

TO-252 Plastic-Encapsulate MOSFETS

Features

- $V_{DS}=20V$
- $I_D=50A$
- $R_{DS(on)}@V_{GS}=4.5V < 8m\Omega$
- $R_{DS(on)}@V_{GS}=2.5V < 13m\Omega$
- Avalanche energy tested
- Fast Switching Speedze
- Improved dv/dt capability, high ruggedness

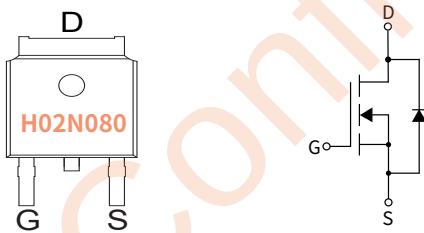
Applications

- DC-DC Converter
- Load switch
- Power management

Mechanical Data

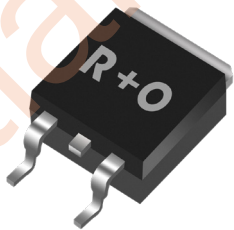
- Case: TO-252
Molding compound meets UL 94V-0 flammability rating, RoHS-compliant,halogen-free
- Terminals: Solder plated, solderable per MIL-STD-750,Method 2026

Function Diagram



Drain-source Voltage
20 V
Drain Current
50 Ampere

TO-252



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	20
Gate-source Voltage	V_{GS}	V	± 12
Drain Current	I_D	A	50
Pulsed Drain Current ⁽¹⁾	I_{DM}	A	200
Total Power Dissipation	P_D	W	32
Single pulse avalanche energy ⁽²⁾	EAS	mJ	42.25
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

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

PARAMETER	SYMBOL	Condition	UNIT	Min	Typ	Max
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_D=250\mu A$	V	20	—	—
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=16V, V_{GS}=0V$	μA	—	—	1.0
Gate-Body Leakage Current	I_{GSS}	$V_{GS}=\pm 12V, V_{DS}=0V$	nA	—	—	± 100
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	V	0.5	0.7	1.2
Static Drain-Source On-Resistance ⁽³⁾	$R_{DS(on)}$	$V_{GS}=4.5V, I_D=20A$	m Ω	—	6.3	8
		$V_{GS}=2.5V, I_D=15A$		—	8	13

● Dynamic Parameters

PARAMETER	SYMBOL	Condition	UNIT	Min	Typ	Max
Input Capacitance	C_{iss}	$V_{DS}=10V, V_{GS}=0V, f=1MHz$	pF	—	1615	—
Output Capacitance	C_{oss}			—	225	—
Reverse Transfer Capacitance	C_{rss}			—	196	—

● Switching Parameters

PARAMETER	SYMBOL	Condition	UNIT	Min	Typ	Max
Turn-on Delay Time	$t_{D(on)}$	$V_{GS}=4.5V, V_{DD}=10V, I_D=20A, R_{GEN}=3\Omega$	nS	—	8	—
Turn-on Rise Time	t_r		nS	—	20	—
Turn-off Delay Time	$t_{D(off)}$		nS	—	37	—
Turn-off fall Time	t_f		nS	—	23	—
Total Gate Charge	Q_g	$V_{DS}=10V, I_D=20A, V_{GS}=4.5V$	nC	—	17	—
Gate-Source Charge	Q_{gs}		nC	—	3.6	—
Gate-Drain Charge	Q_{gd}		nC	—	5.5	—

