

### Product Summary

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	$I_D$
100V	1.9mΩ@10V	270A

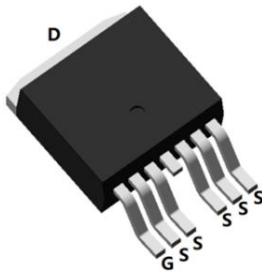
### Feature

- 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

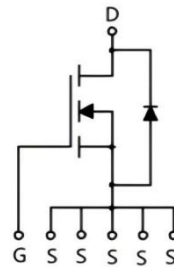
- Load switch
- Battery management
- Solar

### Package

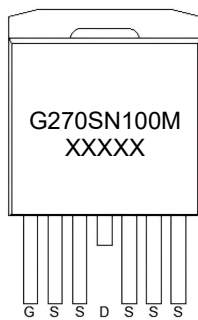


TO-263-7L

### Circuit diagram



### Marking



### Absolute Maximum Ratings (T<sub>C</sub>=25°C unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V <sub>DS</sub>	100	V
Gate-Source Voltage	V <sub>GS</sub>	±20	V
Continuous Drain Current <sup>1,3)</sup> (V <sub>GS</sub> =10V, Chip limitation)	I <sub>D</sub>	270	A
Continuous Drain Current <sup>1,3)</sup> (V <sub>GS</sub> =10V, T <sub>C</sub> =100°C)	I <sub>D</sub> (100°C)	190	A
Pulsed Drain Current (t <sub>p</sub> ≤10μs)	I <sub>DM</sub>	1080	A
Single Pulse Avalanche Energy <sup>2)</sup>	E <sub>AS</sub>	2190.4	mJ
Power Dissipation <sup>1,3)</sup>	P <sub>D</sub>	300	W
Thermal Resistance Junction to Case	R <sub>θJC</sub>	0.5	°C/W
Operating Junction Temperature	T <sub>J</sub>	-55 ~ +175	°C
Storage Temperature	T <sub>STG</sub>	-55 ~ +175	°C

### Electrical characteristics (T<sub>J</sub>=25°C unless otherwise noted)

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
<b>Static Characteristics</b>						
Drain-source breakdown voltage	V <sub>(BR)DSS</sub>	V <sub>GS</sub> =0V, I <sub>D</sub> =1mA	100			V
Zero gate voltage drain current	I <sub>DSS</sub>	V <sub>DS</sub> =80V, V <sub>GS</sub> =0V			1	μA
Gate-body leakage current	I <sub>GSS</sub>	V <sub>DS</sub> =0V, V <sub>GS</sub> =±20V			±100	nA
Gate threshold voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250μA	2	2.6	4	V
Drain-source on-resistance	R <sub>DS(on)</sub>	V <sub>GS</sub> =10V, I <sub>D</sub> =20A		1.4	1.9	mΩ
<b>Dynamic characteristics<sup>4)</sup></b>						
Input Capacitance	C <sub>iss</sub>	V <sub>DS</sub> =50V, V <sub>GS</sub> =0V, f =1MHz		10815		pF
Output Capacitance	C <sub>oss</sub>			2100		
Reverse Transfer Capacitance	C <sub>rss</sub>			35		
Total Gate Charge	Q <sub>g</sub>	V <sub>DS</sub> =50V, V <sub>GS</sub> =10V, I <sub>D</sub> =30A		166		nC
Gate-Source Charge	Q <sub>gs</sub>			34		
Gate-Drain Charge	Q <sub>gd</sub>			49		
Turn-on delay time	t <sub>d(on)</sub>	V <sub>DS</sub> =50V, V <sub>GS</sub> =10V, I <sub>D</sub> =30A R <sub>G</sub> =4.5Ω		30		nS
Turn-on rise time	t <sub>r</sub>			65		
Turn-off delay time	t <sub>d(off)</sub>			121		
Turn-off fall time	t <sub>f</sub>			107		
<b>Source-Drain Diode characteristics</b>						
Diode Forward Current	I <sub>S</sub>				270	A
Diode Forward voltage	V <sub>SD</sub>	V <sub>GS</sub> =0V, I <sub>S</sub> =20A			1.2	V
Reverse Recovery Time	T <sub>rr</sub>	V <sub>GS</sub> =0V, V <sub>R</sub> =50V, I <sub>F</sub> =30A di/dt =-100A/μs		92		nS
Reverse Recovery Charge	Q <sub>rr</sub>			167		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) T<sub>J</sub>=25°C, V<sub>G</sub>=10V, R<sub>G</sub>=25Ω, L=5mH, I<sub>AS</sub>=29.6A.
- 3) Thermal resistance from junction to soldering point (on the exposed drain pad).
- 4) Guaranteed by design, not subject to production testing.

