

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	I_D
200V	55mΩ@10V	28A

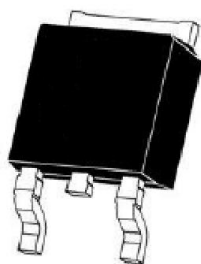
Feature

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

Application

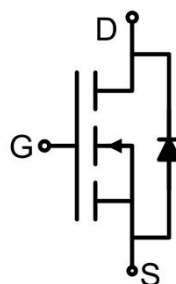
- Industrial power supply

Package



TO-252AB

Circuit diagram



Marking



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

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	200	V
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current ^{1,3)} ($V_{GS}=10\text{V}$, Chip limitation)	I_D	28	A
Continuous Drain Current ^{1,3)} ($V_{GS}=10\text{V}$, $T_C=100^{\circ}\text{C}$)	$I_D(100^{\circ}\text{C})$	17	A
Pulsed Drain Current ($t_p \leq 10\mu\text{s}$)	I_{DM}	100	A
Single Pulse Avalanche Energy ²⁾	E_{AS}	250	mJ
Power Dissipation ^{1,3)}	P_D	104	W
Thermal Resistance Junction to Case	$R_{\theta JC}$	1.2	$^{\circ}\text{C/W}$
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	200			V
Zero gate voltage drain current	I _{DSS}	V _{DS} =200V, 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	2.2	3	3.8	V
Drain-source on-resistance	R _{DS(on)}	V _{GS} =10V, I _D =22A		42	55	mΩ
Dynamic characteristics ⁴⁾						
Input Capacitance	C _{iss}	V _{DS} =100V, V _{GS} =0V, f =1MHz		905		pF
Output Capacitance	C _{oss}			104		
Reverse Transfer Capacitance	C _{rss}			3.8		
Total Gate Charge	Q _g	V _{DS} =100V, V _{GS} =10V, I _D =22A		13		nC
Gate-Source Charge	Q _{gs}			4.1		
Gate-Drain Charge	Q _{gd}			2.1		
Turn-on delay time	t _{d(on)}	V _{DS} =100V, V _{GS} =10V, I _D =22A R _G =3Ω		8.3		nS
Turn-on rise time	t _r			3.6		
Turn-off delay time	t _{d(off)}			14.1		
Turn-off fall time	t _f			2.8		
Source-Drain Diode characteristics						
Diode Continuous Current	I _S	T _C =25°C			28	A
Diode Forward voltage	V _{SD}	V _{GS} =0V, I _S =22A			1.2	V
Reverse recover time	T _{rr}	V _{GS} =0V, V _R =100V, I _F =22A		97.6		nS
Reverse recovery charge	Q _{rr}	di/dt =-100A/us		313		nC

Notes:

- 1) The entire application environment impacts the thermal resistance values shown, they are not constants and are only valid for the particular conditions noted.
- 2) E_{AS} condition: $T_J=25^{\circ}\text{C}$, $V_G=10\text{V}$, $R_G=25\Omega$, $L=5\text{mH}$, $I_{AS}=10\text{A}$.
- 3) Thermal resistance from junction to soldering point (on the exposed drain pad).
- 4) Guaranteed by design, not subject to production testing.