● Drian-Source Diode Characteristics

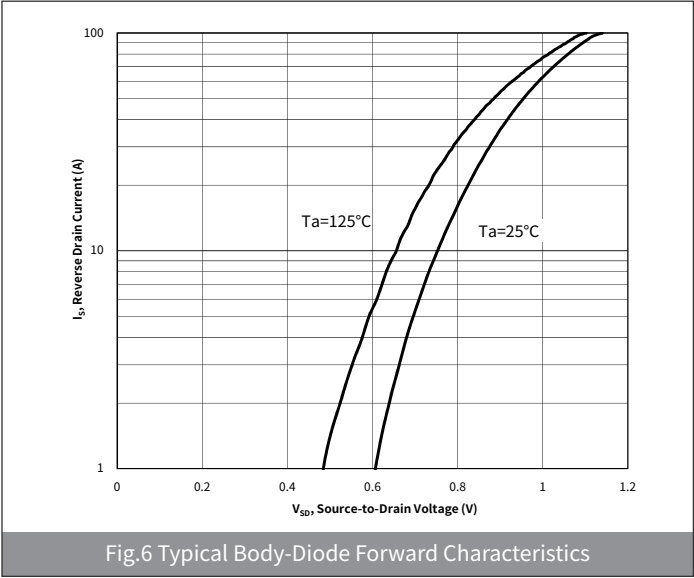
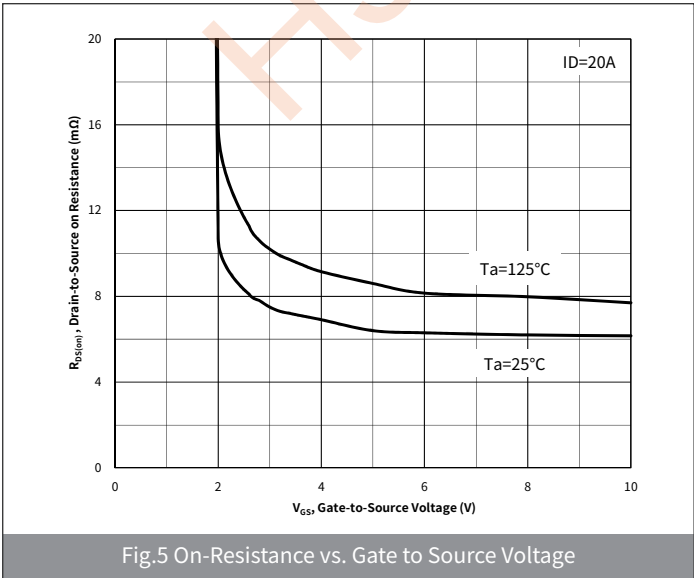
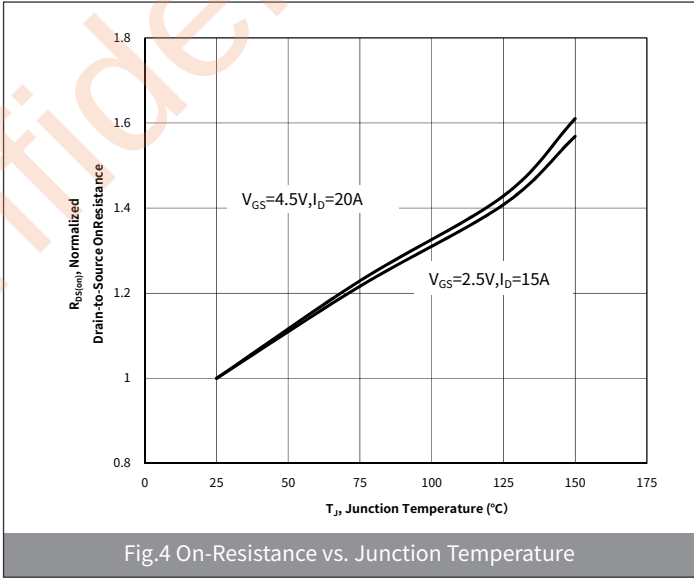
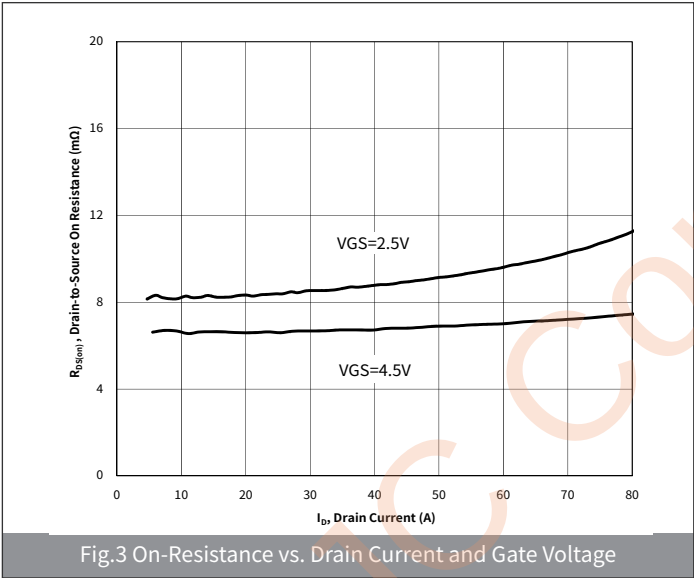
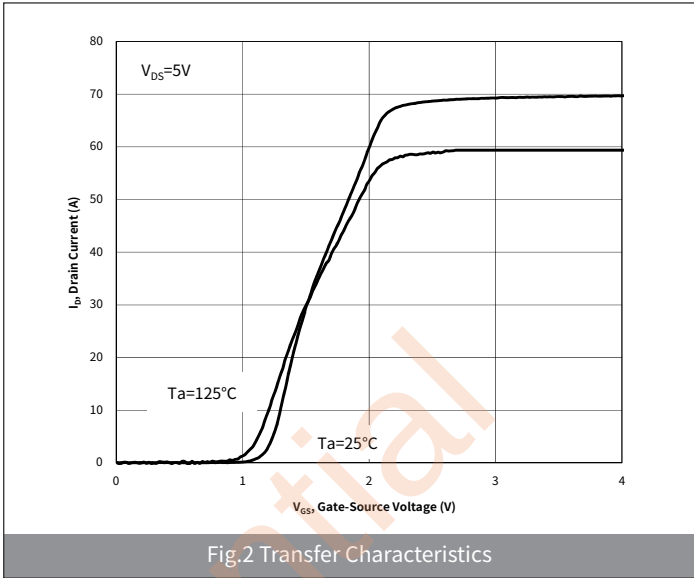
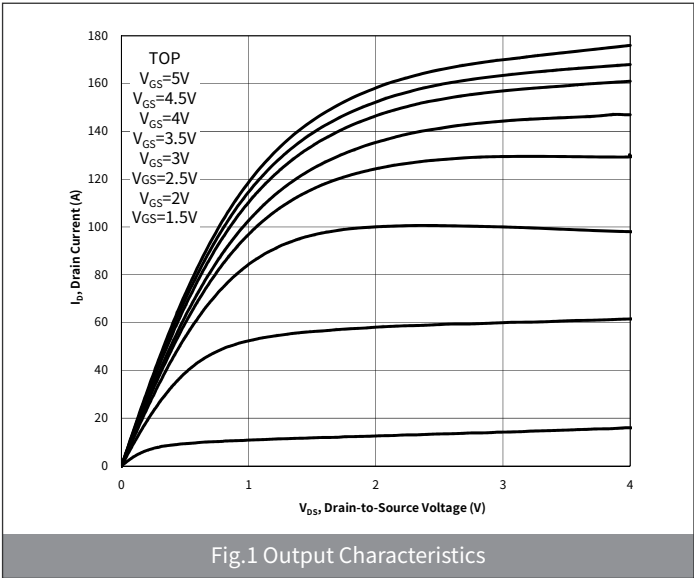
PARAMETER	SYMBOL	Condition	UNIT	Min	Typ	Max
Diode Forward Voltage	V_{SD}	$I_S=1A, V_{GS}=0V$	V	—	—	1.2
Maximum Body-Diode Continuous Current	I_S	—	A	—	—	50
Reverse Recovery Time	t_{rr}	$I_F=20A, di/dt=100A/\mu s$	nS	—	8.5	—
Reverse Recovery Charge	Q_{rr}		nC	—	1.6	—

