

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	I_D
-100V	110mΩ@-10V	-18A
	120mΩ@-4.5V	

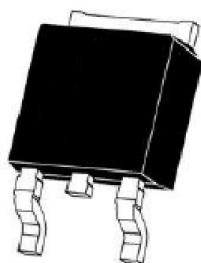
Feature

- Split gate trench MOSFET technology
- Low $R_{DS(on)}$ & FOM
- Extremely low switching loss
- Excellent stability and uniformity
- Suffix "-Q1" for AEC-Q101

Application

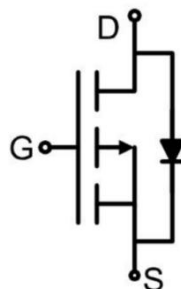
- Power management
- Portable equipment

Package

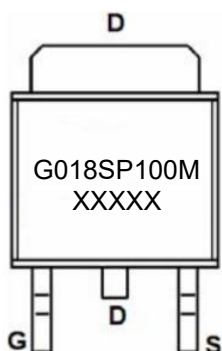


TO-252AB

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	-18	A
Continuous Drain Current ($T_C=100^{\circ}\text{C}$)	$I_D (100^{\circ}\text{C})$	-12	A
Pulsed Drain Current ¹⁾	I_{DM}	-72	A
Single Pulse Avalanche Energy ²⁾	E_{AS}	72	mJ
Power Dissipation ³⁾ ($T_C=25^{\circ}\text{C}$)	P_D	72	W
Thermal Resistance Junction to Case	$R_{\theta JC}$	1.74	$^{\circ}\text{C/W}$
Operating Junction Temperature	T_J	-55 ~ +150	$^{\circ}\text{C}$
Storage Temperature	T_{STG}	-55 ~ +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	-100			V
Zero gate voltage drain current	I _{DSS}	V _{DS} =-100V, 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	-1	-1.8	-2.5	V
Drain-source on-resistance	R _{DS(on)}	V _{GS} =-10V, I _D =-10A		83	110	mΩ
		V _{GS} =-4.5V, I _D =-5A		95	120	
Dynamic characteristics ⁴⁾						
Input Capacitance	C _{iss}	V _{DS} =-50V, V _{GS} =0V, f =1MHz		1040		pF
Output Capacitance	C _{oss}			117		
Reverse Transfer Capacitance	C _{rss}			24.7		
Total Gate Charge	Q _g	V _{DS} =-50V, V _{GS} =-10V I _D =-5A		19.9		nC
Gate-Source Charge	Q _{gs}			3.86		
Gate-Drain Charge	Q _{gd}			4.26		
Turn-on delay time	t _{d(on)}	V _{DS} =-50V, V _{GS} =-10V R _L =2.5Ω, R _G =6Ω		9.9		nS
Turn-on rise time	t _r			29.7		
Turn-off delay time	t _{d(off)}			76		
Turn-off fall time	t _f			80		
Source-Drain Diode characteristics						
Diode Forward Current	I _S				-18	A
Diode Forward Voltage	V _{SD}	V _{GS} =0V, I _S =-10A			-1.3	V
Reverse Recovery Time	T _{rr}	I _F =-5A, di/dt =-100A/μs		70		nS
Reverse Recovery Charge	Q _{rr}			140		nC

Notes:

- 1) Repetitive rating; pulse width limited by max. junction temperature.
- 2) $T_J=25^{\circ}\text{C}, V_{DS}=-50V, V_G=-10V, R_G=25\Omega, L=0.5mH, I_{AS}=-17A$.
- 3) P_d is based on max. junction temperature, using junction-case thermal resistance.
- 4) Guaranteed by design, not subject to production testing.

