

TO-252 Plastic-Encapsulate MOSFETS

Features

- VDS=-60V
- ID=-60A
- RDS(on)@VGS=-10V < 16mΩ
- RDS(on)@VGS=-4.5V < 20mΩ
- Low Gate Charge and Rdson
- Fast Switching Speedze
- Advanced Split Gate Trench Technology

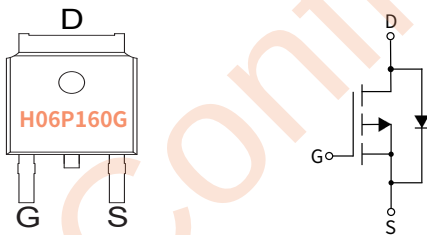
Applications

- DC-DC Converter
- Portatle Equipment
- 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
-60 V
Drain Current
-60 Ampere



Ordering Information

Table with 7 columns: PACKAGE, PACKAGE CODE, UNIT WEIGHT(g), REEL(pcs), BOX(pcs), CARTON(pcs), DELIVERY MODE. Row 1: TO-252, R3, 0.305, 2500, 5000, 25000, 13"

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

Table with 4 columns: PARAMETER, SYMBOL, UNIT, VALUE. Rows include: Drain-source Voltage (VDS, V, -60), Gate-source Voltage (VGS, V, ±20), Drain Current (ID, A, -60), Pulsed Drain Current (IDM, A, -220), Total Power Dissipation (PD, W, 100), Single pulse avalanche energy (EAS, mJ, 176), Junction temperature (TJ, °C, -55 ~+150), Storage temperature (Tstg, °C, -55 ~+150), Thermal Resistance Junction-to-Case (RθJC, °C / W, 1.25).

● 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	-60	—	—
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =-60V, 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	-1.8	-2.5
Static Drain-Source On-Resistance ⁽³⁾	R _{DS(ON)}	V _{GS} = -10V, I _D =-20A	mΩ	—	11	16
		V _{GS} = -4.5V, I _D =-10A		—	14	20

● Dynamic Parameters

PARAMETER	SYMBOL	Condition	UNIT	Min	Typ	Max
Input Capacitance	C _{iss}	V _{DS} =-30V, V _{GS} =0V, f=1MHZ	pF	—	2645	—
Output Capacitance	C _{oss}			—	506	—
Reverse Transfer Capacitance	C _{rss}			—	25	—

