

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	I_D
40V	2.35mΩ@10V	200A

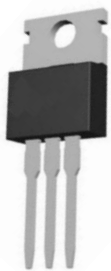
Feature

- Fast Switching
- Low Gate Charge and R_{dson}

Application

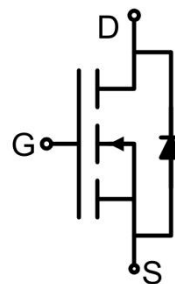
- Power switching application
- DC/DC Converter
- Power Management

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}	40	V
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current ($T_C=25^{\circ}\text{C}$)	I_D	200	A
Continuous Drain Current ($T_C=100^{\circ}\text{C}$)	$I_D (100^{\circ}\text{C})$	140	A
Pulsed Drain Current	I_{DM}	800	A
Single Pulse Avalanche Energy ¹⁾	E_{AS}	711	mJ
Power Dissipation ($T_C=25^{\circ}\text{C}$)	P_D	309	W
Thermal Resistance Junction to Case	$R_{\theta JC}$	0.4	$^{\circ}\text{C/W}$
Operating Junction Temperature	T_J	$-55 \sim +150$	$^{\circ}\text{C}$
Storage Temperature	T_{STG}	$-55 \sim +150$	$^{\circ}\text{C}$

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

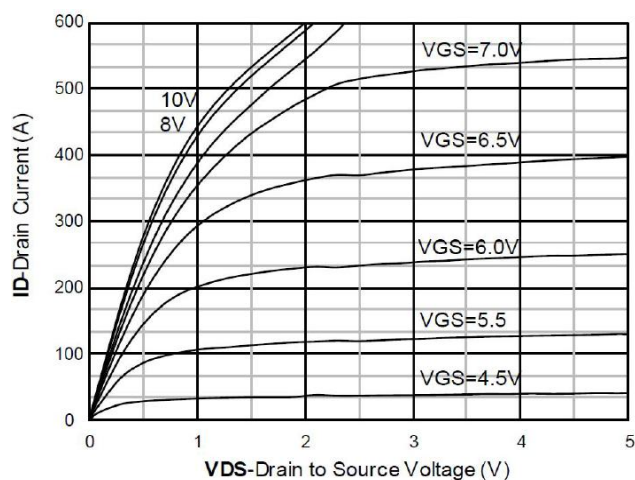
Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Static Characteristics						
Drain-source breakdown voltage	V _{(BR)DSS}	V _{GS} =0V, I _D =250μA	40			V
Zero gate voltage drain current	I _{DSS}	V _{DS} =32V, V _{GS} =0V, T _J =25°C			1	μA
Gate-body leakage current	I _{GSS}	V _{DS} =0V, V _{GS} =±20V			±100	nA
Gate threshold voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250μA	2	3	4	V
Drain-source on-resistance	R _{DS(on)}	V _{GS} =10V, I _D =30A		1.9	2.35	mΩ
Dynamic characteristics ²⁾						
Input Capacitance	C _{iss}	V _{DS} =20V, V _{GS} =0V, f =1MHz		9263		pF
Output Capacitance	C _{oss}			650		
Reverse Transfer Capacitance	C _{rss}			640		
Total Gate Charge	Q _g	V _{DS} =20V, V _{GS} =10V, I _D =30A		138		nC
Gate-Source Charge	Q _{gs}			19		
Gate-Drain Charge	Q _{gd}			31		
Turn-on delay time	t _{d(on)}	V _{DS} =20V, V _{GS} =10V, I _D =30A R _G =2.7Ω		26		nS
Turn-on rise time	t _r			30		
Turn-off delay time	t _{d(off)}			59		
Turn-off fall time	t _f			19		
Source-Drain Diode characteristics						
Diode Continuous Current	I _S				200	A
Diode Forward voltage	V _{SD}	V _{GS} =0V, I _S =1A, T _J =25°C			1.2	V
Reverse recover time	T _{rr}	I _S =190A, di/dt =100A/μs T _J =25°C		53		nS
Reverse recovery charge	Q _{rr}			29		nC

Notes:

