

TO-252 Plastic-Encapsulate MOSFETS

Features

- $V_{DS}=-40V$
- $I_D=-40A$
- $R_{DS(on)}@V_{GS}=-10V < 13m\Omega$
- $R_{DS(on)}@V_{GS}=-4.5V < 18m\Omega$
- Low Gate Charge and R_{dson}
- Fast Switching Speedze
- Improved dv/dt capability, high ruggedness

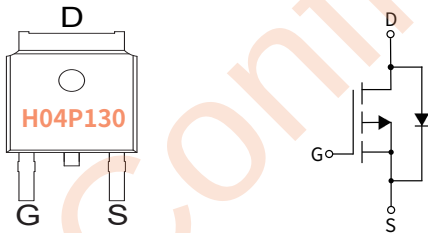
Applications

- 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	-40
Gate-source Voltage	V_{GS}	V	± 20
Drain Current	I_D	A	-40
Pulsed Drain Current ⁽¹⁾	I_{DM}	A	-160
Total Power Dissipation	P_D	W	73
Single pulse avalanche energy ⁽²⁾	EAS	mJ	70
Junction temperature	T_J	°C	-55 ~+150
Storage temperature	T_{stg}	°C	-55 ~+150
Thermal Resistance Junction-to-Case	$R_{\theta JC}$	°C / W	1.7

Drain-source Voltage
-40 V
Drain Current
-40 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	-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	-1.5	-2.5
Static Drain-Source On-Resistance ⁽³⁾	R _{DS(on)}	V _{GS} = -10V, I _D =-12A	mΩ	—	9	13
		V _{GS} = -4.5V, I _D =-10A		—	12	18

● Dynamic Parameters

PARAMETER	SYMBOL	Condition	UNIT	Min	Typ	Max
Input Capacitance	C _{iss}	V _{DS} =-20V, V _{GS} =0V, f=1MHZ	pF	—	3500	—
Output Capacitance	C _{oss}			—	323	—
Reverse Transfer Capacitance	C _{rss}			—	280	—

● Switching Parameters

PARAMETER	SYMBOL	Condition	UNIT	Min	Typ	Max
Turn-on Delay Time	t _{D(on)}	V _{GS} =-10V, V _{DD} =-25V, I _D =-25A, R _{GEN} =6Ω	nS	—	12	—
Turn-on Rise Time	t _r		nS	—	10	—
Turn-off Delay Time	t _{D(off)}		nS	—	203	—
Turn-off fall Time	t _f		nS	—	91	—
Total Gate Charge	Q _g	V _{DS} =-25V, I _D =-25A V _{GS} =-10V	nC	—	72	—
Gate-Source Charge	Q _{gs}		nC	—	8	—
Gate-Drain Charge	Q _{gd}		nC	—	15	—

● 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	—	—	-40
Reverse Recovery Time	t _{rr}	I _F =-25A di/dt=100A/μs	nS	—	24	—
Reverse Recovery Charge	Q _{rr}		nC	—	12	—