## Typical Characteristics

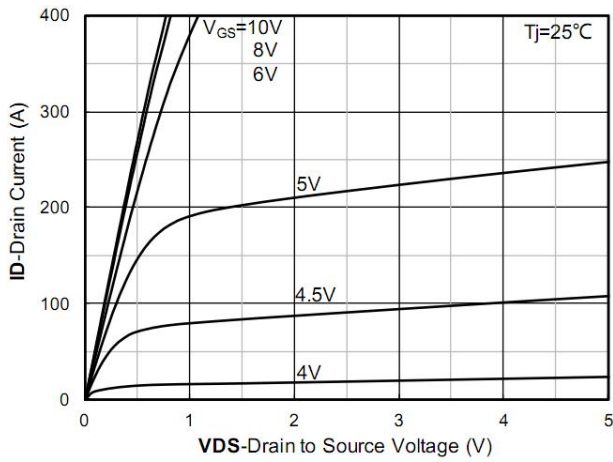


Figure 1. Output Characteristics; typical values

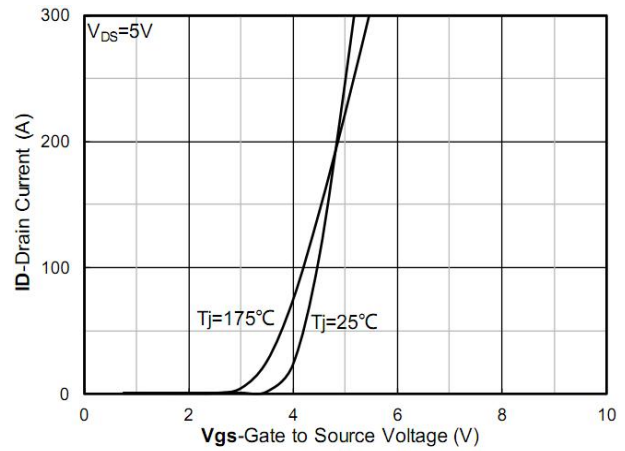


Figure 2. Transfer Characteristics; typical values

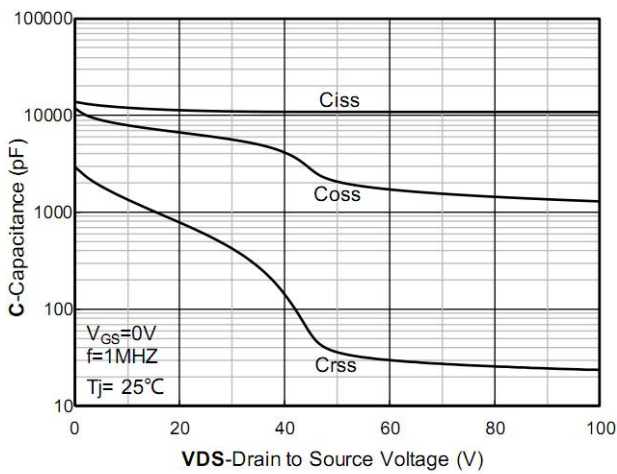


Figure 3. Capacitance Characteristics; typical values

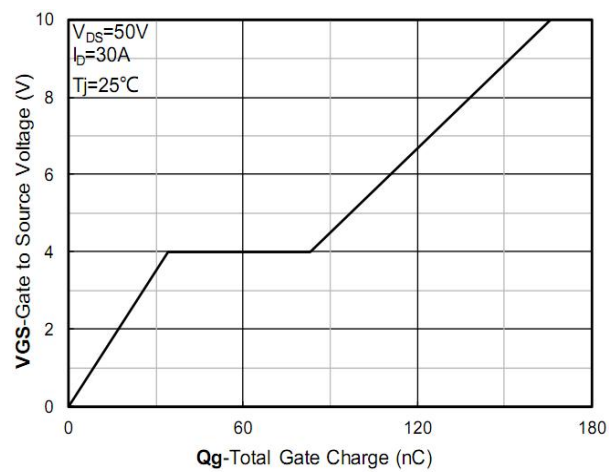


Figure 4. Gate Charge; typical values

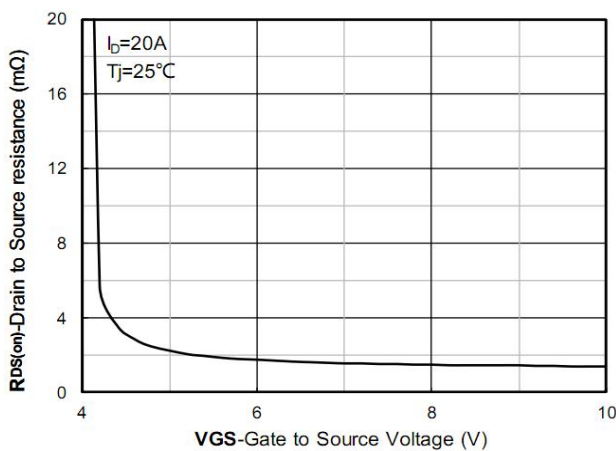


