

### Product Summary

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	$I_D$
60V	2.9mΩ@10V	200A
	3.6mΩ@4.5V	

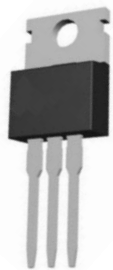
### Feature

- Split Gate Trench MOSFET technology
- Excellent package for heat dissipation
- High density cell design for low  $R_{DS(ON)}$

### Application

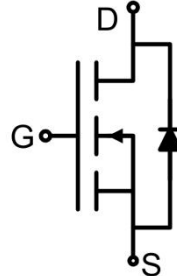
- Consumer electronic power supply
- Isolated DC-DC Converters
- Motor control

### Package

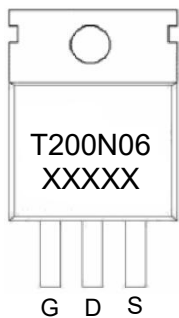


TO-220AB

### Circuit diagram



### Marking



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

Parameter	Symbol	Value	Unit
Drain-Source Voltage	$V_{DS}$	60	V
Gate-Source Voltage	$V_{GS}$	$\pm 20$	V
Continuous Drain Current <sup>1)</sup> ( $T_C=25^{\circ}\text{C}$ )	$I_D$	200	A
Pulsed Drain Current <sup>2)</sup>	$I_{DM}$	600	A
Power Dissipation <sup>4)</sup>	$P_D$	260	W
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	0.48	$^{\circ}\text{C}/\text{W}$
Single pulse avalanche energy <sup>3)</sup>	$E_{AS}$	500	mJ
Junction Temperature	$T_J$	150	$^{\circ}\text{C}$
Storage Temperature	$T_{STG}$	-55 ~ +150	$^{\circ}\text{C}$

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

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
<b>Static Characteristics</b>						
Drain-source breakdown voltage	$V_{(BR)DSS}$	$V_{GS} = 0\text{V}, I_D = 250\mu\text{A}$	60			V
Zero gate voltage drain current	$I_{DSS}$	$V_{DS} = 60\text{V}, V_{GS} = 0\text{V}$			1	$\mu\text{A}$
Gate-body leakage current	$I_{GSS}$	$V_{GS} = \pm 20\text{V}, V_{DS} = 0\text{V}$			$\pm 100$	nA
Gate threshold voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\mu\text{A}$	1.2	1.6	2.2	V
Drain-source on-resistance	$R_{DS(on)}$	$V_{GS} = 10\text{V}, I_D = 20\text{A}$		2.35	2.9	m $\Omega$
		$V_{GS} = 4.5\text{V}, I_D = 15\text{A}$		2.9	3.6	
<b>Dynamic characteristics<sup>5)</sup></b>						
Input Capacitance	$C_{iss}$	$V_{DS} = 25\text{V}, V_{GS} = 0\text{V}, f = 100\text{KHz}$		5950		pF
Output Capacitance	$C_{oss}$			1250		
Reverse Transfer Capacitance	$C_{rss}$			85		
Total Gate Charge	$Q_g$	$V_{DS} = 50\text{V}, V_{GS} = 10\text{V}, I_D = 50\text{A}$		93		nC
Gate-Source Charge	$Q_{gs}$			17		
Gate-Drain Charge	$Q_{gd}$			14		
Turn-on delay time	$t_{d(on)}$	$V_{DD} = 30\text{V}, V_{GS} = 10\text{V}, I_D = 25\text{A}, R_{GEN} = 2\Omega$		22.5		nS
Turn-on rise time	$t_r$			6.7		
Turn-off delay time	$t_{d(off)}$			80.3		
Turn-off fall time	$t_f$			26.9		
<b>Source-Drain Diode characteristics</b>						
Diode Forward Current	$I_S$				200	A
Diode Forward voltage	$V_{SD}$	$V_{GS} = 0\text{V}, I_S = 20\text{A}$			1.2	V

Notes:

- 1) The maximum current rating is package limited.
- 2) Repetitive rating; pulse width limited by max. junction temperature.
- 3)  $V_{DD} = 50\text{V}, R_G = 25\Omega, L = 0.5\text{mH}$ , starting  $T_J = 25^{\circ}\text{C}$ .
- 4)  $P_D$  is based on max. junction temperature, using junction-case thermal resistance.
- 5) Guaranteed by design, not subject to production testing.

