

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	I_D
80V	1.2mΩ@10V	428A

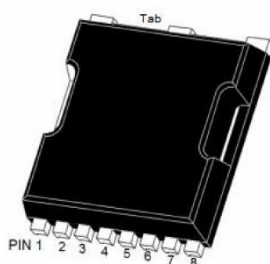
Feature

- Excellent gate charge x $R_{DS(on)}$ product(FOM)
- Very low on-resistance $R_{DS(on)}$
- Suffix "-Q1" for AEC-Q101

Application

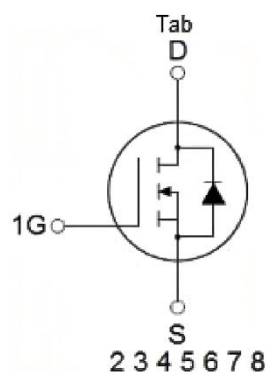
- DC/DC Converter
- Ideal for high-frequency switching and synchronous rectification

Package

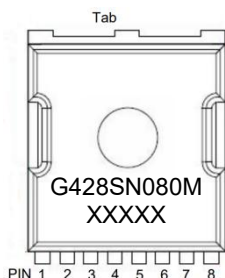


TOLL

Circuit diagram



Marking



Absolute maximum ratings (T_c=25°C unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V _{DS}	80	V
Gate-Source Voltage	V _{GS}	±20	V
Continuous Drain Current	I _D	428	A
Continuous Drain Current(T _c =100°C)	I _D (100°C)	300	A
Pulsed Drain Current	I _{DM}	1712	A
Single Pulse Avalanche Energy ¹⁾	E _{AS}	2704	mJ
Power Dissipation	P _D	405	W
Thermal Resistance Junction to Case	R _{θJC}	0.37	°C/W
Operating Junction Temperature	T _J	-55 ~ +175	°C
Storage Temperature Range	T _{STG}	-55 ~ +175	°C

Electrical characteristics (T_c=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	80			V
Zero gate voltage drain current	I _{DSS}	V _{DS} =80V, 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		4	V
Drain-source on-resistance	R _{DS(on)}	V _{GS} =10V, I _D =40A		1	1.2	mΩ
Dynamic characteristics ²⁾						
Input Capacitance	C _{iss}	V _{DS} =40V, V _{GS} =0V, f =1MHz		11780		pF
Output Capacitance	C _{oss}			5800		
Reverse Transfer Capacitance	C _{rss}			161		
Total Gate Charge	Q _g	V _{DS} =40V, V _{GS} =10V, I _D =20A		168		nC
Gate-Source Charge	Q _{gs}			46		
Gate-Drain Charge	Q _{gd}			41.5		
Turn-on delay time	t _{d(on)}	V _{DS} =40V, V _{GS} =10V, I _D =40A R _G =1.6Ω		33.4		nS
Turn-on rise time	t _r			11.8		
Turn-off delay time	t _{d(off)}			40.4		
Turn-off fall time	t _f			10.2		
Source-Drain Diode characteristics						
Diode Forward Current	I _S				428	A
Diode Forward voltage	V _{SD}	V _{GS} =0V, I _S =40A			1.2	V
Reverse Recovery Time	T _{rr}	I _F =40A, di/dt =100A/μs		84.5		nS
Reverse Recovery Charge	Q _{rr}	T _J =25°C		163		nC

Notes:

1) The test condition is T_J =25°C, V_{DD}=50V, V_{GS}=10V, L=0.5mH, R_G =25Ω.

2) Guaranteed by design, not subject to production.

