

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	I_D
900V	1200mΩ@10V	9A

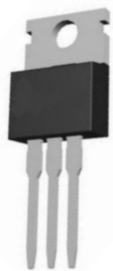
Feature

- Self-aligned planar technology
- Low conduction loss

Application

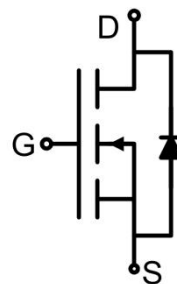
- Uninterruptible power supply (UPS)
- Power factor correction (PFC)

Package



TO-220AB

Circuit diagram



Marking



Absolute maximum ratings($T_C=25^{\circ}\text{C}$ unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	900	V
Gate-Source Voltage	V_{GS}	± 30	V
Continuous Drain Current ¹⁾ ($V_{GS}=10\text{V}$)	I_D	9	A
Continuous Drain Current ¹⁾ ($V_{GS}=10\text{V}$, $T_C=100^{\circ}\text{C}$)	$I_{D(100^{\circ}\text{C})}$	5.8	A
Pulsed Drain Current ³⁾	I_{DM}	36	A
Single Pulse Avalanche Energy ²⁾	E_{AS}	576	mJ
Power Dissipation ⁴⁾	P_D	31.2	W
Thermal Resistance Junction to Case	$R_{\theta JC}$	4	$^{\circ}\text{C/W}$
Operating Junction Temperature	T_J	$-55 \sim +150$	$^{\circ}\text{C}$
Storage Temperature	T_{STG}	$-55 \sim +150$	$^{\circ}\text{C}$

Electrical characteristics ($T_J=25^{\circ}\text{C}$, unless otherwise noted)

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Static Characteristics						
Drain-source breakdown voltage	$V_{(BR)DSS}$	$V_{GS}=0V, I_D=250\mu A$	900			V
Zero gate voltage drain current	I_{DSS}	$V_{DS}=900V, V_{GS}=0V$			1	μA
Gate-body leakage current	I_{GSS}	$V_{DS}=0V, V_{GS}=\pm 30V$			± 100	nA
Gate threshold voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	2		4	V
Drain-source on-resistance	$R_{DS(on)}$	$V_{GS}=10V, I_D=4.5A$		975	1200	m Ω
Dynamic characteristics ⁶⁾						
Input Capacitance	C_{iss}	$V_{DS}=25V, V_{GS}=0V, f=1MHz$		2752		pF
Output Capacitance	C_{oss}			206		
Reverse Transfer Capacitance	C_{rss}			36		
Total Gate Charge	Q_g	$V_{DS}=450V, V_{GS}=10V$ $I_D=9A$		80		nC
Gate-Source Charge	Q_{gs}			12		
Gate-Drain Charge	Q_{gd}			38		
Turn-on delay time	$t_{d(on)}$	$V_{DS}=450V, I_D=9A$ $R_G=25\Omega$		33		nS
Turn-on rise time	t_r			57		
Turn-off delay time	$t_{d(off)}$			270		
Turn-off fall time	t_f			91		
Source-Drain Diode characteristics						
Diode Continuous Current ^{1,5)}	I_S				9	A
Diode Forward voltage ²⁾	V_{SD}	$V_{GS}=0V, I_S=9A$			1.4	V
Reverse recover time	T_{rr}	$V_{GS}=0V, I_S=9A$		533		nS
Reverse recovery charge	Q_{rr}	$di/dt=100A/us$		6.2		μC

Notes:

- 1) The data tested by surface mounted on a 1 inch² FR-4 board with 20Z copper.
- 2) The EAS data shows Max. rating . $L=4.1\text{mH}$, $I_{AS}=18\text{A}$, $V_{DD}=50\text{V}$, $R_G=25\Omega$, Starting $T_J=25^{\circ}\text{C}$.
- 3) The test condition is Pulse Test: Pulse width $\leq 300\mu\text{s}$, Duty Cycle $\leq 1\%$.
- 4) The power dissipation is limited by 150°C junction temperature.
- 5) The data is theoretically the same as I_D and I_{DM} , in real applications, should be limited by total power dissipation.
- 6) Guaranteed by design, not subject to production testing.

