

TO-252 Plastic-Encapsulate MOSFETS

Features

- $V_{DS}=40V$
- $I_D=100A$
- $R_{DS(on)}@V_{GS}=10V < 4m\Omega$
- $R_{DS(on)}@V_{GS}=4.5V < 6m\Omega$
- Avalanche energy tested
- Fast Switching Speedze
- Improved dv/dt capability, high ruggedness

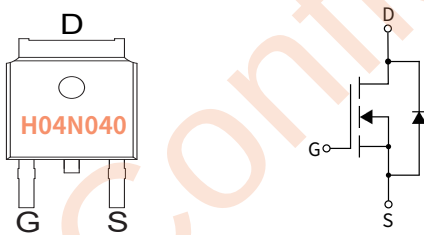
Applications

- Power Switching Application
- Load switch
- Power management

Mechanical Data

- Case: TO-252
- Molding compound meets UL 94V-0 flammability rating, RoHS-compliant,halogen-free
- Terminals: Solder plated, solderable per MIL-STD-750,Method 2026

Function Diagram



Drain-source Voltage

40 V

Drain Current

100 Ampere



Ordering Information

PACKAGE	PACKAGE CODE	UNIT WEIGHT(g)	REEL(pcs)	BOX(pcs)	CARTON(pcs)	DELIVERY MODE
TO-252	R3	0.305	2500	5000	30000	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	100
Pulsed Drain Current ⁽¹⁾	I_{DM}	A	400
Total Power Dissipation	P_D	W	56.8
Single pulse avalanche energy ⁽²⁾	EAS	mJ	125
Junction temperature	T_J	°C	-55 ~+150
Storage temperature	T_{stg}	°C	-55 ~+150
Thermal Resistance Junction-to-Case	$R_{\theta JC}$	°C / W	2.2

● Static Parameter Characteristics (Tj=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} =32V, 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	1.0	1.7	3.0
Static Drain-Source On-Resistance ⁽³⁾	R _{DS(ON)}	V _{GS} = 10V, I _D =30A	mΩ	—	3.3	4
		V _{GS} = 4.5V, I _D =10A		—	4.3	6

● Dynamic Parameters

PARAMETER	SYMBOL	Condition	UNIT	Min	Typ	Max
Input Capacitance	C _{iss}	V _{DS} =20V, V _{GS} =0V, f=1MHZ	pF	—	6720	—
Output Capacitance	C _{oss}			—	455	—
Reverse Transfer Capacitance	C _{rss}			—	411	—

