

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	I_D
-60V	50mΩ@-10V	-25A
	65mΩ@-4.5V	

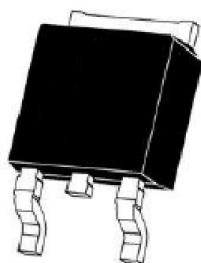
Feature

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

Application

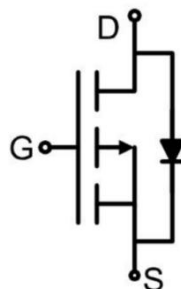
- Synchronous Rectification in DC/DC and AC/DC Converters
- Industrial and Motor Drive applications

Package

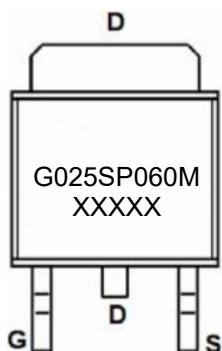


TO-252AB

Circuit diagram



Marking



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

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	-60	V
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current ($T_C=25^{\circ}\text{C}$)	I_D	-25	A
Continuous Drain Current ($T_C=100^{\circ}\text{C}$)	$I_D (100^{\circ}\text{C})$	-16	A
Pulsed Drain Current ¹⁾	I_{DM}	-100	A
Single Pulse Avalanche Energy ²⁾	E_{AS}	49	mJ
Power Dissipation ³⁾ ($T_C=25^{\circ}\text{C}$)	P_D	72	W
Thermal Resistance Junction to Case	$R_{\theta JC}$	1.7	$^{\circ}\text{C/W}$
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	-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	-1.3	-1.8	-2.5	V
Drain-source on-resistance	R _{DS(on)}	V _{GS} =-10V, I _D =-20A		38	50	mΩ
		V _{GS} =-4.5V, I _D =-10A		48	65	
Dynamic characteristics ⁴⁾						
Input Capacitance	C _{iss}	V _{DS} =-30V, V _{GS} =0V, f =1MHz		1100		pF
Output Capacitance	C _{oss}			350		
Reverse Transfer Capacitance	C _{rss}			28		
Total Gate Charge	Q _g	V _{DS} =-30V, V _{GS} =-10V I _D =-20A		18.7		nC
Gate-Source Charge	Q _{gs}			4.7		
Gate-Drain Charge	Q _{gd}			3		
Turn-on delay time	t _{d(on)}	V _{DS} =-30V, V _{GS} =-10V I _D =-12A, R _G =6Ω		7.5		nS
Turn-on rise time	t _r			39.5		
Turn-off delay time	t _{d(off)}			43.2		
Turn-off fall time	t _f			55.1		
Source-Drain Diode characteristics						
Diode Forward Current	I _S				-25	A
Diode Forward Voltage	V _{SD}	V _{GS} =0V, I _S =-20A			-1.3	V
Reverse Recovery Time	T _{rr}	I _F =-20A, di/dt =100A/μs		20.2		nS
Reverse Recovery Charge	Q _{rr}			8.2		nC

Notes:

- 1) Repetitive rating; pulse width limited by max. junction temperature.
- 2) $V_{DD}=50V, R_G=25\Omega, L=0.5mH, I_{AS}=14A$.
- 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

