

TO-252 Plastic-Encapsulate MOSFETS

Features

- $V_{DS}=-60V$
- $I_D=-14A$
- $R_{DS(on)}@V_{GS}=-10V < 80m\Omega$
- $R_{DS(on)}@V_{GS}=-4.5V < 110m\Omega$
- Low Gate Charge and R_{ds}
- Fast Switching Speedze
- Improved dv/dt capability, high ruggedness

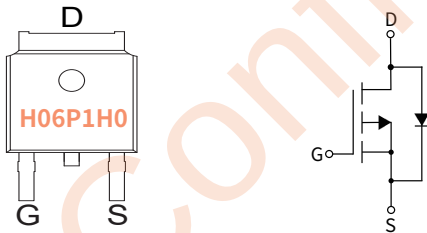
Applications

- DC-DC Converter
- Load switch

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



Ordering Information

PACKAGE	PACKAGE CODE	UNIT WEIGHT(g)	REEL(pcs)	BOX(pcs)	CARTON(pcs)	DELIVERY MODE
TO-252	R3	0.305	2500	5000	40000	13"

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

PARAMETER	SYMBOL	UNIT	VALUE
Drain-source Voltage	V_{DS}	V	-60
Gate-source Voltage	V_{GS}	V	± 20
Drain Current	I_D	A	-14
Pulsed Drain Current ⁽¹⁾	I_{DM}	A	-56
Total Power Dissipation	P_D	W	32
Single pulse avalanche energy ⁽²⁾	EAS	mJ	39
Junction temperature	T_J	°C	-55 ~+150
Storage temperature	T_{stg}	°C	-55 ~+150
Thermal Resistance Junction-to-Case	$R_{\theta JC}$	°C / W	3.9

Drain-source Voltage
-60 V
Drain Current
-14 Ampere



● 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	-60	—	—
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =-48V, 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	-1.5	-2.8
Static Drain-Source On-Resistance ⁽³⁾	R _{DS(on)}	V _{GS} = -10V, I _D =-8A	mΩ	—	55	80
		V _{GS} = -4.5V, I _D =-8A		—	62	110

● Dynamic Parameters

PARAMETER	SYMBOL	Condition	UNIT	Min	Typ	Max
Input Capacitance	C _{iss}	V _{DS} =-30, V _{GS} =0V, f=1MHZ	pF	—	1090	—
Output Capacitance	C _{oss}			—	77	—
Reverse Transfer Capacitance	C _{rss}			—	58	—

● Switching Parameters

PARAMETER	SYMBOL	Condition	UNIT	Min	Typ	Max
Turn-on Delay Time	t _{D(on)}	V _{GS} =-10V, V _{DD} =-30V, I _D =-10A, R _{GEN} =3Ω	nS	—	9.8	—
Turn-on Rise Time	t _r		nS	—	6.1	—
Turn-off Delay Time	t _{D(off)}		nS	—	44	—
Turn-off fall Time	t _f		nS	—	12.7	—
Total Gate Charge	Q _g	V _{DS} =-30V, I _D =-6A V _{GS} =-10V	nC	—	23	—
Gate-Source Charge	Q _{gs}		nC	—	5.8	—
Gate-Drain Charge	Q _{gd}		nC	—	4.1	—

● Drian-Source Diode Characteristics

PARAMETER	SYMBOL	Condition	UNIT	Min	Typ	Max
Diode Forward Voltage	V _{SD}	I _S =-1A, V _{GS} =0V	V	—	—	-1.2
Maximum Body-Diode Continuous Current	I _S	—	A	—	—	-14
Reverse Recovery Time	t _{rr}	I _F =-8A di/dt=100A/μs	nS	—	25	—
Reverse Recovery Charge	Q _{rr}		nC	—	31	—

