

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	I_D
40V	3.5mΩ@10V	130A

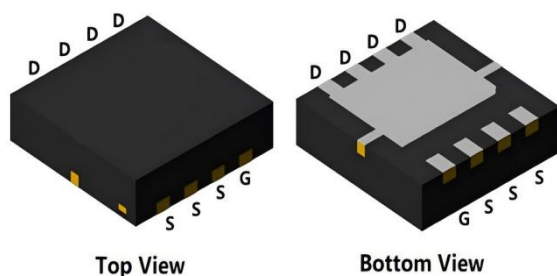
Feature

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

Application

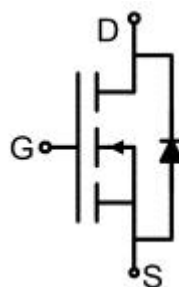
- Power switching application
- Uninterruptible power supply
- DC/DC converter

Package

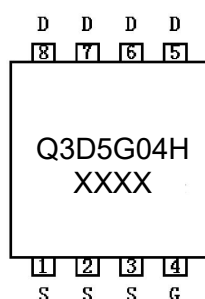


DFN3.3*3.3-8L

Circuit diagram



Marking



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

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V _{DS}	40	V
Gate-Source Voltage	V _{GS}	±20	V
Continuous Drain Current ¹⁾ (V _{GS} =10V)	I _D	130	A
Continuous Drain Current ¹⁾ (V _{GS} =10V, T _c =100°C)	I _D (100°C)	92	A
Pulsed Drain Current (t _p ≤ 10μs)	I _{DM}	520	A
Single Pulse Avalanche Energy ²⁾	E _{AS}	172.98	mJ
Power Dissipation ^{1,3)}	P _D	100	W
Thermal Resistance Junction to Case	R _{θJC}	1.5	°C/W
Operating Junction Temperature	T _J	-55 ~ +175	°C
Storage Temperature Range	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	$V_{(BR)DSS}$	$V_{GS}=0V, I_D=250\mu A$	40			V
Zero gate voltage drain current	I_{DSS}	$V_{DS}=32V, V_{GS}=0V$			1	μA
Gate-body leakage current	I_{GSS}	$V_{DS}=0V, V_{GS}=\pm 20V$			± 100	nA
Gate threshold voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	2.2	2.8	3.7	V
Drain-source on-resistance	$R_{DS(on)}$	$V_{GS}=10V, I_D=20A$		2.8	3.5	m Ω
Dynamic characteristics ⁴⁾						
Input Capacitance	C_{iss}	$V_{DS}=20V, V_{GS}=0V, f=1MHz$		2134		pF
Output Capacitance	C_{oss}			1093		
Reverse Transfer Capacitance	C_{rss}			76		
Total Gate Charge	Q_g	$V_{DS}=20V, V_{GS}=10V, I_D=20A$		38.2		nC
Gate-Source Charge	Q_{gs}			10.6		
Gate-Drain Charge	Q_{gd}			10.6		
Turn-on delay time	$t_{d(on)}$	$V_{DS}=20V, V_{GS}=10V, I_D=20A$ $R_G=3\Omega$		17		nS
Turn-on rise time	t_r			59		
Turn-off delay time	$t_{d(off)}$			28		
Turn-off fall time	t_f			16		
Source-Drain Diode characteristics						
Diode Forward Current	I_S				130	A
Diode Forward voltage	V_{SD}	$V_{GS}=0V, I_S=20A$			1.2	V
Reverse Recovery Time	T_{rr}	$V_{GS}=0V, V_R=20V, I_F=20A$ $di/dt=100A/\mu s$		31.5		nS
Reverse Recovery Charge	Q_{rr}			25		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_J=25°C, V_G=10V, R_G=25Ω, L=1mH, I_{AS}=18.6A.
- 3) Thermal resistance from junction to soldering point (on the exposed drain pad).
- 4) Guaranteed by design, not subject to production testing.

