

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	I_D
40V	7mΩ@10V	50A

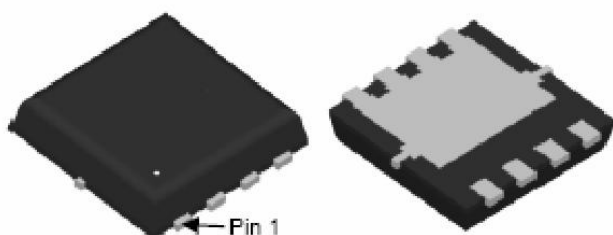
Feature

- High density cell design for ultra low $R_{DS(on)}$
- Split gate trench MOSFET technology
- Excellent package for heat dissipation
- Suffix "-Q1" for AEC-Q101

Application

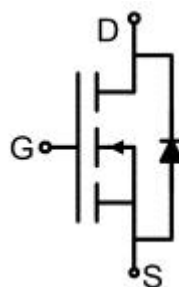
- Power switching application
- Uninterruptible power supply
- DC-DC convertor

Package

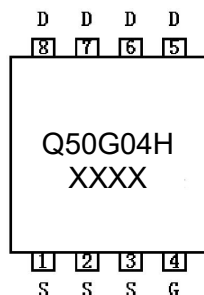


DFN3.3*3.3-8L

Circuit diagram



Marking



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

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	40	V
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current ($T_C=25^{\circ}\text{C}$)	I_D	50	A
Continuous Drain Current ($T_C=100^{\circ}\text{C}$)	$I_D(100^{\circ}\text{C})$	35	A
Pulsed Drain Current ¹⁾	I_{DM}	200	A
Avalanche Energy ²⁾	E_{AS}	72	mJ
Power Dissipation ³⁾ ($T_C=25^{\circ}\text{C}$)	P_D	50	W
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	3	$^{\circ}\text{C}/\text{W}$
Junction Temperature	T_J	175	$^{\circ}\text{C}$
Storage Temperature	T_{STG}	-55 ~ +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	$V_{(BR)DSS}$	$V_{GS}=0V, I_D=250\mu A$	40			V
Zero gate voltage drain current	I_{DSS}	$V_{DS}=40V, V_{GS}=0V$			1	μA
Gate-body leakage current	I_{GSS}	$V_{GS}=\pm 20V, V_{DS}=0V$			± 100	nA
Gate threshold voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	2	3	4	V
Drain-source on-resistance	$R_{DS(on)}$	$V_{GS}=10V, I_D=20A$		5.3	7	m Ω
Dynamic characteristics ⁴⁾						
Input Capacitance	C_{iss}	$V_{DS}=20V, V_{GS}=0V, f=1MHz$		965		pF
Output Capacitance	C_{oss}			350		
Reverse Transfer Capacitance	C_{rss}			11		
Total Gate Charge	Q_g	$V_{DS}=20V, V_{GS}=10V, I_D=25A$		12.5		nC
Gate-Source Charge	Q_{gs}			4.6		
Gate-Drain Charge	Q_{gd}			2.9		
Turn-on delay time	$t_{d(on)}$	$V_{DD}=20V, V_{GS}=10V, I_D=25A, R_{GEN}=2.2\Omega$		9		nS
Turn-on rise time	t_r			127		
Turn-off delay time	$t_{d(off)}$			14		
Turn-off fall time	t_f			5		
Source-Drain Diode characteristics						
Diode Forward Current	I_S				50	A
Diode Forward voltage	V_{SD}	$V_{GS}=0V, I_S=20A$			1.2	V
Reverse Recovery Time	t_{rr}	$I_F=25A, di/dt=170A/\mu s$		17.5		nS
Reverse Recovery Charge	Q_{rr}			10		nC

Notes:

- 1) Repetitive rating; pulse width limited by max. junction temperature.
- 2) $T_J=25^{\circ}\text{C}, V_G=10\text{V}, R_G=25\Omega, L=1\text{mH}, I_{AS}=12\text{A}$.
- 3) P_d is based on max. junction temperature, using junction-case thermal resistance.
- 4) Guaranteed by design, not subject to production testing.

