

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	I_D
100V	1.55mΩ@10V	300A
	2.4mΩ@6V	

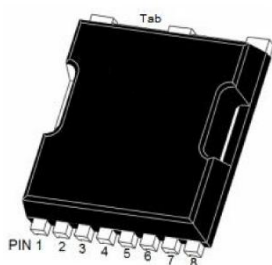
Feature

- Excellent package for heat dissipation
- High density cell design for low $R_{DS(ON)}$
- Suffix "-Q1" for AEC-Q101

Application

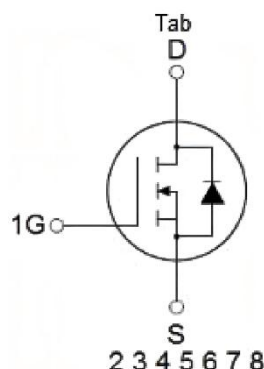
- High power inverter system
- Uninterruptible power supply
- LCDM appliances

Package

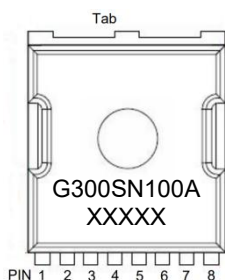


TOLL

Circuit diagram



Marking



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

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	100	V
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current ($T_C=25^{\circ}\text{C}$)	I_D	300	A
Continuous Drain Current ($T_C=100^{\circ}\text{C}$)	$I_D(100^{\circ}\text{C})$	212	A
Pulsed Drain Current ¹⁾	I_{DM}	900	A
Single Pulse Avalanche Energy ²⁾	E_{AS}	2116	mJ
Power Dissipation ³⁾ ($T_C=25^{\circ}\text{C}$)	P_D	375	W
Thermal Resistance Junction to Case	$R_{\theta JC}$	0.4	$^{\circ}\text{C/W}$
Operating Junction Temperature	T_J	$-55 \sim +175$	$^{\circ}\text{C}$
Storage Temperature Range	T_{STG}	$-55 \sim +175$	$^{\circ}\text{C}$

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	100			V
Zero gate voltage drain current	I _{DSS}	V _{DS} =100V, 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	2	2.6	4	V
Drain-source on-resistance	R _{DS(on)}	V _{GS} =10V, I _D =30A		1.2	1.55	mΩ
		V _{GS} =6V, I _D =15A		1.8	2.4	
Dynamic characteristics ⁴⁾						
Input Capacitance	C _{iss}	V _{DS} =50V, V _{GS} =0V f =100kHz		10411		pF
Output Capacitance	C _{oss}			1986		
Reverse Transfer Capacitance	C _{rss}			24.7		
Total Gate Charge	Q _g	V _{DS} =50V, V _{GS} =10V, I _D =30A		166		nC
Gate-Source Charge	Q _{gs}			34		
Gate-Drain Charge	Q _{gd}			49		
Turn-on delay time	t _{d(on)}	V _{DS} =50V, V _{GS} =10V, I _D =30A R _G =4.5Ω		30		nS
Turn-on rise time	t _r			65		
Turn-off delay time	t _{d(off)}			121		
Turn-off fall time	t _f			107		
Source-Drain Diode characteristics						
Diode Forward Current	I _S				300	A
Diode Forward voltage	V _{SD}	V _{GS} =0V, I _S =30A			1.2	V
Reverse Recovery Time	T _{rr}	I _F =30A, di/dt =100A/μs		92		nS
Reverse Recovery Charge	Q _{rr}			167		nC

Notes:

- 1) Repetitive rating; pulse width limited by max. junction temperature.
- 2) The test condition is $T_J=25^{\circ}\text{C}$, $V_{DS}=80V$, $V_G=10V$, $L=2mH$, $R_G=25\Omega$, $I_{AS}=46A$.
- 3) P_D is based on max. junction temperature, using junction-case thermal resistance.
- 4) Guaranteed by design, not subject to production.

