

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	I_D
-60V	75mΩ@-10V	-13A
	97mΩ@-4.5V	

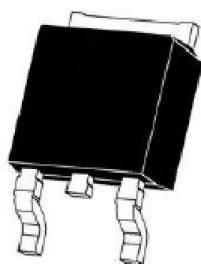
Feature

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

Application

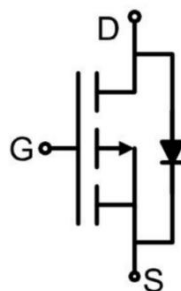
- Power management
- Load switch

Package

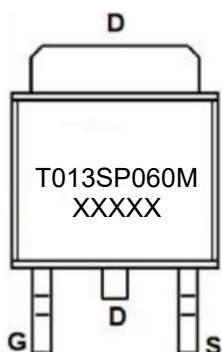


TO-252AB

Circuit diagram



Marking



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

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V _{DS}	-60	V
Gate-Source Voltage	V _{GS}	±20	V
Continuous Drain Current ^{1,2)} (V _{GS} =-10V)	I _D	-13	A
Continuous Drain Current ^{1,2)} (V _{GS} =-10V, T _c =100°C)	I _D (100°C)	-8.2	A
Pulsed Drain Current (t _p ≤ 10μs)	I _{DM}	-48	A
Single Pulse Avalanche Energy ³⁾	E _{AS}	30	mJ
Power Dissipation ^{1,2)}	P _D	26.6	W
Thermal Resistance Junction-to-Case	R _{θJC}	4.7	°C/W
Operating Junction Temperature	T _J	-55 ~ +150	°C
Storage Temperature	T _{STG}	-55 ~ +150	°C

Electrical characteristics (T_J=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	-60			V
Zero gate voltage drain current	I _{DSS}	V _{DS} =-60V, 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	-1.5	-2	V
Drain-source on-resistance	R _{DS(on)}	V _{GS} =-10V, I _D =-10A		54	75	mΩ
		V _{GS} =-4.5V, I _D =-5A		64	97	
Dynamic characteristics ⁴⁾						
Input Capacitance	C _{iss}	V _{DS} =-30V, V _{GS} =0V, f =1MHz		1197		pF
Output Capacitance	C _{oss}			64		
Reverse Transfer Capacitance	C _{rss}			54		
Total Gate Charge	Q _g	V _{DS} =-30V, V _{GS} =-10V I _D =-10A		26		nC
Gate-Source Charge	Q _{gs}			3.7		
Gate-Drain Charge	Q _{gd}			4.4		
Turn-on delay time	t _{d(on)}	V _{DS} =-30V, V _{GS} =-10V I _D =-10A, R _G =3Ω		7.1		nS
Turn-on rise time	t _r			3.6		
Turn-off delay time	t _{d(off)}			34		
Turn-off fall time	t _f			14		
Source-Drain Diode characteristics						
Diode Forward Current	I _S				-13	A
Diode Forward voltage	V _{SD}	V _{GS} =0V, I _S =-10A			-1.2	V
Reverse Recovery Time	T _{rr}	V _{GS} =0V, V _R =-30V		21		nS
Reverse Recovery Charge	Q _{rr}	I _F =-10A, di/dt =100A/μs		22		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) Thermal resistance from junction to soldering point (on the exposed drain pad).
- 3) ESD condition: T_J=25°C, V_G=-10V, R_G=25Ω, L=0.5mH, I_{AS}=-11A.
- 4) Guaranteed by design, not subject to production testing.

