

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	I_D
-60V	8.8mΩ@-10V	-100A
	10mΩ@-6V	

Feature

- Split gate trench MOSFET technology
- High density cell design for low $R_{DS(on)}$
- Excellent stability and uniformity
- Suffix "-Q1" for AEC-Q101

Application

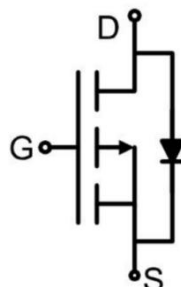
- Power management
- Portable equipment

Package

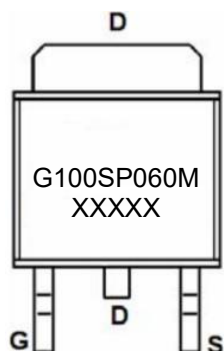


TO-263AB

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}	± 18	V
Continuous Drain Current ($T_C=25^{\circ}\text{C}$)	I_D	-100	A
Continuous Drain Current ($T_C=100^{\circ}\text{C}$)	$I_D(100^{\circ}\text{C})$	-63	A
Pulsed Drain Current ¹⁾	I_{DM}	-320	A
Single Pulse Avalanche Energy ²⁾	E_{AS}	625	mJ
Power Dissipation ³⁾ ($T_C=25^{\circ}\text{C}$)	P_D	178	W
Thermal Resistance Junction to Case	$R_{\theta JC}$	0.7	$^{\circ}\text{C/W}$
Operating Junction Temperature	T_J	$-55 \sim +150$	$^{\circ}\text{C}$
Storage Temperature Range	T_{STG}	$-55 \sim +150$	$^{\circ}\text{C}$

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} =±18V			±100	nA
Gate threshold voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =-250μA	-2	-2.6	-4	V
Drain-source on-resistance	R _{DS(on)}	V _{GS} =-10V, I _D =-50A		6.5	8.8	mΩ
		V _{GS} =-10V, I _D =-20A		6.5	8.8	
		V _{GS} =-6V, I _D =-20A		7.2	10	
Dynamic characteristics ⁴⁾						
Input Capacitance	C _{iss}	V _{DS} =-30V, V _{GS} =0V f =1MHz		5370		pF
Output Capacitance	C _{oss}			970		
Reverse Transfer Capacitance	C _{rss}			72		
Total Gate Charge	Q _g	V _{DS} =-30V, V _{GS} =-10V I _D =-20A		82		nC
Gate-Source Charge	Q _{gs}			25		
Gate-Drain Charge	Q _{gd}			17		
Turn-on delay time	t _{d(on)}	V _{DS} =-30V, V _{GS} =-10V I _D =-20A, R _G =1.6Ω		15		nS
Turn-on rise time	t _r			50		
Turn-off delay time	t _{d(off)}			135		
Turn-off fall time	t _f			160		
Source-Drain Diode characteristics						
Diode Forward Current	I _S				-100	A
Diode Forward voltage	V _{SD}	V _{GS} =0V, I _S =-50A			-1.2	V
Reverse Recovery Time	T _{rr}	I _F =-20A, di/dt =-500A/μs		150		nS
Reverse Recovery Charge	Q _{rr}			45		nC

Notes:

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

Typical Characteristics

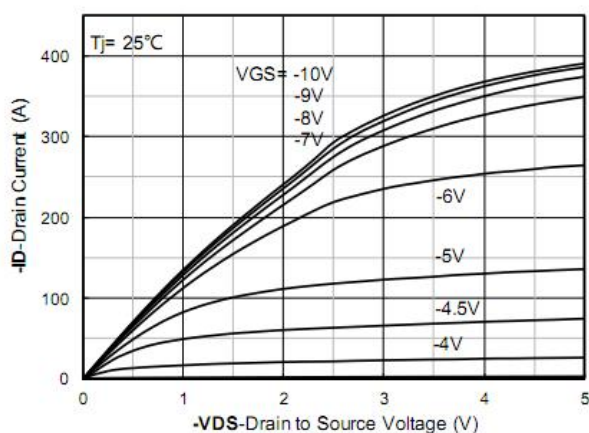


Figure 1. Output Characteristics

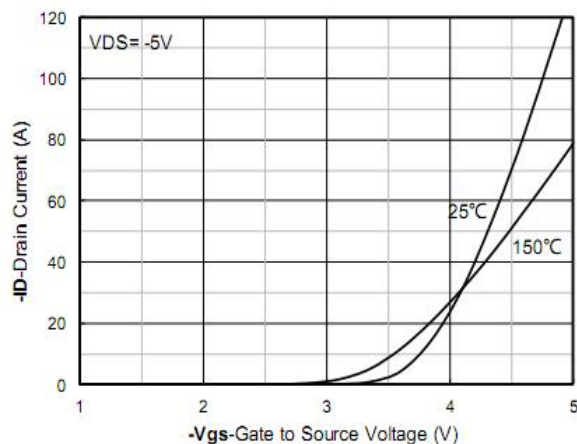


Figure 2. Transfer Characteristics

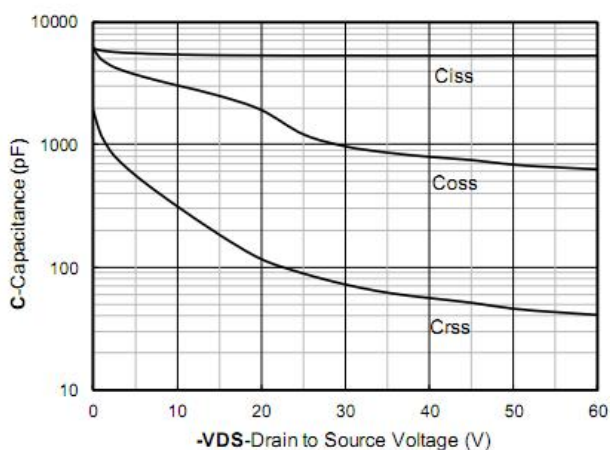


Figure 3. Capacitance Characteristics

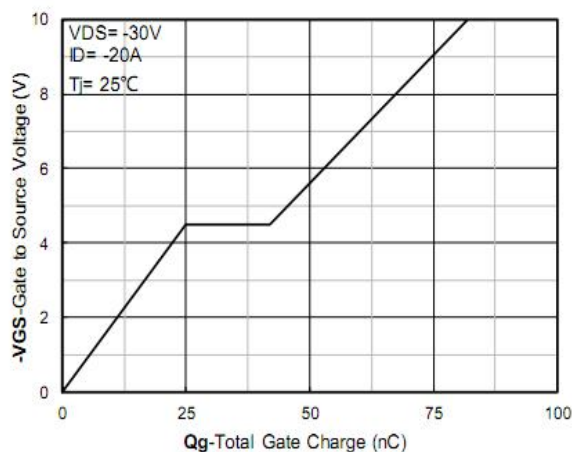


Figure 4. Gate Charge

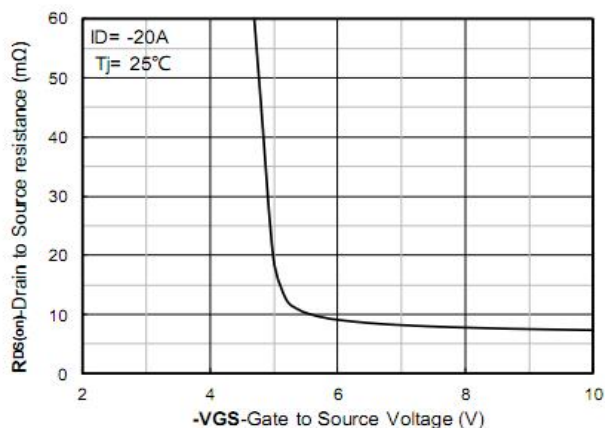


Figure 5. On-Resistance vs Gate to Source Voltage