● Switching Parameters

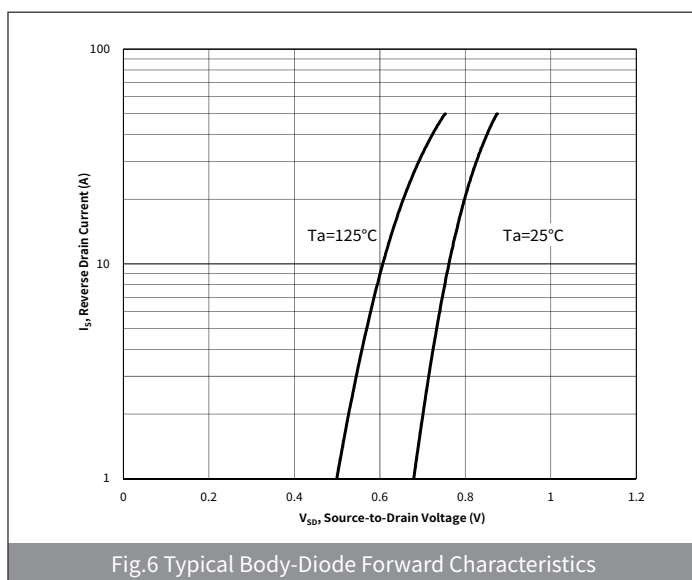
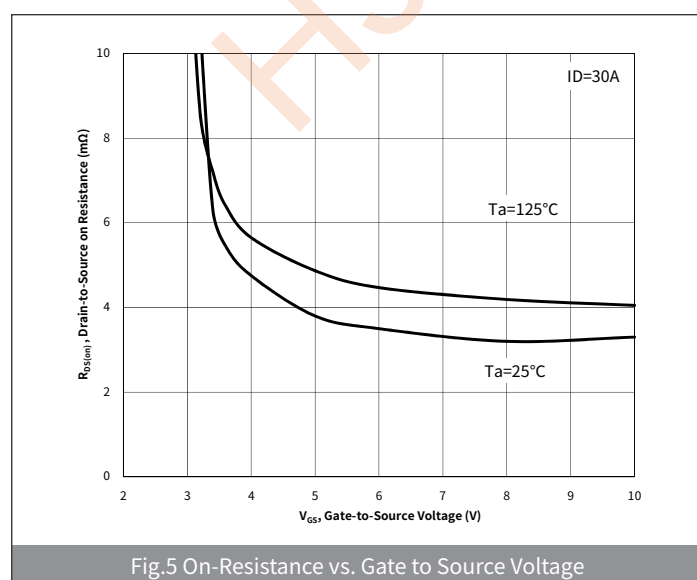
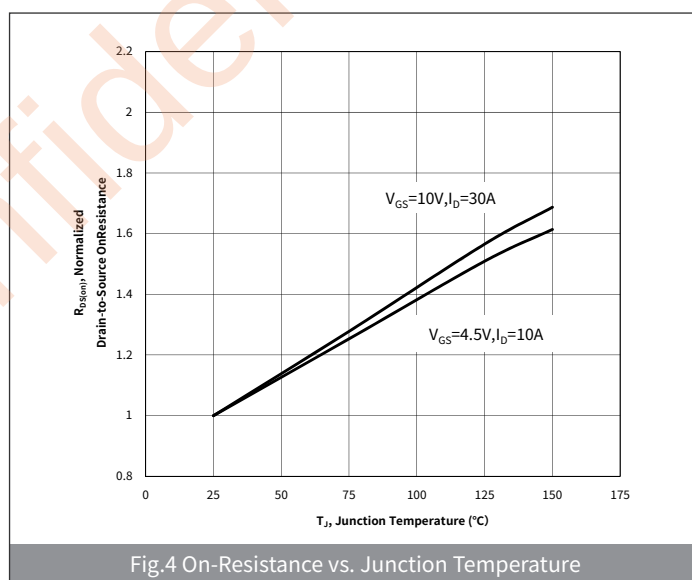
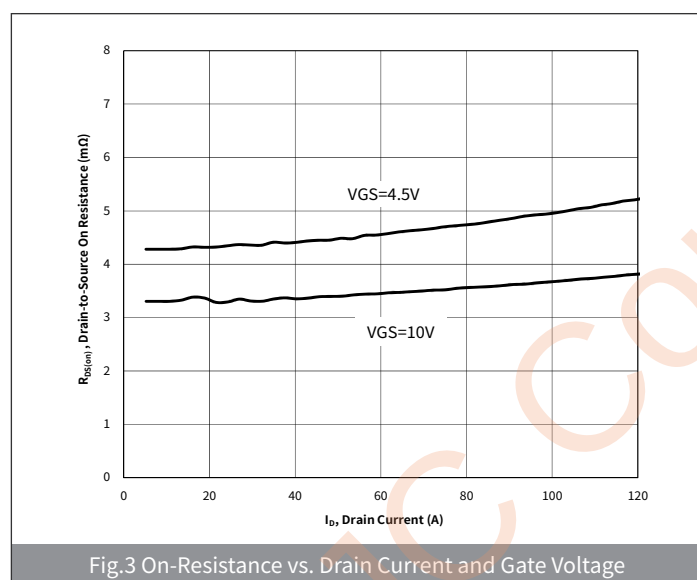
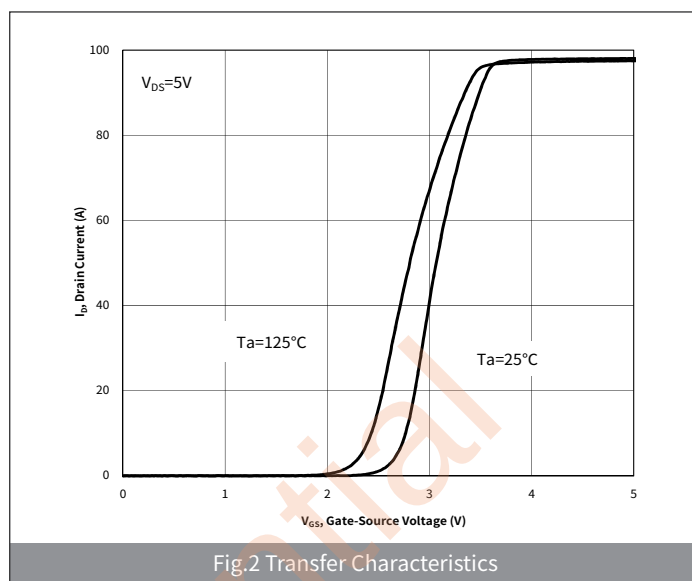
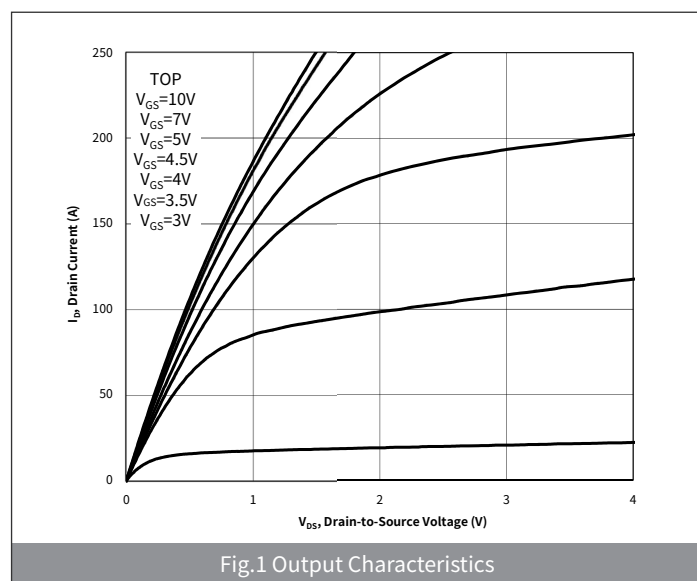
PARAMETER	SYMBOL	Condition	UNIT	Min	Typ	Max
Turn-on Delay Time	t _{D(on)}	V _{GS} =10V, V _{DD} =15V, I _D =15A ,R _{GEN} =3.3Ω	nS	—	10.3	—
Turn-on Rise Time	t _r		nS	—	5.3	—
Turn-off Delay Time	t _{D(off)}		nS	—	44	—
Turn-off fall Time	t _f		nS	—	9.2	—
Total Gate Charge	Q _g	V _{DS} =20V, I _D =30A V _{GS} =10V	nC	—	120.1	—
Gate-Source Charge	Q _{gs}		nC	—	20.5	—
Gate-Drain Charge	Q _{gd}		nC	—	20.4	—