Typical Characteristics

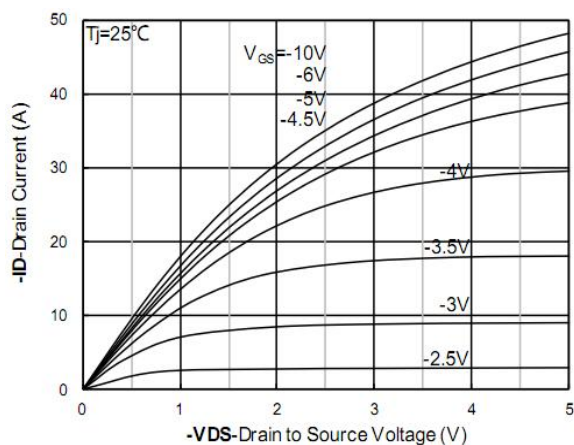


Figure 1. Output Characteristics; typical values

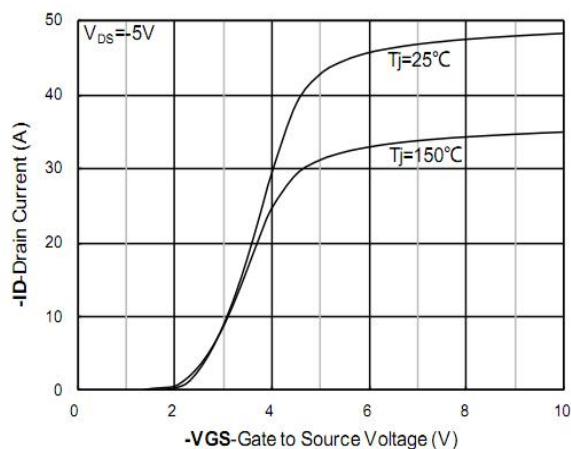


Figure 2. Transfer Characteristics; typical values

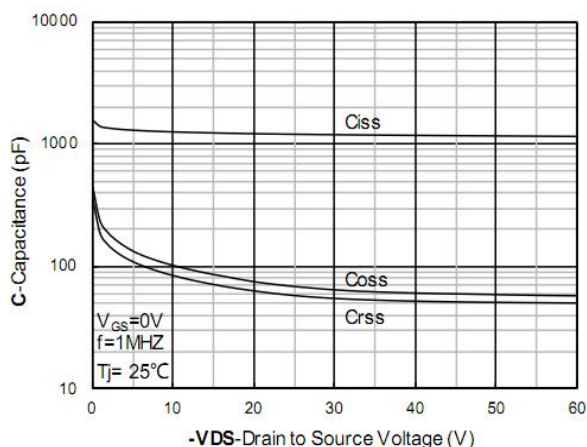


Figure 3. Capacitance Characteristics; typical values

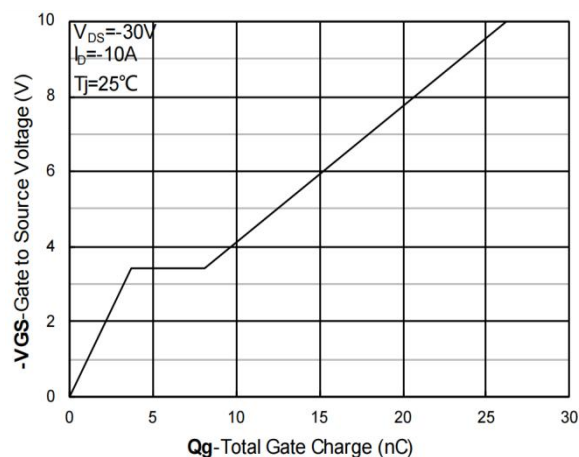


Figure 4. Gate Charge; typical values

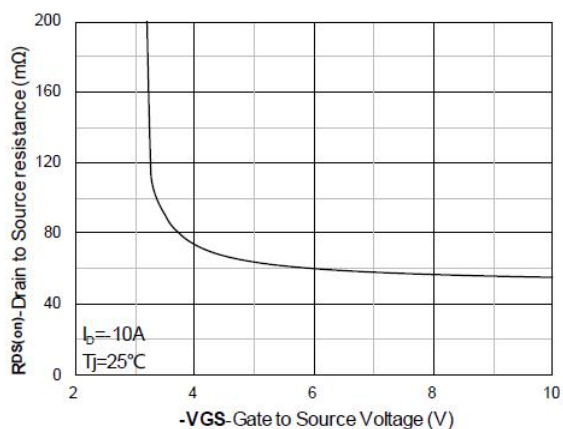


Figure 5. On-Resistance vs. Gate to Source Voltage; typical values