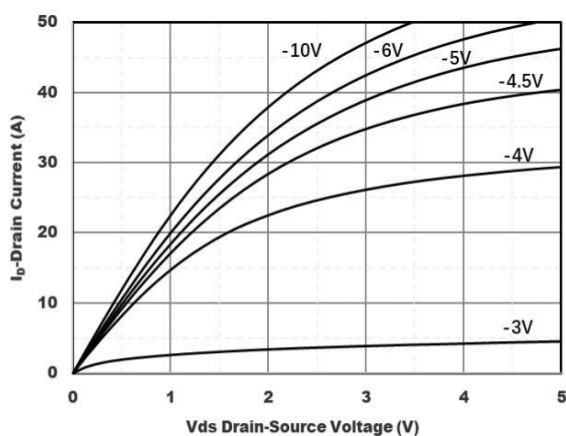


Figure1. Output Characteristics

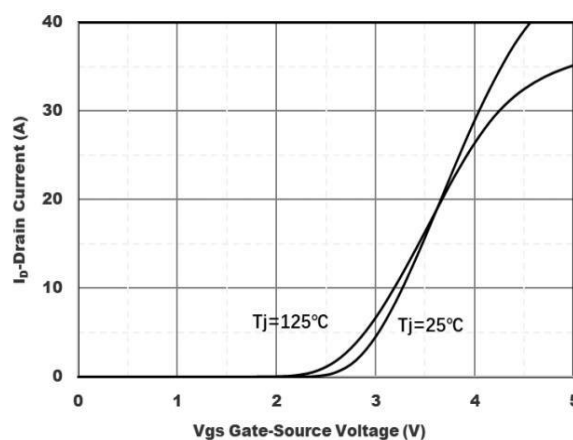


Figure2. Transfer Characteristics

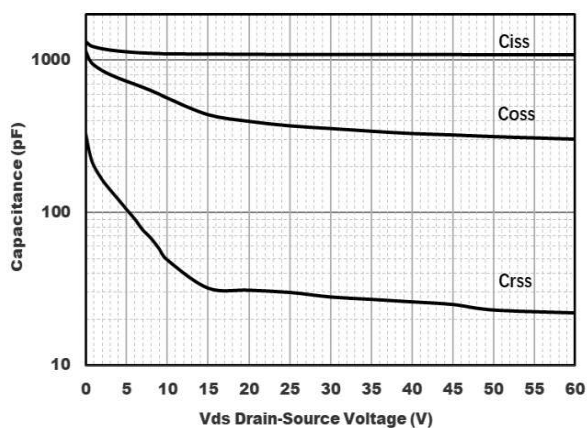


Figure3. Capacitance Characteristics

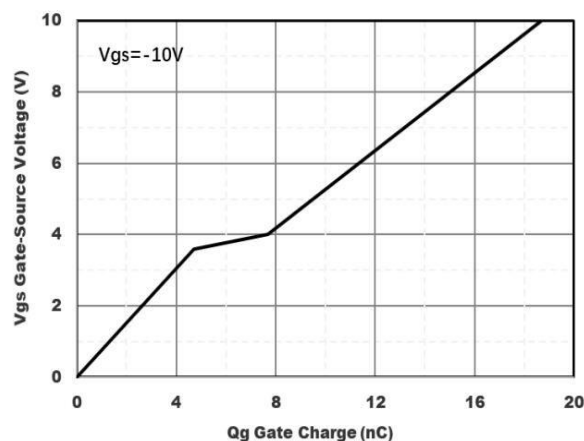


Figure4. Gate Charge

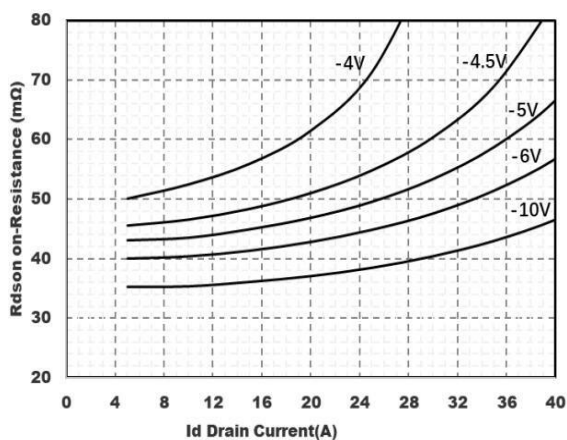


Figure5. : On-Resistance vs. Drain Current