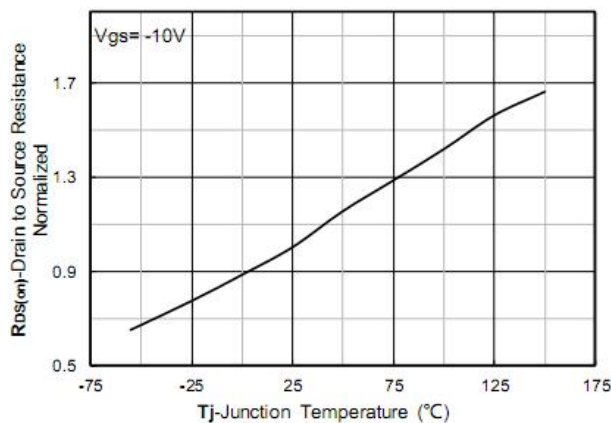


Figure 6. Normalized On-Resistance

Typical Characteristics

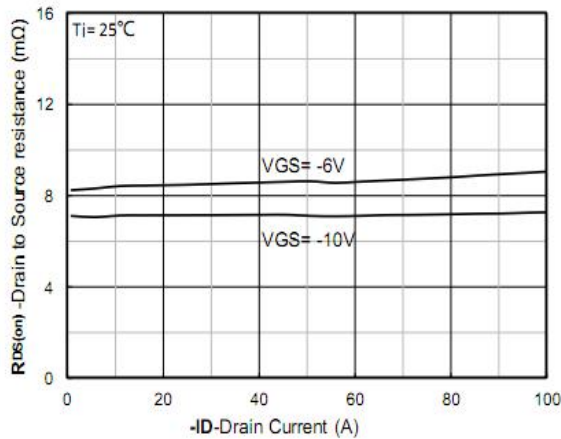


Figure 7. $R_{DS(on)}$ VS Drain Current

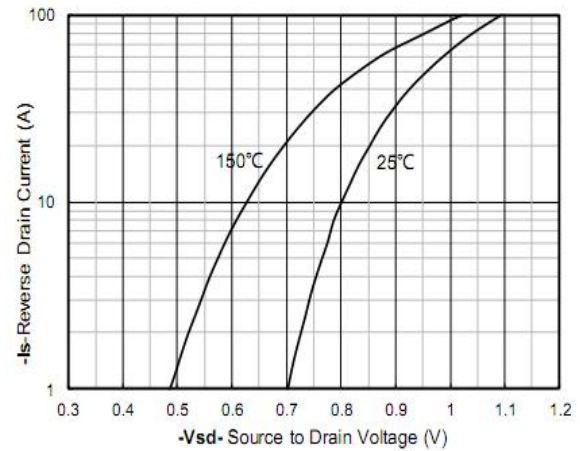


Figure 8. Forward characteristics of reverse diode

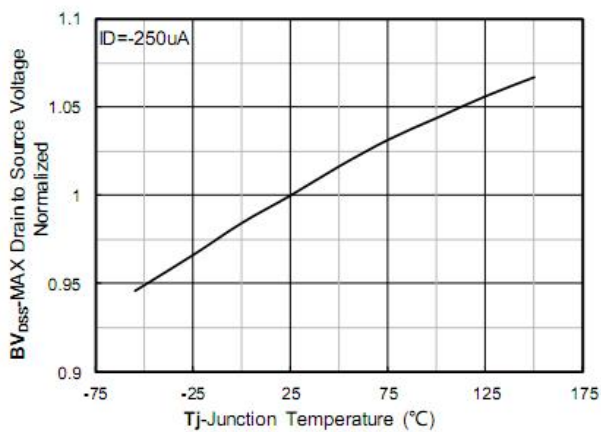


Figure 9. Normalized breakdown voltage

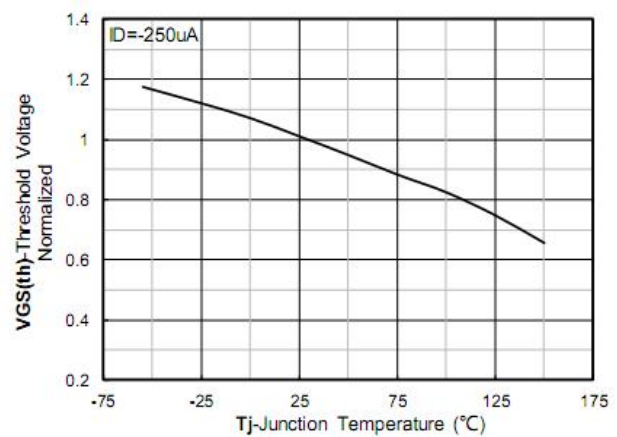


Figure 10. Normalized Threshold voltage

