

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	I_D
100V	12.5mΩ@10V	45A
	16mΩ@4.5V	

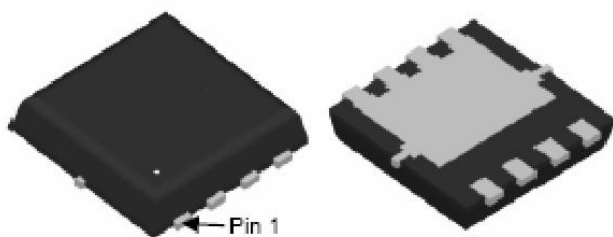
Feature

- 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

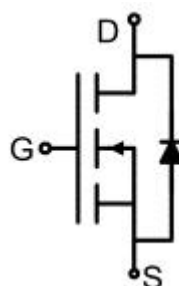
- Power switching application
- Uninterruptible power supply
- DC/DC converter

Package

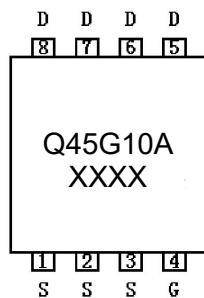


DFN3.3*3.3-8L

Circuit diagram



Marking



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

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	100	V
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current ($T_C=25^{\circ}\text{C}$)	I_D	45	A
Continuous Drain Current ($T_C=100^{\circ}\text{C}$)	$I_D (100^{\circ}\text{C})$	28	A
Pulsed Drain Current ¹⁾	I_{DM}	170	A
Avalanche Energy ²⁾	E_{AS}	100	mJ
Power Dissipation ³⁾ ($T_C=25^{\circ}\text{C}$)	P_D	46	W
Thermal Resistance, Junction-to-Ambient ⁴⁾	$R_{\theta JA}$	60	$^{\circ}\text{C/W}$
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	2.7	$^{\circ}\text{C/W}$
Junction Temperature	T_J	150	$^{\circ}\text{C}$
Storage Temperature	T_{STG}	-55 ~ +150	$^{\circ}\text{C}$

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 _{GS} =±20V, V _{DS} = 0V			±100	nA
Gate threshold voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250μA	1	1.7	3	V
Drain-source on-resistance	R _{DS(on)}	V _{GS} =10V, I _D =22.5A		10	12.5	mΩ
		V _{GS} =10V, I _D =20A		10	12.5	
		V _{GS} =4.5V, I _D =20A		12.5	16	
Dynamic characteristics ⁵⁾						
Input Capacitance	C _{iss}	V _{DS} =50V,V _{GS} =0V,f =1MHz		1800		pF
Output Capacitance	C _{oss}			590		
Reverse Transfer Capacitance	C _{rss}			20		
Total Gate Charge	Q _g	V _{DS} =50V,V _{GS} =10V, I _D =25A		30		nC
Gate-Source Charge	Q _{gs}			9		
Gate-Drain Charge	Q _{gd}			4		
Gate Resistance	R _g	f=1MHz, Open drain		1.4		Ω
Turn-on delay time	t _{d(on)}	V _{DD} =50V,V _{GS} =10V, I _D =25A,R _{GEN} =3Ω		13		nS
Turn-on rise time	t _r			52		
Turn-off delay time	t _{d(off)}			26		
Turn-off fall time	t _f			77		
Source-Drain Diode characteristics						
Diode Forward Current	I _S				45	A
Diode Forward voltage	V _{SD}	V _{GS} =0V, I _S =22.5A			1.2	V
Reverse Recovery Time	t _{rr}	I _F =25A,di/dt = 100A/μs		35		nS
Reverse Recovery Charge	Q _{rr}			26		nC

Notes:

- 1) Repetitive rating; pulse width limited by max. junction temperature.
- 2) $T_J=25^{\circ}\text{C}$, $V_G=10V$, $R_G=25\Omega$, $L=0.5mH$, $I_{AS}=20A$.
- 3) P_D is based on max. junction temperature, using junction-case thermal resistance.
- 4) The value of $R_{\theta JA}$ is measured with the device mounted on 1in² FR-4 board with 2oz. Copper, in the still air environment with $T_A=25^{\circ}\text{C}$. The maximum allowed junction temperature of 150°C .
The value in any given application depends on the user's specific board design.
- 5) Guaranteed by design, not subject to production testing.