● Drian-Source Diode Characteristics

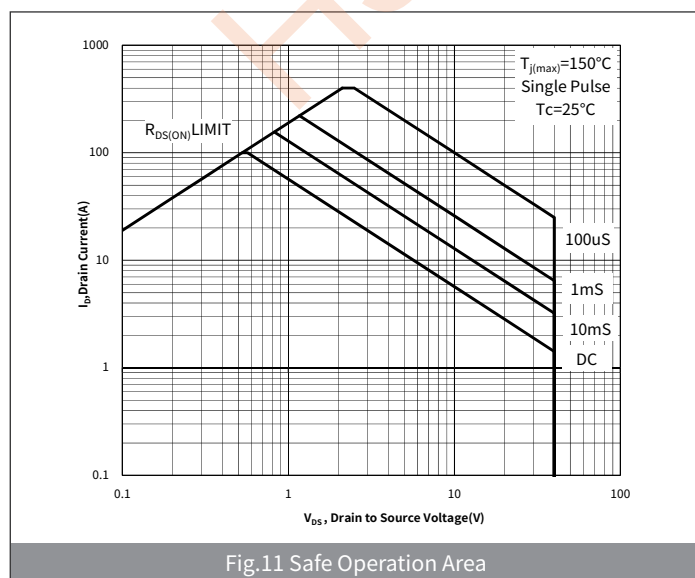
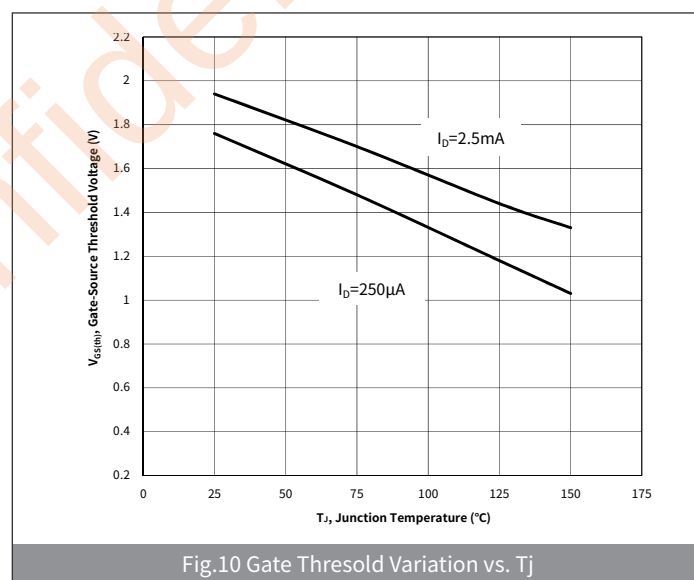
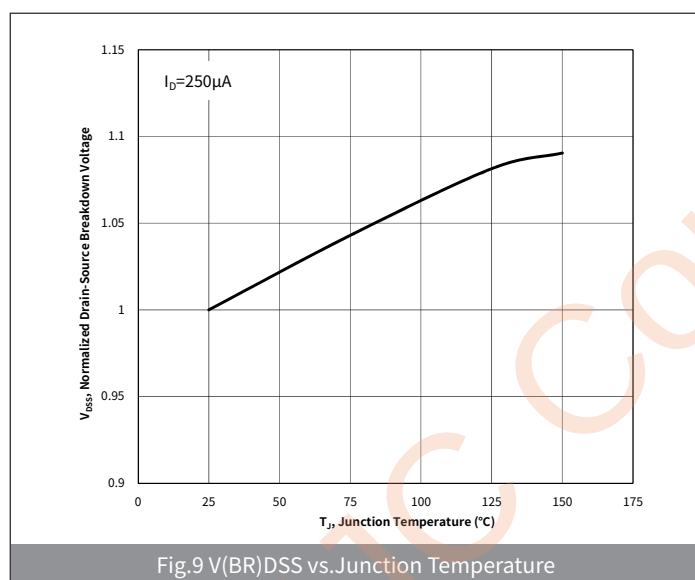
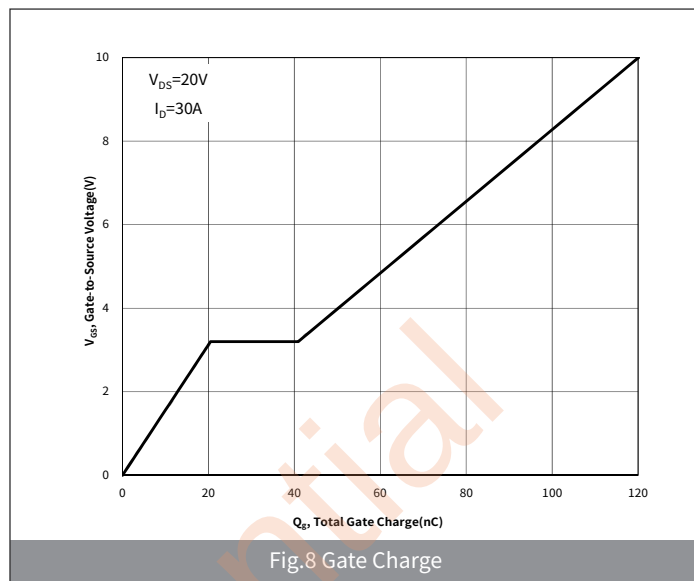
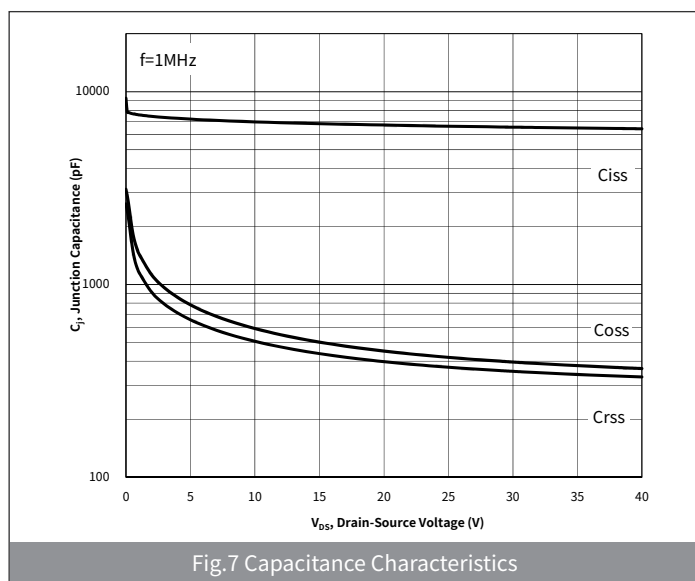
PARAMETER	SYMBOL	Condition	UNIT	Min	Typ	Max
Diode Forward Voltage	V _{SD}	I _S =10A, V _{GS} =0V	V	—	—	1.2
Maximum Body-Diode Continuous Current	I _S	—	A	—	—	100