Typical Characteristics

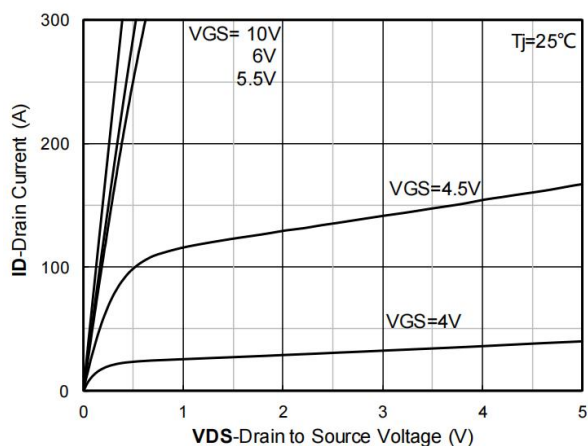


Figure 1. Output Characteristics

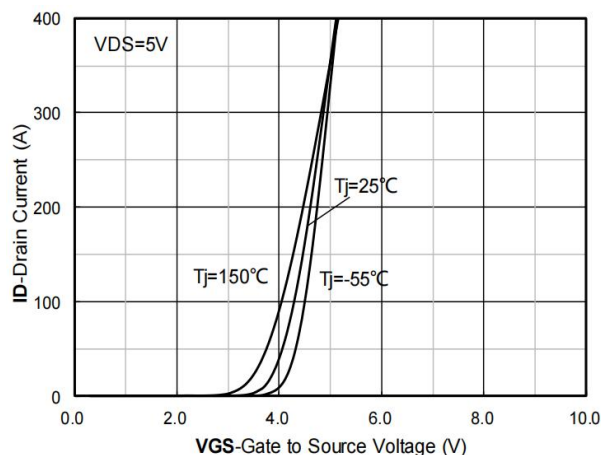


Figure 2. Transfer Characteristics

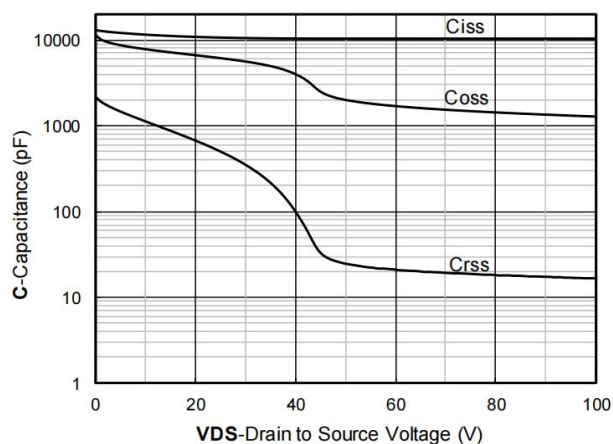


Figure 3. Capacitance Characteristics

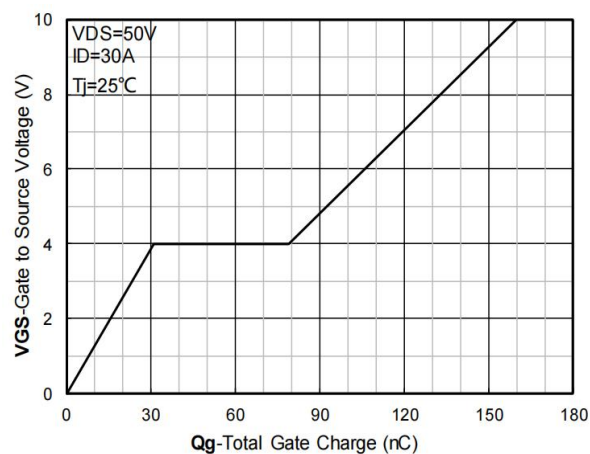


Figure 4. Gate Charge

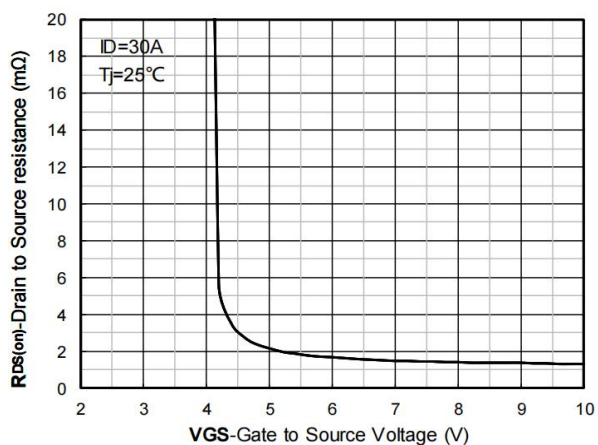


Figure 5. On-Resistance vs Gate to Source Voltage

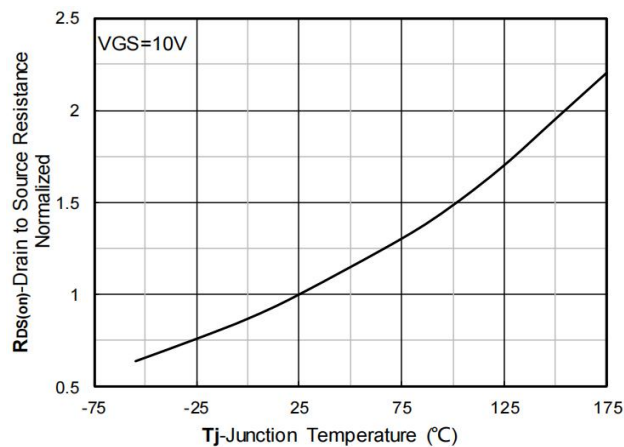


Figure 6. Normalized On-Resistance