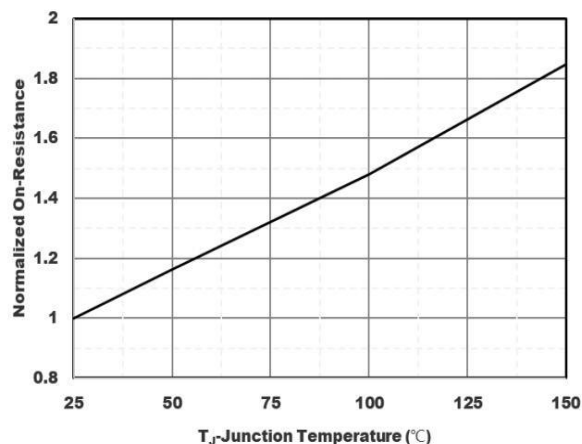


Figure6. Normalized On-Resistance

Typical Characteristics

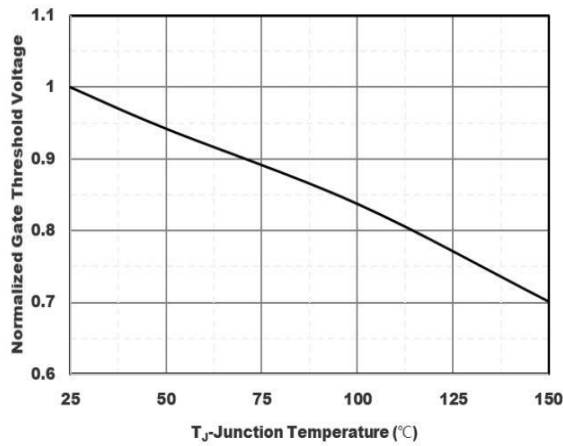


Figure 7. Normalized Gate Threshold Voltage

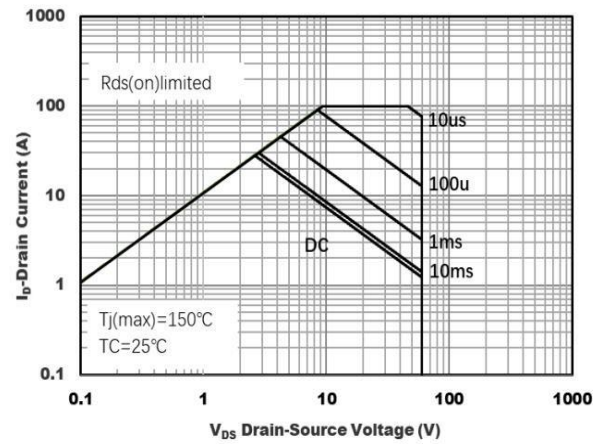


Figure 8. Safe Operation Area

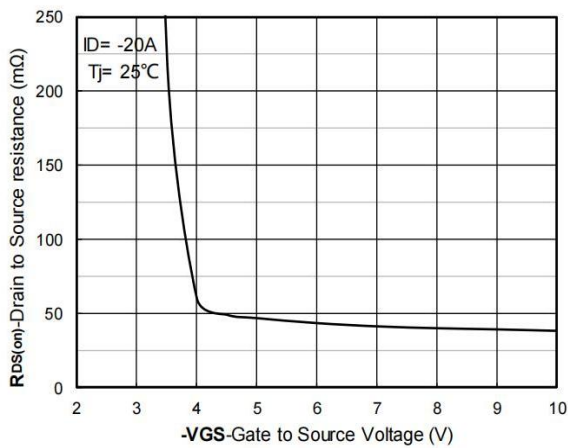


Figure 9. On-Resistance vs Gate to Source Voltage

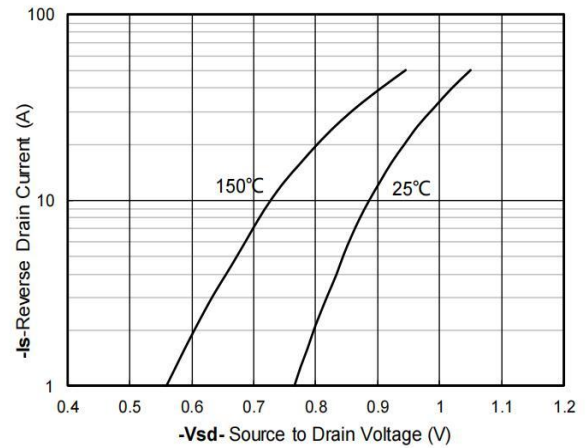


