

TO-220AB Plastic-Encapsulate MOSFETS

Features

- $V_{DS}=60V$
- $I_D=120A$
- $R_{DS(on)}@V_{GS}=10V < 2.5m\Omega$
- SGT technology
- Low gate charge
- Extremely low on impedance

Drain-source Voltage
60 V
Drain Current
120 Ampere

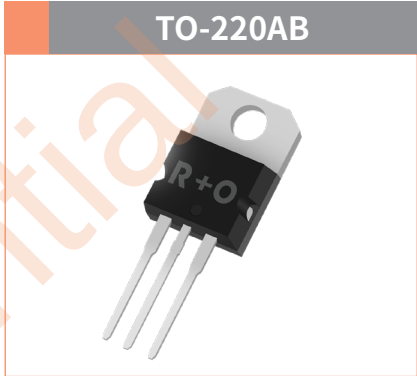
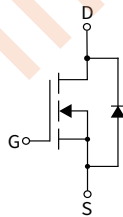
Applications

- Battery protection
- Load switch
- Power management

Mechanical Data

- Case: TO-220AB
Molding compound meets UL 94V-0 flammability rating, RoHS-compliant,halogen-free
- Terminals: Solder plated, solderable per MIL-STD-750,Method 2026

Function Diagram



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	120
Pulsed Drain Current	I_{DM}	A	400
Total Power Dissipation	P_D	W	62.5
Single pulse avalanche energy ⁽²⁾	EAS	mJ	484
Junction temperature	T_J	°C	-55 ~+150
Storage temperature	T_{stg}	°C	-55 ~+150
Device on PCB cooling area ⁽¹⁾	$R_{\theta JA}$	°C / W	60
Thermal resistance junction-to-case	$R_{\theta JC}$	°C / W	2.0

Ordering Information

PACKAGE	UNIT WEIGHT(g)	Tube(pcs)	BOX(pcs)	CARTON(pcs)
TO-220AB	2.04	50	2500	5000

● 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	2.0	3.0	4.0
Static Drain-Source On-Resistance	R _{DS(ON)}	V _{GS} = 10V, I _D =30A	mΩ	—	1.9	2.5

● Dynamic Parameters

PARAMETER	SYMBOL	Condition	UNIT	Min	Typ	Max
Input Capacitance	C _{iss}	V _{DS} =50 V, V _{GS} =0V, f=1MHz	pF	—	9169	—
Output Capacitance	C _{oss}			—	1771	—
Reverse Transfer Capacitance	C _{rss}			—	391	—

