

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	I_D
150V	6.8mΩ@10V	117A

Feature

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

Application

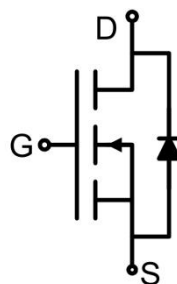
- Power switching application
- Uninterruptible power supply
- DC-DC convertor

Package

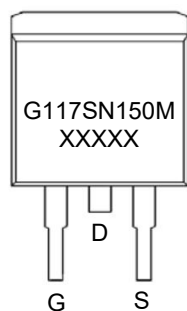


TO-263AB

Circuit diagram



Marking



Absolute Maximum Ratings (T_J=25°C unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V _{DS}	150	V
Gate-Source Voltage	V _{GS}	±20	V
Continuous Drain Current ^{1,2)} (T _C =25°C)	I _D	117	A
Continuous Drain Current ^{1,2)} (T _C =100°C)	I _D (100°C)	82	A
Pulsed Drain Current (T _C =25°C, t _p ≤10μs)	I _{DM}	468	A
Power Dissipation ^{1,2)} (T _C =25°C)	P _D	230	W
Thermal Resistance,Junction-to-Case	R _{θJC}	0.65	°C/W
Single pulse avalanche energy ³⁾	E _{AS}	400	mJ
Operating Junction Temperature	T _J	-55 ~ +175	°C
Storage Temperature	T _{STG}	-55 ~ +175	°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	150			V
		V _{GS} =0V, I _D =1mA	150			
Zero gate voltage drain current	I _{DSS}	V _{DS} =150V, V _{GS} =0V			1	μA
		V _{DS} =150V, V _{GS} =0V, T _J =150°C			100	
Gate-body leakage current	I _{GSS}	V _{GS} =±20V, V _{DS} =0V			±100	nA
Gate threshold voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250μA	2.4	3.0	3.6	V
Drain-source on-resistance	R _{DS(on)}	V _{GS} =10V, I _D =50A		5.7	6.8	mΩ
Dynamic characteristics ⁴⁾						
Input Capacitance	C _{iss}	V _{DS} =75V, V _{GS} =0V, f =1MHz		6280		pF
Output Capacitance	C _{oss}			470		
Reverse Transfer Capacitance	C _{rss}			9		
Total Gate Charge	Q _g	V _{DS} =75V, V _{GS} =10V, I _D =50A		75		nC
Gate-Source Charge	Q _{gs}			25.3		
Gate-Drain Charge	Q _{gd}			12.5		
Turn-on delay time	t _{d(on)}	V _{DD} =75V, V _{GS} =10V, I _D =50A R _{GEN} =2.7Ω		4.4		nS
Turn-on rise time	t _r			24.6		
Turn-off delay time	t _{d(off)}			38.1		
Turn-off fall time	t _f			9.5		
Source-Drain Diode characteristics						
Diode Forward Current	I _S				117	A
Diode Forward voltage	V _{SD}	V _{GS} =0V, I _S =50A			1.2	V
Reverse Recovery Time	t _{rr}	I _F =50A, di/dt =100A/μs		97.4		nS
Reverse Recovery Charge	Q _{rr}			217		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) EAS condition : T_J =25°C, V_G =10V, R_G =25Ω, L =0.5mH, I_{AS} =40A.
- 4) Guaranteed by design, not subject to production testing.

