

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	I_D
100V	120mΩ@10V	12A
	135mΩ@4.5V	

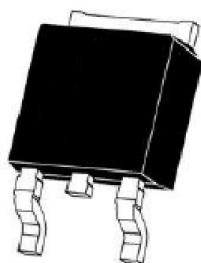
Feature

- Trench Power MV MOSFET technology
- Excellent package for heat dissipation
- High density cell design for low $R_{DS(ON)}$
- Suffix "-Q1" for AEC-Q101

Application

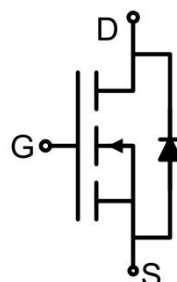
- DC-DC Converters
- Power management functions

Package

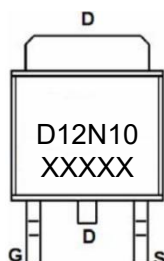


TO-252AB

Circuit diagram



Marking



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

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	100	V
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current ($T_C=25^{\circ}\text{C}$)	I_D	12	A
Continuous Drain Current ($T_C=100^{\circ}\text{C}$)	$I_D(100^{\circ}\text{C})$	8.5	A
Pulsed Drain Current ¹⁾	I_{DM}	25	A
Power Dissipation ²⁾ ($T_C=25^{\circ}\text{C}$)	P_D	50	W
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	3	$^{\circ}\text{C/W}$
Single pulse avalanche energy ³⁾	E_{AS}	12	mJ
Junction Temperature	T_J	175	$^{\circ}\text{C}$
Storage Temperature	T_{STG}	-55 ~ +175	$^{\circ}\text{C}$

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	100			V
Zero gate voltage drain current	I _{DSS}	V _{DS} =100V,V _{GS} = 0V			1	μA
		V _{DS} =100V,V _{GS} = 0V,T _J =175℃			100	
Gate-body leakage current	I _{GSS}	V _{GS} =±20V, V _{DS} = 0V			±100	nA
Gate threshold voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250μA	1.1	1.8	2.5	V
Drain-source on-resistance	R _{DS(on)}	V _{GS} =10V, I _D =10A		93	120	mΩ
		V _{GS} =4.5V, I _D =10A		97	135	
Dynamic characteristics ⁴⁾						
Input Capacitance	C _{iss}	V _{DS} =50V,V _{GS} =0V,f =1MHz		940		pF
Output Capacitance	C _{oss}			28		
Reverse Transfer Capacitance	C _{rss}			20		
Total Gate Charge	Q _g	V _{DS} =50V,V _{GS} =10V,I _D =12A		19		nC
Gate-Source Charge	Q _{gs}			3.1		
Gate-Drain Charge	Q _{gd}			3.4		
Turn-on delay time	t _{d(on)}	V _{DD} =50V,V _{GS} =10V, I _D =12A, R _{GEN} =2.2Ω		7		nS
Turn-on rise time	t _r			25		
Turn-off delay time	t _{d(off)}			21		
Turn-off fall time	t _f			2.5		
Source-Drain Diode characteristics						
Diode Forward Current	I _S				12	A
Diode Forward voltage	V _{SD}	V _{GS} =0V, I _S =12A			1.2	V
Reverse Recovery Time	t _{rr}	I _F =12A,di/dt = 100A/μs		28		nS
Reverse Recovery Charge	Q _{rr}			27		nC

Notes:

- 1) Repetitive rating; pulse width limited by max. junction temperature.
- 2) P_D is based on max. junction temperature, using junction-case thermal resistance.
- 3) $T_J=25^{\circ}\text{C}$, $V_G=10V$, $R_G=25\Omega$, $L=0.5\text{mH}$, $I_{AS}=7A$
- 4) Guaranteed by design, not subject to production testing.