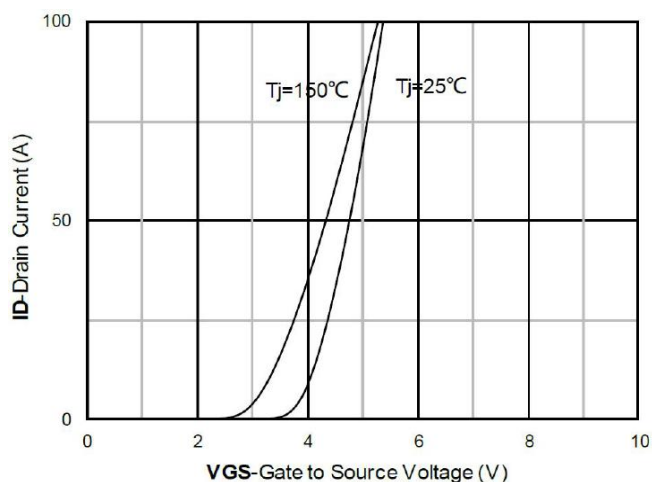
1) E_{AS} is tested at starting $T_J=25^{\circ}\text{C}$, $V_{DD}=75V, V_{GS}=10V, L=0.5mH, R_G=25\Omega$.

2) Guaranteed by design, not subject to production testing.