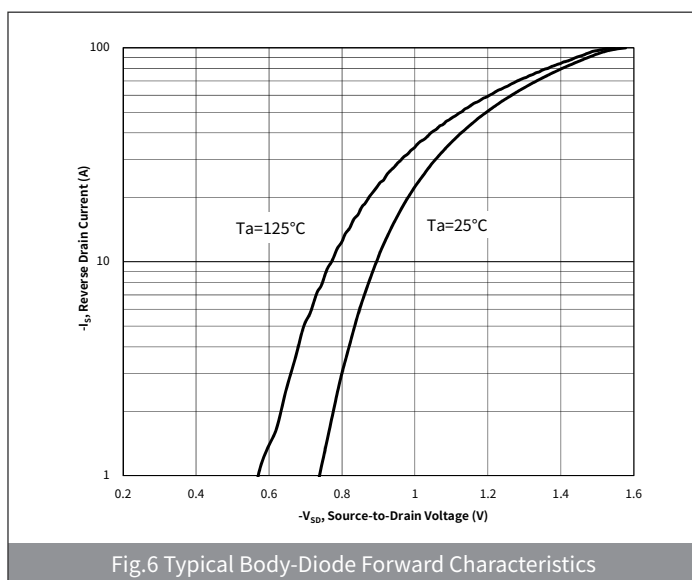
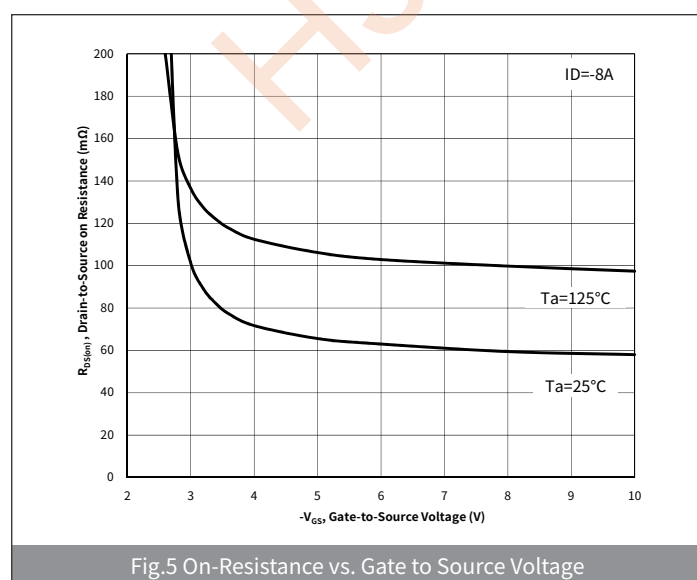
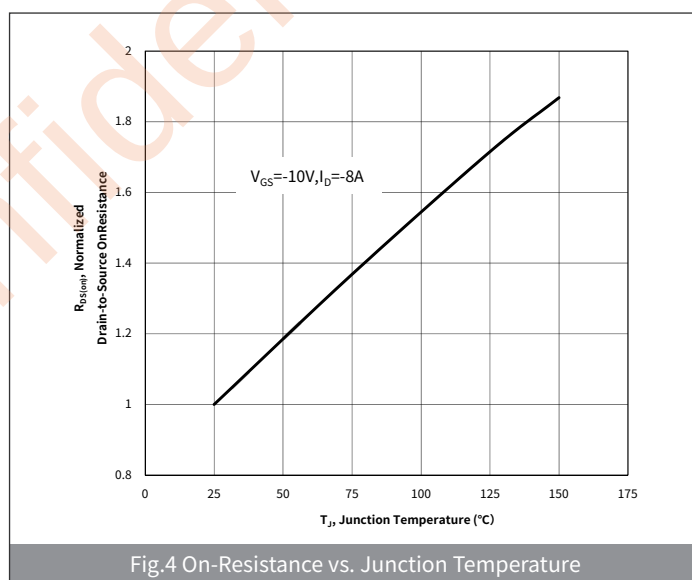