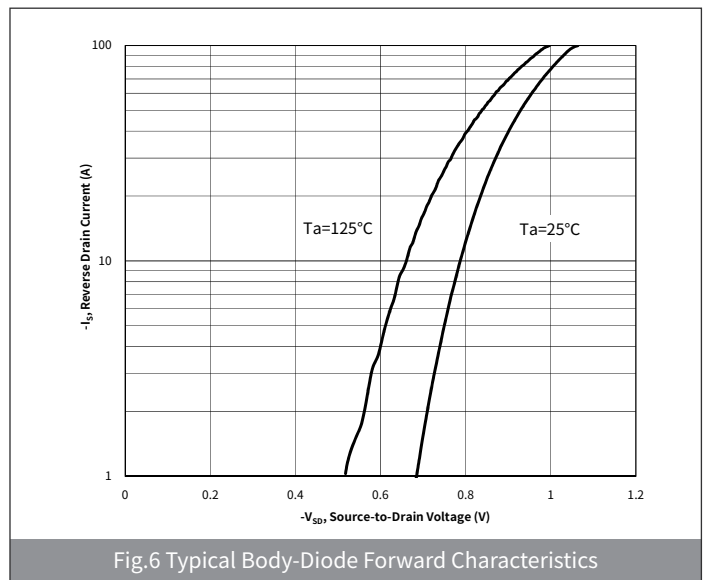
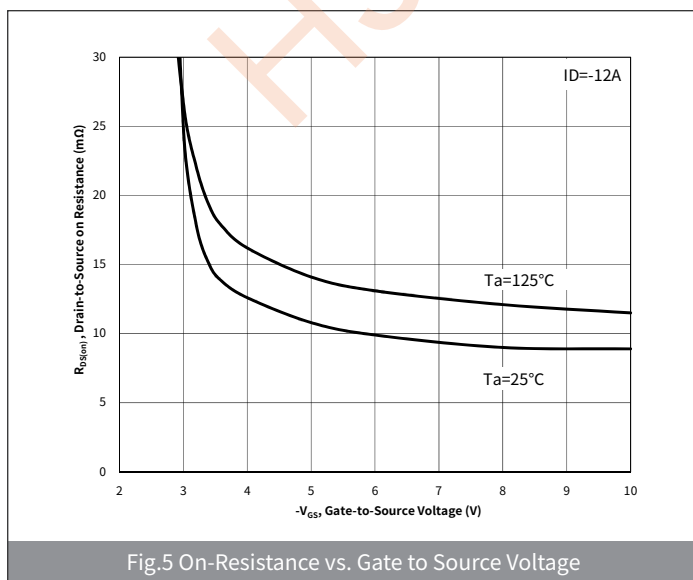
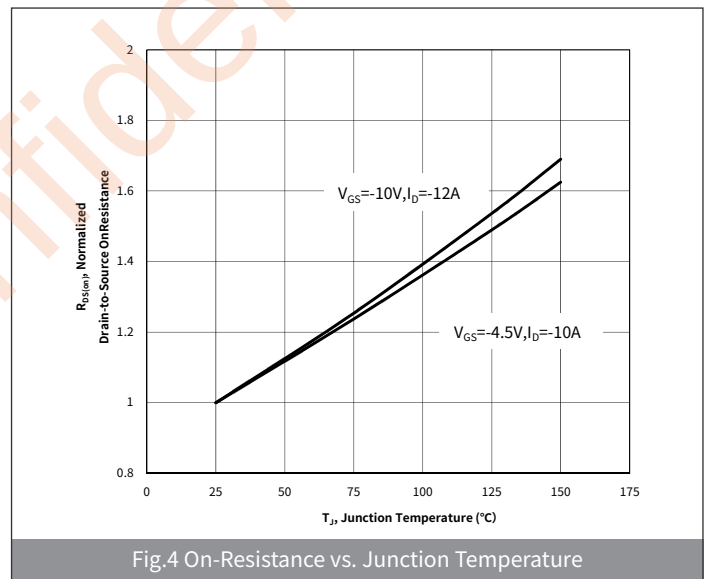