Typical Characteristics

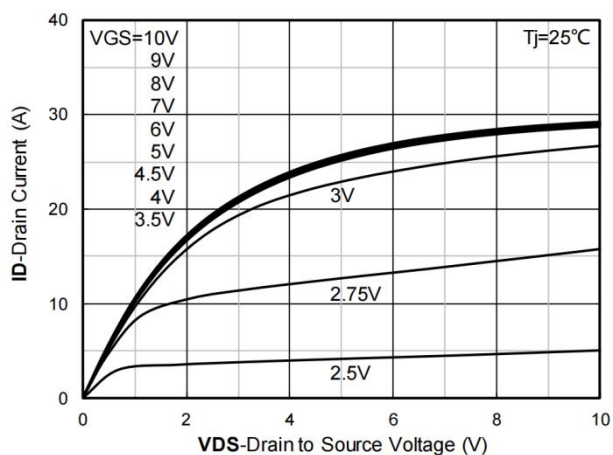


Figure 1. Output Characteristics

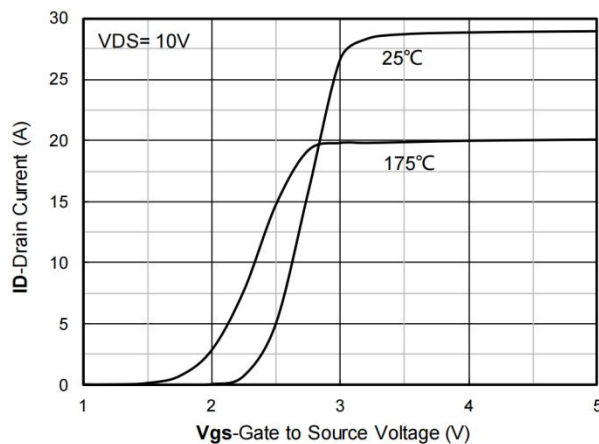


Figure 2. Transfer Characteristics

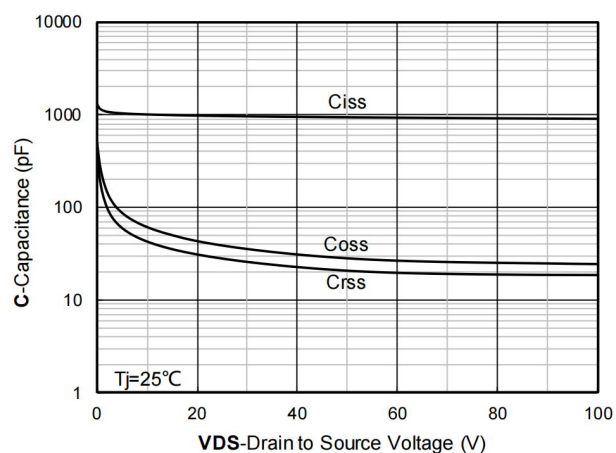


Figure 3. Capacitance Characteristics

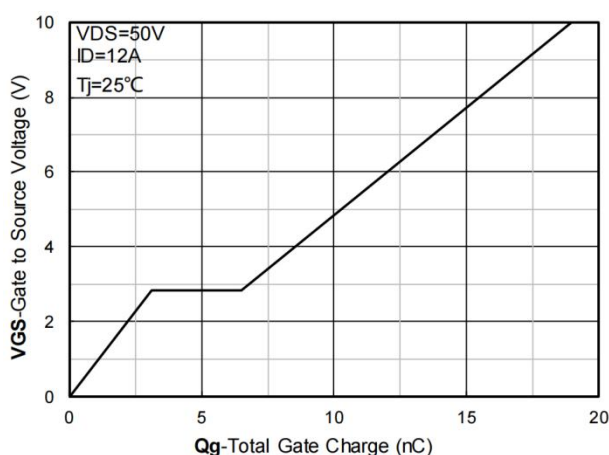


Figure 4. Gate Charge

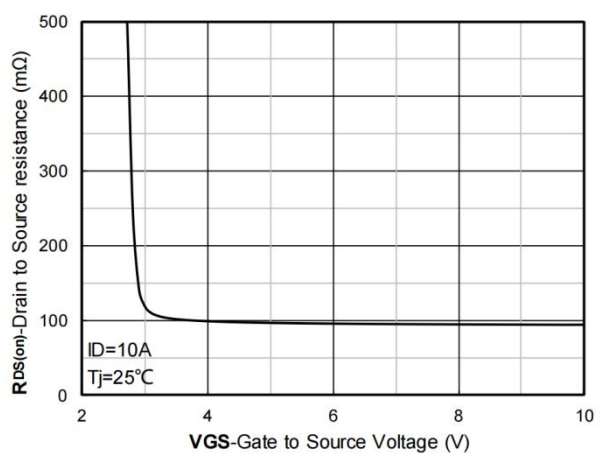


Figure 5. On-Resistance vs Gate to Source Voltage