● Switching Parameters

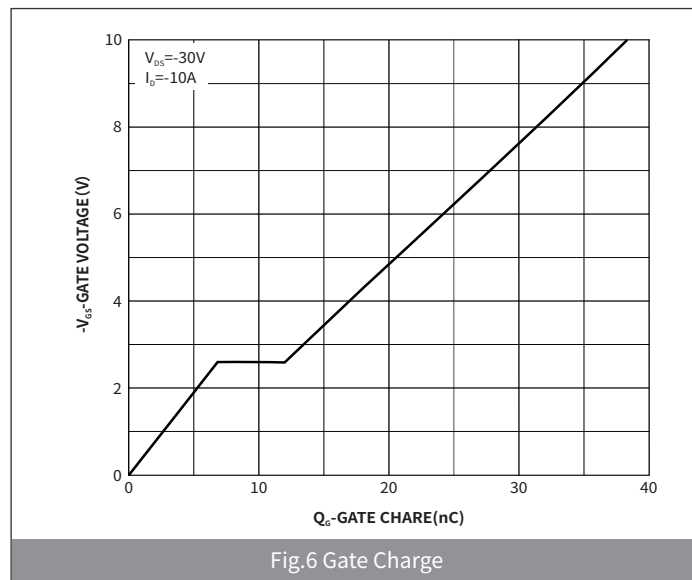
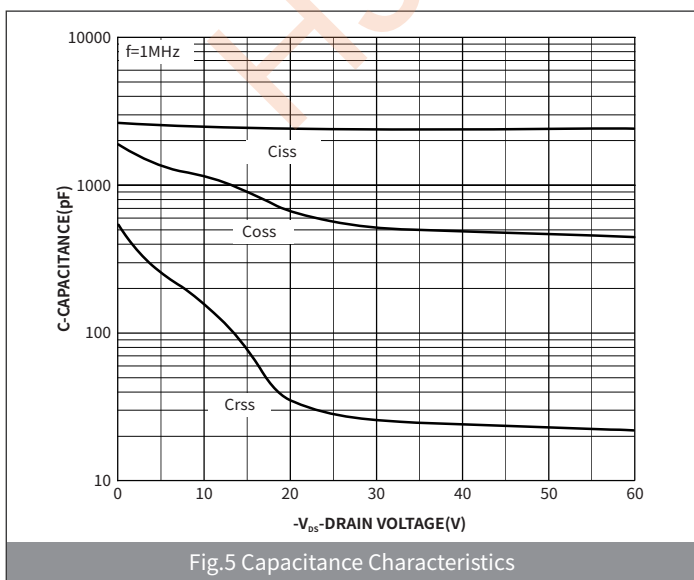
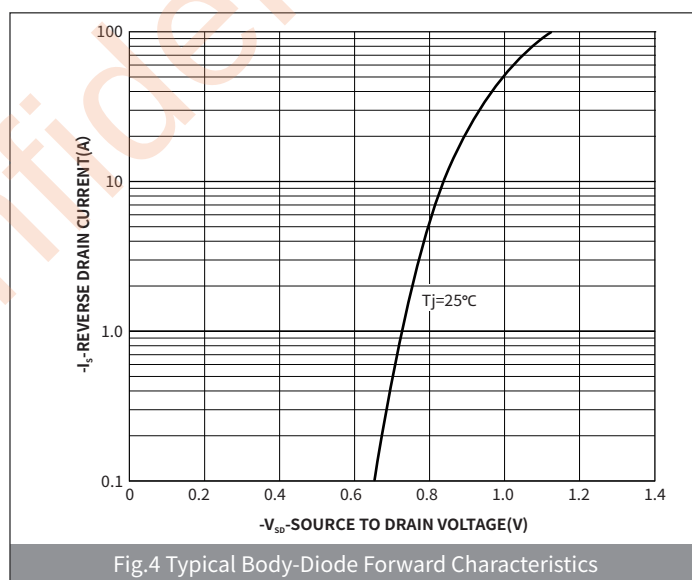
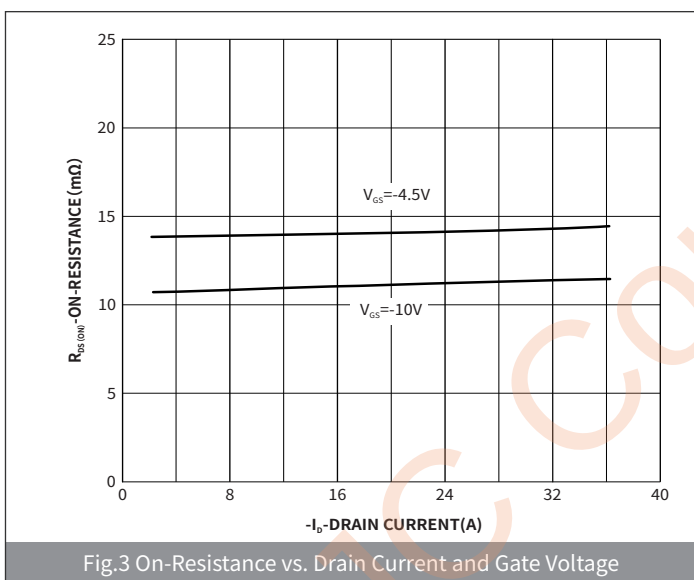
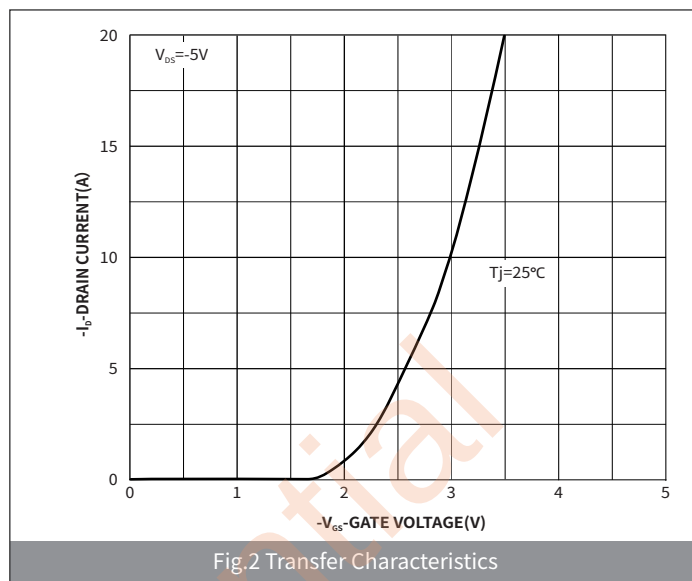
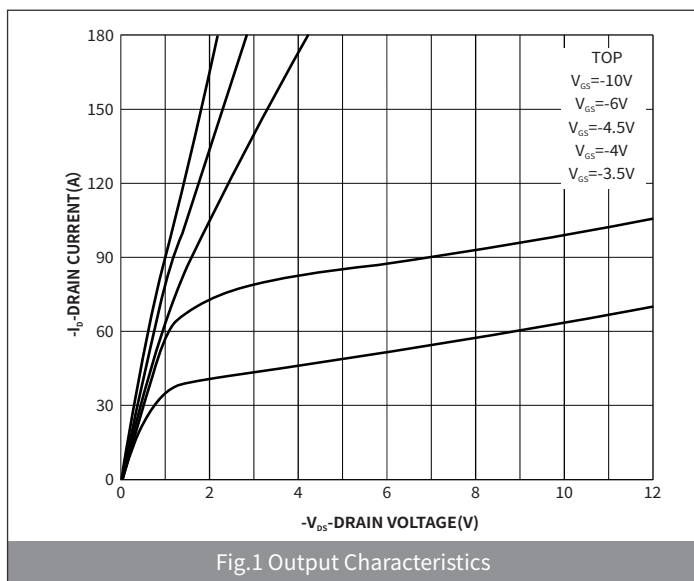
PARAMETER	SYMBOL	Condition	UNIT	Min	Typ	Max
Turn-on Delay Time	t _{D(on)}	V _{GS} =-10V, V _{DD} =-30V, I _D =-10A, R _{GEN} =3Ω	nS	—	20	—
Turn-on Rise Time	t _r		nS	—	25	—
Turn-off Delay Time	t _{D(off)}		nS	—	60	—
Turn-off fall Time	t _f		nS	—	30	—
Total Gate Charge	Q _g	V _{DS} =-30V, I _D =-10A V _{GS} =-10V	nC	—	38	—
Gate-Source Charge	Q _{gs}		nC	—	6.9	—
Gate-Drain Charge	Q _{gd}		nC	—	4.98	—