Typical Characteristics

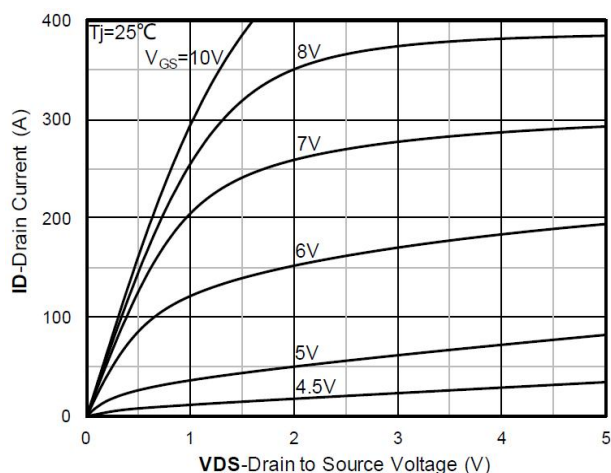


Figure 1. Output Characteristics; typical values

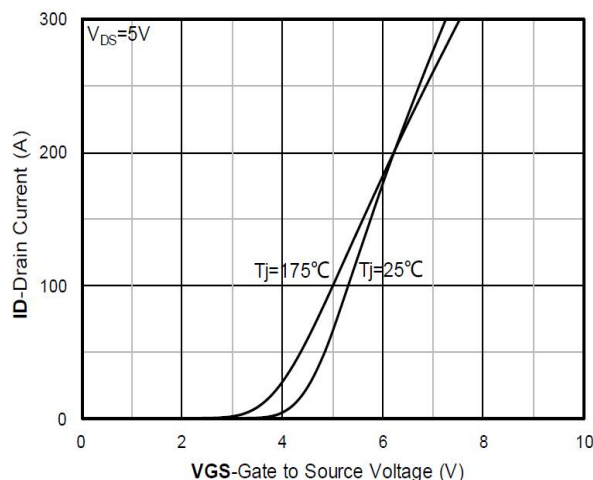


Figure 2. Transfer Characteristics; typical values

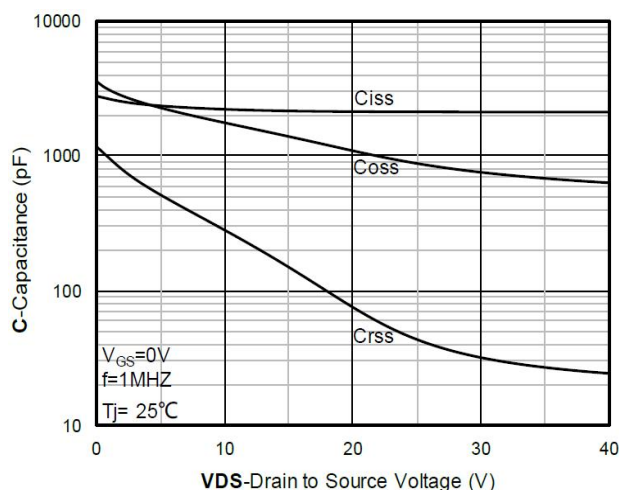


Figure 3. Capacitance Characteristics; typical values

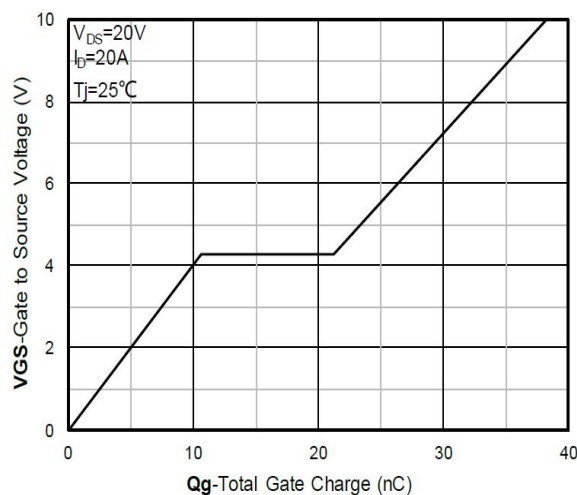


Figure 4. Gate Charge; typical values

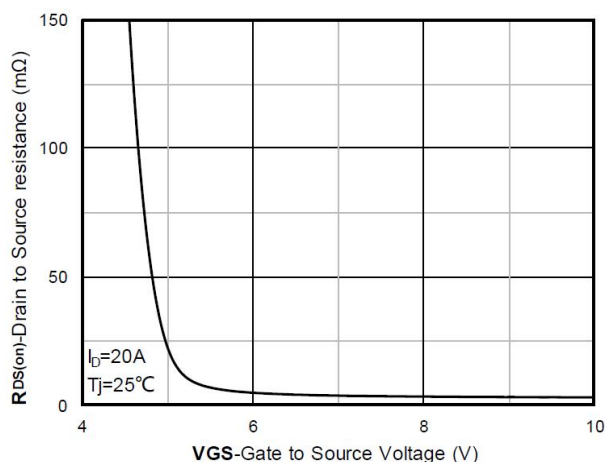