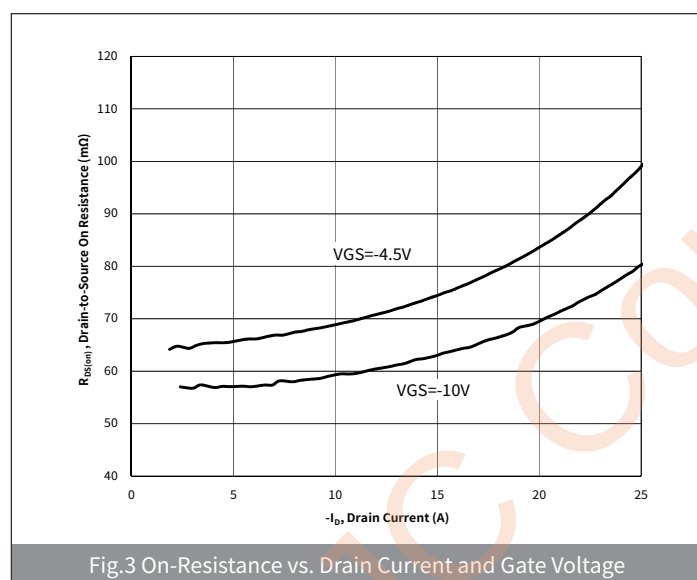
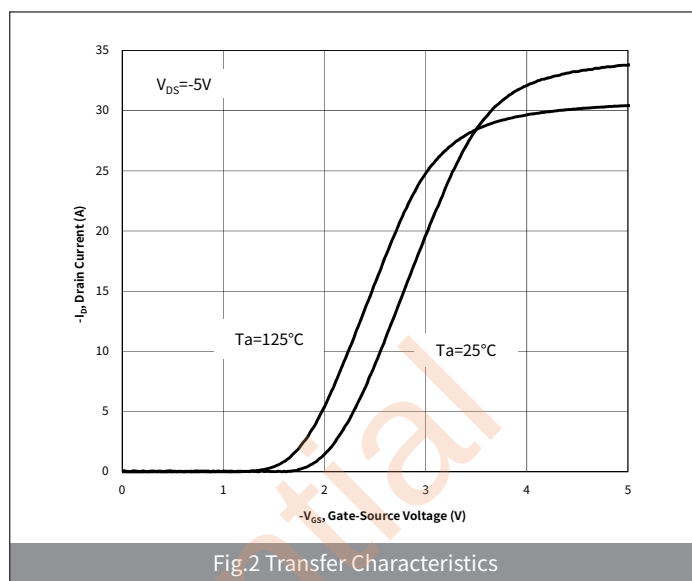
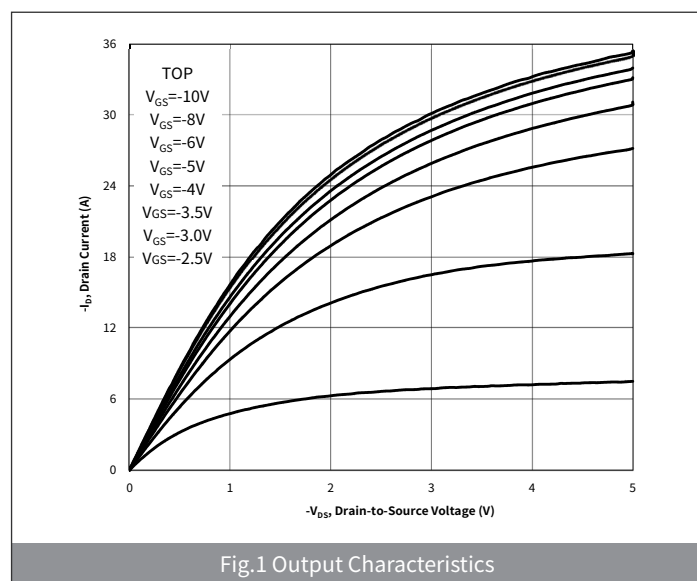
Note :

