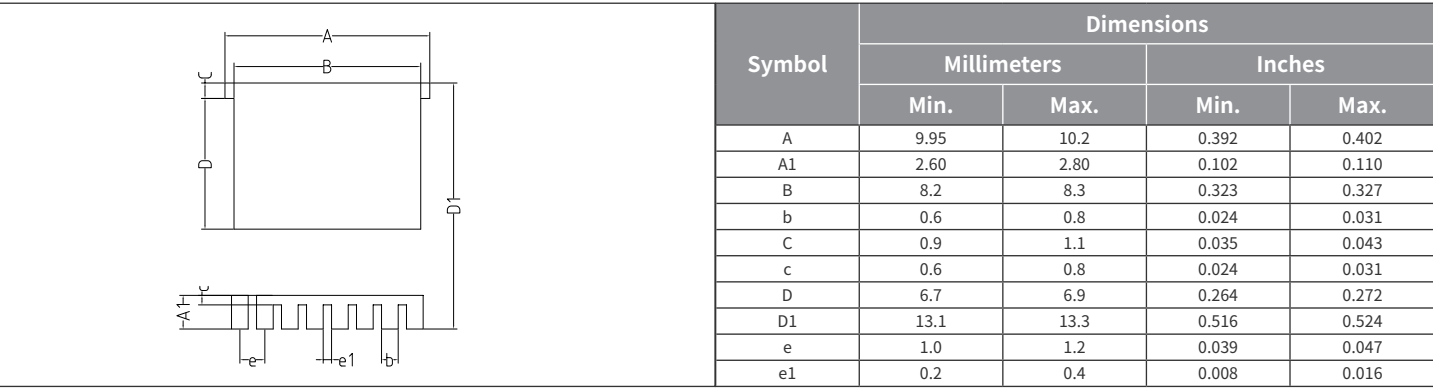


Fig.12 Normalized Maximum Transient Thermal Impedance

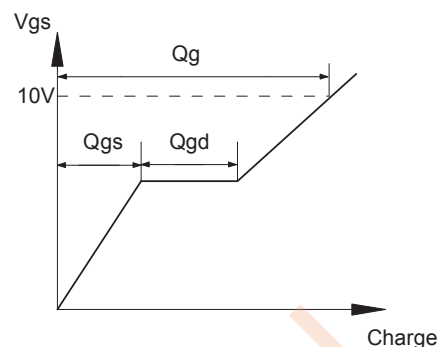
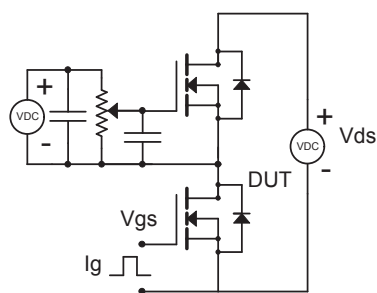
● Package Outline Dimensions (TOLL)



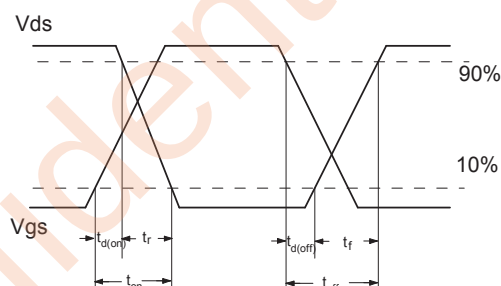
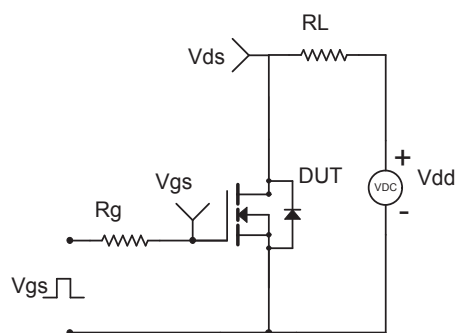
● Suggested Pad Layout



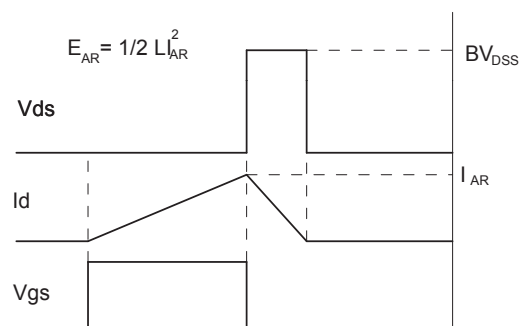
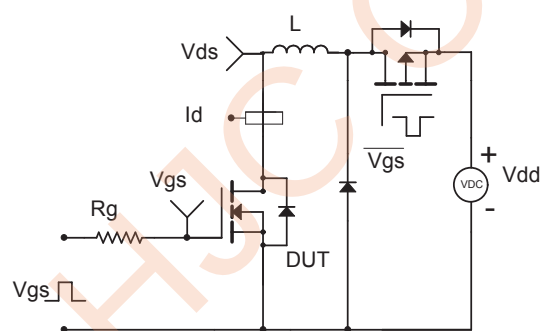
1. Gate Charge Test Circuit & Waveforms



2. Resistive Switching Test Circuit & Waveforms



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



4. Diode Recovery Test Circuit & Waveforms

