

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	I_D
150V	20mΩ@10V	50A

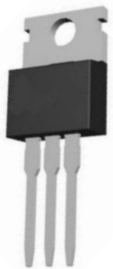
Feature

- Fast Switching
- Low Gate Charge and $R_{DS(ON)}$
- Advanced Split Gate Trench Technology

Application

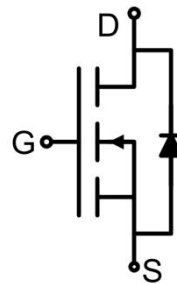
- Power switching application
- DC-DC converter
- Power management

Package



TO-220AB

Circuit diagram



Marking



Absolute maximum ratings (T_A=25°C unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V _{DS}	150	V
Gate-Source Voltage	V _{GS}	±20	V
Continuous Drain Current (T _C =25°C)	I _D	50	A
Continuous Drain Current (T _C =100°C)	I _D (100°C)	35	A
Pulsed Drain Current	I _{DM}	200	A
Single Pulse Avalanche Energy ¹⁾	E _{AS}	240	mJ
Power Dissipation (T _C =25°C)	P _D	145	W
Thermal Resistance Junction to Case	R _{θJC}	0.86	°C/W
Operating Junction Temperature	T _J	-55 ~ +150	°C
Storage Temperature Range	T _{STG}	-55 ~ +150	°C

Electrical characteristics (T_A=25°C, unless otherwise noted)

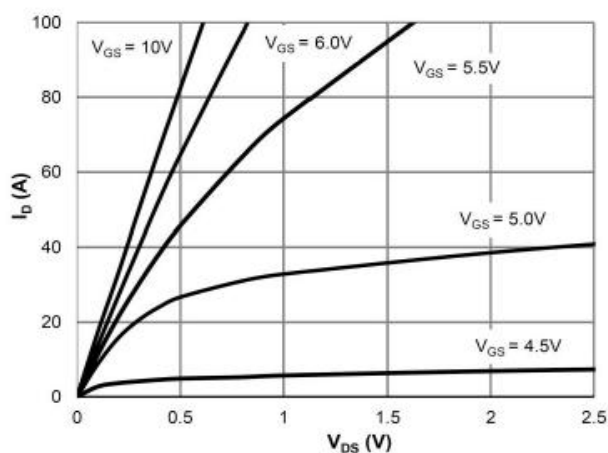
Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Static Characteristics						
Drain-source breakdown voltage	V _{(BR)DSS}	V _{GS} =0V, I _D =250μA	150			V
Zero gate voltage drain current	I _{DSS}	V _{DS} =120V, V _{GS} =0V			1	μA
Gate-body leakage current	I _{GSS}	V _{DS} =0V, V _{GS} =±20V			±0.1	μA
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 =20A		16	20	mΩ
Dynamic characteristics ²⁾						
Input Capacitance	C _{iss}	V _{DS} =75V, V _{GS} =0V, f =1MHz		1869		pF
Output Capacitance	C _{oss}			153		
Reverse Transfer Capacitance	C _{rss}			9		
Total Gate Charge	Q _g	V _{DS} =75V, V _{GS} =10V, I _D =20A		25		nC
Gate-Source Charge	Q _{gs}			7.8		
Gate-Drain Charge	Q _{gd}			4		
Turn-on delay time	t _{d(on)}	V _{DS} =50V, V _{GS} =10V, I _D =20A R _G =6Ω		13		nS
Turn-on rise time	t _r			5		
Turn-off delay time	t _{d(off)}			21		
Turn-off fall time	t _f			5		
Source-Drain Diode characteristics						
Diode Continuous Current	I _S				50	A
Diode Forward voltage	V _{SD}	V _{GS} =0V, I _S =1A			1.2	V
Reverse recover time	T _{rr}	I _S =20A, di/dt =100A/us		70		nS
Reverse recovery charge	Q _{rr}	T _J = 25℃		156		nC

Notes:

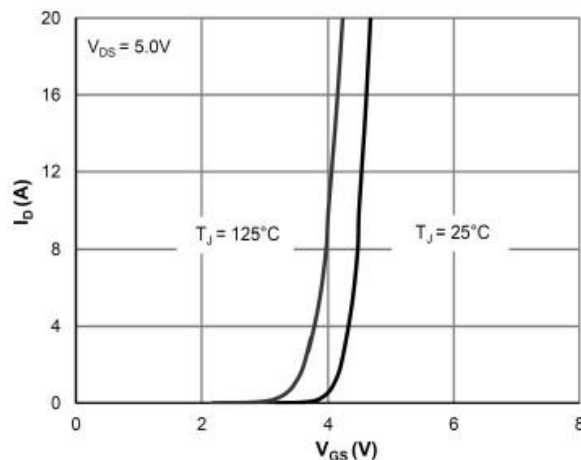
1) The EAS test condition is V_{DD} = 50V, V_{GS} = 10V, L = 0.5mH, R_G = 25Ω.

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

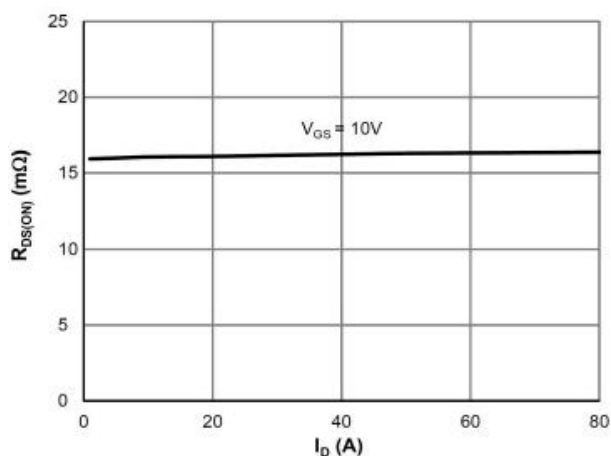
Typical Characteristics



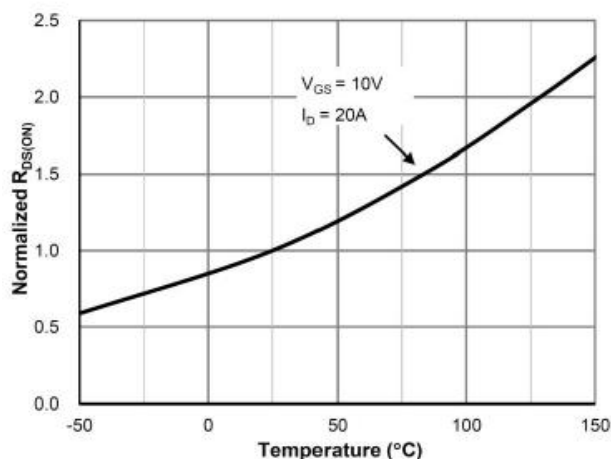
Saturation Characteristics