Figure 5. On-Resistance vs. Gate to Source Voltage; typical values

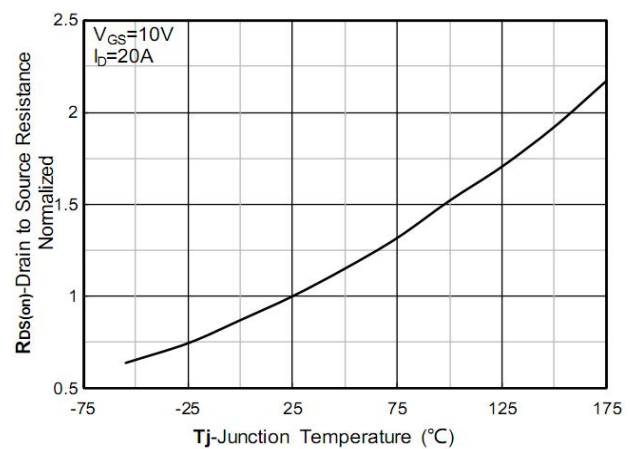


Figure 6. Normalized On-Resistance

### Typical Characteristics

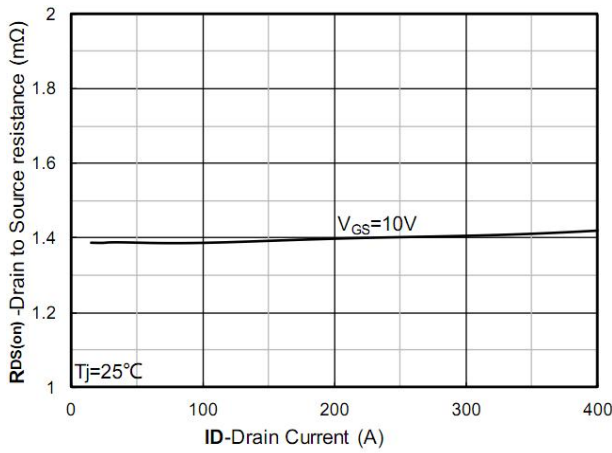


Figure 7.  $R_{DS(on)}$  vs. Drain Current; typical values

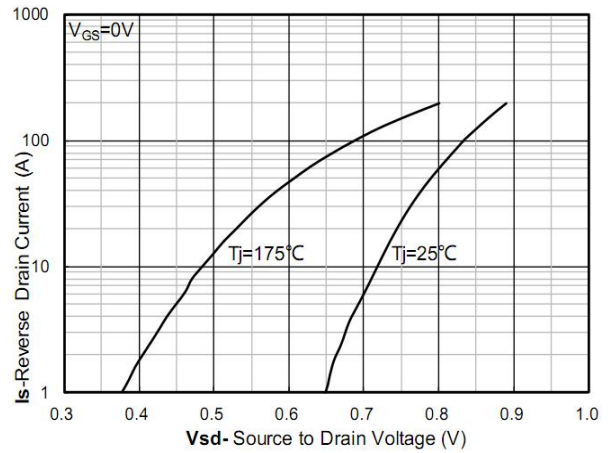


Figure 8. Forward characteristics of reverse diode; typical values

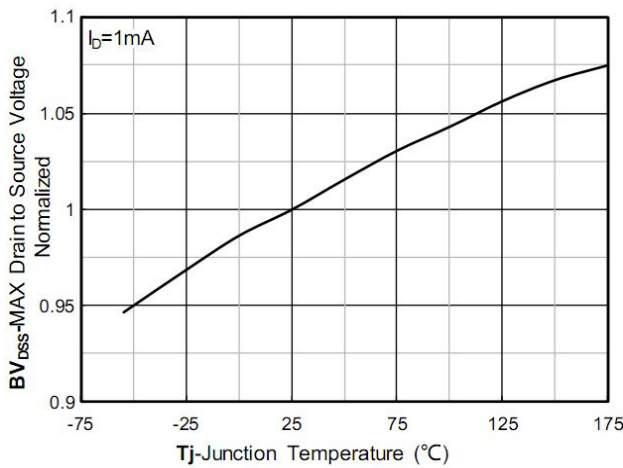


Figure 9. Normalized breakdown voltage