Typical Characteristics

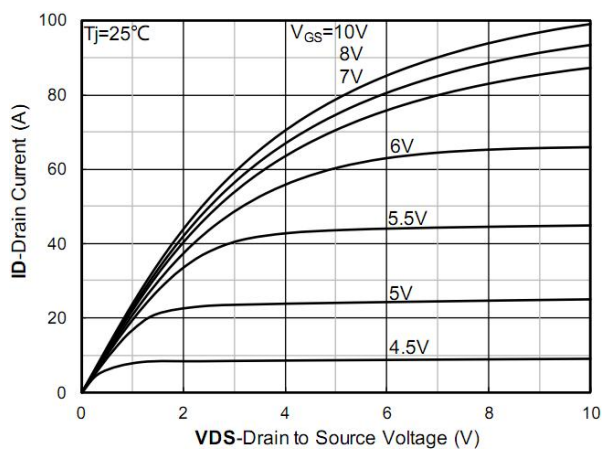


Figure 1. Output Characteristics; typical values

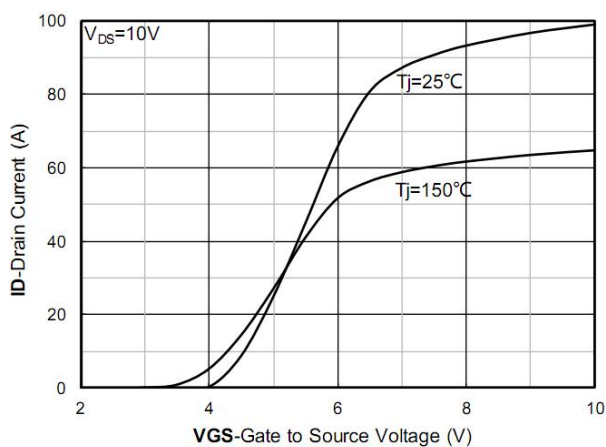


Figure 2. Transfer Characteristics; typical values

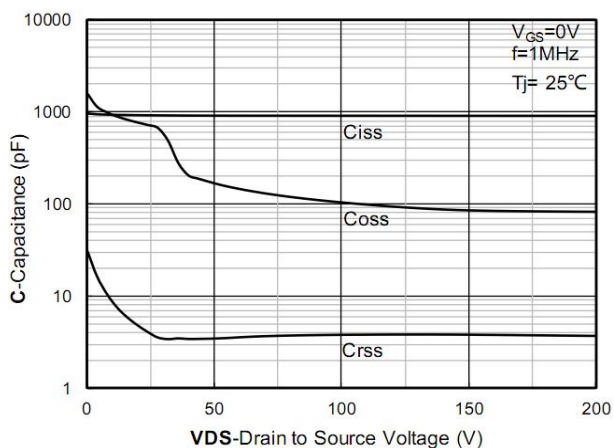


Figure 3. Capacitance Characteristics; typical values

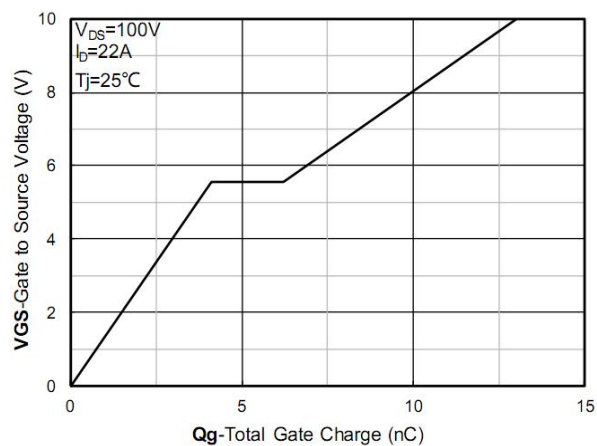


Figure 4. Gate Charge; typical values

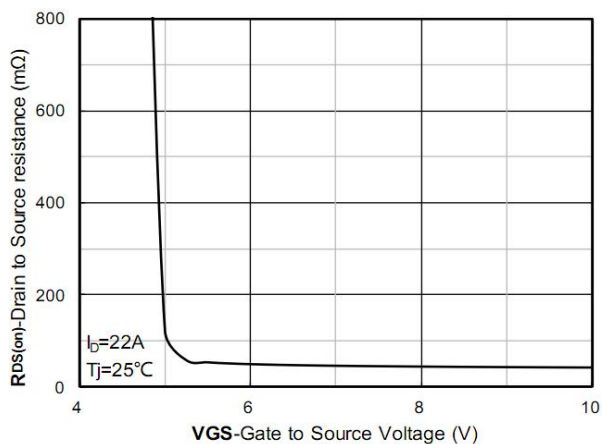


Figure 5. On-Resistance vs. Gate to Source Voltage; typical values

