

TO-252 Plastic-Encapsulate MOSFETS

Features

- $V_{DS}=-30V$
- $I_D=-40A$
- $R_{DS(on)}@V_{GS}=-10V < 18m\Omega$
- $R_{DS(on)}@V_{GS}=-4.5V < 30m\Omega$
- Low Gate Charge and R_{ds}
- Fast Switching Speedze
- Improved dv/dt capability, high ruggedness

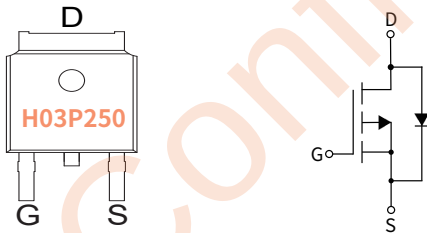
Applications

- 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



Drain-source Voltage
-30 V
Drain Current
-40 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	-30
Gate-source Voltage	V_{GS}	V	± 20
Drain Current	I_D	A	-40
Pulsed Drain Current ⁽¹⁾	I_{DM}	A	-120
Total Power Dissipation	P_D	W	50
Single pulse avalanche energy ⁽²⁾	EAS	mJ	37.7
Junction temperature	T_J	°C	-55 ~+150
Storage temperature	T_{stg}	°C	-55 ~+150
Thermal Resistance Junction-to-Case	$R_{\theta JC}$	°C / W	2.5

● 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	-30	—	—
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =-30V, 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 =-20A	mΩ	—	15	18
		V _{GS} = -4.5V, I _D =-15A		—	21	30

● Dynamic Parameters

PARAMETER	SYMBOL	Condition	UNIT	Min	Typ	Max
Input Capacitance	C _{iss}	V _{DS} =-15V, V _{GS} =0V, f=1MHZ	pF	—	1920	—
Output Capacitance	C _{oss}			—	210	—
Reverse Transfer Capacitance	C _{rss}			—	196	—

