

## Product Summary

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

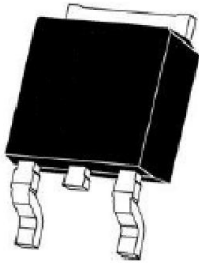
## Feature

- Trench power MV MOSFET technology
- Excellent package for heat dissipation
- High density cell design for low  $R_{DS(ON)}$

## Application

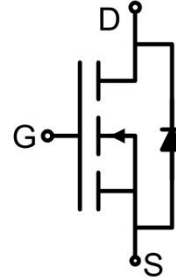
- Power management functions
- DC-DC convertor

## Package

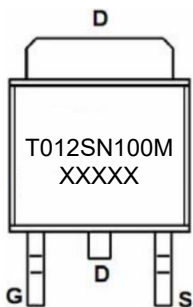


TO-252AB

## Circuit diagram



## Marking



### Absolute Maximum Ratings (T<sub>A</sub>=25°C unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V <sub>DS</sub>	100	V
Gate-Source Voltage	V <sub>GS</sub>	±20	V
Continuous Drain Current (T <sub>C</sub> =25°C)	I <sub>D</sub>	12	A
Continuous Drain Current (T <sub>C</sub> =100°C)	I <sub>D</sub> (100°C)	8.5	A
Pulsed Drain Current <sup>1)</sup>	I <sub>DM</sub>	25	A
Single Pulse Avalanche Energy <sup>2)</sup>	E <sub>AS</sub>	12	mJ
Power Dissipation <sup>3)</sup> (T <sub>C</sub> =25°C)	P <sub>D</sub>	50	W
Thermal Resistance Junction to Case	R <sub>θJC</sub>	3	°C/W
Operating Junction Temperature	T <sub>J</sub>	-55 ~ +175	°C
Storage Temperature	T <sub>STG</sub>	-55 ~ +175	°C

### Electrical characteristics (T<sub>J</sub>=25°C unless otherwise noted)

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
<b>Static Characteristics</b>						
Drain-source breakdown voltage	V <sub>(BR)DSS</sub>	V <sub>GS</sub> = 0V, I <sub>D</sub> = 250μA	100			V
Zero gate voltage drain current	I <sub>DSS</sub>	V <sub>DS</sub> = 100V, V <sub>GS</sub> = 0V			1	μA
Gate-body leakage current	I <sub>GSS</sub>	V <sub>DS</sub> = 0V, V <sub>GS</sub> = ±20V			±100	nA
Gate threshold voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 250μA	1.1	1.8	2.5	V
Drain-source on-resistance	R <sub>DS(on)</sub>	V <sub>GS</sub> = 10V, I <sub>D</sub> = 10A		93	120	mΩ
		V <sub>GS</sub> = 4.5V, I <sub>D</sub> = 10A		97	135	
<b>Dynamic characteristics<sup>4)</sup></b>						
Input Capacitance	C <sub>iss</sub>	V <sub>DS</sub> = 50V, V <sub>GS</sub> = 0V, f = 1MHz		940		pF
Output Capacitance	C <sub>oss</sub>			28		
Reverse Transfer Capacitance	C <sub>rss</sub>			20		
Total Gate Charge	Q <sub>g</sub>	V <sub>DS</sub> = 50V, V <sub>GS</sub> = 10V, I <sub>D</sub> = 12A		19		nC
Gate-Source Charge	Q <sub>gs</sub>			3.1		
Gate-Drain Charge	Q <sub>gd</sub>			3.4		
Turn-on delay time	t <sub>d(on)</sub>	V <sub>DS</sub> = 50V, V <sub>GS</sub> = 10V, I <sub>D</sub> = 12A R <sub>G</sub> = 2.2Ω		7		nS
Turn-on rise time	t <sub>r</sub>			25		
Turn-off delay time	t <sub>d(off)</sub>			21		
Turn-off fall time	t <sub>f</sub>			2.5		
<b>Source-Drain Diode characteristics</b>						
Diode Forward Current	I <sub>S</sub>				12	A
Diode Forward voltage	V <sub>SD</sub>	V <sub>GS</sub> = 0V, I <sub>S</sub> = 12A			1.2	V
Reverse Recovery Time	T <sub>rr</sub>	I <sub>F</sub> = 12A, di/dt = -100A/μs		28		nS
Reverse Recovery Charge	Q <sub>rr</sub>			27		nC

Notes:

- 1) Repetitive rating; pulse width limited by max. junction temperature.
- 2) T<sub>J</sub>=25°C, V<sub>G</sub>=10V, R<sub>G</sub>=25Ω, L=0.5mH, I<sub>AS</sub>=7A.
- 3) P<sub>D</sub> is based on max. junction temperature, using junction-case thermal resistance.
- 4) Guaranteed by design, not subject to production testing.