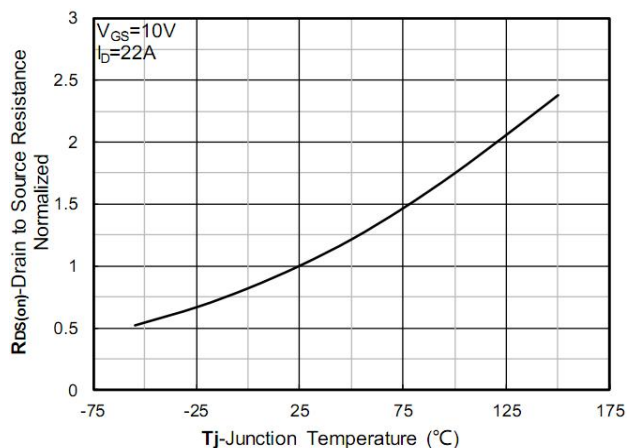


Figure 6. Normalized On-Resistance

Typical Characteristics

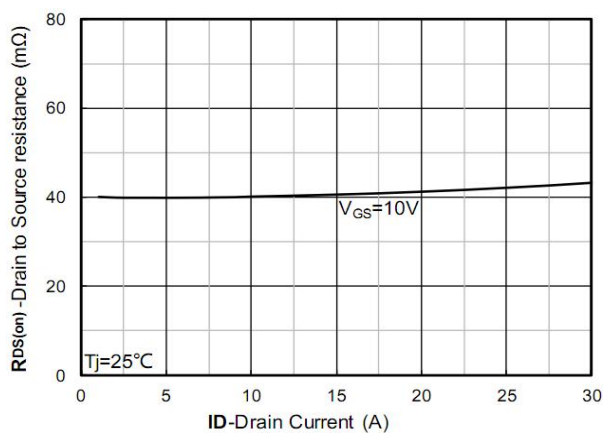


Figure 7. $R_{DS(on)}$ vs. Drain Current; typical values

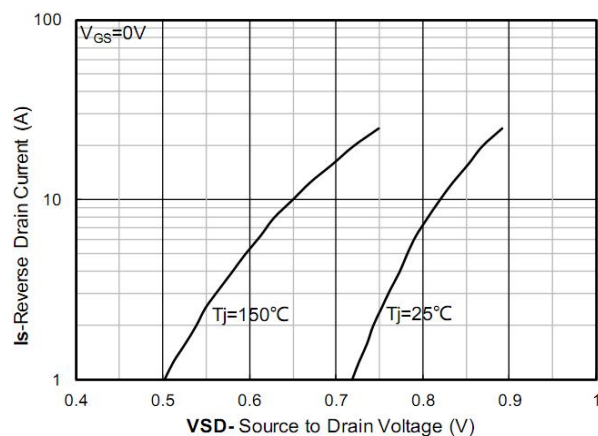


Figure 8. Forward characteristics of reverse diode; typical values

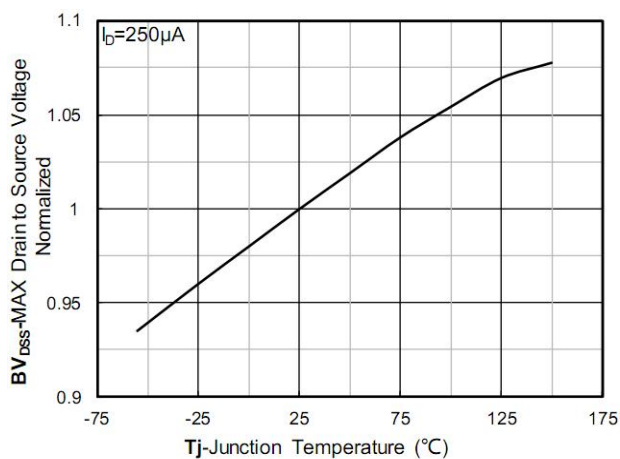


Figure 9. Normalized breakdown voltage

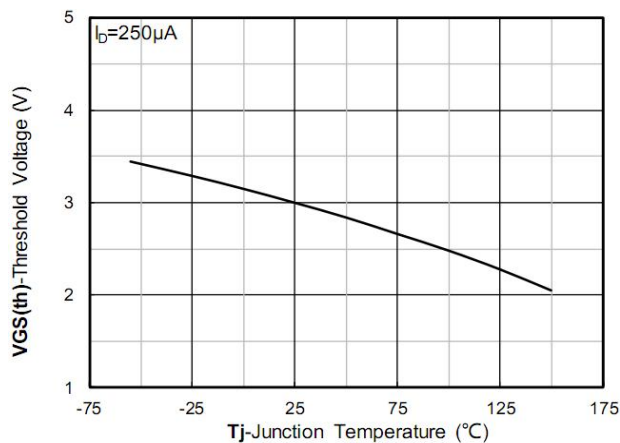


