

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	I_D
85V	6.2mΩ@10V	120A

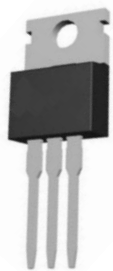
Feature

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

Application

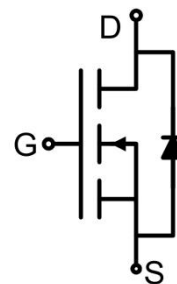
- Power switching application
- DC/DC Converter
- Power Management

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}	85	V
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current ($T_C=25^{\circ}\text{C}$)	I_D	120	A
Continuous Drain Current ($T_C=100^{\circ}\text{C}$)	$I_D (100^{\circ}\text{C})$	90	A
Pulsed Drain Current	I_{DM}	480	A
Single Pulse Avalanche Energy ¹⁾	E_{AS}	576	mJ
Power Dissipation ($T_C=25^{\circ}\text{C}$)	P_D	180	W
Thermal Resistance Junction to Case	$R_{\theta JC}$	0.7	$^{\circ}\text{C/W}$
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)

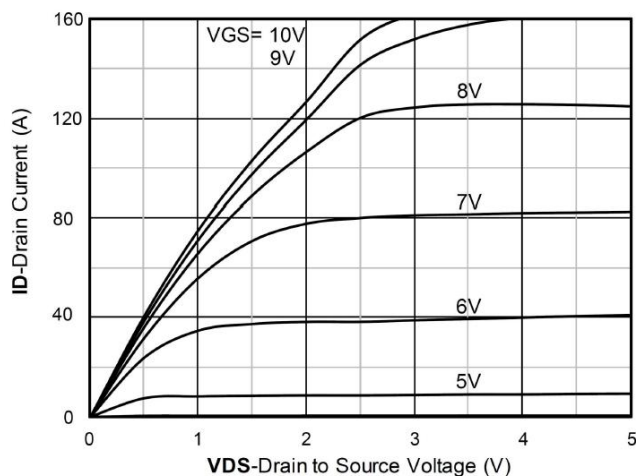
Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Static Characteristics						
Drain-source breakdown voltage	V _{(BR)DSS}	V _{GS} =0V, I _D =250μA	85			V
Zero gate voltage drain current	I _{DSS}	V _{DS} =68V, V _{GS} =0V, T _J =25°C			1	μA
Gate-body leakage current	I _{GSS}	V _{DS} =0V, V _{GS} =±20V			±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 =45A		4.9	6.2	mΩ
Dynamic characteristics ²⁾						
Input Capacitance	C _{iss}	V _{DS} =40V, V _{GS} =0V, f =1MHz		4300		pF
Output Capacitance	C _{oss}			741		
Reverse Transfer Capacitance	C _{rss}			45		
Total Gate Charge	Q _g	V _{DS} =68V, V _{GS} =10V, I _D =45A		48		nC
Gate-Source Charge	Q _{gs}			7		
Gate-Drain Charge	Q _{gd}			12		
Turn-on delay time	t _{d(on)}	V _{DS} =40V, V _{GS} =10V, I _D =45A R _G =6Ω		24		nS
Turn-on rise time	t _r			50		
Turn-off delay time	t _{d(off)}			120		
Turn-off fall time	t _f			18		
Source-Drain Diode characteristics						
Diode Continuous Current	I _S				120	A
Diode Forward voltage	V _{SD}	V _{GS} =0V, I _S =1A			1.2	V
Reverse recover time	T _{rr}	I _S =45A, di/dt =100A/μs		30		nS
Reverse recovery charge	Q _{rr}	T _J =25°C		48		nC

Notes:

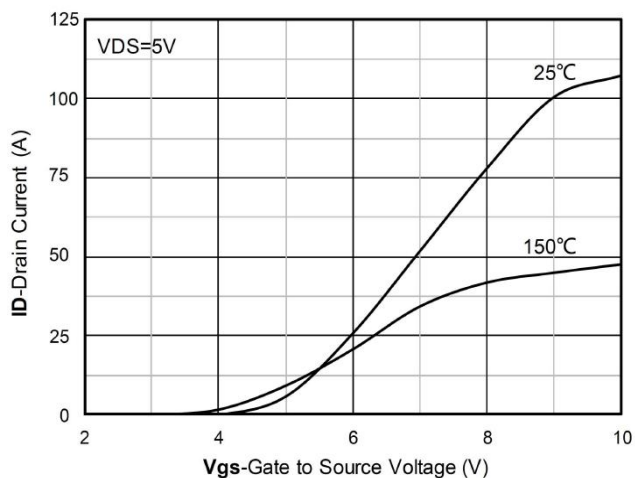
1) EAS condition : $T_J=25^{\circ}\text{C}$, $V_{DD}=40V$, $V_G=10V$, $L=0.3\text{mH}$, $R_G=25\Omega$.