Typical Characteristics

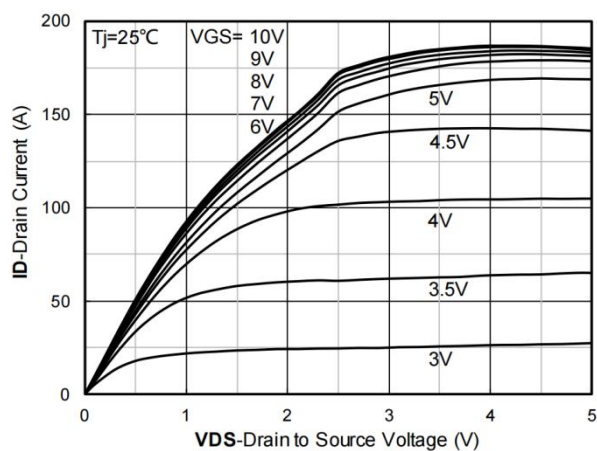


Figure 1. Output Characteristics

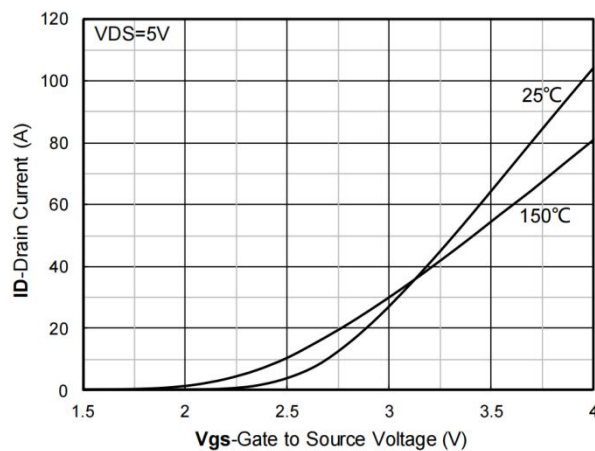


Figure 2. Transfer Characteristics

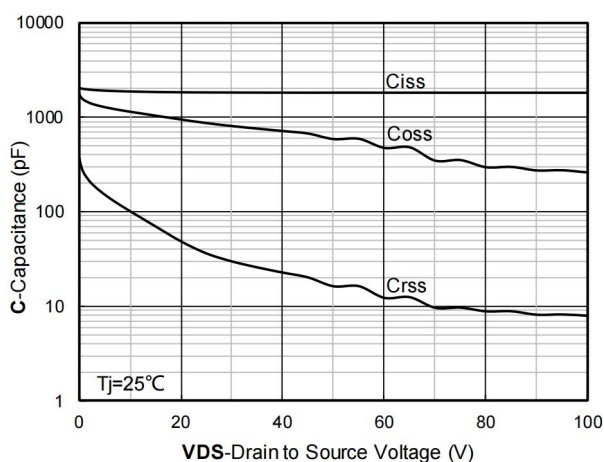


Figure 3. Capacitance Characteristics

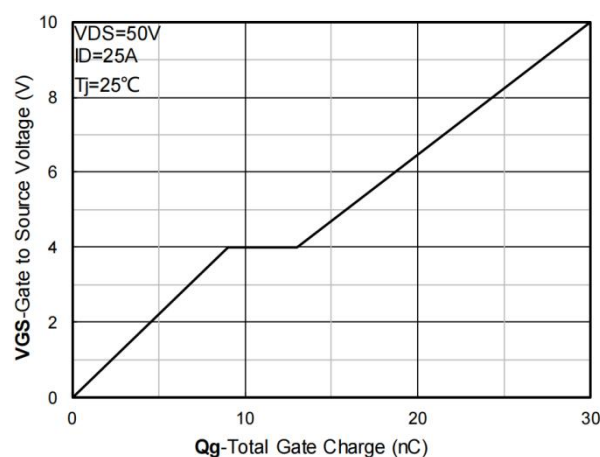


Figure 4. Gate Charge

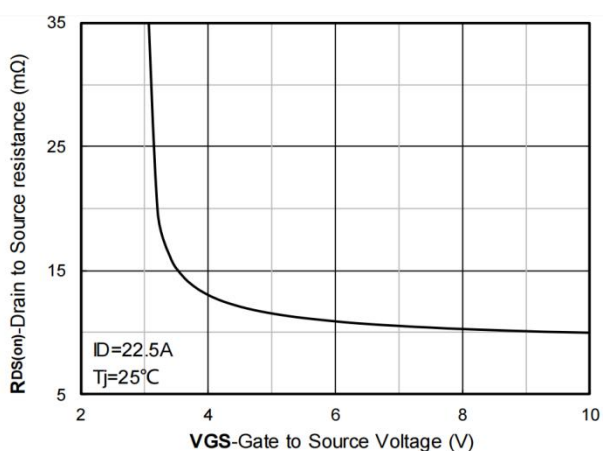


Figure 5. On-Resistance vs Gate to Source Voltage