Note :

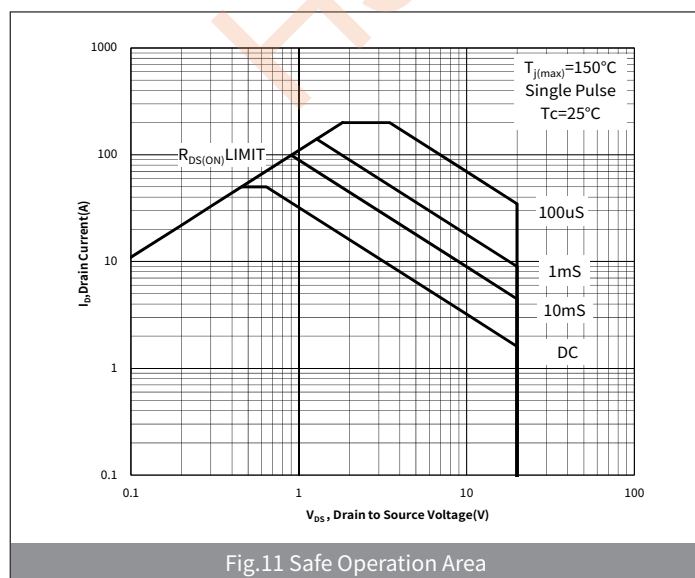
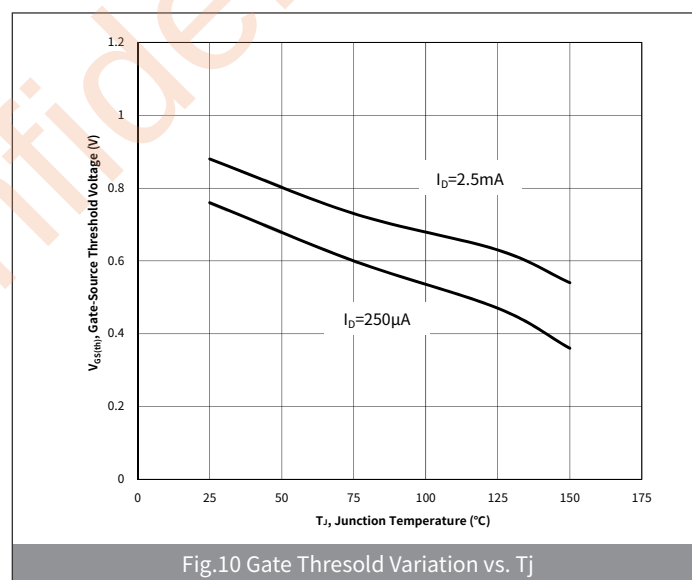
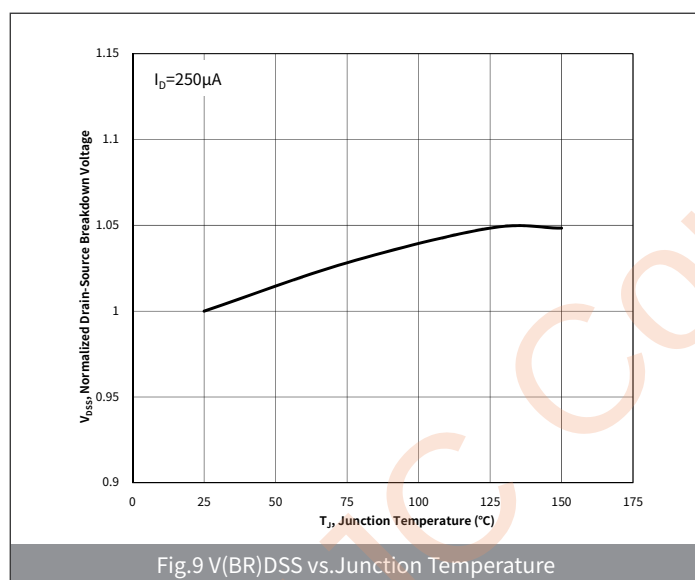