Typical Characteristics

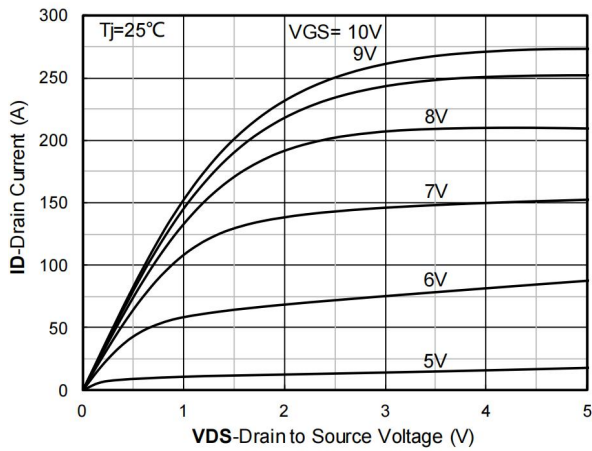


Figure 1. Output Characteristics

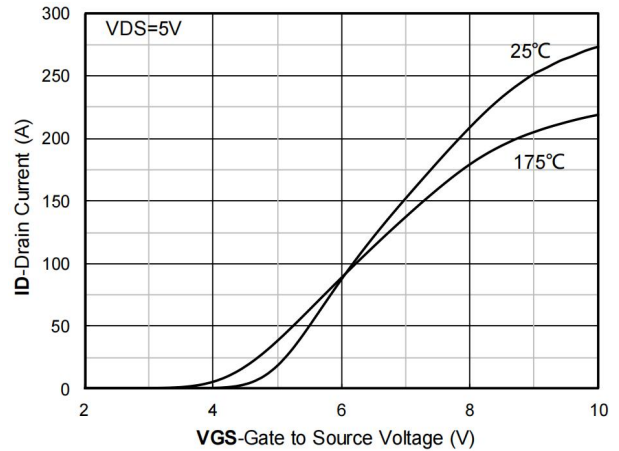


Figure 2. Transfer Characteristics

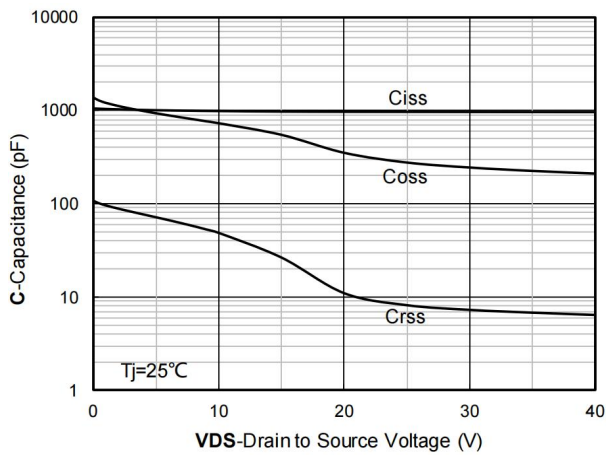


Figure 3. Capacitance Characteristics

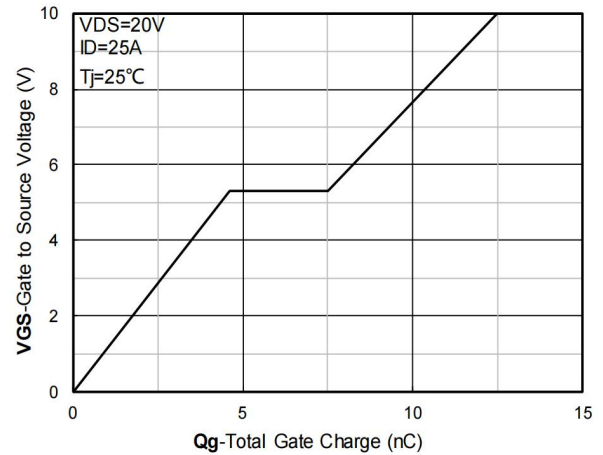


Figure 4. Gate Charge

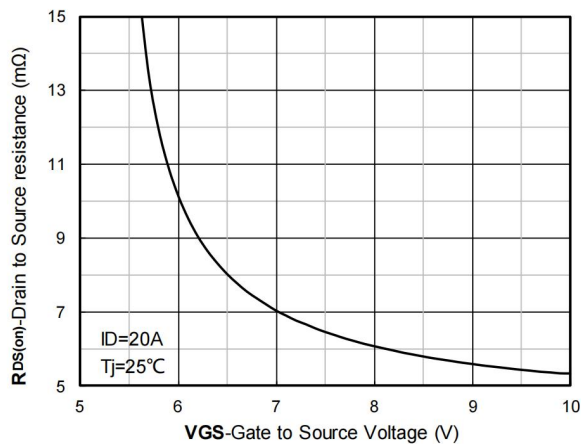


Figure 5. On-Resistance vs Gate to Source Voltage