● Switching Parameters

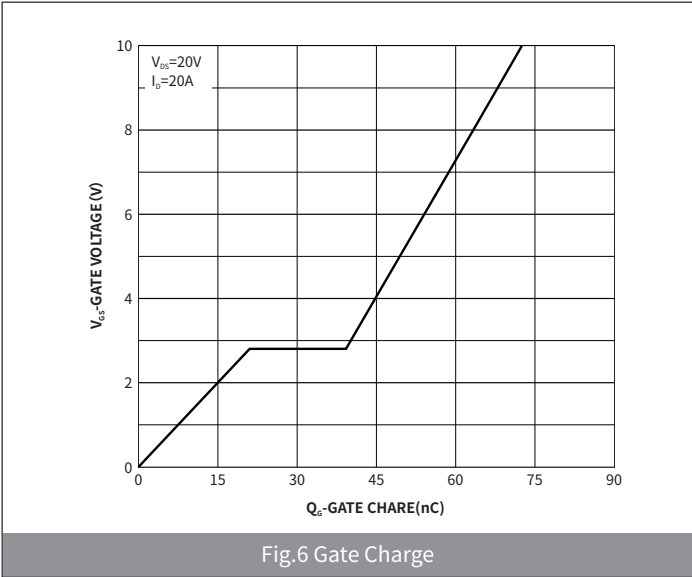
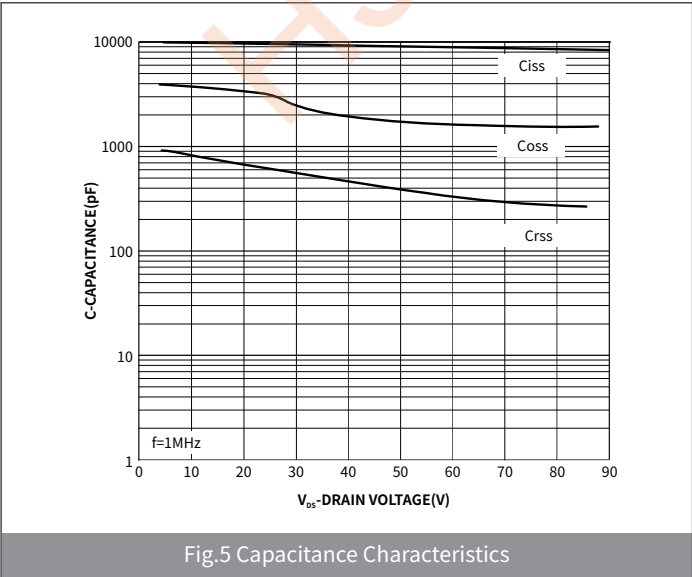
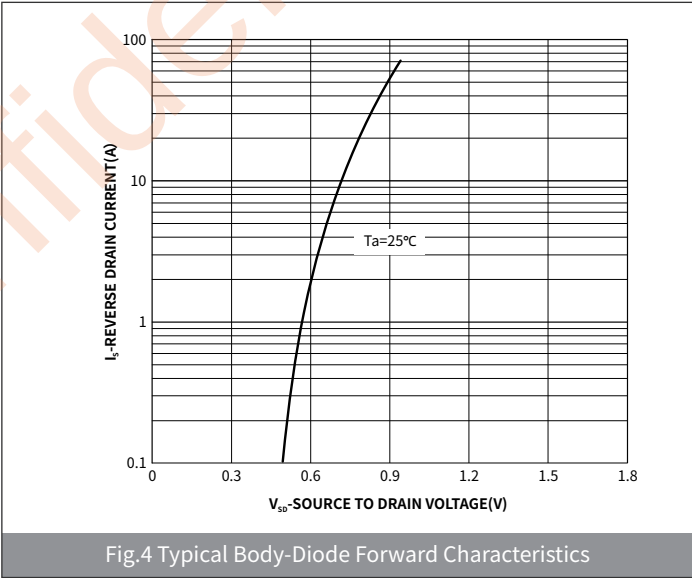
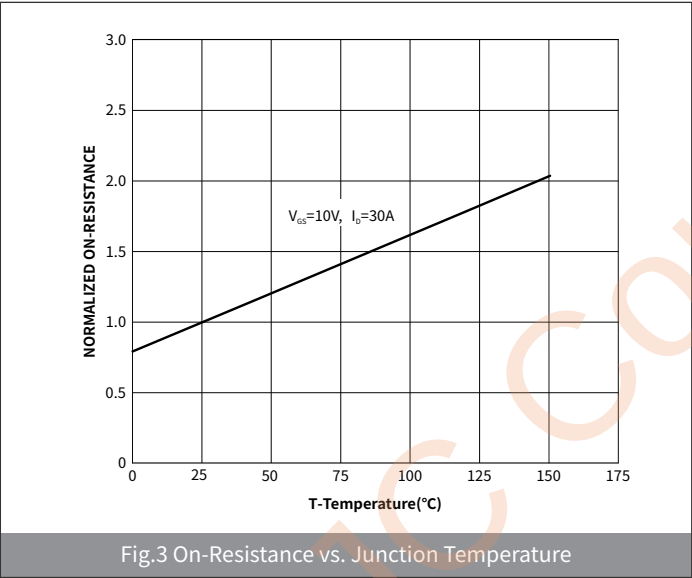
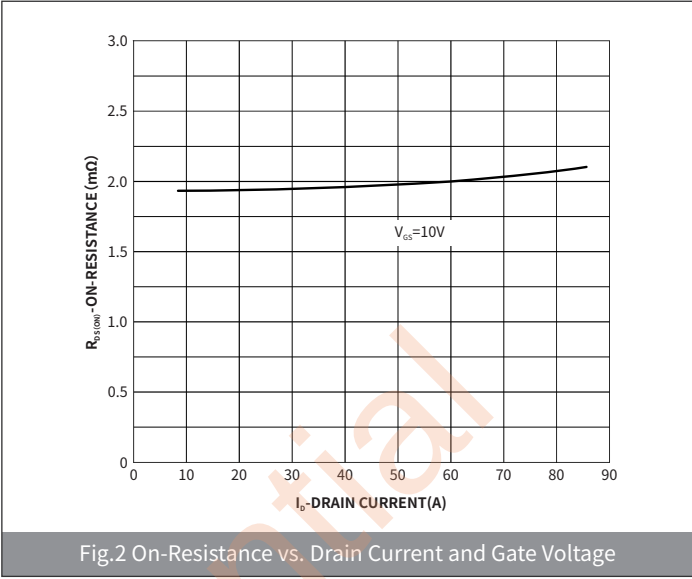
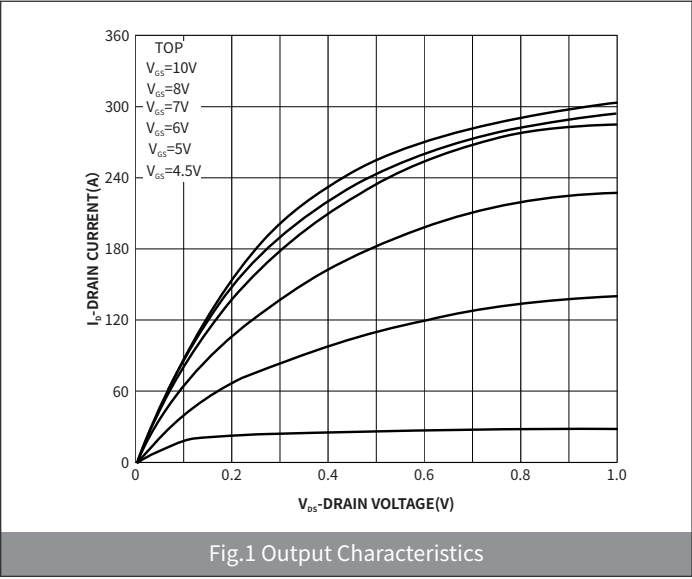
PARAMETER	SYMBOL	Condition	UNIT	Min	Typ	Max
Turn-on Delay Time	t _{D(on)}	V _{GS} =10V, V _{DD} =20V, R _{GEN} =3Ω ^{(2) (4)}	nS	—	17	—
Turn-on Rise Time	t _r		nS	—	32	—
Turn-off Delay Time	t _{D(off)}		nS	—	46	—
Turn-off fall Time	t _f		nS	—	26	—
Total Gate Charge	Q _g	V _{DS} =20V, I _D =20A V _{GS} =10V ^{(2) (4)}	nC	—	70	—
Gate-Source Charge	Q _{gs}		nC	—	21	—
Gate-Drain Charge	Q _{gd}		nC	—	17	—