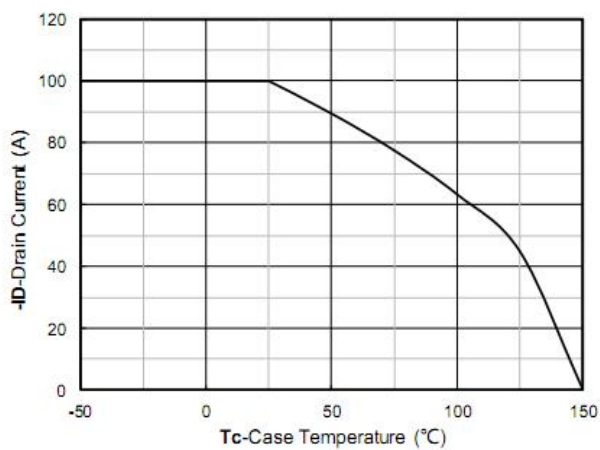


Figure 11. Current dissipation

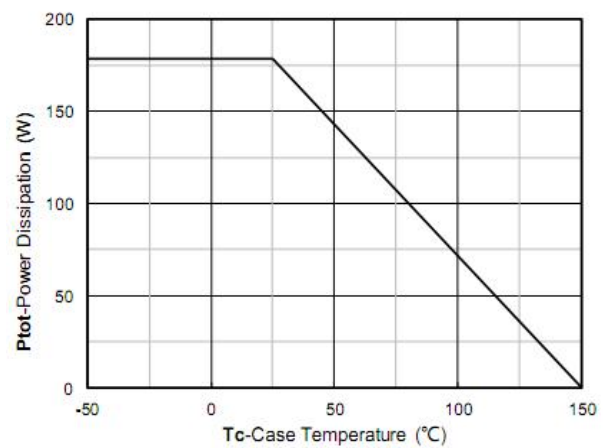


Figure 12. Power dissipation

Typical Characteristics

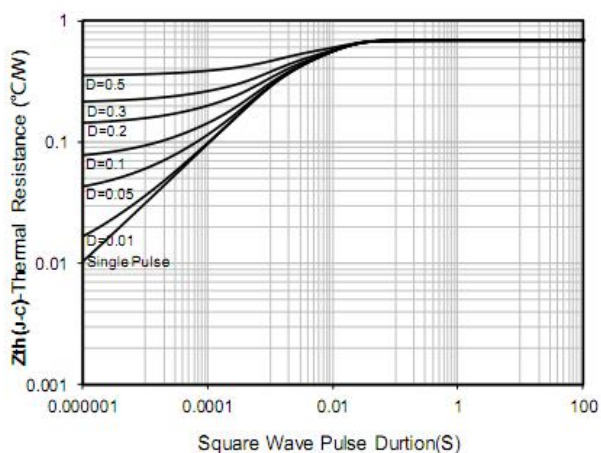


Figure 13. Maximum Transient Thermal Impedance

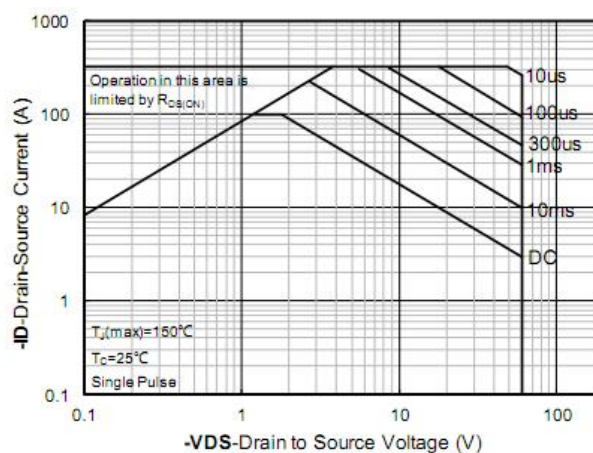
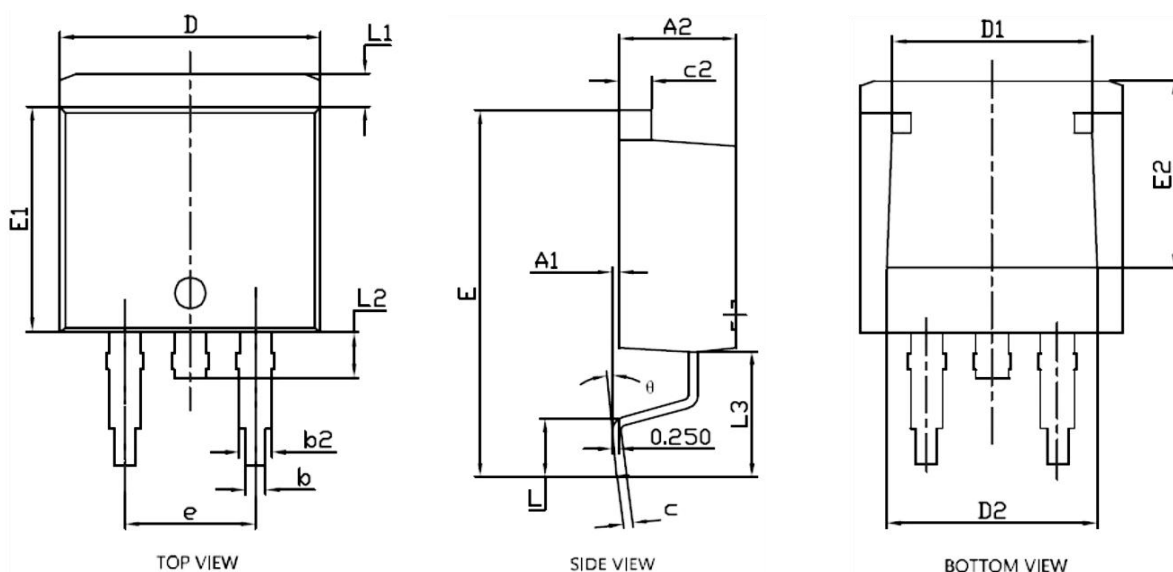


Figure 14. Safe Operation Area

TO-263AB Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A1	0.000	0.250	0.000	0.010
A2	4.430	4.730	0.174	0.186
b	0.720	0.920	0.028	0.036
b2	1.180	1.380	0.046	0.054
c	0.330	0.450	0.013	0.018
c2	1.220	1.340	0.048	0.053
D	10.000	10.300	0.394	0.406
D1	7.500	8.100	0.295	0.319
D2	7.700	8.300	0.303	0.327
E	14.500	15.500	0.571	0.610
E1	8.550	8.850	0.337	0.348
E2	7.000	7.600	0.276	0.299
e	5.080 BSC		0.200 BSC	
L	1.790	2.790	0.070	0.110
L1	1.120	1.420	0.044	0.056
L2	0.770	1.770	0.030	0.070
L3	5.000 REF		0.197 REF	
θ	0°	8°	0°	8°