Typical Characteristics

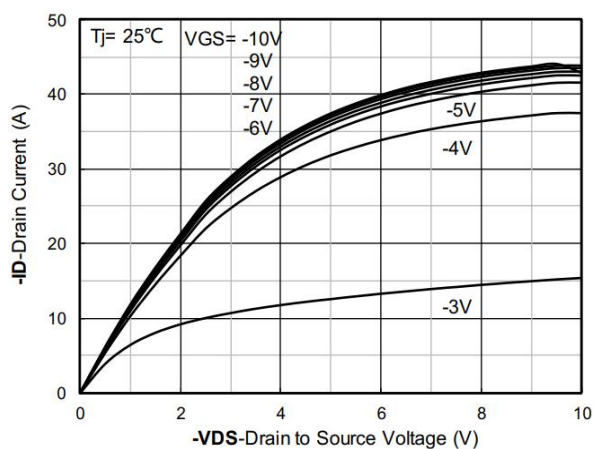


Figure1. Output Characteristics

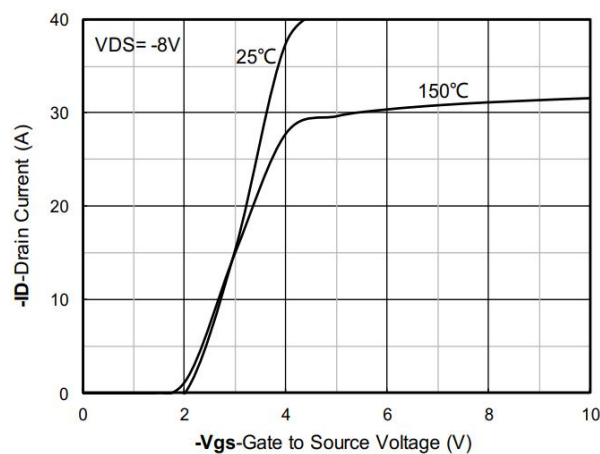


Figure2. Transfer Characteristics

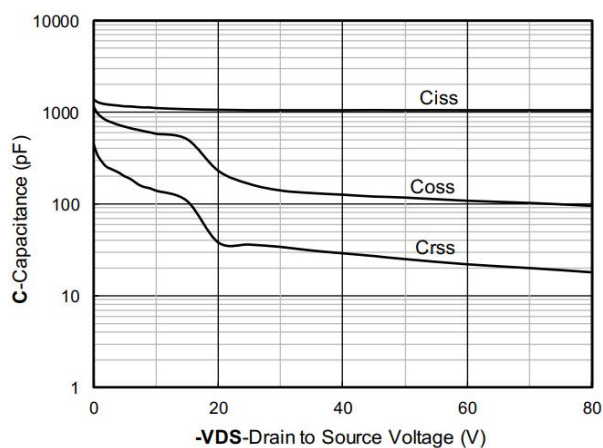


Figure3. Capacitance Characteristics

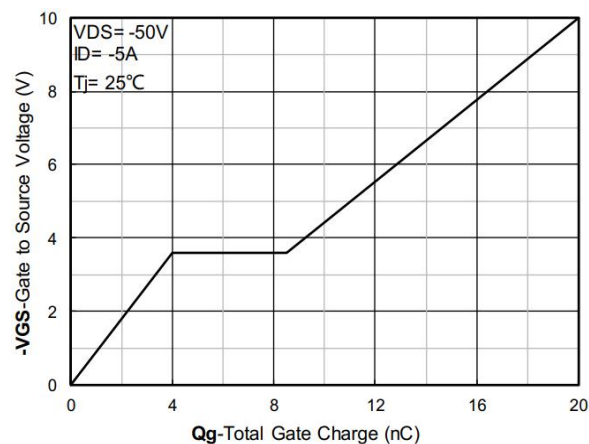


Figure4. Gate Charge

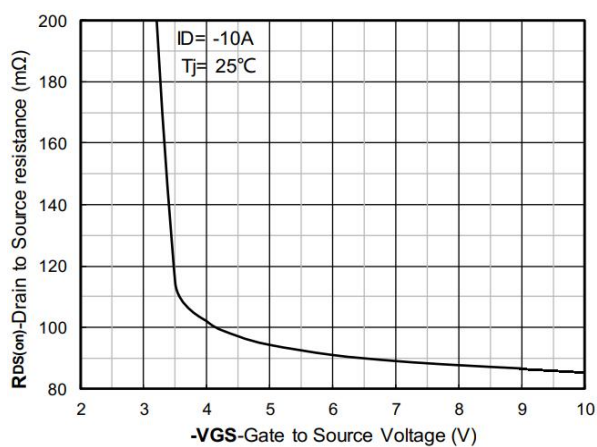


Figure5. On-Resistance vs Gate to Source Voltage

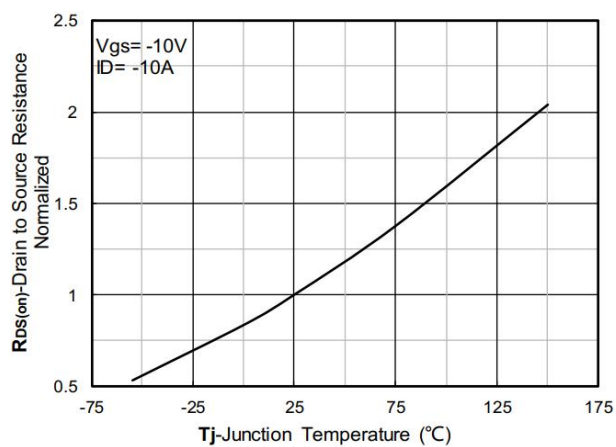