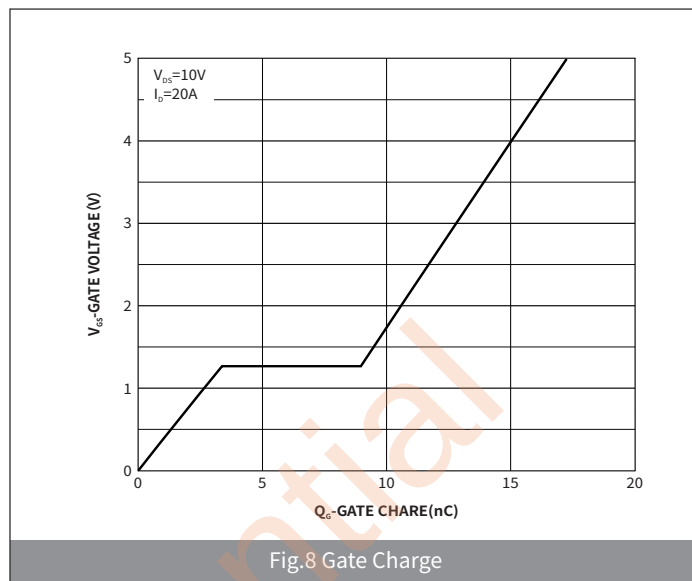
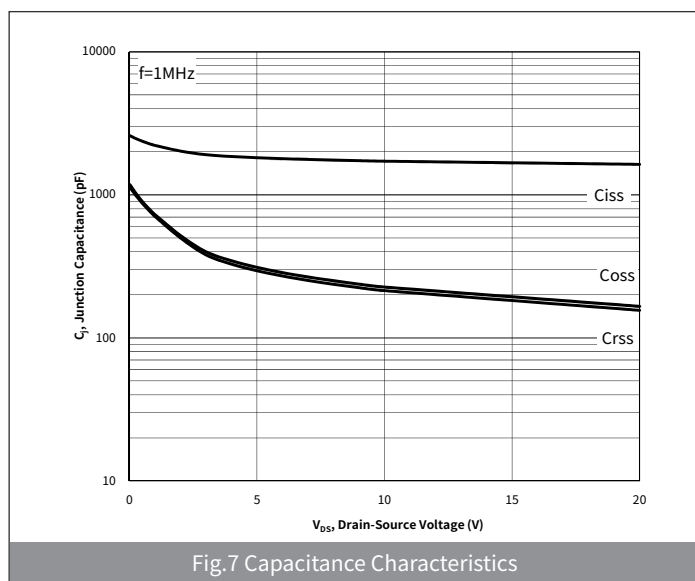
(1) Repetitive Rating: Pulse width limited by maximum junction temperature.