● Drian-Source Diode Characteristics

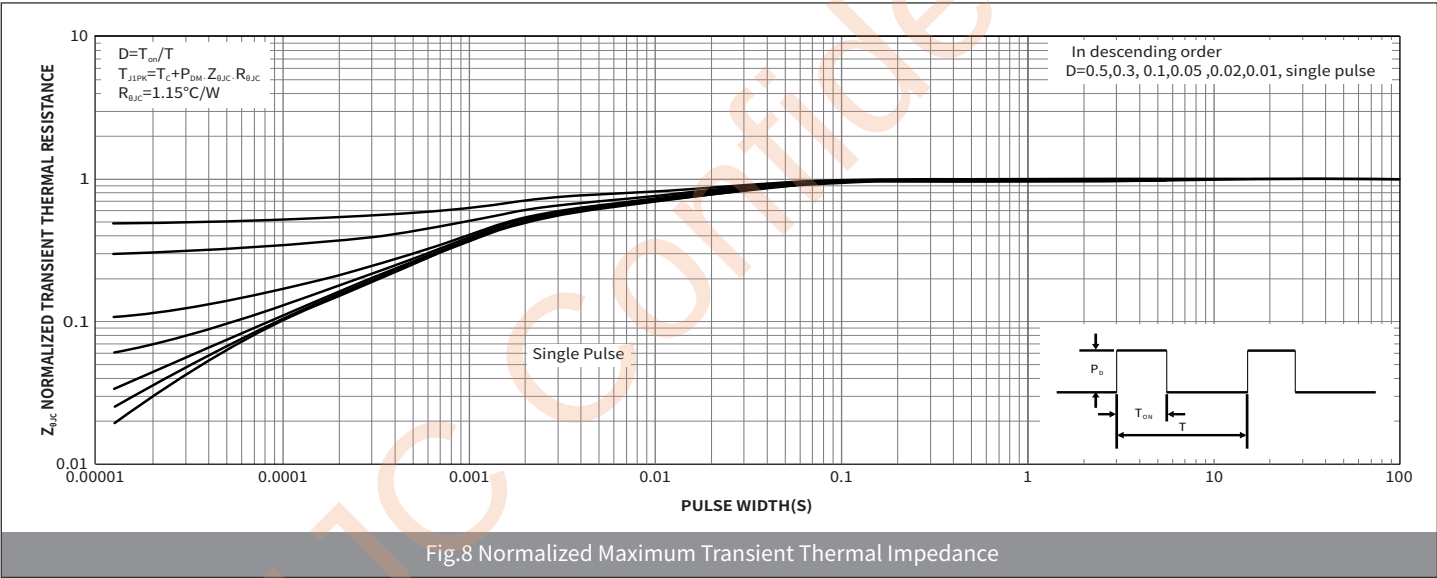
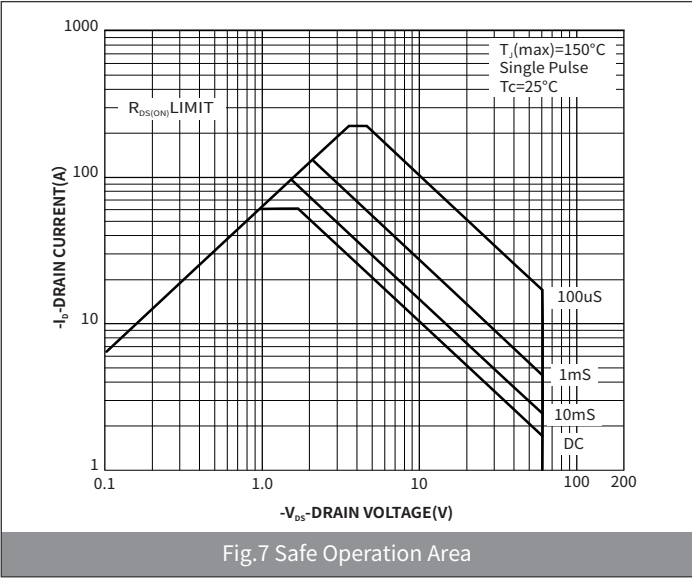
PARAMETER	SYMBOL	Condition	UNIT	Min	Typ	Max
Diode Forward Voltage	V _{SD}	I _S =-60A, V _{GS} =0V	V	—	—	-1.2
Maximum Body-Diode Continuous Current	I _S	—	A	—	—	-60

Note :
(1)Repetitive Rating: Pulse width limited by maximum junction temperature.
(2)EAS condition : Tj=25°C ,VDD=-30V,VG=-10V,L=0.5mH,IAS=-26.5A,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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HB06P160SG