Note :
(1)Repetitive Rating: Pulse width limited by maximum junction temperature.
(2)EAS condition : Tj=25°C ,VDD=25V,VG=10V,L=0.5mH,IAS=22.4A,Rg=25Ω.
(3)Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2%.

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



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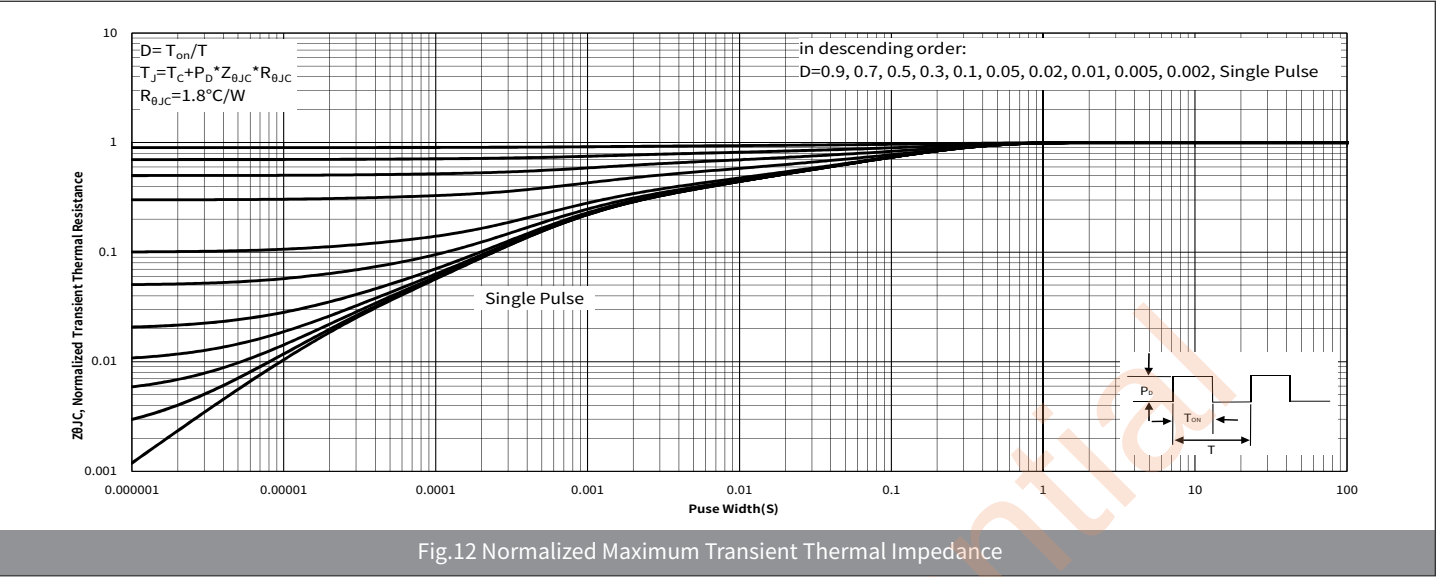
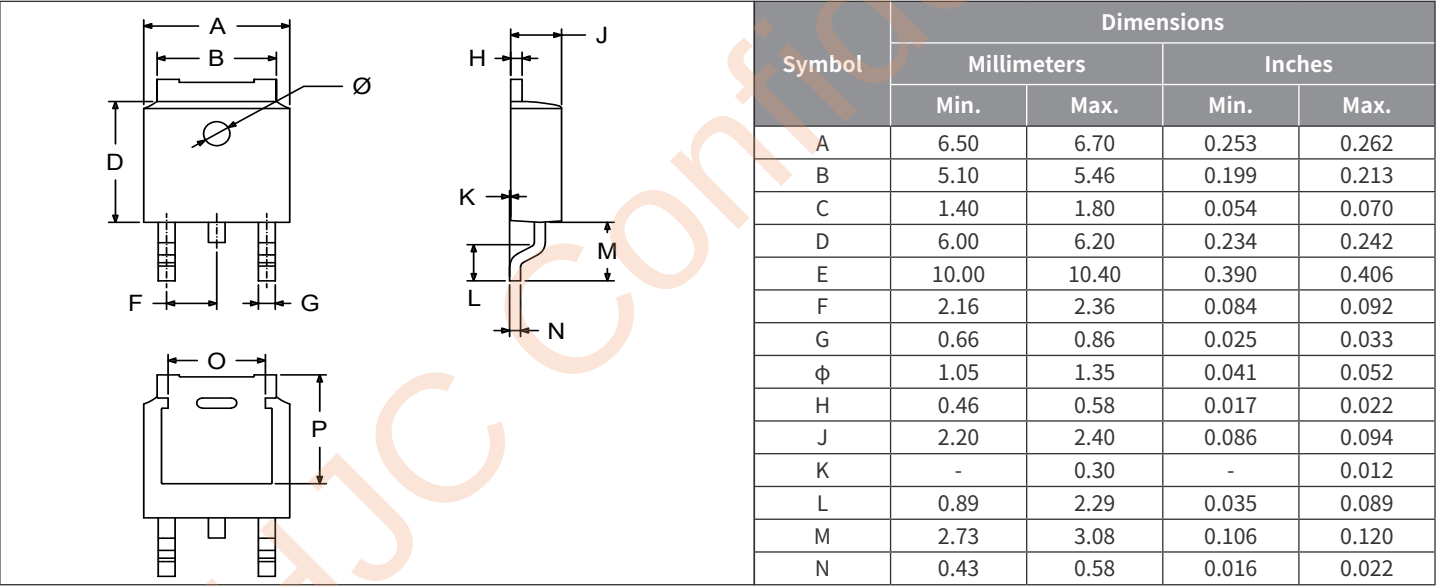
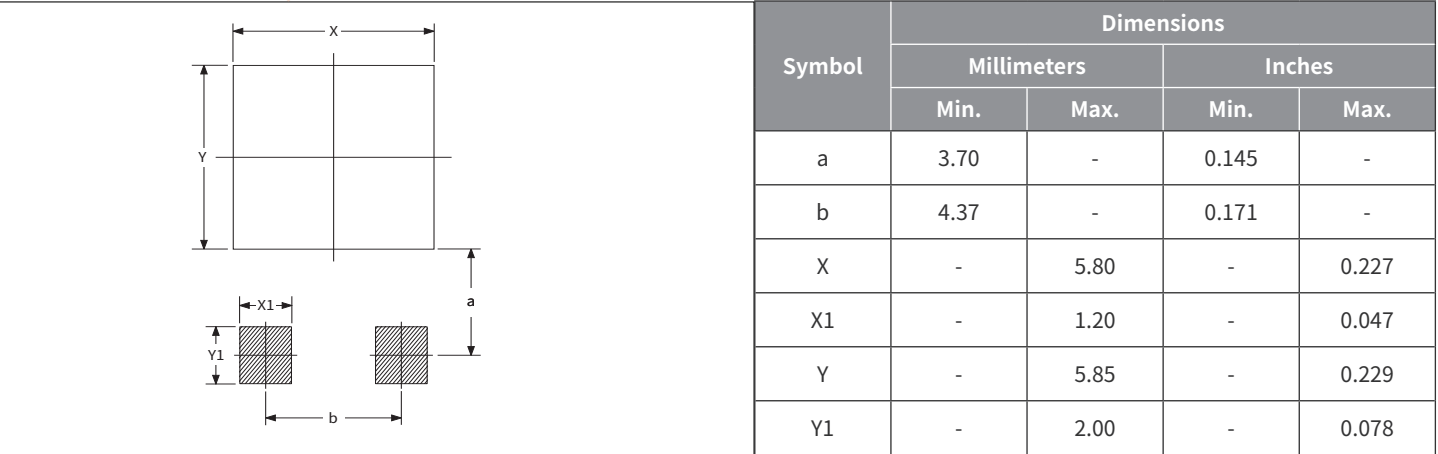