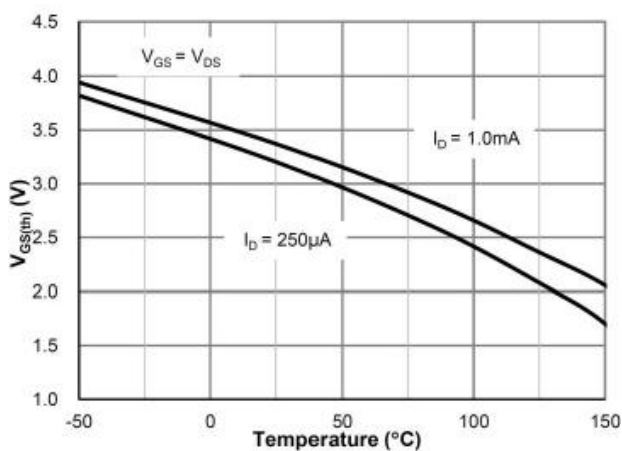
Transfer Characteristics



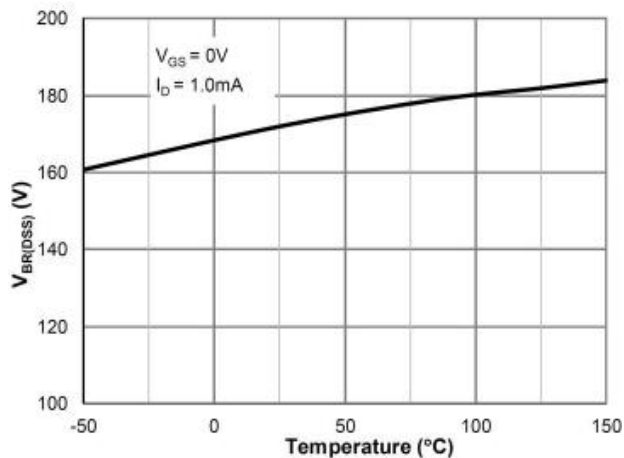
$R_{DS(on)}$ vs. Drain Current



$R_{DS(on)}$ vs. Junction Temperature

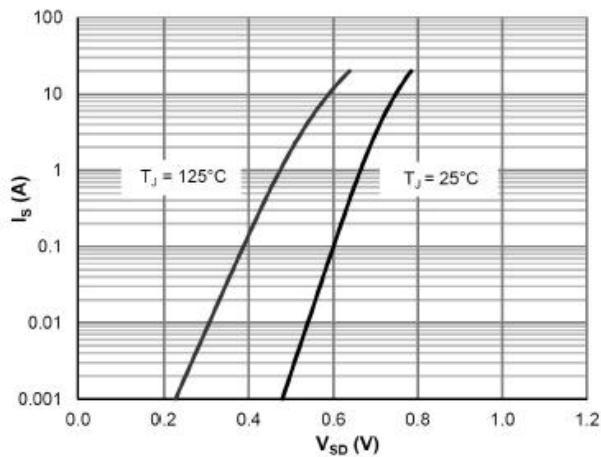


$V_{GS(th)}$ vs. Junction Temperature

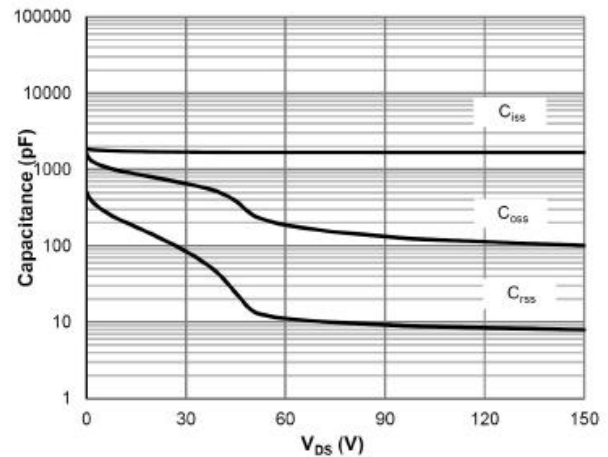