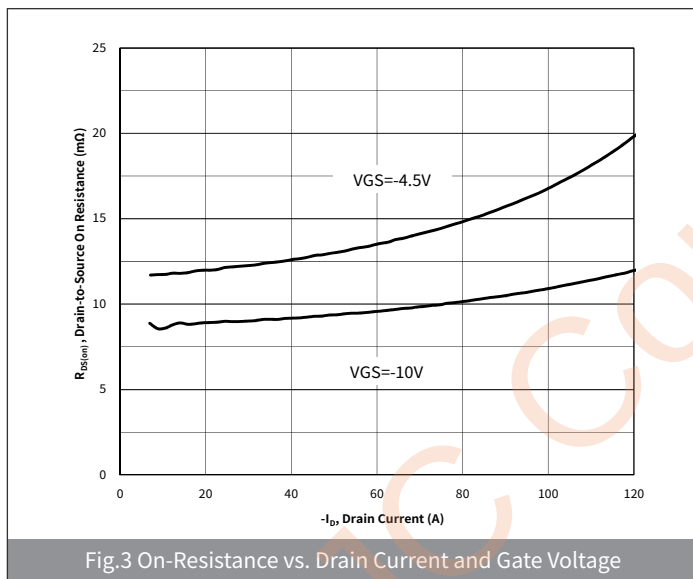
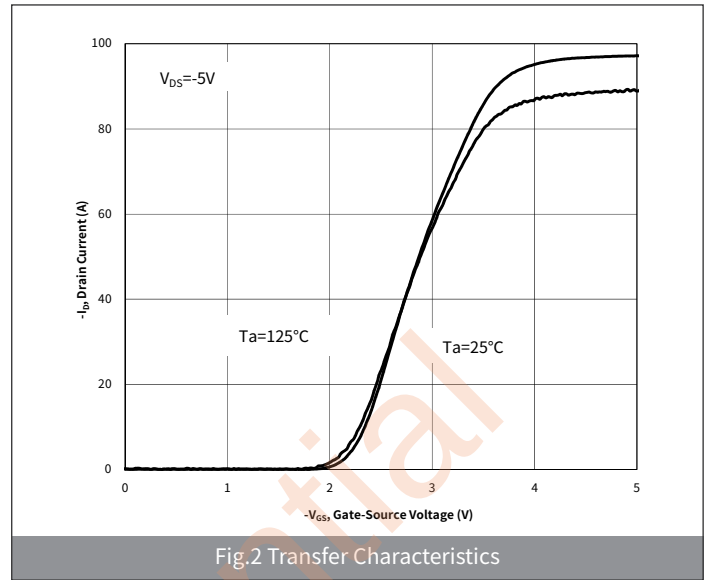
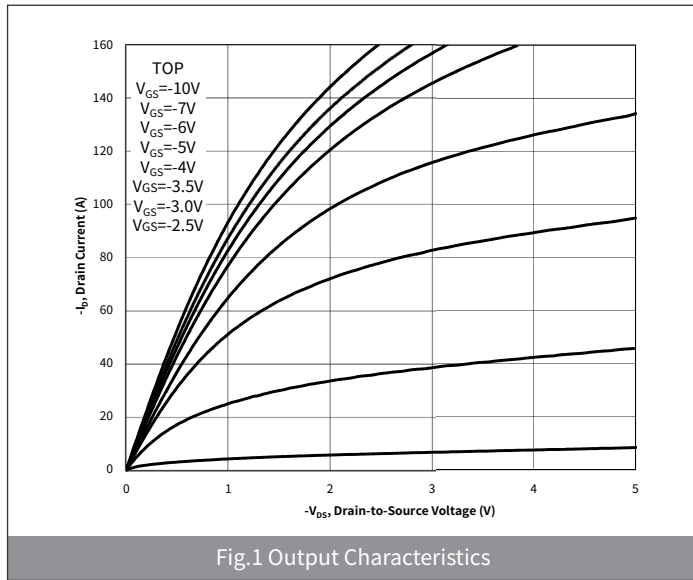
Note :