Figure 10. Forward characteristics of reverse diode

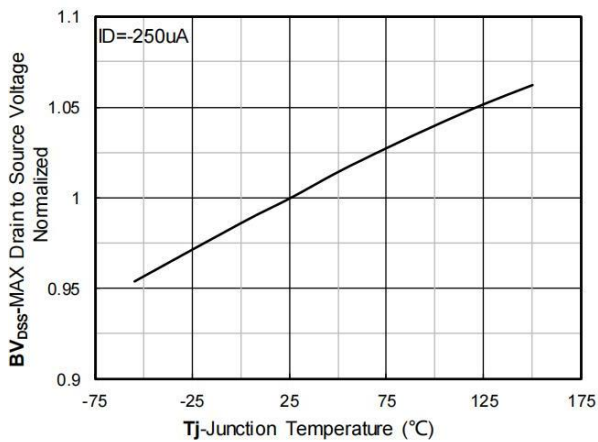


Figure 11. Normalized breakdown voltage

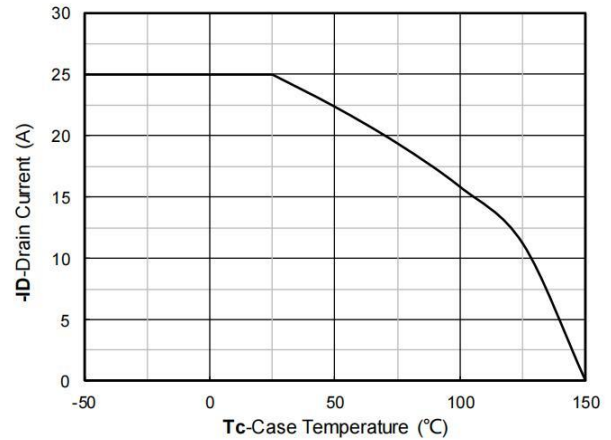


Figure 12. Current dissipation

Typical Characteristics

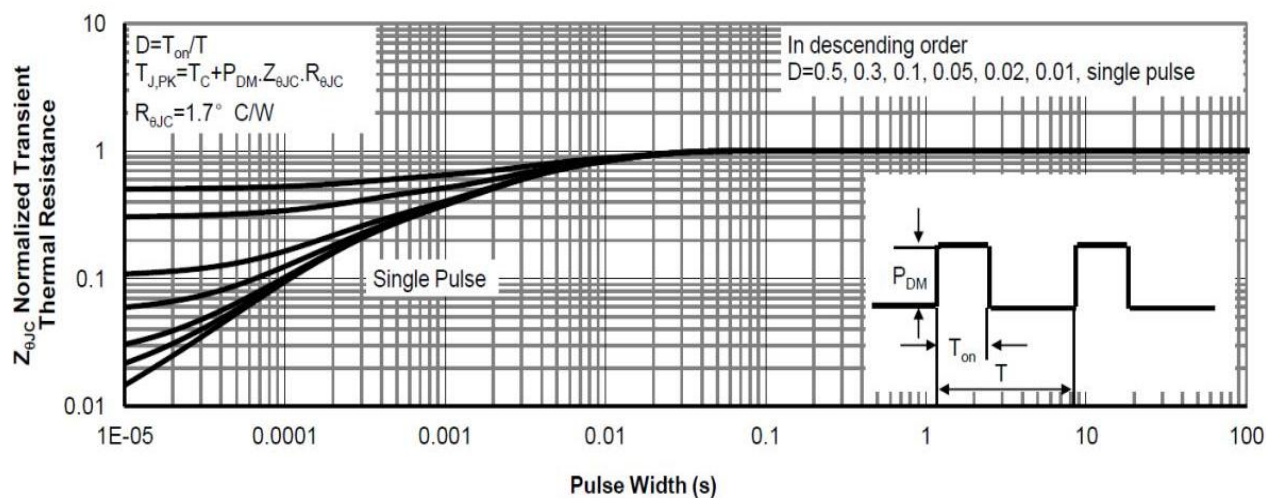
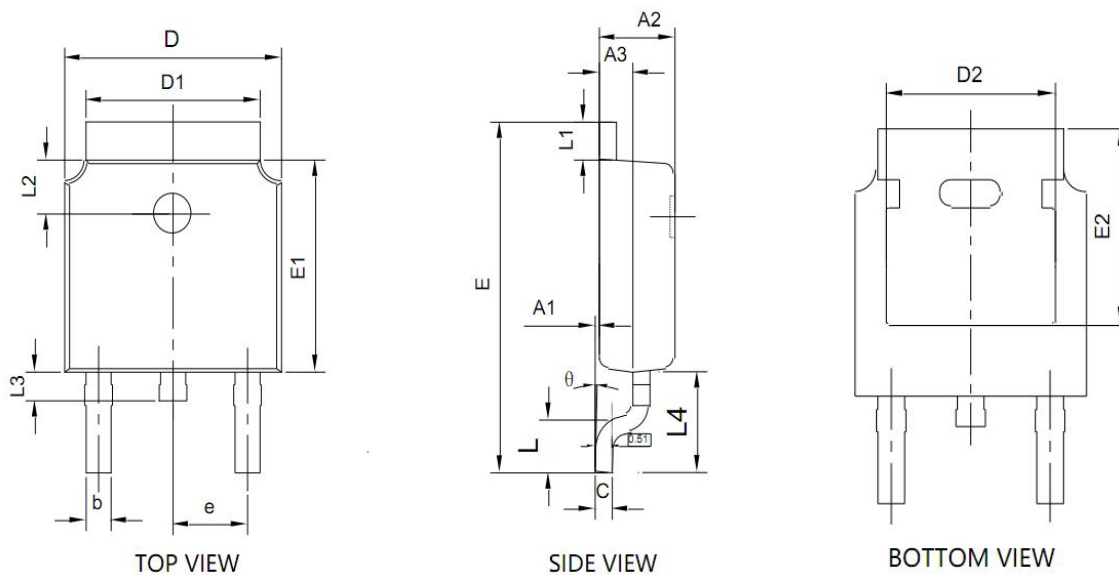


Figure13.Normalized Maximum Transient thermal impedance

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°