Typical Characteristics

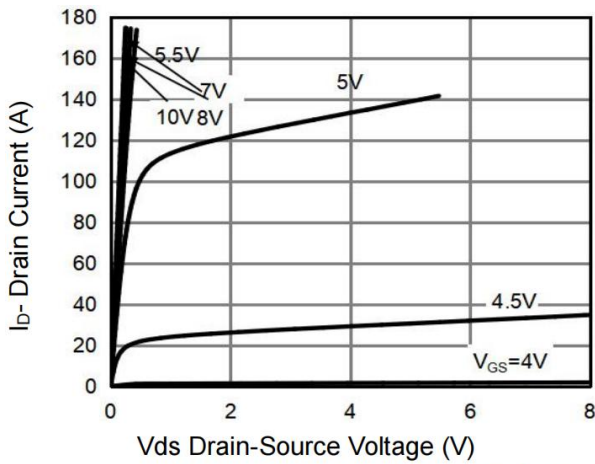


Figure 1 Output Characteristics

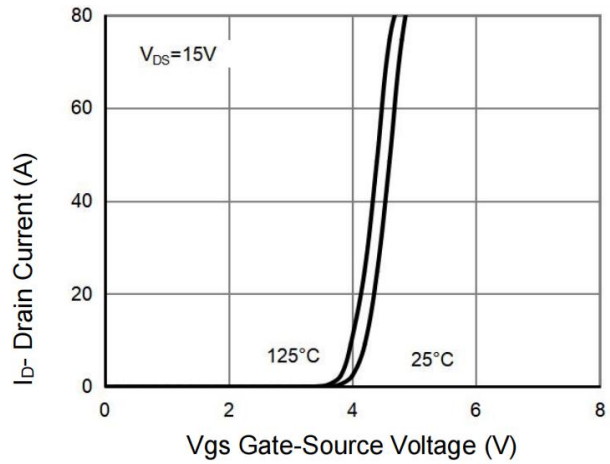


Figure 2 Transfer Characteristics

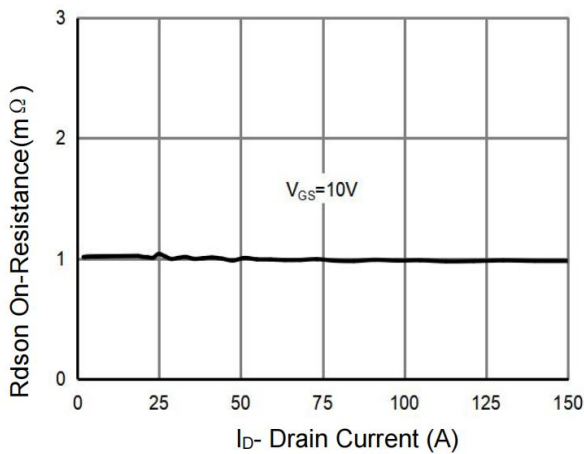


Figure 3 Rdson- Drain Current

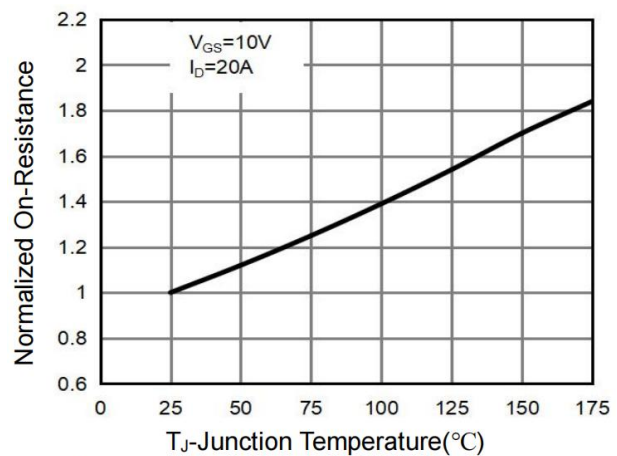


Figure 4 Rdson-Junction Temperature

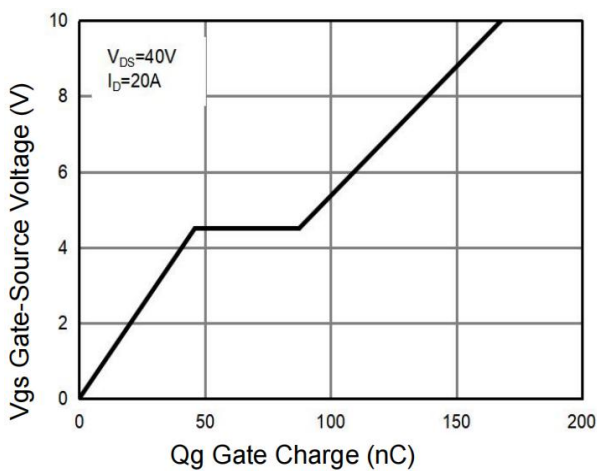


Figure 5 Gate Charge

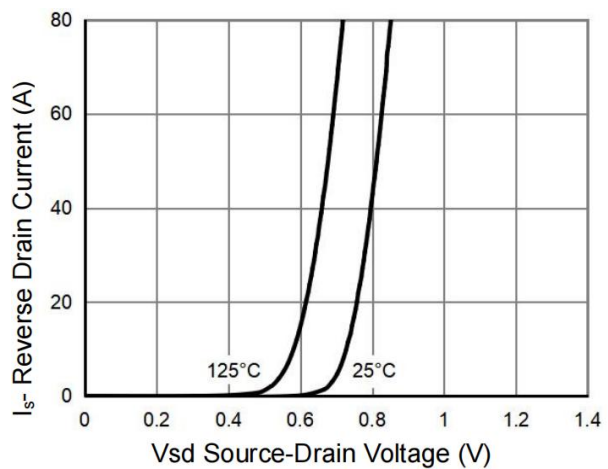


Figure 6 Source- Drain Diode Forward