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

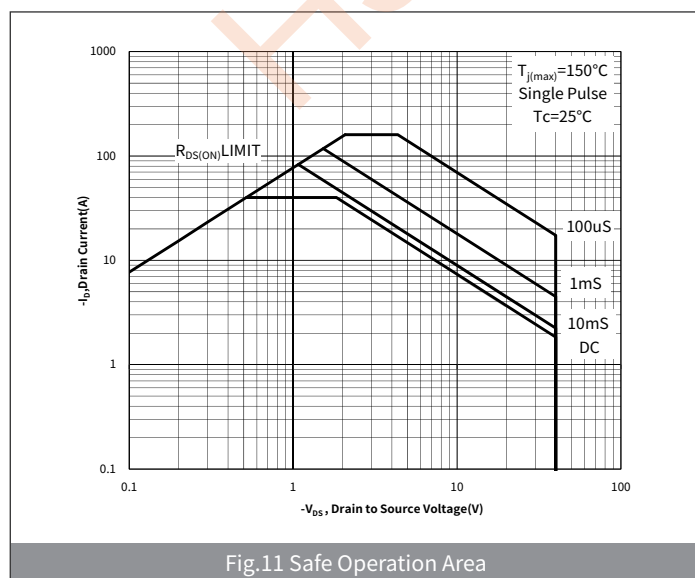
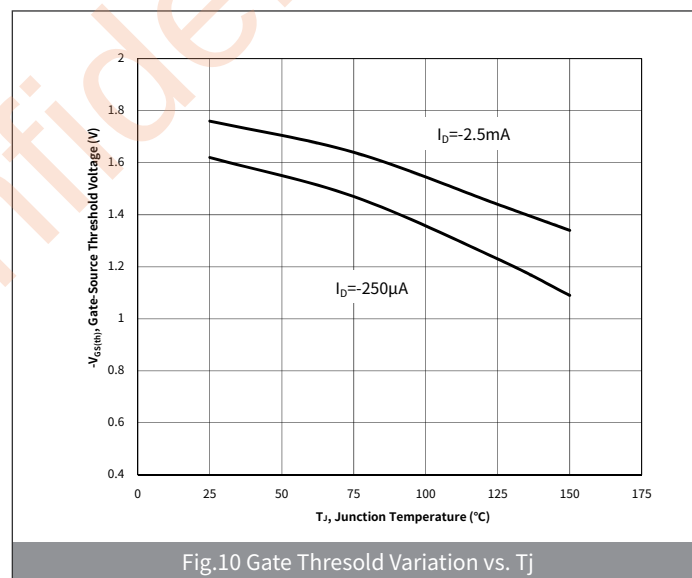
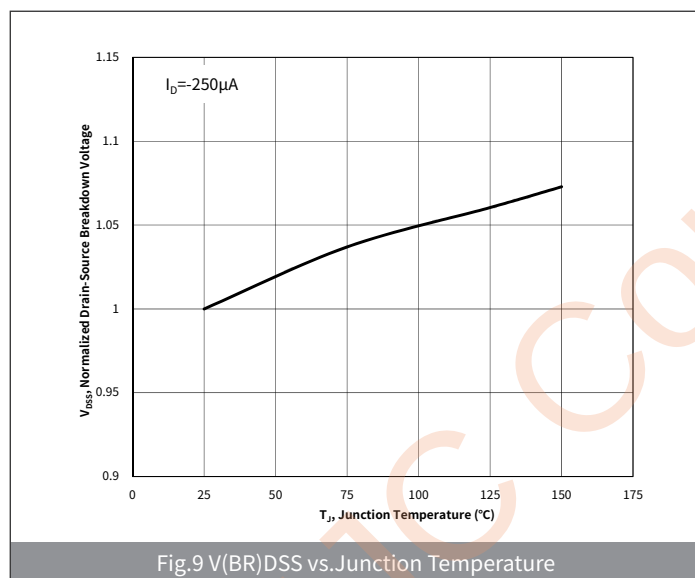
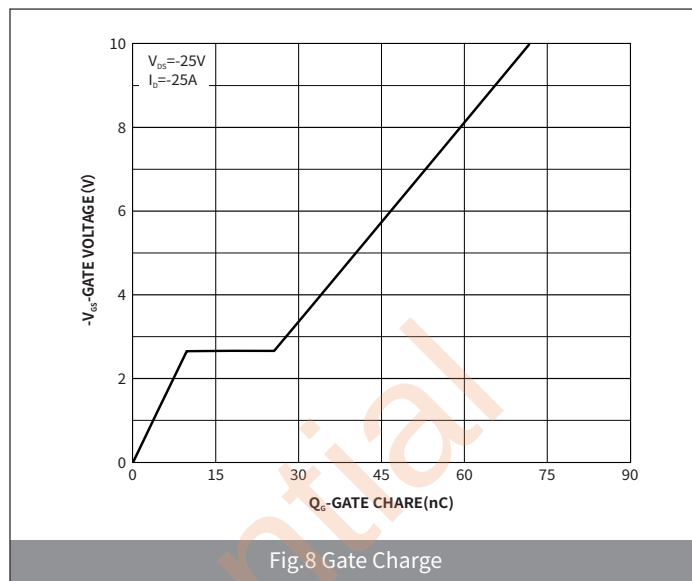
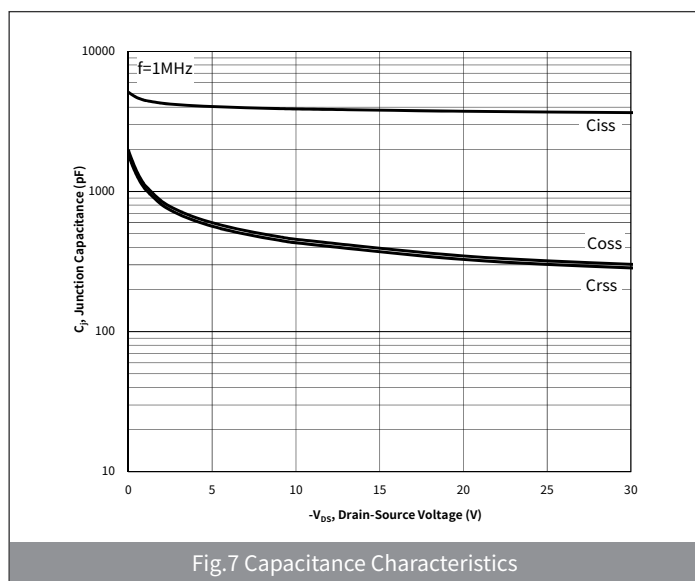
(2) EAS condition : T_j=25°C ,V_{DD}=-20V,V_G=-10V,L=0.1mH,I_{AS}=-38A,R_G=25Ω.