## Typical Characteristics

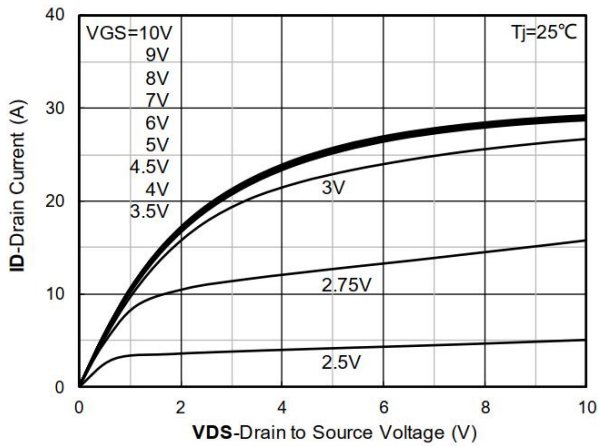


Figure 1. Output Characteristics

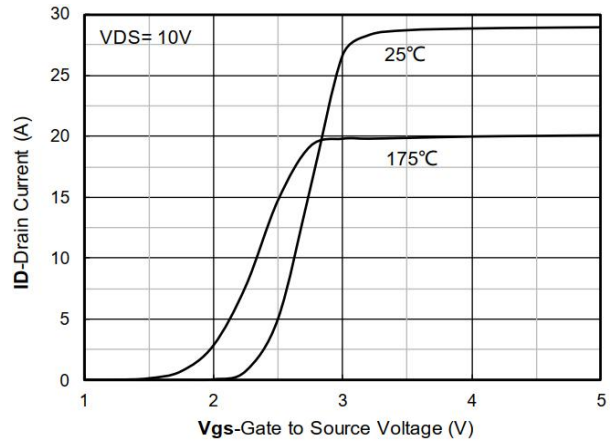


Figure 2. Transfer Characteristics

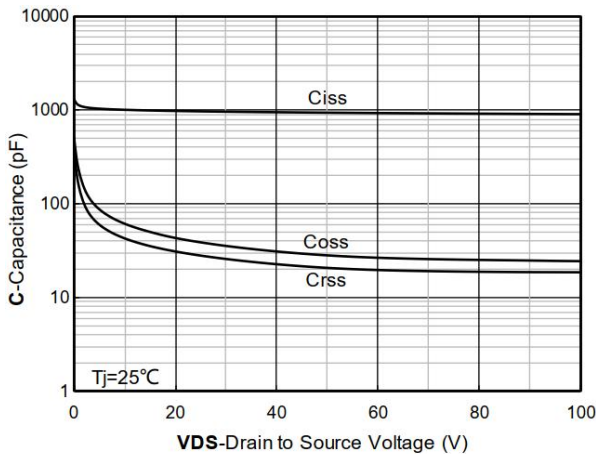


Figure 3. Capacitance Characteristics

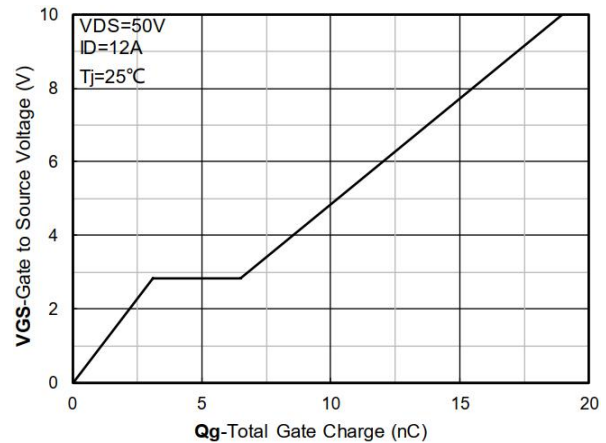


Figure 4. Gate Charge