Typical Characteristics

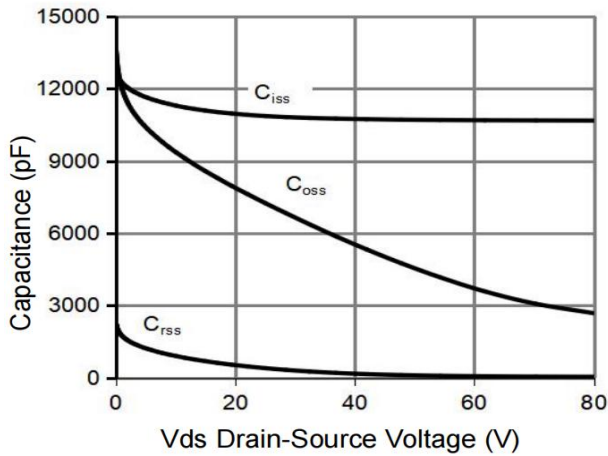


Figure 7 Capacitance vs Vds

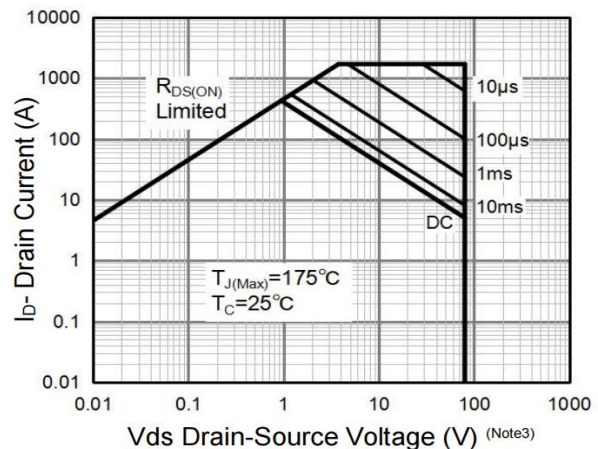


Figure 8 Safe Operation Area

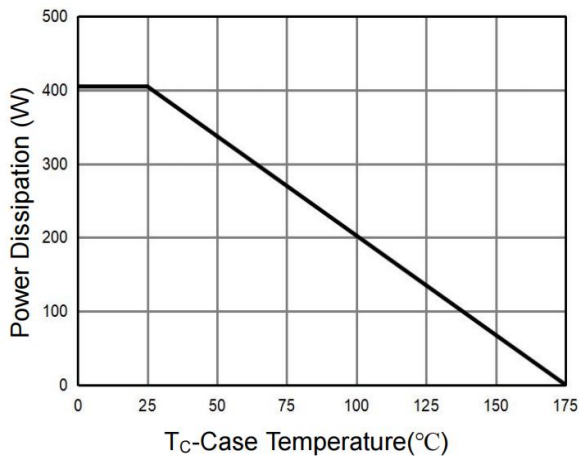


Figure 9 Power De-rating

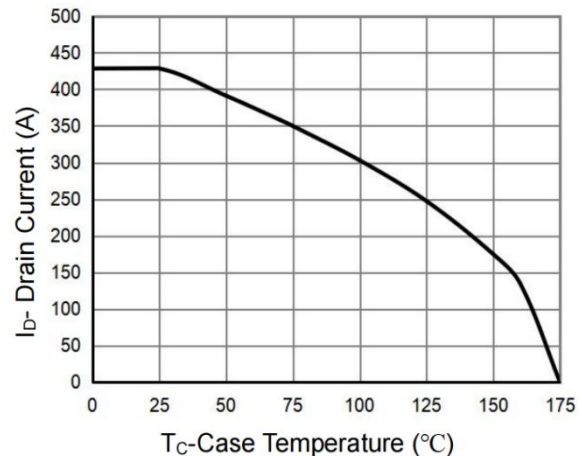


Figure 10 Current De-rating

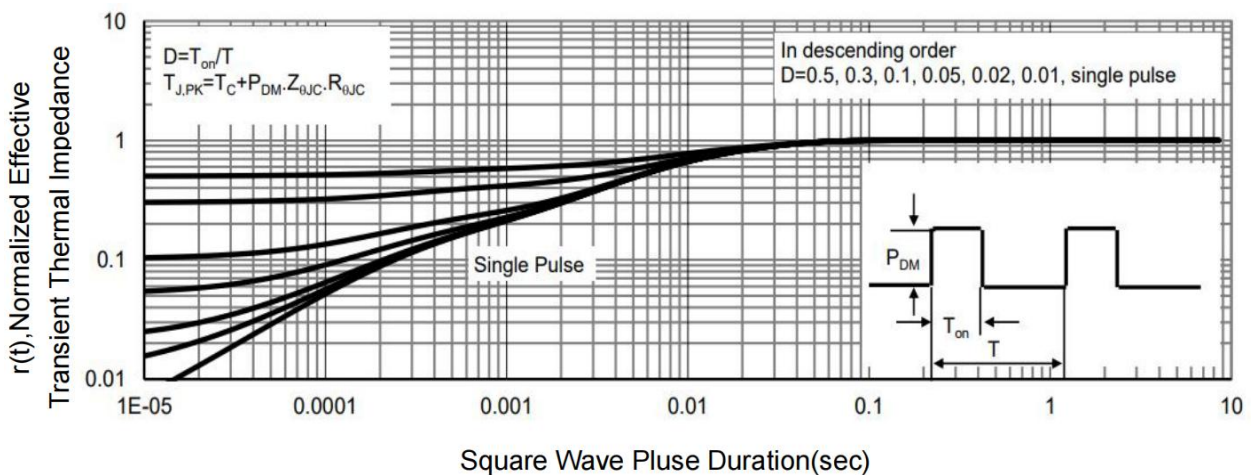
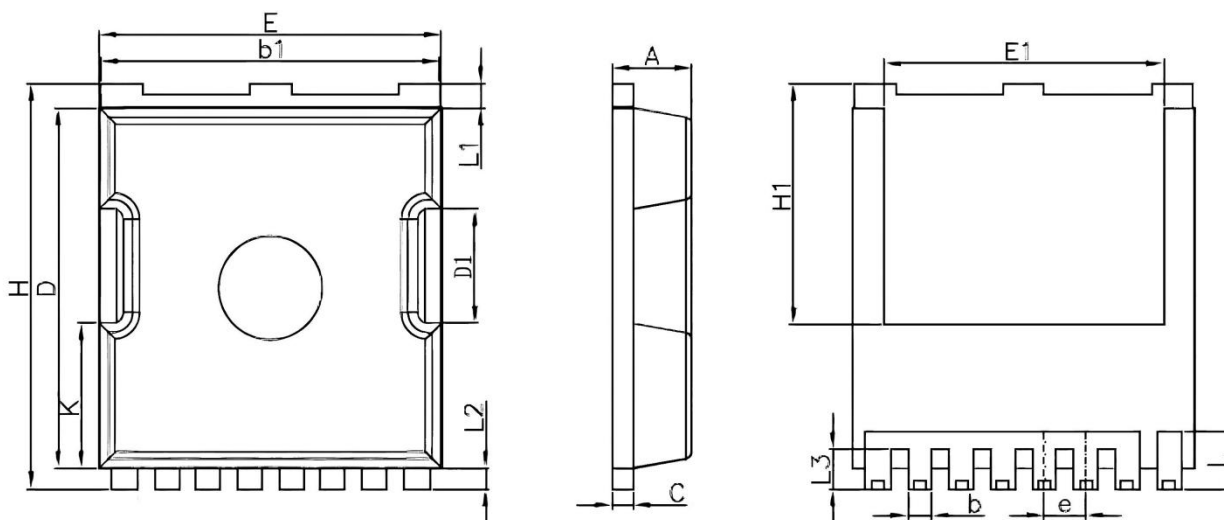


Figure 11 Normalized Maximum Transient Thermal Impedance

TOLL Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	2.200	2.400	0.087	0.094
b	0.650	0.850	0.026	0.033
b1	9.700	9.900	0.382	0.390
C	0.500	0.700	0.020	0.028
D	10.300	10.500	0.406	0.413
D1	3.150	3.450	0.124	0.136
E	9.700	10.100	0.382	0.398
E1	8.000	8.200	0.315	0.323
e	1.100	1.300	0.043	0.051
H	11.600	11.800	0.457	0.465
H1	6.850	7.050	0.270	0.278
K	4.080	4.280	0.161	0.169
L	1.600	2.100	0.063	0.083
L1	0.600	0.800	0.024	0.031
L2	0.500	0.700	0.020	0.028
L3	1.050	1.300	0.041	0.051