Figure 10. Gate Threshold voltage; typical values

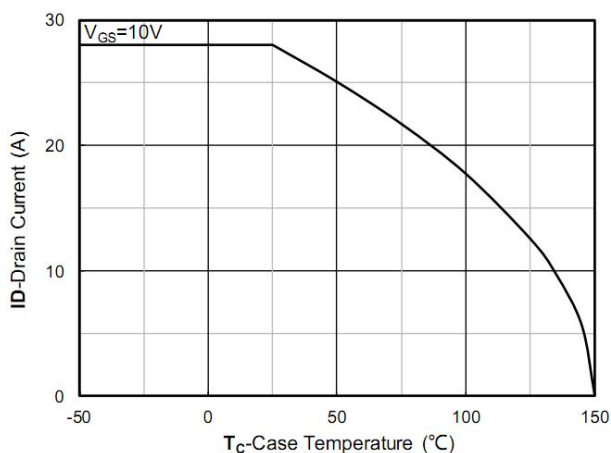


Figure 11. Current dissipation

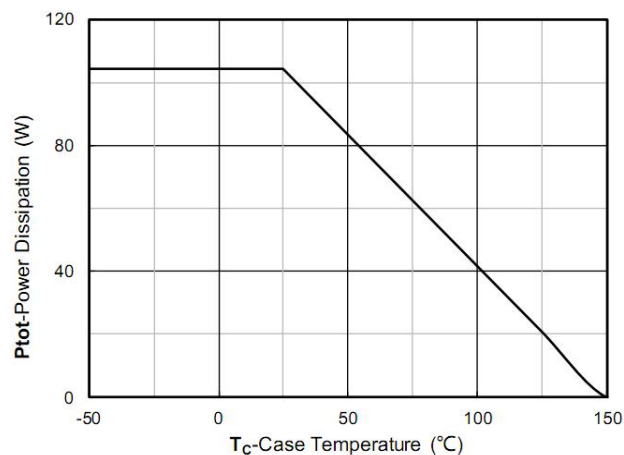


Figure 12. Power dissipation

Typical Characteristics

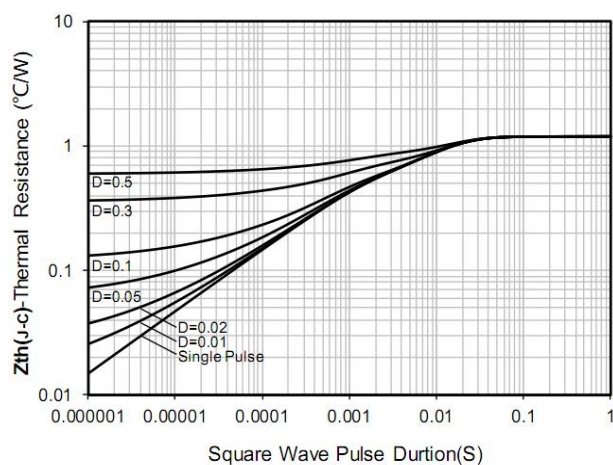


Figure 13. Maximum Transient Thermal Impedance

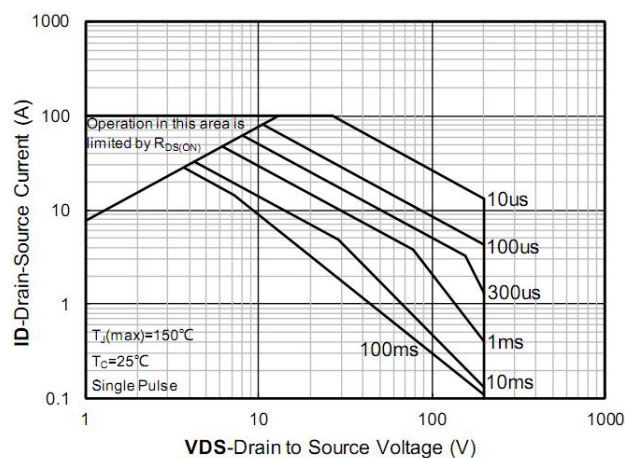
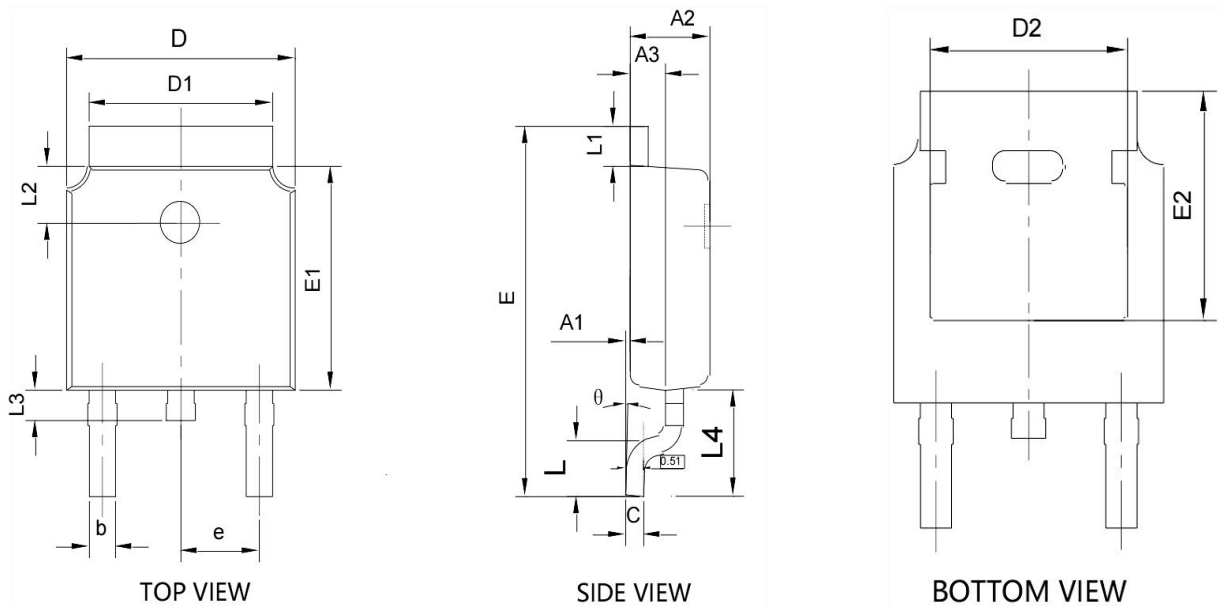


Figure 14. Safe Operation Area

TO-252AB Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A1	0.000	0.200	0.000	0.008
A2	2.200	2.400	0.087	0.094
A3	0.900	1.100	0.035	0.043
b	0.660	0.860	0.026	0.034
c	0.460	0.580	0.018	0.023
D	6.500	6.700	0.256	0.264
D1	5.150	5.450	0.203	0.215
D2	4.600	4.950	0.181	0.195
E	9.900	10.300	0.390	0.406
E1	6.000	6.200	0.236	0.244
E2	5.150	5.450	0.203	0.215
e	2.286 BSC.		0.090 BSC.	
L	1.250	1.750	0.049	0.069
L1	0.900	1.270	0.035	0.050
L2	1.400	1.900	0.055	0.075
L3	0.600	1.000	0.024	0.039
L4	2.900 REF.		0.114 REF.	
θ	0°	10°	0°	10°