## Typical Characteristics

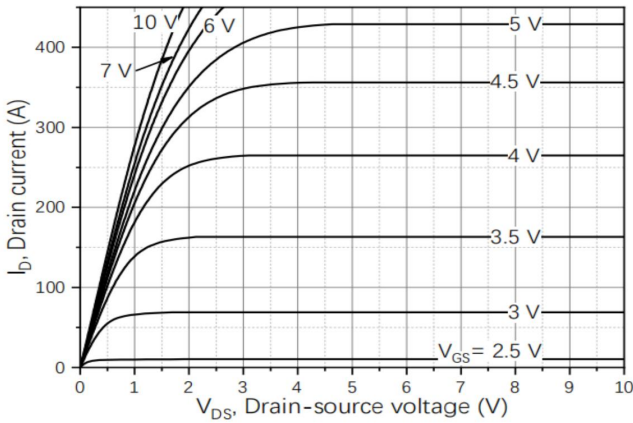


Figure1. Output Characteristics

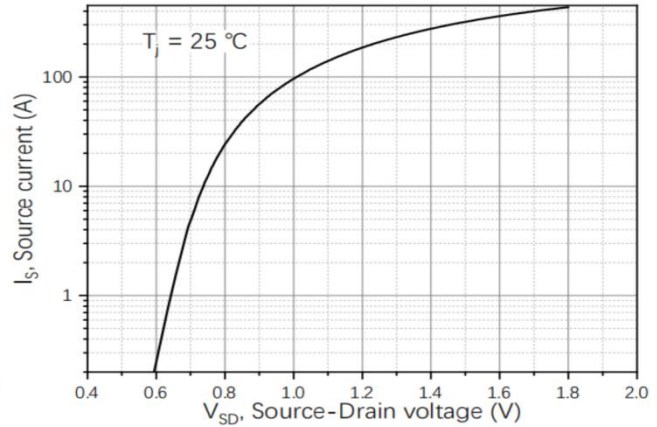


Figure2. Transfer Characteristics

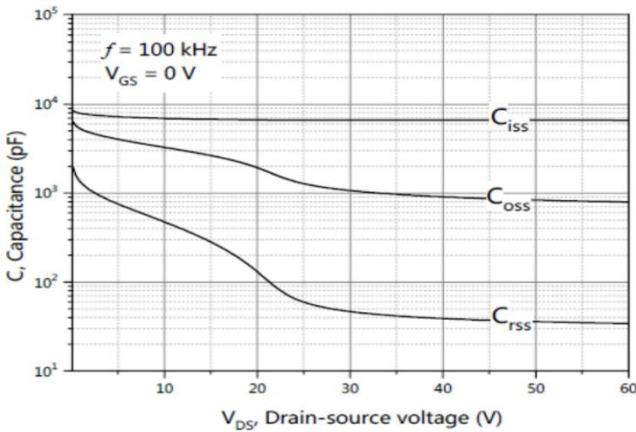


Figure3. Capacitance Characteristics

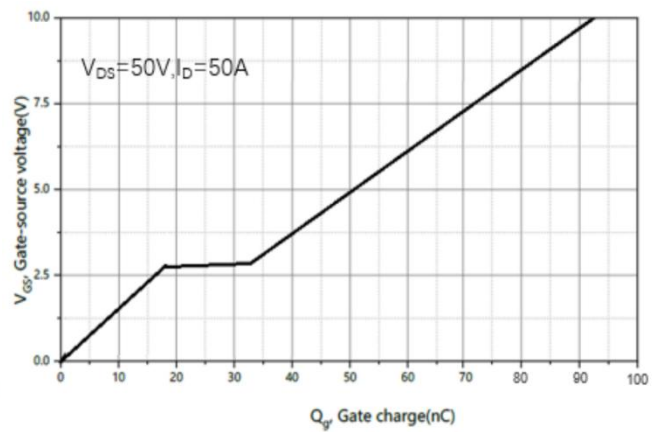


Figure4. Gate Charge

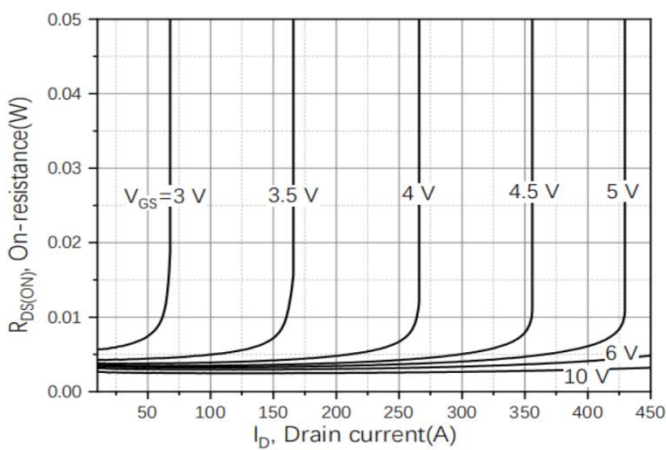


Figure5. Drain-Source on Resistance