Typical Characteristics

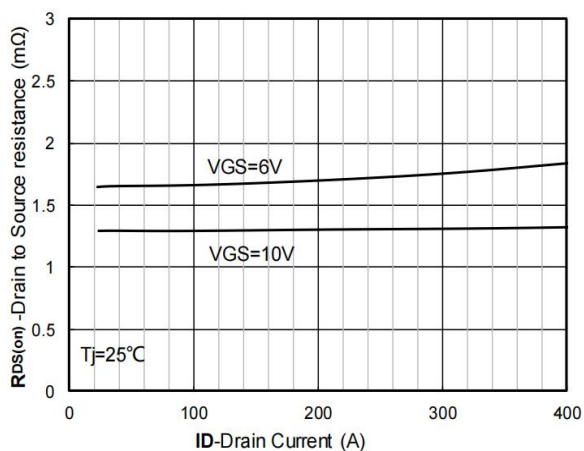


Figure 7. RDS(on) VS Drain Current

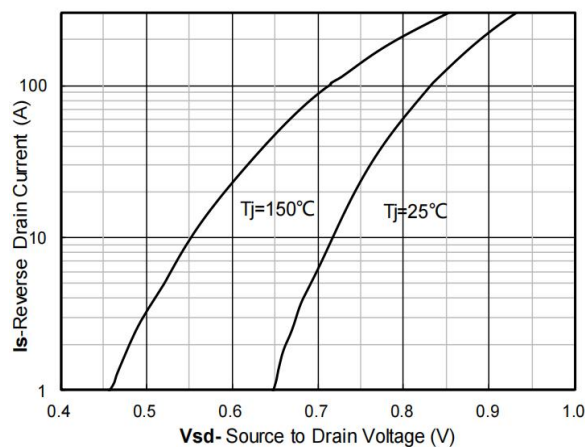


Figure 8. Forward characteristics of reverse diode

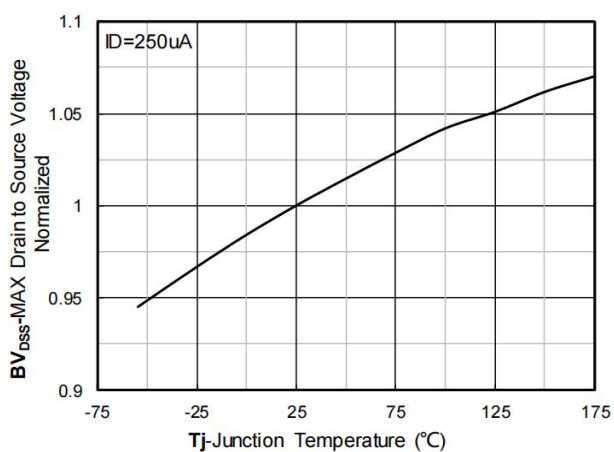


Figure 9. Normalized breakdown voltage

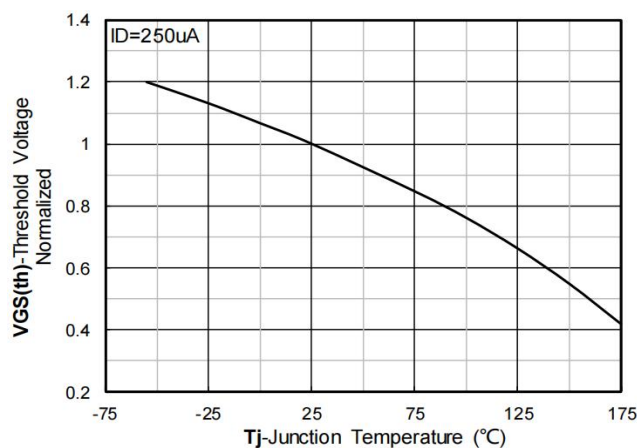


Figure 10. Normalized Threshold voltage

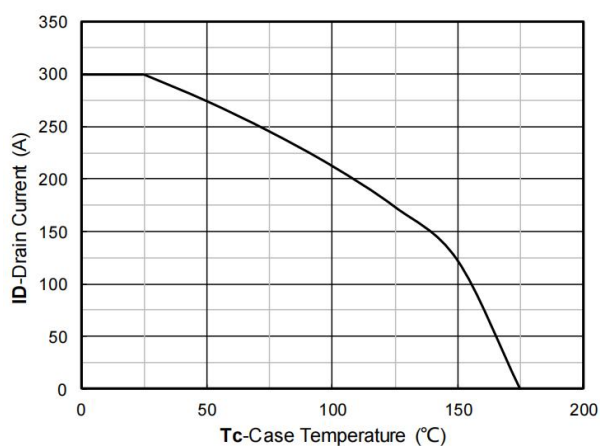


Figure 11. Current dissipation

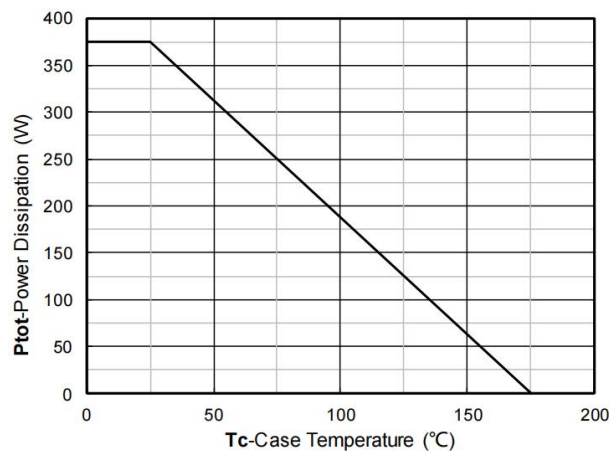


Figure 12. Power dissipation

