

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	I_D
120V	2.8mΩ@10V	230A

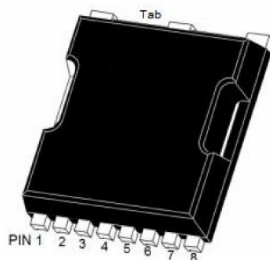
Feature

- Excellent gate charge x $R_{DS(on)}$ product(FOM)
- Very low on-resistance $R_{DS(on)}$
- 175 °C operating temperature
- Suffix "-Q1" for AEC-Q101

Application

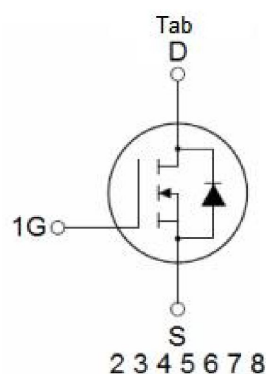
- DC/DC Converter
- Ideal for high-frequency switching and synchronous rectification

Package

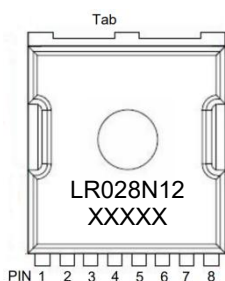


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Circuit diagram



Marking



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

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V _{DS}	120	V
Gate-Source Voltage	V _{GS}	±20	V
Continuous Drain Current	I _D	230	A
Continuous Drain Current (T _C =100°C)	I _D (100°C)	165	A
Pulsed Drain Current	I _{DM}	920	A
Power Dissipation	P _D	380	W
Thermal Resistance,Junction-to-Case ¹⁾	R _{θJC}	0.4	°C/W
Single pulse avalanche energy ⁴⁾	E _{AS}	2300	mJ
Junction Temperature	T _J	175	°C
Storage Temperature	T _{STG}	-55 ~ +175	°C

Electrical characteristics (Tc=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	120			V
Zero gate voltage drain current	I _{DSS}	V _{DS} =120V, V _{GS} = 0V			1	μA
Gate-body leakage current	I _{GSS}	V _{GS} =±20V, V _{DS} = 0V			±100	nA
Gate threshold voltage ²⁾	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250μA	2.0	3.0	4.0	V
Drain-source on-resistance ²⁾	R _{DS(on)}	V _{GS} =10V, I _D =115A		2.0	2.8	mΩ
Dynamic characteristics³⁾						
Input Capacitance	C _{iss}	V _{DS} =60V, V _{GS} =0V, f =1MHz		12700		pF
Output Capacitance	C _{oss}			870		
Reverse Transfer Capacitance	C _{rss}			48		
Total Gate Charge	Q _g	V _{DS} =50V, V _{GS} =10V, I _D =115A		213		nC
Gate-Source Charge	Q _{gs}			58		
Gate-Drain Charge	Q _{gd}			58		
Turn-on delay time	t _{d(on)}	V _{DD} =60V, V _{GS} =10V, I _D =115A, R _G =1.6Ω		34		nS
Turn-on rise time	t _r			27		
Turn-off delay time	t _{d(off)}			78		
Turn-off fall time	t _f			30		
Source-Drain Diode characteristics						
Diode Forward Current ¹⁾	I _S				230	A
Diode Forward voltage ²⁾	V _{SD}	V _{GS} =0V, I _S =115A			1.2	V
Reverse Recovery Time	t _{rr}	T _J = 25°C, I _F =115A		101		nS
Reverse Recovery Charge	Q _{rr}	di/dt = 100A/μs ²⁾		280		nC

Notes:

- 1) Surface Mounted on FR4 Board, t ≤ 10 sec.
- 2) Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2%.
- 3) Guaranteed by design, not subject to production
- 4) EAS condition : T_J=25°C, V_{DD}=60V, V_G=10V, L=0.5mH, R_g=25Ω