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

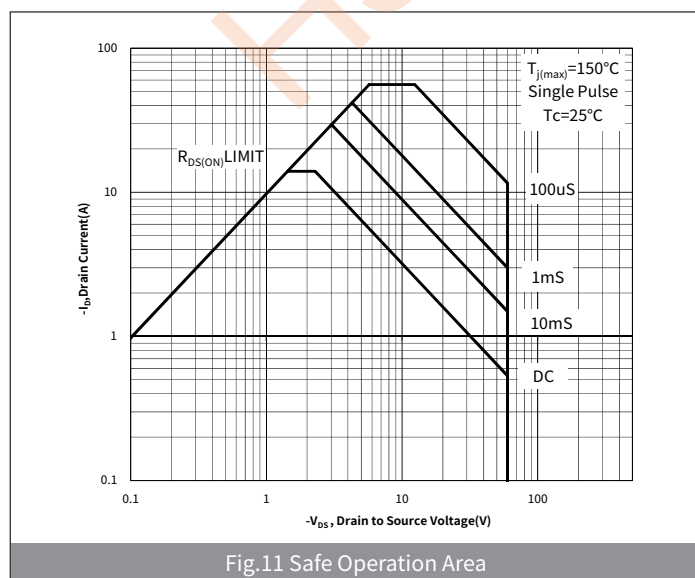
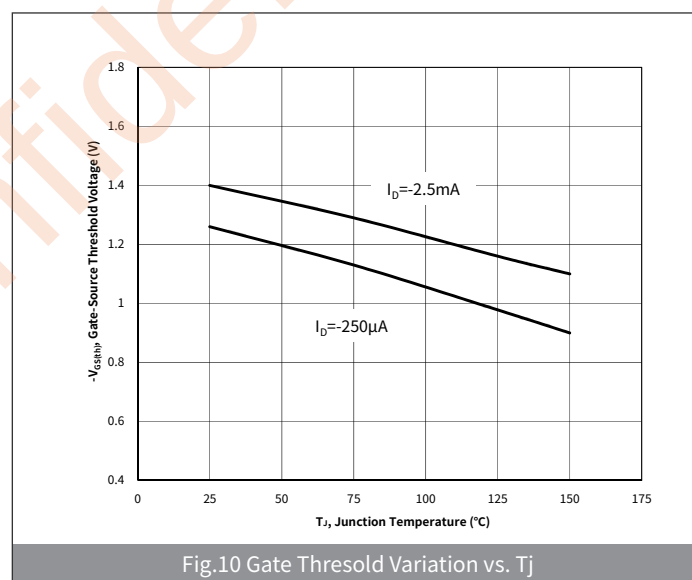
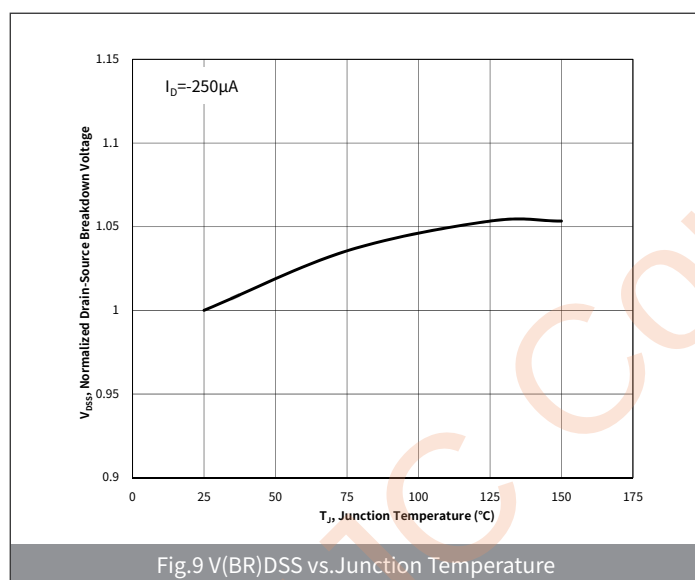
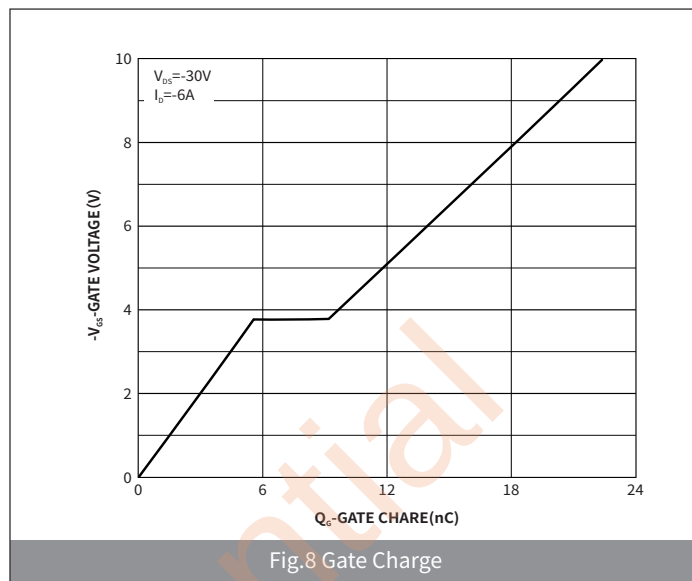
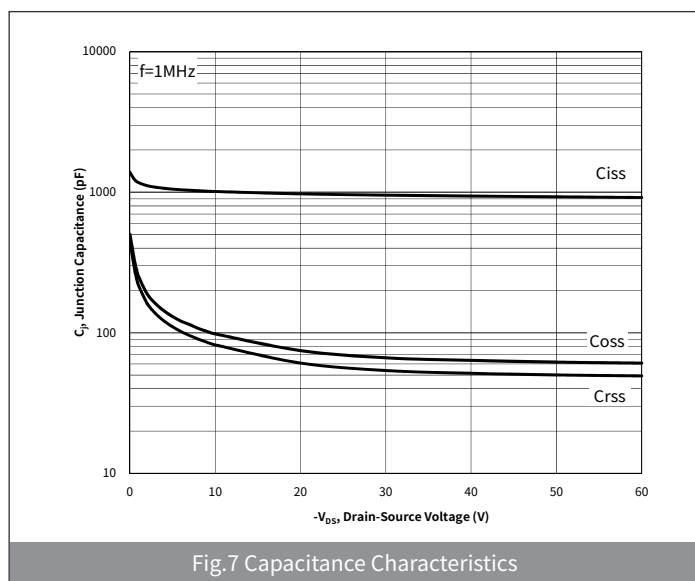
(2) EAS condition : T_j=25°C ,V_{DD}=-30V,V_G=-10V,L=0.1mH,I_{AS}=-28A,R_g=25Ω.