Typical Characteristics

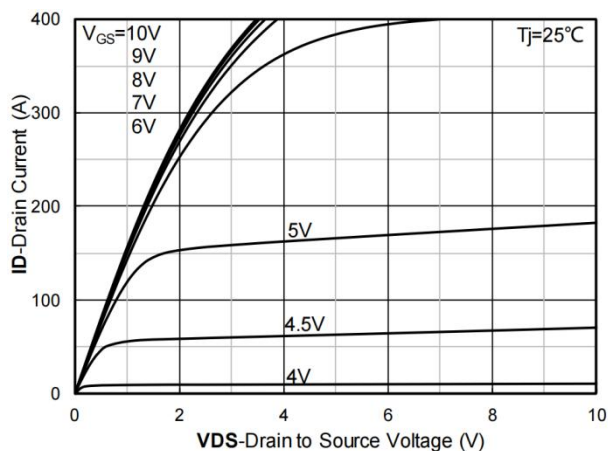


Figure 1. Output Characteristics

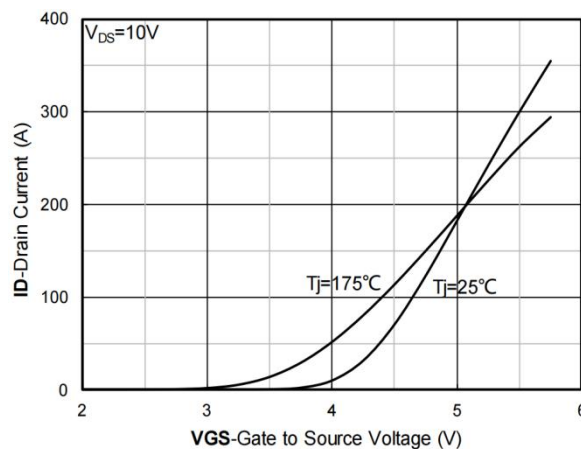


Figure 2. Transfer Characteristics

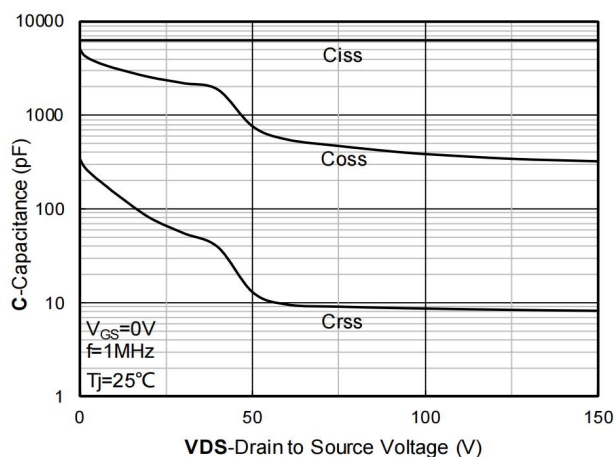


Figure 3. Capacitance Characteristics

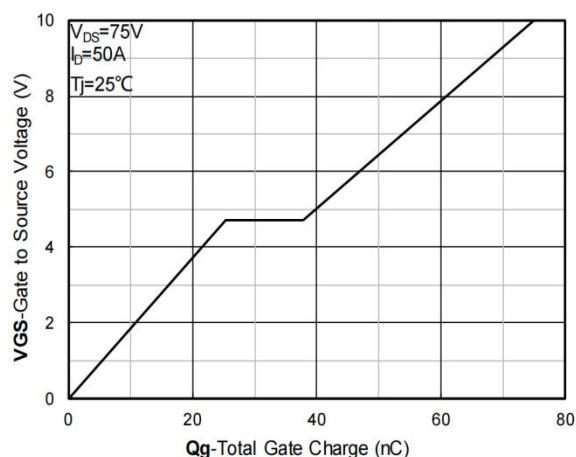


Figure 4. Gate Charge

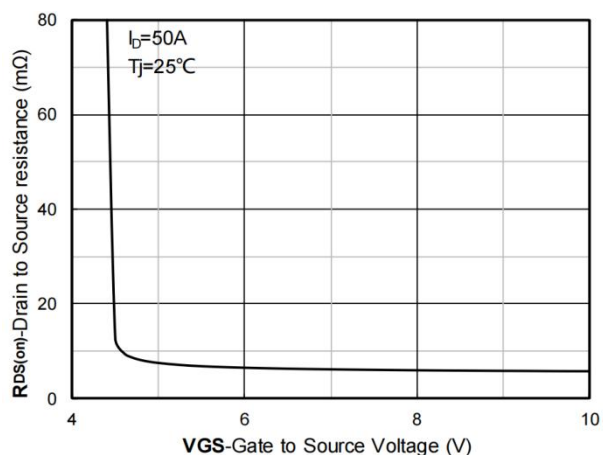


Figure 5. On-Resistance vs Gate to Source Voltage

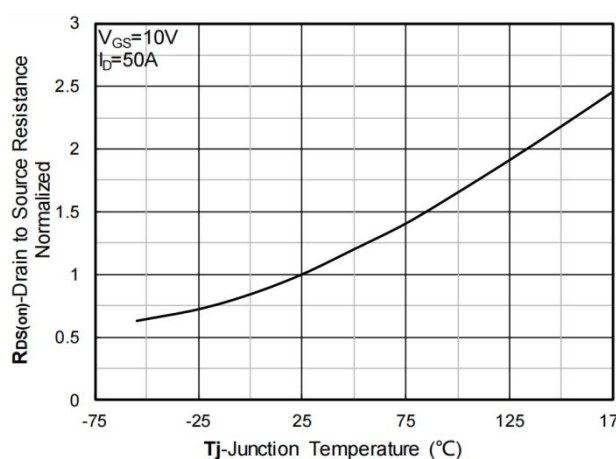