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

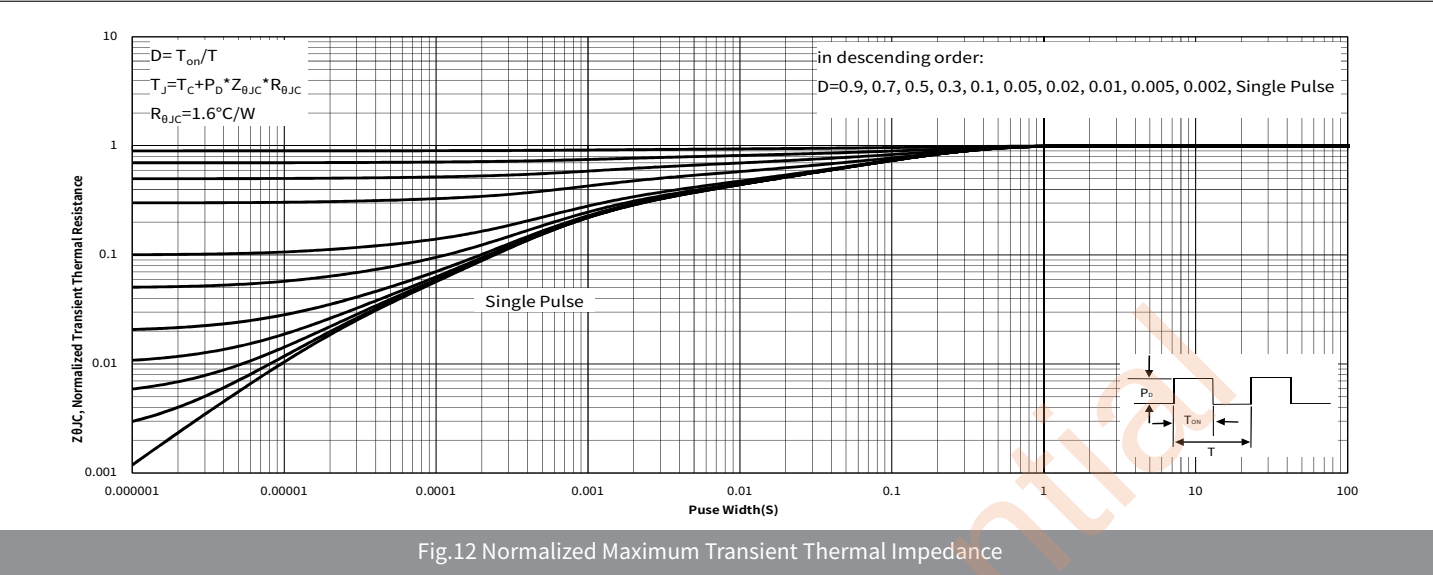
● Ratings And Characteristics Curves (Ta=25°C Unless otherwise specified)