Typical Characteristics

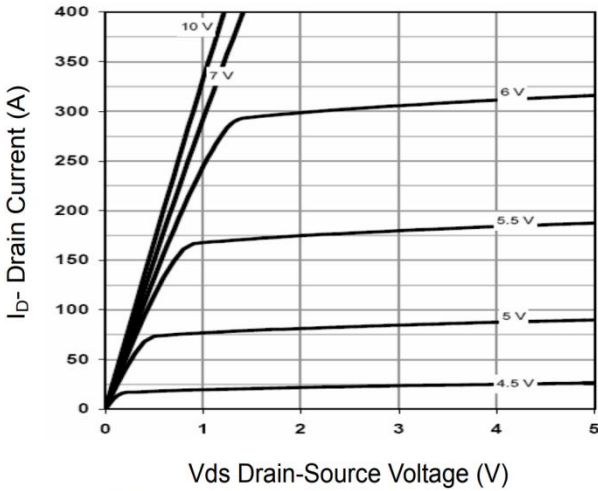


Figure 1 Output Characteristics

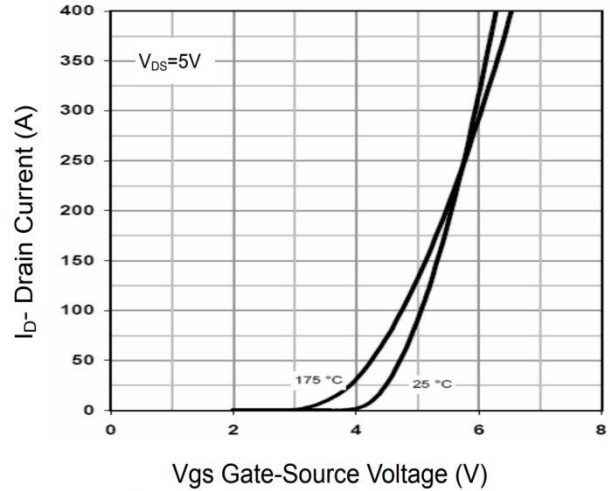


Figure 2 Transfer Characteristics

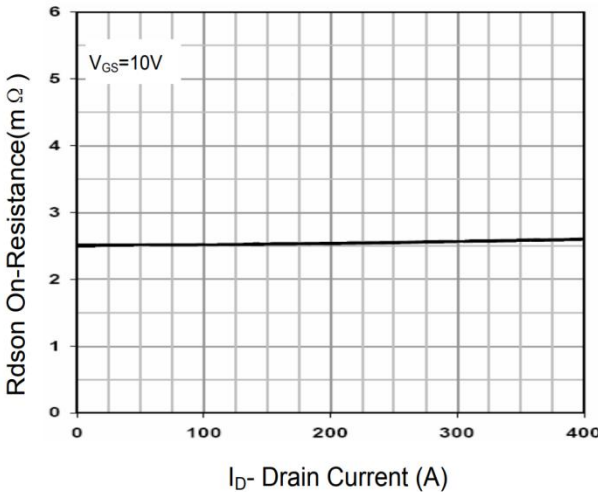


Figure 3 Rdson- Drain Current