$V_{BR(DSS)}$ vs. Junction Temperature

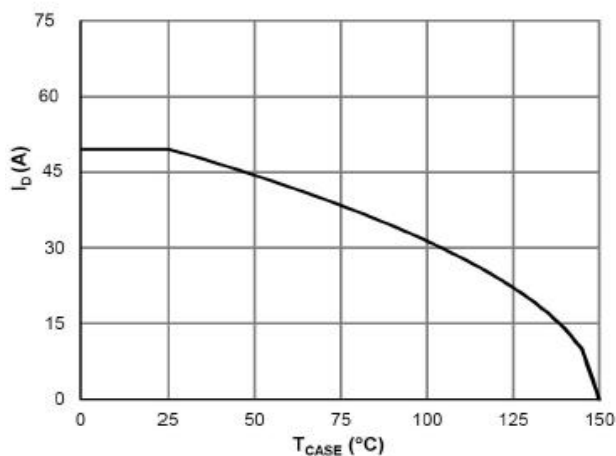
Typical Characteristics



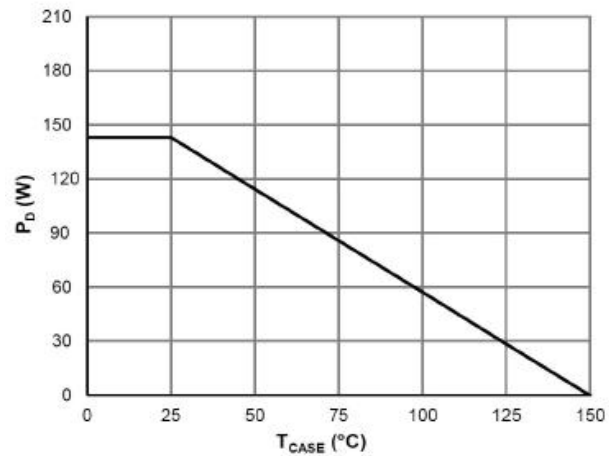
Body-Diode Characteristics



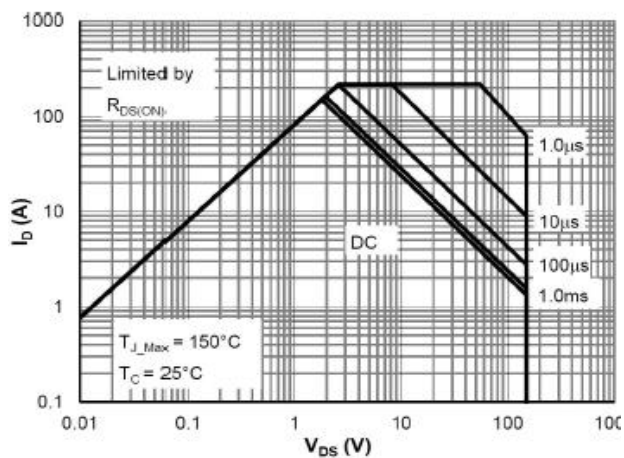
Capacitance Characteristics



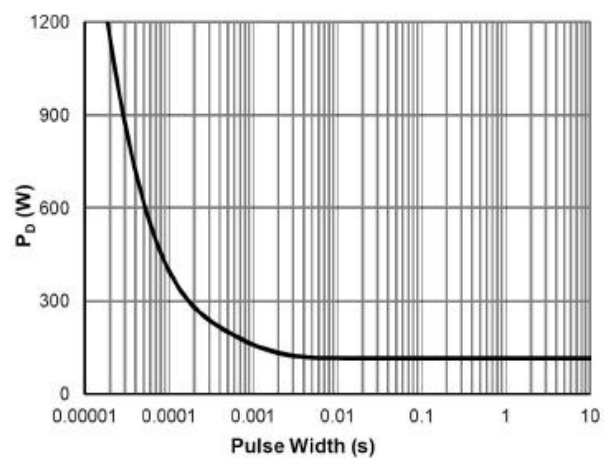
Current De-rating