Figure 6. Normalized On-Resistance

Typical Characteristics

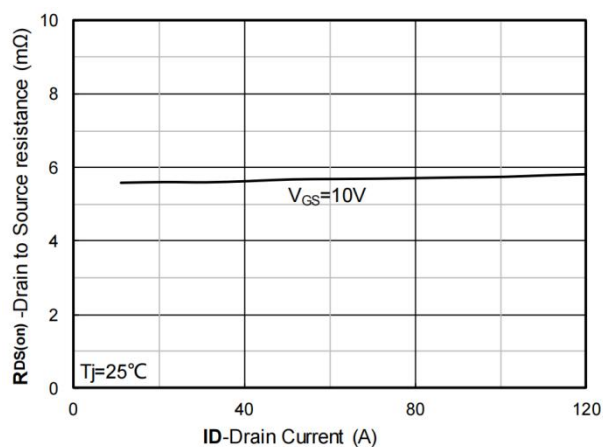


Figure 7. $R_{DS(on)}$ VS Drain Current

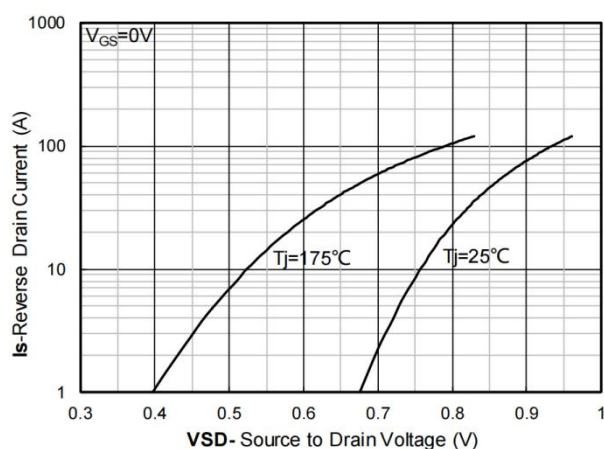


Figure 8. Forward characteristics of reverse diode

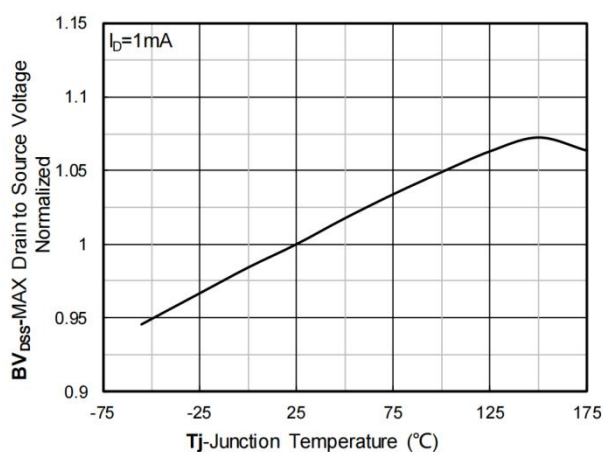


Figure 9. Normalized breakdown voltage

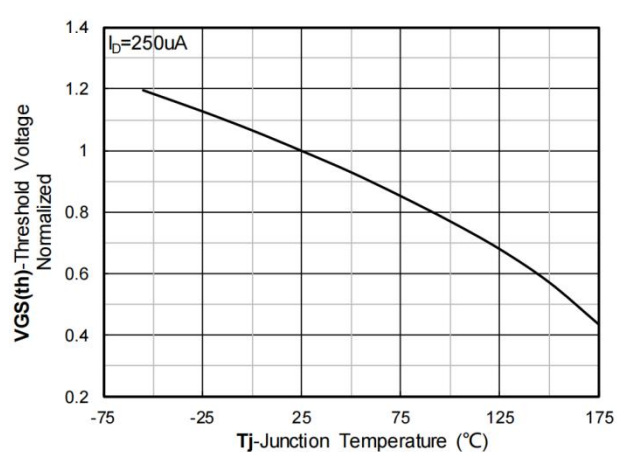


Figure 10. Normalized Threshold voltage

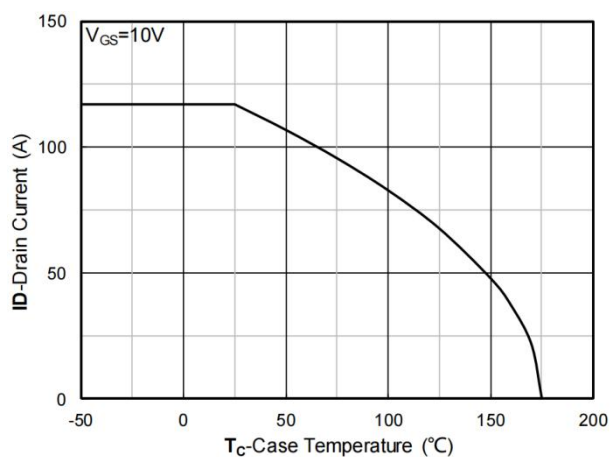


Figure 11. Current dissipation