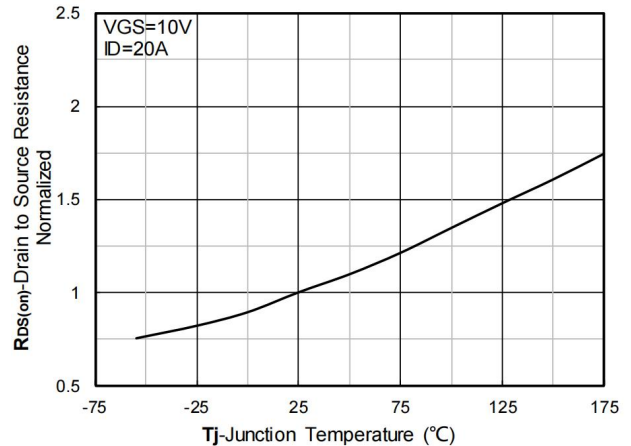


Figure 6. Normalized On-Resistance

Typical Characteristics

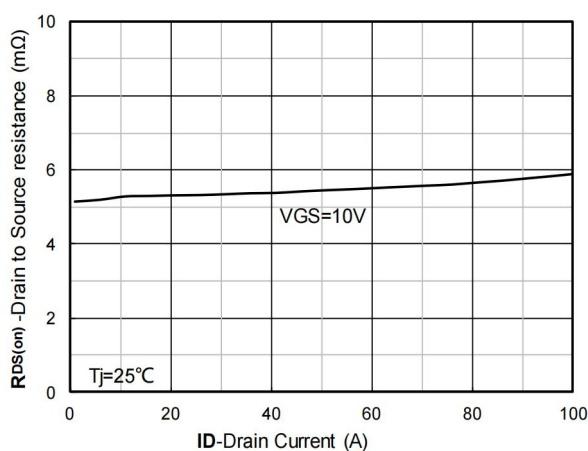


Figure 7. $R_{DS(on)}$ VS Drain Current

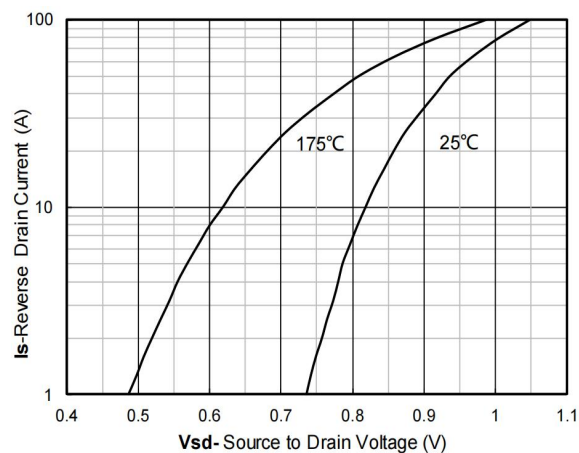


Figure 8. Forward characteristics of reverse diode

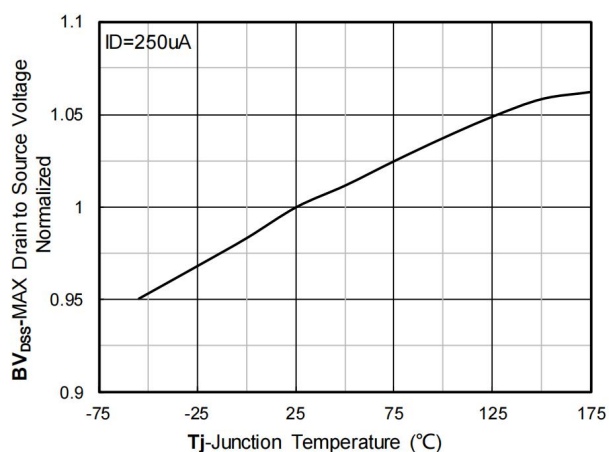


Figure 9. Normalized breakdown voltage

