

### Product Summary

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	$I_D$
100V	21mΩ@10V	40A
	25mΩ@6V	

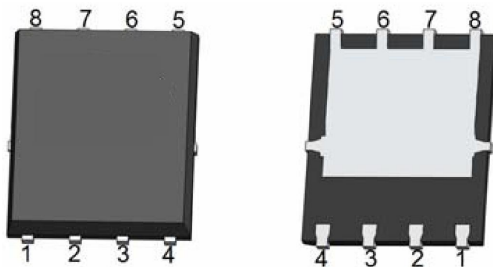
### Feature

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

### Application

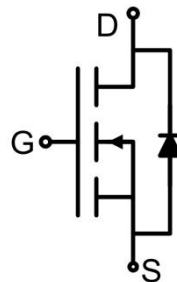
- DC/DC converter
- Power switching application
- Uninterruptible power supply

### Package

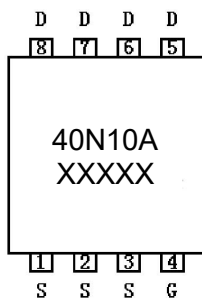


DFN5X6-8L

### Circuit diagram



### Marking



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

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V <sub>DS</sub>	100	V
Gate-Source Voltage	V <sub>GS</sub>	±20	V
Continuous Drain Current (T <sub>c</sub> =25°C)	I <sub>D</sub>	40	A
Continuous Drain Current (T <sub>c</sub> =100°C)	I <sub>D</sub>	25	A
Pulsed Drain Current	I <sub>DM</sub>	100	A
Power Dissipation (T <sub>c</sub> =25°C)	P <sub>D</sub>	70	W
Thermal Resistance,Junction-to-Ambient	R <sub>θJA</sub>	50	°C/W
Thermal Resistance,Junction-to-Case	R <sub>θJC</sub>	1.8	°C/W
Single pulse avalanche energy	E <sub>AS</sub>	84	mJ
Junction Temperature	T <sub>J</sub>	150	°C
Storage Temperature	T <sub>STG</sub>	-55 ~ +150	°C

### Electrical characteristics (T<sub>J</sub>=25 °C, unless otherwise noted)

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
<b>Static Characteristics</b>						
Drain-source breakdown voltage	V <sub>(BR)DSS</sub>	V <sub>GS</sub> = 0V, I <sub>D</sub> =250μA	100			V
Zero gate voltage drain current	I <sub>DSS</sub>	V <sub>DS</sub> =100V, V <sub>GS</sub> = 0V			1	μA
Gate-body leakage current	I <sub>GSS</sub>	V <sub>GS</sub> =±20V, V <sub>DS</sub> = 0V			±100	nA
Gate threshold voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250μA	2.0		4.0	V
Drain-source on-resistance <sup>1)</sup>	R <sub>DS(on)</sub>	V <sub>GS</sub> =10V, I <sub>D</sub> =20A		16	21	mΩ
		V <sub>GS</sub> =6V, I <sub>D</sub> =20A		19	25	
Gate resistance	R <sub>G</sub>	f=1.0MHz		1.4		Ω
<b>Dynamic characteristics<sup>2)</sup></b>						
Input Capacitance	C <sub>iss</sub>	V <sub>DS</sub> =50V, V <sub>GS</sub> =0V, f =1MHz		1200		pF
Output Capacitance	C <sub>oss</sub>			350		
Reverse Transfer Capacitance	C <sub>rss</sub>			11		
Total Gate Charge	Q <sub>g</sub>	V <sub>DS</sub> =50V, V <sub>GS</sub> =10V, I <sub>D</sub> =20A		32		nC
Gate-Source Charge	Q <sub>gs</sub>			11		
Gate-Drain Charge	Q <sub>gd</sub>			5		
Turn-on delay time	t <sub>d(on)</sub>	V <sub>DD</sub> =50V, V <sub>GS</sub> =10V, I <sub>D</sub> =20A, R <sub>GEN</sub> =2.2Ω		51		nS
Turn-on rise time	t <sub>r</sub>			14		
Turn-off delay time	t <sub>d(off)</sub>			69		
Turn-off fall time	t <sub>f</sub>			21		
<b>Source-Drain Diode characteristics</b>						
Diode Forward Current <sup>1)</sup>	I <sub>S</sub>				40	A
Diode Forward voltage	V <sub>SD</sub>	V <sub>GS</sub> =0V, I <sub>S</sub> =20A			1.2	V
Reverse Recovery Time	t <sub>rr</sub>	T <sub>J</sub> = 25°C, I <sub>F</sub> =20A di/dt = 100A/μs <sup>1)</sup>		52		nS
Reverse Recovery Charge	Q <sub>rr</sub>				84	

Notes:

- 1) Pulse Test: Pulse Width < 300μs, Duty Cycle ≤2%.
- 2) Guaranteed by design, not subject to production testing.