Figure 5. On-Resistance vs. Gate to Source Voltage; typical values

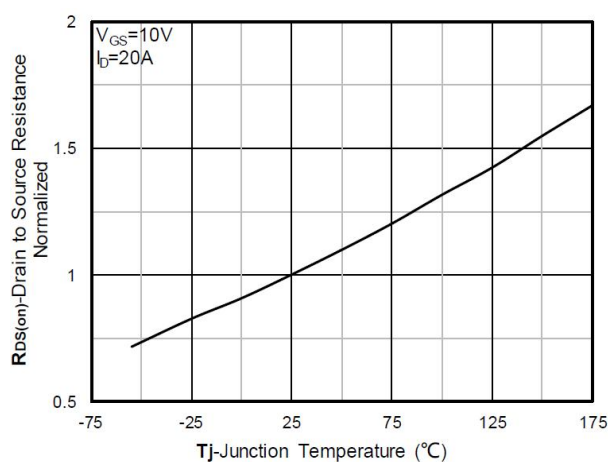


Figure 6. Normalized On-Resistance

Typical Characteristics

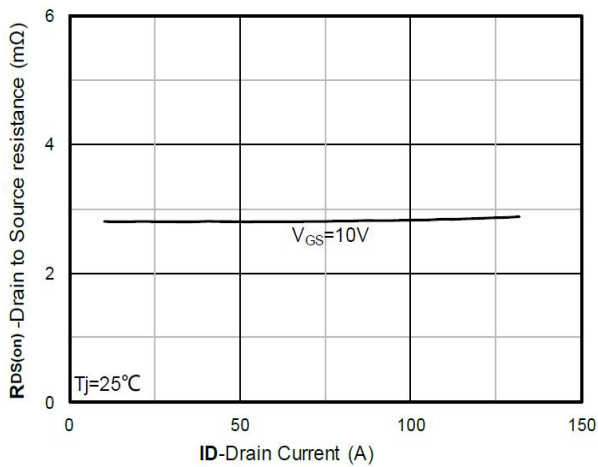


Figure 7. $R_{DS(on)}$ vs. Drain Current; typical values

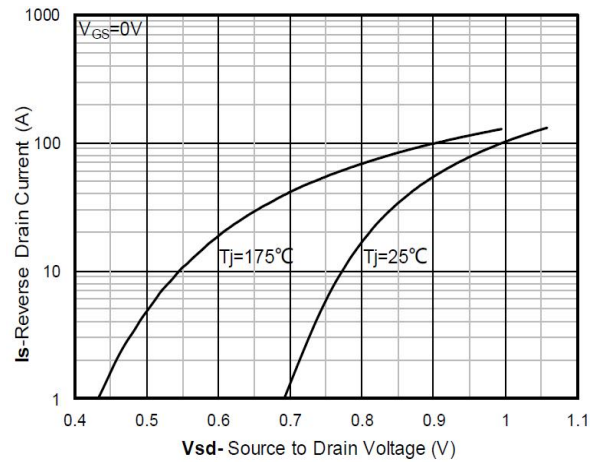


Figure 8. Forward characteristics of reverse diode; typical values

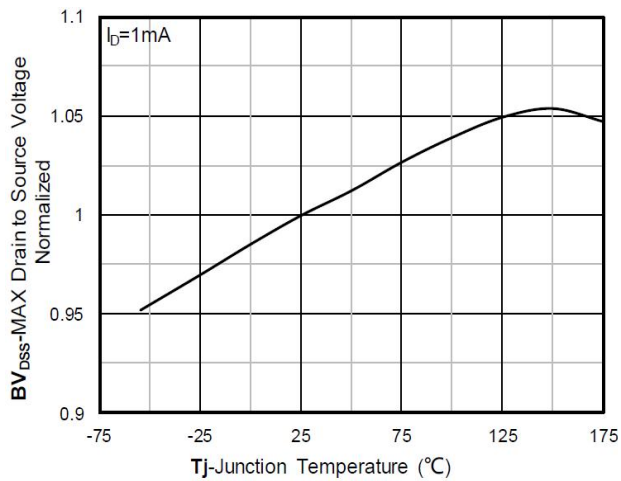