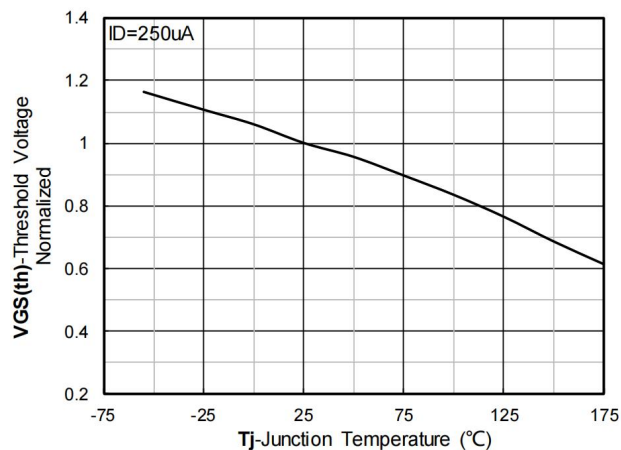


Figure 10. Normalized Threshold voltage

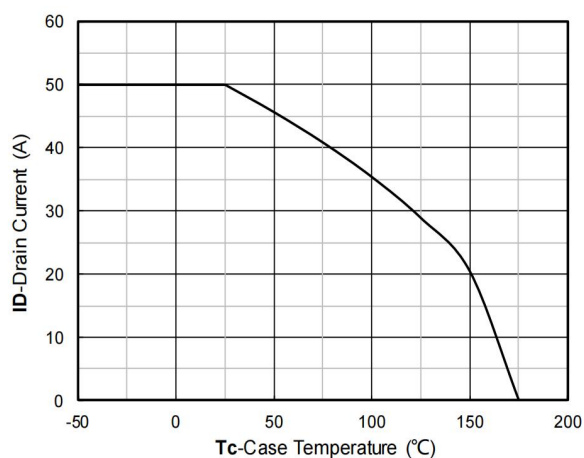


Figure 11. Current dissipation

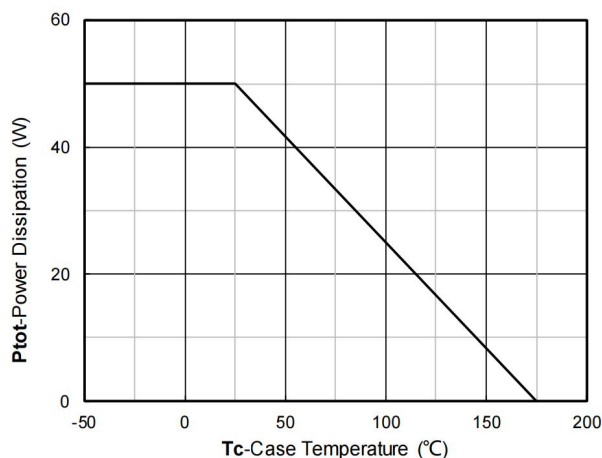


Figure 12. Power dissipation

Typical Characteristics

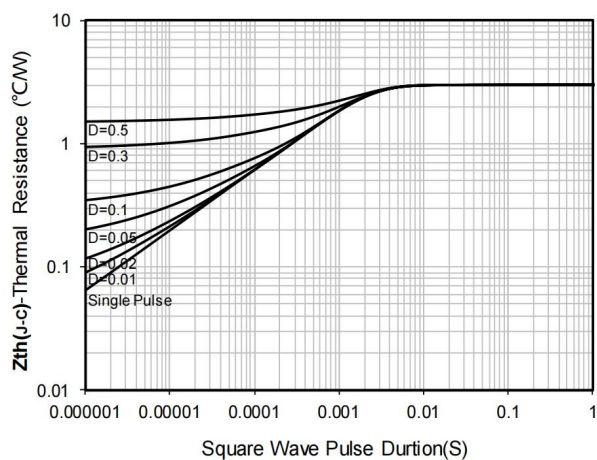


Figure 13. Maximum Transient Thermal Impedance

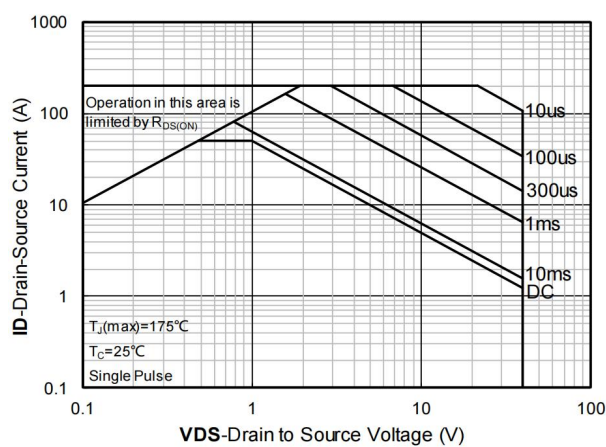