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

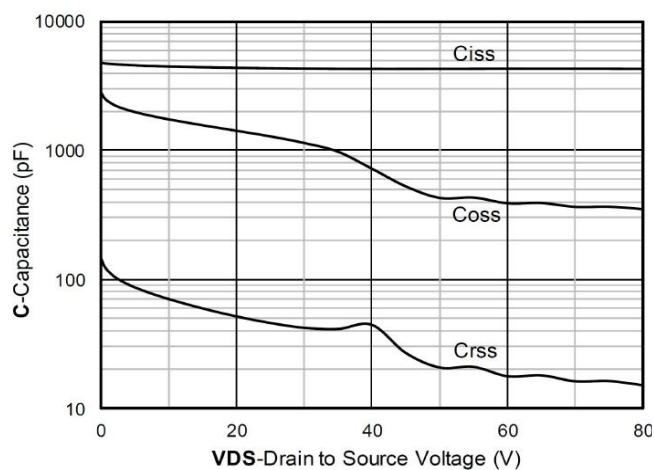
Typical Characteristics



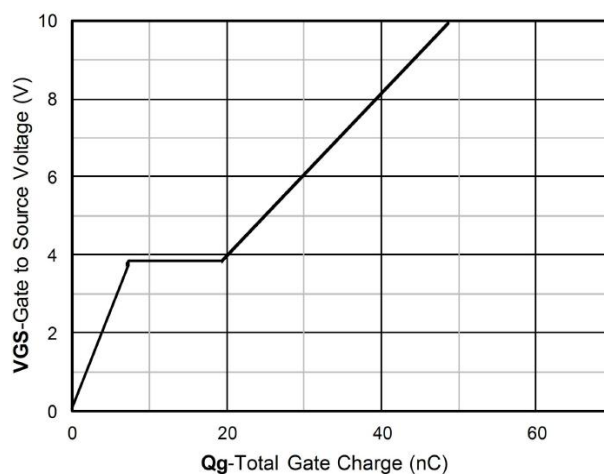
Output Characteristics



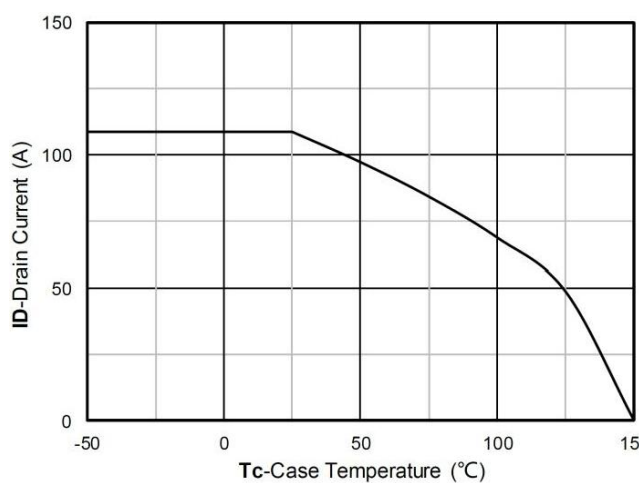
Transfer Characteristics



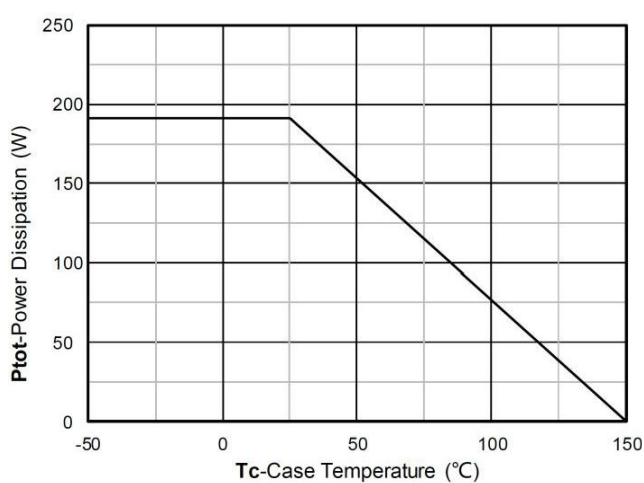
Capacitance Characteristics



Gate Charge