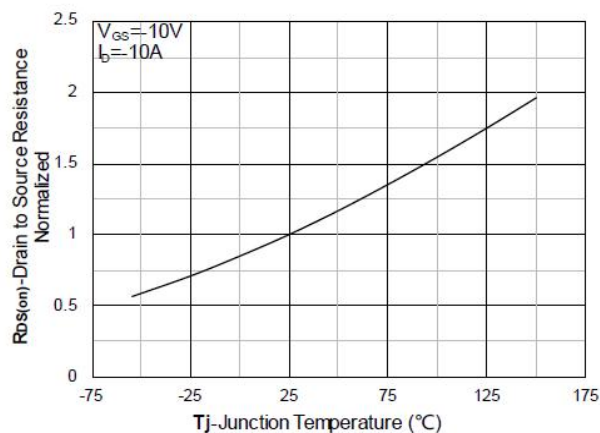


Figure 6. Normalized On-Resistance

Typical Characteristics

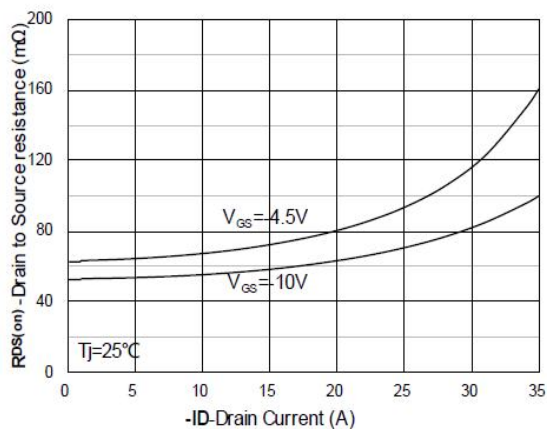


Figure 7. $R_{DS(on)}$ vs. Drain Current; typical values

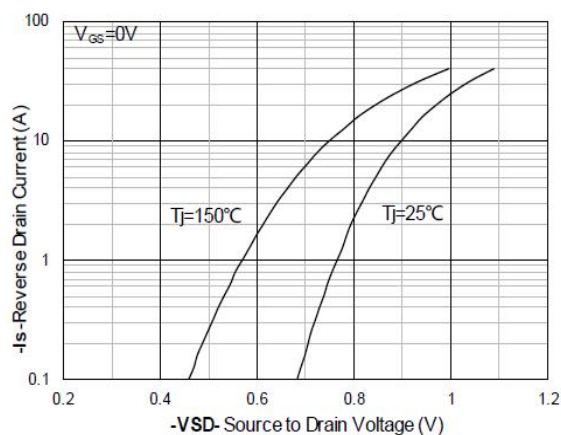


Figure 8. Forward characteristics of reverse diode; typical values

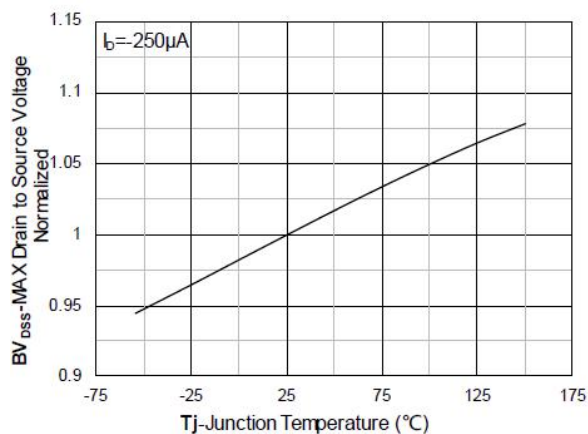


Figure 9. Normalized breakdown voltage

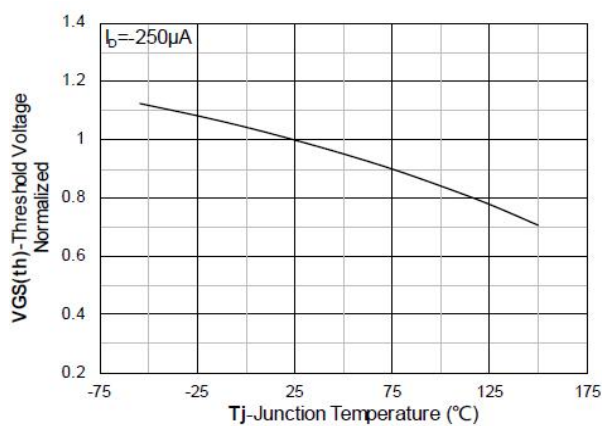