● Drian-Source Diode Characteristics

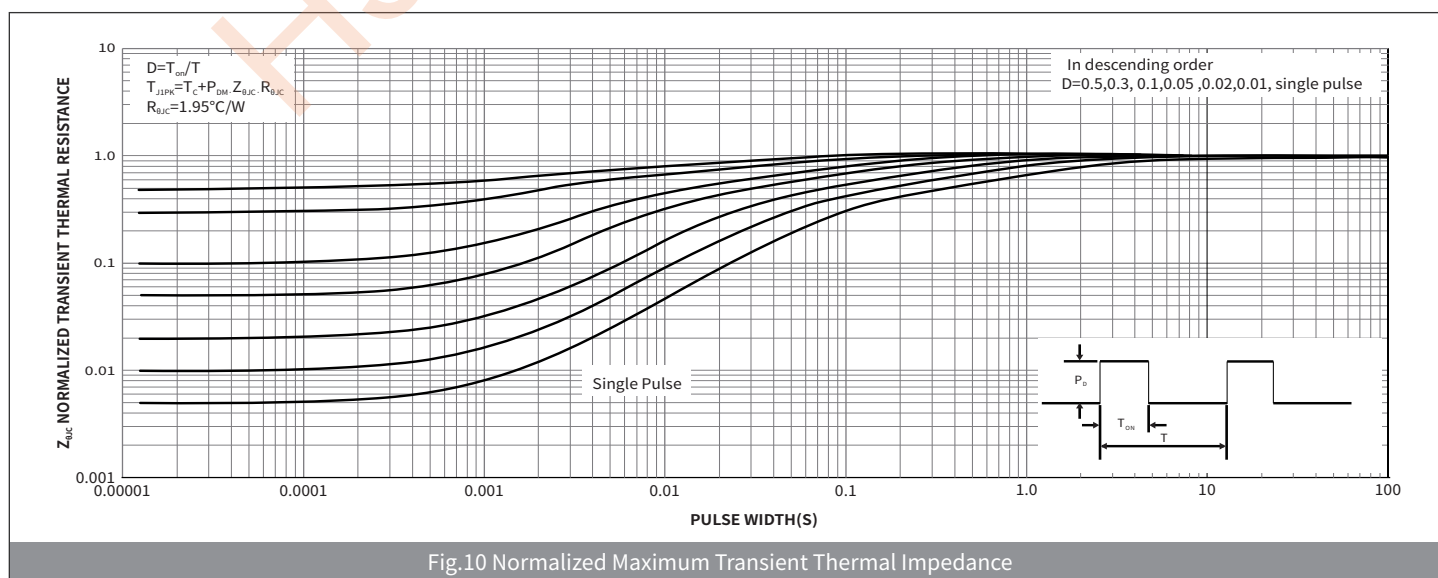
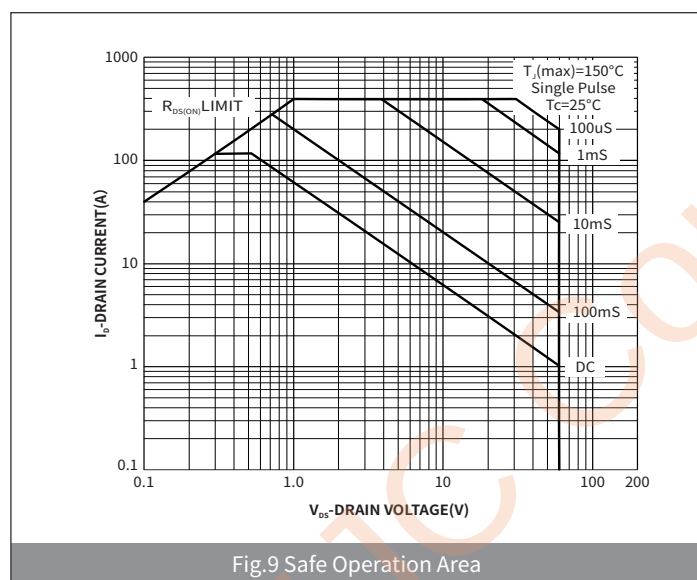
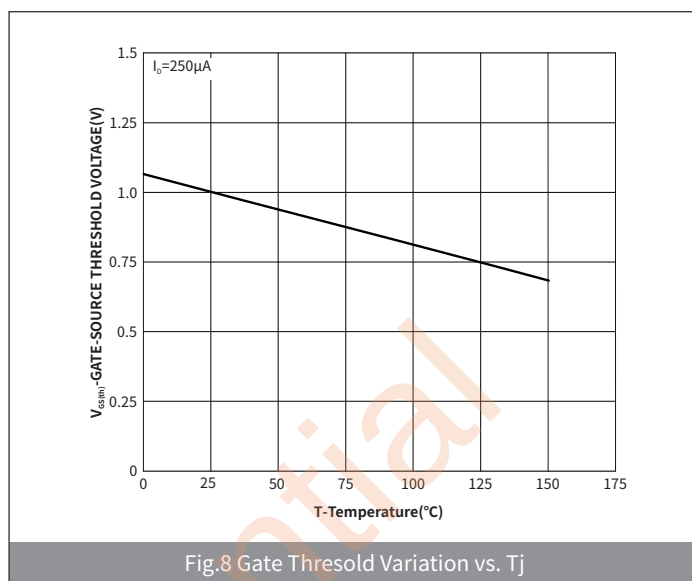
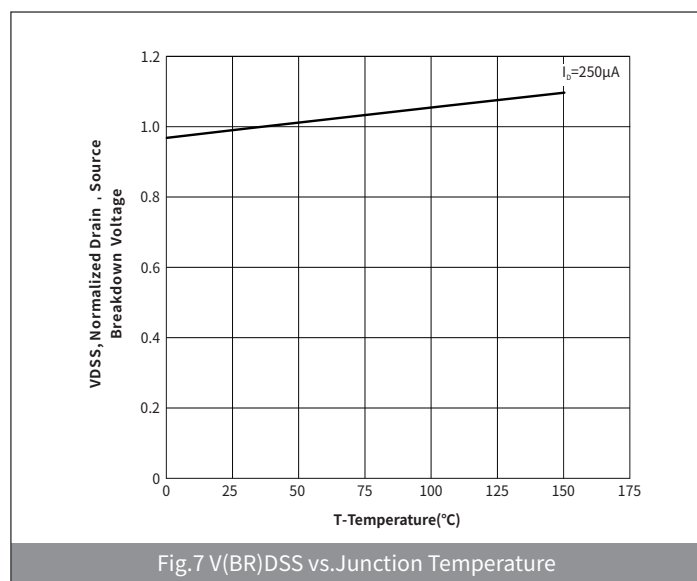
PARAMETER	SYMBOL	Condition	UNIT	Min	Typ	Max
Diode Forward Voltage ⁽²⁾	V _{SD}	I _S =100A, V _{GS} =0V	V	—	—	1.2
Maximum Body-Diode Continuous Current	I _S	—	A	—	—	120
Reverse Recovery Time	t _{rr}	I _F =20A di/dt=100A/μs	nS	—	65	—
Reverse Recovery Charge	Q _{rr}		nC	—	87	—

Note :
(1)Device on 40mm×40mm×1.5mm epoxy PCB FR-4 with 6cm²(one layer, 70μm thick).
(2)Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2%.
(3)EAS condition : Tj=25°C ,VDD=90V,VG=10V,L=0.5mH,IAS=44A,Rg=25Ω.
(4)Essentially independent of operating temperature.