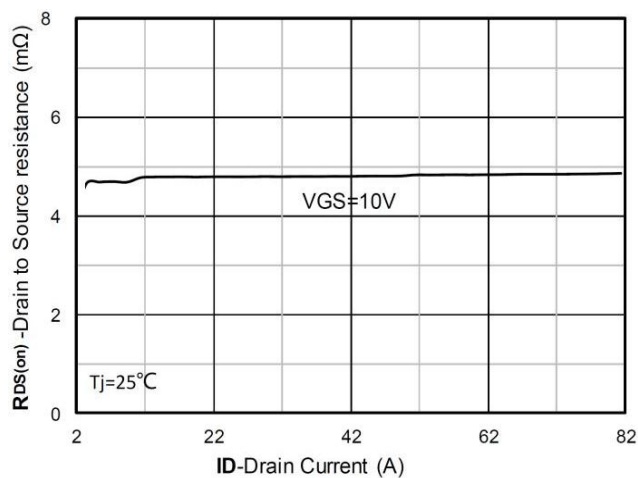


Current dissipation

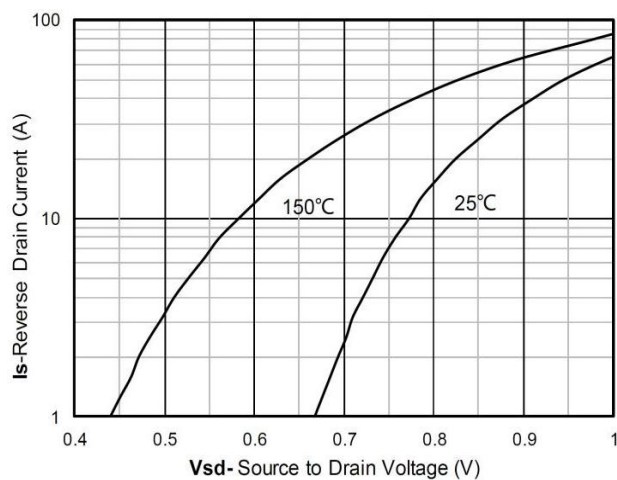


Power dissipation

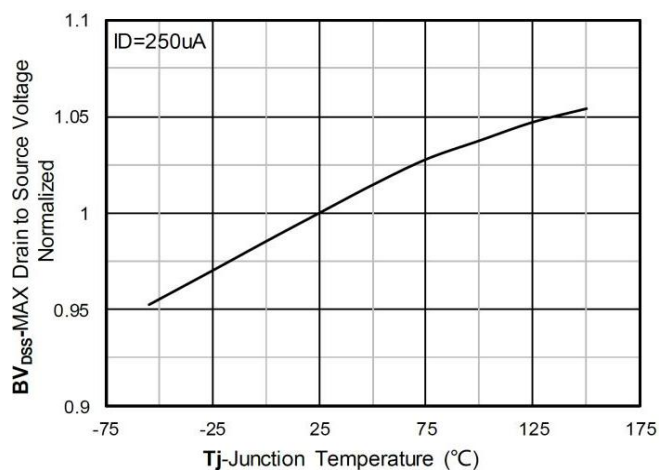
Typical Characteristics



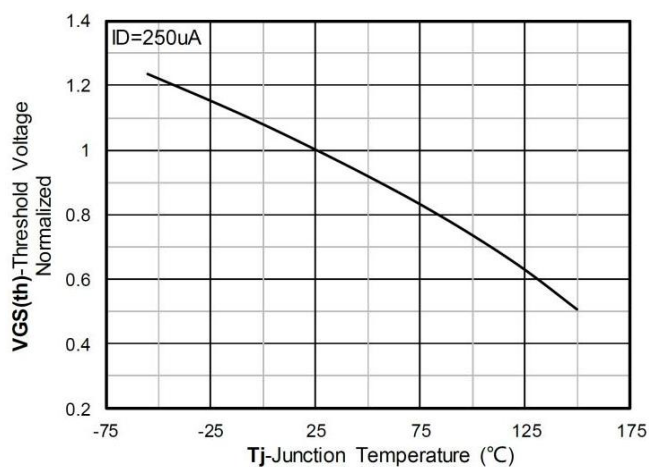
$R_{DS(on)}$ VS Drain Current



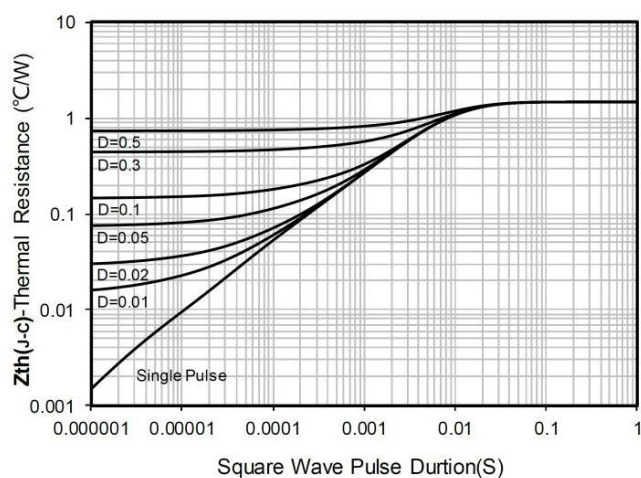
Forward characteristics of reverse diode