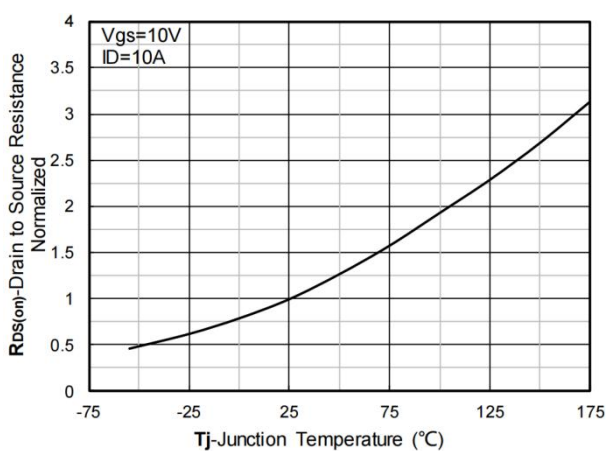


Figure 6. Normalized On-Resistance

Typical Characteristics

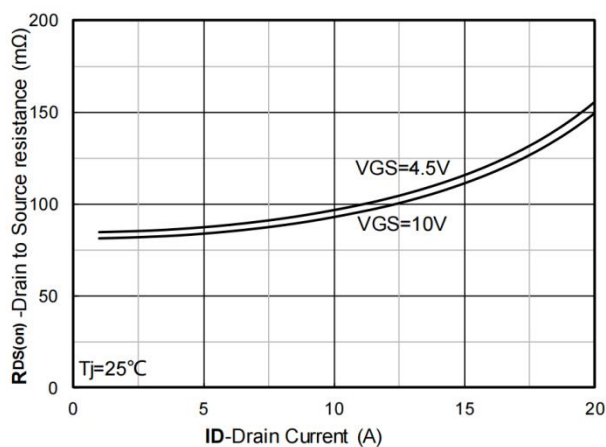


Figure 7. $R_{DS(on)}$ VS Drain Current

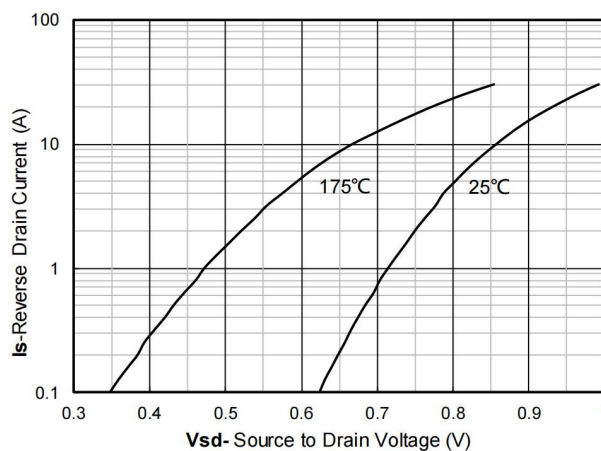


Figure 8. Forward characteristics of reverse diode

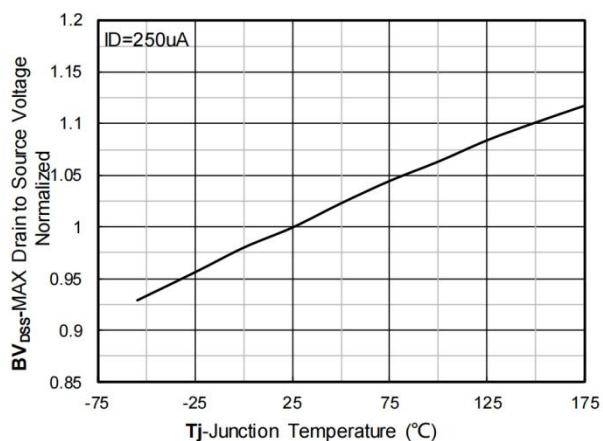


Figure 9. Normalized breakdown voltage