● Switching Parameters

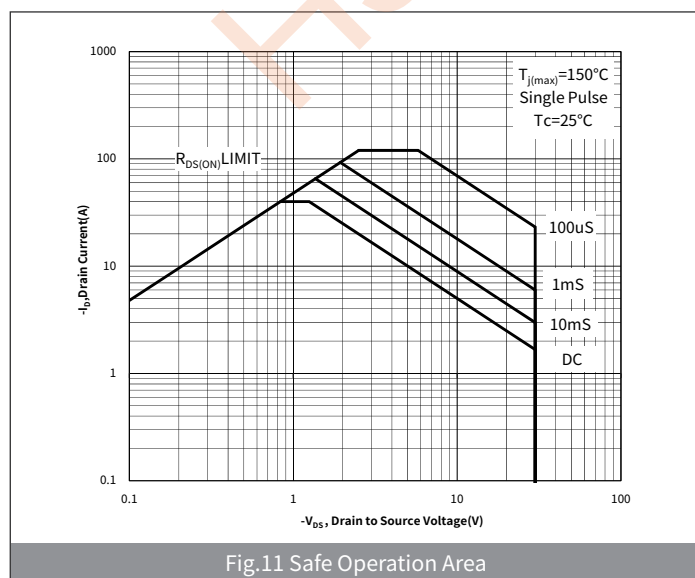
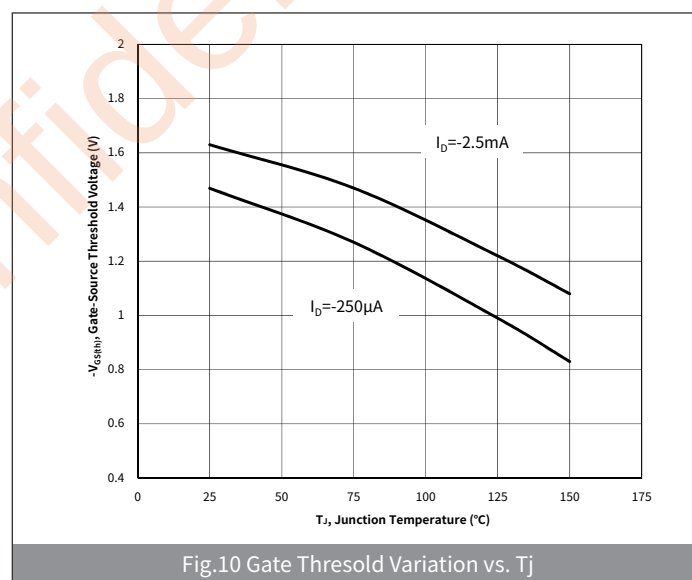
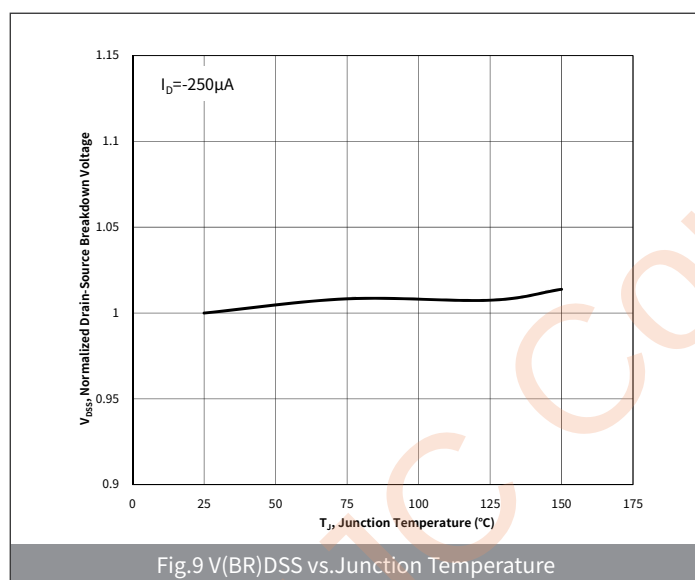
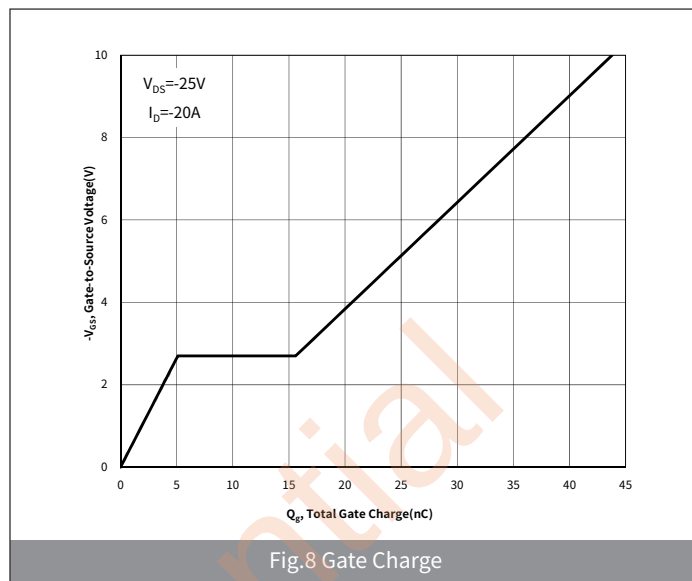
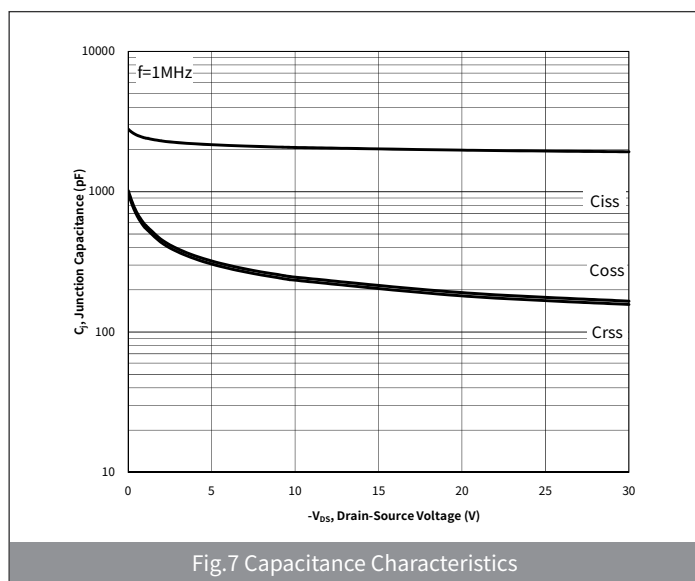
PARAMETER	SYMBOL	Condition	UNIT	Min	Typ	Max
Turn-on Delay Time	t _{D(on)}	V _{GS} =-10V, V _{DD} =-15V, I _D =-20A, R _{GEN} =3Ω	nS	—	10	—
Turn-on Rise Time	t _r		nS	—	11.5	—
Turn-off Delay Time	t _{D(off)}		nS	—	55	—
Turn-off fall Time	t _f		nS	—	22	—
Total Gate Charge	Q _g	V _{DS} =-25V, I _D =-20A V _{GS} =-10V	nC	—	43.8	—
Gate-Source Charge	Q _{gs}		nC	—	5.1	—
Gate-Drain Charge	Q _{gd}		nC	—	10.5	—