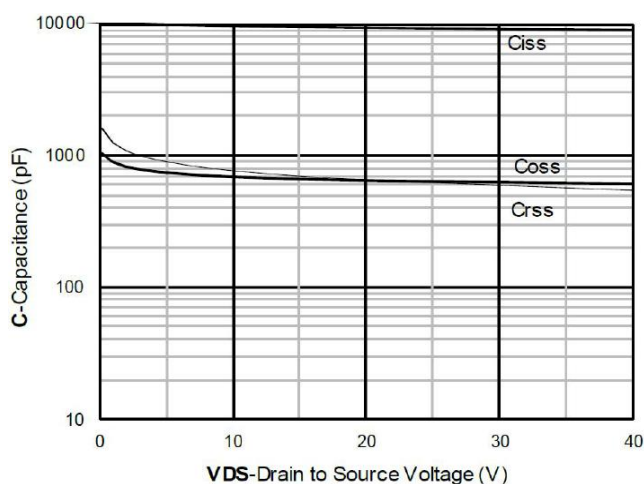
Typical Characteristics



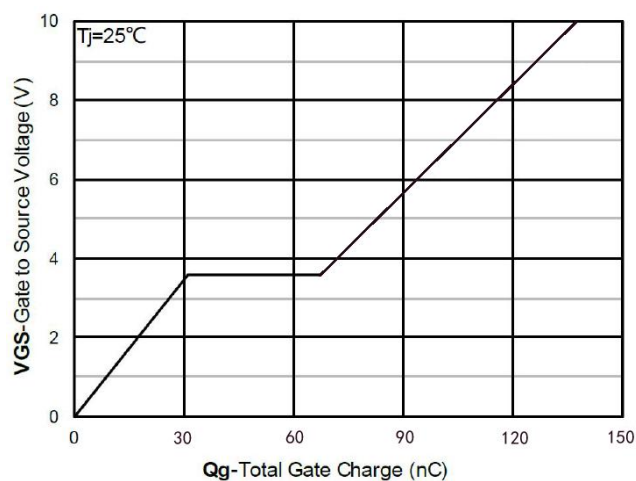
Output Characteristics



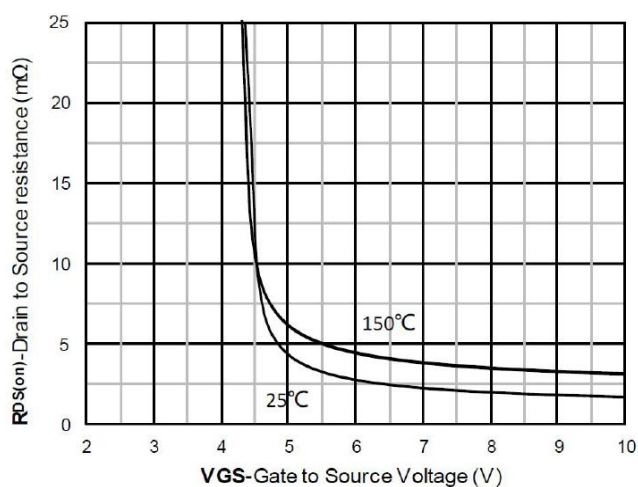
Transfer Characteristics



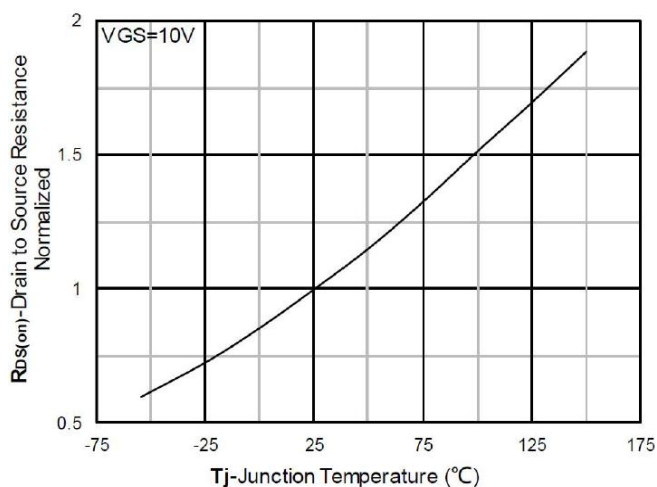
Capacitance Characteristics



Gate Charge

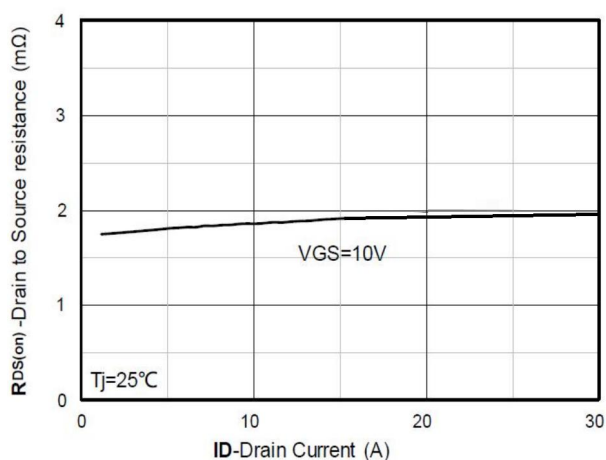