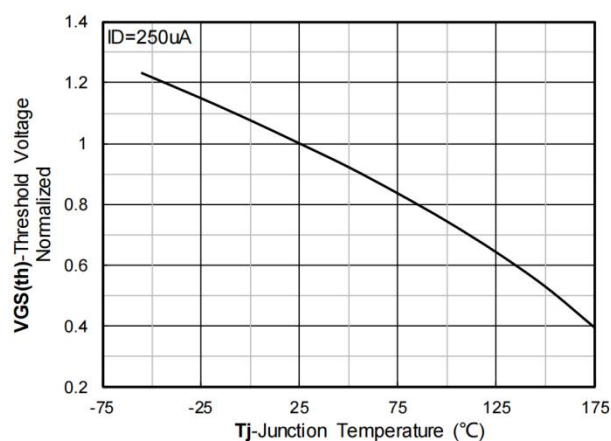


Figure 10. Normalized Threshold voltage

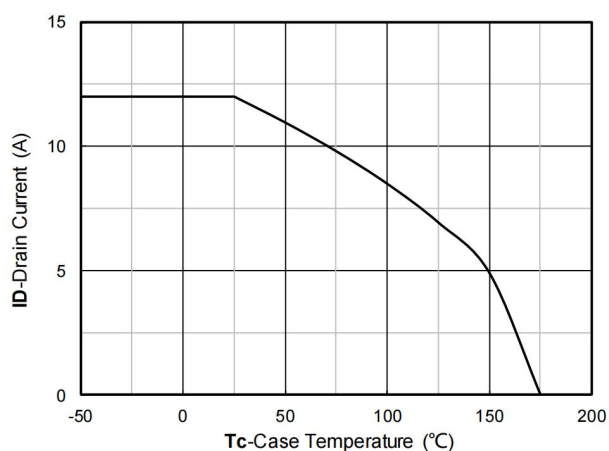


Figure 11. Current dissipation

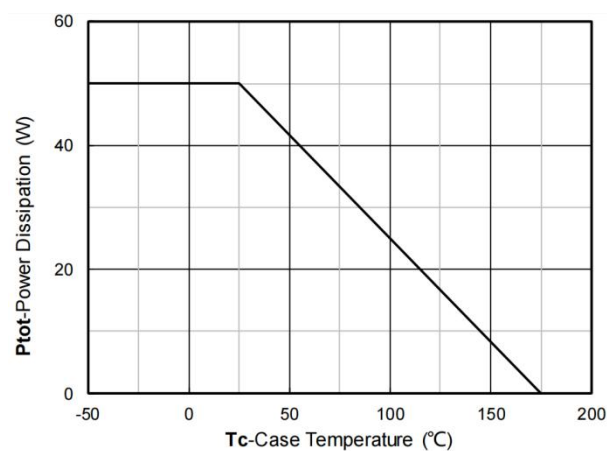


Figure 12. Power dissipation

Typical Characteristics

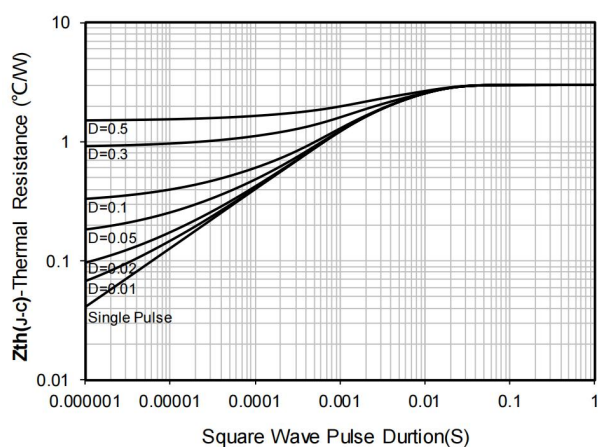


Figure 13. Maximum Transient Thermal Impedance

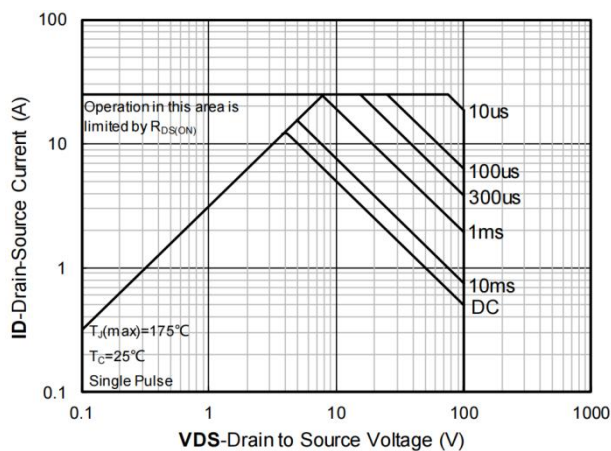
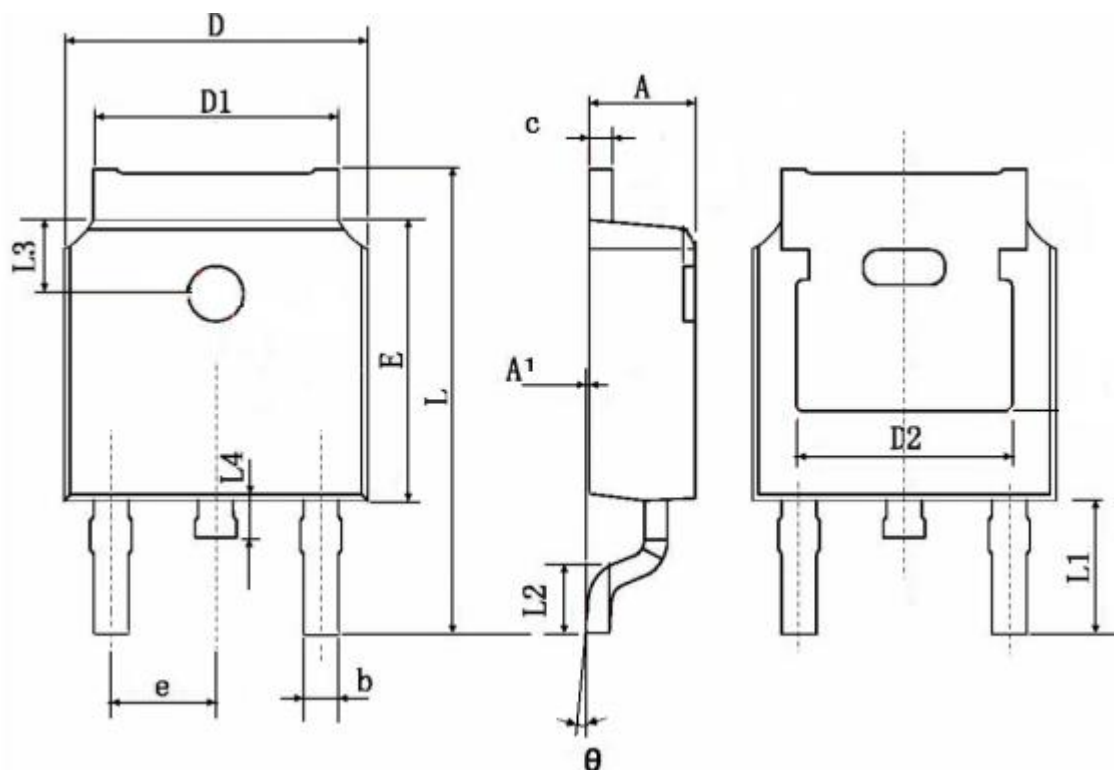


Figure 14. Safe Operation Area

TO-252AB Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	2.200	2.400	0.087	0.094
A1	0.000	0.200	0.000	0.008
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	6.000	6.200	0.236	0.244
e	2.286 BSC.		0.090 BSC.	
L	9.900	10.300	0.390	0.406
L1	2.900 REF.		0.114 REF.	
L2	1.250	1.750	0.049	0.069
L3	1.400	1.900	0.055	0.075
L4	0.600	1.000	0.024	0.039
θ	0°	10°	0°	10°