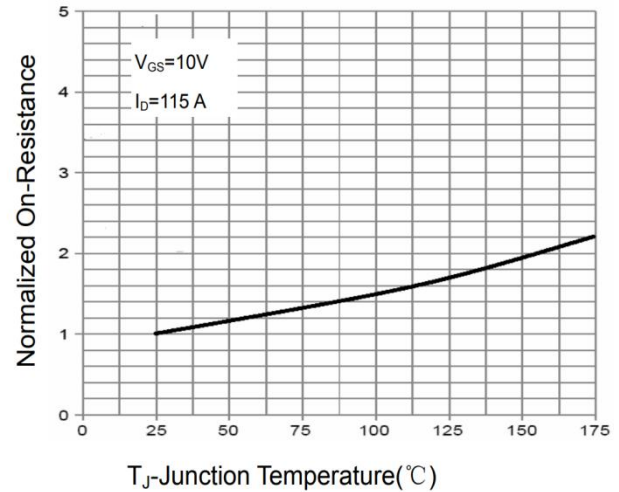


Figure 4 Rdson-Junction Temperature

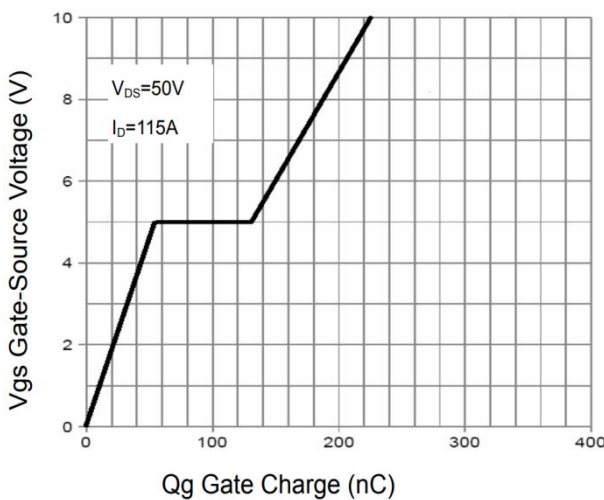


Figure 5 Gate Charge

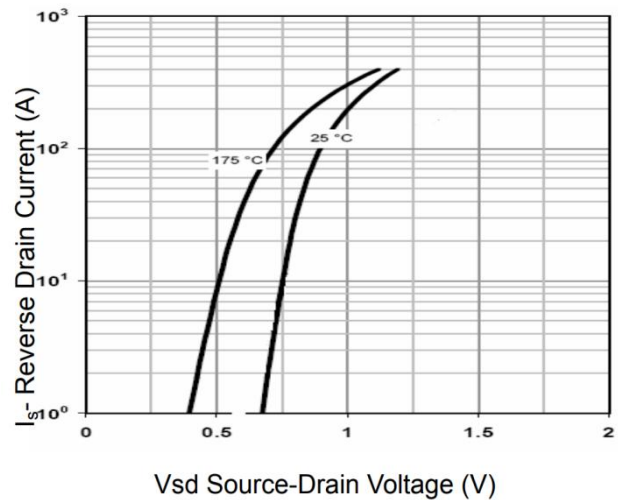
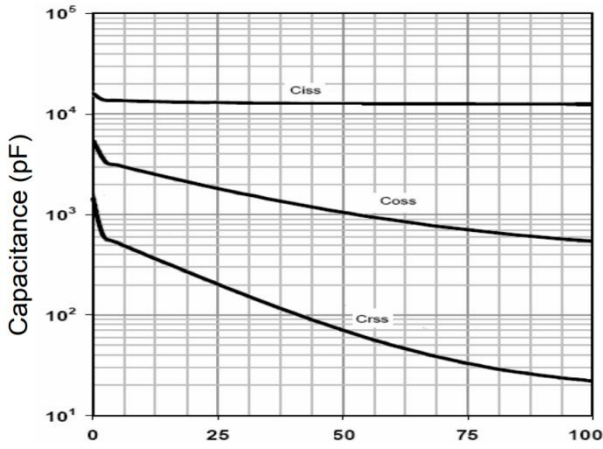
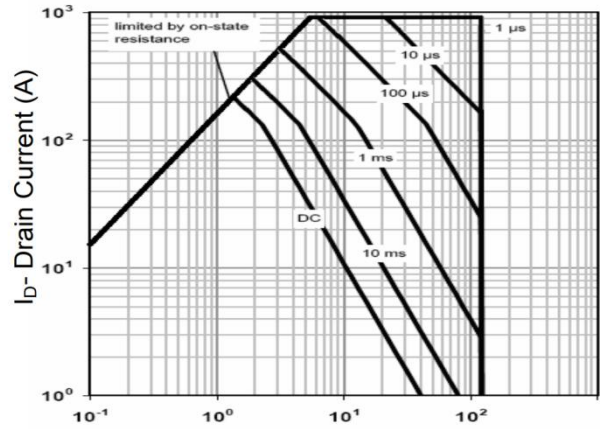