● Drian-Source Diode Characteristics

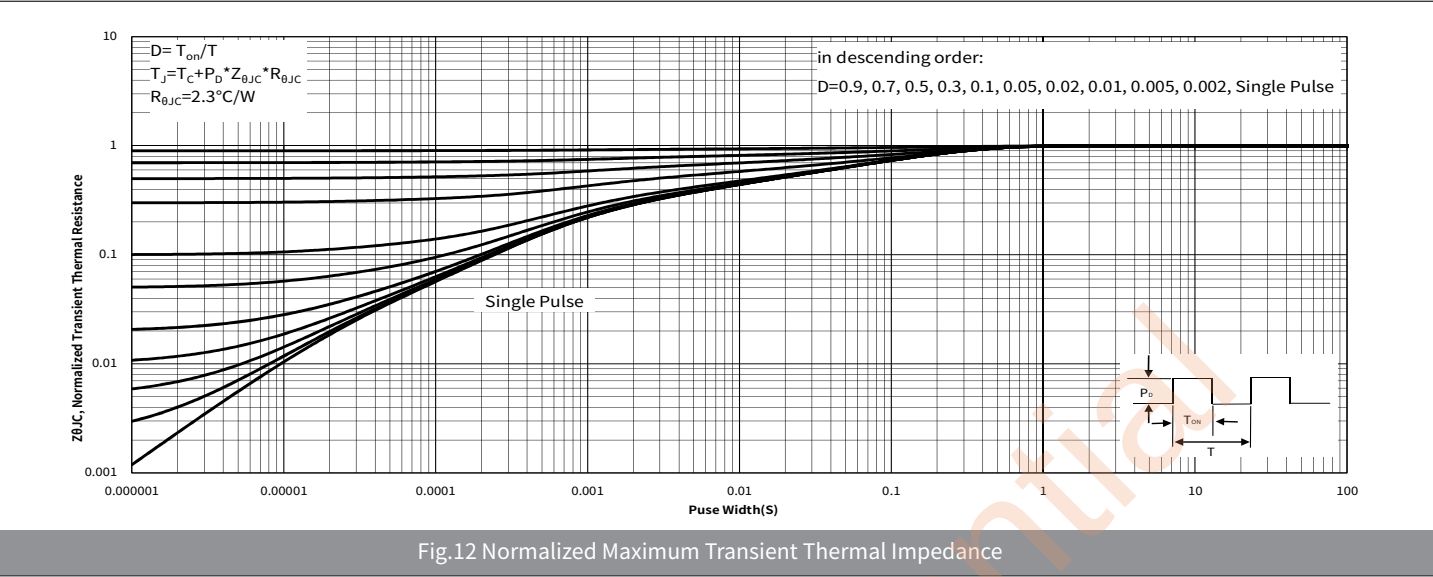
PARAMETER	SYMBOL	Condition	UNIT	Min	Typ	Max
Diode Forward Voltage	V _{SD}	I _S =-15A, V _{GS} =0V	V	—	—	-1.2
Maximum Body-Diode Continuous Current	I _S	—	A	—	—	-40