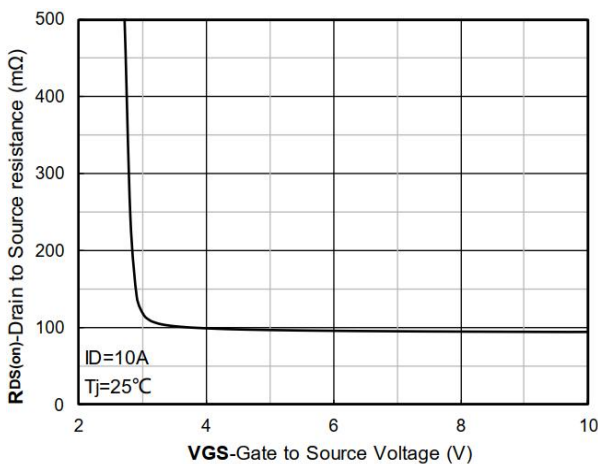


Figure 5. On-Resistance vs Gate to Source Voltage

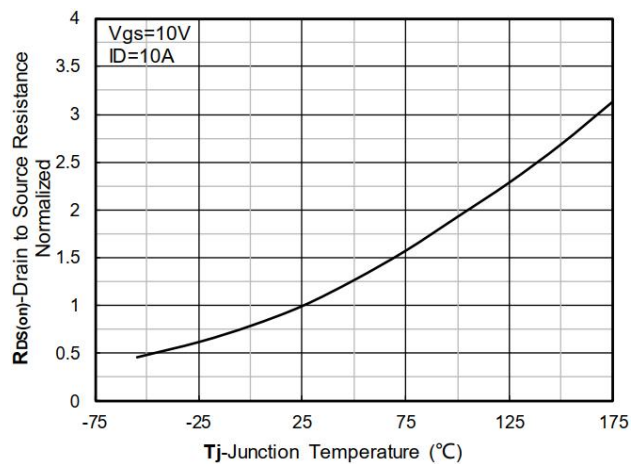


Figure 6. Normalized On-Resistance

## Typical Characteristics

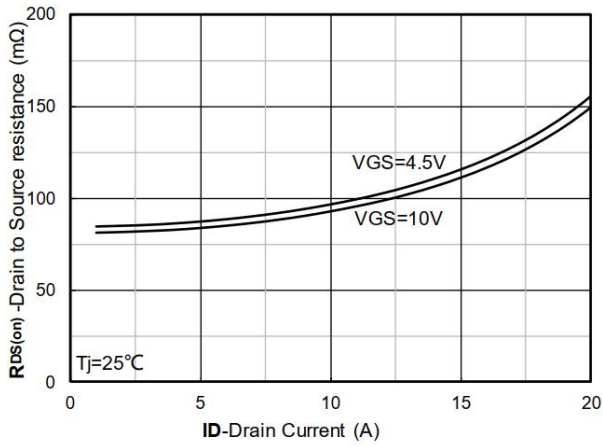


Figure 7. RDS(on) VS Drain Current

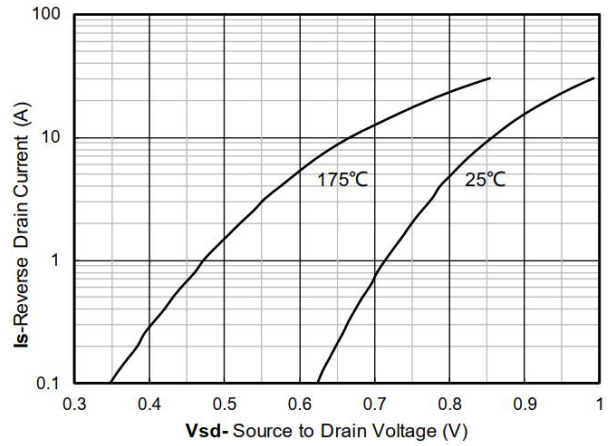


Figure 8. Forward characteristics of reverse diode