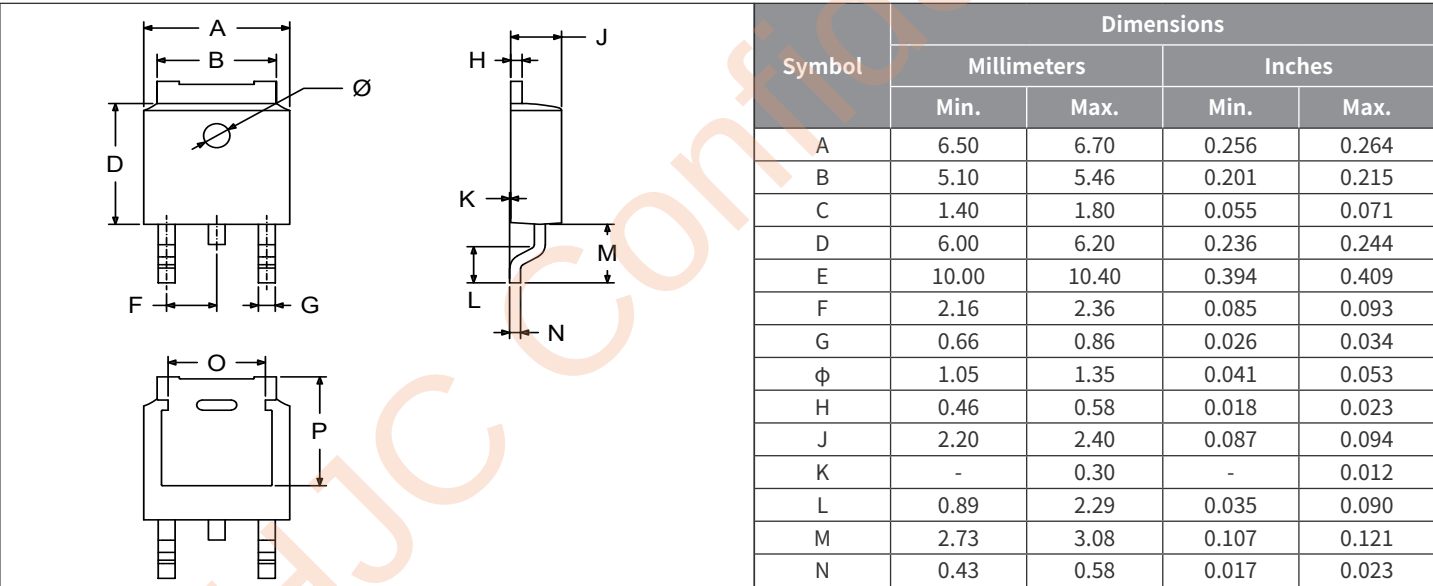
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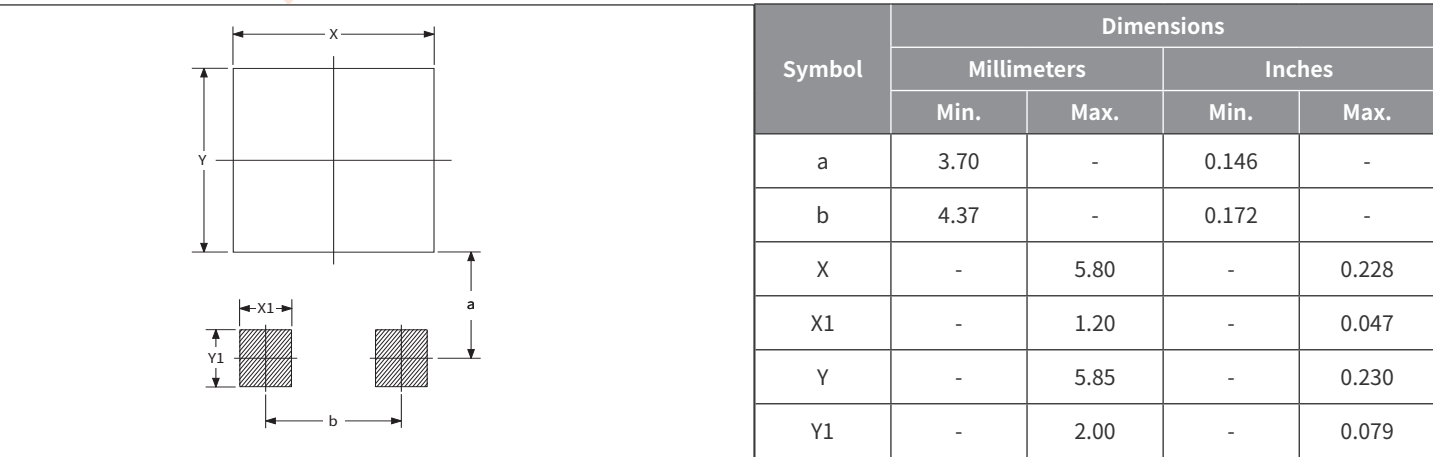
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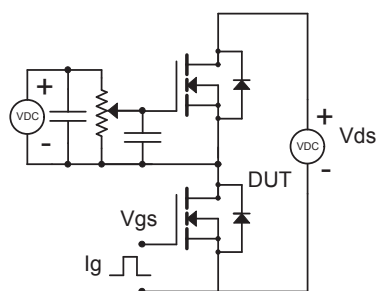
● Package Outline Dimensions (TO-252)



● Suggested Pad Layout



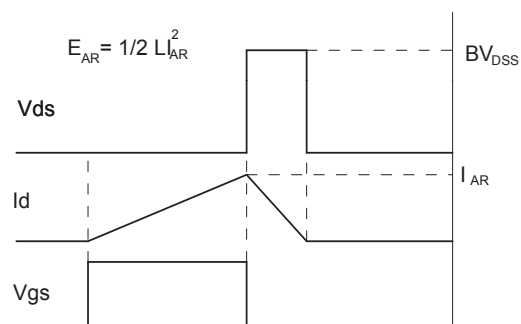
1. Gate Charge Test Circuit & Waveforms



2. Resistive Switching Test Circuit & Waveforms



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



4. Diode Recovery Test Circuit & Waveforms