## Typical Characteristics

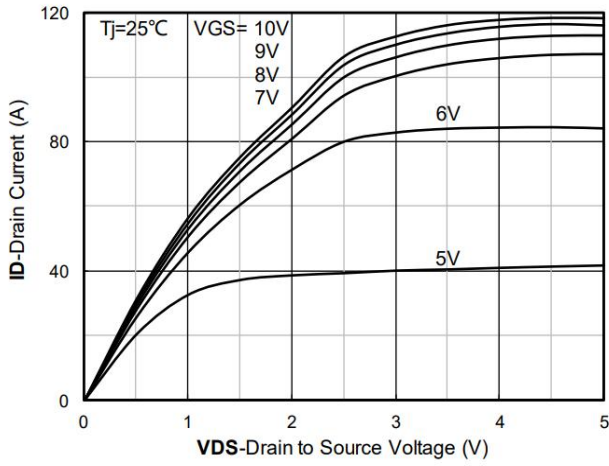


Figure 1. Output Characteristics

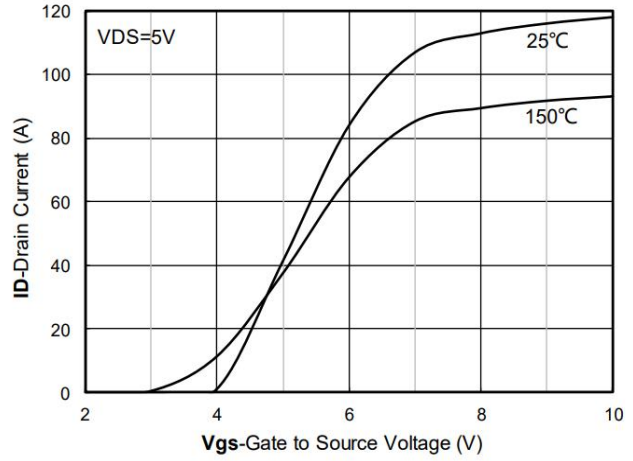


Figure 2. Transfer Characteristics

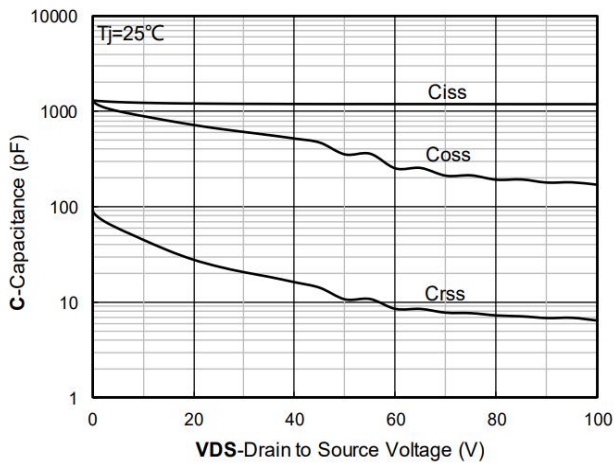


Figure 3. Capacitance Characteristics

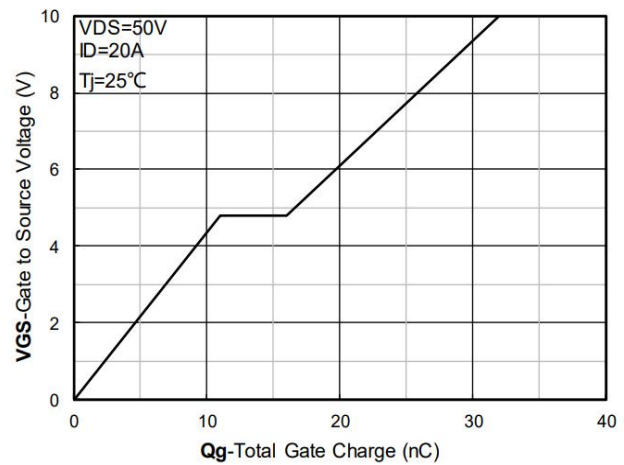


Figure 4. Gate Charge

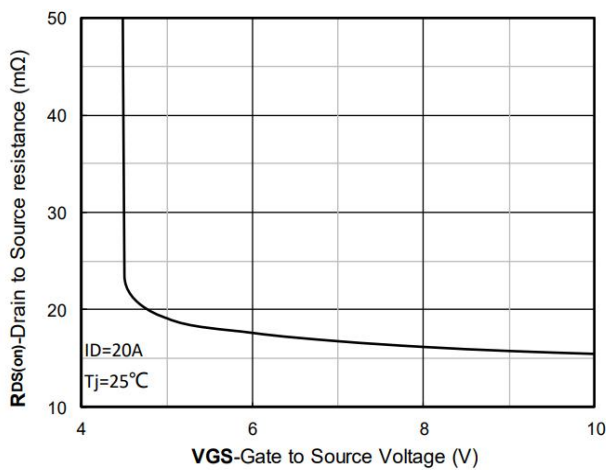


Figure 5. On-Resistance vs Gate to Source Voltage