P-CHANNEL MOSFET

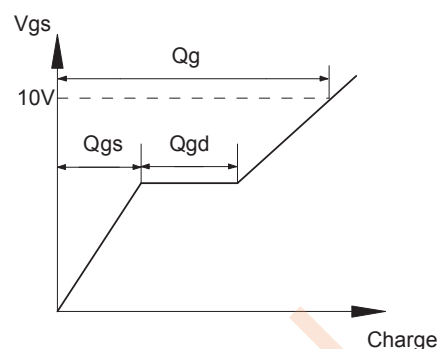
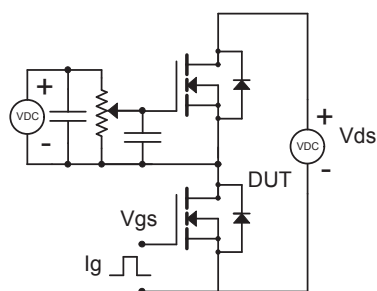
Package Outline Dimensions (TO-252)

Symbol	Dimensions			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A2	0.90	1.10	0.035	0.043
b	0.66	0.86	0.026	0.034
b1	5.10	5.46	0.201	0.215
b2	4.27	4.37	0.168	0.172
b3	0.78	0.90	0.031	0.035
c	0.46	0.58	0.018	0.023
D	6.00	6.20	0.236	0.244
D1	5.35 REF.		0.211 REF.	
E	6.50	6.70	0.256	0.264
E1	4.83 REF.		0.190 REF.	
e	2.18	2.38	0.086	0.094
H	9.80	10.4	0.386	0.409
L1	2.90 REF.		0.114 REF.	
L3	0.90	1.20	0.035	0.047
L4	0.60	1.00	0.024	0.039
L5	1.6 REF.		0.063 REF.	
L6	-	0.12	-	0.005

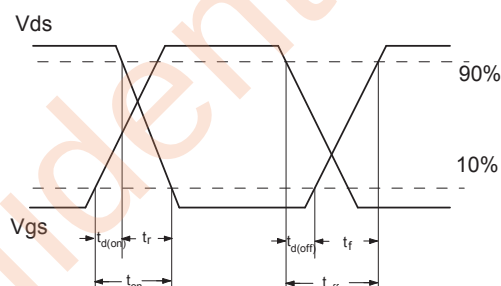
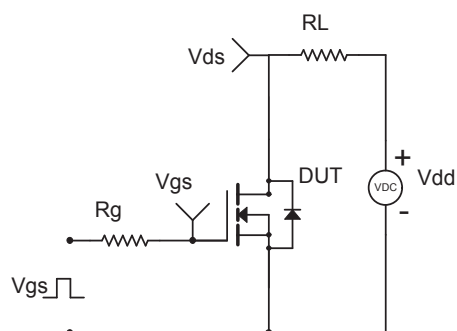
Suggested Pad Layout

Symbol	Dimensions			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
a	3.70	-	0.146	-
b	4.37	-	0.172	-
X	-	5.80	-	0.228
X1	-	1.20	-	0.047
Y	-	5.85	-	0.230
Y1	-	2.00	-	0.079

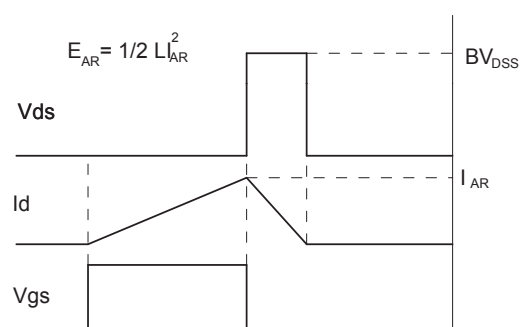
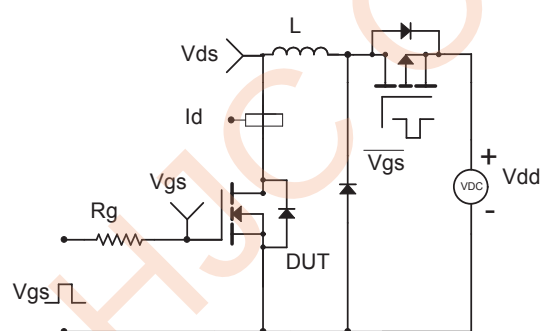
1. Gate Charge Test Circuit & Waveforms



2. Resistive Switching Test Circuit & Waveforms



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



4. Diode Recovery Test Circuit & Waveforms