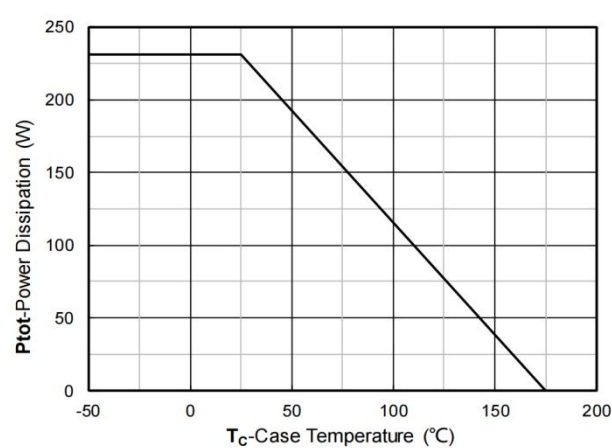


Figure 12. Power dissipation

Typical Characteristics

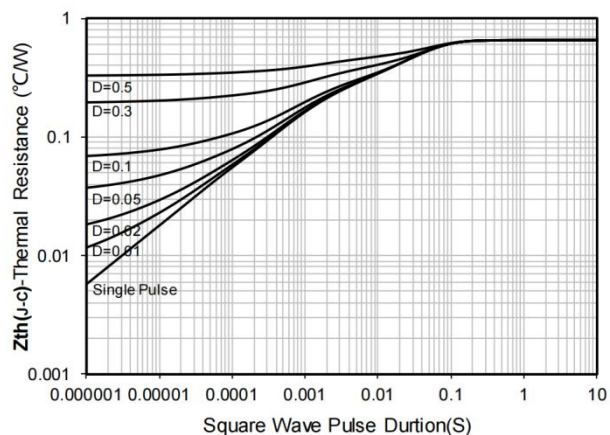


Figure 13. Maximum Transient Thermal Impedance

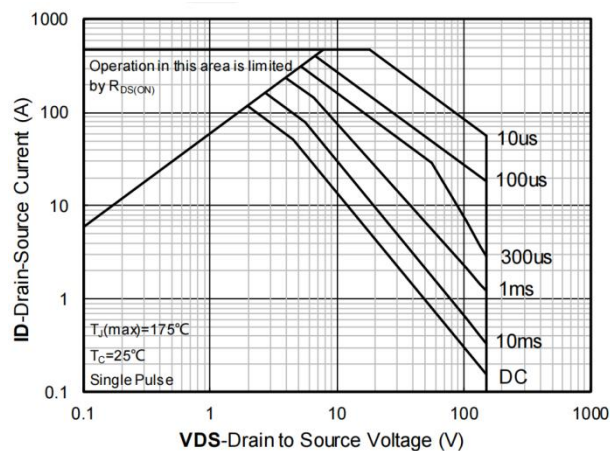
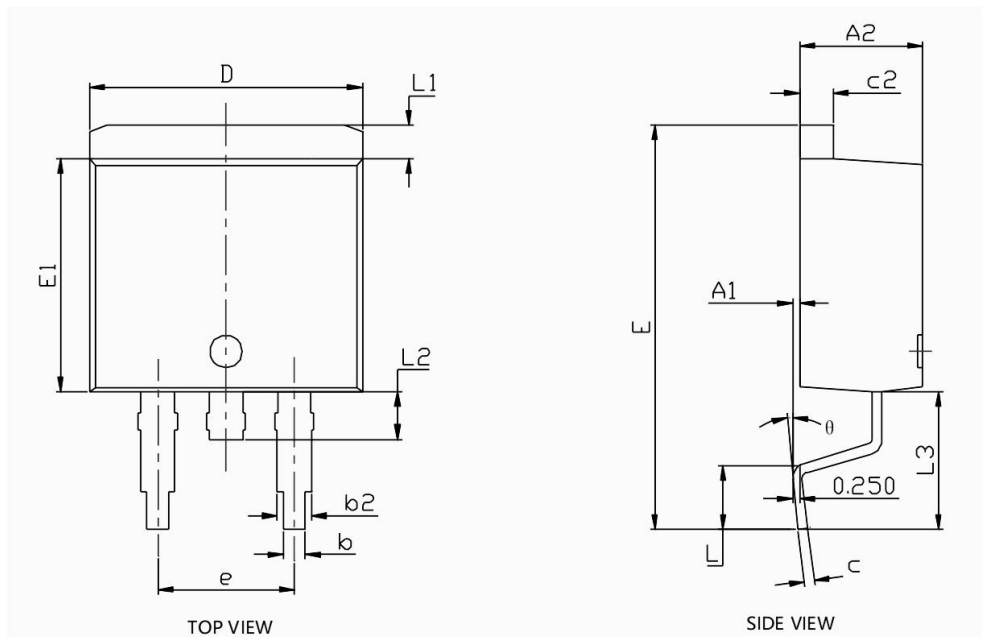


Figure 14. Safe Operation Area

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
E	14.500	15.500	0.571	0.610
E1	8.550	8.850	0.337	0.348
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°