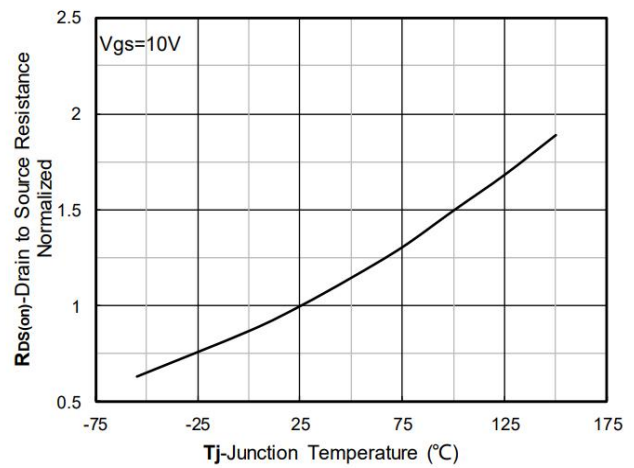


Figure 6. Normalized On-Resistance

## Typical Characteristics

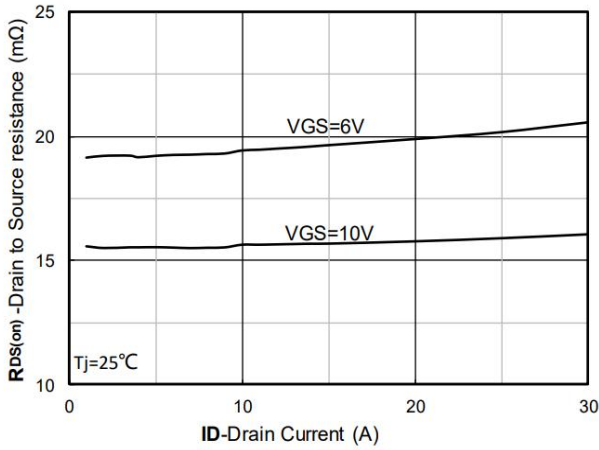


Figure 7. RDS(on) VS Drain Current

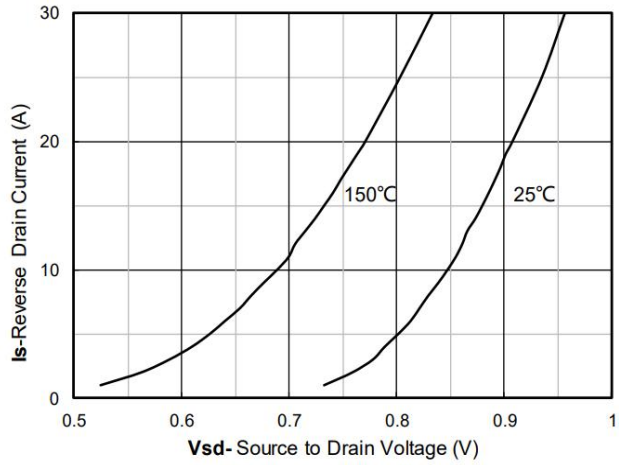


Figure 8. Forward characteristics of reverse diode

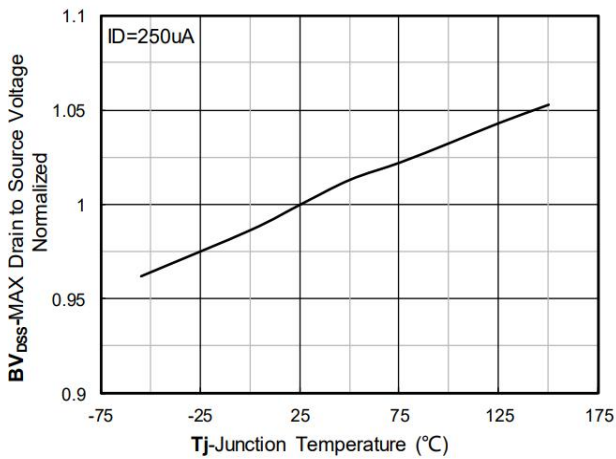


Figure 9. Normalized breakdown voltage

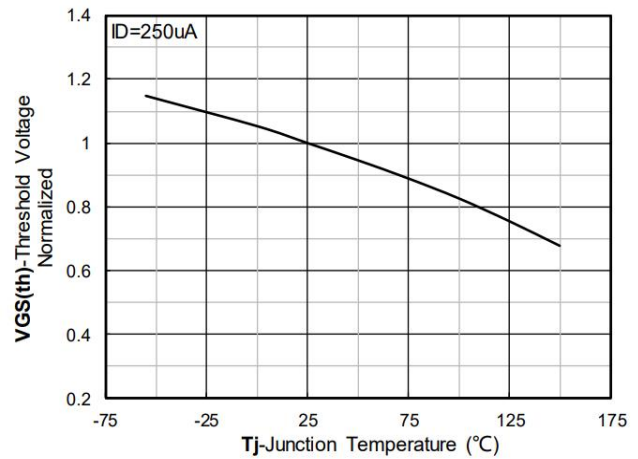