Figure 9. Normalized breakdown voltage

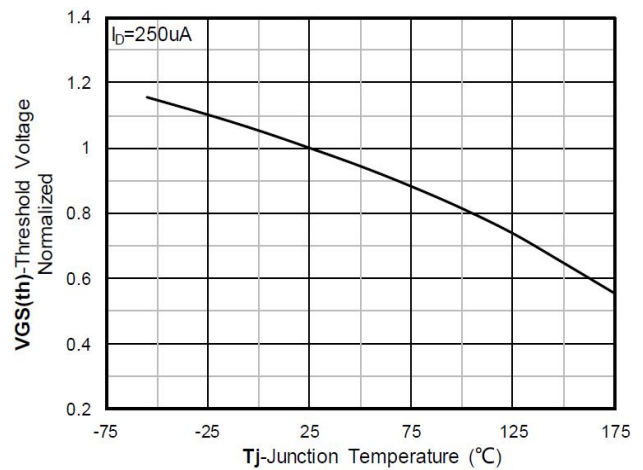


Figure 10. Normalized Threshold voltage

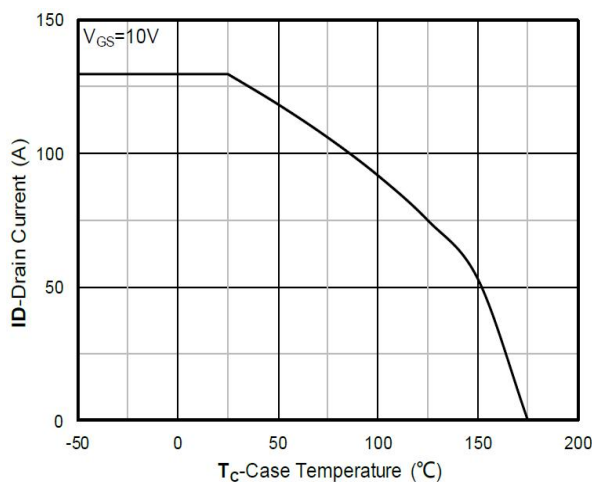


Figure 11. Current dissipation

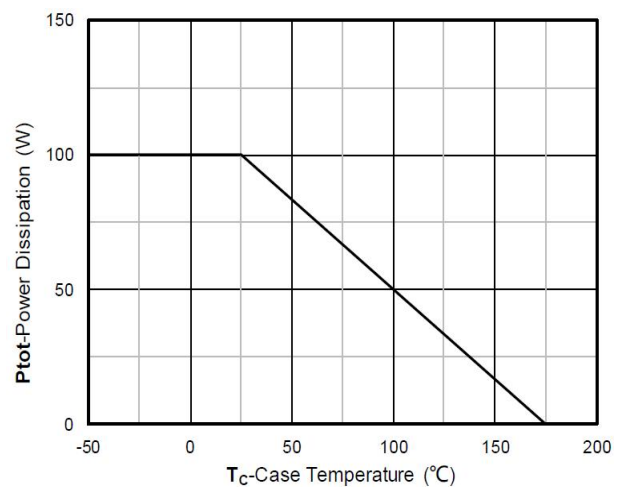


Figure 12. Power dissipation

Typical Characteristics

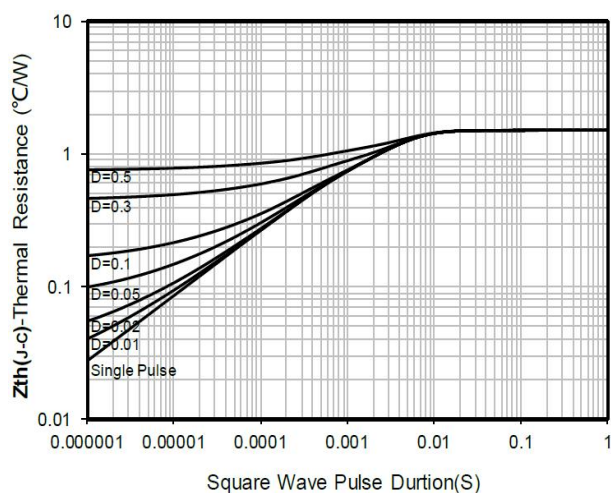


Figure 13. Maximum Transient Thermal Impedance

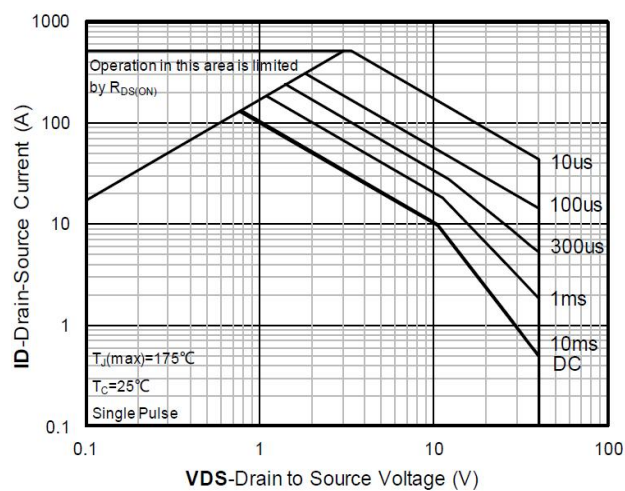