Figure 10. Normalized Threshold voltage

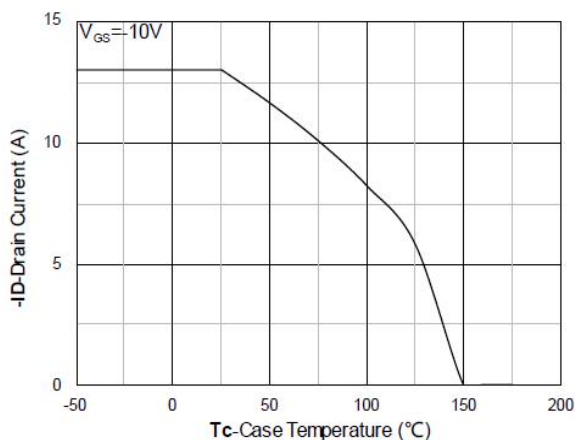


Figure 11. Current dissipation

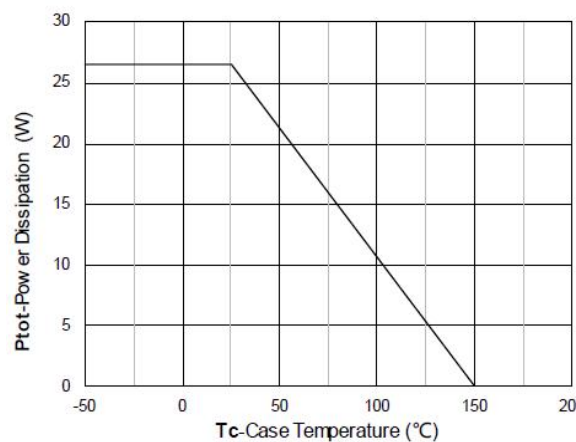


Figure 12. Power dissipation

Typical Characteristics

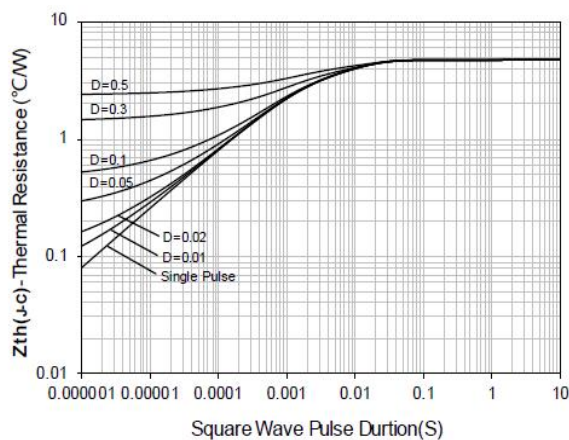


Figure 13. Maximum Transient Thermal Impedance

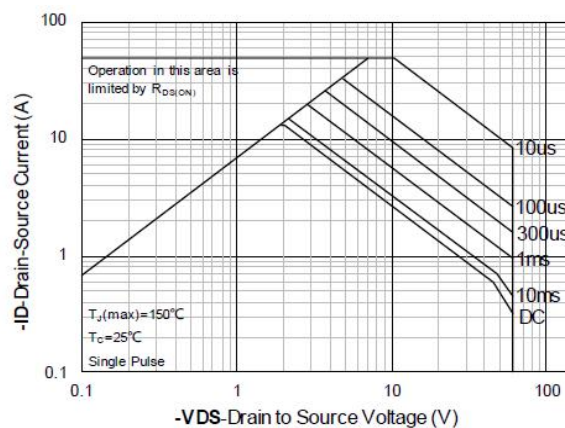
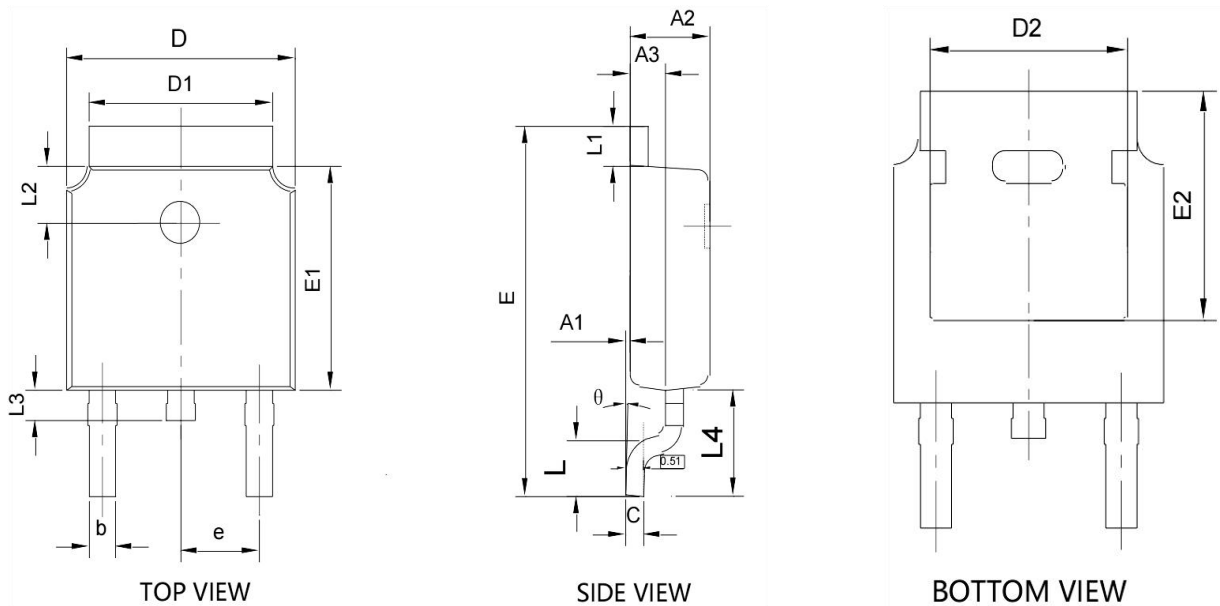


Figure 14. Safe Operation Area

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.	
θ	0°	10°	0°	10°