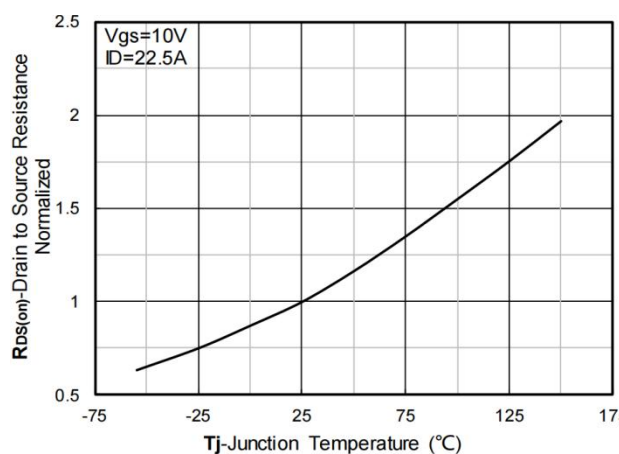


Figure 6. Normalized On-Resistance

Typical Characteristics

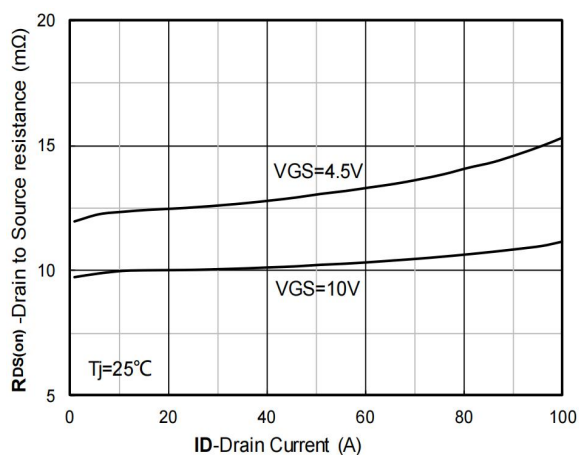


Figure 7. $R_{DS(on)}$ VS Drain Current

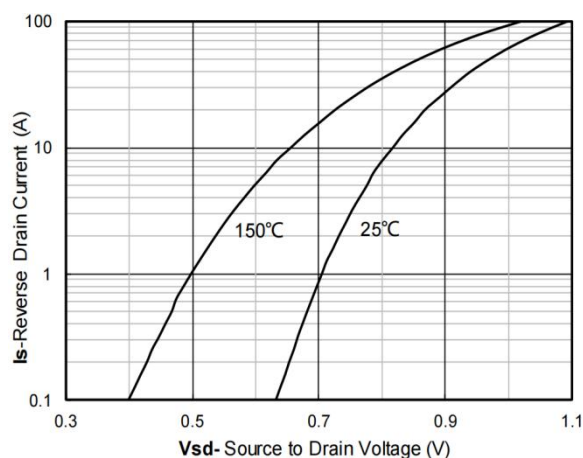


Figure 8. Forward characteristics of reverse diode

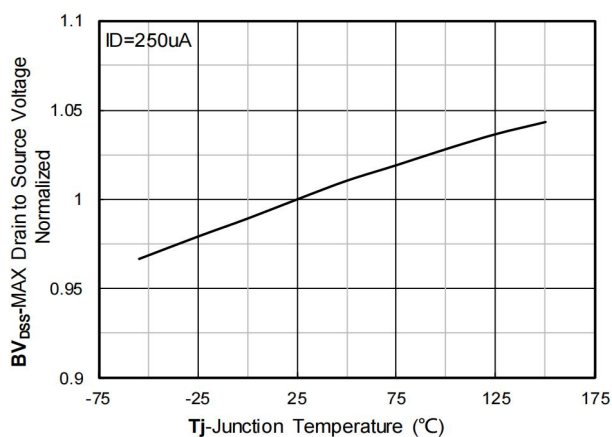


Figure 9. Normalized breakdown voltage

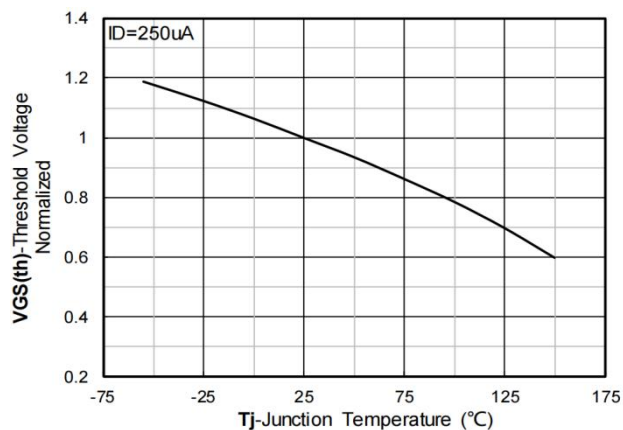


Figure 10. Normalized Threshold voltage