Figure 10. Normalized Threshold voltage

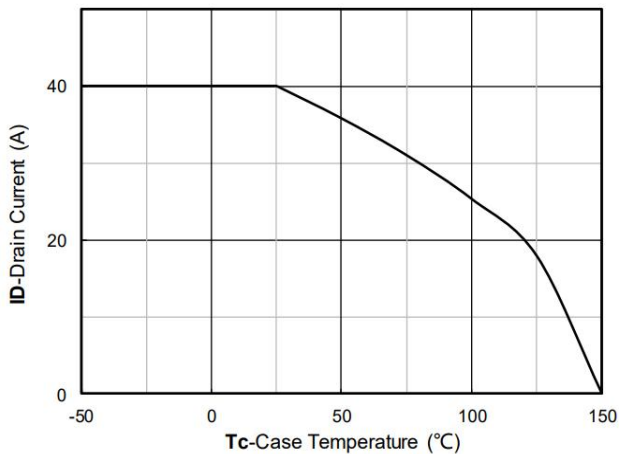


Figure 11. Current dissipation

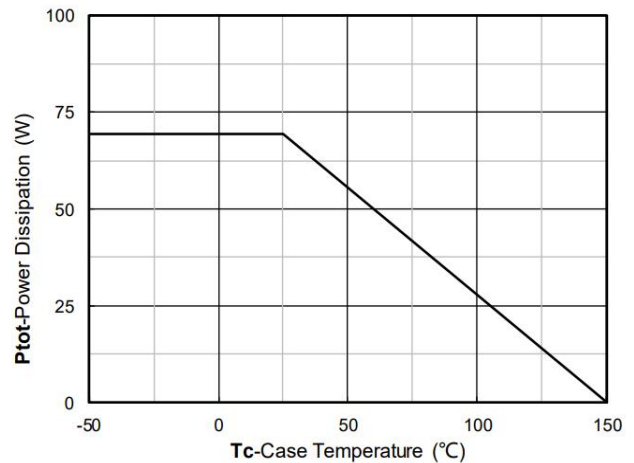


Figure 12. Power dissipation

## Typical Characteristics

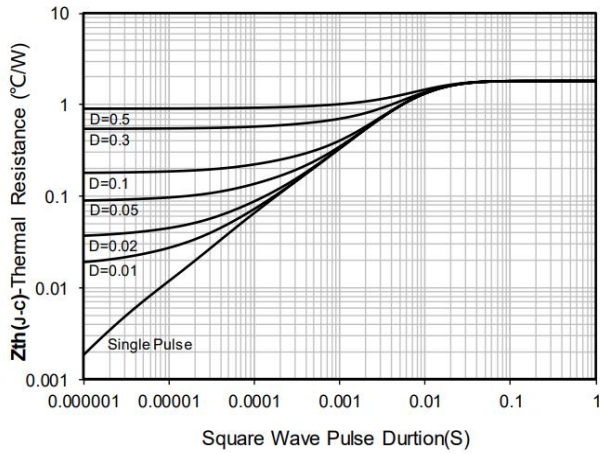


Figure 13. Maximum Transient Thermal Impedance

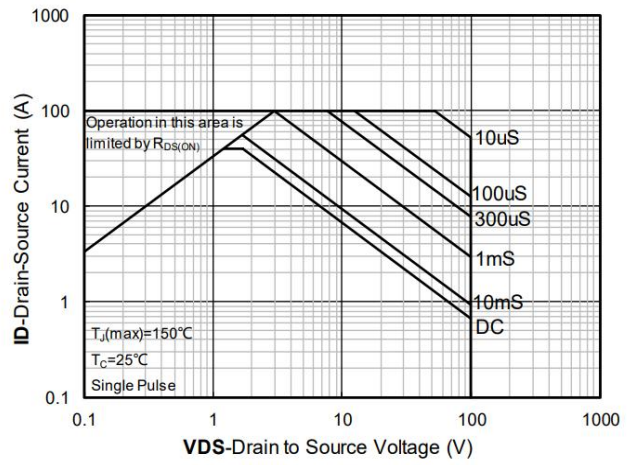
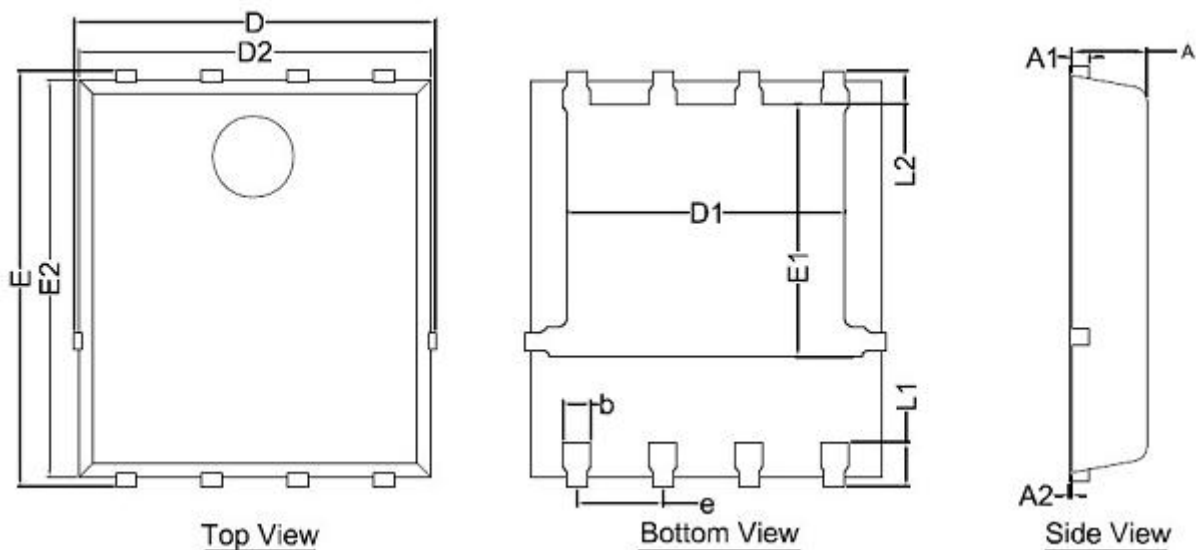


Figure 14. Safe Operation Area

### DFN5X6-8L Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	1.000	1.200	0.039	0.047
A1	0.254BSC.		0.010BSC.	
A2	0.000	0.100		0.004
D	5.150	5.550	0.202	0.219
E	5.950	6.350	0.234	0.250
D1	3.920	4.320	0.154	0.170
E1	3.520	3.920	0.139	0.154
D2	5.000	5.400	0.197	0.212
E2	5.660	6.060	0.223	0.239
b	0.310	0.510	0.012	0.020
e	1.270BSC.		0.050BSC	
L1	0.560	0.760	0.022	0.030
L2	0.500BSC.		0.020BSC	