Figure 6 Source- Drain Diode Forward

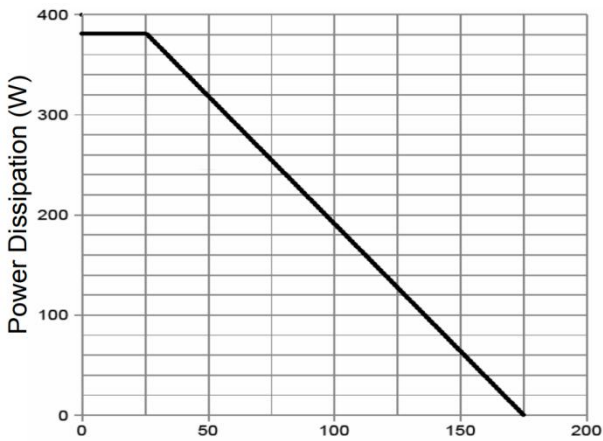
Typical Characteristics



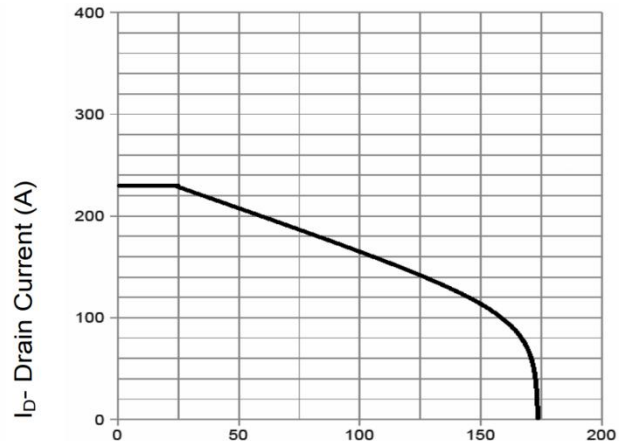
Vds Drain-Source Voltage (V)
Figure 7 Capacitance vs Vds



Vds Drain-Source Voltage (V)
Figure 8 Safe Operation Area



T_J-Junction Temperature(°C)
Figure 9 Power De-rating



T_J-Junction Temperature (°C)
Figure 10 Current De-rating

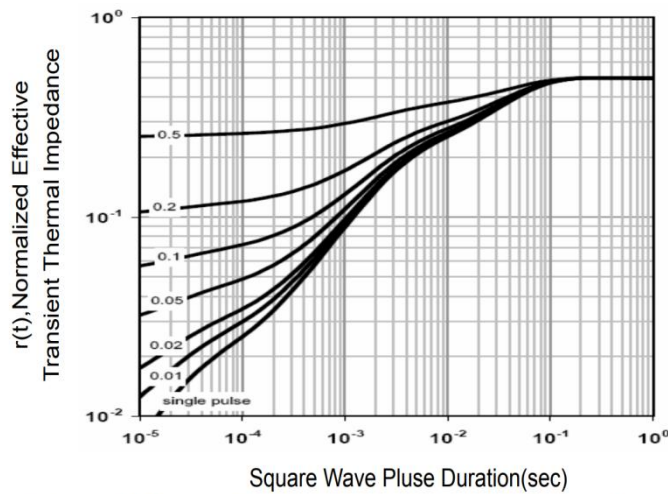
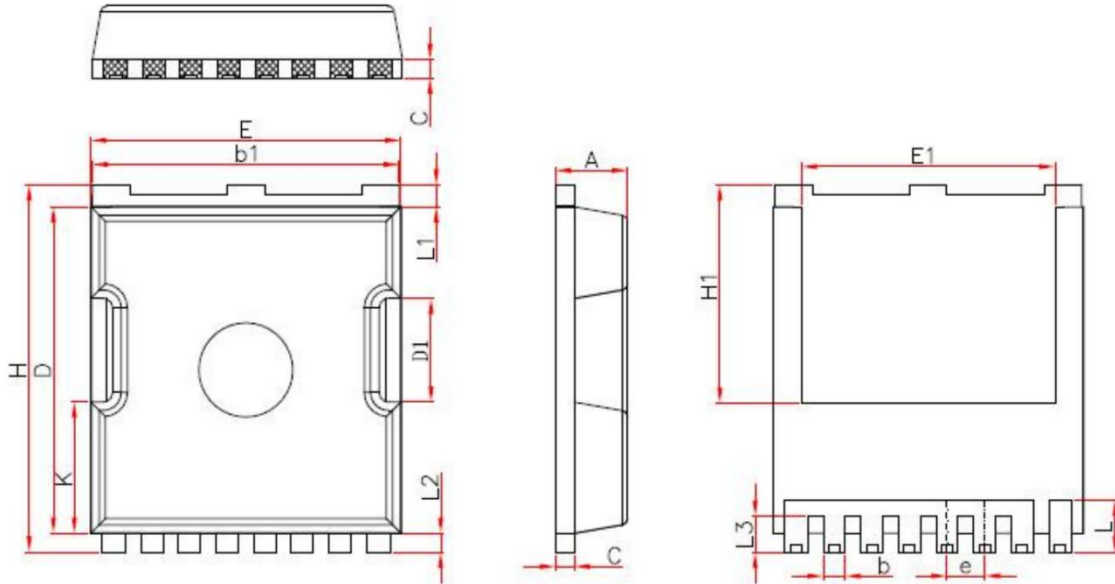


Figure 11 Normalized Maximum Transient Thermal Impedance

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	0.027
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