Typical Characteristics

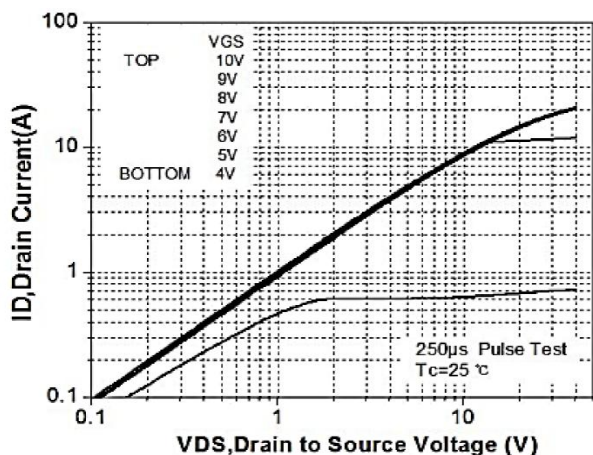


Figure 1. On-Region Characteristics

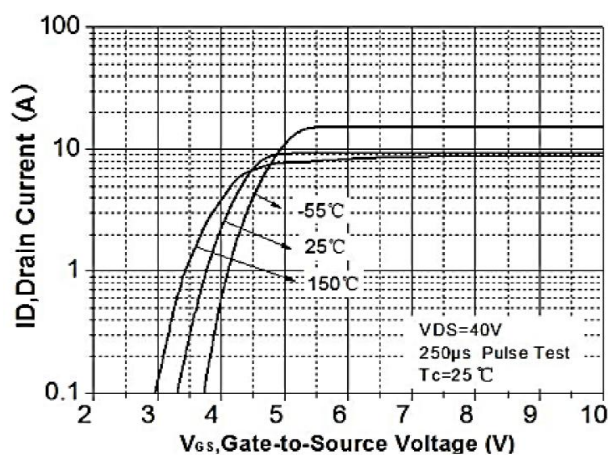


Figure 2. Transfer Characteristics

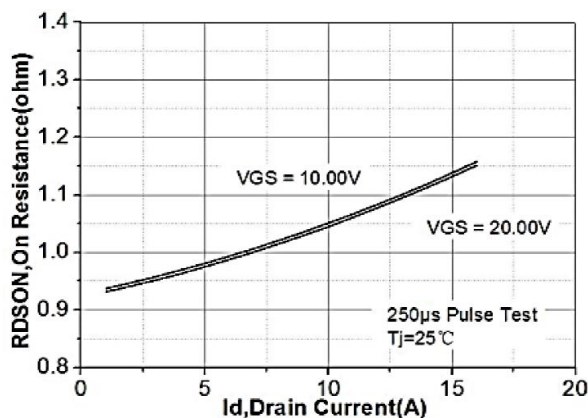


Figure 3. On-Resistance Variation vs. Drain Current and Gate Voltage

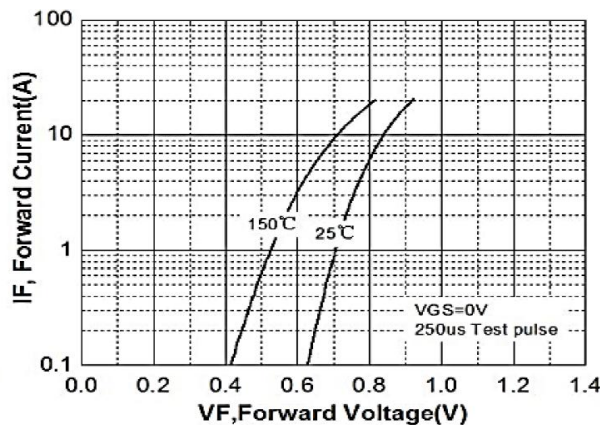


Figure 4. Body Diode Forward Voltage Variation with Source Current and Temperature