Power De-rating

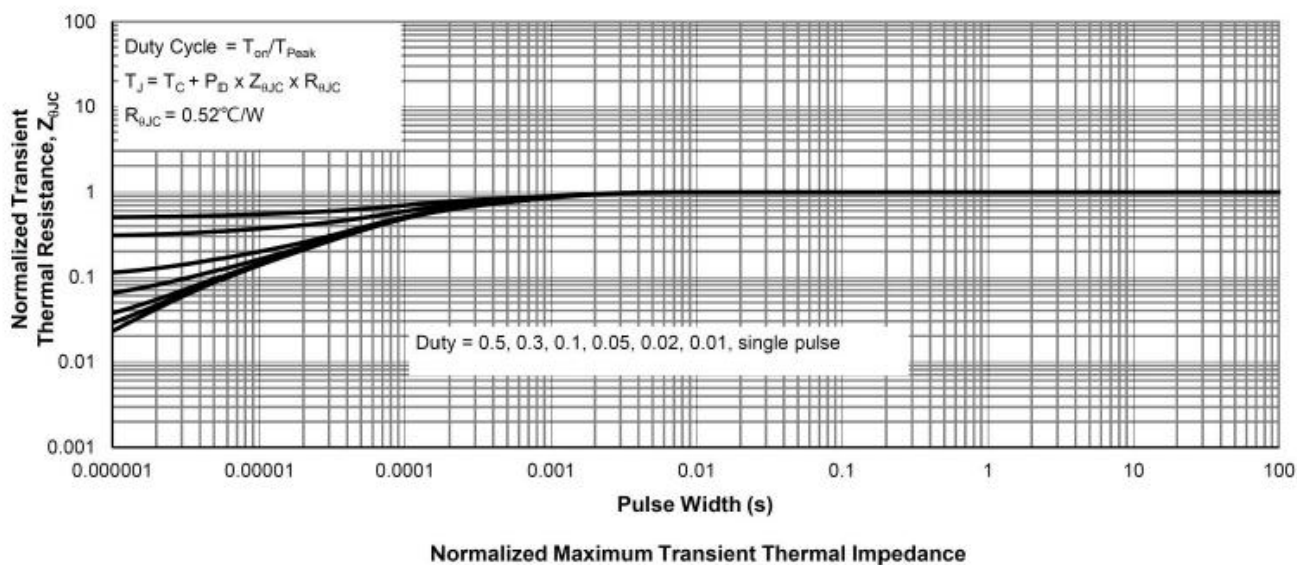


Maximum Safe Operating Area

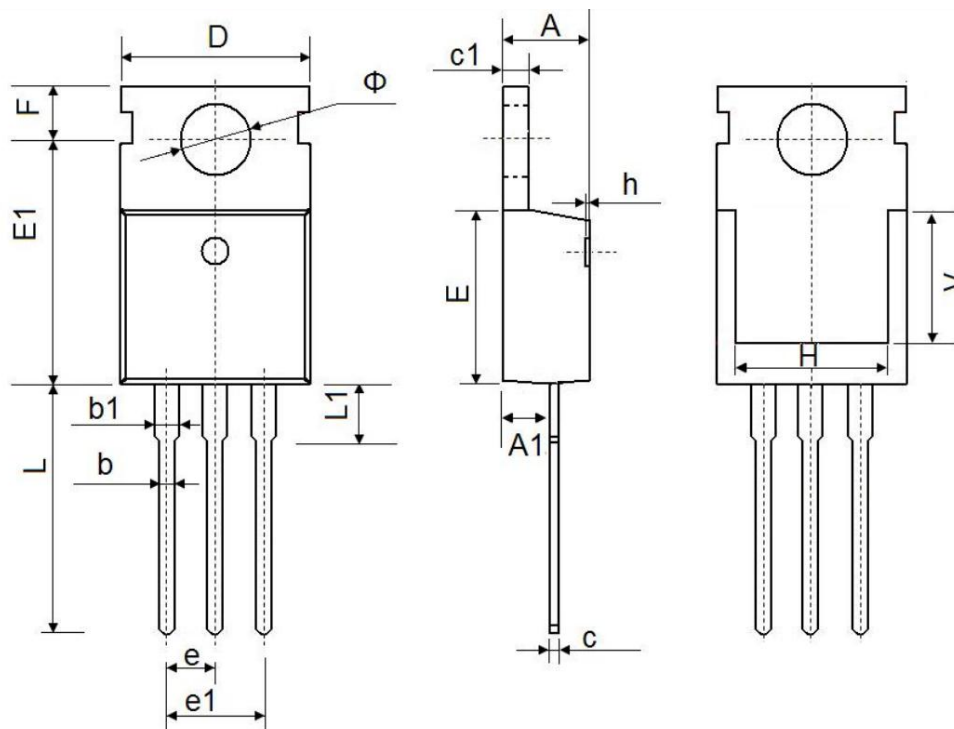


Single Pulse Power Rating, Junction-to-Case

Typical Characteristics



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	13.050	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