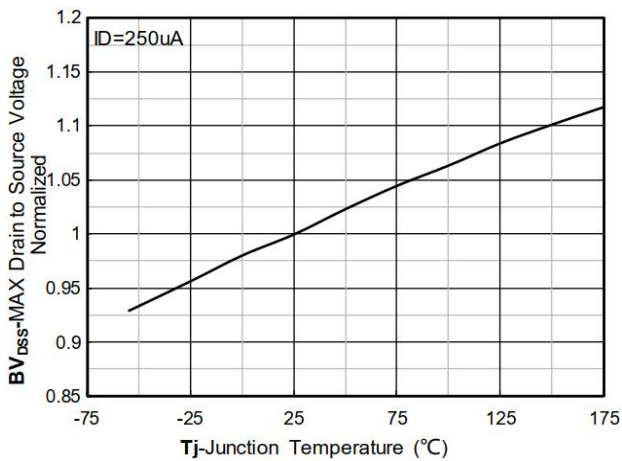


Figure 9. Normalized breakdown voltage

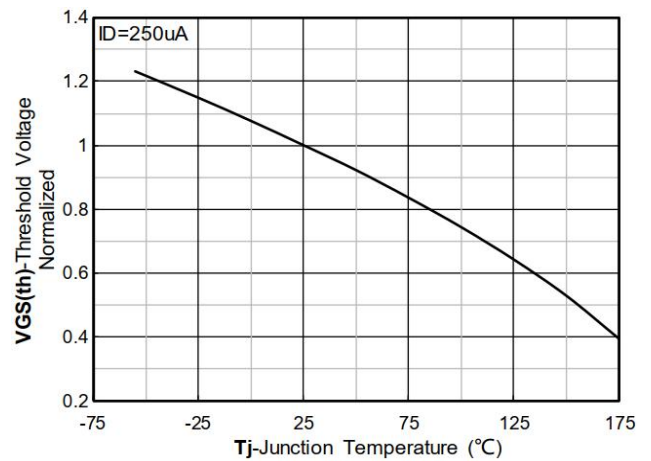


Figure 10. Normalized Threshold voltage

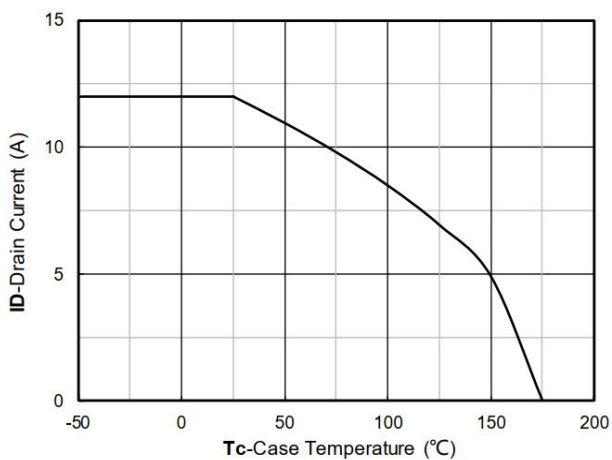


Figure 11. Current dissipation

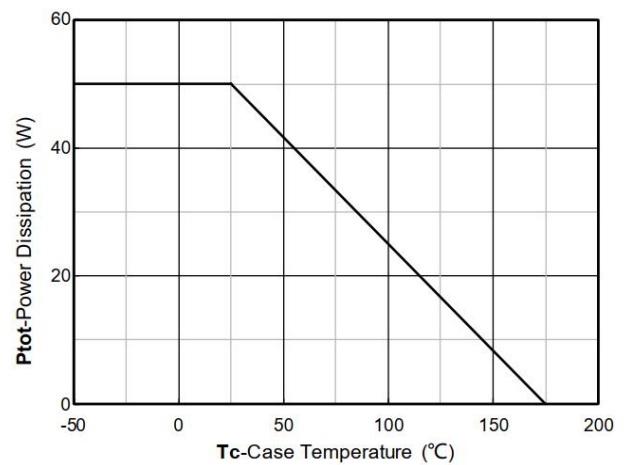


Figure 12. Power dissipation