On-Resistance vs Gate to Source Voltage

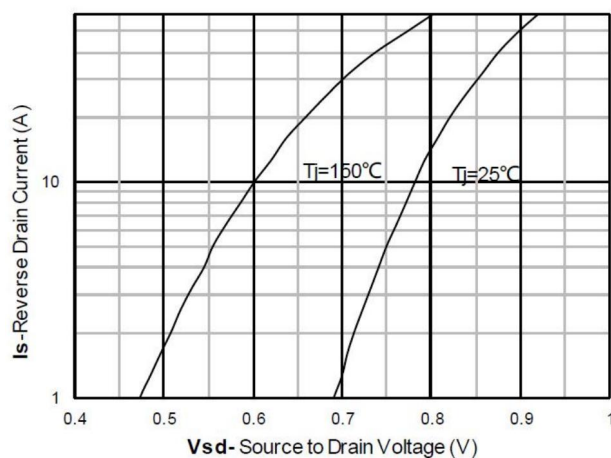


Normalized On-Resistance

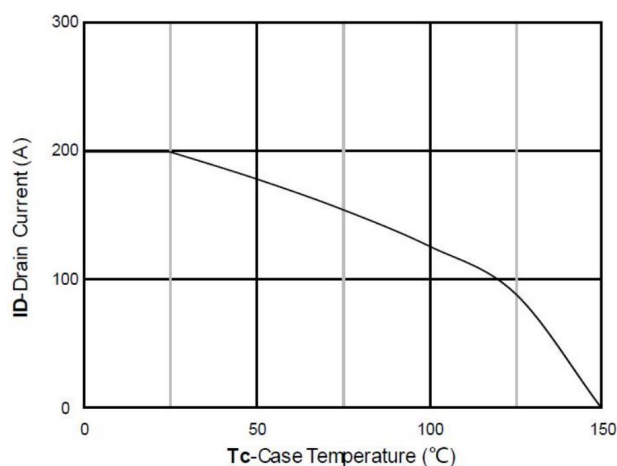
Typical Characteristics



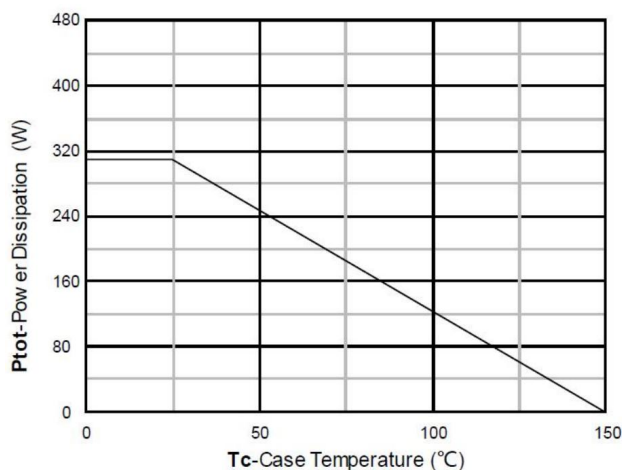
$R_{DS(on)}$ VS Drain Current



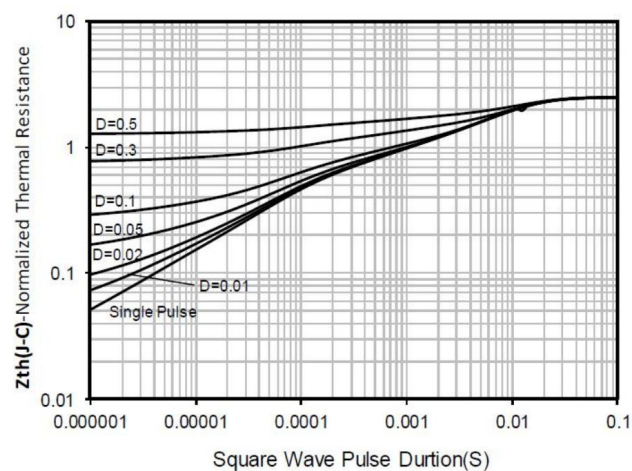
Forward characteristics of reverse diode