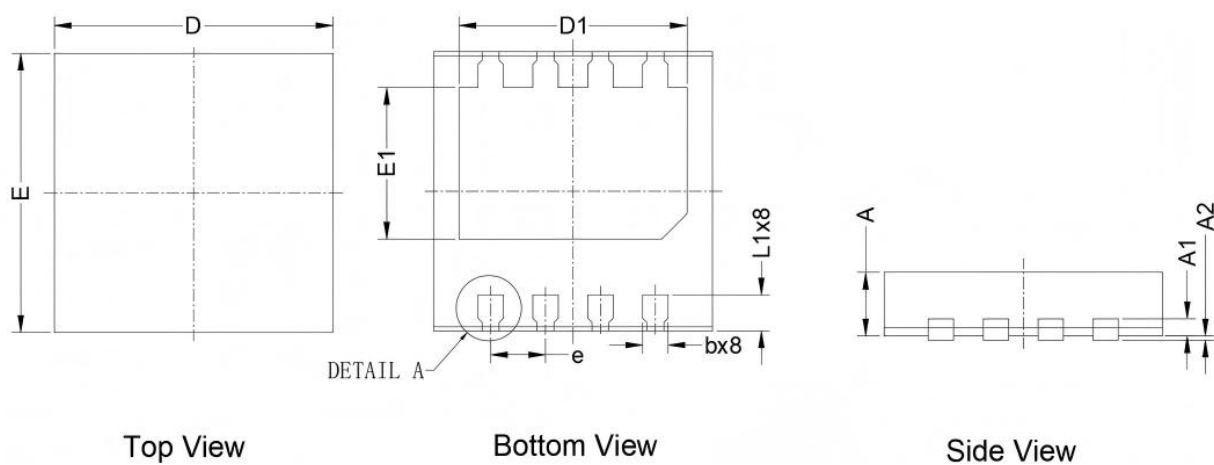


Figure 14. Safe Operation Area

DFN3.3*3.3-8L Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
D	3.300 BSC.		0.130 BSC.	
E	3.300 BSC.		0.130 BSC.	
A	0.700	0.800	0.028	0.031
A1	0.203 BSC.		0.008 BSC.	
A2	0.000	0.100	0.000	0.004
D1	2.600	2.800	0.102	0.110
E1	1.690	1.890	0.067	0.074
L1	0.325	0.525	0.013	0.021
b	0.200	0.400	0.008	0.016
e	0.650 BSC.		0.026 BSC.	