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



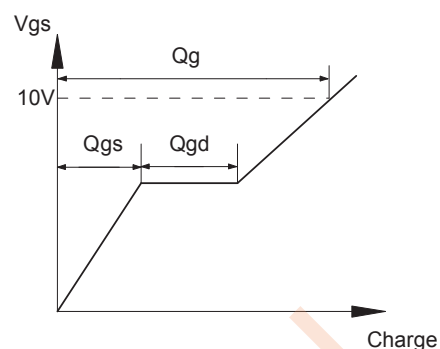
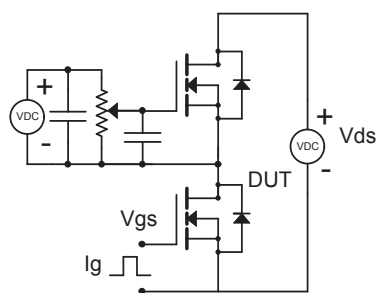
● Ratings And Characteristics Curves (Ta=25°C Unless otherwise specified)



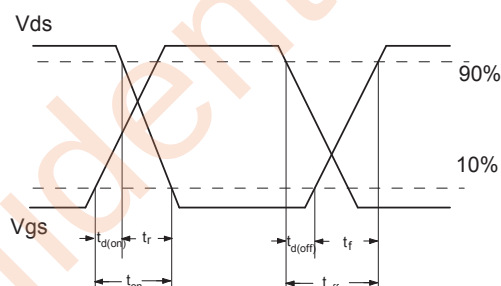
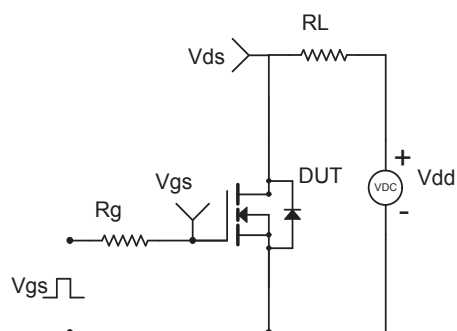
● Package Outline Dimensions (TO-220AB)

Symbol	Dimensions			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
*A	10.08	10.28	0.397	0.405
*B	2.64	2.84	0.104	0.112
b	1.27	1.67	0.050	0.066
b1	0.7	0.9	0.028	0.035
C	4.25	4.65	0.167	0.183
D	15.14	15.54	0.596	0.612
E	1.17	1.37	0.046	0.054
F	2.39	2.79	0.094	0.110
G	2.44	2.64	0.096	0.104
H	0.4	0.6	0.016	0.024
L	3.48	3.88	0.137	0.153
L1	12.73	13.13	0.501	0.517
M	5.99	6.39	0.236	0.252
N	3.82(TPY)		0.150(TPY)	

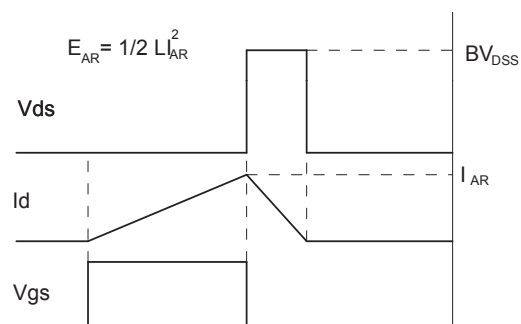
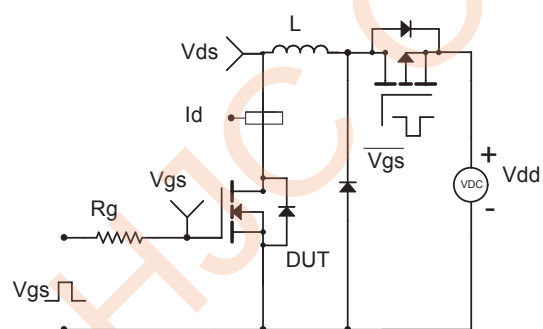
1. Gate Charge Test Circuit & Waveforms



2. Resistive Switching Test Circuit & Waveforms



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



4. Diode Recovery Test Circuit & Waveforms

