

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	I_D
60V	3.2mΩ@10V	200A

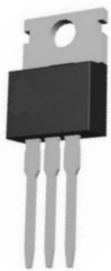
Feature

- Excellent package for heat dissipation
- High density cell design for low $R_{DS(on)}$
- Split gate trench MOSFET technology
- Suffix “-Q1” for AEC-Q101

Application

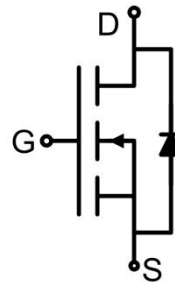
- Invertors
- Motor control
- Isolated DC-DC convertor
- Consumer electronic power supply

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}	± 20	V
Continuous Drain Current ¹⁾ ($T_C=25^{\circ}\text{C}$)	I_D	200	A
Continuous Drain Current ¹⁾ ($T_C=100^{\circ}\text{C}$)	$I_D (100^{\circ}\text{C})$	125	A
Pulsed Drain Current ²⁾	I_{DM}	600	A
Single Pulse Avalanche Energy ³⁾	E_{AS}	500	mJ
Power Dissipation ⁴⁾	P_D	260	W
Thermal Resistance Junction to Case	$R_{\theta JC}$	0.48	$^{\circ}\text{C/W}$
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 =250μA	60			V
Zero gate voltage drain current	I _{DSS}	V _{DS} =60V, V _{GS} =0V			1	μA
Gate-body leakage current	I _{GSS}	V _{DS} =0V, V _{GS} =±20V			±100	nA
Gate threshold voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250μA	2.0	2.8	4.0	V
Drain-source on-resistance	R _{DS(on)}	V _{GS} =10V, I _D =20A		2.5	3.2	mΩ
Dynamic characteristics ⁵⁾						
Input Capacitance	C _{iss}	V _{DS} =25V, V _{GS} =0V, f =100KHz		4165		pF
Output Capacitance	C _{oss}			900		
Reverse Transfer Capacitance	C _{rss}			59		
Total Gate Charge	Q _g	V _{DS} =50V, V _{GS} =10V, I _D =50A		65		nC
Gate-Source Charge	Q _{gs}			11.9		
Gate-Drain Charge	Q _{gd}			9.8		
Turn-on delay time	t _{d(on)}	V _{DS} =30V, V _{GS} =10V, I _D =25A R _G =2Ω		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		
Source-Drain Diode characteristics						
Diode Continuous Current	I _S				200	A
Diode Forward voltage	V _{SD}	V _{GS} =0V, I _S =20A			1.2	V
Reverse recover time	T _{rr}	I _F =25A , di/dt =-100A/us		58		nS
Reverse recovery charge	Q _{rr}			63		nC

Notes:

- 1) The maximum current rating is package limited.
- 2) Repetitive rating: pulse width limited by max. junction temperature.
- 3) $V_{DD}=50V, R_G=25\Omega, L=0.5mH$, 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