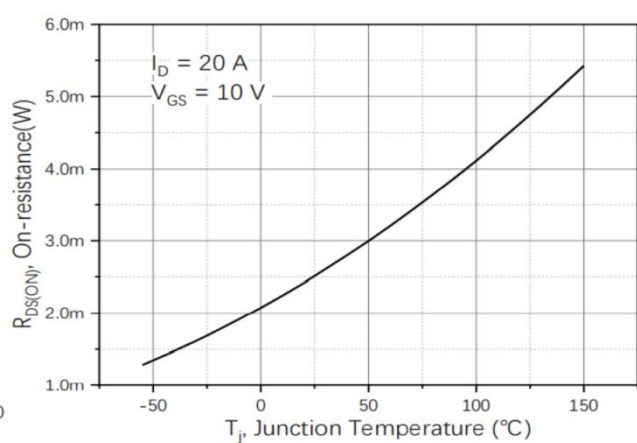


Figure6. Drain-Source on Resistance

## Typical Characteristics

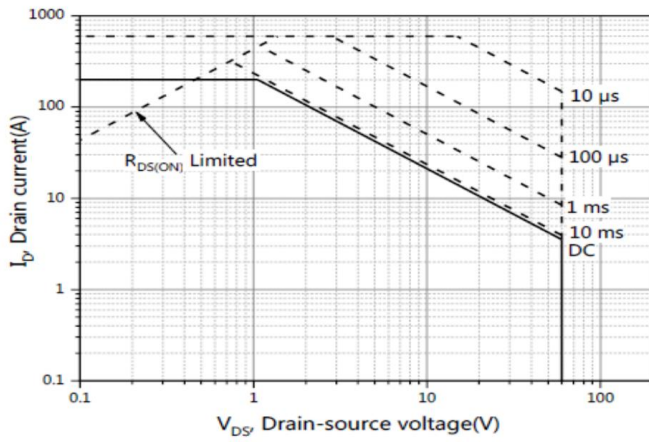


Figure7. Safe Operation Area

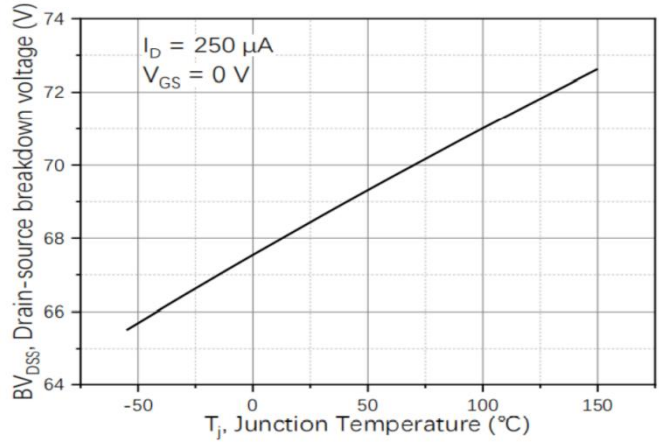
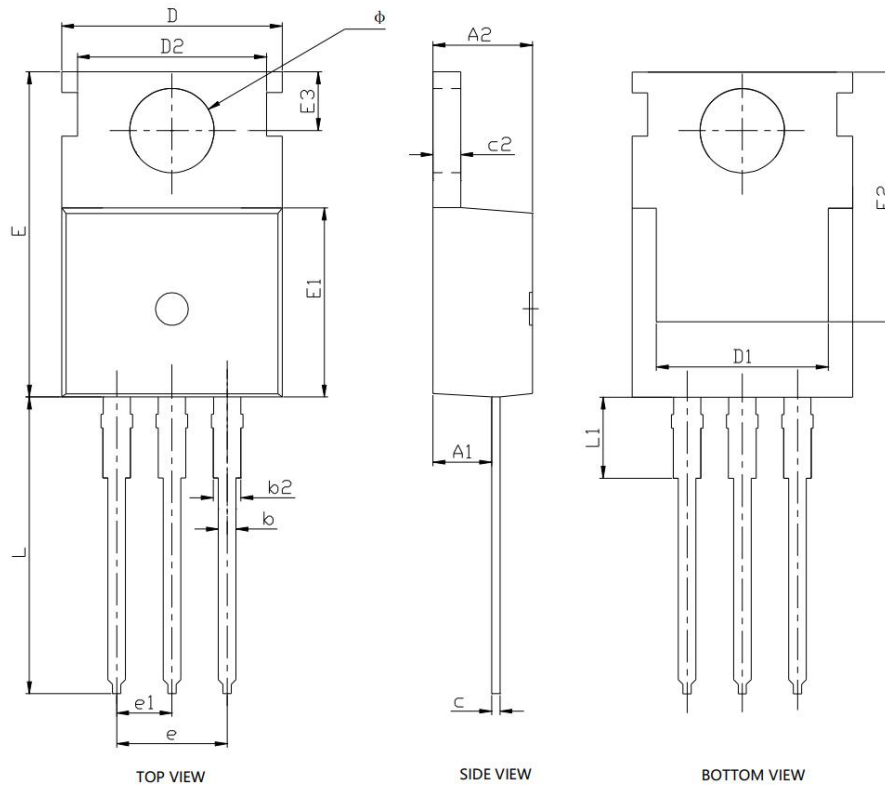


Figure8. Drain-source breakdown voltage

### TO-220AB Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A1	2.300	2.500	0.091	0.098
A2	4.400	4.600	0.173	0.181
b	0.700	0.900	0.028	0.035
b2	1.250	1.420	0.049	0.056
c	0.450	0.550	0.018	0.022
c2	1.250	1.350	0.049	0.053
D	9.700	10.200	0.382	0.402
D1	7.500	8.400	0.295	0.331
D2	8.500	8.900	0.335	0.350
E	15.300	16.100	0.602	0.634
E1	9.100	9.300	0.358	0.366
E2	12.630	13.330	0.497	0.525
E3	2.750 BSC		0.108 BSC	
e	5.080 BSC		0.200 BSC	
e1	2.540 BSC		0.100 BSC	
L	13.000	13.500	0.512	0.531
L1	-	3.500	-	0.138
φ	3.550	3.750	0.140	0.148