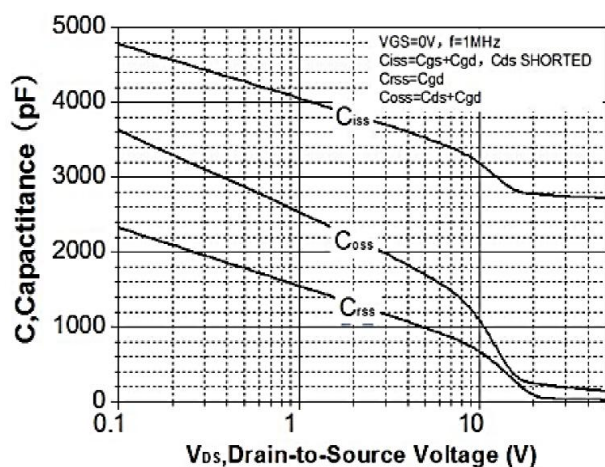


Figure 5. Capacitance Characteristics

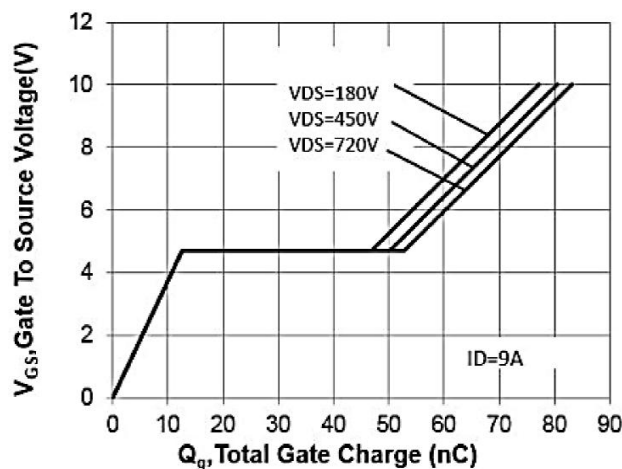


Figure 6. Gate Charge Characteristics

Typical Characteristics

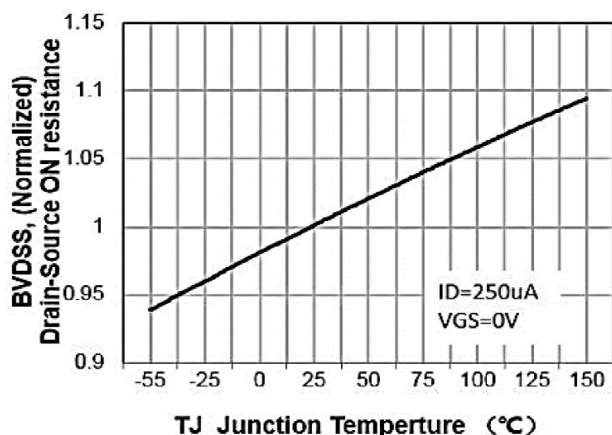


Figure 7. Breakdown Voltage Variation vs Temperature

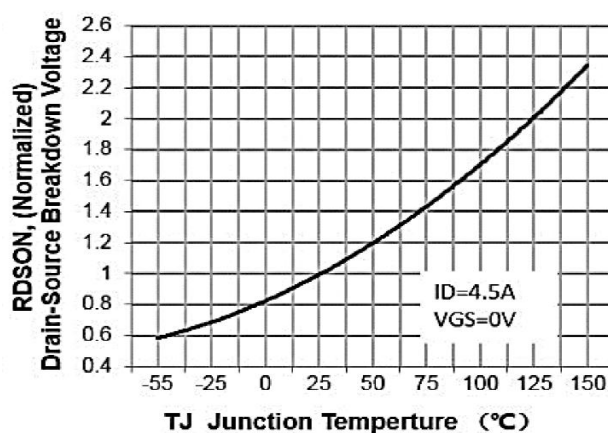


Figure 8. On-Resistance Variation vs Temperature

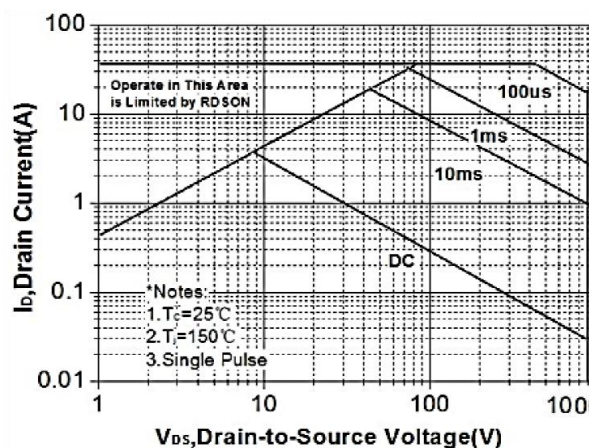


Figure 9. Maximum Safe Operating Area

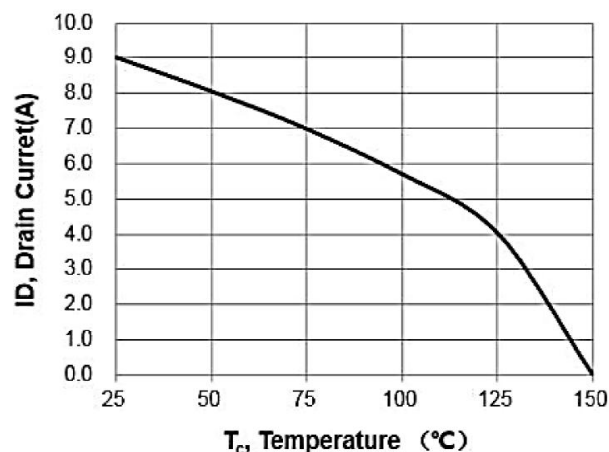