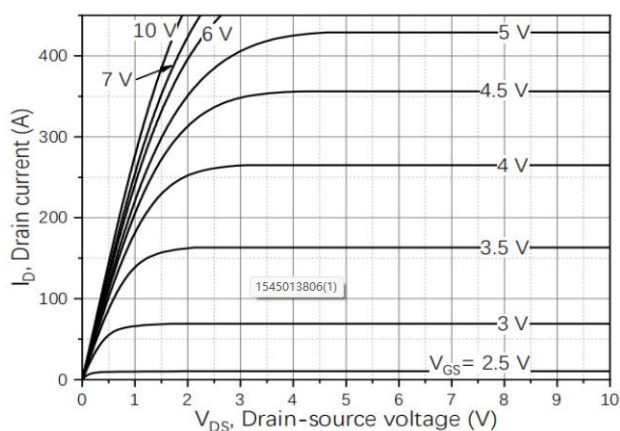


Figure1. Output Characteristics

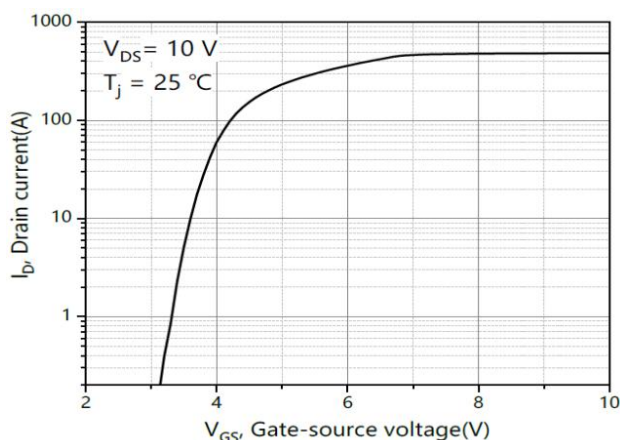


Figure2. Transfer Characteristics

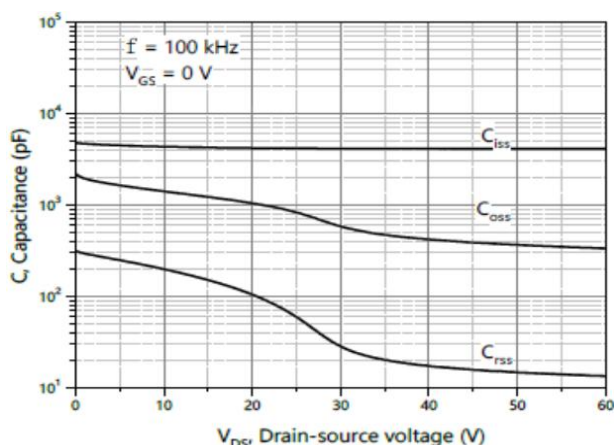


Figure3. Capacitance Characteristics

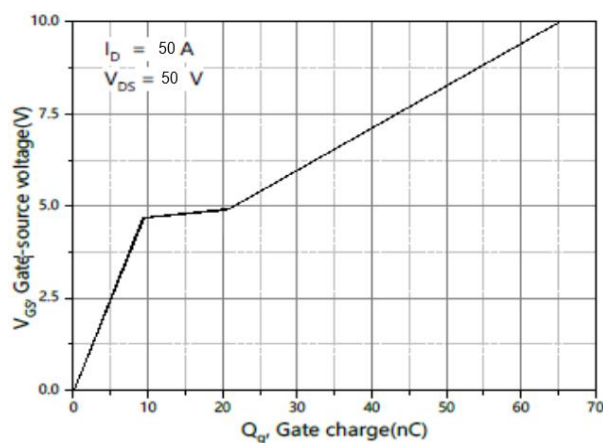


Figure4. Gate Charge

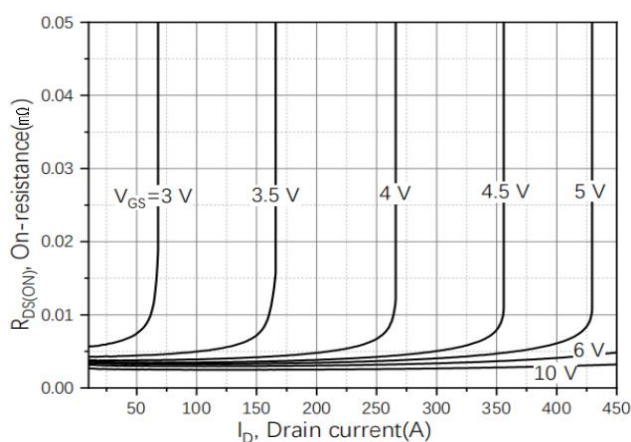


Figure5. Drain-Source on Resistance

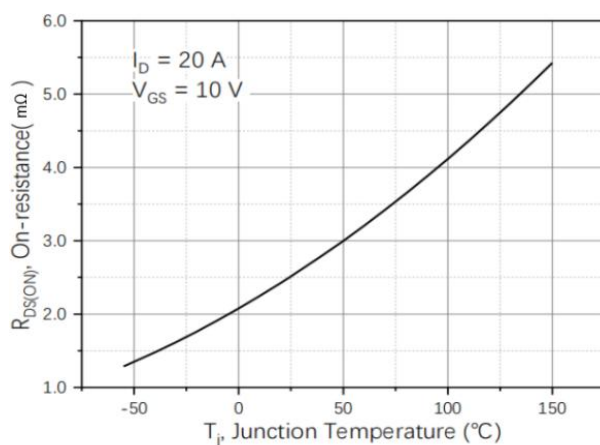