Note :
(1)Repetitive Rating: Pulse width limited by maximum junction temperature.
(2)EAS condition : Tj=25°C ,VDD=-15V,VG=-10V,L=0.5mH,IAS=-12.3A,Rg=25Ω .
(3)Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2%.

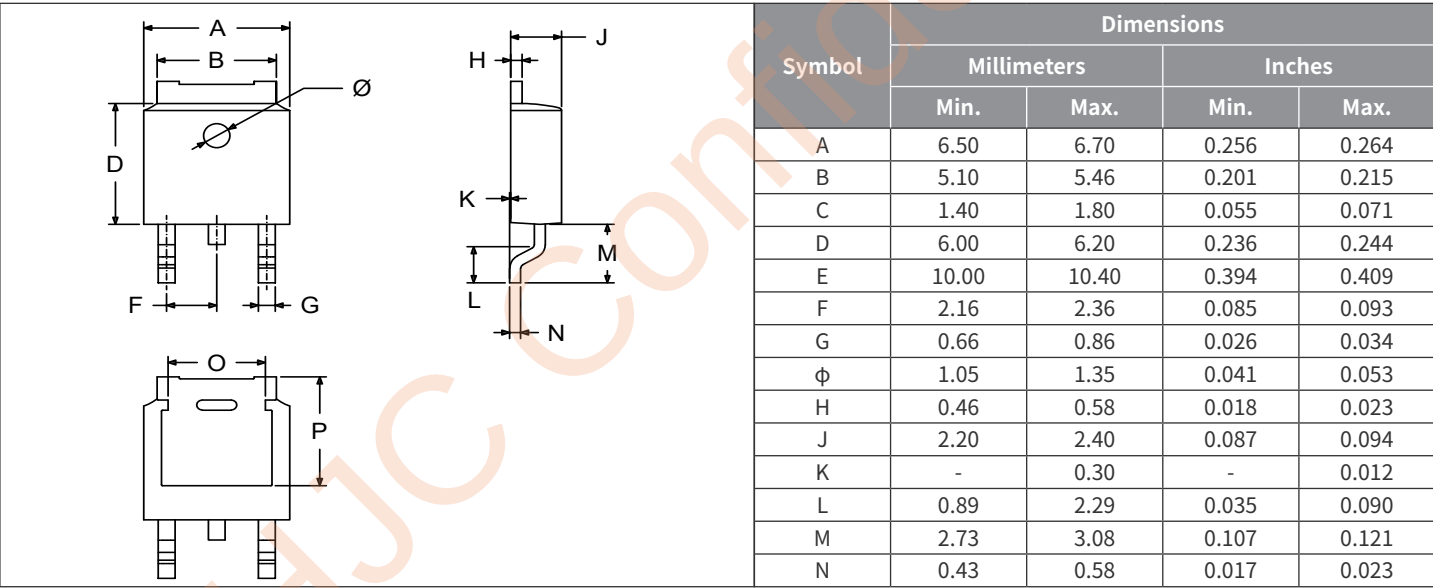
● Ratings And Characteristics Curves (Ta=25°C Unless otherwise specified)