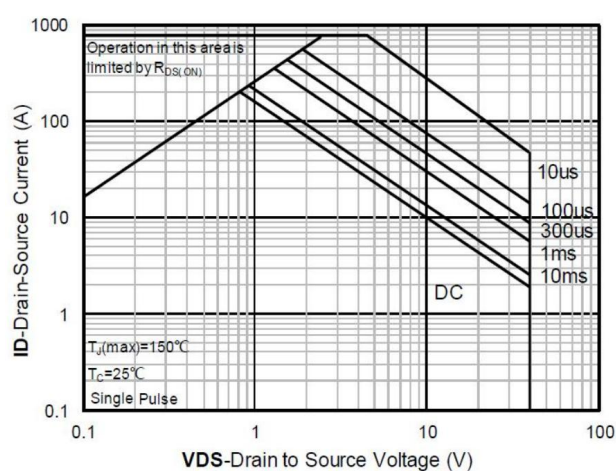
Current dissipation



Power dissipation

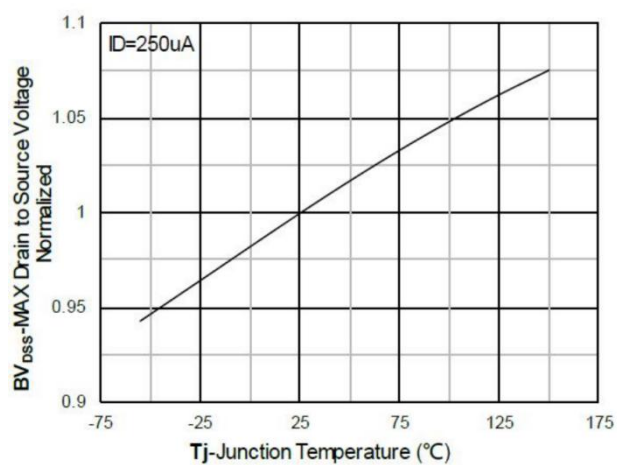


Maximum Transient Thermal Impedance

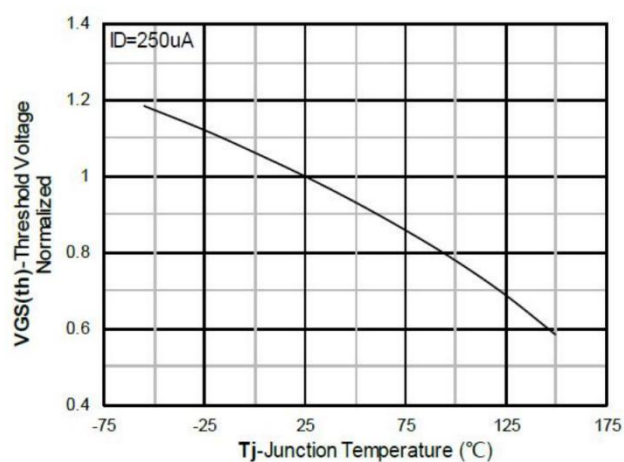


Safe Operation Area

Typical Characteristics

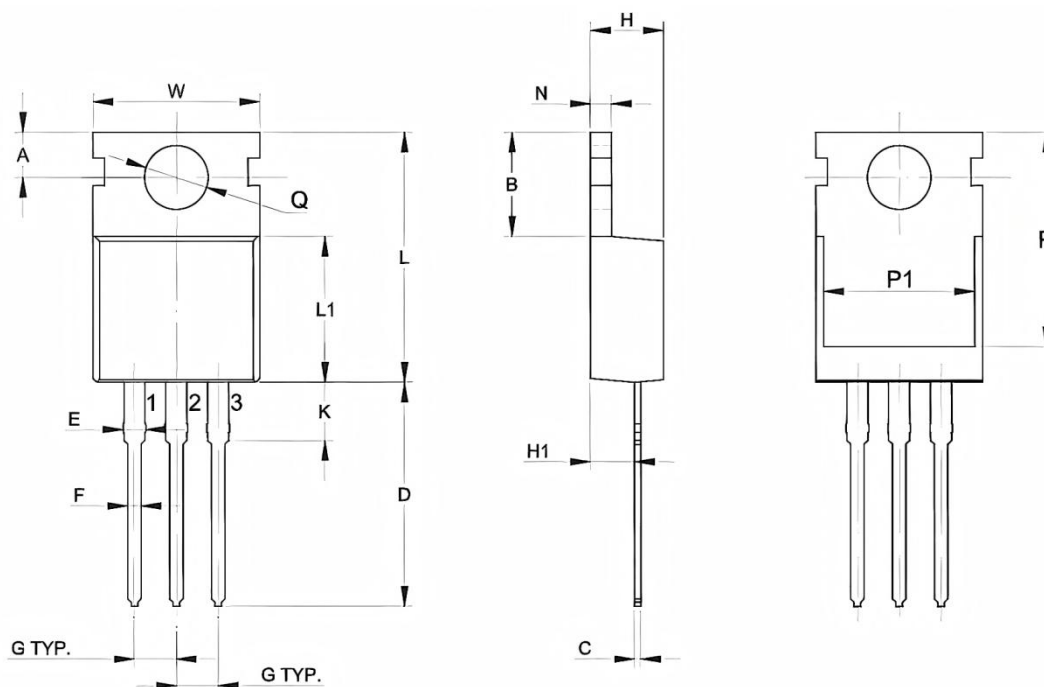


Normalized breakdown voltage



Normalized Threshold voltage

TO-220AB Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	2.700	2.900	0.106	0.114
B	6.400	6.800	0.252	0.268
C	0.300	0.700	0.012	0.028
D	11.000	15.000	0.433	0.591
E	1.100	1.500	0.043	0.059
F	0.700	0.900	0.028	0.035
G	2.540 TYP.		0.100 TYP.	
W	9.800	10.200	0.386	0.402
H	4.300	4.700	0.169	0.185
H1	2.200	2.500	0.087	0.098
K	2.700	3.100	0.106	0.122
L	14.800	16.800	0.583	0.661
L1	9.000	9.400	0.354	0.370
N	1.200	1.400	0.047	0.055
P	12.700	13.300	0.500	0.524
P1	7.600	8.200	0.299	0.323
Q	3.500	3.700	0.138	0.146