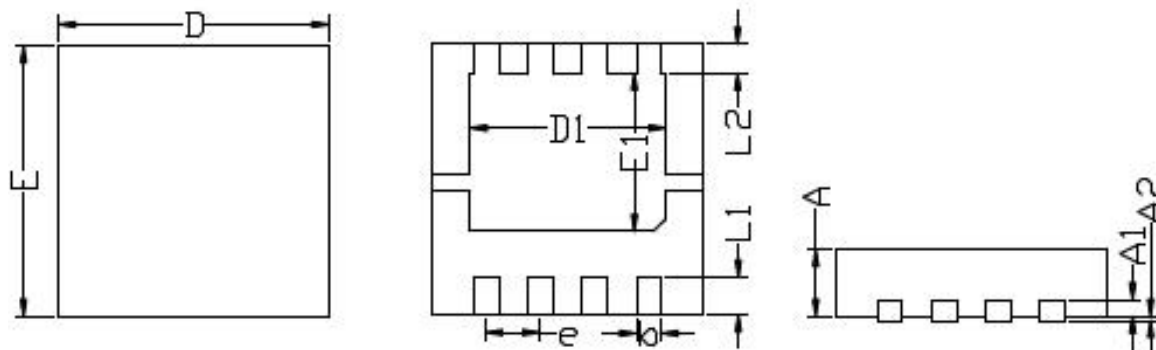


Figure 14. Safe Operation Area

DFN3.3*3.3-8L Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.700	0.900	0.027	0.035
A1	0.200BSC		0.008BSC	
A2	0.000	0.100	0.000	0.004
b	0.200	0.400	0.008	0.016
D	3.150	3.350	0.124	0.132
D1	2.200	2.500	0.086	0.098
E	3.150	3.350	0.124	0.132
E1	1.800	2.000	0.071	0.079
e	0.650 BSC		0.026 BSC	
L1	0.350	0.550	0.013	0.022
L2	0.350 BSC		0.014BSC	