Figure 10. Maximum Drain Current vs Case Temperature

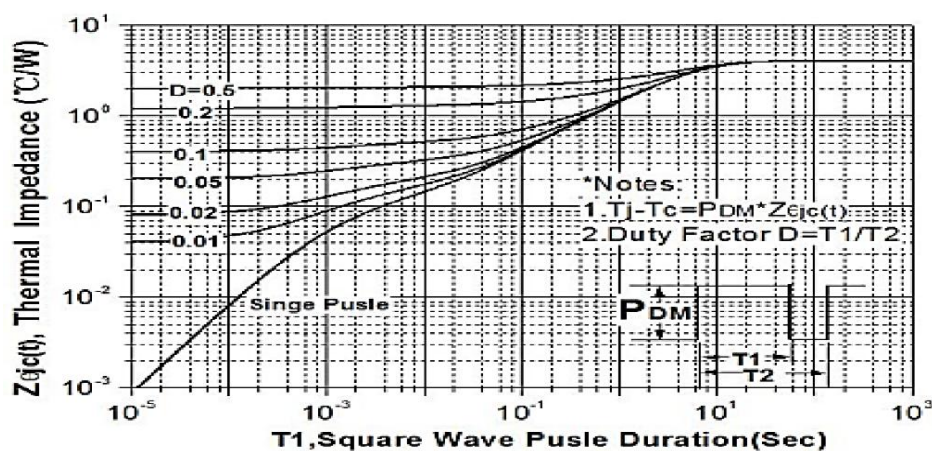
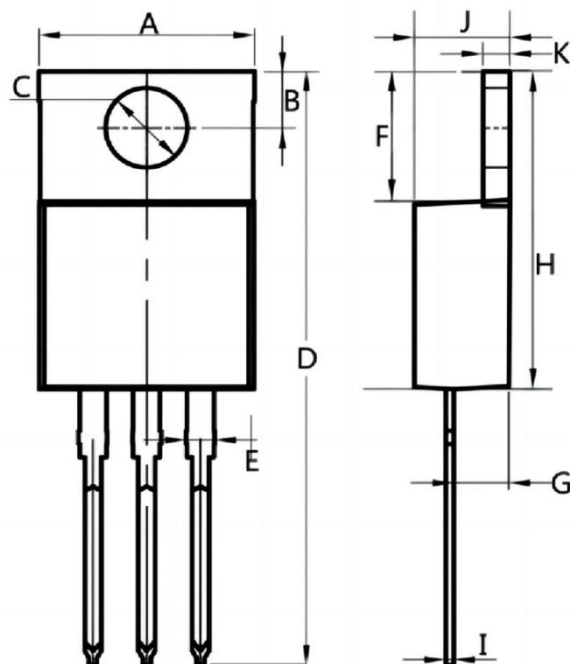


Figure 11. Transient Thermal Response Curve

TO-220AB Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	10.000	10.400	0.394	0.409
B	2.500	3.000	0.098	0.118
C	3.500	4.000	0.138	0.157
D	28.000	30.000	1.102	1.181
E	1.100	1.500	0.043	0.059
F	6.200	6.600	0.244	0.260
G	2.900	3.300	0.114	0.130
H	15.000	16.000	0.591	0.630
I	0.350	0.450	0.014	0.018
J	4.300	4.700	0.169	0.185
K	1.200	1.400	0.047	0.055