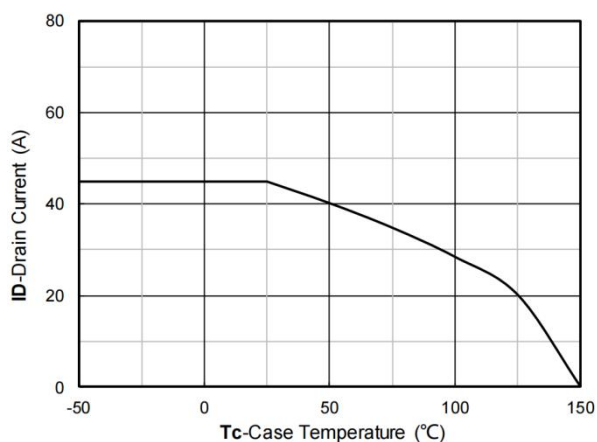


Figure 11. Current dissipation

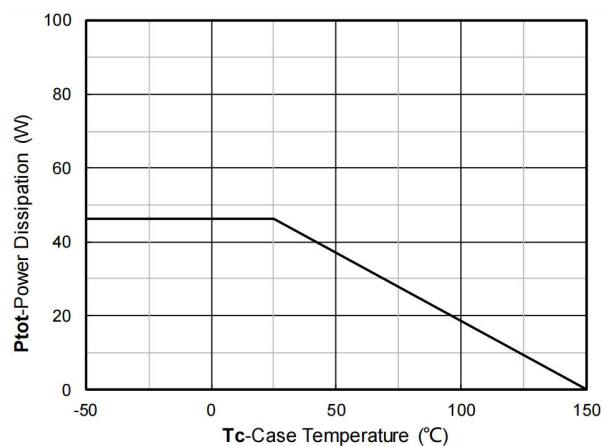


Figure 12. Power dissipation

Typical Characteristics

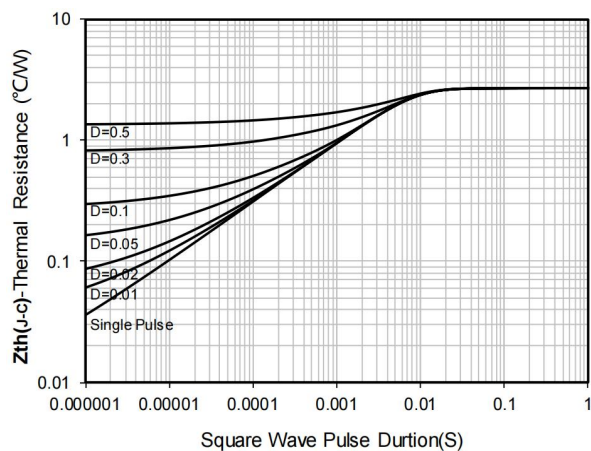


Figure 13. Maximum Transient Thermal Impedance

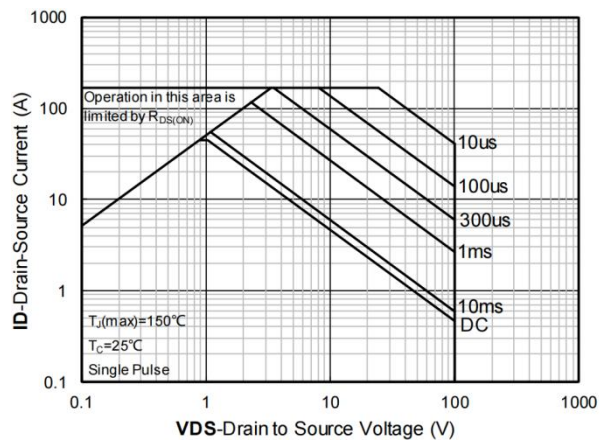
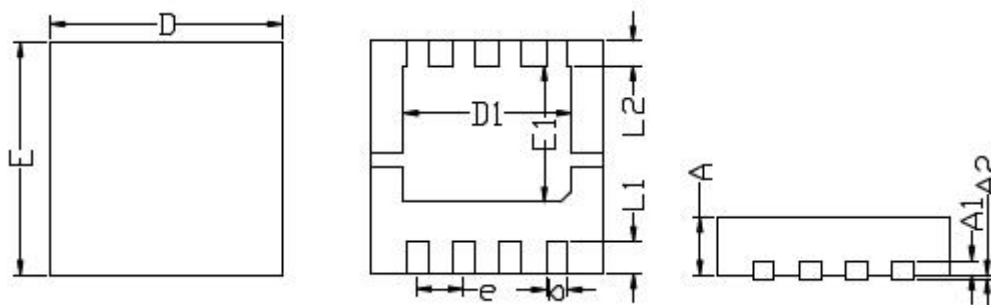


Figure 14. Safe Operation Area

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	