Figure6. Drain-Source on Resistance

Typical Characteristics

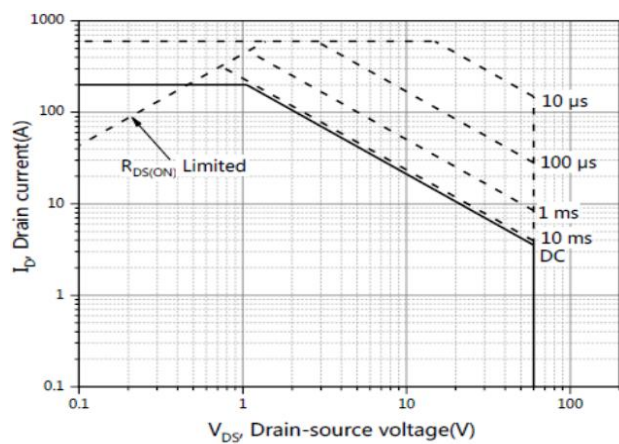


Figure7. Safe Operation Area

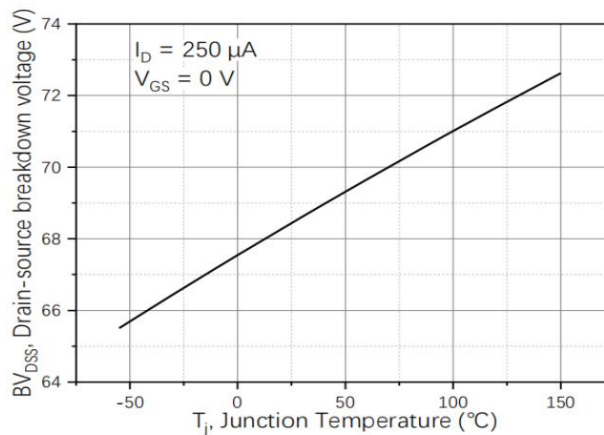
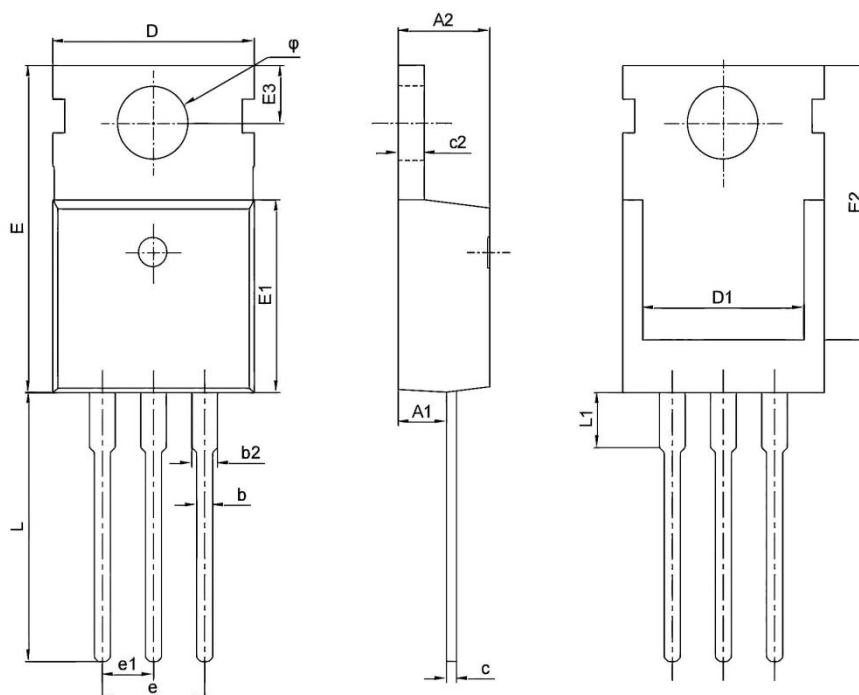


Figure8. Drain-source breakdown voltage

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
E	15.300	16.100	0.602	0.634
E1	9.100	9.300	0.358	0.366
E2	12.630	13.300	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