(2) EAS condition : Tj=25°C, VDD=10V, VG=10V, L=0.5mH, IAS=13A, Rg=25 Ω .(3) Pulse Test: Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 2\%$.

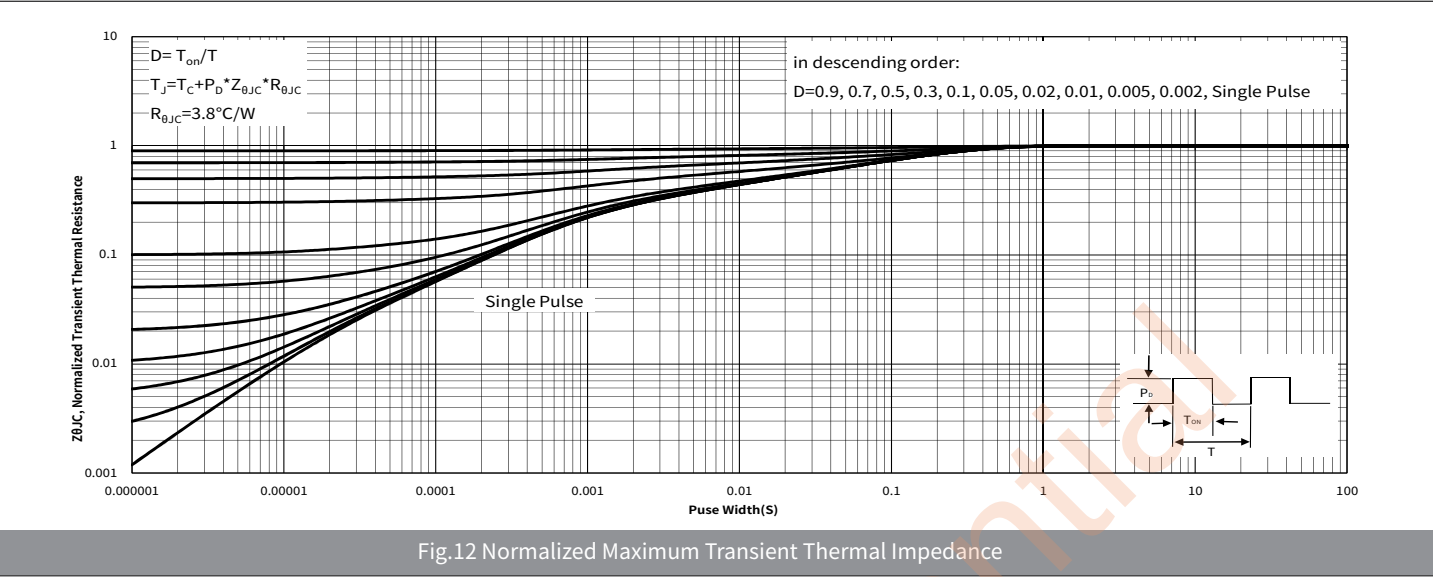
● Ratings And Characteristics Curves (Ta=25°C Unless otherwise specified)