Typical Characteristics

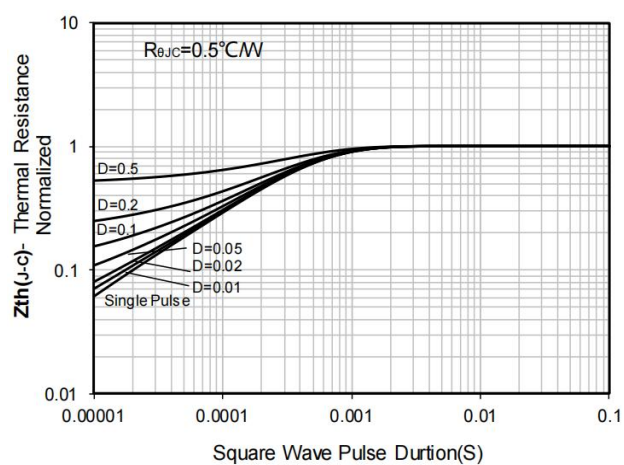


Figure 13. Maximum Transient Thermal Impedance

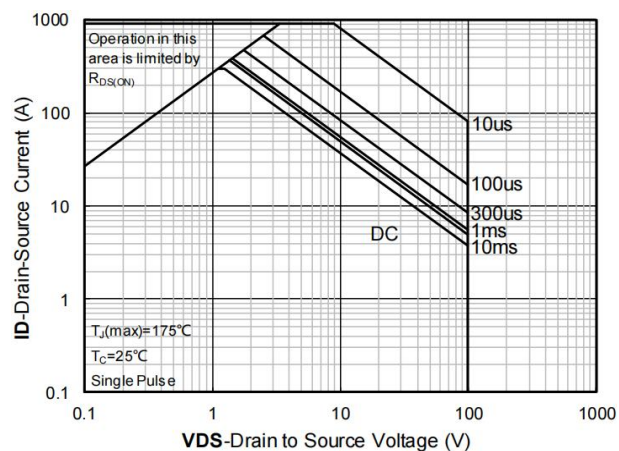
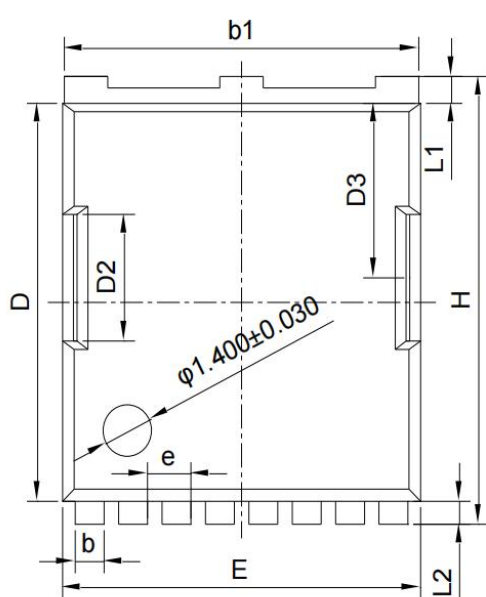
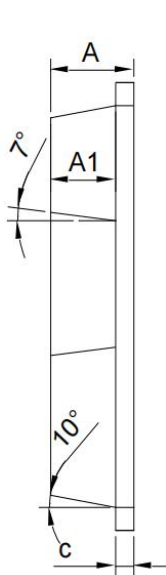


Figure 14. Safe Operation Area

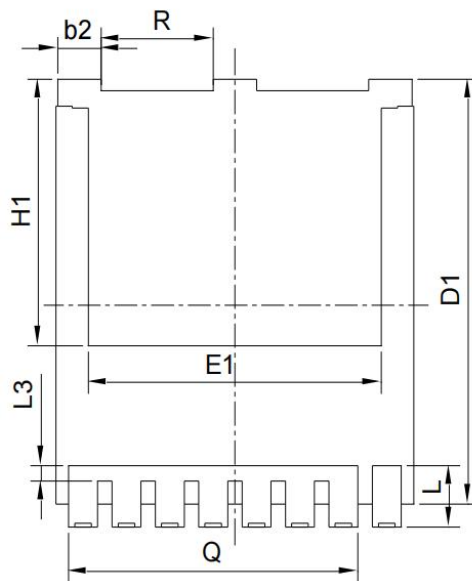
TOLL Package Information



TOP VIEW



SIDE VIEW



BOTTOM VIEW

Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	2.200	2.400	0.087	0.094
A1	1.700	1.900	0.067	0.075
b	0.700	0.900	0.028	0.035
b1	9.700	9.900	0.382	0.390
b2	1.100	1.300	0.043	0.051
c	0.400	0.600	0.016	0.024
D	10.280	10.480	0.405	0.413
D1	10.980	11.180	0.432	0.440
D2	3.200	3.400	0.126	0.134
D3	4.450	4.650	0.175	0.183
E	9.800	10.00	0.386	0.394
E1	8.000	8.200	0.315	0.323
e	1.200 BSC.		0.047 BSC.	
H	11.580	11.780	0.456	0.464
H1	6.950 BSC.		0.274 BSC.	
L	1.500	1.700	0.059	0.067
L1	0.600	0.800	0.024	0.031
L2	0.500	0.700	0.020	0.028
L3	0.300	0.500	0.012	0.020
Q	8.000 REF.		0.315 REF.	
R	3.000	3.200	0.118	0.126