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

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



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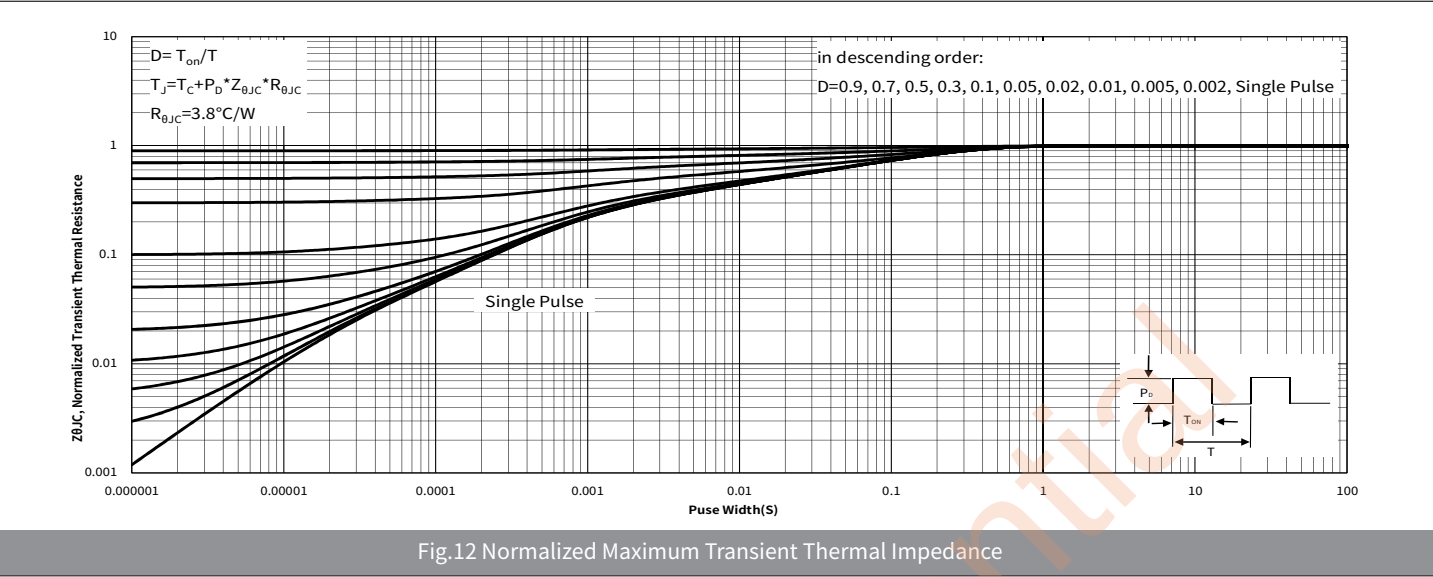
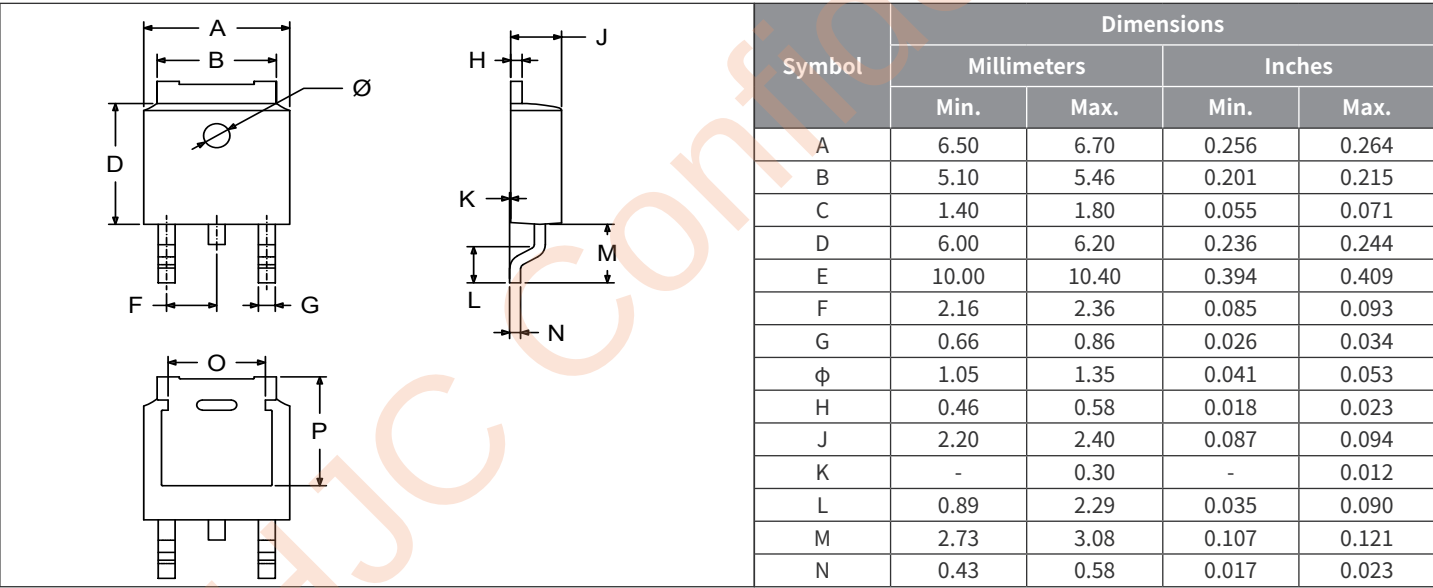
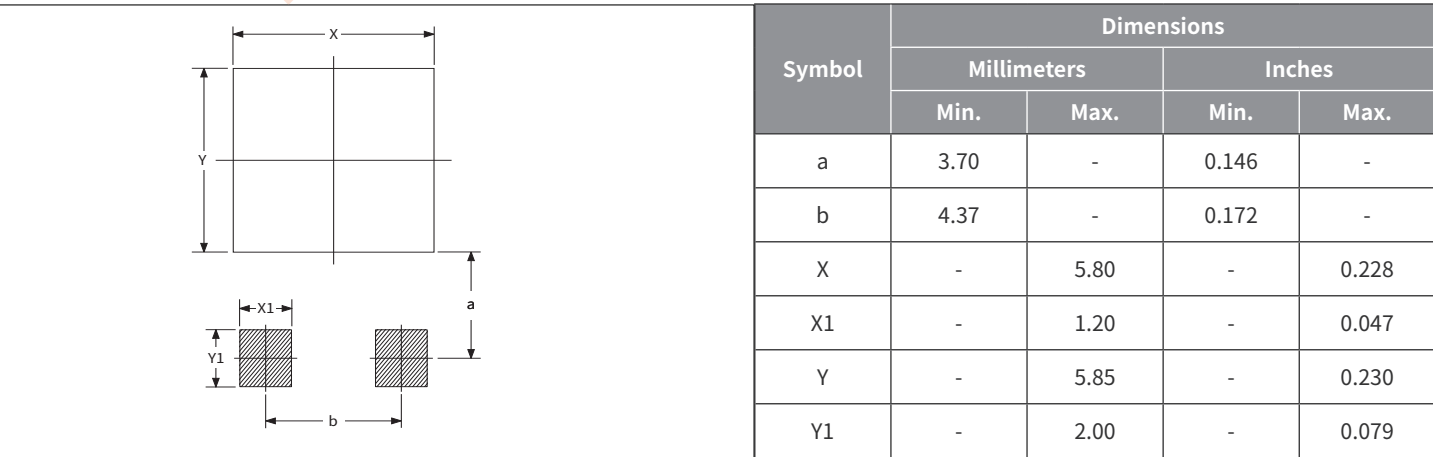