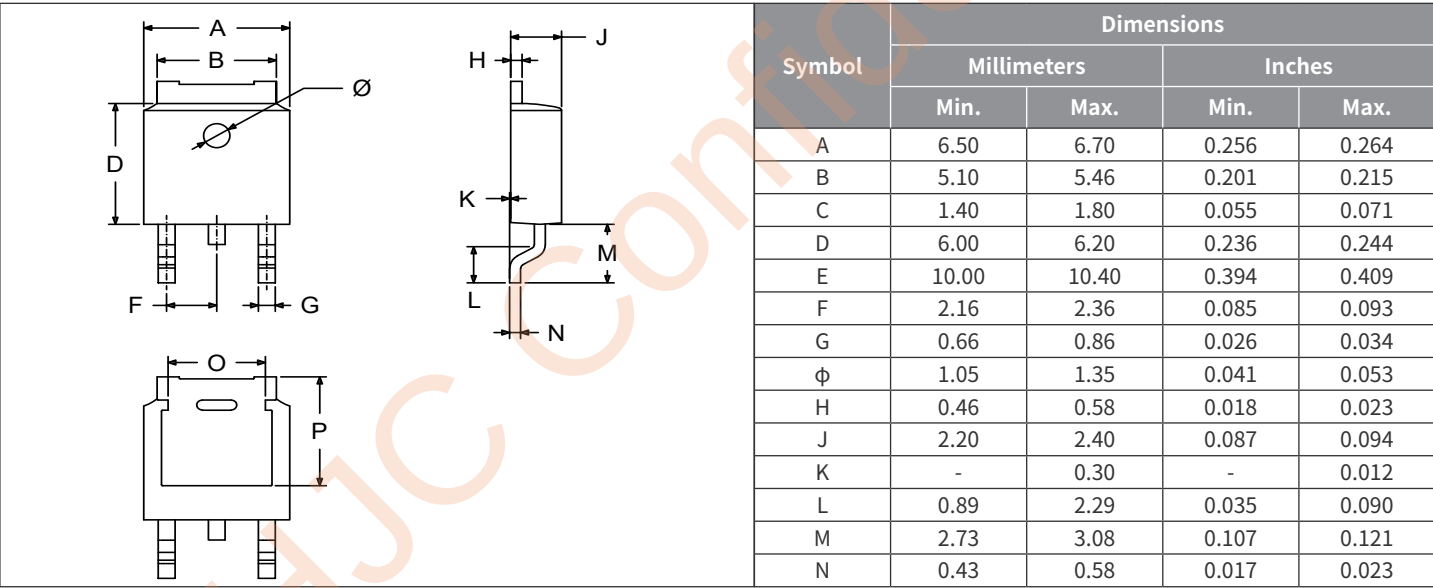
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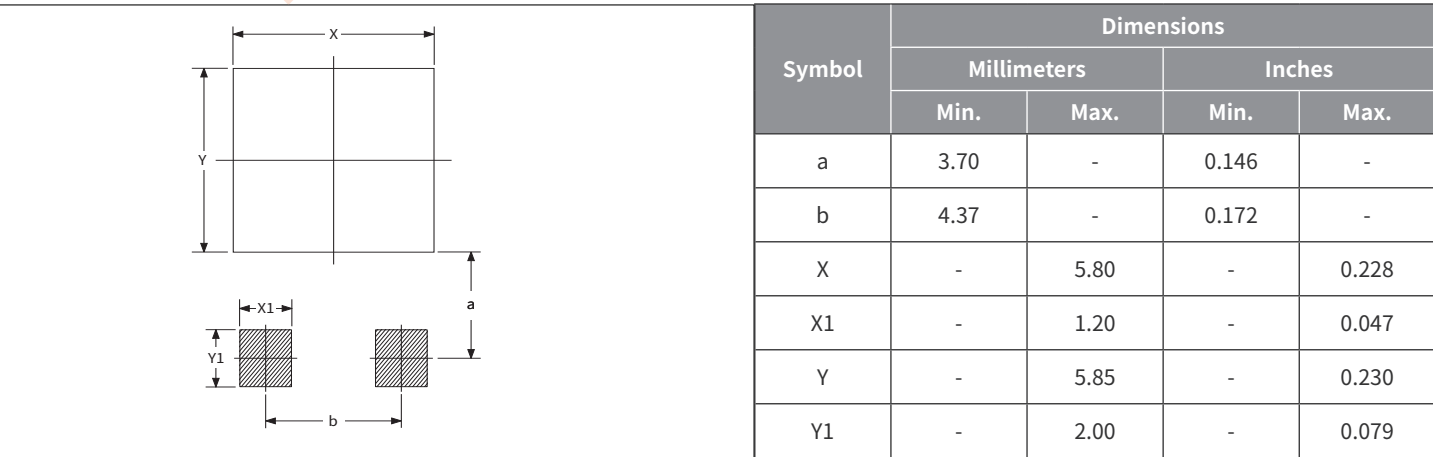
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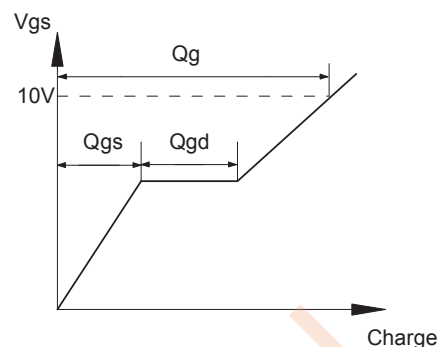
● Package Outline Dimensions (TO-252)



● Suggested Pad Layout



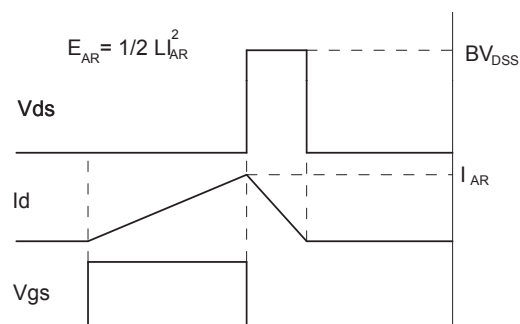
1. Gate Charge Test Circuit & Waveforms



2. Resistive Switching Test Circuit & Waveforms



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



4. Diode Recovery Test Circuit & Waveforms