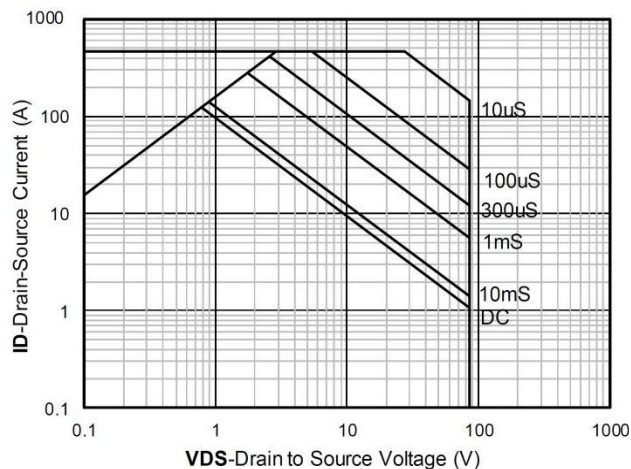
Normalized breakdown voltage



Normalized Threshold voltage

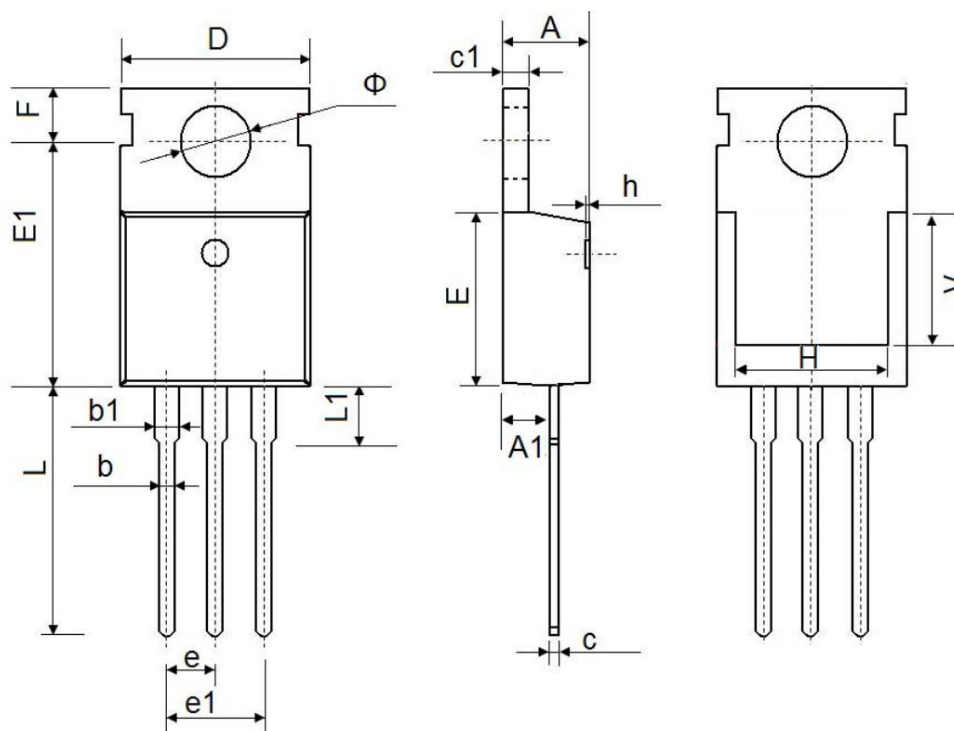


Maximum Transient Thermal Impedance



Safe Operation Area

TO-220AB Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	4.400	4.600	0.173	0.181
A1	2.250	2.550	0.089	0.100
b	0.710	0.910	0.028	0.036
b1	1.170	1.370	0.046	0.054
c	0.330	0.650	0.013	0.026
c1	1.200	1.400	0.047	0.055
D	9.910	10.250	0.390	0.404
E	8.950	9.750	0.352	0.384
E1	12.650	12.950	0.498	0.510
e	2.540 TYP.		0.100 TYP.	
e1	4.980	5.180	0.196	0.204
F	2.650	2.950	0.104	0.116
H	7.900	8.100	0.311	0.319
h	0.000	0.300	0.000	0.012
L	12.900	13.400	0.508	0.528
L1	2.850	3.250	0.112	0.128
V	6.900 REF.		0.276 REF.	
φ	3.400	3.800	0.134	0.150