Fig.12 Normalized Maximum Transient Thermal Impedance

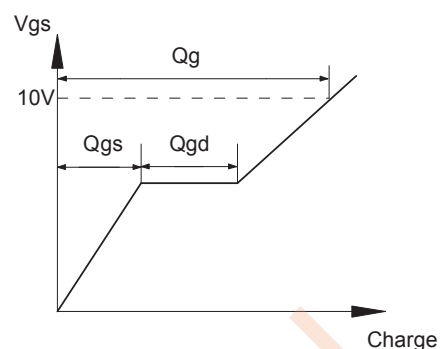
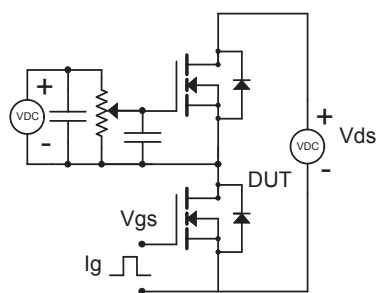
● Package Outline Dimensions (TO-252)



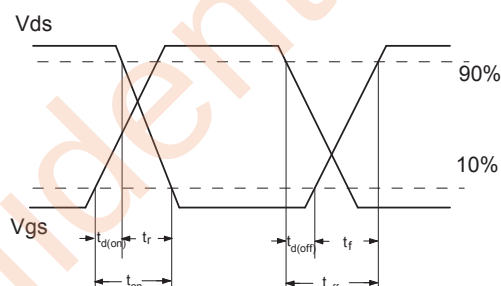
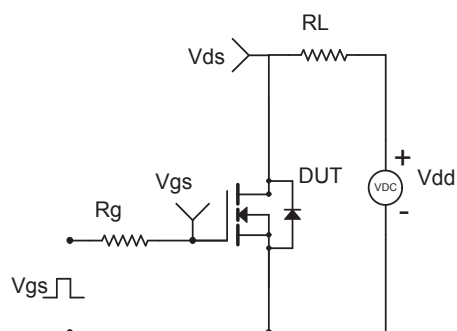
● Suggested Pad Layout



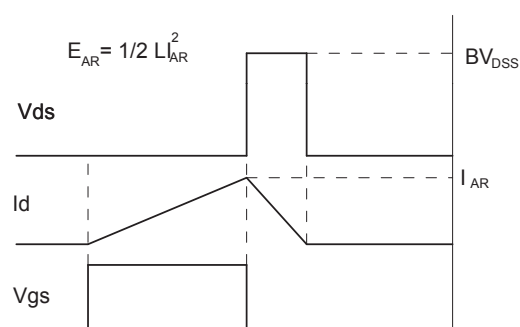
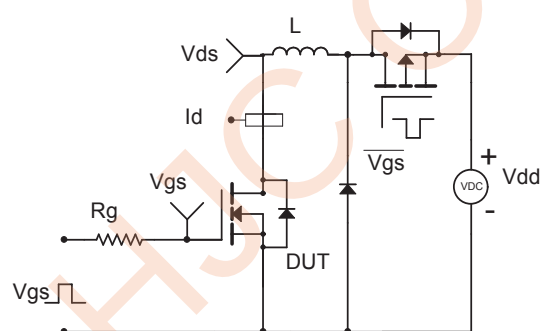
1. Gate Charge Test Circuit & Waveforms



2. Resistive Switching Test Circuit & Waveforms



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



4. Diode Recovery Test Circuit & Waveforms