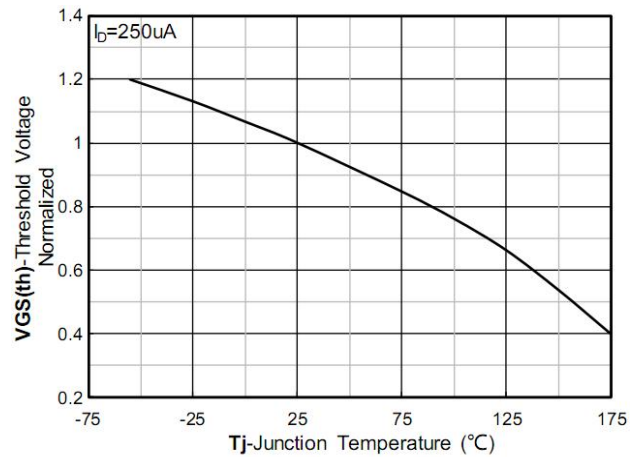


Figure 10. Normalized Threshold voltage

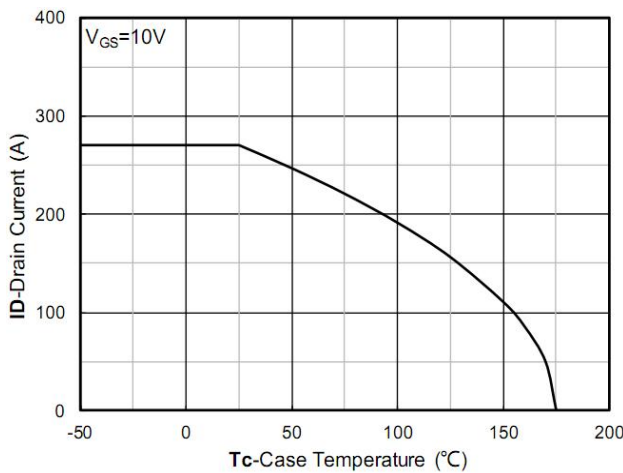


Figure 11. Current dissipation

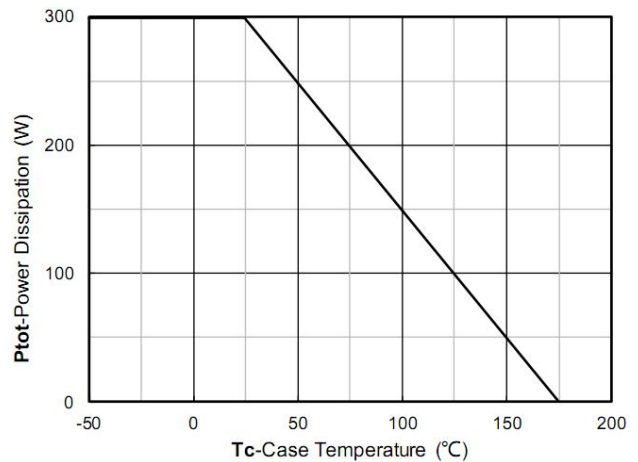


Figure 12. Power dissipation

## Typical Characteristics

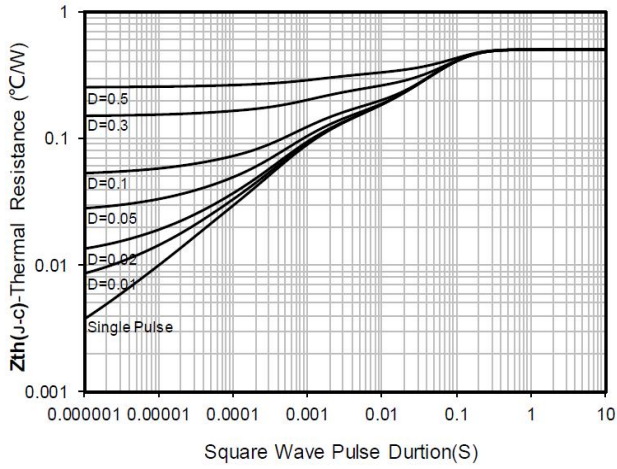


Figure 13. Maximum Transient Thermal Impedance

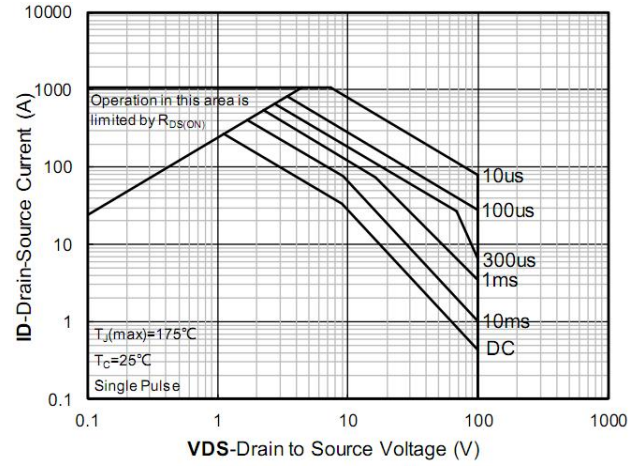
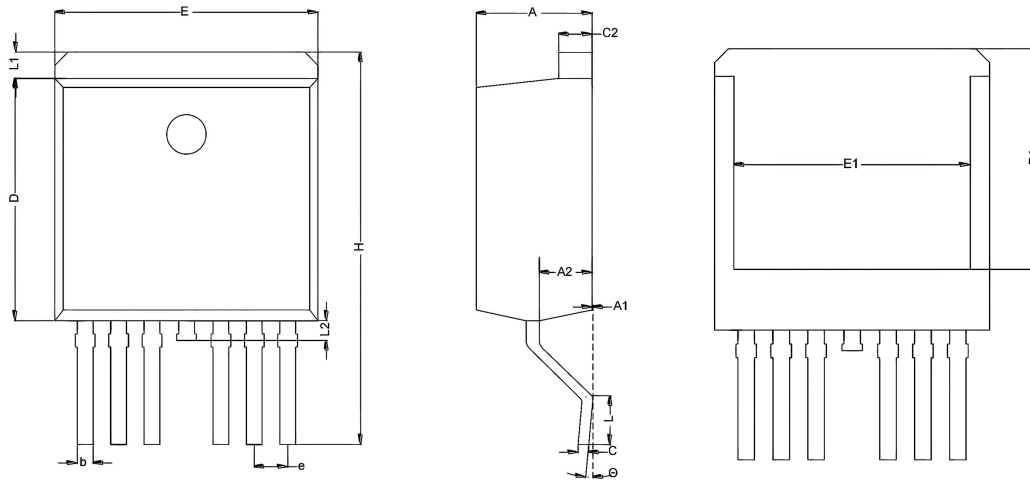


Figure 14. Safe Operation Area

### TO-263-7L Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	4.300	4.700	0.169	0.185
A1	0.000	0.250	0.000	0.010
A2	2.200	2.600	0.087	0.102
b	0.500	0.700	0.020	0.028
c	0.450	0.600	0.018	0.024
c2	1.200	1.350	0.047	0.053
D	9.000	9.400	0.354	0.370
D1	7.800	8.200	0.307	0.323
E	9.800	10.200	0.386	0.402
E1	8.400	8.800	0.331	0.346
e	1.270 BSC.		0.050 BSC.	
L1	0.900	1.100	0.035	0.043
L2	0.850	1.150	0.034	0.045
H	14.610	15.880	0.575	0.625
theta	0°	8°	0°	8°