Figure6. Normalized On-Resistance

Typical Characteristics

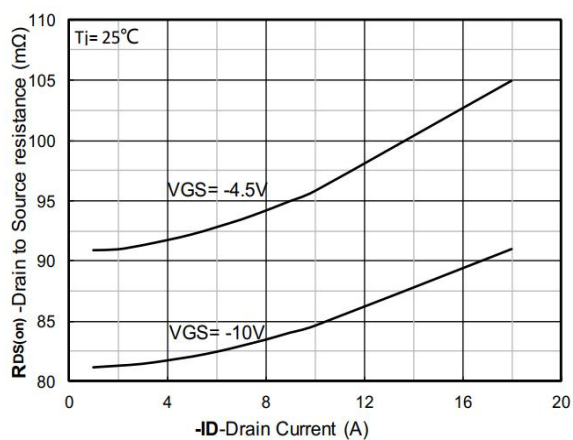


Figure7. RDS(on) VS Drain Current

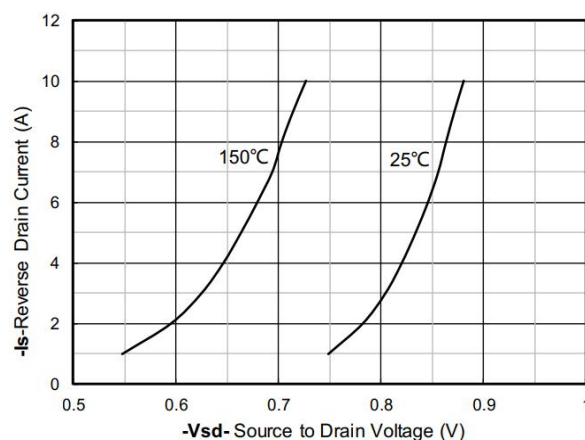


Figure8. Forward characteristics of reverse diode

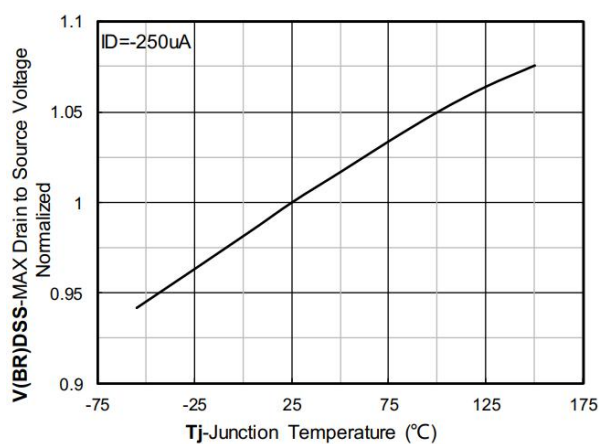


Figure9. Normalized breakdown voltage

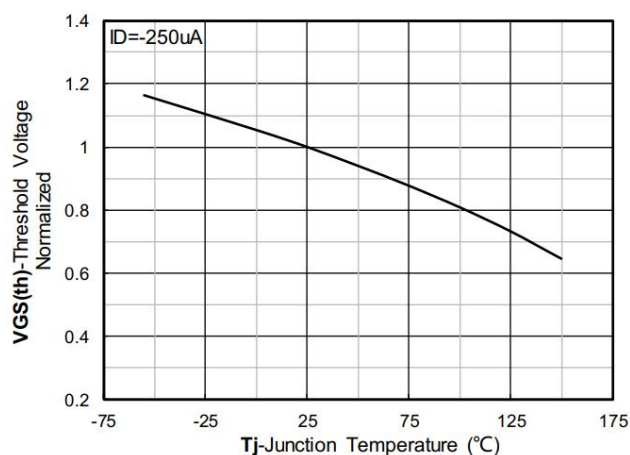


Figure10. Normalized Threshold voltage

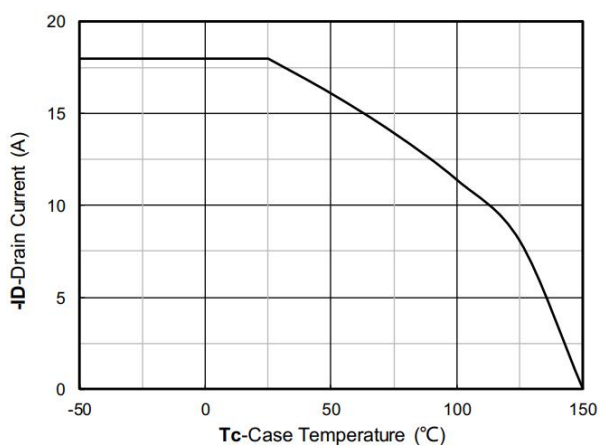