Fig.12 Normalized Maximum Transient Thermal Impedance

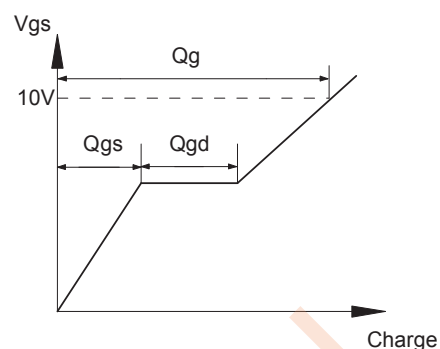
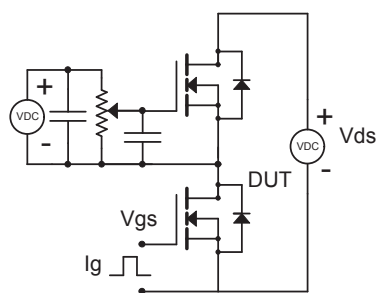
● Package Outline Dimensions (TO-252)



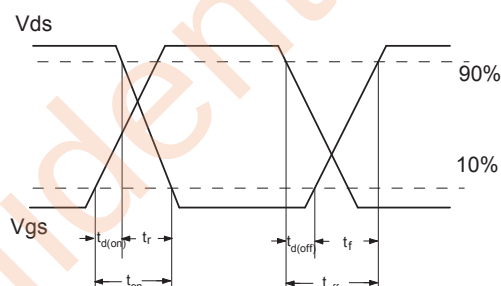
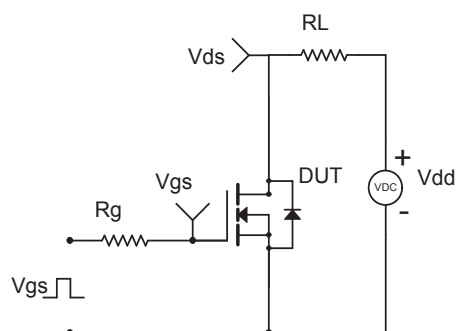
● Suggested Pad Layout



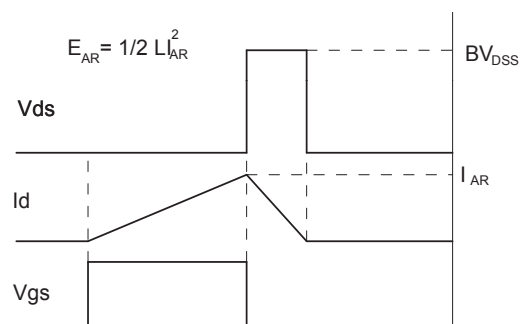
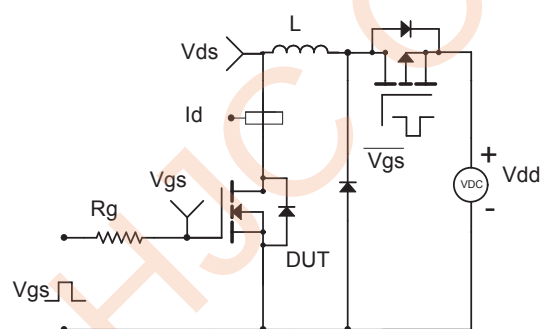
1. Gate Charge Test Circuit & Waveforms



2. Resistive Switching Test Circuit & Waveforms



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



4. Diode Recovery Test Circuit & Waveforms