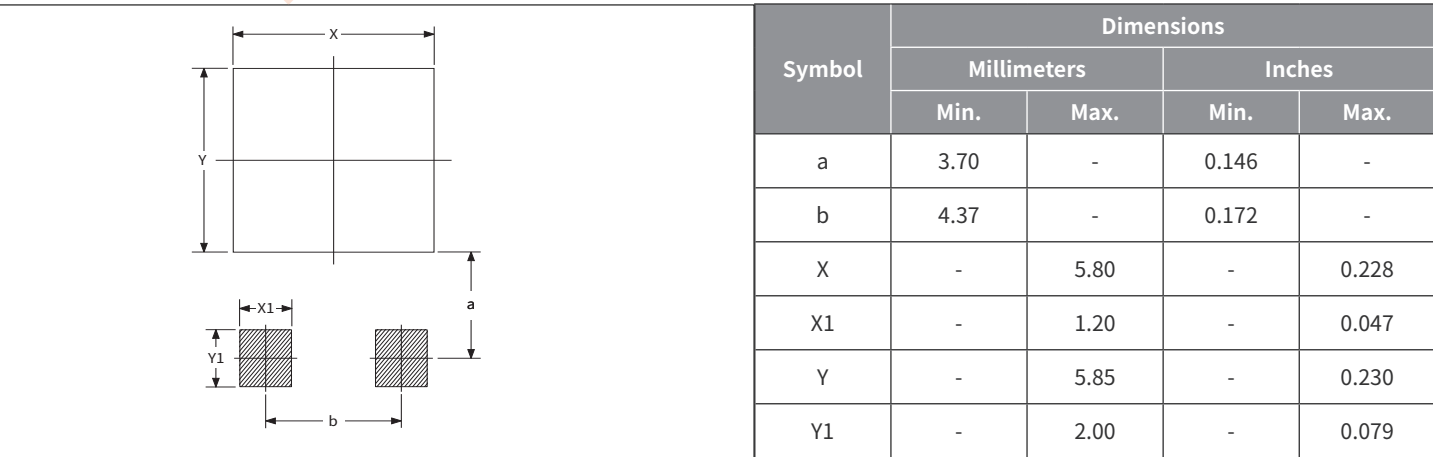
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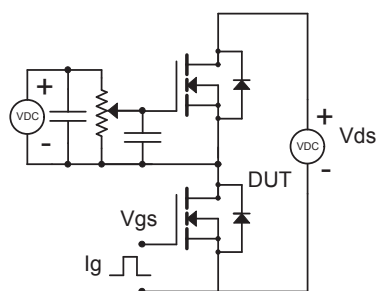
● Package Outline Dimensions (TO-252)



● Suggested Pad Layout



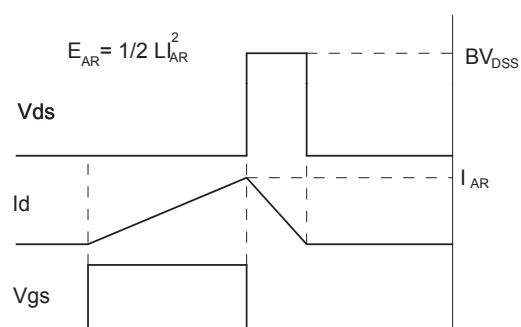
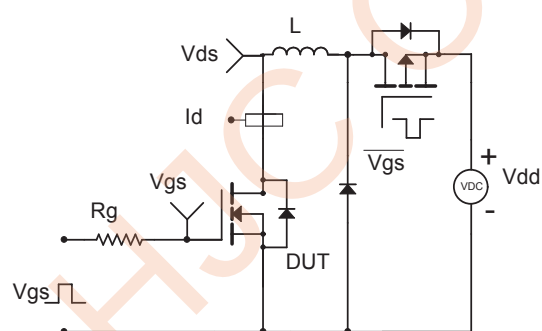
1. Gate Charge Test Circuit & Waveforms



2. Resistive Switching Test Circuit & Waveforms



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



4. Diode Recovery Test Circuit & Waveforms