Figure11. Current dissipation

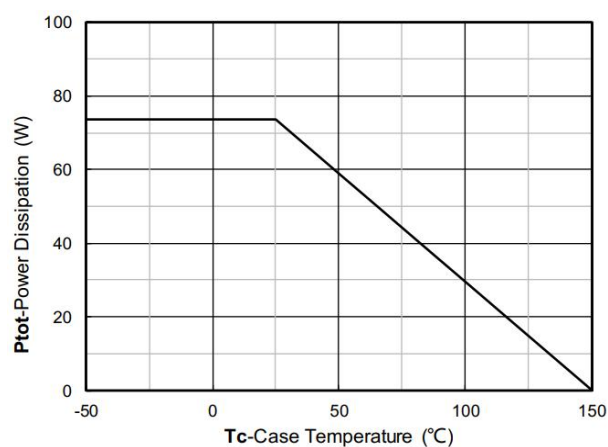


Figure12. Power dissipation

Typical Characteristics

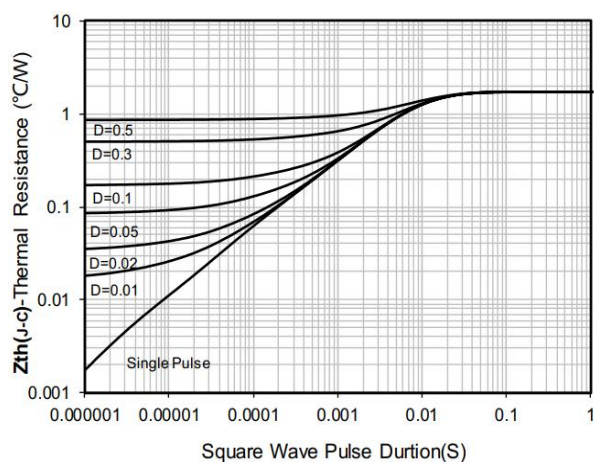


Figure13. Maximum Transient Thermal Impedance

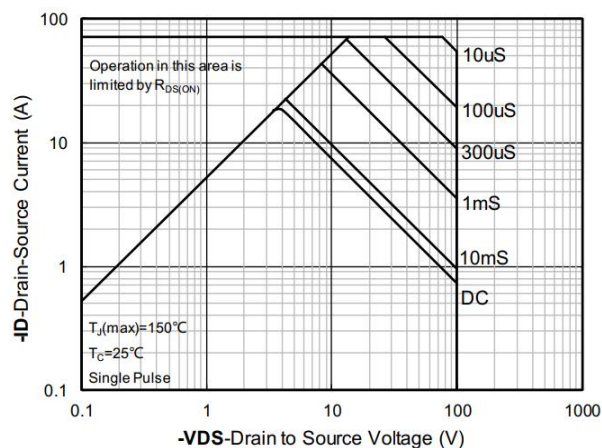
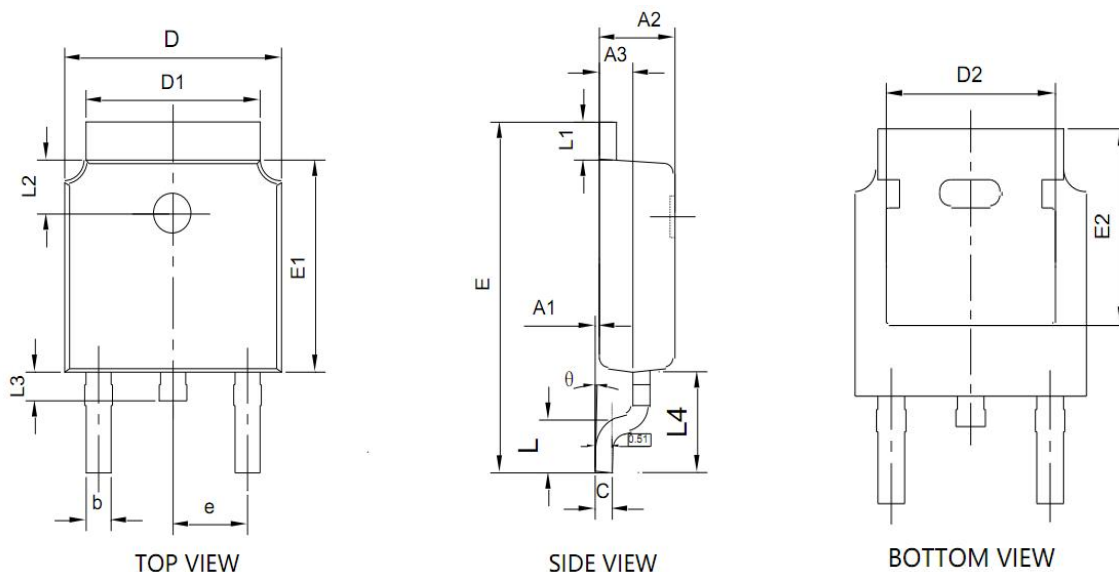


Figure14. Safe Operation Area

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	0.870	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°