## Typical Characteristics

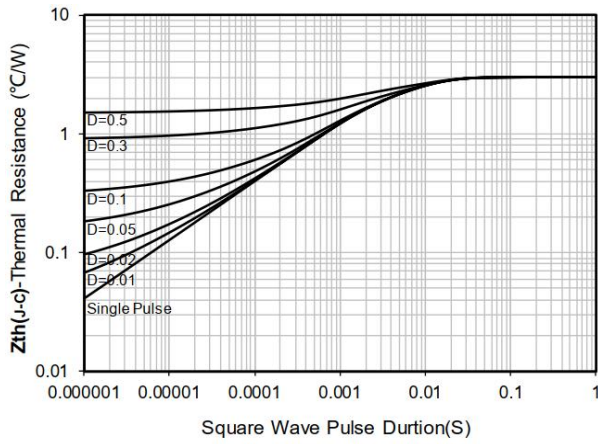


Figure 13. Maximum Transient Thermal Impedance

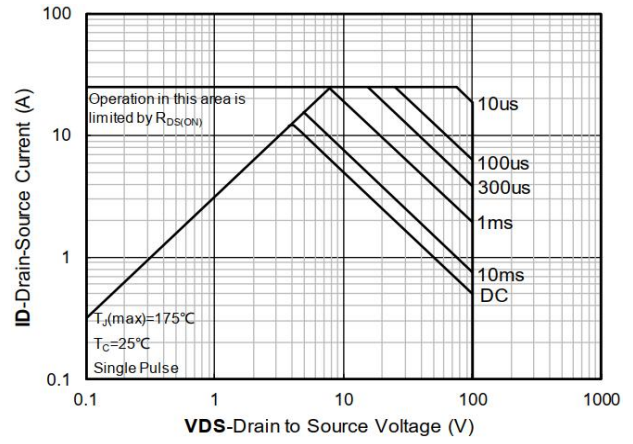
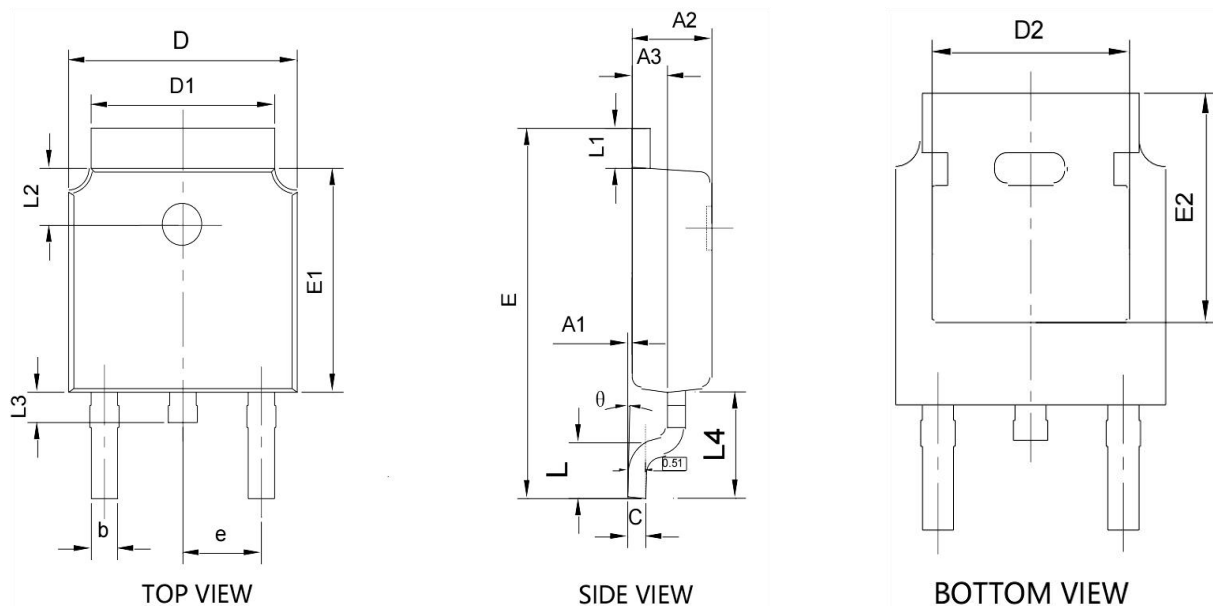


Figure 14. Safe Operation Area

### TO-252AB Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
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.	
$\theta$	0°	10°	0°	10°